Oracle Enterprise Metadata Management

User Guide

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Contents

Introduction 11
Explore Metadata 14
Signing In 14
Edit My User Account Details 18
Edit My User Preferences 22
Explorer Panel 22
Browse Hierarchically Using the Explorer Panel 25
Search using the Explorer Panel 41
Search 48
Immediate Search 48
Search in Model 51
Search (Worksheet) Page 54
Search Text 56
Search Syntax 56
Collections 60
Explorer Collections 61
Create a Collection 63
Add Metadata Elements to a Collection 64
Share a Collection 69
Working with Collections 73
Worksheets 75
Explore Worksheets 76
Create a Worksheet 78
Edit a Worksheet 87
Save a Worksheet 105
Manage Worksheets 109
Dashboards 119
Explore Dashboards 119
Create a Dashboard 122
Edit (Customize) a Dashboard 125
Manage Dashboards 156

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Default Dashboards 165
Enterprise Architecture (Configuration) 169
Recently Viewed 172
Favorites 175
Analyze Metadata 176
Metadata Details Page Default Presentation 176
Examples 177
Edit Business Name and Description 185
Custom Attributes 188
Comments tab 194
Related Reports 197
Data Flow 202
Semantic Flow 207
History tab 211
Customization of tabs using Worksheets 215
Associate a Worksheet with the tab on a Details Page 215
Metadata Details Page Customized Presentation 224
Customizing the Details Page Presentation 224
Data Sampling and Profiling 243
Profile Data Attributes 248
Data Sampling and Profiling Sources 249
Data Sampling and Profiling process 249
Showing and Hiding Sample data and Profiling Results 249
Data Sampling and Profiling Technical Details 259
On Demand Data Sampling and Profiling 260
Data and Semantic Flow 260
Data Flow 260
Semantic Flow 272
Related Reports 280
Related Processes 283
Lineage Trace in General 285
Data Flow Overview for Models 311
Relationships 311

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Discovering Relationships 312
Managing and Curating Relationships 313
Dynamic Relationship Diagram 314
Forward Engineering to Business Intelligence Tools 314
Visualize the Diagram of a Model 314
Data Model Diagram Visualization Common Features 315
Label Metadata 322
Compare Metadata 324
Compare Data Store Model Versions 325
Compare Multi-Model Versions 332
Comparing Different Models 339
Comparing Configurations 340
Collaboration with URL Bookmarks 342
Comments and review 342
File Attachments 345
Manage Metadata Content 347
Metadata Harvesting General Principles 347
Create a Model and Import Metadata 348
Analyze the log 361
Assign security roles 363
Create new versions only when new import has changes 365
Propagate documentation 365
Data Sampling and Profiling 366
Email Notification 368
Naming Standards 374
Harvest several Models from a directory of external metadata files. 374
Including Models from an erwin Mart 376
Export to a 3rd Party Tool 377
Assign Security Roles 379
Analyze Versions 379
Viewing the Version History 379
Analyze the Log 381
Open Reports in a Business Intelligence Tool 383

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Manage Enterprise Architecture (Configuration) 386
Changing the Current Configuration 387
Stitching Models Together for Data Flow Tracing 390
Stitching Models Together for Semantic Tracing 396
Architecture Diagram 399
Business Glossary 402
Glossary Workflow 403
Create and Manage a Business Glossary 406
Create a Business Glossary 406
Delete a Business Glossary 435
View Term Management Dashboard 436
Workflow Actions in Grid Mode 439
View Term Changes 442
Assign Workflow Roles 443
Assign a Steward 446
Set the Status of a Term 446
List Terms by Steward Assignment 446
Produce an Audit Log 446
Export a Business Glossary 446
Import a Business Glossary 448
Using the Glossary Export/ImportCSV format 450
Data Cataloging 451
Data Documentation 461
Reuse Business Glossary Terminology 461
Stewardship 468
Explicitly Define the Business Name and Description 468
Semantic Flow Tab and Inferred Business Name and Description 475
Inferred Name and Description Worksheet 483
Social Curation 486
Semantic Type Discovery 488
Auto-tagging 491
Relationship Discovery and Curation 496
Active Data Cataloging 496

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Semantic Mapping and Linking 497
Create a Semantic Mapping 498
View a Semantic Mapping 499
Linking a Metadata Element 500
Edit a Semantic Mapping 505
Auto-detect Child Semantic Links 506
From the Mapping Editor 508
From the Semantic Mapping tab 512
Recursively Remove Child Semantic Links 517
Importing a Semantic Mapping 519
Exporting a Semantic Mapping 520
Data Mappings 520
Create a Data Mapping 521
Edit a Query Mapping 522
Edit a Bulk Mapping 537
Replace a Mapping 544
Export a Data Mapping to Excel 548
Import a Data Mapping from Excel 548
Forward Engineering a Data Mapping 549
Bulk mapping application 549
Use cases 549
Detect link algorithm 550
Data Modeling 550
Data Modeling with Ordinary Models 551
Edit a Model 551
Naming Standard for a Model 566
Data modeling with Physical Data Models (PDM) 569
Create a Physical Data Model 569
Edit a Physical Data Model 571
Naming Standard for a Physical Data Model 580
Exporting a Physical Data Model 580
Active Data Governance 581
Version and Configuration Management 581

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Manage the Repository 581
Manage Model Versions 581
Add a New Version to a Model 582
Review import log 582
Publish a Version of a Content 582
Make a Version of a Content the Default 583
Delete Unused Versions 583
Retain Maximum Versions 586
Manage Configurations 586
Create a New Configuration 587
Build a Configuration 588
Assign a Group to a Configuration 589
Publish a Configuration 589
Publish a Content to Any Configuration 590
Manage Configuration Structure 590
Automatic Configuraton Update 590
Scheduling the Update and Build of a Configuration 592
Configuration History 594
Manage Configuration Versions 595
Application Integration 596
Business Intelligence Tool Integration 596
Call from Third Party BI tool back to MIMM 597
Open an Object in MIMM from a Third Party Tool 599
Implementing the call back 599
Open Object URL 599
Report Preview Snapshots 601
REST API Access 601
Putting it All Together 607
Personally Identifiable Information (PII) 607
PII Semantic Types 607
Semantic Types in the Glossary 613
Administration and System Management 623
Manage Users and Authentication 623

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Listing All Users 624
Edit User Account Details 624
Delete a User 628
Open User Profile 629
Set the Login Timeout 632
Import Users 633
Download Users and Statistics 633
Manage Native Authentication 633
Manage LDAP Authentication 636
Manage OAuth Authentication 638
Manage SAML2 Authentication 648
Manage User Group Assignment 660
Manage Concurrent Users 664
Manage Groups 666
Create a New Group 668
Assign Security Roles to a Repository Object 672
Special Groups 675
Download Group Report 676
Manage System logs 676
Manage Scheduled Tasks 677
Repository Wide Operations 678
Additional Operation Parameters 679
Scheduled Task Content Details 680
Execution History 681
Manage Operations 682
Manage (Harvesting) Servers 686
Upgrade 690
Cloud-based Application Server and Shared Secret 693
Manage Custom Attributes 695
Manage Email Notification 700
Manage Semantic Types 704
Add a Semantic Type 706
Edit a Semantic Type 707

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Delete a Semantic Type 708
Manage Default Worksheets 708
Manage Default Dashboards 709
Manage Presentations 710
Manage License 712
Named vs. Concurrent Users 715
Producers vs. Consumers 715
Download License Information 715
Update the License 716
Manage System 718
Administer the Database 718
Clear Database Cache 719
Run performance script 719
Enable/disable debug logging 720
Upgrade 720
Software Upgrade Specialized Tasks 724
Preferences 738
Dates in Worksheets 738
Other Useful Management Tasks 738
Manage Processes 738
Obtain an object ID 738
Switch to Metadata Manager UI 740
Logging “Popular” Search Queries 740
View Links 740
Organize the Repository Tree 742
Analyze Content Statistics 743
Configuration Statistics 743
Repository Statistics 745
Configuration and Repository Search Statistics 746
Audit log reporting 748
System Backup 755
Installation 756
HostInfo File and Licensing 756

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Troubleshooting 756
General Troubleshooting 756
Creating a Backup 760
Backup system managed objects (users, groups, custom attributes, semantic types) 762
Backup all versions of models content (as MIR XMI files) 762
Remove business data and personal information 762
Save Logs for support (not Restore) purposes 763
Restoring a Backup 763
RESTful API 763
Log and Logging of Search Queries 764

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Introduction

Welcome to the User Guide for MIMM .

Disclaimer

Some of the features detailed in this document may not apply and/or be available for the particular [MIMM] edition you may have.

Metadata Overview

MIMM provides a comprehensive and well integrated set of Metadata Management (MM), Data Cataloging (DC) and Data Governance (DG) solutions supporting on premise, cloud based or hybrid Enterprise Architectures ranging from the classic Data Warehouse to the latest Data Lakes and Data Vaults:

- Integrated Solutions: Metadata Management, Data Cataloging, and Data Governance
- Multi-Deployments: On Premise, Cloud, or hybrid (Cloud with on premise harvesting)
- Multi-Architectures from the Data Warehouse to the new Data Lake / Data Vault
- Multi-Vendors from any Data Integration and Business Intelligence tools
- Multi-Technologies from files and SQL based RDBMS, to the new NoSQL, JSON, Avro, Parquet, XML and Hadoop big data technologies, REST API Data Services
- Multi-Storage File Systems: Data Cataloging by file crawling over Linux/Windows, Hadoop HDFS, Amazon S3, Azure Blob Storage, OpenStack Swift, Apache Kafka, etc.
- Multi-Configurations with Change Management and Incremental Metadata Harvesting, Comparison, Version & Configuration Management and automatic stitching
- Multiple integrated tools for Search, Data Flow and Semantic Lineage, Data Modeling, Data Mapping, Active Data Governance (generation of self-service DI and BI), Multi-Vendor BI Web Portal

MIMM provides solutions for a full range of users:

- Most business end users in need of a multi-vendor Business Intelligence (BI) web Portal with quick access to the right report understand its content with proper business definitions from the enterprise business glossary.
- Advanced business users and compliance officers looking for information traceability (data lineage) and data privacy for General Data Protection Regulation (GDPR), Sarbanes-Oxley (SOX) regulations, and more.
- Data stewards, data modelers, and data quality experts working on enterprise data standardization, common vocabulary, data modeling and business rules with powerful tools like the business glossary, semantic mapper, data modeler.
- Data analysts in need of self-service data integration, preparation, and business intelligence using the data mapping design tool with active data governance (forward engineering) to their actual DI/BI tools.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

- IT engineers, data scientists data Integration and business intelligence developers looking complex multi-vendor and multi-architecture end to end linage in great details down the design level information of each tool with support for change impact with full detailed version and configuration management.

Features

Metadata Harvesting

- Data Stores
  - Databases (Oracle, SQL Server, Teradata, IBM DB2, PostgreSQL, MySQL, AWS Redshift, GreenPlum, Netezza, SAP HANA, etc.)
  - Big Data (Hadoop Hive, Hcatalog, Google Big query, etc.)
  - NoSQL (Cassandra, HBase, MarkLogic, MongoDB, etc.)
  - Flat Files (CSV, XLSX)
  - Hierarchical Files (JSON, Avro, Parquet, XML, XML XSD, etc.)
  - File Systems ((Linux/Windows)
  - Data Lake and Cloud Hadoop HDFS, Amazon S3, etc.)
  - Data Services (Open API, etc.)
- Metadata Stores
  - Data Modeling Tools (Erwin, ER/Studio, PowerDesigner, etc.)
  - Metadata Management (Atlas, Navigator, etc.)
  - Semantic Web Ontology (OWL/RDF)
- Data Integration
  - DI/ETL Scripts (Oracle PL/SQL, Teradata BTEQ/FastLoad/BulkLoad, Hadoop HiveQL, Sqoop, SAS code, etc.)
  - DI/ETL Tools (Informatica PowerCenter, IBM DataStage, Oracle ODI, Microsoft SSIS, SQP Data Services, SAS DI, Talend, etc.)
- Business Intelligence (SAP BusinessObjects, IBM Cognos, Microsoft SSAS/SSRS, Azure PowerBI, Oracle OBIEE, Microstrategy, Qlik, Tableau, ThoughtSpot, TIBCO Spotfire, etc.)
- Business Applications (SAP Business Suite, SAP Business Warehouse, Salesforce, etc.)

Metadata Management (MM)

- Model Manager (with automatic metadata stitching, and Enterprise Architecture diagramming)
- Metadata Search (metadata driven pre and post filters, semantic search language)
- Metadata Browser (hierarchical metadata browsers with custom metadata profiles per tool/technology)

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

- Metadata reporting capabilities where both search and browse end up to the same reporting page which is also directly available at WORKSHEETS > Manage.
- Metadata Tabular Analyzer Reporter (with bulk editing capabilities)
- Data Model Visualizer (ER Diagrams)
- Data Flow Lineage and Impact Analyzer (Data flow Lineage and impact analyzer down to feature level, with data vs control flow)
- Multi-Configuration Management (multi configurations for different enterprise architectures and groups)
- Multi-Version Management (efficient automatic incremental harvesting, with model history/SOX compliance)
- Metadata Comparator (comparison with previous versions for the impact of change)

Data Governance (DG)

- Business Glossary (BG) (with customizable workflow automation)
- Semantic Mapper (search driven, auto map, and multi-levels from glossaries to data stores via design models)
- Semantic Lineage Analyzer (term usage, and automatic glossary definition on data pass through)
- Local Documentation (quick in place editing of business names and descriptions while browsing harvested data stores)
- Glossary Linking (quick in place semantic linking while browsing harvested data stores, DI jobs, and BI reports)
- Data Tagging (applying reusable Labels available in search)
- Comments and Reviews (collecting business user feedback and managing reviews)

Data Cataloging (DC)

- File System Crawling (file type auto-detection, partitioning auto-detection)
- Data Profiling (from data sampling to full data profiling with statistical results)
- Semantic Discovery (semantic types, patterns/lists machine learning)
- Relationship Discovery (data driven matching semantic types and metadata driven inferred from usage in DI, BI, SQL, etc.)
- Social Curation (endorsement, warnings, certifications with impact on search)
- Data Modeling
- Data Store Documenter (automatic reverse engineering of naming standards with supervised machine learning)
- Data Store Modeler (with full data model diagram editing)
- Data Store Designer (new data store specifications and design)

Data Mapping

- Data Mapper (from business user data mapping specifications to design for bulk and feature/SQL with joins/filters/lookups)
- Metadata Applications

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

- BI Web Portal (Multi-vendor BI Web Portal with bi-directional integration, and glossary generation)

Active Data Governance (Forward Engineering)

- Data Modeling Tools (Erwin, ER/Studio, PowerDesigner, etc.)
- Data Integration Scripts (PL/SQL, BTEQ, HiveQL, etc.)
- Data Integration (to self-service / data prep tools)
- Business Intelligence (to self-service like Tableau or design layers like BO Universes.)

Administration, Customization, & Extensions

- Custom Attribute Extensions (MyCompanyCertificationLevel, etc.)
- Customizable UI (menus, widget layout, etc.)
- REST API (glossary lookups, linage trace, automatic harvesting, search, browse, update, etc.)

Explore Metadata

Fundamentally, MIMM is a metadata management tool. Thus, a key aspect of the feature of MIMM centers around looking up, finding or discovering metadata that is harvested into the system.

In particular, you may use the search (both immediately as you type as well as a more advanced search page) by contained text. In addition, you may browse directly by metadata category and type. You may create worksheets to report on the metadata. Finally, you may locate elements by navigating the current configuration architecture.

Customization: The search categories, results and available actions may all be customized and new categories defined. Please see the Customization tutorial for this capability.

Signing In

In order to sign in, you must have a valid username and password or already be authenticated when using external authentication.

Once authenticated, you will either be directly connected to your assigned configuration or will be able to pick a configuration and version of that configuration.

Steps

1. Enter the URL as defined for MIMM .

The Authentication page is shown

2. Enter your **Username** and **Password** and click **LOGIN**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

This may take you to the MIMM *homepage if you have specified a default configuration seeting (see below) or if you only have access to one configuraton version.*

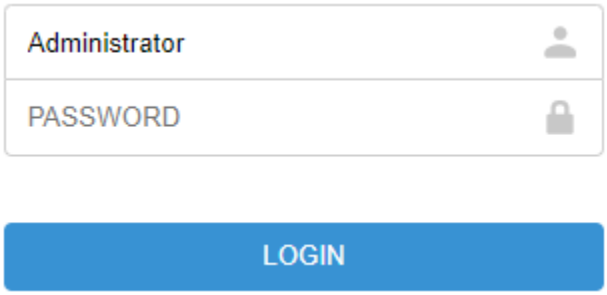
3. Select a configuration.

4. Click Choose Version to select a version of that configuration.

You may check ***the Automatically use this configuration by default*** *checkbox to always enter this configuration on signing in with this account.*

Example

Open a web browser and enter the URL as defined for MIMM .

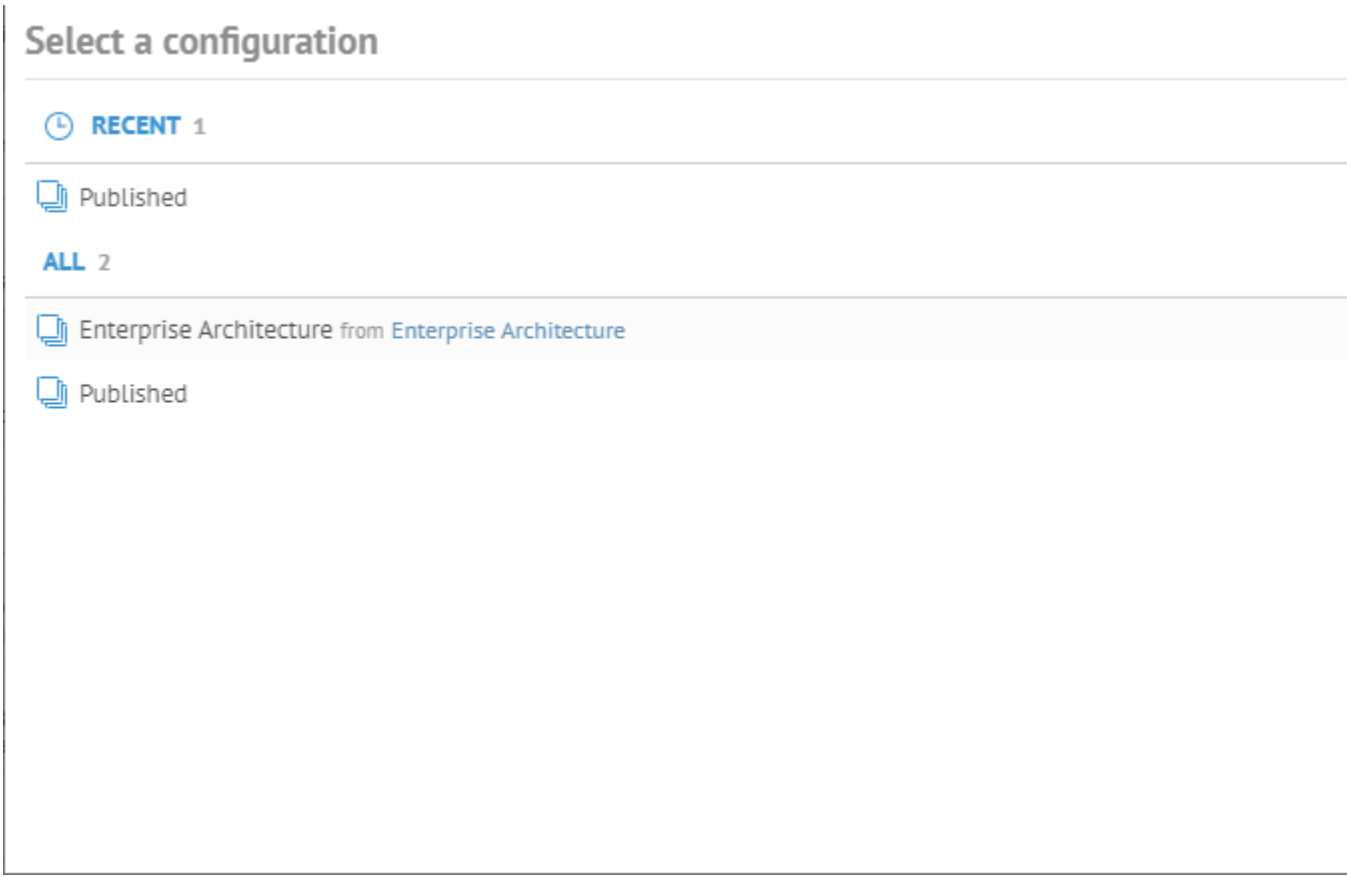


You are presented with the login page.

Enter your **username** and **password**.

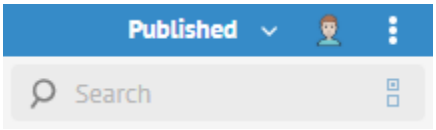
You are then presented with the ***Select a configuration*** *dialog.*

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Select the **Published** configuration in the **Enterprise Architecture** folder by double-clicking on that entry.

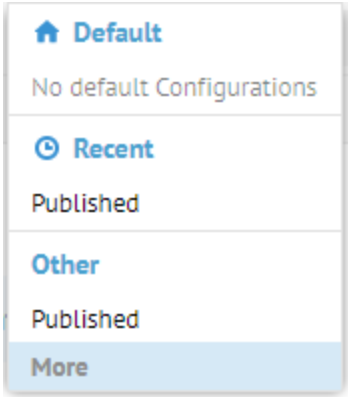
You now are at the homepage for that configuration.



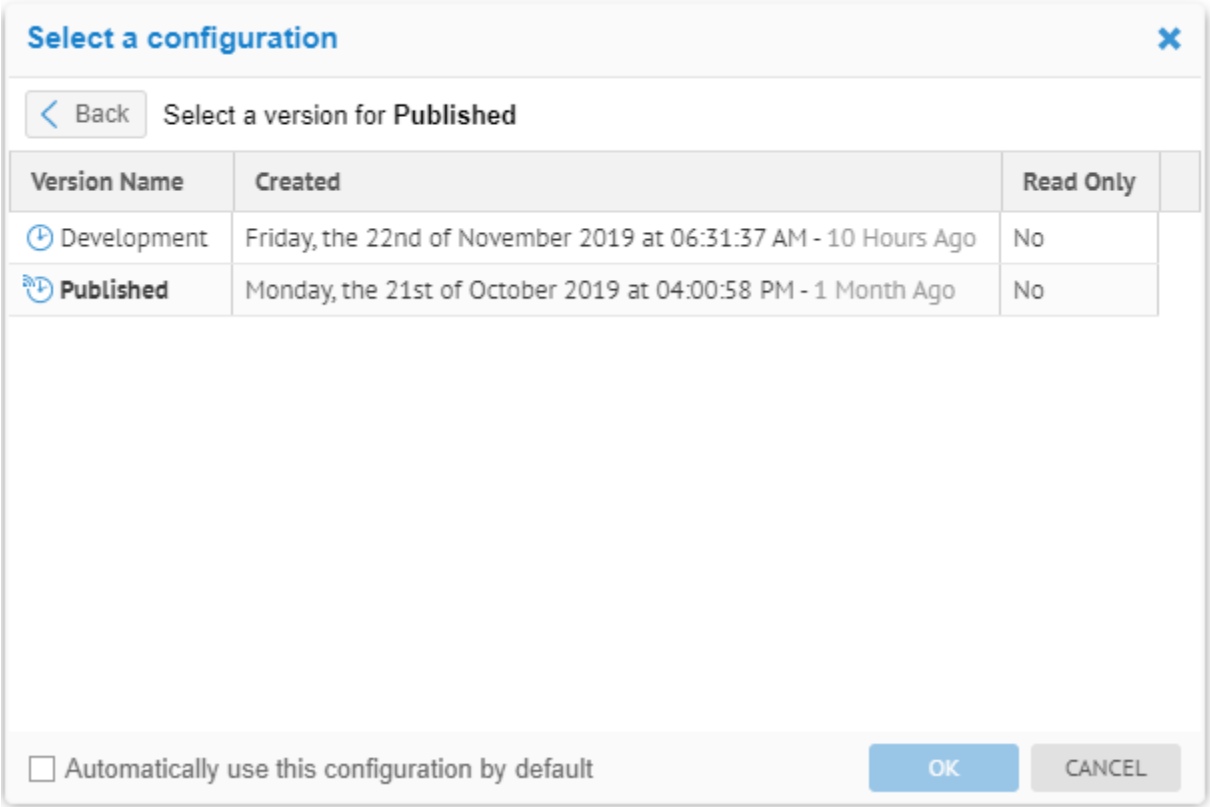
The configuration is identified in the upper right of that banner.

Return to the Select a Configuration dialog by clicking on that configuration name in the banner and going to **More**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



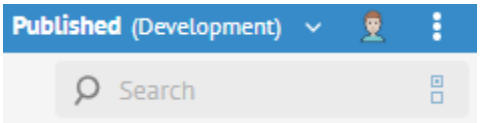
Select the **Published** configuration in the **Enterprise Architecture** folder with a single-click this time, and click **CHOOSE VERSION**.



*There are two versions of this configuration, one **Published** (what you are one now as it is the default) and one **Development** (used for glossary workflow actions).*

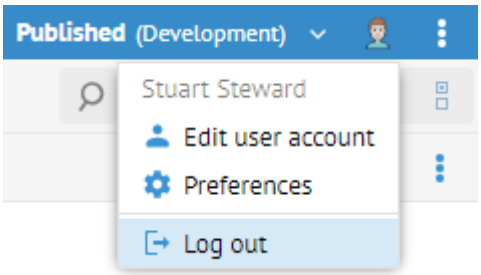
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Click on the **Development** version and check the **Automatically use this configuration by default** checkbox. Then click OK.



The configuration (and version) is identified in the upper right of that banner.

Click on your avatar in the upper right of the banner **Log out**. Then, log back in.



The configuration (and version) is identified in the upper right of that banner as you are returned to your new default.

Edit My User Account Details

After signing in, you may set or update the identifying details associated with the user account you signed in with.

Steps

1. Click on the thumbnail picture of the signed in user in the upper right-hand of the UI.
2. Select **Edit user account**.
3. Enter or update **User account avatar**.
4. Enter or update the fields provided:
   - FULL NAME
   - EMAIL

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

- DESCRIPTION

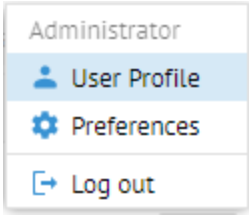
5. To reset the password (for a native user) enter the **PASSWORDS** and **RE-TYPE PASSWORD** fields.

6. You may also review and analyze details about the STATISTICS and ACIVITY STREAM.

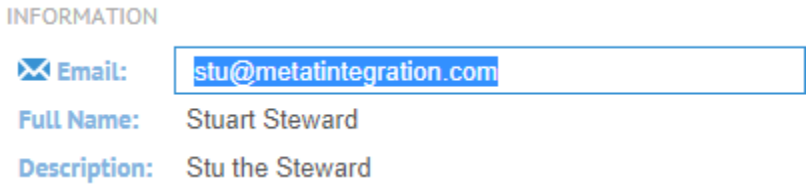
Example

Sign in as any user (Stu is used here).

Click on the thumbnail picture in the upper right-hand and select **Edit user account**.

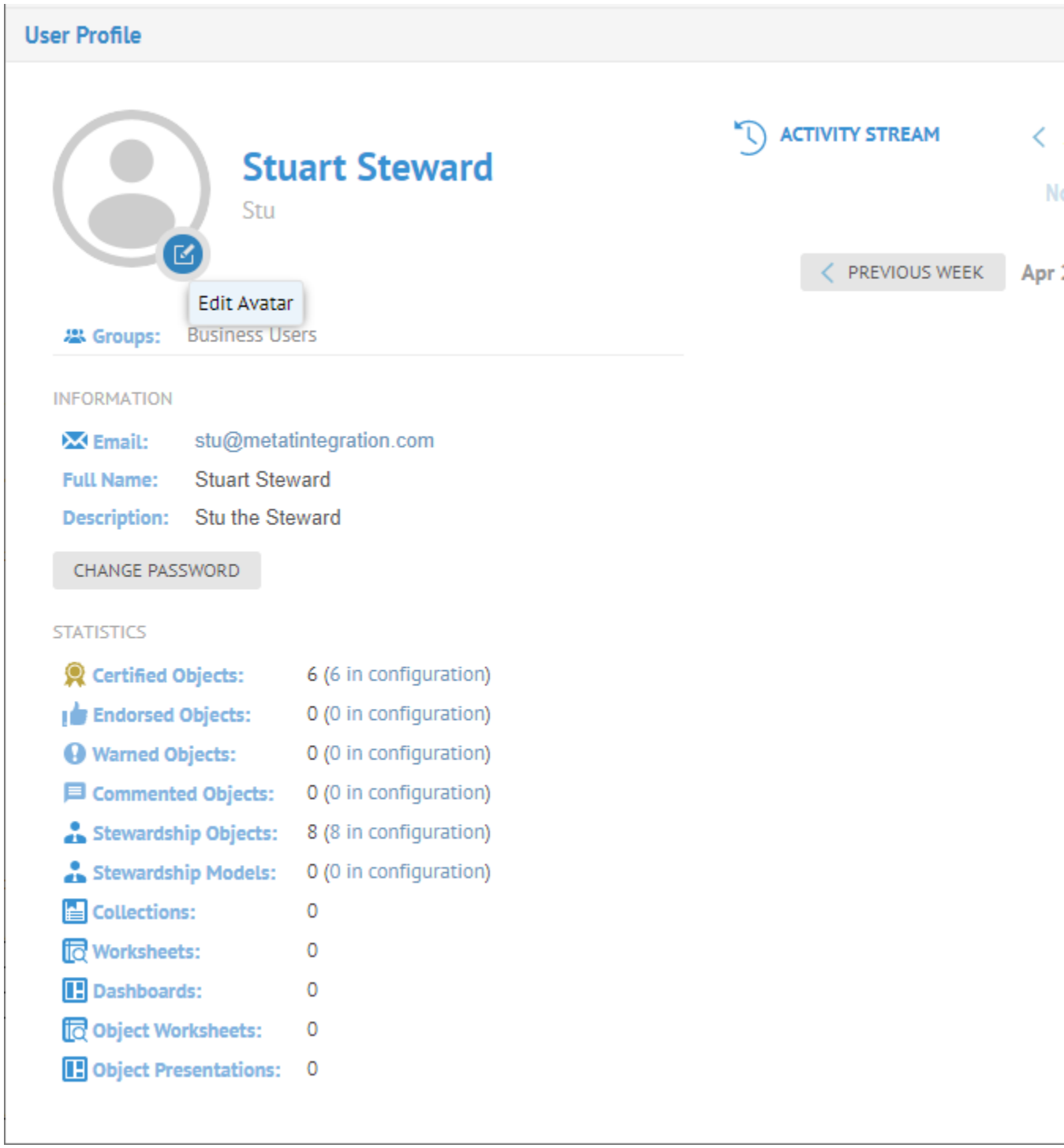


Enter the identifying information in place.



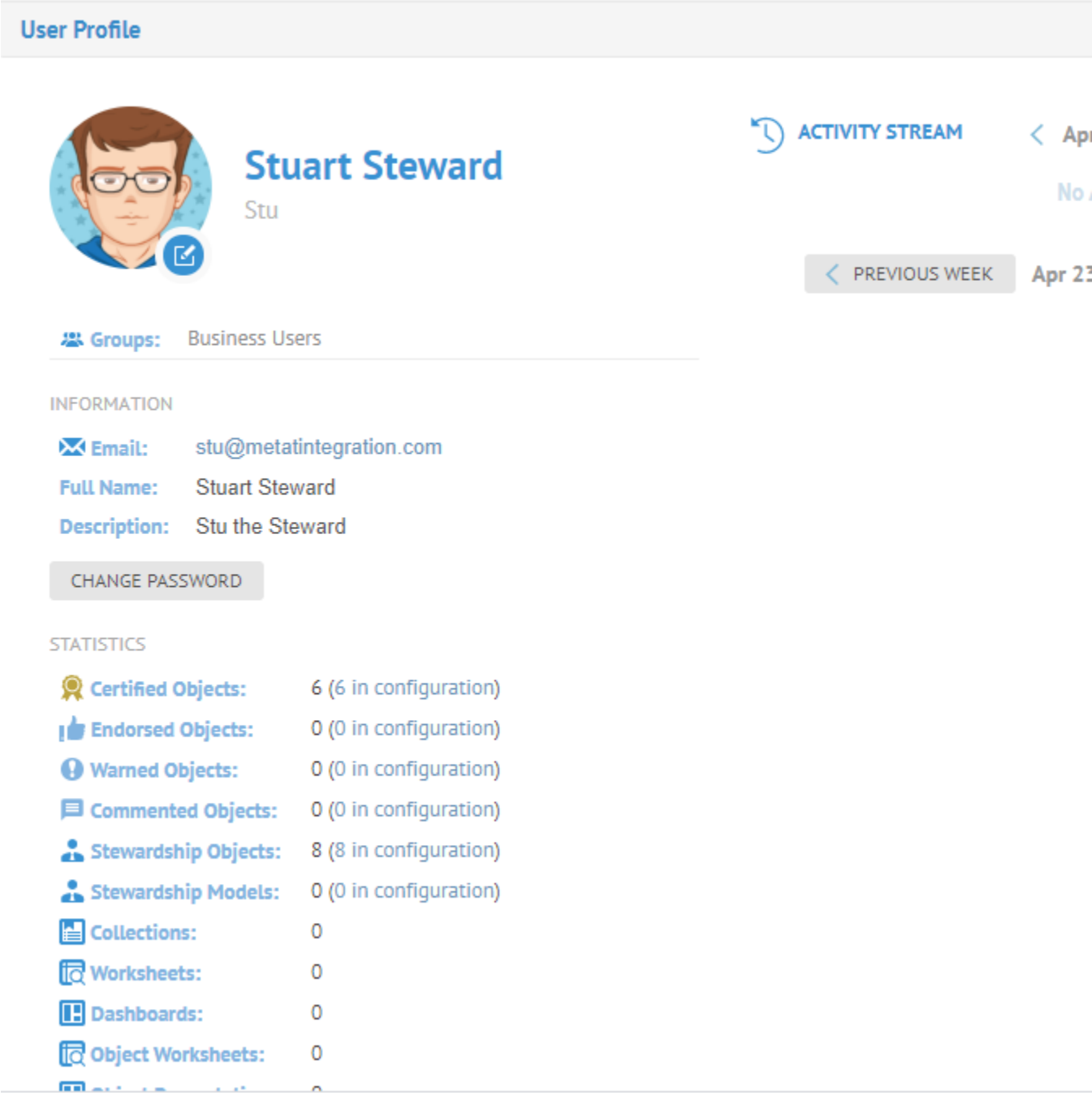
Click the **Edit Avatar** button .

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Navigate to your image and click **Open**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



The user account is contained inside parentheses and the Full Name is displayed directly below the avatar image. Groups that a specific user belongs to are displayed below the user account.

You may also review and analyze details about the STATISTICS and ACIVITY STREAM

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Edit My User Preferences

After signing in, you may set or update the preferences associated with the user account you signed in with.

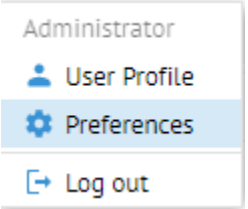
Steps

1. Click on the thumbnail picture of the signed in user in the upper right-hand of the UI.
2. Select **Preferences**.
3. Use checkboxes to set or unset preferences.

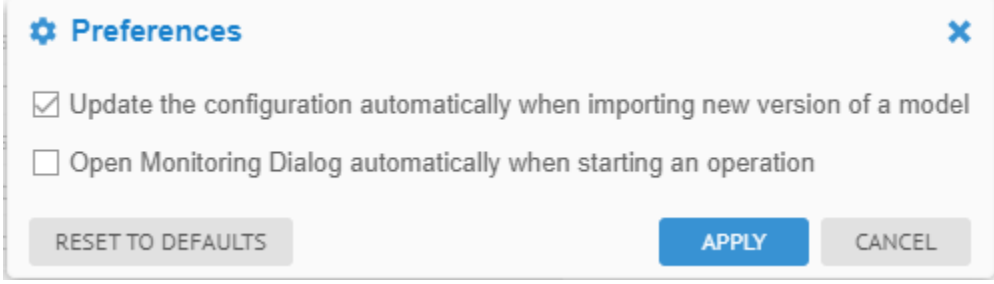
Example

Sign in as any user (Stu is used here).

Click on the thumbnail picture in the upper right-hand and select **Preferences**.



Check the first checkbox.



Explorer Panel

The explorer panel is a UI feature of MIMM which emphasizes navigation using various organizational structures presented as a tree, asset of flat search results or collections of objects.

There are several flavors of the explorer panel:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

- Object
- Collection
- Worksheet
- Dashboard

The object explorer is the default explorer presentation and is always accessible simply by clicking the OBJECTS menu on any page. There are several presentations available with the object explorer panel:

- The **Browse** presentation shows a limited number of siblings and allows you to jump to them all, much like a traditional **Tree** interface or a **Drill** presentation is useful when you need to work with a long list of siblings (e.g., 10000 tables in a database schema).
- The **Search** based Explorer Panel allows one to work with a flat list of text search results.

Steps

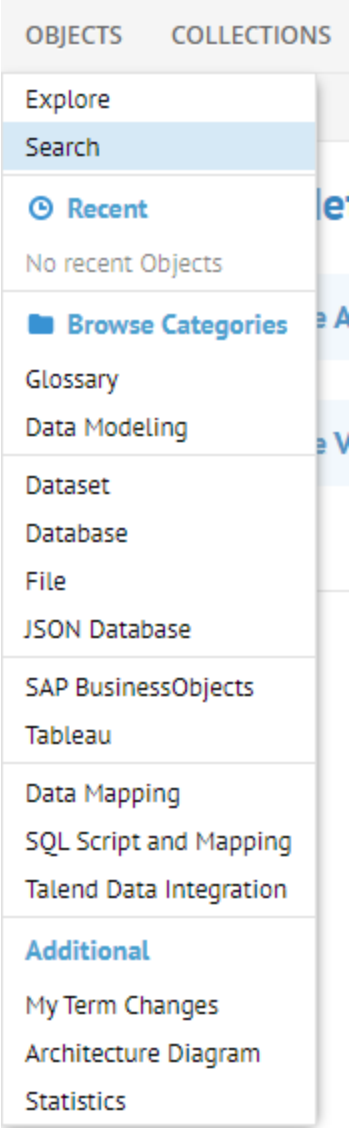
1. Several options exist:

    - Click the **OBJECTS** menu
    - Click **OBJECTS** and select entries under **Explore**

Example

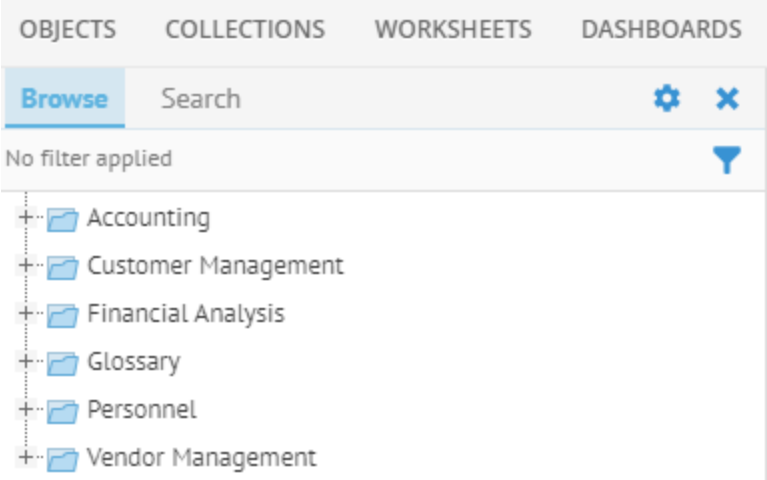
Click the **OBJECTS** menu. The Objects explorer panel opens on the left.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click Explore, and Browse panel opens with no filters or search criteria (or the last ones you entered).

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



You may remove the panel by clicking the Close (✖) icon. Otherwise, it is pinned open as you click on objects in the tree.

Explore Further

Browse Hierarchically Using the Explorer Panel

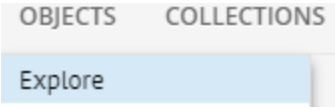
Once in the explorer panel, you may use the Browse tab and navigate the hierarchical structures in the configuration. This Browse functionality provides a single hierarchy that may be navigated down to the lowest level of granularity (e.g., fields in a file, or columns in a table) without stopping at the model (harvested) level.

Steps

1. Open the explorer panel.
2. Click the **Browse** tab at the top of the panel.

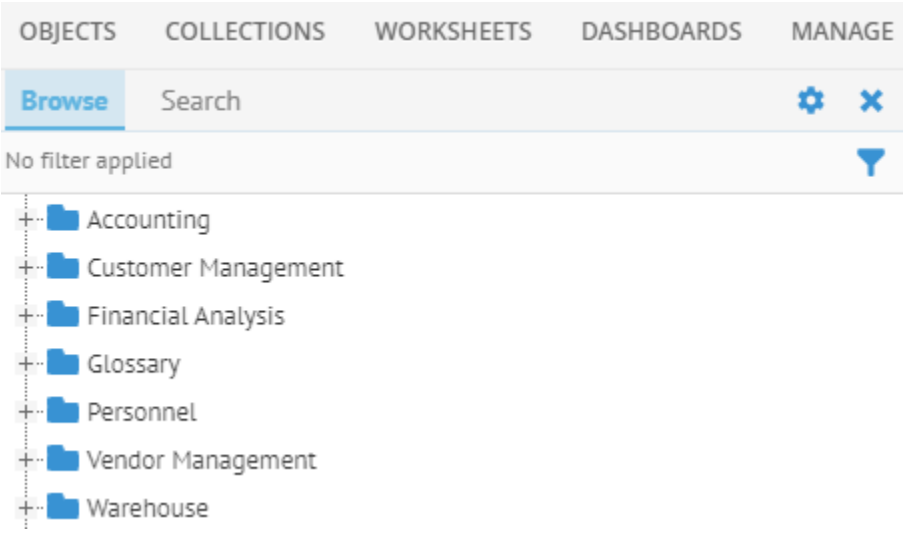
Example

Go to **OBJECTS > Explore** in the menu.



The default hierarchical presentation is a tree view based upon the configuration folder structure.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Explore Further

The explorer panel **Browse** tab has several options in terms of presentation. You may specify display **Preferences**.

1. Click the **Preferences** icon ( ).
2. Select the specific options.

DISPLAY MODE

There are two modes of navigating the resulting hierarchy.

- **Tree** - The **Tree** presentation shows a limited number of siblings and allows you to jump to them all, much like a traditional tree interface.
- **Drill** - The **Drill** presentation is useful when you need to work with a long list of siblings (e.g., 10K of tables in a database schema)

HIERARCHY TYPE

This options allows you to show the tree structure based upon one of the following hierarchical structures, as they are defined in different components within MIMM :

- **None** – Simply a flat structure of the models in the configuration.
- **Configuration** – Displays the tree using the structure of folders and contents defined in the configuration itself.
- **Repository** – Displays the tree using the structure of folders and contents defined in the repository.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

MAXIMUM OBJECTS PER LEVEL

Tree structures may be huge and thus MIMM "paginates" the results in order to improve responsiveness over networks. This option allows you to specify the number of elements to display at a particular level.

SHOW ATTRIBUTES

Additional attributes may be shown in the tree, including all the curation icons as well as Alternate Name.

Root Filters

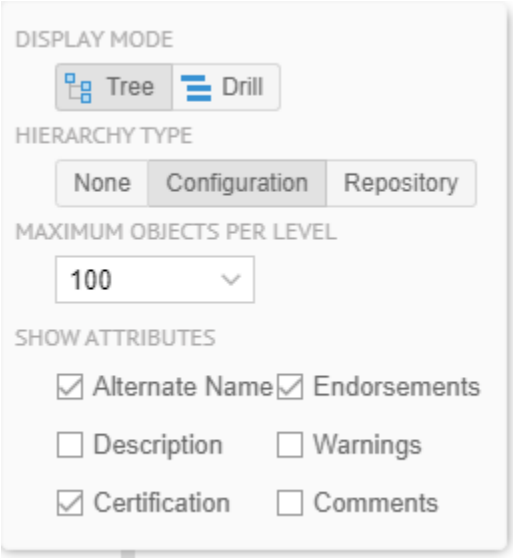
Additional filters to apply from the root on down in the hierarchy. These include:

- CATEGORY
- STEWARD
- LABEL

Example

DISPLAY MODE

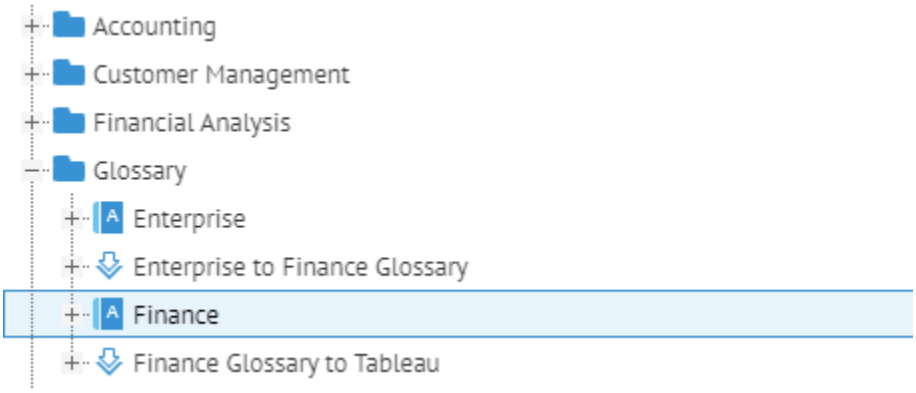
Click the **Preferences** icon ( ) and click **Tree.**



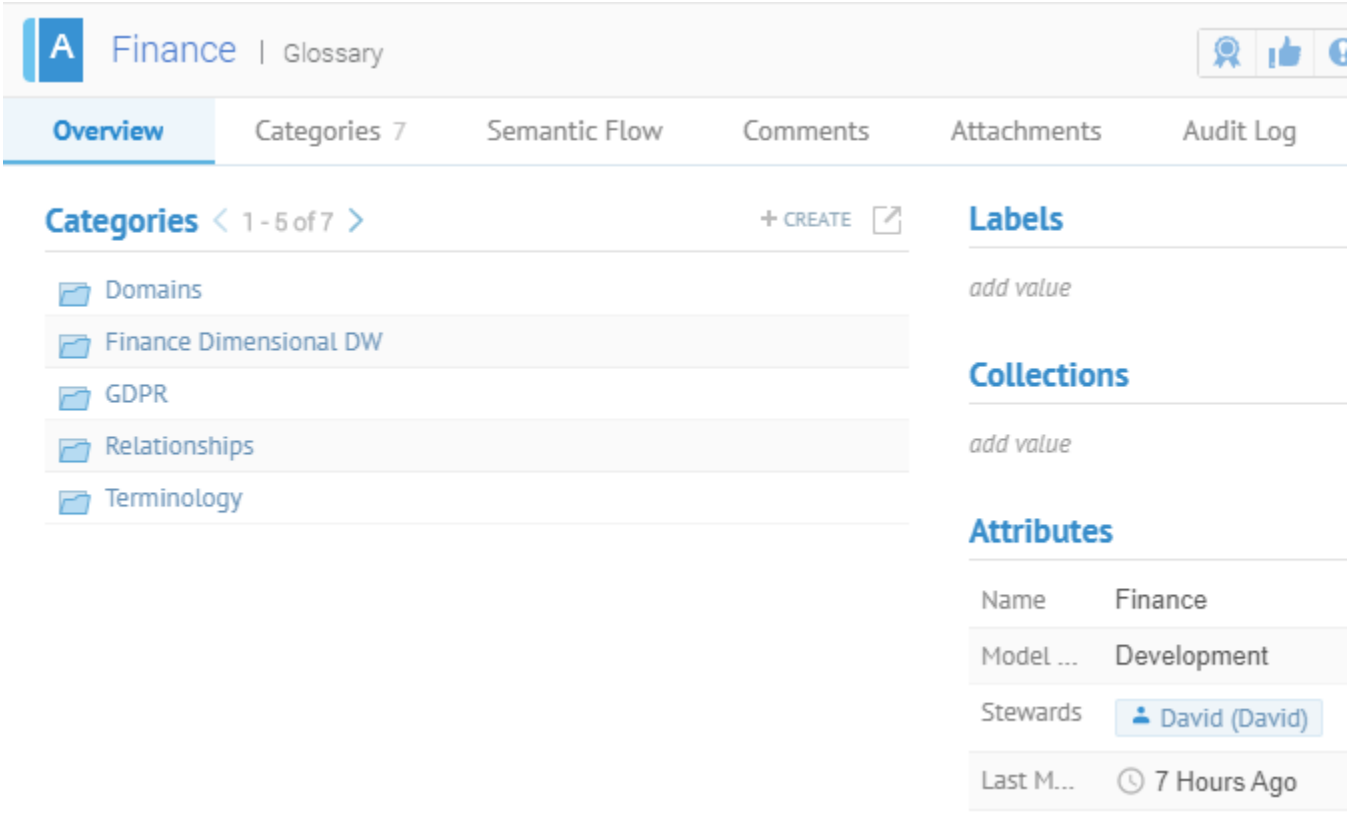
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Tree Mode

Expand the Glossary folder.



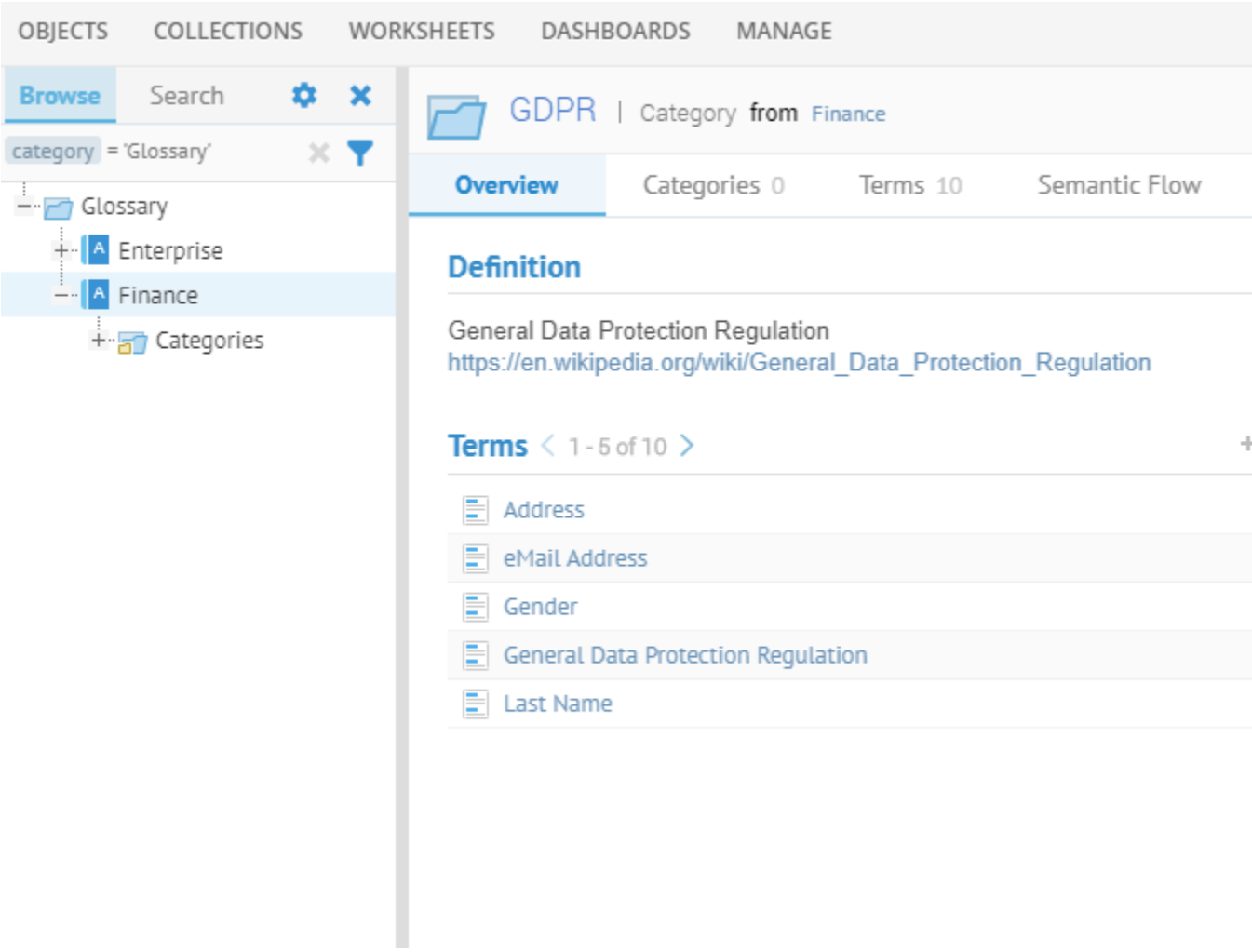
Click the **Finance** glossary item.



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

*To restore the tree, simply click OBJECTS again. If you click on another item in the tree, you will be taken to that element's details page. However, the reverse is not true. If you navigate from the details page to an item, the Explorer Panel does not update. Instead, you may use the **Show in Explorer** option in the upper right.*

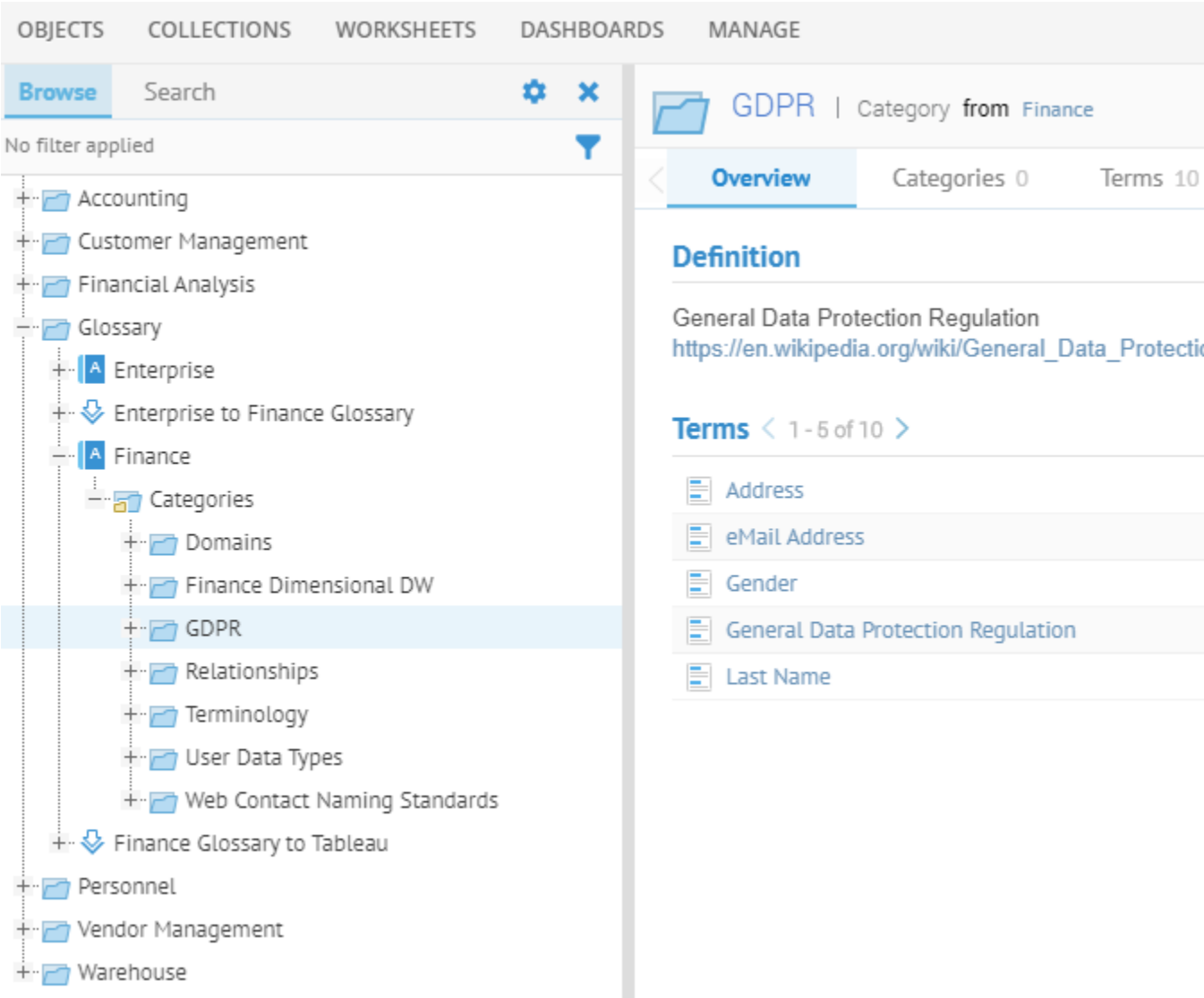
Click the **GDPR** category in the details page. Here, we navigate to the **GDPR** category, but when you click **OBJECTS** the **Explorer Panel** does not update to **GDPR**.



With the explorer panel opened, it remains as you click outside and other panels are resized to accommodate it.

Now, select **Show in Explorer** from the **More actions** pull down in the upper right of the details page, and the Explorer Panel is updated.

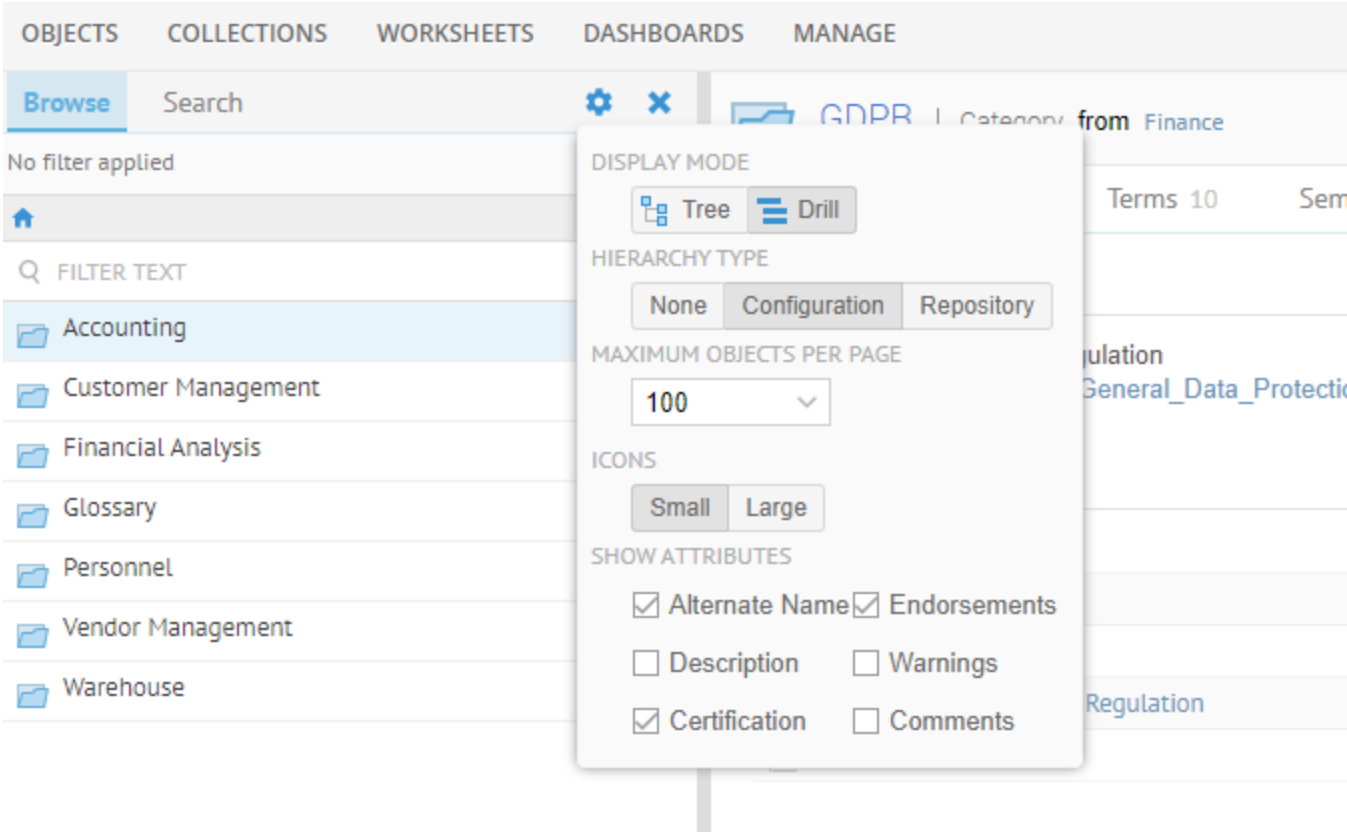
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



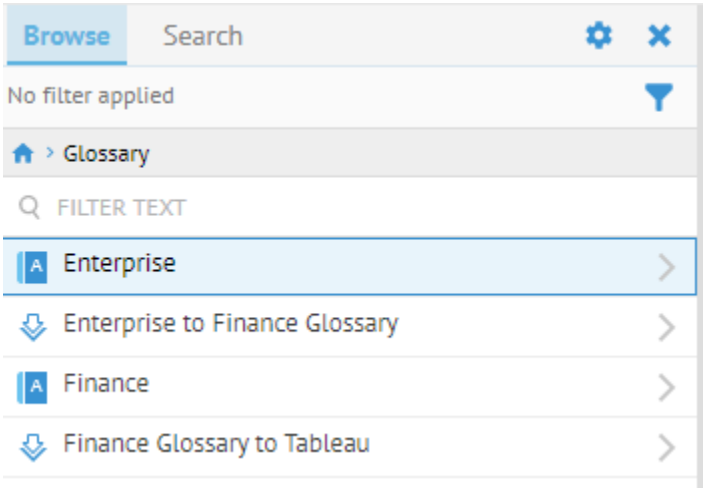
Drill MODE

Click the **Preferences** icon in the **Explorer Panel** (⚙) and click **Drill**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click the caret (>) to expand the **Glossary** folder.

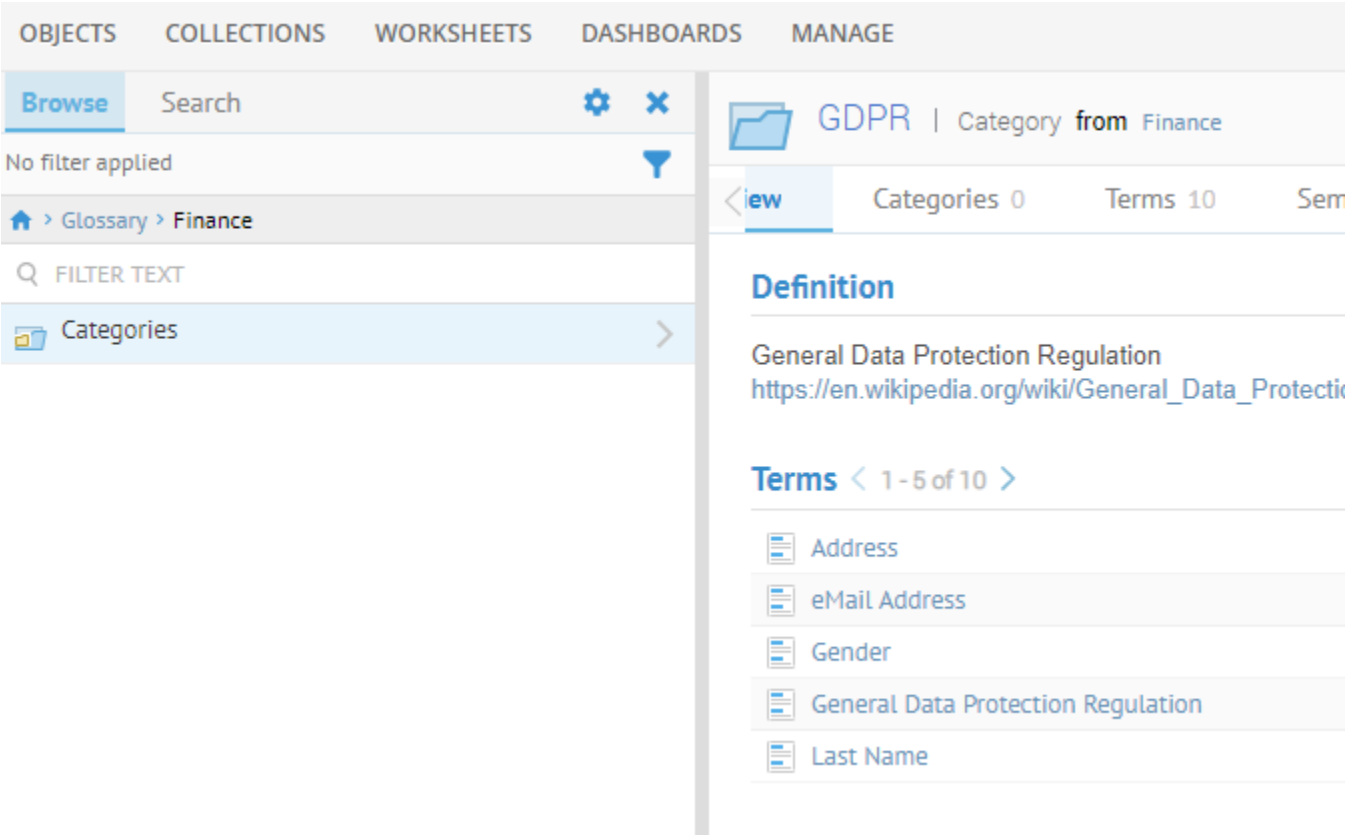


Click the **Finance** glossary item.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

If you click on another item in the drill list, you will be taken to that details page. However, the reverse is not true. If you navigate from the details page to an item, the Explorer Panel does not update.

Click the **GDPR** category in the details page. Here, we navigate to the **GDPR** category, but the **Explorer Panel** does not update.



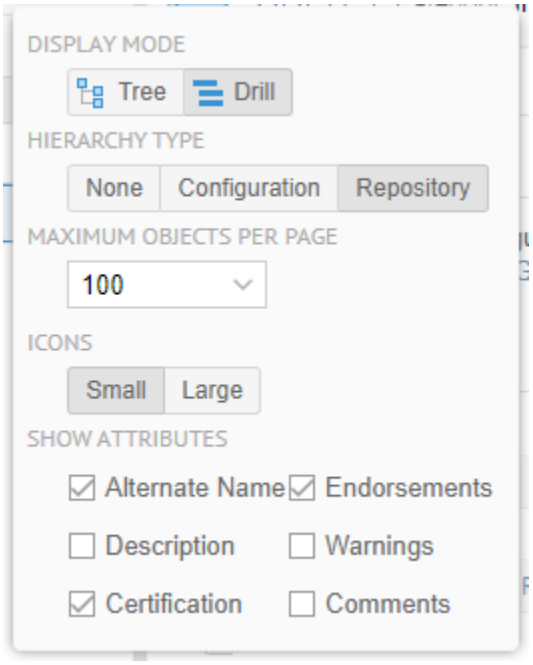
Now, select **Show in Explorer** from the **More actions** pull down in the upper right of the details page, and the Explorer Panel is updated.

In Drill mode, there is no tree to expand, so the drill level is changed.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Hierarchy TYPE

Click the **Preferences** icon ( ) and select **Repository** for the **HIERARCHY TYPE**.

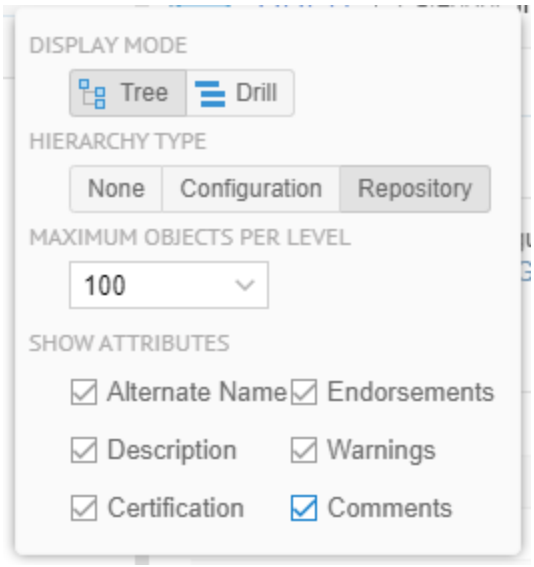


The hierarchical structure now reflects what is defined within the Repository as a whole.

SHOW ATTRIBUTES

Click the **Preferences** icon ( ),and click **Tree,** and select all of the options under **SHOW ATTRIBUTES**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Now, we see all the curation icons and alternate names.

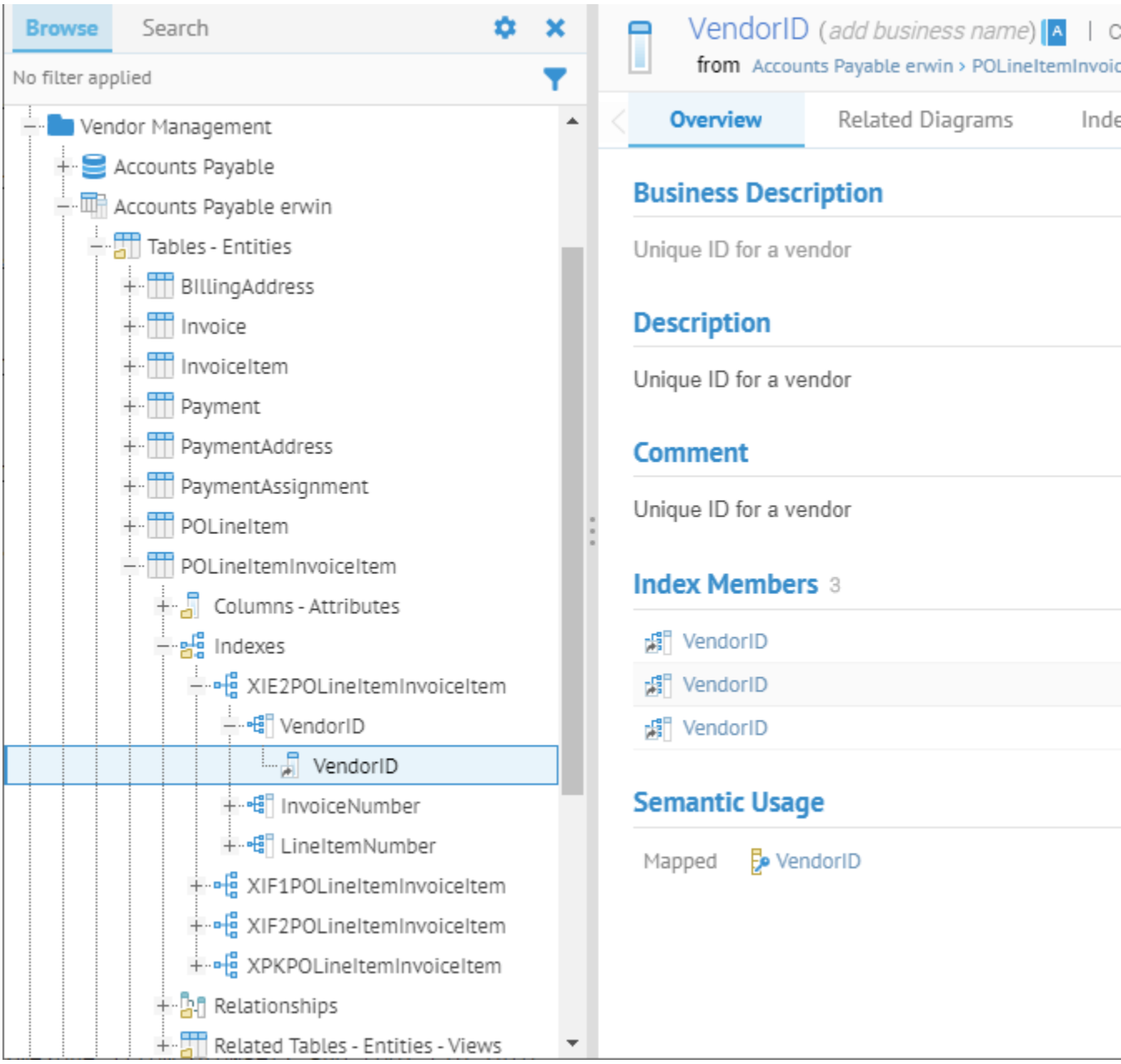
Navigating a Hyperlinked Tree

In some instances there are a number of relationships between elements in a model that cannot be represented by a simple tree structure. E.g., and index on a table relates to a specific set of columns, but is not contained in any one column, so it is shown as contained with the table with hyperlinks (represented by a curved arrow over its icon) to related columns.

Steps

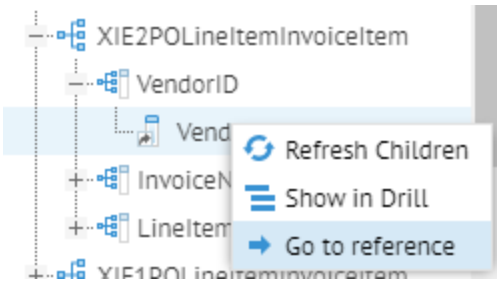
1. Open the explorer panel.
2. Click the **Browse** tab at the top of the panel.
3. Expand to the following in the tree: and click on the VendorID reference (hyperlink)

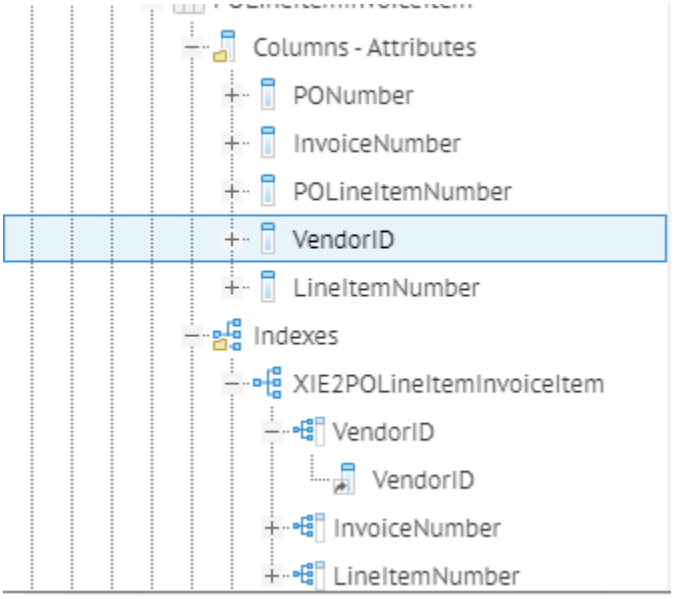
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



You may also right-click the reference and select **Go to reference** and it will take you to that element in the tree.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)





*When navigating in the **MANAGE > Repository** page, you may double-click on a reference in the tree of a model in order to go to the referred object, as well as right-clicking and selection **Go to reference**.*

Organize the Configuration

You may organize the contents presented for the particular configuration.

Steps

1. Sign in as a user with at least the **Editor** security role to the configuration you wish to organize.
2. Go to **MANAGE** > **Repository**.
3. Click the configuration version.
4. In the configuraton manager, click **New Folder** to create folders.

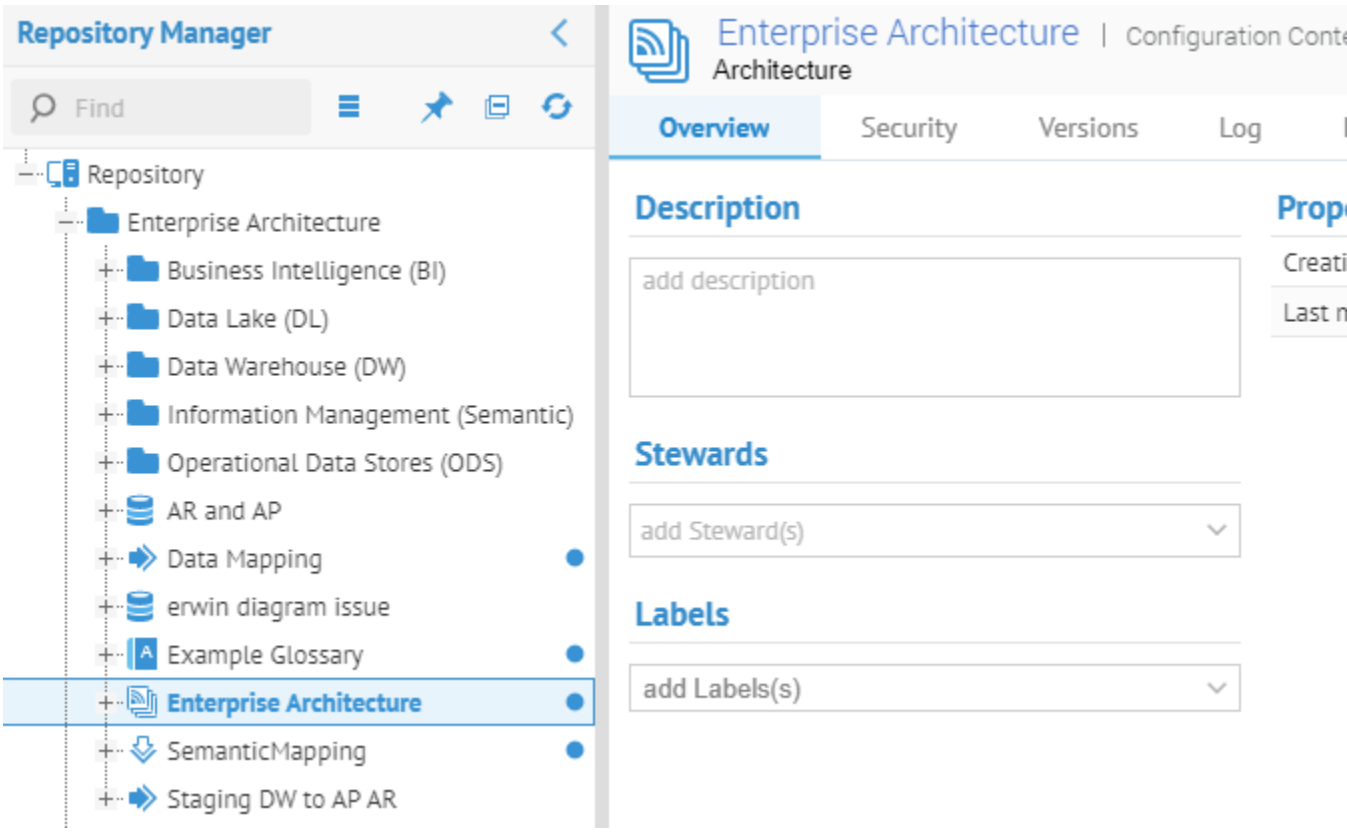
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

5. Drag any content in the configuration into a folder to organize.

Example

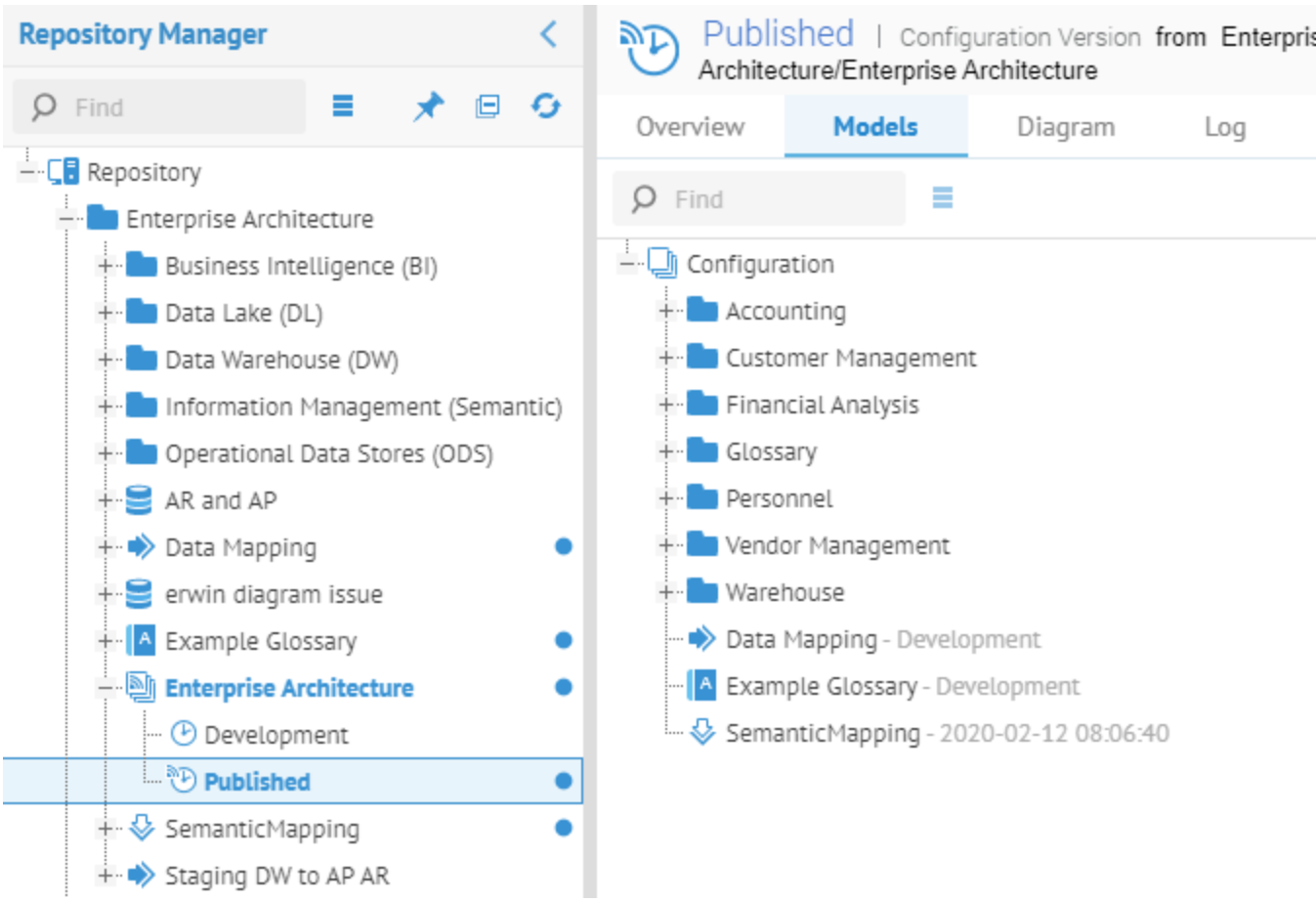
Sign in as **Administrator** and go to **MANAGE** > **Repository**.

In the **Repository** panel, expand the tree until you see the **Enterprise Architecture** configuration.



Expand the plus sign next to this configuration and click the **Published** version.

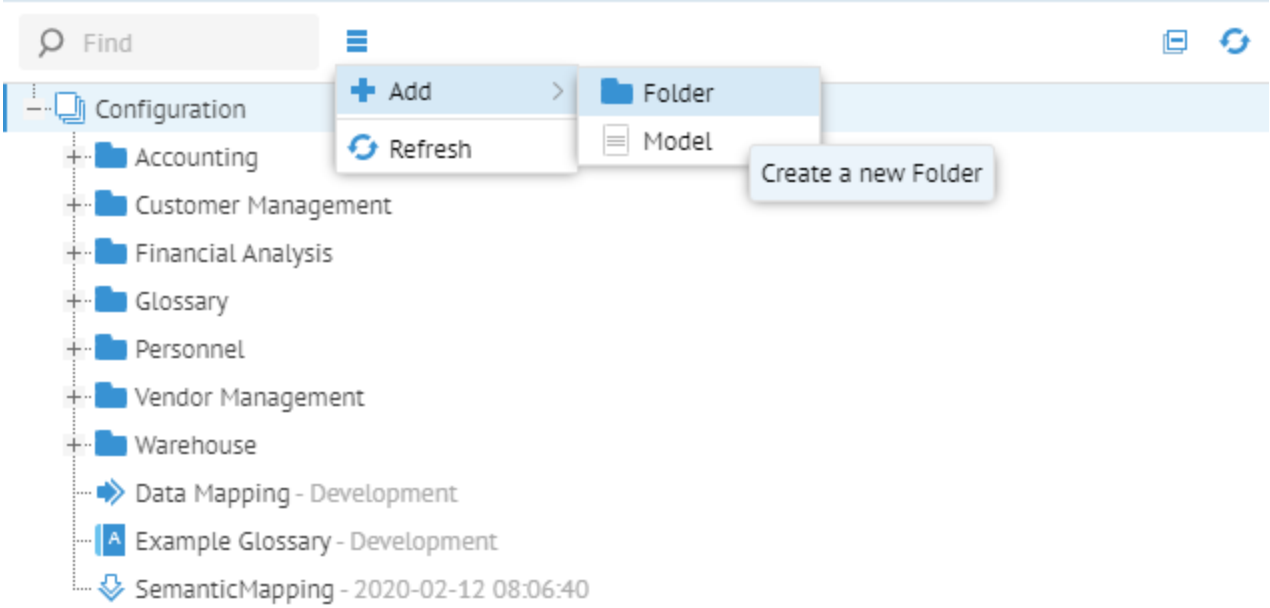
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



The configuration opens in the middle work panel.

Note, there is already a structure. Click on the **More Actions (☰)** icon, **Add, New folder** icon and name it **Warehouse**.

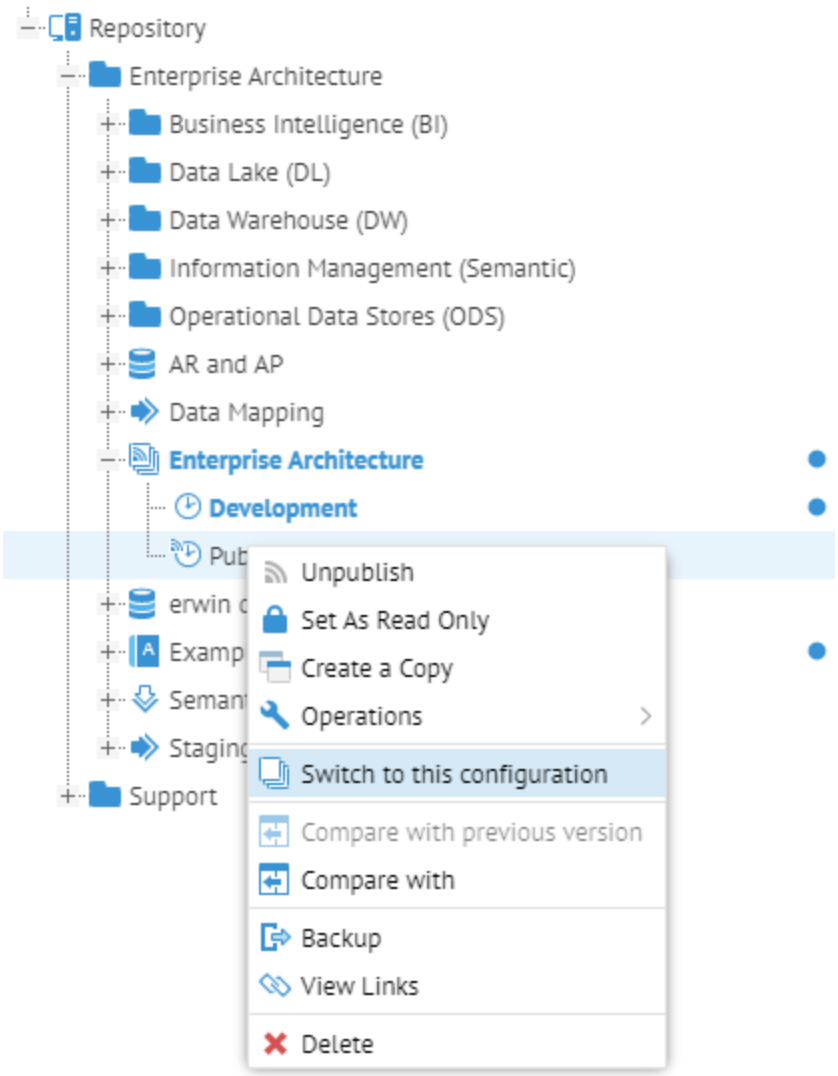
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Drag the Dimensional DW model into that folder.

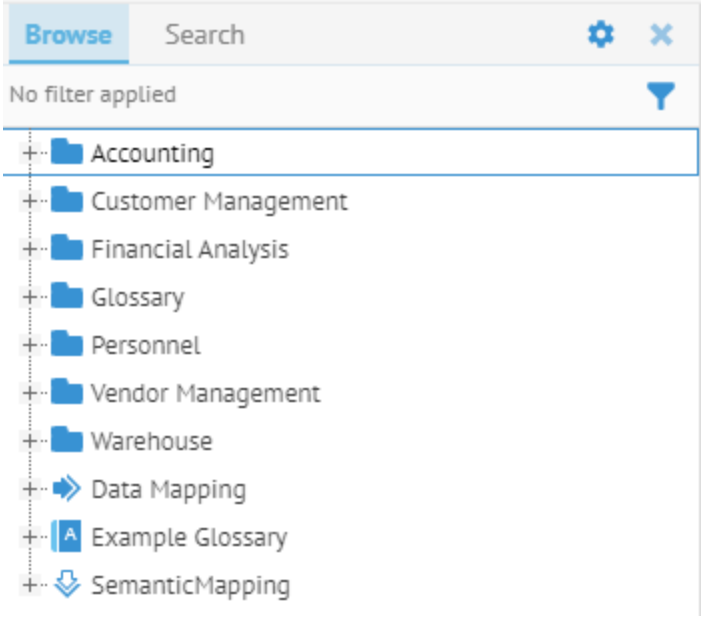
Close the configuration and right-click on it in the Repository panel and select **Switch to this configuration**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Now, again look at the configuraton hierarchy in the Explorer.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



See the new folder and structure.

Organize the Repository

You may organize the contents presented in the **Repository Tree** for the Repository as a whole.

Repository organization is very important as you may schedule, assign permissions, and perform actions (right-click) by folder.

Search using the Explorer Panel

Once in the explorer panel, you may use the **Search** tab to present as a flat list of text search and filtering results.

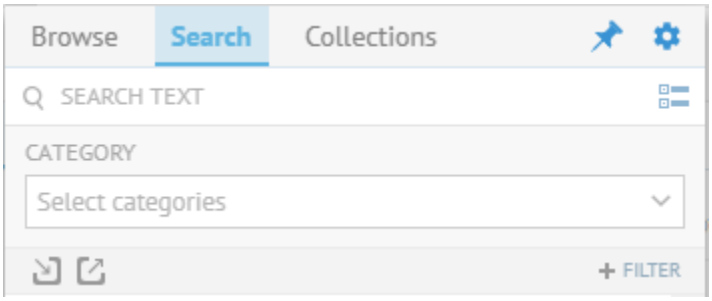
Steps

1. Open the object explorer panel.
2. Click the **Collections** tab at the top of the panel.
3. Enter text in the SEARCH TEXT field to filter the results according to that text string.
4. Click CATEGORY to select an object type to filter the results by.
5. Click **+FILTER** to add additional filter criteria, or clear these by clicking **RESET FILTERS**.
6. Click any item in the results to display the details page for that item.
7. Click the **Open as worksheet** link to produce a worksheet out of the search results.

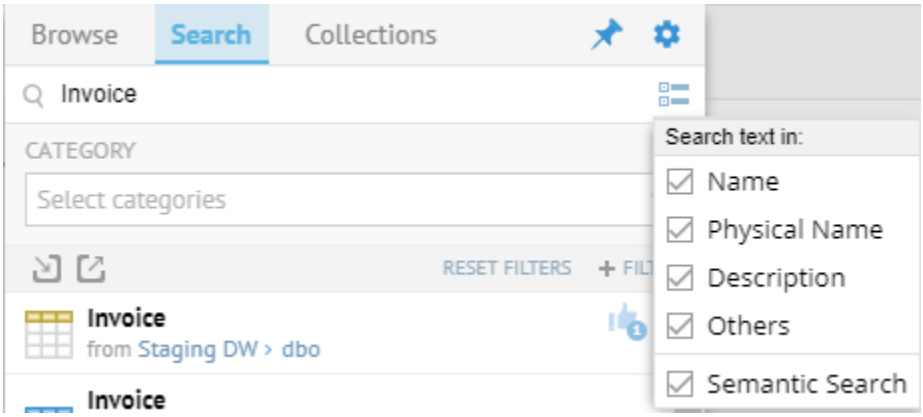
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Example

Click the **Search** tab in the explorer panel header.



Enter "Invoice" in the **SEARCH TEXT** box.



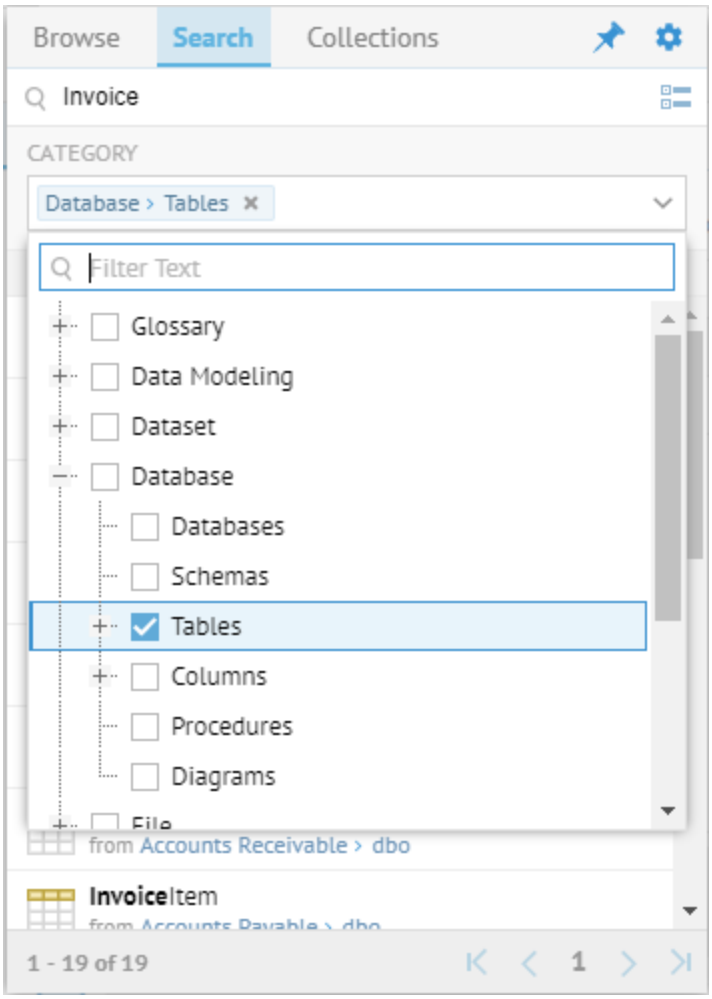
As you type the search already begins. You may use the search to understand what is available in the configuration.

Click on the search text in ( ) icon to specify the text search options.

By default, the search only includes Name and Physical Name, but you may extend that even to include the [Semantic Search rules](#).

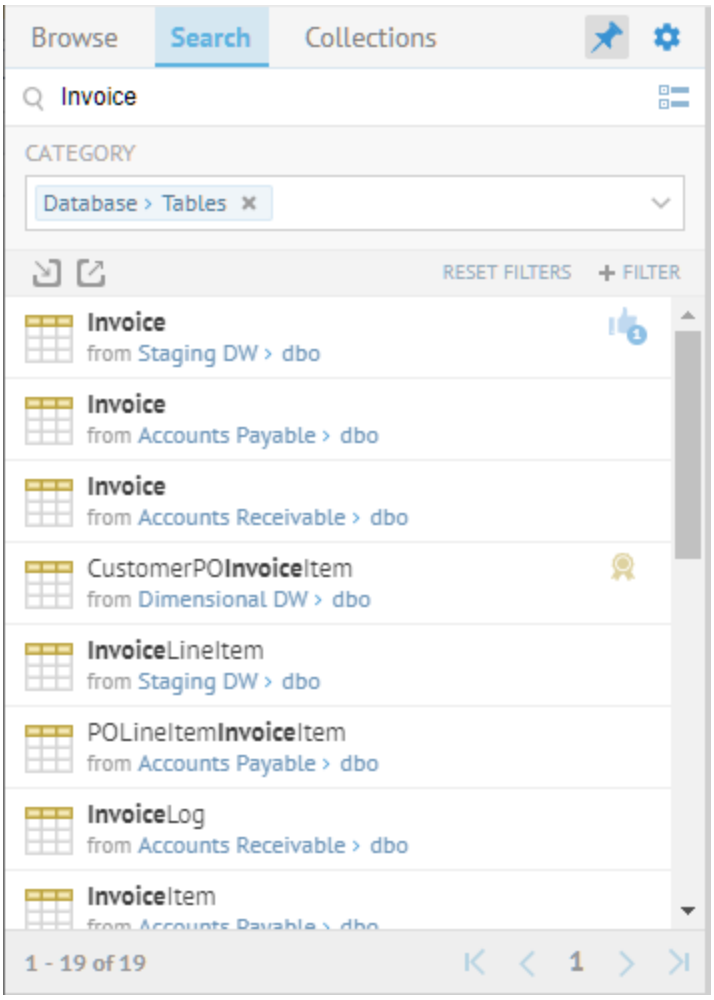
Click on **CATEGORY** and select **Database** > **Table**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



And the results are now filtered to only show Tables and Views.

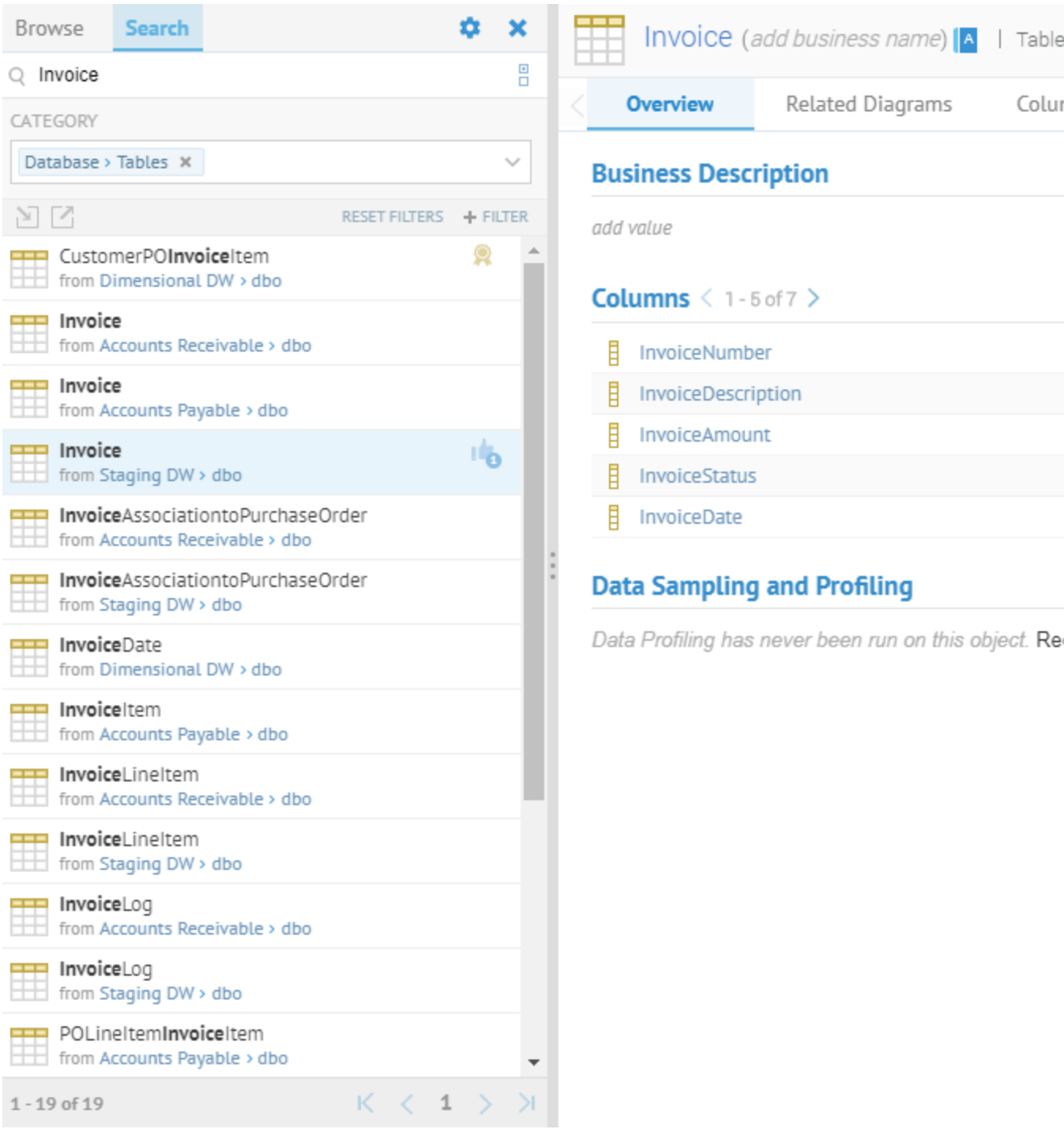
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Pin the explorer panel as we will have it open for a while.

Click the **Invoice** table in **Staging DW** > **dbo**.

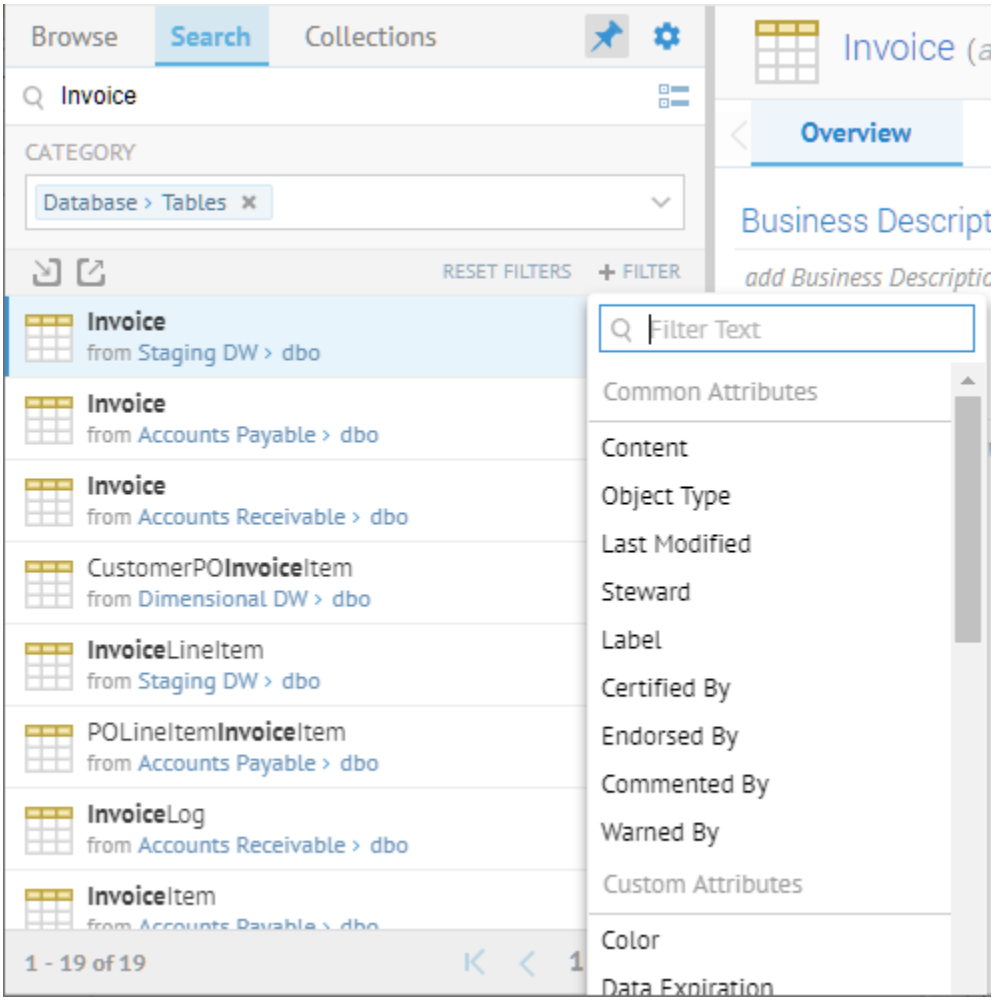
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



If you click on another item in the search results, you will be taken to that details page. However, the reverse is not true. If you navigate from the details page to an item, the Explorer Panel does not update.

Click **+FILTER**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



*Already we have one filter (shown above the **+ FILTER** link), the Content filter. You may add any number of filters on any of the attributes listed. You may clear all current filters with the **RESET FILTERS** link.*

Click **Open in worksheet** ( ) and you have a report based upon the same search criteria and filters.

Explore Further

You may specify display **Preferences**.

1. Click the **Preferences** icon ( ).

2. Select the specific options.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

SORT DIRECTION

Ascending or descending.

ITEMS PER PAGE

Search result sets may be huge and thus MIMM "paginates" the results in order to improve responsiveness over networks. This option allows you to specify the number of elements to display at a time..

ICONS

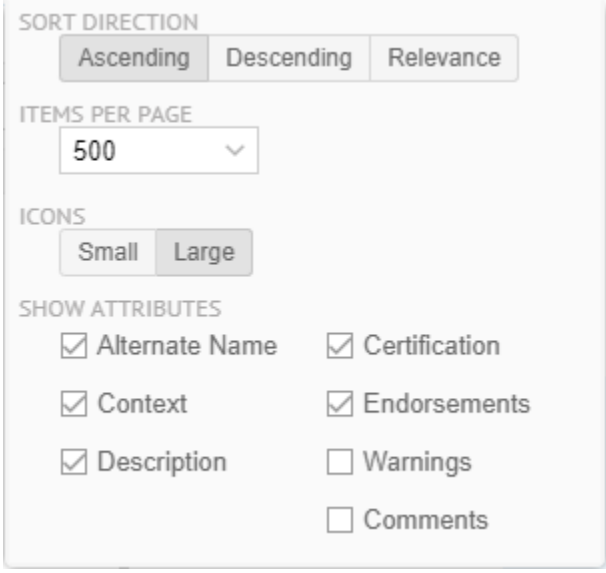
Small or Large.

SHOW ATTRIBUTES

Additional attributes may be shown in the search results, including all the curation icons as well as Alternate Name.

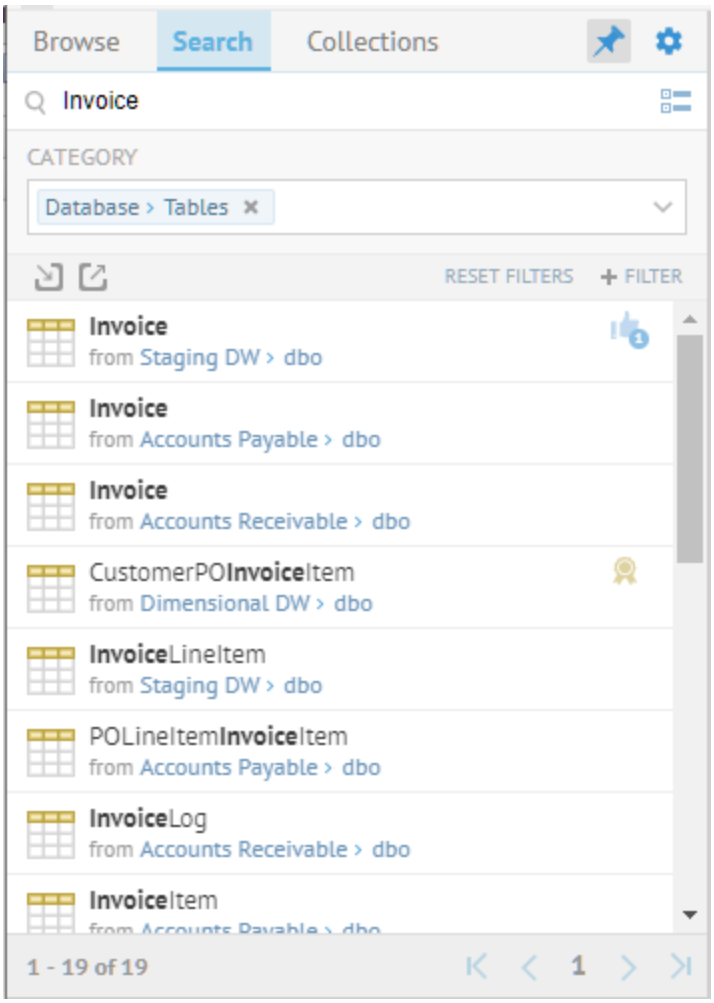
Example

Click the **Preferences** icon ( ) and select all of the options under **SHOW ATTRIBUTES**.



Now, we see all the curation icons and alternate names.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Search

Immediate Search

You may immediately perform searches from anywhere.

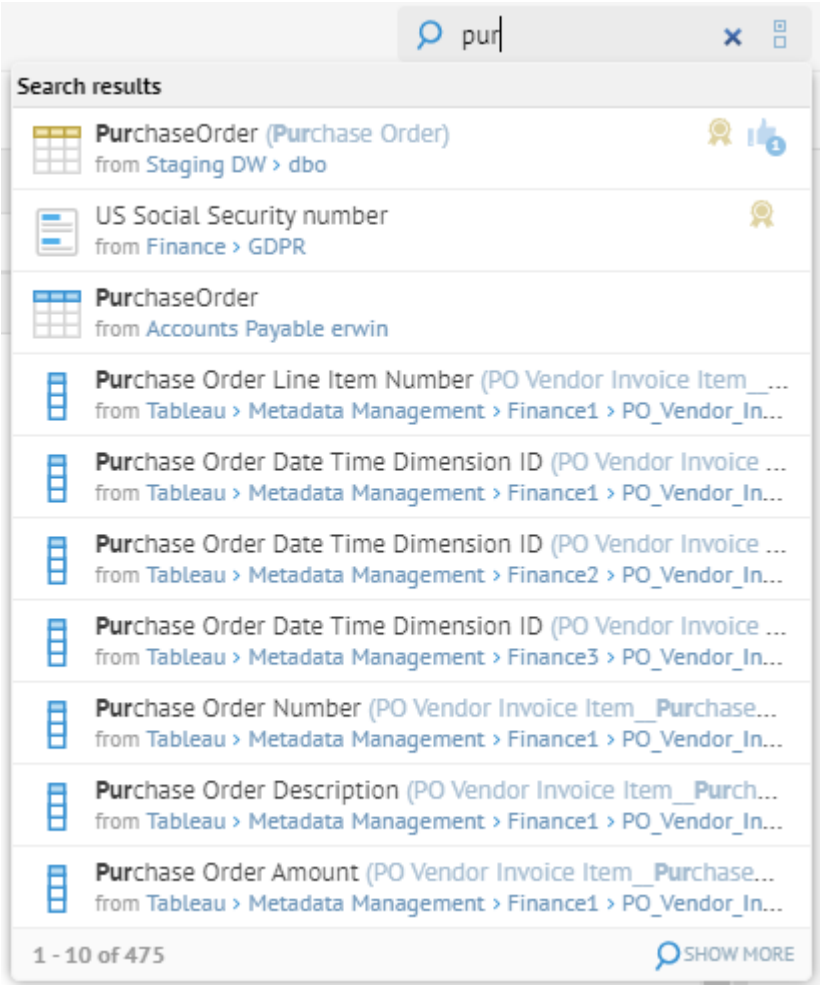
Steps

1. Click in the Search text box in the upper right.
2. Enter any text.

Example

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

You search for any metadata element containing the word “purchase”.



Relevance and Ordering of Results: The first metadata element in the list of results are Certified. The presentation order of the search results are altered by actions like certification. To learn more go here.

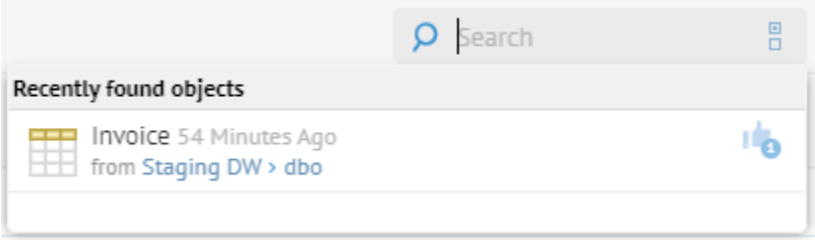
Semantic Search: The search uses semantic search rules so that you may specify fairly sophisticated queries within a simple syntax. This syntax is documented here.

Explore Further

Recent searches

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

The Search will initially show recent search requests that you may select before you type anything in the text box.



Open the metadata element details page

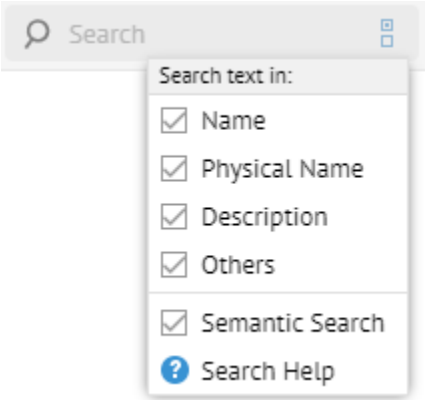
Click any metadata element or any of the structures in its Context (or model path) to view the details page.

Show full results

Only the most relevant few results are listed in the immediate search dropdown. Press Enter to present the results as a worksheet.

Search in Text

Click ( ) to specify what text to search in.



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

If you press enter, these options will be carried forward to the filter for the results as a worksheet.

Search in Model

Generally, the scope of searching is the current configuration. However, You may perform searches for just a given model.

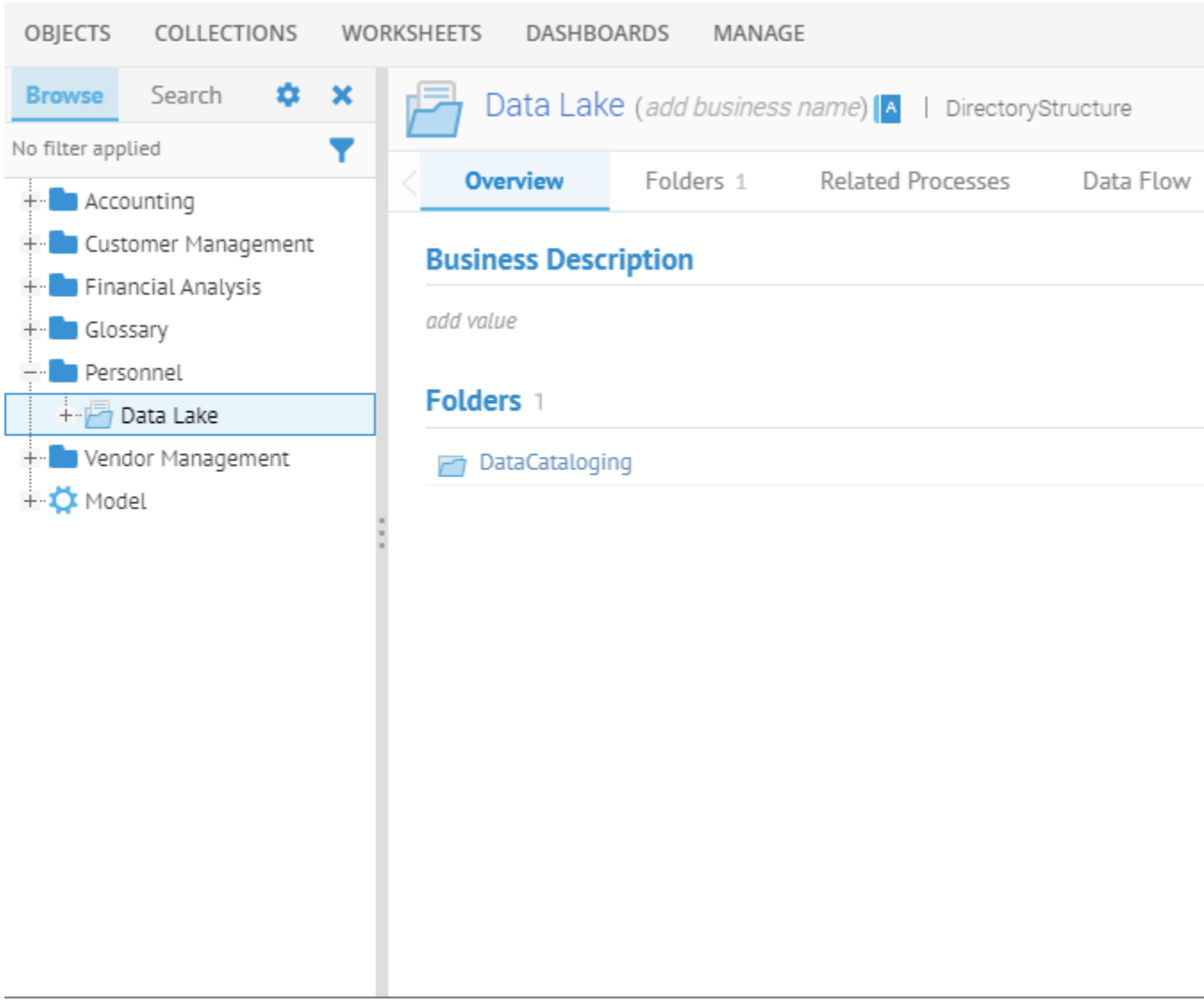
Steps

1. Navigating to that element's details page.
2. Click on the **More Actions** icon and select **Search in Model**.
3. Enter any text.

Example

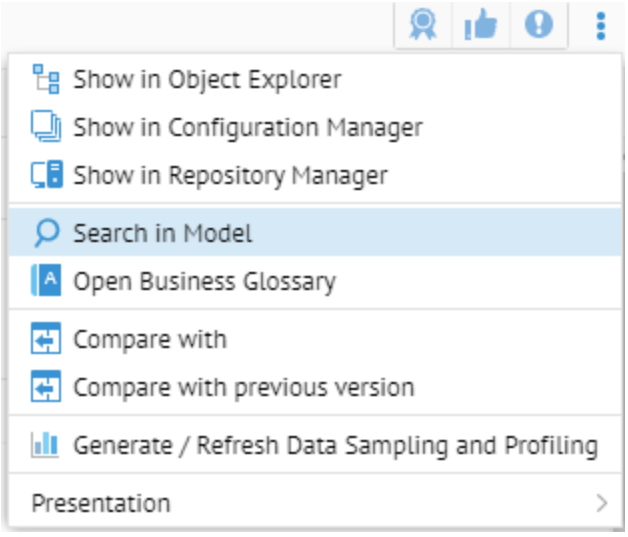
Go to the details page for the **Data Lake** model.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



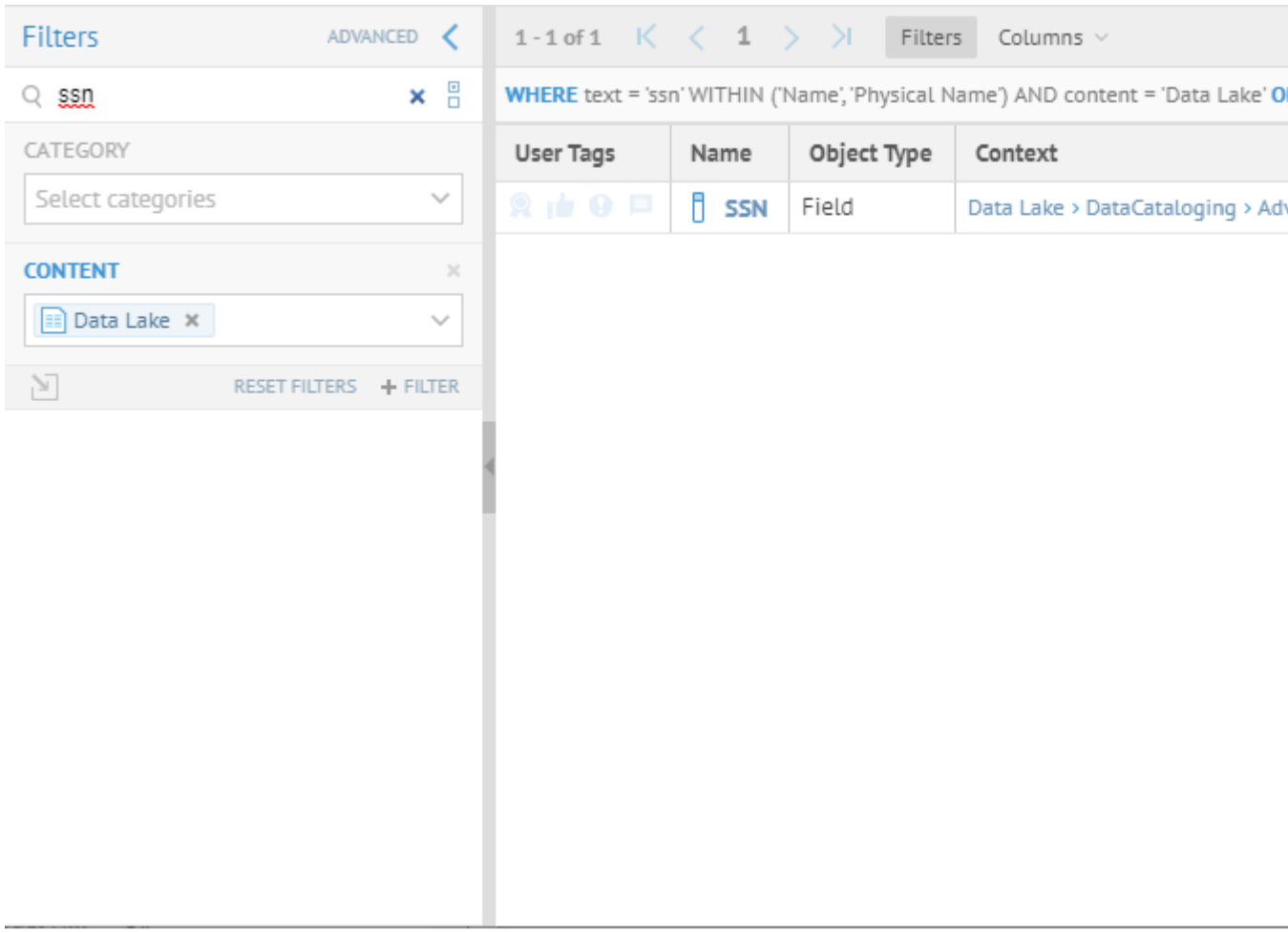
Click **More Actions** and select **Search in Model**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Search for any metadata element containing the word “ssn”.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



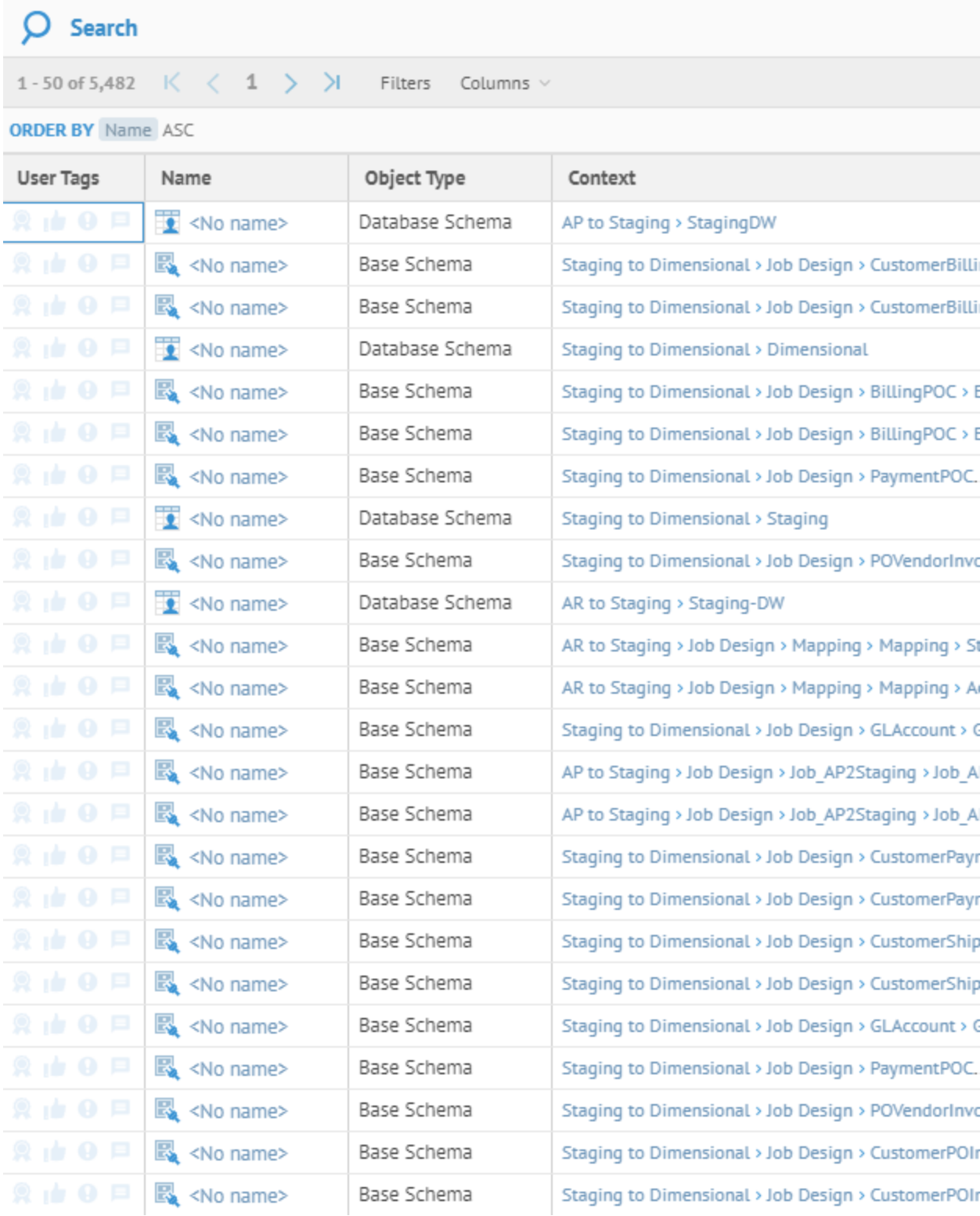
All the same search options as for the [immediate search](#) are here.

Search (Worksheet) Page

Steps

1. You may either:
    - From the [immediate search](#), you may simply click enter
    - Click **OBJECTS** and select **Search**:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



- Click **Open in worksheet** ( ) when searching using the explorer panel.

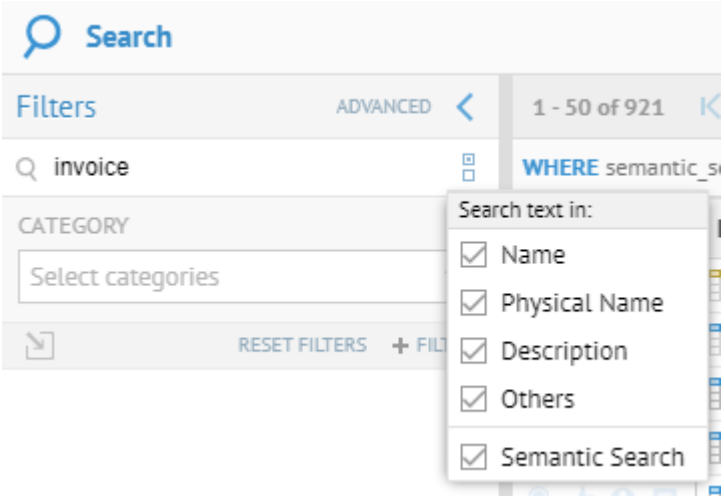
You are then presented with the common worksheet page.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Search Text

When searching, once you are on the results page, you may specify what fields to search for text. By default only the name and physical name are searched. All options are:

- Name
- Physical name
- Description
- Others, which includes other text properties (like comment) and custom attributes.



Search Syntax

Before you type, a simple click will list your previous searches. Otherwise, search is automatically activated as your type, offering you choices that you can select in the suggested list, or type enter to get to the advanced search window.

You may search for very precise results by specifying a search using the built-in query language. This is quite similar to most other web based search engines.

Specific searches may be made for the following type of criteria:

To search for	Example	Result
Any words	sales order	Any result containing the word “sales” or the word “order”
Exact phrase	“sales order”	Any result containing the exact phrase “sales order”
All Words	+sales +order	Any result containing BOTH the words “sales” and “order”

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Exclude Words	sales –order	Any result containing the word “sales” but cannot contain the word “order”
Wild Card End	sale*	Any result containing part of a word beginning with “sale”
Parent and Child	sales.order	Any result where the parent is named “sales” and the child is named “order”. E.g., the attribute “order” contained within the entity “sales”.
Exact Name	.order	Any result only containing the word “order”

One can, of course, append these together into a search string. E.g.:

Sales +order -date property:physicalname type:column

When searching for words with spaces or punctuation characters, such exact words must be quoted (e.g. “Product SKU”). By default, the search is only based on the name.

Use the text search options to search in descriptions and more).

Case sensitivity varies by object. The search is case-sensitive search for objects, like Labels, Stewards and Custom Attributes and case-insensitive for text, like name and description, by default.

For system objects, like Labels, in general the UI is defined to allow you to pick the object (not the text of its name). You can define two Labels, web and Web, and search for any or all of them. When you need to search for both web and Web labels you should use the **Equal ANY** option.

The characters "_" (underscore), ":" (colon), "'" (single quote) and "." (dot) as well as white space characters are treated as word breakers by the search tokenizer. Therefore the search text "_end" will be tokenized as "pll" and thus will match both “example_end” and “append”. Furthermore, any search text that is not quoted by the double quote character (") will be surrounded by the wildcard character to match more objects. If you do not want wildcard characters to be added, quote the search text with the double quote character, i.e. make the search text "_ end ". You will find objects with only "_ end " not "append".

Semantic Search

In addition, the semantic search offers the use of the following key words in your search:

- Object Types: term, dataset, attribute, entity, table, column, file, field, database, model, data model, and report. Such key words can be used in singular or plural (e.g. terms).

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

- Model Categories: glossary, glossaries, database, databases, db, modeling, data modeling, bi, reporting, tableau, bo, cognos, and obi.

Note that the above key words do not need to be quoted when space is used (e.g. data model).

Then such key words can be used in a user friendly convenient syntax with additional qualifier key words as follows:

- *customer table* : returns all database tables having *customer* in the name.
- *datasets with ssn* : returns all tables (or files) with a column (or fields) having *ssn* in the name.
- *tables with sensitive label* : returns all tables with a label applied to them having *sensitive* in the name.
- *my terms* : returns all terms for which I am the steward.
- *john's terms* : returns all terms for which *john* is the steward.
- *customer in tableau* : returns any tableau BI reports having *customer* in the name of any objects.

The search uses semantic search rules so that you may specify fairly sophisticated queries within a simple syntax. This syntax is documented below.

Semantic Search BNF Syntax

<semantic search query> ::= <type> | <children> | <label> | <steward> | <category>

<type> ::= <name> <types>

<name> ::= <alphanumeric>+ | "<character>+"

<types> ::= "datasets" | "dataset" | "entities" | "entity" | "tables" | "table" | "files" | "file" |

"attributes" | "attribute" | "columns" | "column" | "fields" | "field" |

"reports" | "report" |

"terms" | "term" |

"databases" | "database" |

"data models" | "data model" | "models" | "model"

<children> ::= <types> "with" <name>

<label> ::= <types> "with" <name> "label"

<steward> ::= "my terms" <types> | *<name>* ***"'s terms"***

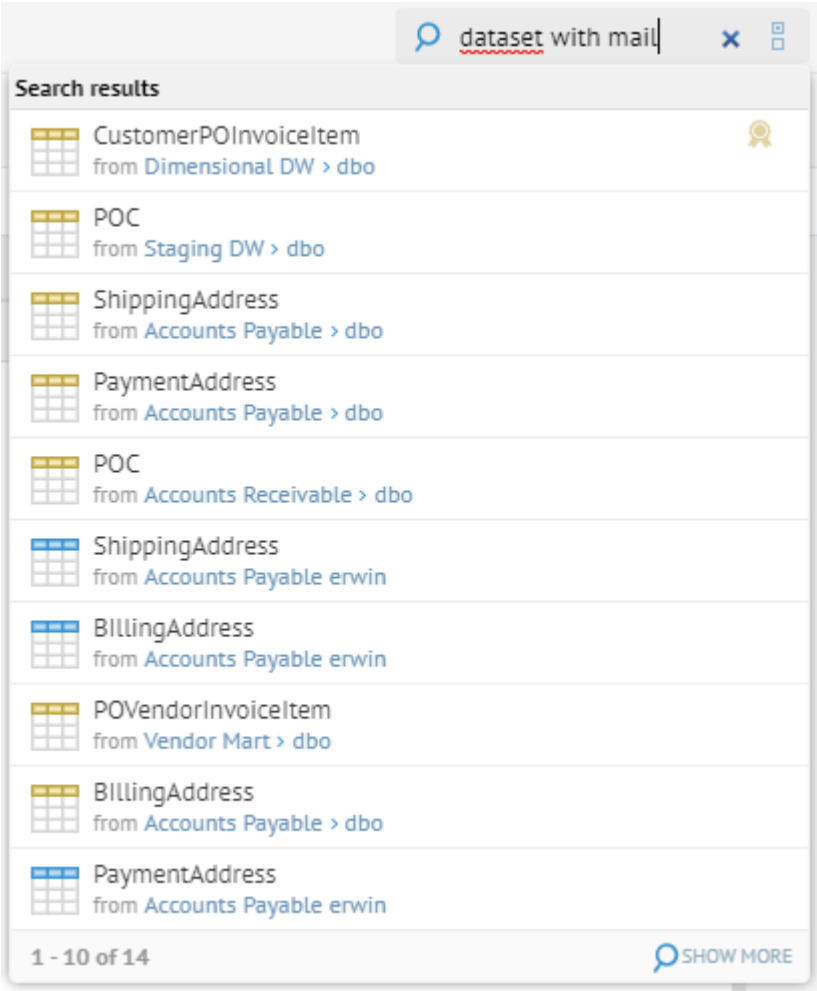
<category> ::= <name> "in" <categories>

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

<categories> ::= "glossary" | "glossaries" | "database" | "databases" | "db" | "modeling" | "data modeling" | "bi" | "reporting" | "tableau" | "bo" | "cognos" | "obi"

Example

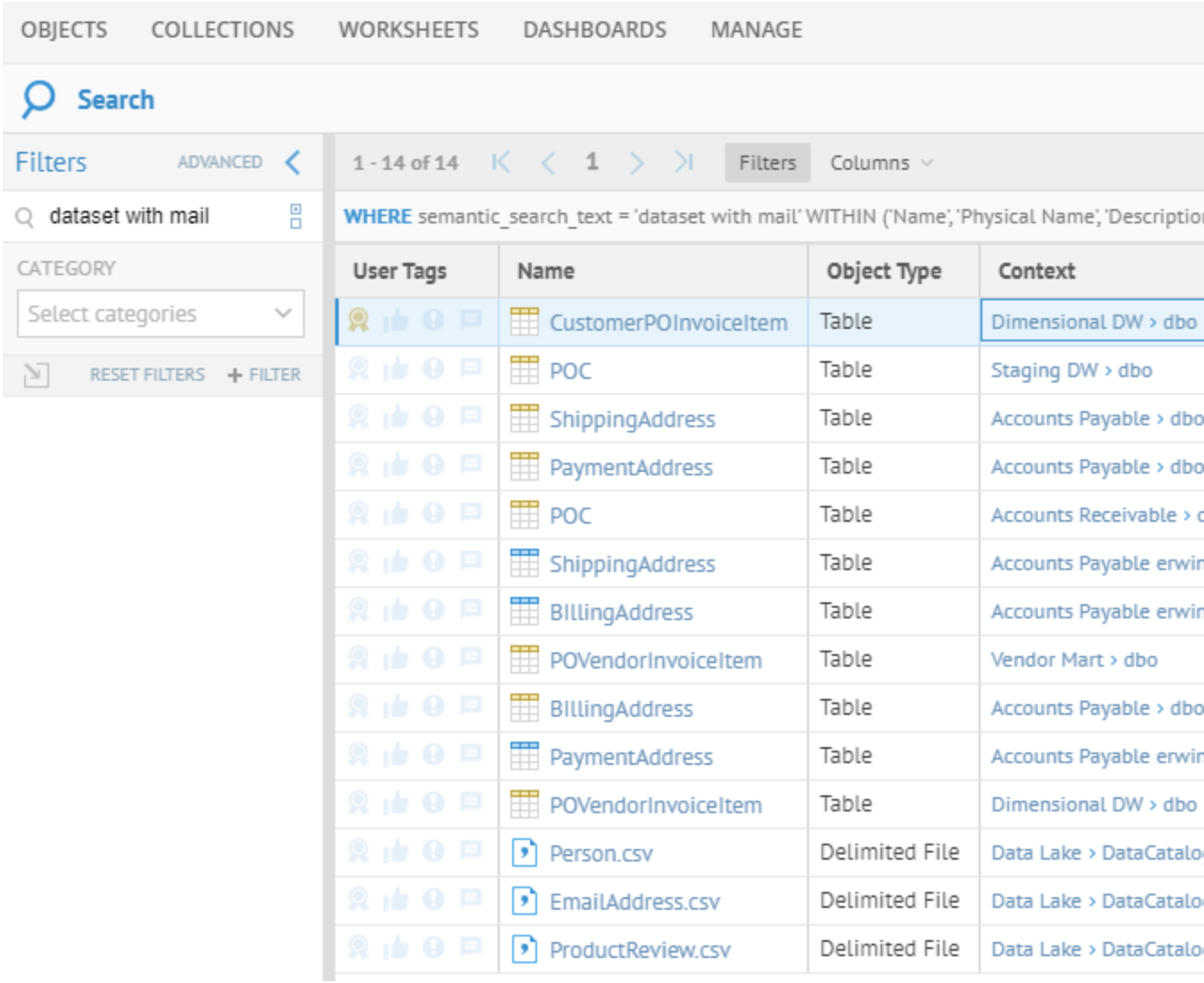
You search for “dataset with mail”.



The results contain all tables that contain a column that has the word “mail” in the name.

Now press the **Enter** key.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



All the results are displayed as a worksheet along with the filter panel on the left.

Collections

The collection management feature allows users to define and mange collections of metadata objects. Just like labels, collections are available anywhere in the UI to add/remove objects, for bulk editing, and assisting in management.

Collections can contain any type of metadata such as “My favorite” collection of terms, tables, reports, etc.

Collections can also can contain multiple types of content such us “My to do collection” with terms, tables, reports, etc., in that collection.

Collections may be shared with other users when marked as public, such as “Our quarterly review” collection.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Collections are flat, therefore not hierarchical and with no sub-collection or include concepts.

Explorer Collections

You may use the collections explorer to select and present results according to the user-defined collections available.

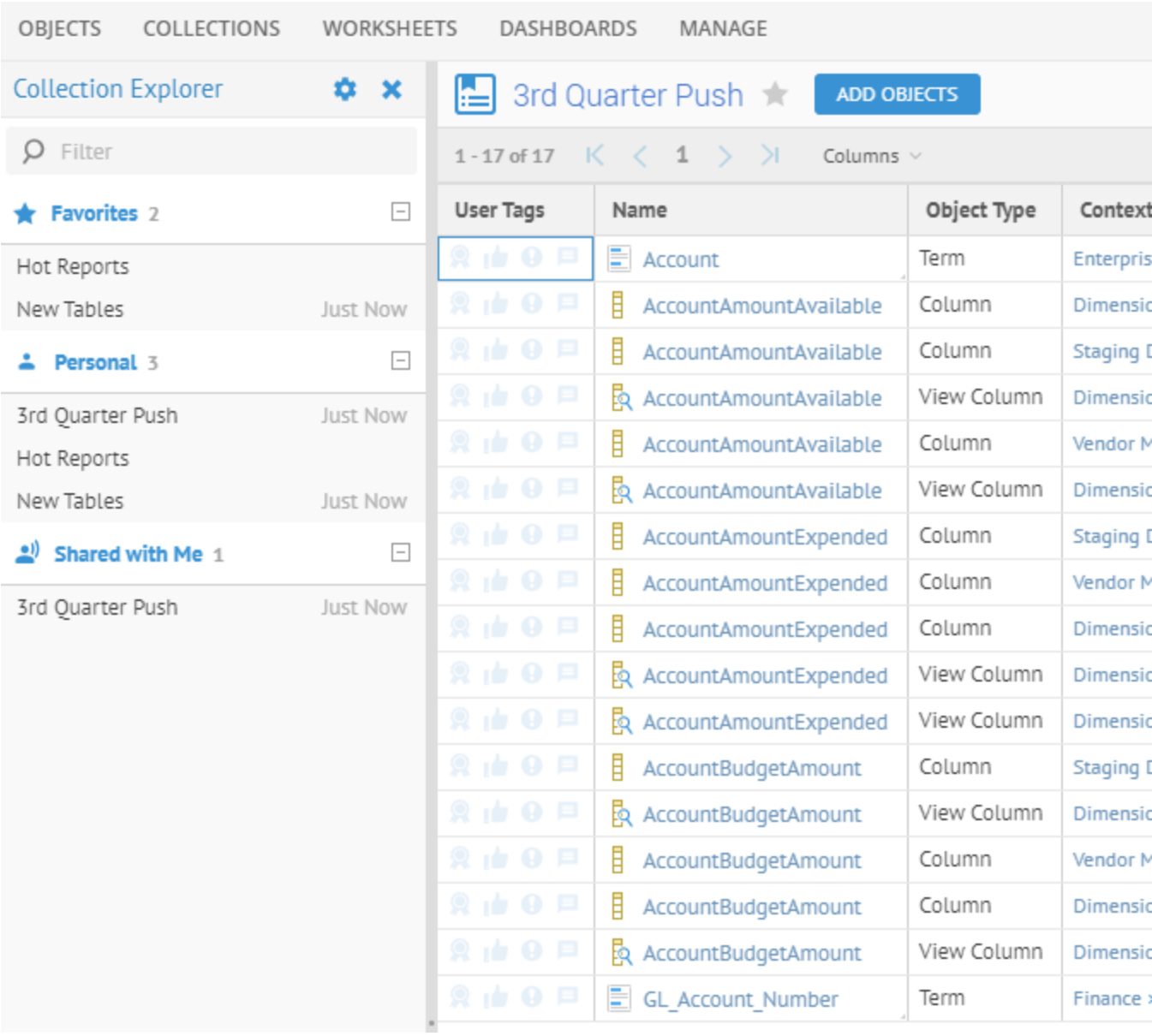
Steps

1. Go to **COLLECTIONS > Explore**.
2. Select the collection to use from the pick lists:
   - **Favorites**
   - **Recent**
   - **Personal**
   - Shared **with me**
3. You may filter the worksheet lists by entering text.
4. Click on any collection results to edit and manage that collection.
5. Click on the Preferences ( ) icon to set the Maximum count for each presentation of collections.
6. Click the Close ( ) icon to close the explorer.

Example

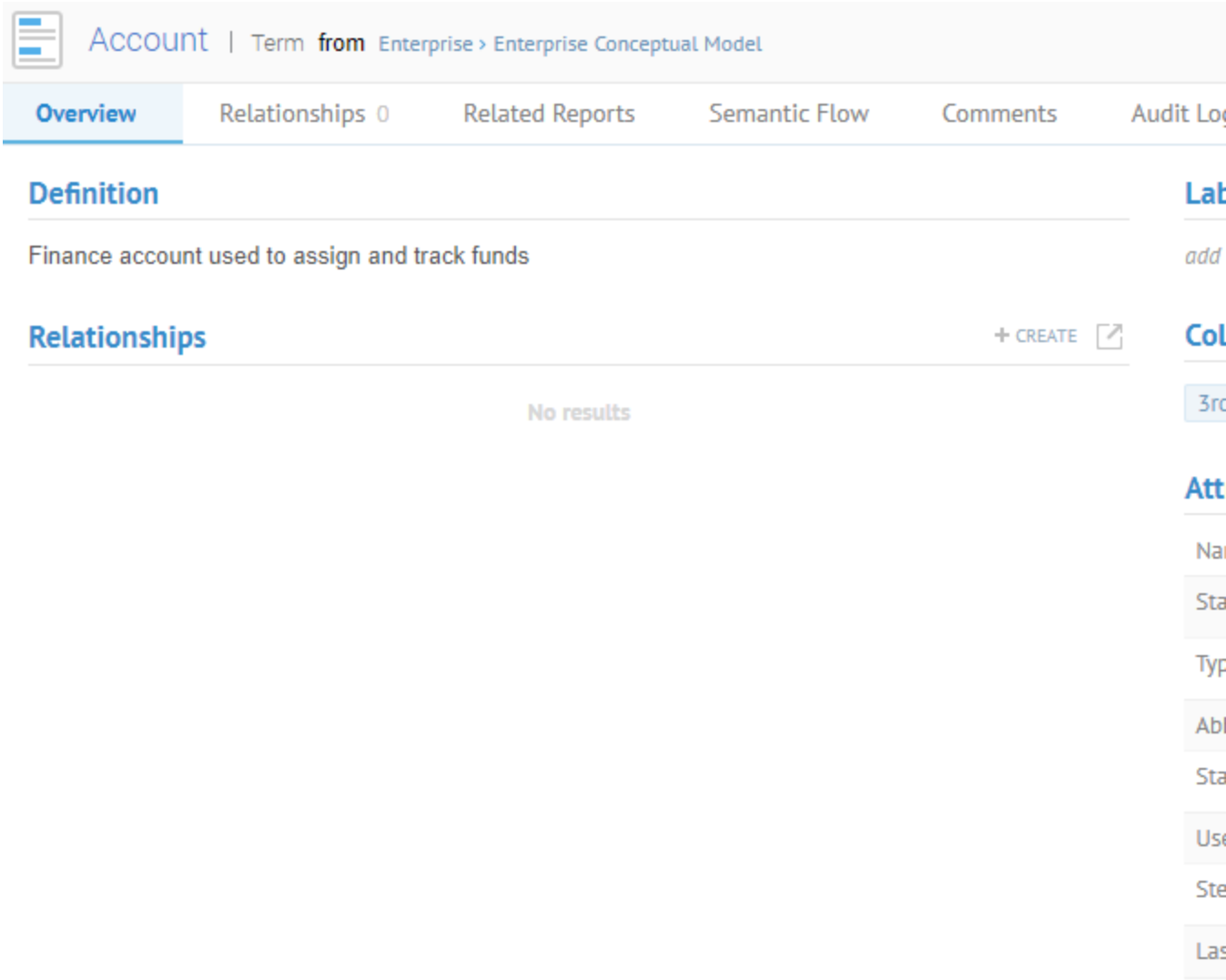
Go to **COLLECTIONS > Explore**

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Select the **3rd Quarter Push** collection.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click the **Account** term.

Create a Collection

The collection management feature allows users to define and mange collections of metadata objects. Just like labels, collections are available anywhere in the UI to add/remove objects, for bulk editing, and assisting in management.

Steps

1. Go to **COLLECTIONS** > **Manage**. This is the **Collection Management** page.

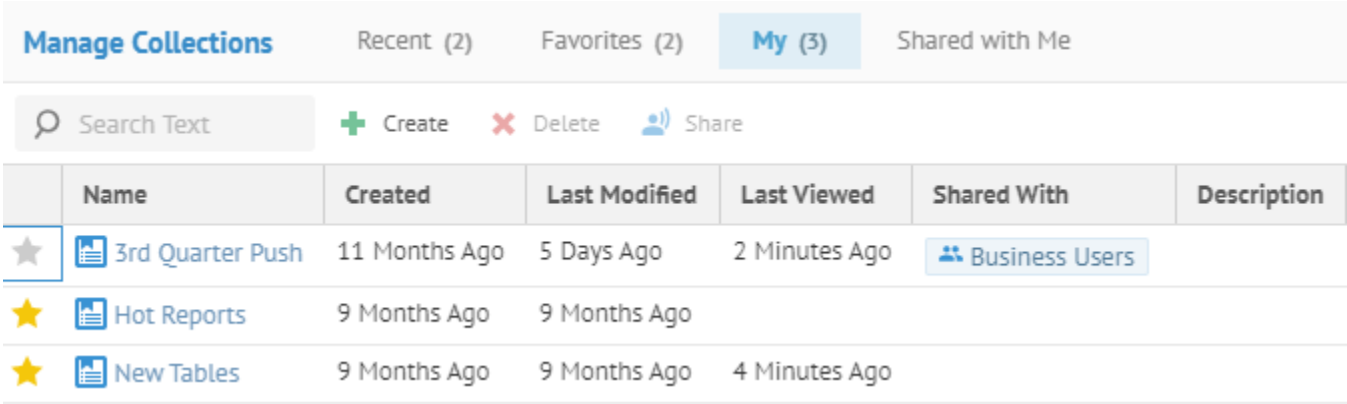
2. Click the plus sign to **Add** a new collection.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

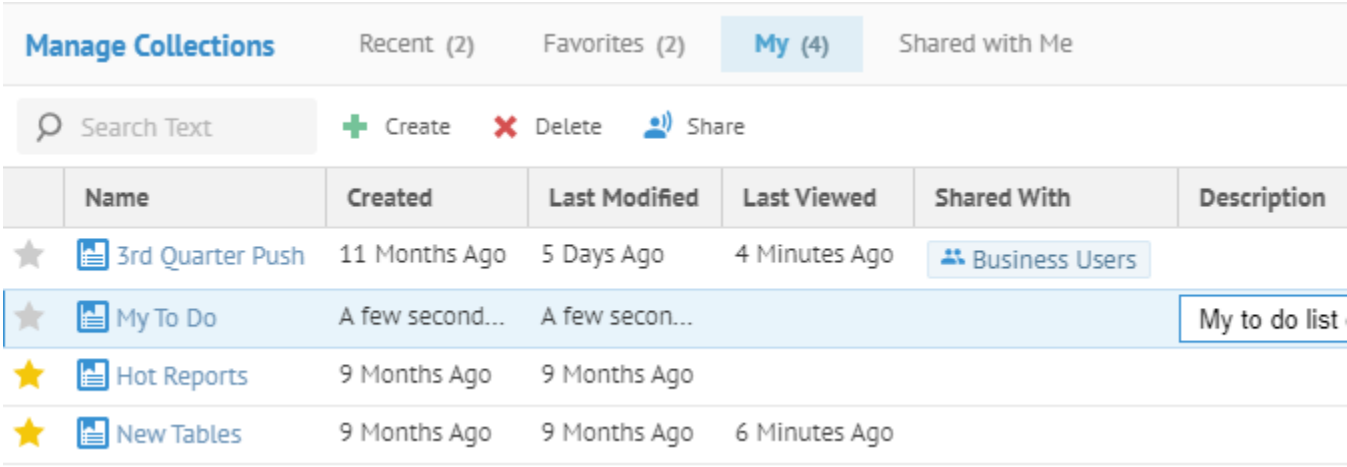
3. Provide a Name and Description.

Example

Go to **COLLECTIONS** > **Manage**. Click **Create** to add a new collection.



Provide a **Name** and **Description** as “My To Do” and “My to do list of objects”..



Add Metadata Elements to a Collection

Collections can contain any type of metadata such as “My favorite” collection of terms, tables, reports, etc.

Collections can also can contain multiple types of content such us ”My to do collection” with terms, tables, reports, etc., in that collection.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Add Metadata Elements to a Collection in the Collection Management Page

You may add items to the collection from the Collection Management page**.**

Steps

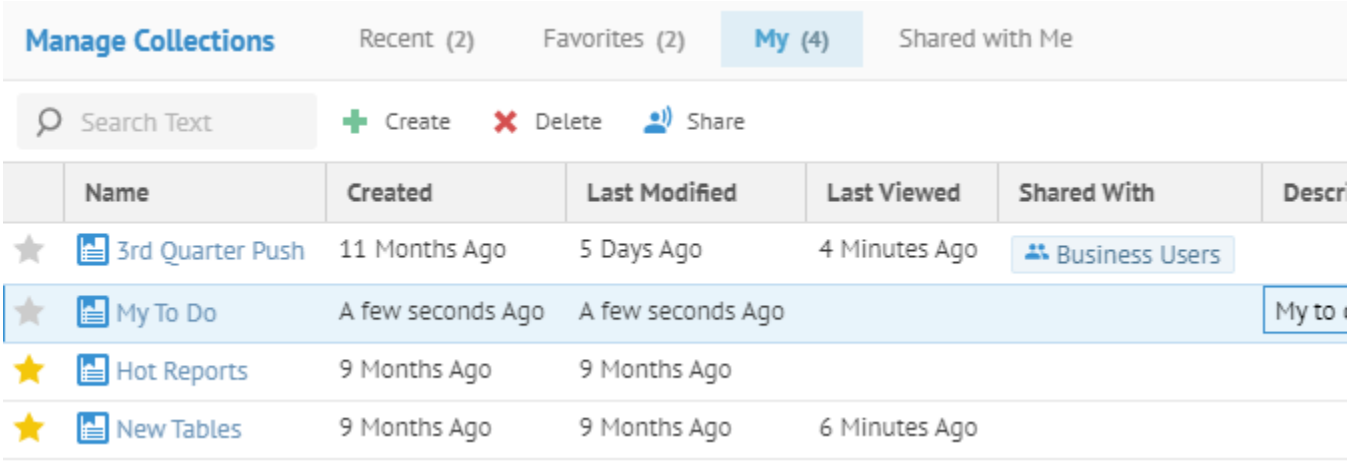
1. Either:
   - Go to **COLLECTIONS** > **Manage**. This is the **Collection Management** page.
   - Go to **COLLECTIONS > Explore**.
2. Click a collection to open it.
3. Click Add Objects to an items to the collection.
4. Use the search and filters to find elements to add to the collection.

> *You may always add any object to a collection at any time from the objects details page or from a list or grid (worksheets), unless your [group assignment Properties restricts](#) the* ***Edit Collections Property***

Example

Go to **COLLECTIONS** > **Manage**.

Click the **My** tab.

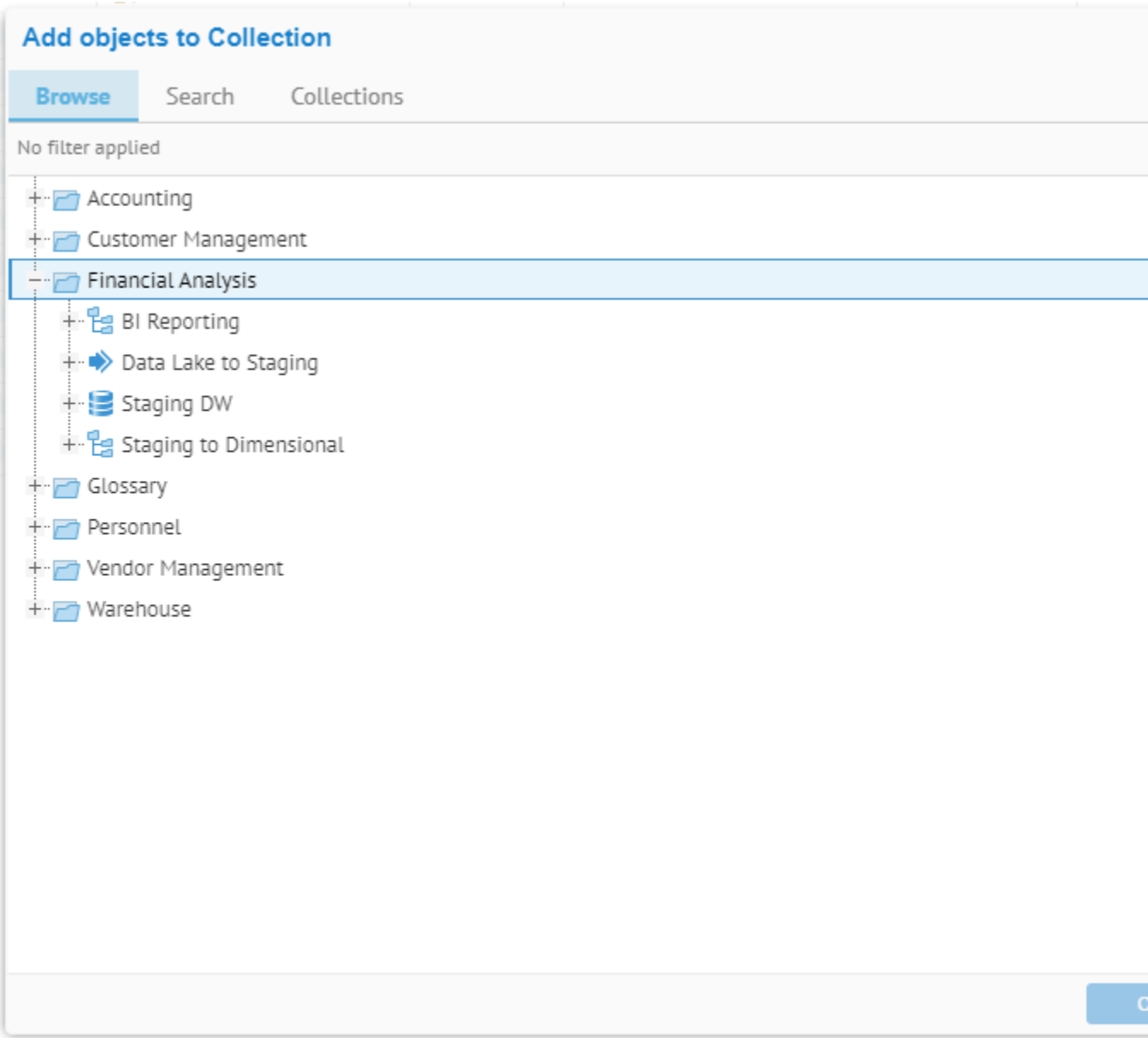


Click the Hot Reports collection (hyperlink that is its name).

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

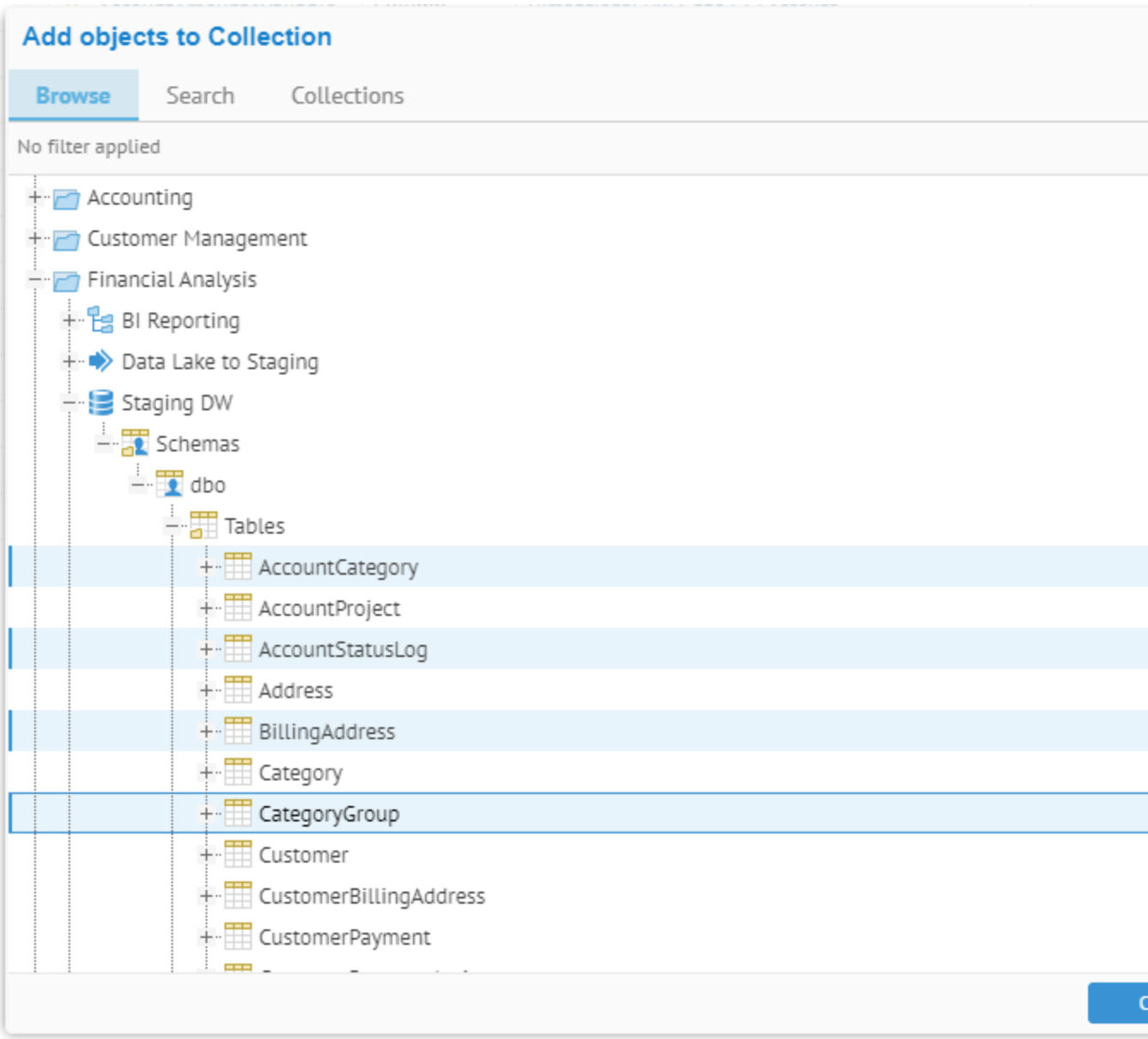
Click ADD OBJECTS. You are presented with the explorer panel type presentation.

Select the model where you want to pick elements from, in this case Staging DW.



Expand the tree until you can select several items using Ctrl-click and Shift-click.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click OK.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Hot Reports ADD OBJECTS

1 - 19 of 19 1 Columns

User Tags	Name	Object Type	Context
	AccountAmountAvailable	Column	Vendor Mart › dbo › GLAccount
	AccountAmountAvailable	Column	Staging DW › dbo › GLAccount
	AccountAmountAvailable	View Column	Dimensional DW › dbo › PaidCustomerPOGLAccountV...
	AccountAmountAvailable	Column	Dimensional DW › dbo › GLAccount
	AccountAmountAvailable	View Column	Dimensional DW › dbo › PaidPurchaseOrderGLAccou...
	AccountAmountExpended	View Column	Dimensional DW › dbo › PaidPurchaseOrderGLAccou...
	AccountAmountExpended	Column	Vendor Mart › dbo › GLAccount
	AccountAmountExpended	View Column	Dimensional DW › dbo › PaidCustomerPOGLAccountV...
	AccountAmountExpended	Column	Dimensional DW › dbo › GLAccount
	AccountAmountExpended	Column	Staging DW › dbo › GLAccount
	AccountBudgetAmount	Column	Staging DW › dbo › GLAccount
	AccountBudgetAmount	Column	Vendor Mart › dbo › GLAccount
	AccountBudgetAmount	Column	Dimensional DW › dbo › GLAccount
	AccountBudgetAmount	View Column	Dimensional DW › dbo › PaidPurchaseOrderGLAccou...
	AccountBudgetAmount	View Column	Dimensional DW › dbo › PaidCustomerPOGLAccountV...
	AccountCategory	Table	Staging DW › dbo
	AccountStatusLog	Table	Staging DW › dbo
	BillingAddress	Table	Staging DW › dbo
	CategoryGroup	Table	Staging DW › dbo

The items are added to the collection

Add Metadata Elements to a Collection from the Details Page.

Steps

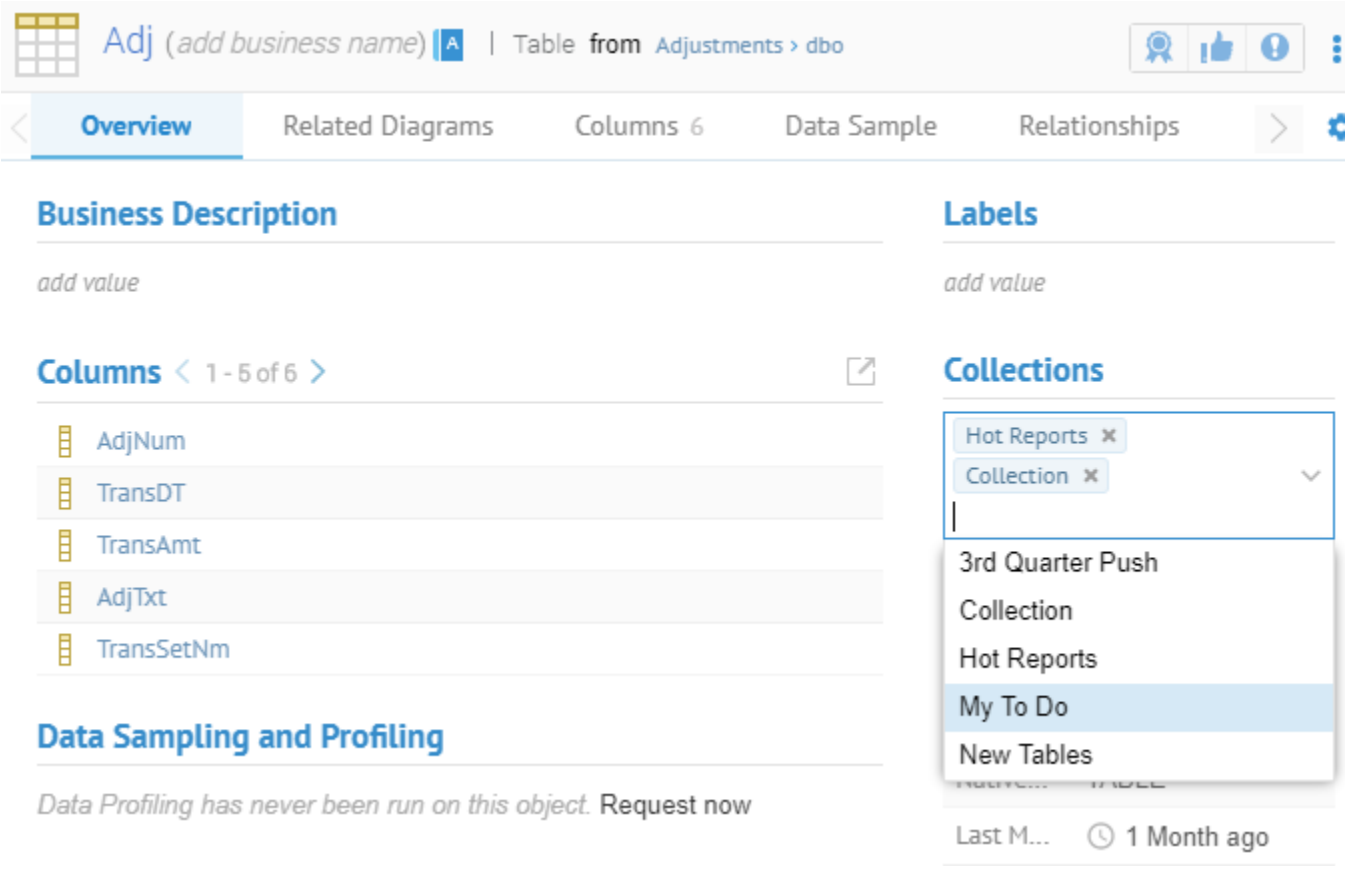
1. Navigate to the details page for the metadata element you wish to add to the collection.
2. Select a collection from the **Collections** control.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Example

Navigate to the details page of the **Adj** table.

In the Collections area, select from the matching collection names.



You may add a metadata element to any number of collections

Add Metadata Elements to a Collection in a worksheet or search result.

Please see working with worksheet or search results.

Share a Collection

Collections may be shared with other users when marked as public, such as the "Monthly Review" collection.

Steps

1. Go to **COLLECTIONS** > **Manage**. This is the **Collection Management** page.

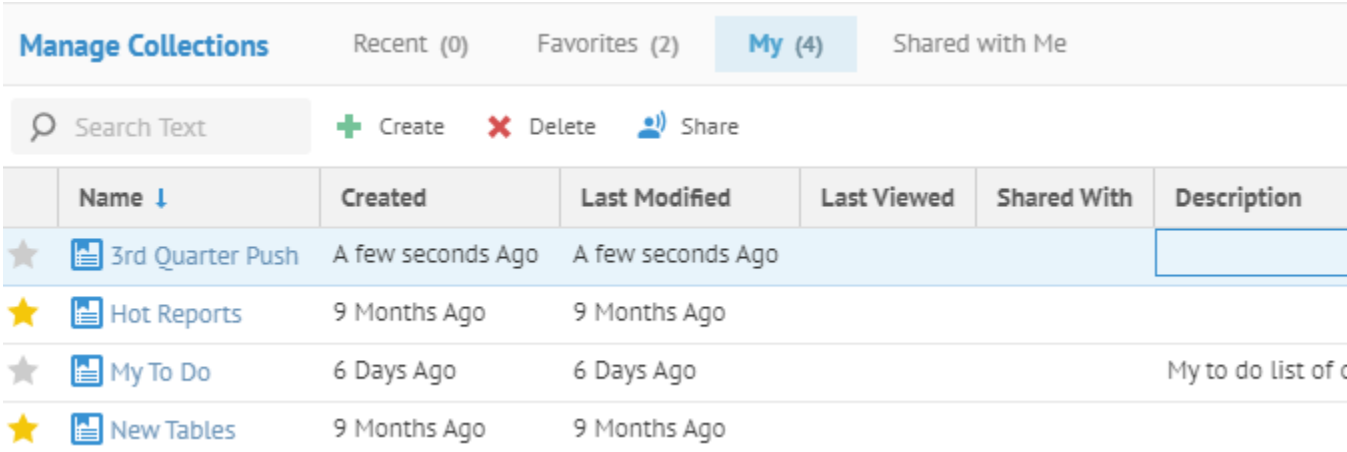
2. Click the **My** tab.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

3. Select a collection.
4. Click **Share**.
5. Pick one or more users and/or groups to share the worksheet with.
6. To un-share a worksheet, simply remove the specific (or all of) users and/or groups.

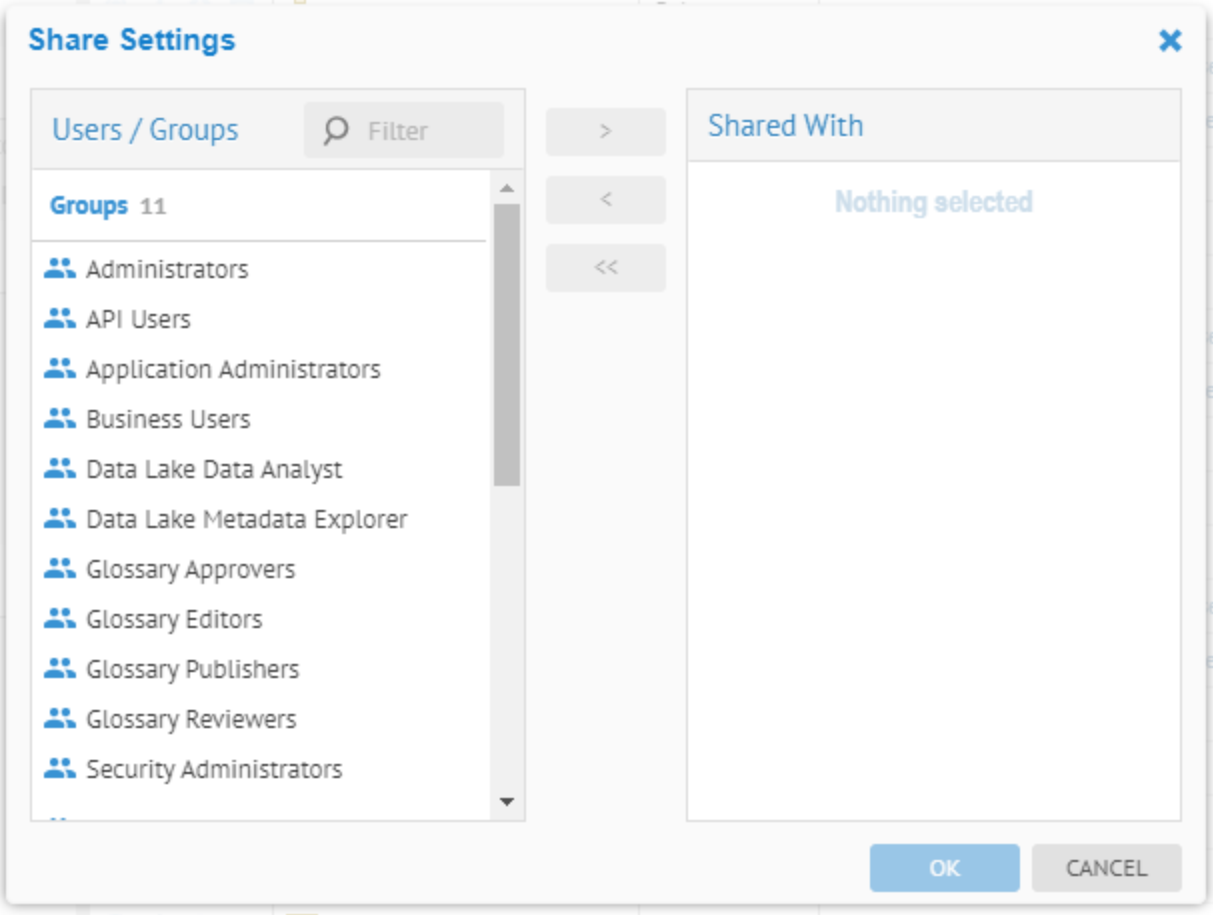
Example

Go to **COLLECTIONS** > **Manage**. Click the **My** tab. Click the line for **3rd Quarter Push.**



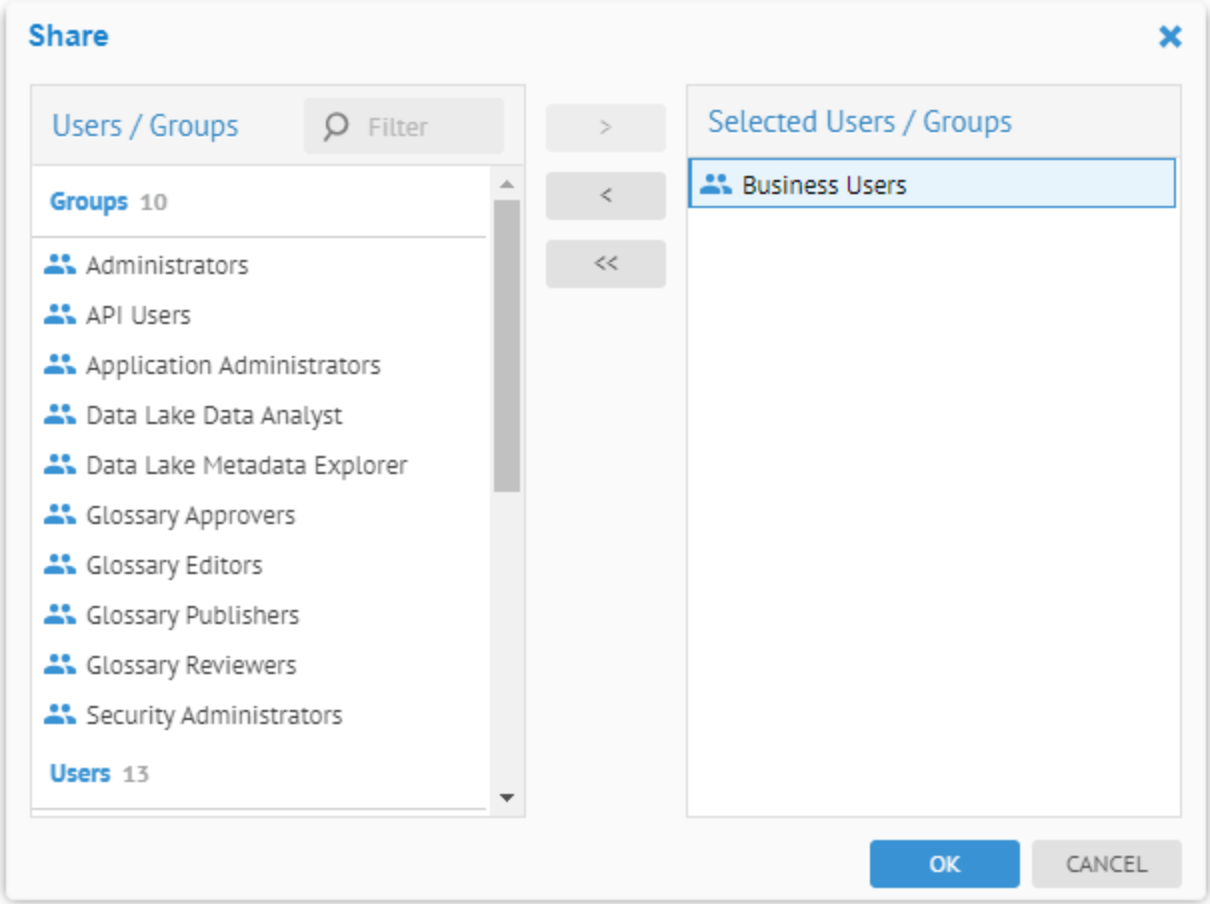
Now, click Share.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Move the Business Users group to the right hand side show the collection is shared with those users.

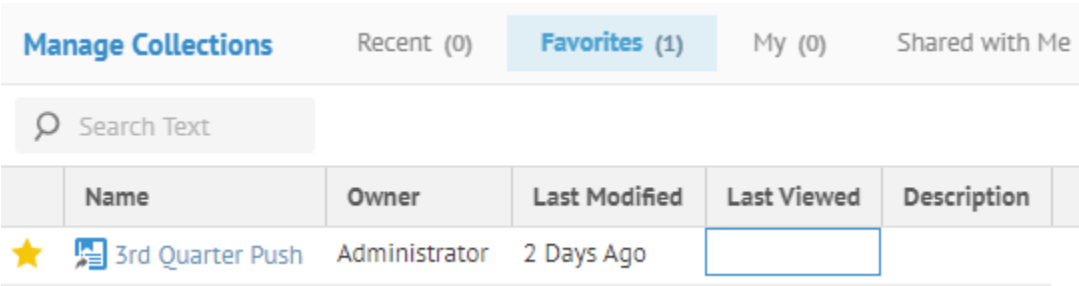
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Log out and log in as Bob.

Go to **COLLECTIONS** > **Manage**. Click the **Shared with Me** tab. Click Search. Locate the **3rd Quarter Push** collection. Click the Favorite icon next to that collection.

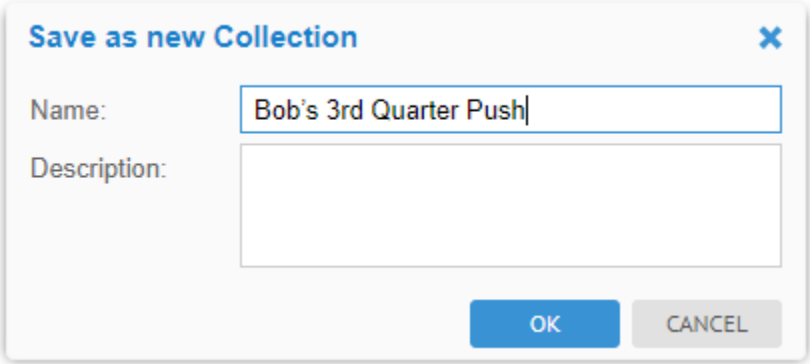
Now, go to the Favorites tab and see this collection as Bob.



You cannot add to this collection as Bob because Bob does not own it.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Click Save As and enter the name "Bob's 3rd Quarter Push" and Click OK.



You may now edit the list. You could also share it back with Administrator.

Working with Collections

Just like labels, collections are available anywhere in the UI to add/remove objects, for bulk editing, and assisting in management.

Using Shared Worksheets

Simply because you have shared a worksheet does not mean that all those other users can see it. They must first look it up in Shared with Me. Once they have done so, they may

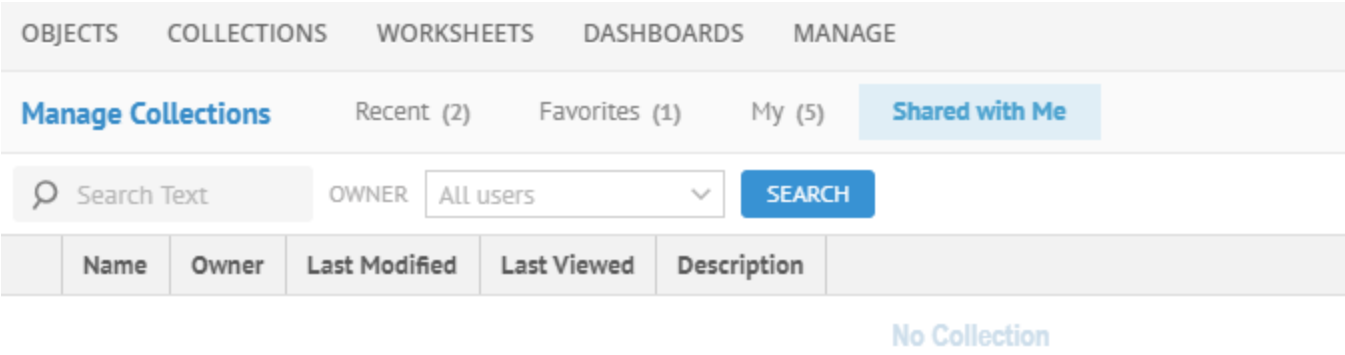
- **View** it
- **Favorite** it
- **Save As** their own worksheet that they may edit.

Steps

7. Go to **COLLECTIONS > Manage.**

8. Go to the **Shared with Me** tab.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



This list will be empty at first. You must search for worksheets that are shared with you.

9. Enter text or just click **Search**.

10. From here you may:

    - Open/Edit the worksheet
    - Restrict the list by using the **Search Text**
    - **Favorite** or un-**Favorite** a worksheet

Explore Further

Working on Elements in a Collection

Steps

1. Go to the Collection Management page.

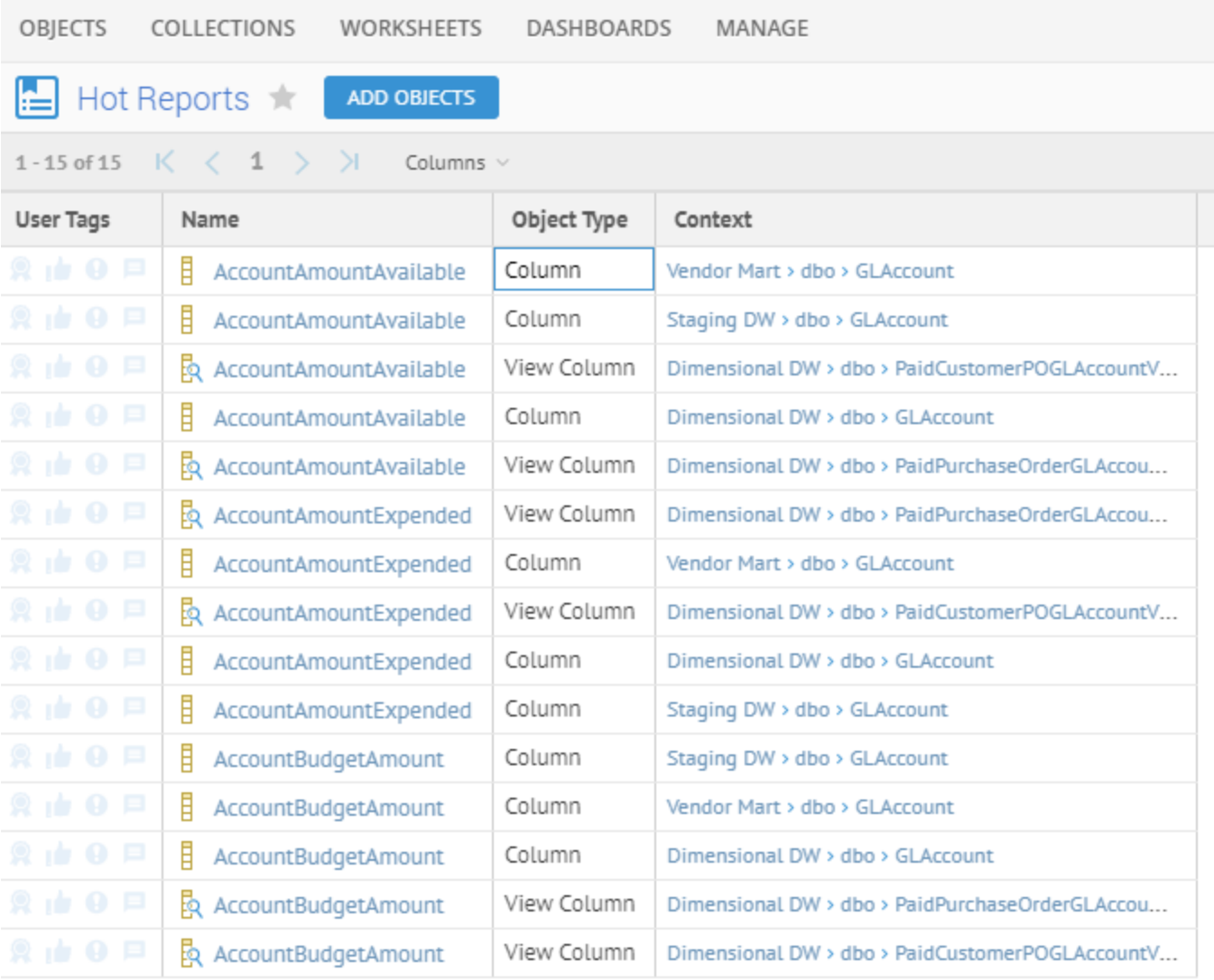
2. Click the **My** tab.

3. Click a collection to open.

4. Results are a common results (reports) page where you may operate on the items in grid mode.

Example

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Add a Public Collection to my Collections

Collections may be shared with other users when marked as public, such as “Our quarterly review” collection.

Steps

1. Go to the Collection Management page.

2. Click the Add plus sign and pick a collection from what is **Public**.

Worksheets

MIMM provides metadata reporting capabilities where both search and browse (as well as a direct link in the OBJECTS menu) lead to a common worksheet page.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Starting from search simply predefines the text filtering (e.g. customer), while browsing predefines a category (e.g. database / tables), and direct access to a worksheet does not predefine anything.

The worksheet capabilities offers you the ability to select multiple categories (e.g. database / tables + Flat files) and subset by content (My Data lake + Sales DW database) before drilling down with the following filters:

- Then filtering is available for Last Modified, Stewards, Labels, Semantic Types, Endorsed By, Certified By, Created By, Warning By, and Commented By
- More custom filtering per attribute (including custom attributes) common to the metadata subset (e.g. SecurityLevel = Orange)
- Worksheets can be reused by saving the URL as favorites (further versions will support full report management within the application).

Explore Worksheets

You may use the collections explorer to select and present results according to the worksheets available.

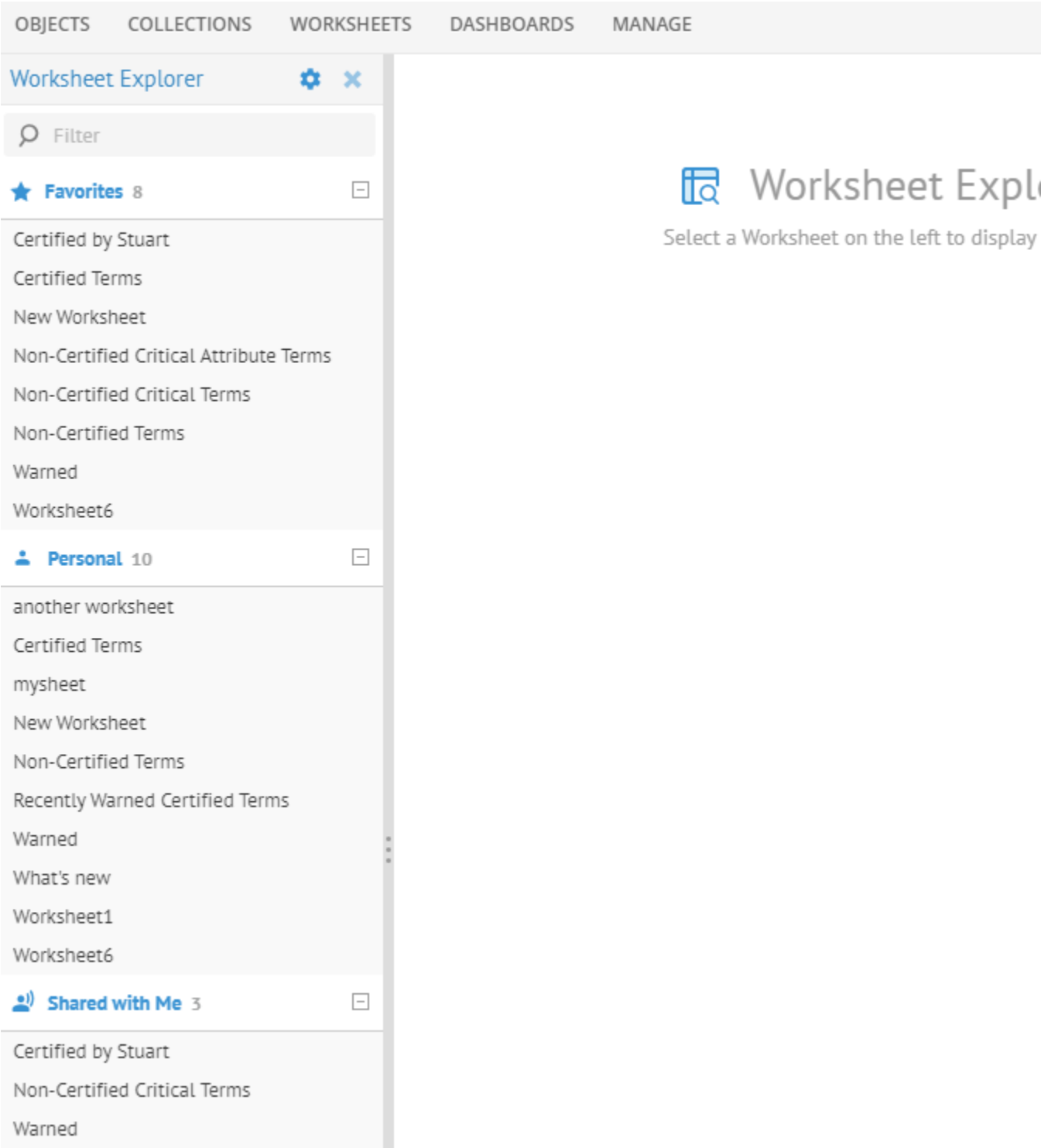
Steps

1. Go to **WORKSHEETS > Explore**.
2. Select the worksheet to use from the pick lists:
   - **Favorites**
   - **Recent**
   - **Personal**
   - Shared **with me**
3. You may filter the worksheet lists by entering text.
4. Click on any item results to edit and manage that worksheet.
5. Click on the Preferences ( ) icon to set the Maximum count for each presentation of dashboards.
6. Click the Close ( ) icon to close the explorer.

Example

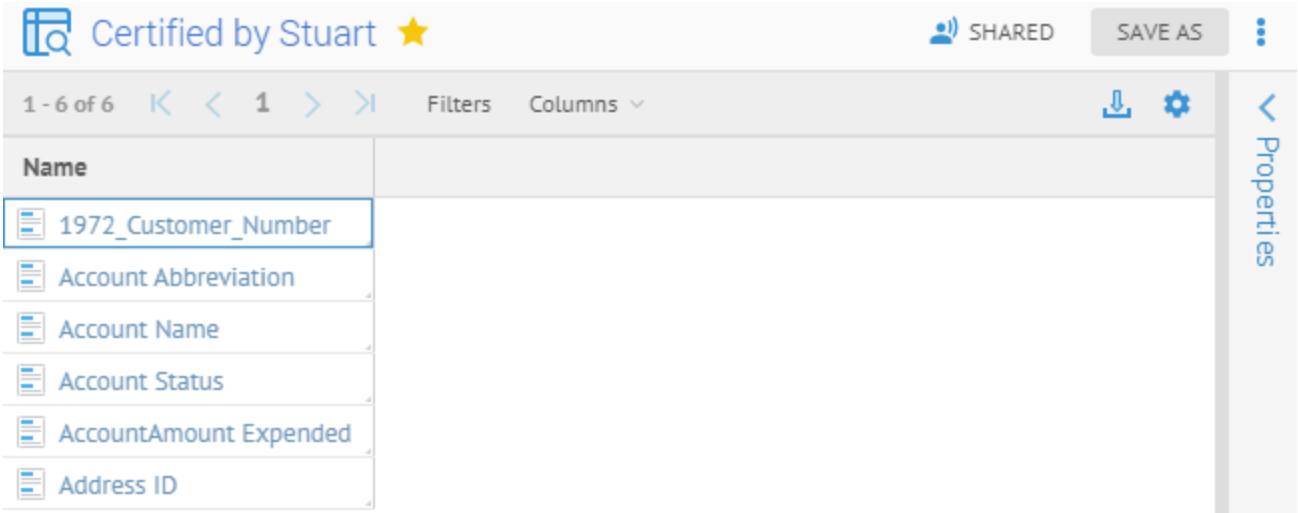
Go to **WORKSHEETS > Explore**

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Select the **Certified by Stuart** worksheet.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Create a Worksheet

To build a worksheet, you generally begin by searching. You may also go straight to the create option on the manage worksheets page.

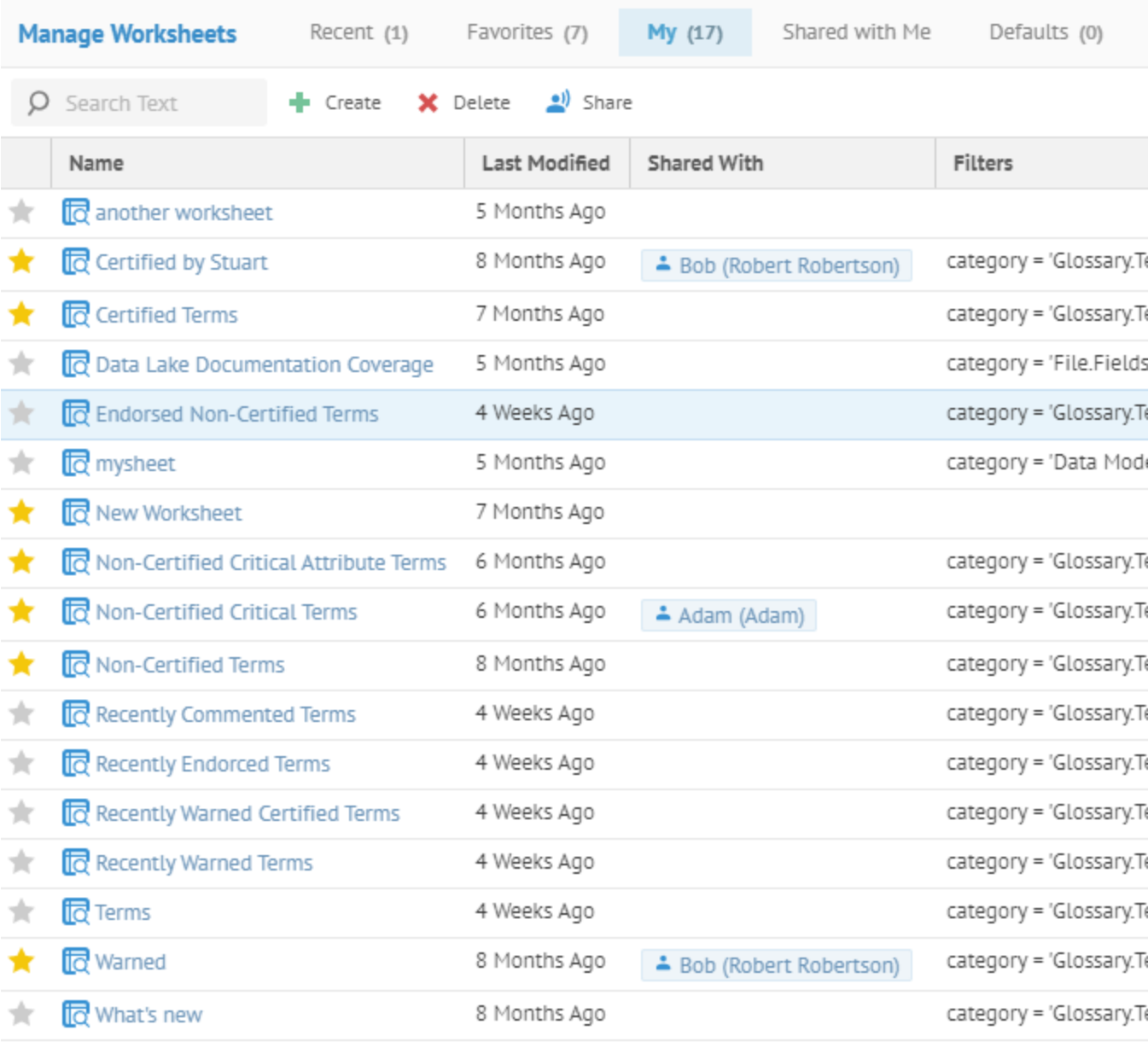
Steps

1. There are several options available for creating as worksheet

   - You may use the immediate search to open a search page as a basis for a worksheet.
   - You may also select **OBJECTS > Search** to begin working on a worksheet where you have the results of all objects in the configuration and may filter from there.
   - You may also click **WORKSHEETS >** and select any of the options under
     - **Favorites**
     - **Recent**
     - **Categories**
   - You may also click **Open worksheet with the current filter** ( )when using the explorer panel **Search** tab.
   - You may also manage worksheets and click Create.

Example

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

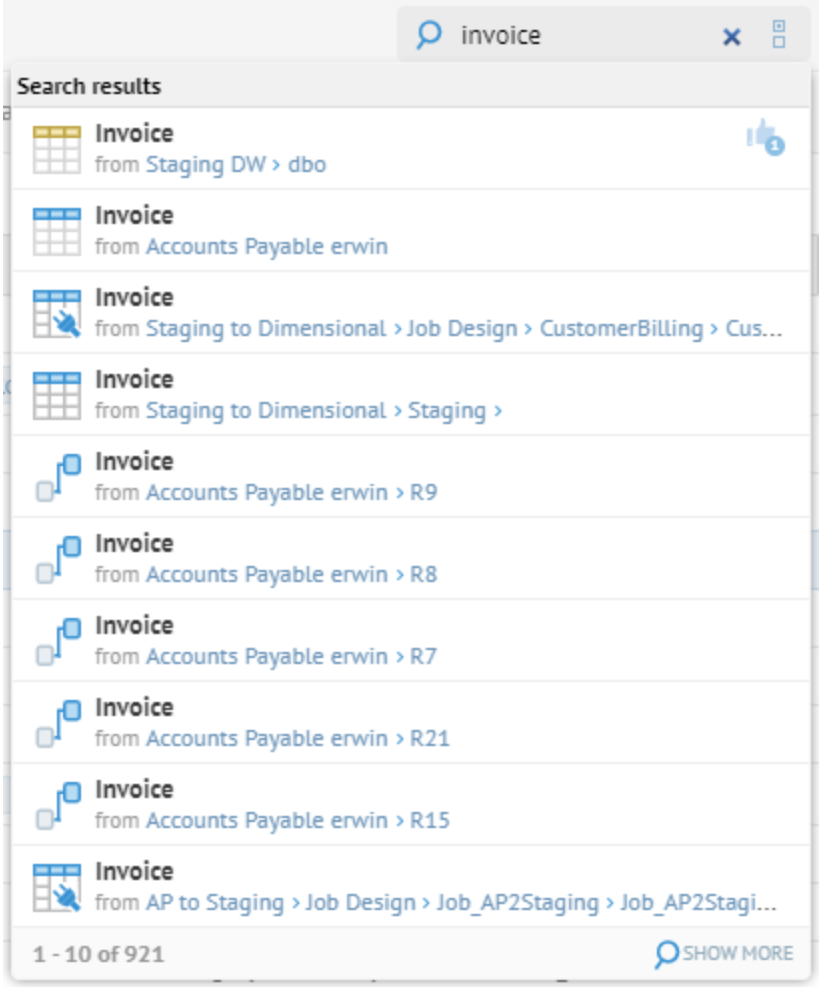


Immediate Search

You may immediately perform searches from anywhere.

Click in the Search text box in the upper right and enter “invoice” text.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Results are presented as soon as you start typing.

Press Enter or click **SHOW MORE**. You will then have a worksheet template with the same filter criteria in the search.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Search

Filters

1 - 50 of 921 1 Filters Columns

WHERE semantic_search_text = 'invoice' WITHIN ('Name', 'Physical Name', 'Description', 'Others') ORDER BY RELEVANCE

User Tags	Name	Object Type	Context
	Invoice	Table	Staging DW › dbo
	Invoice	Table	Accounts Payable erwin
	Invoice	Base Table	Staging to Dimensional › Job Design
	Invoice	Table	Staging to Dimensional › Staging ›
	Invoice	Unnamed RelationshipEnd	Accounts Payable erwin › R9
	Invoice	Unnamed RelationshipEnd	Accounts Payable erwin › R8
	Invoice	Unnamed RelationshipEnd	Accounts Payable erwin › R7
	Invoice	Unnamed RelationshipEnd	Accounts Payable erwin › R21
	Invoice	Unnamed RelationshipEnd	Accounts Payable erwin › R15
	Invoice	Base Table	AP to Staging › Job Design › Job_AP2
	Invoice	Table	Accounts Payable › dbo
	Invoice	Table	Accounts Receivable › dbo
	Invoice	Table	AR to Staging › AccountsReceivable ›
	Invoice	Base Table	Staging to Dimensional › Job Design
	Invoice	Base Table	Staging to Dimensional › Job Design
	Invoice	Table	AP to Staging › AccountsPayable ›
	Invoice	Base Table	Staging to Dimensional › Job Design
	Invoice	Table	AR to Staging › Staging-DW ›
	Invoice	Base Table	AR to Staging › Job Design › Mapping
	Invoice	Base Table	AR to Staging › Job Design › Mapping
	Invoice	Term	Enterprise › Enterprise Conceptual M
	CustomerPOInvoiceItem	Table	Dimensional DW › dbo
	"Invoice"	tMSSqlInput	Staging to Dimensional › Job Design
	"Invoice"	tMSSqlInput	Staging to Dimensional › Job Design
	"Invoice"	tMSSqlInput	Staging to Dimensional › Job Design
	"Invoice"	tMSSqlInput	Staging to Dimensional › Job Design
	"Invoice"	tMSSqlInput	AR to Staging › Job Design › Mapping
	"Invoice"	tMSSqlInput	AP to Staging › Job Design › Job_AP2

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

You now have a worksheet.

OBJECTS > Search

Select **OBJECTS** > **Search**:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Search

Filters

1 - 50 of 5,482 1 Filters Columns

ORDER BY Name ASC

User Tags	Name	Object Type	Context
	"AccountProject"	tMSSqlInput	Staging to Dimensional › Job Design › GLAccount › GL
	"Address"	tMSSqlInput	Staging to Dimensional › Job Design › CustomerPaym
	"Address"	tMSSqlInput	Staging to Dimensional › Job Design › CustomerBillin
	tMSSqlInput	tMSSqlInput	Staging to Dimensional › Job Design › BillingPOC › Bi
	"Address"	tMSSqlInput	AR to Staging › Job Design › Mapping › Mapping
	"Address"	tMSSqlInput	Staging to Dimensional › Job Design › PaymentPOC ›
	"Address"	tMSSqlInput	Staging to Dimensional › Job Design › CustomerShipp
	"Address"	tMSSqlInput	Staging to Dimensional › Job Design › POVendorInvoi
	"Address"	tMSSqlInput	Staging to Dimensional › Job Design › ShippingPOC ›
	"Address"	tMSSqlOutput	AP to Staging › Job Design › Job_AP2Staging › Job_AP
	"Address"/1	tMSSqlInput	AP to Staging › Job Design › Job_AP2Staging › Job_AP
	"Address"/1	tMSSqlOutput	AR to Staging › Job Design › Mapping › Mapping
	"Address"/2	tMSSqlInput	AP to Staging › Job Design › Job_AP2Staging › Job_AP
	"Address"/3	tMSSqlOutput	AP to Staging › Job Design › Job_AP2Staging › Job_AP
	"Address"/4	tMSSqlInput	AP to Staging › Job Design › Job_AP2Staging › Job_AP
	"Address"/5	tMSSqlOutput	AP to Staging › Job Design › Job_AP2Staging › Job_AP
	"BillingAddress"	tMSSqlInput	Staging to Dimensional › Job Design › BillingPOC › Bi
	"BillingAddress"	tMSSqlOutput	AR to Staging › Job Design › Mapping › Mapping
	"BillingAddress"	tMSSqlInput	AP to Staging › Job Design › Job_AP2Staging › Job_AP
	"Customer"	tMSSqlInput	AR to Staging › Job Design › Mapping › Mapping
	<No name>	Database Schema	AP to Staging › StagingDW
	<No name>	Base Schema	Staging to Dimensional › Job Design › CustomerBillin
	<No name>	Base Schema	Staging to Dimensional › Job Design › CustomerBillin
	<No name>	Database Schema	Staging to Dimensional › Dimensional
	<No name>	Base Schema	Staging to Dimensional › Job Design › BillingPOC › Bi
	<No name>	Base Schema	Staging to Dimensional › Job Design › BillingPOC › Bi
	<No name>	Base Schema	Staging to Dimensional › Job Design › PaymentPOC ›
	<No name>	Database Schema	Staging to Dimensional › Staging
	<No name>	Base Schema	Staging to Dimensional › Job Design › POVendorInvoi
	<No name>	Database Schema	AR to Staging › Staging-DW
	<No name>	Base Schema	AR to Staging › Job Design › Mapping › Mapping › Sta

Copyright

You will then have a worksheet template with no filters defined.

WORKSHEETS Menu

Every entry in the menu opens a worksheet, except for Manage.

Click **WORKSHEETS >** and under **CATEGORIES** select **Database > Tables.**

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Tables

Filters

1 - 50 of 83 1 Filters Columns

WHERE category='Database.Tables' ORDER BY Name ASC

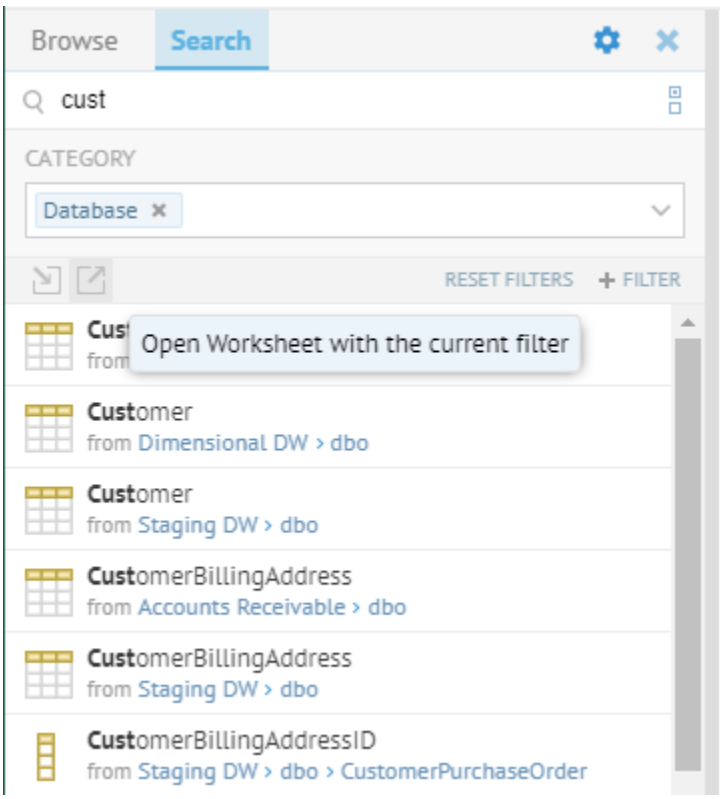
User Tags	Name	Object Type	Context	Term
	AccountCategory	Table	Staging DW › dbo	
	AccountProject	Table	Staging DW › dbo	
	AccountStatusLog	Table	Staging DW › dbo	
	Address	Table	Staging DW › dbo	
	Address	Table	Accounts Receivable › dbo	
	Adj	Table	Adjustments › dbo	
	AdjType	Table	Adjustments › dbo	
	BillingAddress	Table	Staging DW › dbo	
	BillingAddress	Table	Accounts Payable › dbo	
	Category	Table	Dimensional DW › dbo	Categor
	Category	Table	Staging DW › dbo	
	CategoryGroup	Table	Staging DW › dbo	
	CategoryGroup	Table	Dimensional DW › dbo	Categor
	Customer	Table	Staging DW › dbo	
	Customer	Table	Dimensional DW › dbo	Custom
	Customer	Table	Accounts Receivable › dbo	
	CustomerBillingAddress	Table	Staging DW › dbo	
	CustomerBillingAddress	Table	Accounts Receivable › dbo	
	CustomerPayment	Table	Staging DW › dbo	
	CustomerPaymentAssignment	Table	Staging DW › dbo	
	CustomerPaymentDate	Table	Dimensional DW › dbo	Custom
	CustomerPODate	Table	Dimensional DW › dbo	Custom
	CustomerPOInvoiceItem	Table	Dimensional DW › dbo	Custom
	CustomerPurchaseOrder	Table	Accounts Receivable › dbo	
	CustomerPurchaseOrder	Table	Staging DW › dbo	
	CustomerPurchaseOrderLineItem	Table	Accounts Receivable › dbo	
	CustomerPurchaseOrderLineItem	Table	Staging DW › dbo	

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

You have a worksheet pre-filtered for the category **Database > Tables.**

Explorer Panel > Search

Open the explorer panel and click **Open worksheet with the current filter** ( ). You will then have a worksheet with the same filters defined.



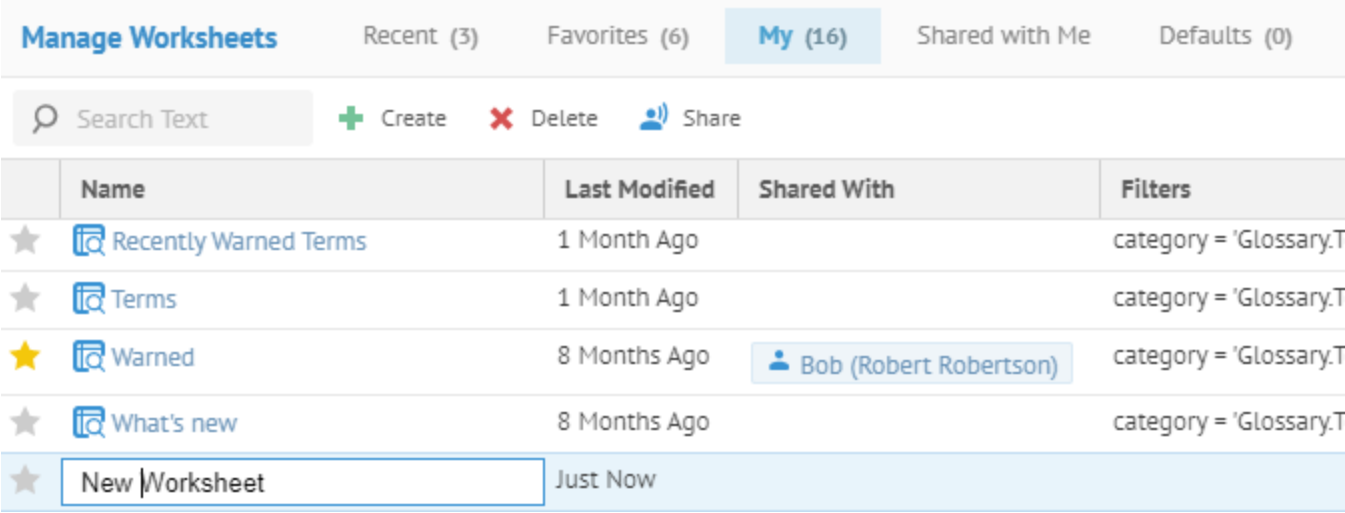
Create and new saved worksheet

Go to **WORKSHEETS > Manage**.

Click the **My** tab.

Click **Create. Enter the name "New Worksheet" and press Enter.**

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



You have a worksheet template with no filters defined.

Edit a Worksheet

Whether editing a saved worksheet or simply working with a search result that is presented as a worksheet, this is the common environment for filtering and manipulating that worksheet.

Steps

1. Open a worksheet by any of the create methods detailed., or go to

   - **WORKSHEETS > Manage**,
   - **WORKSHEETS > Favorites >**,
   - **WORKSHEETS > Recent >**.

From here you may:

- Page through the results using the first, previous, next and last controls above the results.

- Click **Filter** to show the left side panel to filter the results in the worksheet. You may hide the panel with the same **Filter** button or the left caret ( ). In the filter panel you may:

  - Specify **Search Text**. Also, can specify **Search Text In ( )** options to control which properties are a part of the search.
  - Pick one or more **CATEGORY** of metadata to filter by, such as Table or Column.
  - Click **+FILTER** to add additional filters.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

- Click **Columns** to add/remove columns from the worksheet as well as sort or ORDER BY those columns.
- Specify **Preferences** for the worksheet, including
    - **ITEMS PER PAGE** picker
    - **QUERY PANEL** display toggle for the MQL display
    - **MISCELLANEOUS**, including Word Wrap display toggle.
- **Download** the results of the worksheet to a CSV file.
- **SAVE AS** a saved (and sharable) worksheet.

Editing cells

If you have sufficient permission, you may edit cells in the metadata results. To do this, either double-click that cell or right-click and select Edit. You may then use the Tab and Enter keys to traverse the grid for editing further.

Curating rows

You may click the Certify, Endorse and/or Warn icons for any row.

> *Any user may Comment, Endorse or Warn. Users with the Manager security role may edit or removes those of other users. Only the steward and Administrators may certify.*

Bulk Editing

Multi-select: You may select more than one row (Shift-click, Ctrl-click, etc.). With this feature one may apply an action to all of the selected rows. Only those actions available to ALL of the selected rows will be presented.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

1 - 19 of 19 1 Filters Columns

Name	Warnings	Endorsements	Comments	Definition
Category Group Number				A number uniquely
Billing Street Address 2				Second line of stree
Category Description				Detailed descriptior
Amount Paid				Amount Paid to Dat
Customer Payment Type				Type of payment
Customer Payment POC Phone				Contact phone num
Billing Street Address2				Second line of stree
Customer Payment Date Customer Payment ...				Date and time of pa
Customer Payment Amount				Dollar amount of pa
Account Encumbered Amount				Dollar amount of th
Customer Payment Status				Status of payment
Customer PO Amount				Total amount of the
Customer PO Invoice Item Billing City				City
Customer PO Date Customer PO Date				Date on purchase o
Customer Name				Name of a customer
Category Name				Category Name
Customer Payment Description				Detailed descriptive
Customer Payment Address Description				Description of locat
Customer Description				Detailed descriptior

For all the selected objects, you may bulk edit:

- Common Attributes that apply to all object types, including curation
- Custom Attributes available to all the objects
- Basic **Object Attributes** that apply to all the objects.

You may also add multi-selections to a collection

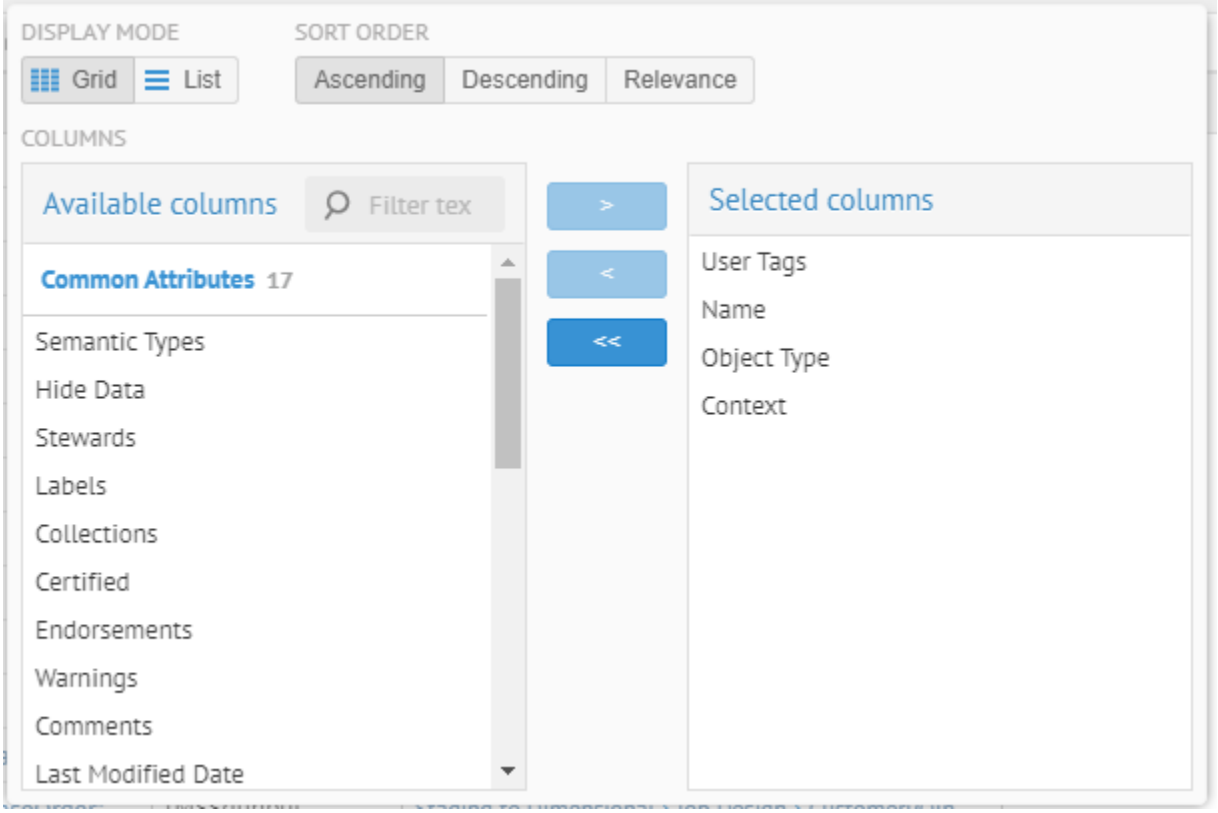
Columns and Sort Direction

Click **Columns** to add/remove columns from the worksheet as well as sort or **ORDER BY** those columns.

Sort Direction

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

You may specify the sort order, or direction, of the report results. This applies to all the results of the search, not just the page you are viewing.



You may also simply click on a column header to toggle the sort on that column between ascending and descending and the original order.

Ascending

Alpha order from lowest to highest.

Descending

Alpha order from highest to lowest.

Original

Restores back to the originally presented order.

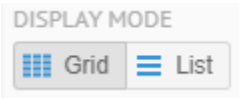
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Relevance

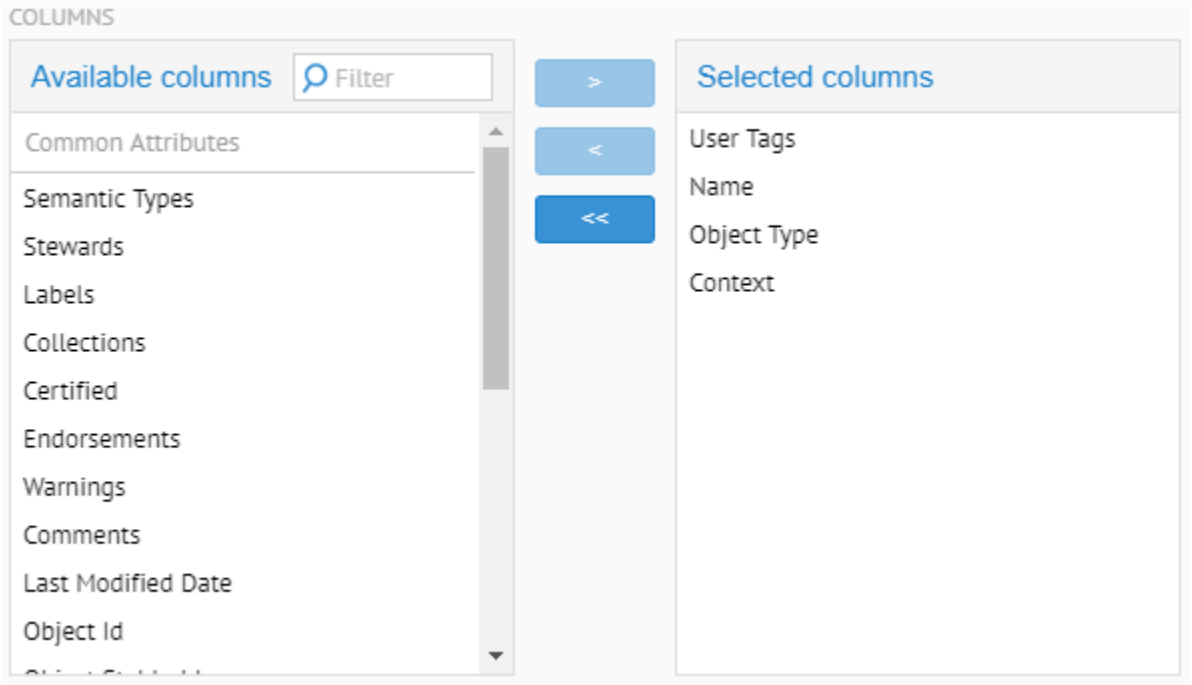
Ordered from most to least relevant to the selected filters.

Grid vs. List Mode

One may toggle between presenting the results as a simple collection or as a spreadsheet-like grid. MIMM provides a rich set of features to manage the columns in a grid and allows for editing of the cells just as with a spreadsheet.



You may also add and remove columns by including or removing them from the list at the right.



Paginated Display and Navigation

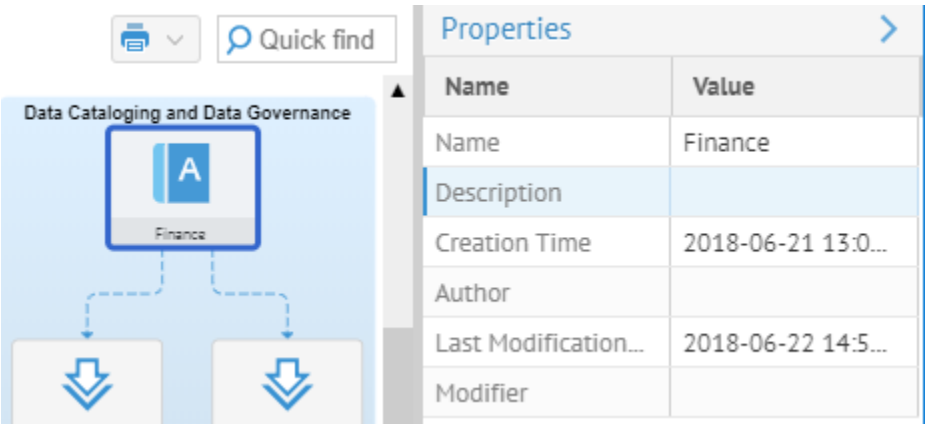
If the list of metadata elements is long, only a portion of that list is presented. This portion is referred to as a Page. MIMM provides a number of common display and navigation tools for these lists.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Filtering, sorting, etc., only apply to a page of the results at a time. Be sure to specify a large enough Items per page to ensure that you are getting the results you expect.

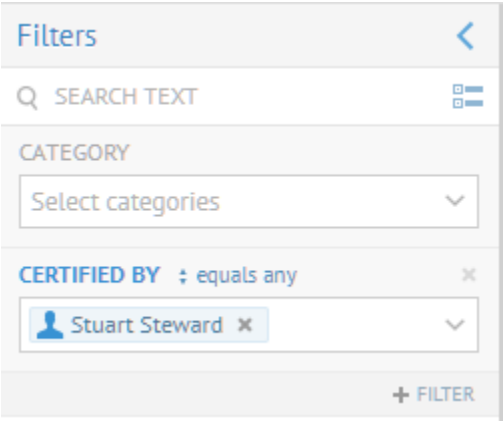
Properties Panel

There is a Properties Panel on the right. If you show this panel then you may click on an object and view its properties in the panel.



Metadata Filtering

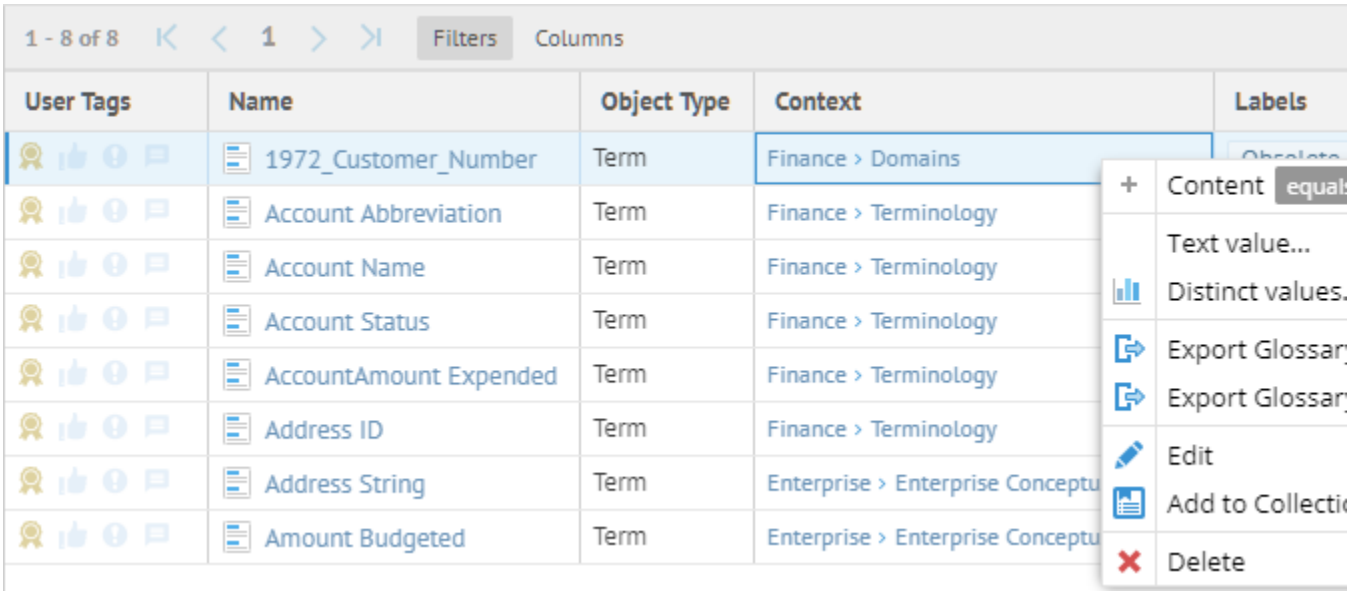
A filter panel can be presented to the left of the results. MIMM provides a sophisticated set of post filtering options.



Filter by example by column

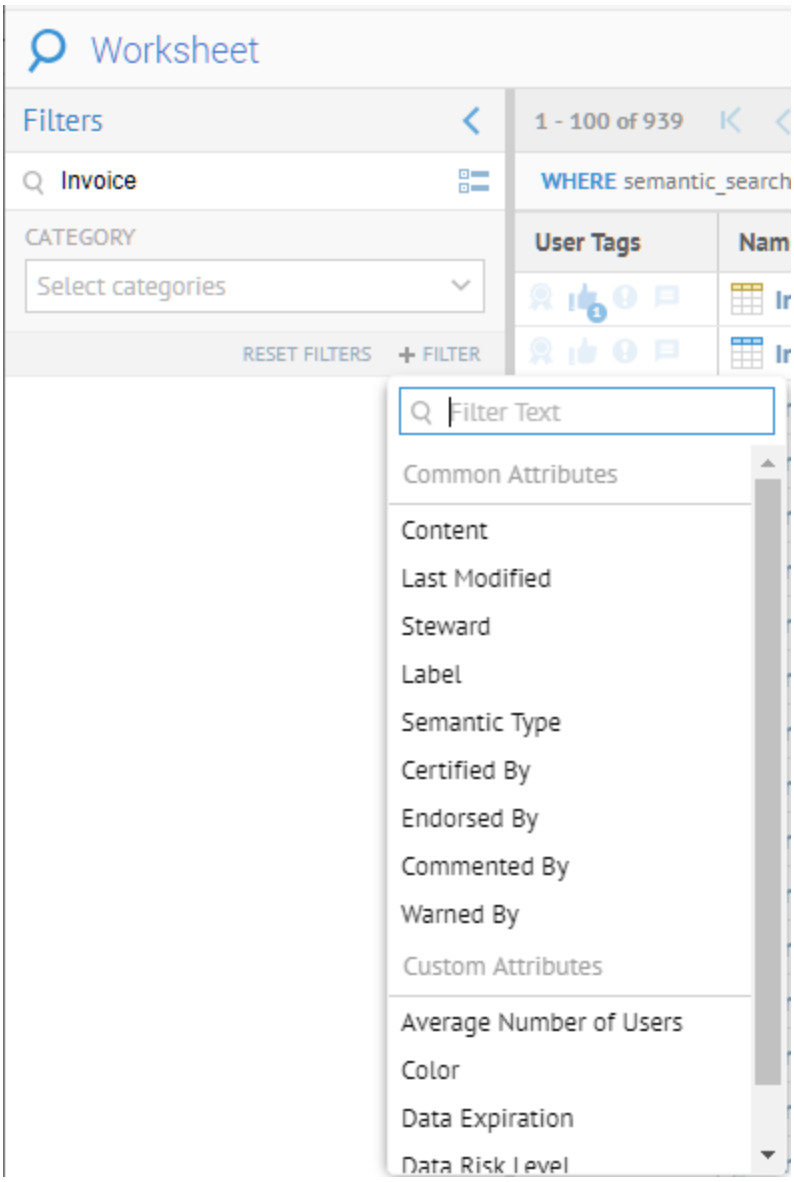
You may always filter the results by what is already presented. E.g., if one wishes to only see columns for Type View Column, you may simply right-click a cell in the grid that contains that value and select that option.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Using the filter panel

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



You may also expand ( ) the Filters panel on the left in order to limit the results based upon advanced matching criteria.

FilterCriteria	Description
Search Text	Text to match against. One may select which properties (e.g., name vs. description) to match against.
Category	Filter by categories defined in the customization MM installation file /conf/resources/MetadataExplorer.xml, down to the object type level.
Content	Only those results in particular Contents

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Last Modified	Only those resulting objects which were last updated in a given date range
Steward	Only those results with a particular Steward assignment
Label	Only those results tagged by particular Labels
Endorsed by	Only those results endorsed and/or endorsed by a particular individual or set of individuals
Certified by	Only those results certified and/or certified by a particular individual or set of individuals
Warned by	Only those results warned and/or warned by a particular individual or set of individuals
Commented by	Only those results commented on and/or commented on by a particular individual or set of individuals
Custom Attributes	Additional properties specific to the type of metadata element

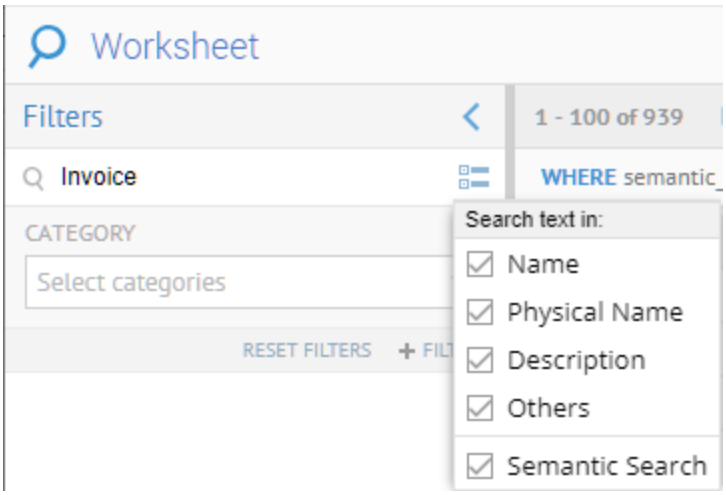
Use **+FILTER** to add addition filter criteria, **RESET FILTERS** to clear the all the filter criteria or click the x next to a specific filter to clear that one.

You may always filter the results by what is already presented. E.g., if one wishes to only see columns for Type View Column, you may simply right-click a cell in the grid that contains that value and select that option.

Filter by Search Text

You may enter text to filter by, and the text will be matched to the properties specified, as follows:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

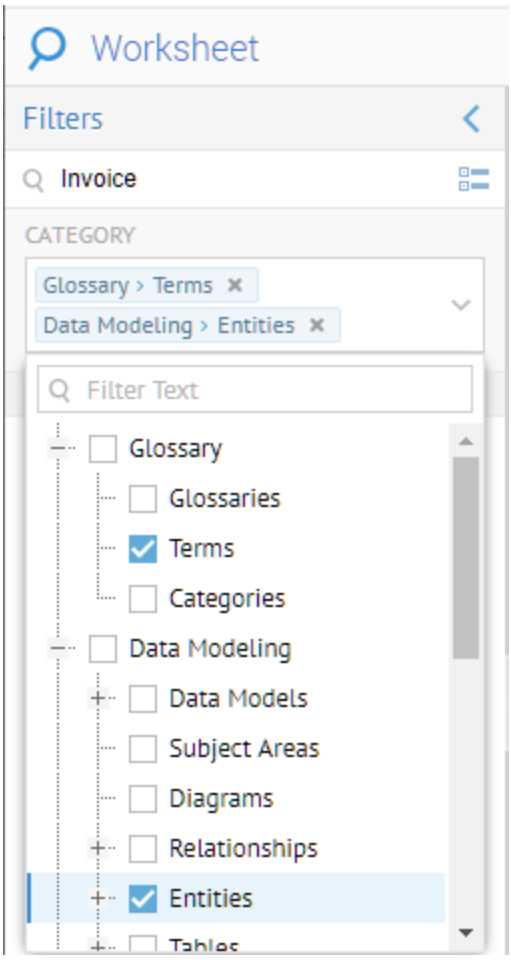


The semantic search language is defined here.

Filter by Category

You may specify from a hierarchical pick list which metadata element types to include in the results. Thus, you may include, e.g., both Terms and Database Columns in the search results.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



The organization of categories in the pick list are defined in the customization MM installation file /conf/resources/MetadataExplorer.xml. One may control the categories, results and available actions using this file. You may Please see the Customization tutorial for this capability.

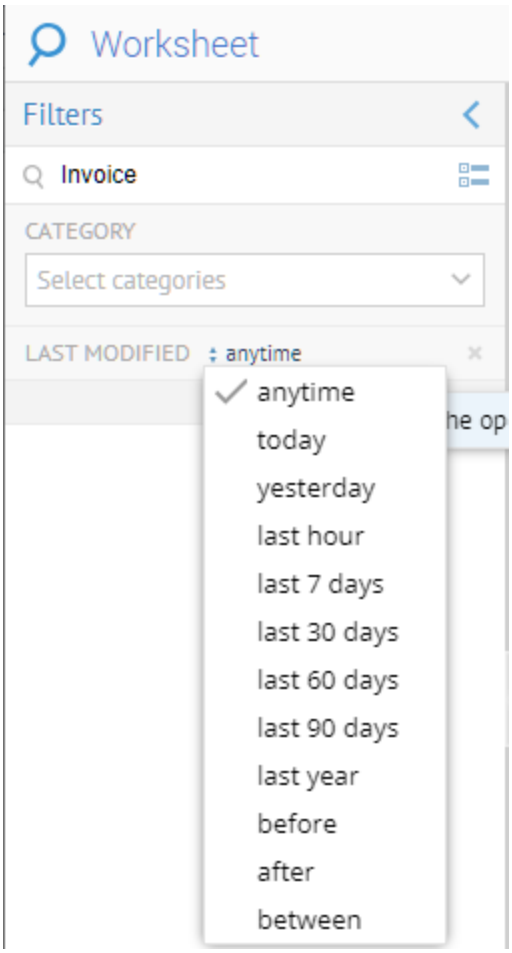
Filter by Content

Use this filter to restrict the results to only those which are a contained within particular contents (e.g., a specific model or glossary).

Filter by Last Modified

Filter to only those results which have a Date Modified value in a specific date range.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



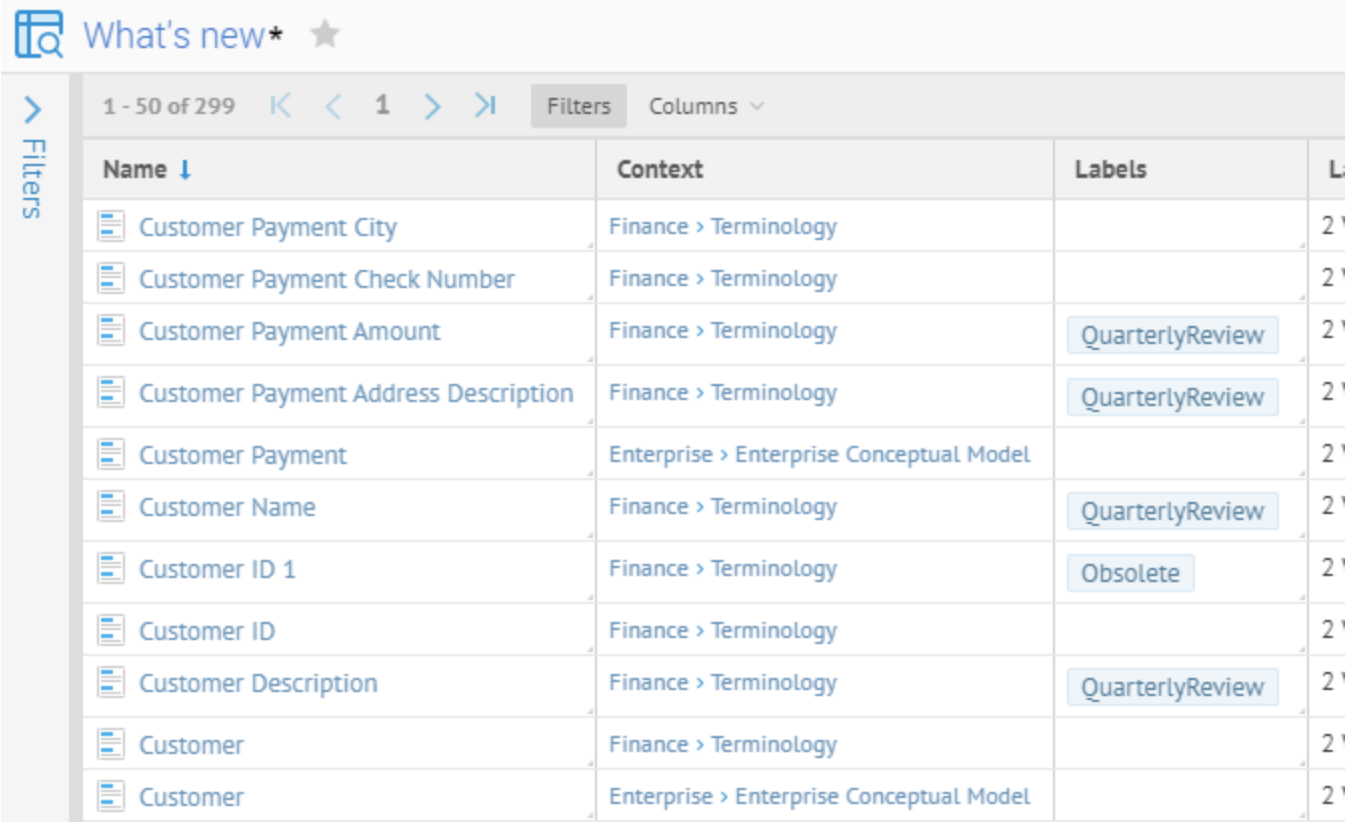
Dates in Worksheets

Dates and times are stored and presented in UTC format in:

- Log entries
- Administration pages
- Etc.

In worksheets, one may also see the local time when viewing worksheets as a tool tip that appear when a date/time is in focus:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Filter by Steward

Filter to only those results which are assigned to one or more **Stewards**.

Filter by Label

Filter to only those results which have one of the selected labels assigned.

Filter by Curation Status

You may endorse, certify, warn and comment on any metadata element.

You may then filter to only those results which have any of these or any of these from a specific set of individuals.

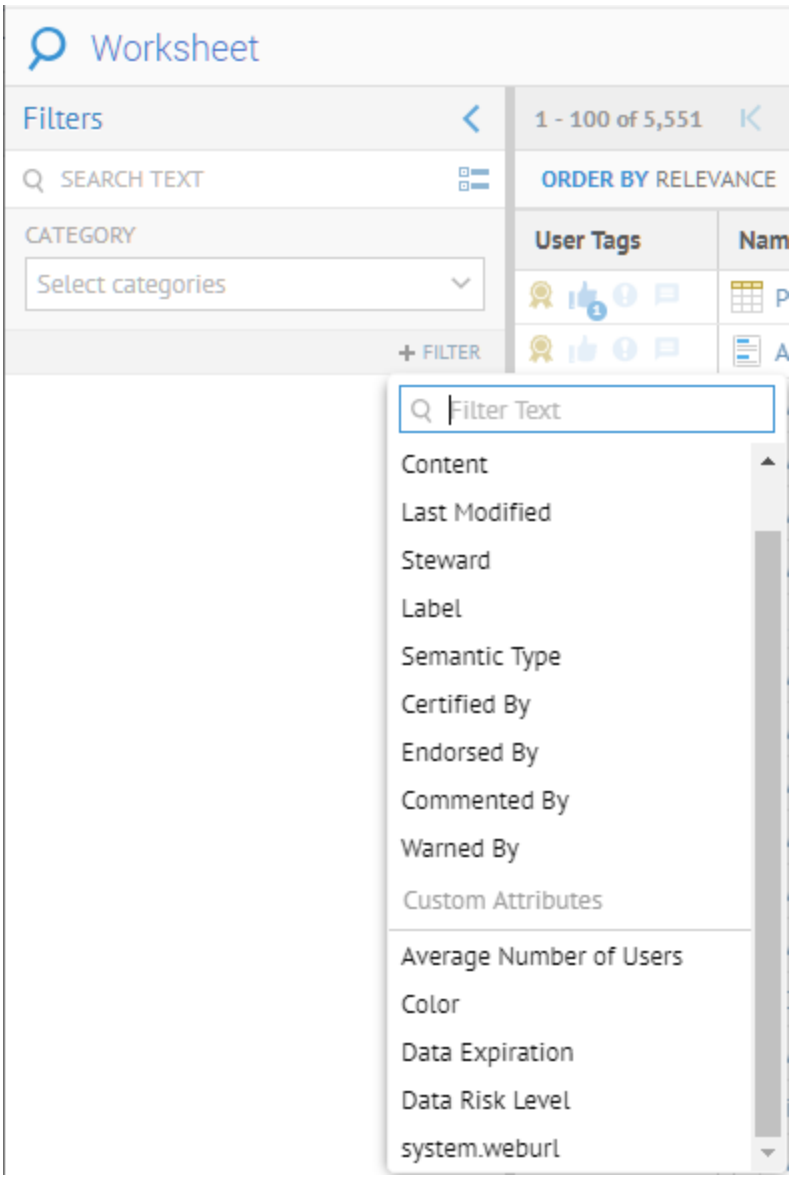
Filter by Comment

You may filter by the existence or content of comments.

Other Filters

You may filter to only those results which have specific values in specific properties.

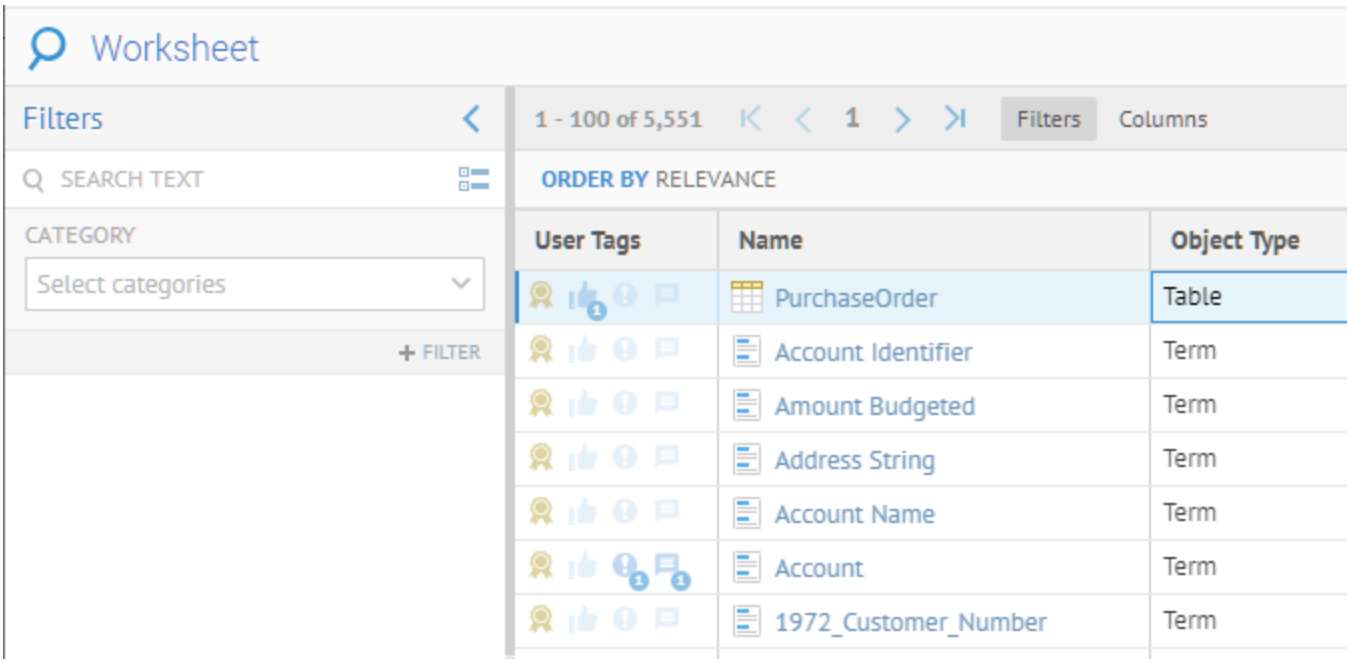
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Identify distinct values by column

You may quickly obtain a list of the distinct values available in the metadata. To do this, right-click a cell in the grid and select that option.

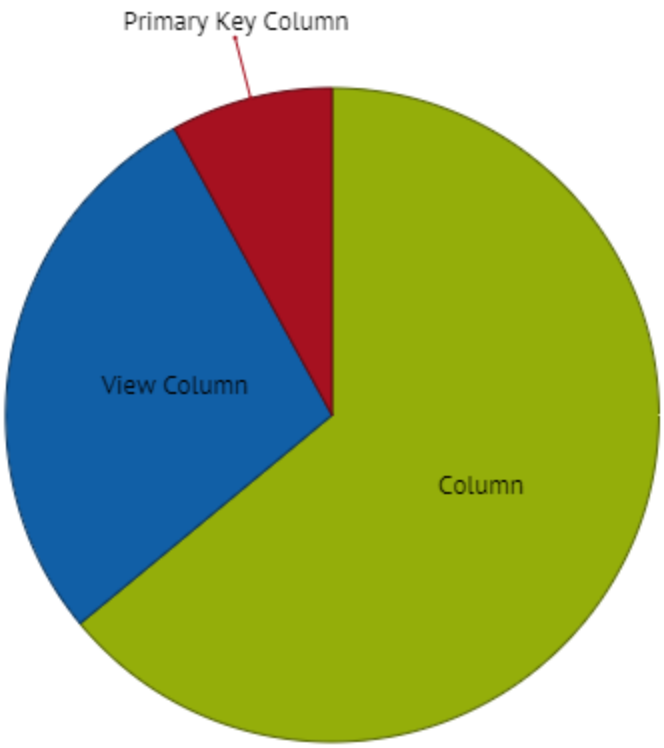
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



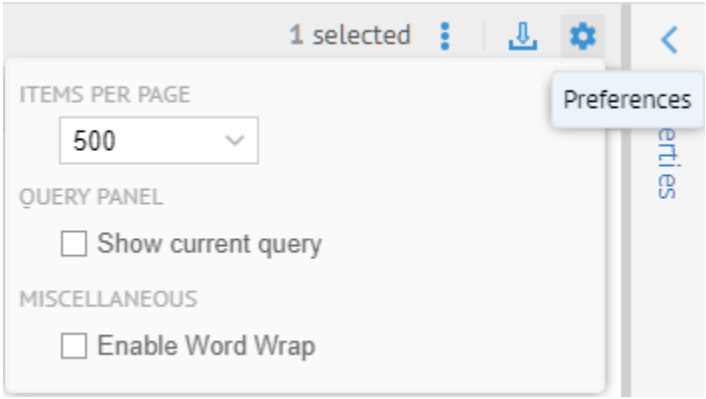
The result is statistics on the distinct values present according to the filters defined

Value	Count	Repartition
Column	32	64%
View Column	14	28%
Primary Key Column	4	8%

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Worksheet Preferences



Here, you may specify

- **ITEMS PER PAGE**: Specify the number of items on a page.

Filtering, sorting, etc., only apply to a page of the results at a time. Be sure to specify a large enough Items per page to ensure that you are getting the results you expect.

- **QUERY PANEL > Show the current query** to toggle showing or hiding the metadata query language (MQL) query executed based upon your filter criteria.

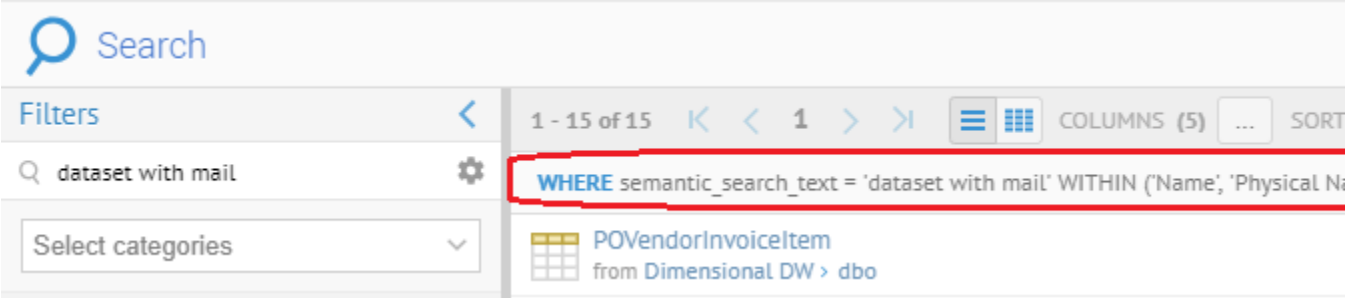
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

- **MISCELLANEOUS > Enable Word Wrap: toggle the word wrap of longer text in the cells.**

*You may specify larger limits on the number of items per page and items to export by updating the **Worksheet Export Maximum number of objects** and **Worksheet Maximum number of objects per Page** in Group Preferences for a group that the user is a member of.*

Metadata Query Language

MQL allows users to define powerful and complex metadata queries with a familiar SQL syntax.



The MQL is available through the REST API and constitute the foundation of the search / worksheet page. For syntax details, refer to http://www.metaintegration.com/Products/MIMM/REST-API/mql.html.

You may use the worksheet Preferences to toggle showing or hiding the metadata query language (MQL) query.

Anything you do in the **Filters** is reflected in the MQL. You may also edit the **Filters** from the perspective of the MQL directly by using the **Advanced** model.

Steps

1. Open a worksheet by any of the create methods detailed, or go to

   - **WORKSHEETS > Manage**,
   - **WORKSHEETS > RECENT >**,
   - **WORKSHEETS > FAVORITES >**

2. Click **Advanced** in the Filters panel.

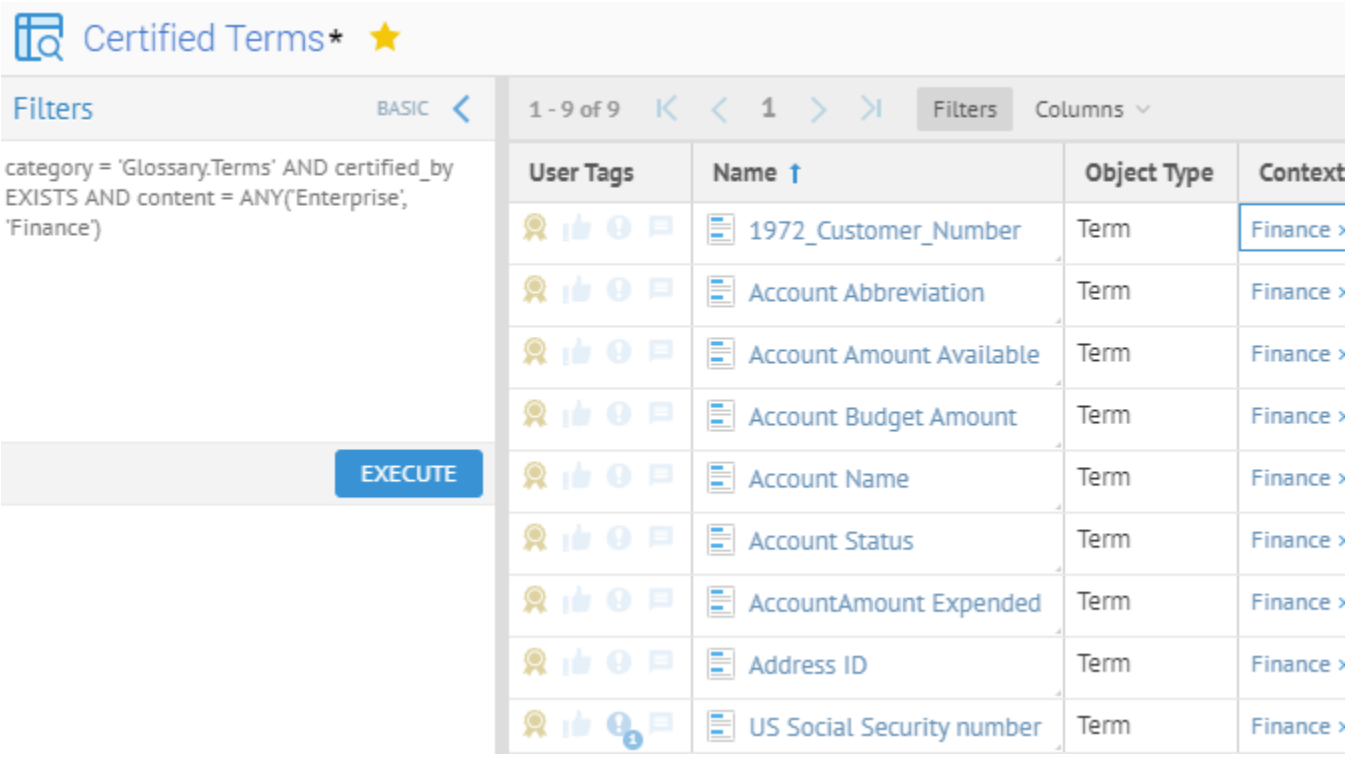
You may now edit the query for the worksheet by editing the MQL.

Example

Click WORKSHEETS > FAVORITES > Certified Terms.

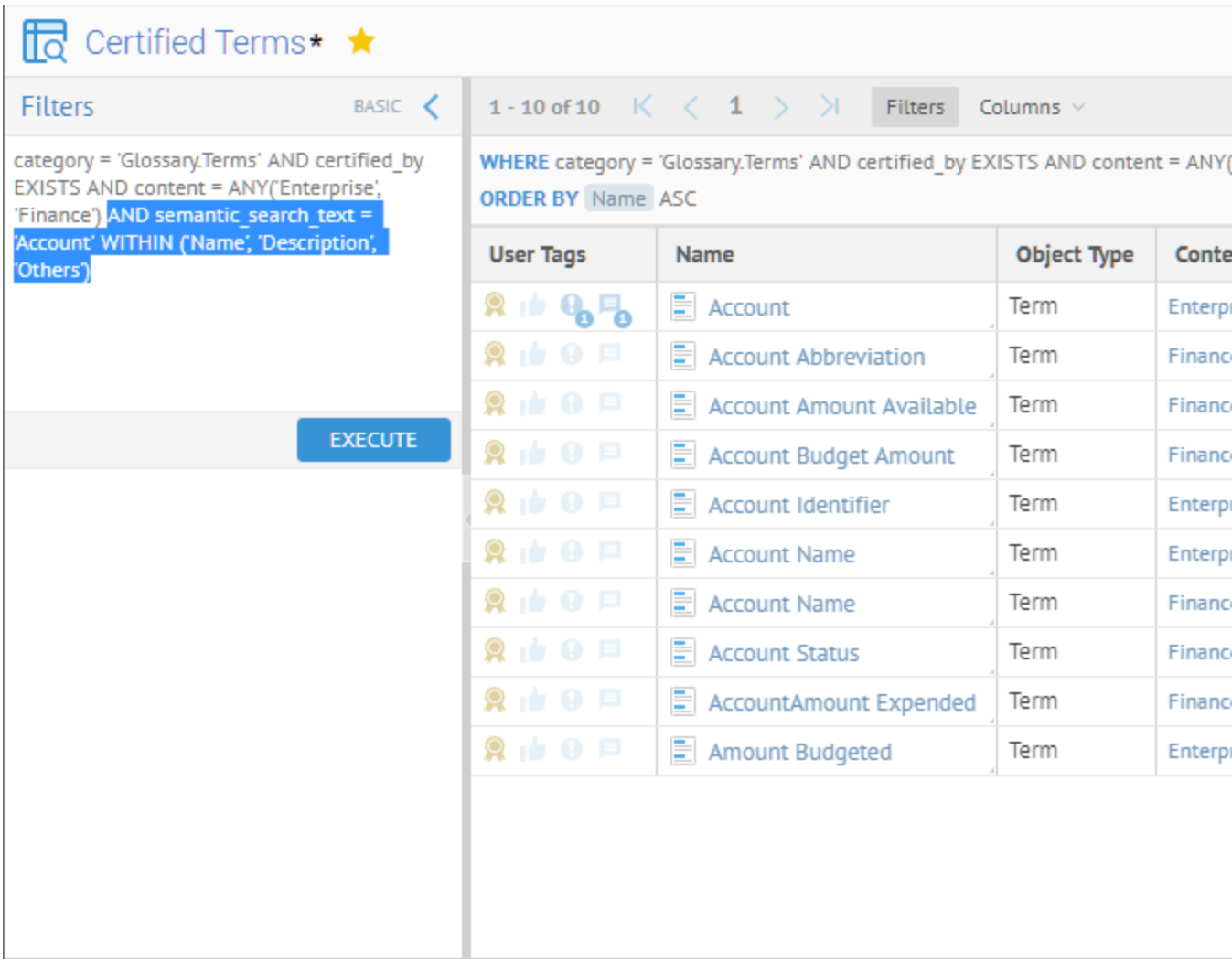
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Click **Advanced** in the Filters panel.



Update the MQL and click **EXECUTE**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Save a Worksheet

You may save any worksheet you are working on at any time, evening existing saved ones by be saved as new worksheets.

Steps

1. Open a worksheet by any of the create methods detailed, or go to

   - **WORKSHEETS > Manage**,
   - **WORKSHEETS > RECENT >**,
   - **WORKSHEETS > FAVORITES >**.

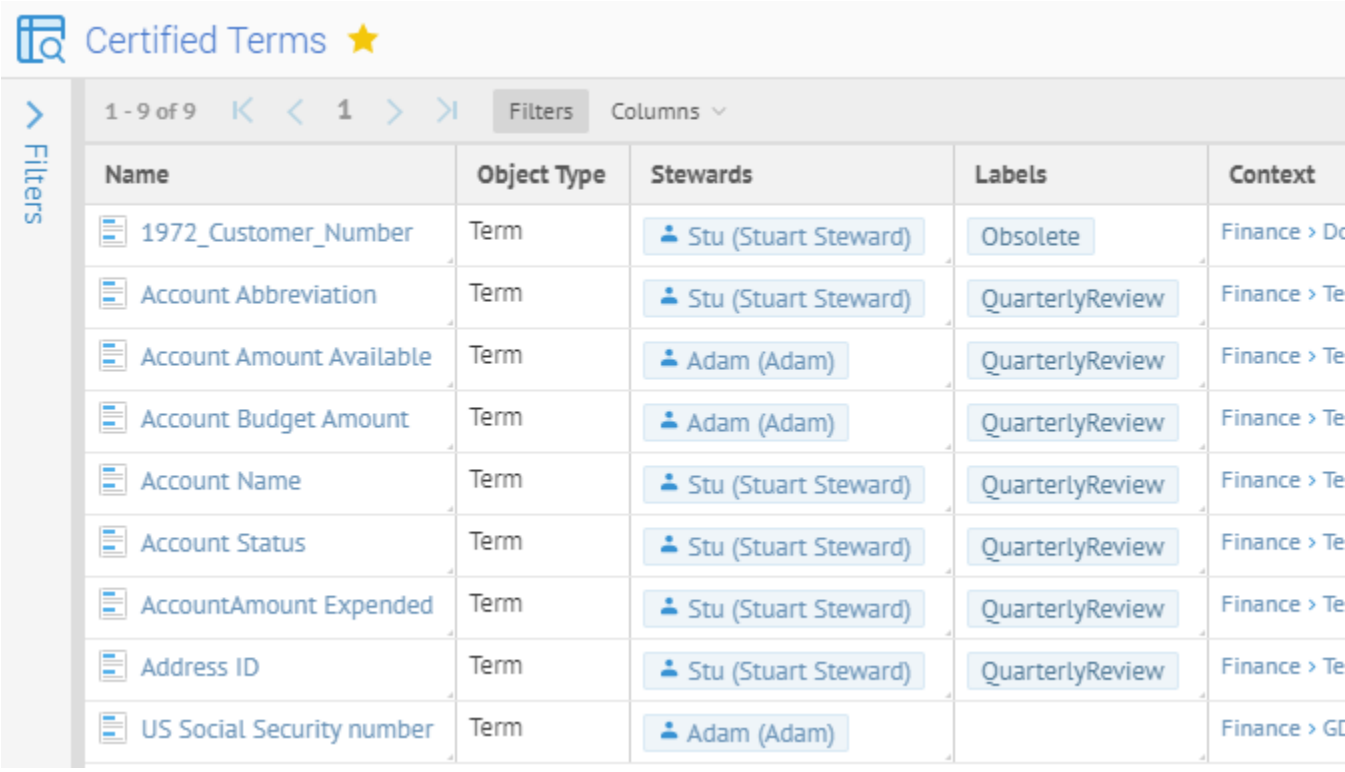
2. Click **Save** to save the updated state of an existing saved worksheet or save and assign a name to a not yet saved worksheet.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

3. Click **Save As** to save the updated state of an existing saved worksheet and assign a name.

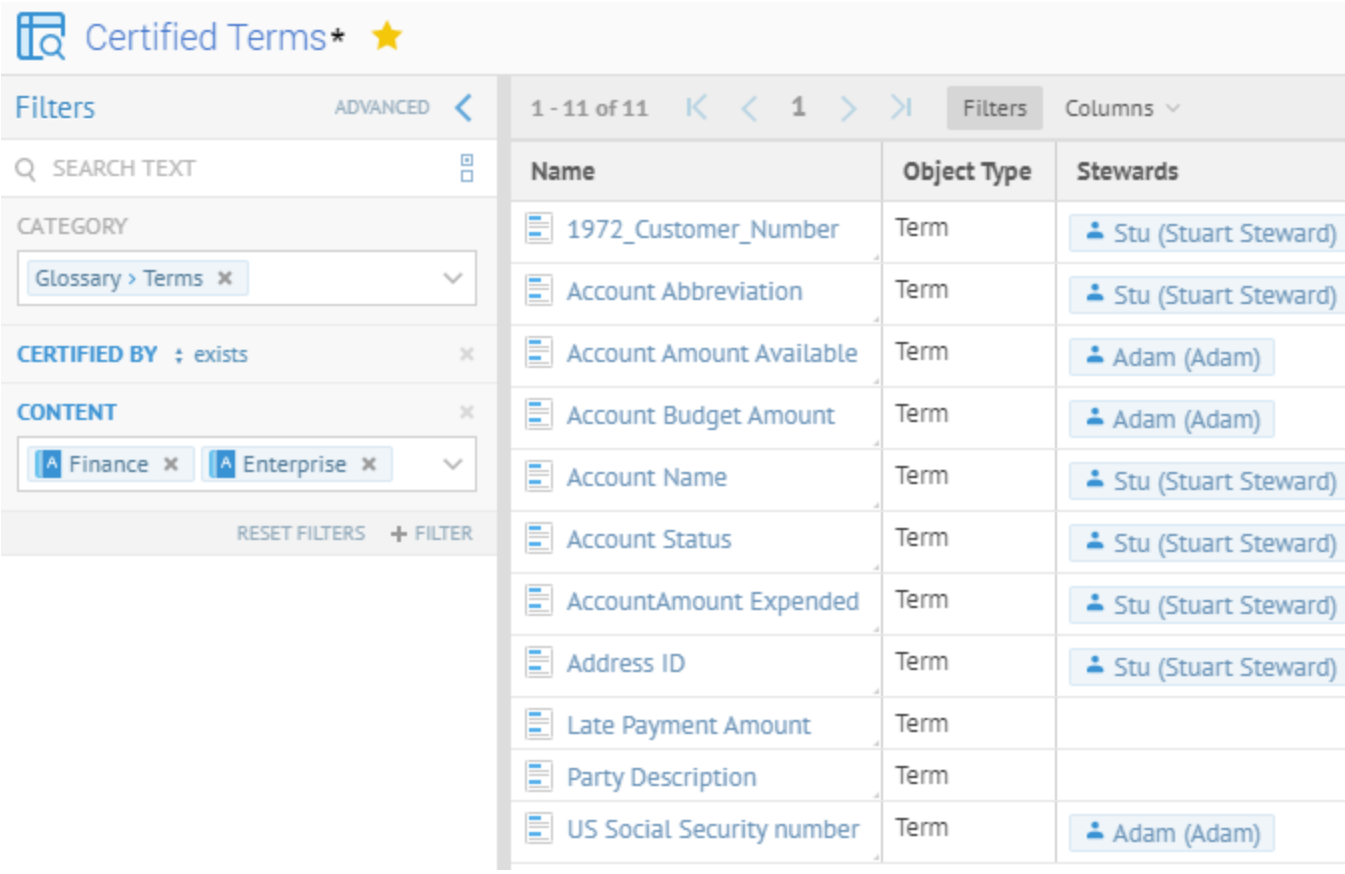
Example

Click **WORKSHEETS** > **FAVORITES** > **Certified Terms**.



Click **+FILTER > Content**. Include both glossaries.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

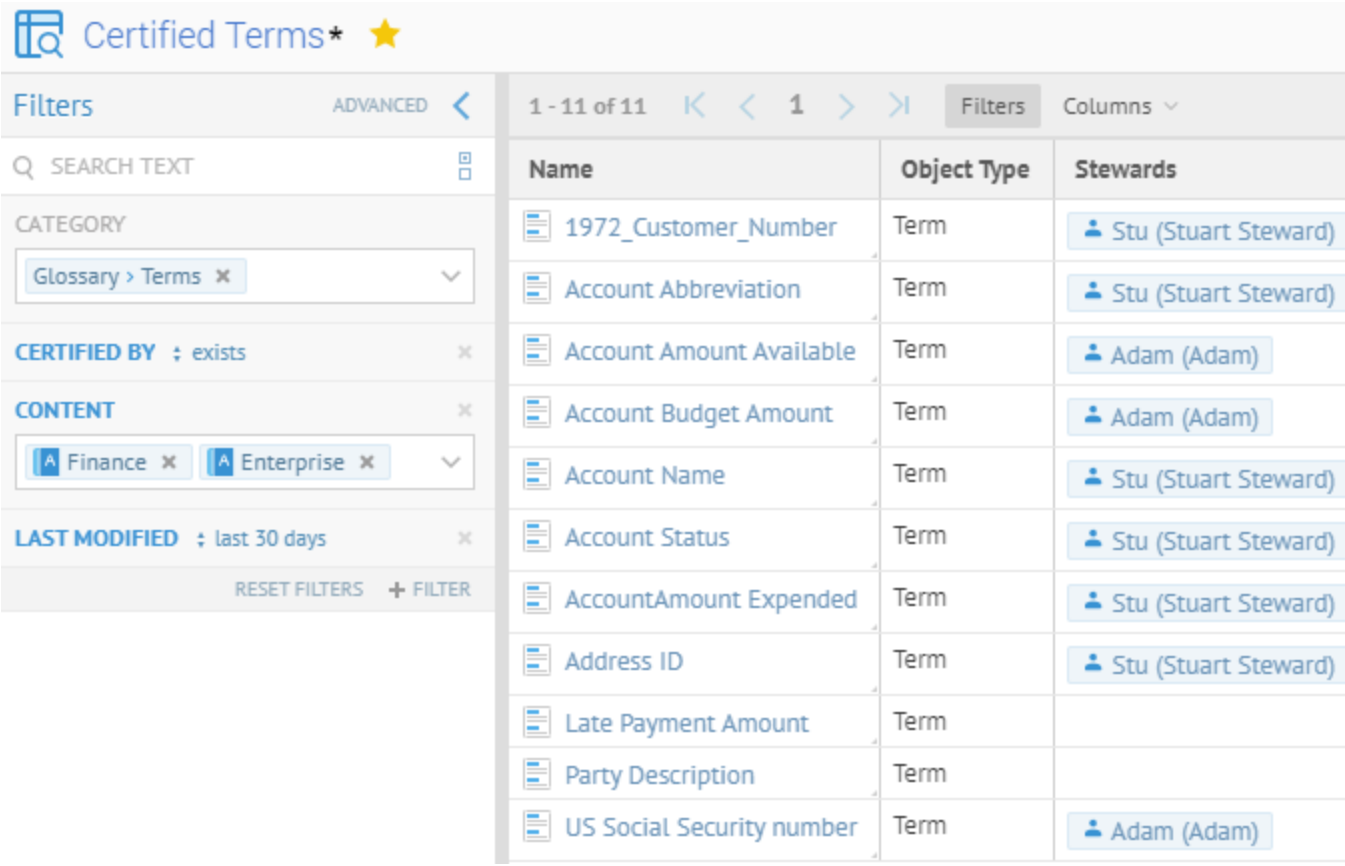


*The MQL statement has changed and the **Save** button is enabled.*

Click Save. You have now updated an existing worksheet.

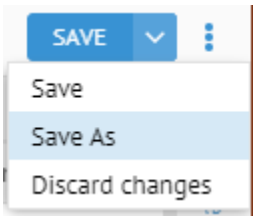
Click **+FILTER > Last Modified**. Select **last 30 days**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



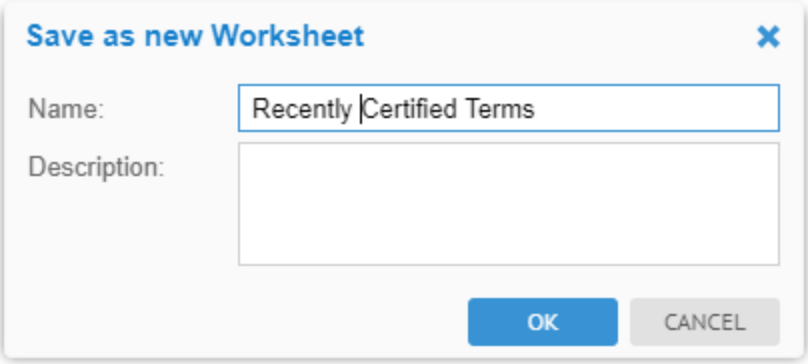
*The MQL statement has changed and the **Save** button is enabled.*

Click **Save As…**.



Enter the name “Recently Certified Terms” and click **OK**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Manage Worksheets

You may also select **WORKSHEETS > Manage** to manage your existing worksheets.

Steps

1. Go to **WORKSHEETS > Manage.**

   - You see the list of **Favorites**. It is the default tab.

All the worksheets you have favorited are here.

   - From here you may:
     - Open/Edit the worksheet
     - Restrict the list by using the **Search Text**
     - **Favorite** or un-**Favorite** a worksheet

2. Click the **My** tab.

All the worksheets you have created are here.

   - From here you may:
     - Open/Edit the worksheet
     - Restrict the list by using the **Search Text**
     - **Create a new saved worksheet**
     - **Delete and existing saved worksheet**
     - **Favorite** or un-**Favorite** a worksheet
     - Share this worksheet with groups and/or users
     - Edit the **Name** or **Description** of a worksheet

3. Click the **Recent** Tab**.**

All the worksheets you have recently opened are here.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

- From here you may:
  - Open/Edit the worksheet
  - Restrict the list by using the **Search Text**
  - **Favorite** or un-**Favorite** a worksheet

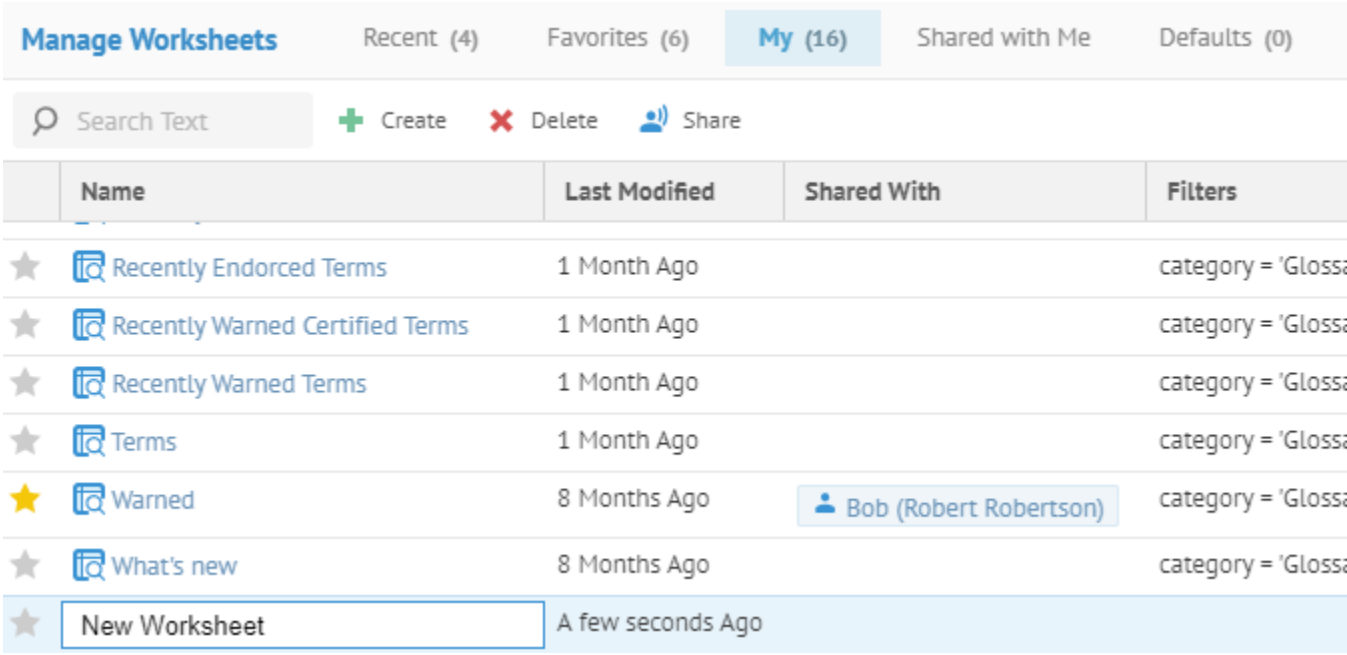
Example

Create

Go to **Worksheets > Manage**.

Click the **My** tab.

Click **Create. Enter the name "New Worksheet" and press Enter.**



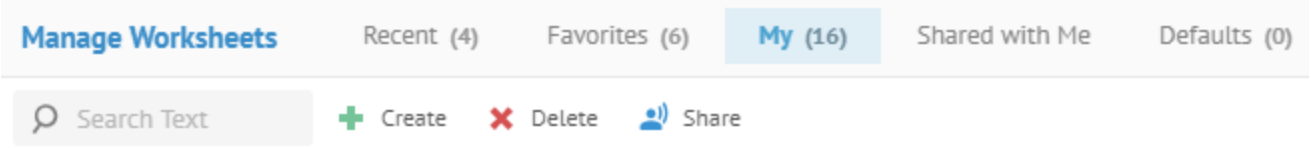
You will then have a worksheet actually saved but with no filters defined yet.

Delete

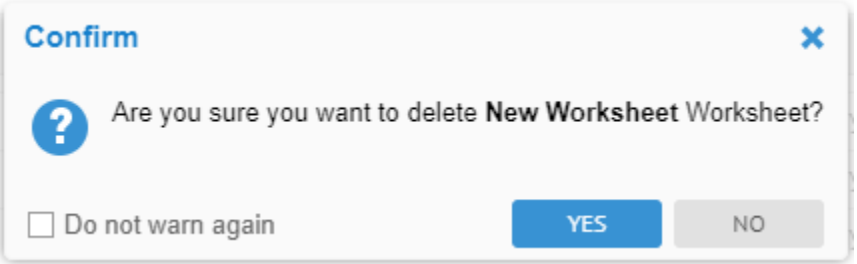
Go to **Worksheets > Manage**.

Click the **My** tab.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click ✖ **Delete.**

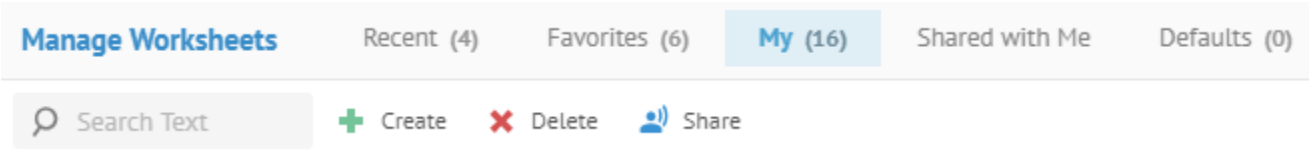


Confirm.

Favorite / Un-Favorite

Go to **Worksheets > Manage**.

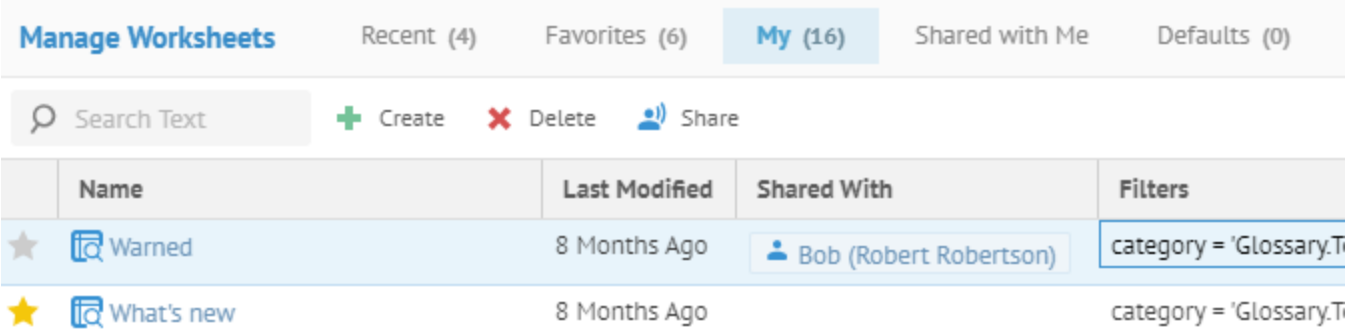
Click the **My** tab.



Click ☆ next to New Worksheet to Favorite that worksheet.

Click ★ next to What's new to un-Favorite that worksheet

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Explorer Further

Shared Worksheet

Worksheets have an owner who is the creator of the worksheet. That owner may open, edit and remove a worksheet. The worksheets that one owns may always be found in the **My** tab under **WORKSHEETS > Manage**.

In addition, a worksheet may be made public, or shared, with specific users and/or groups. Once shared, users that are in the sharing criteria specified may view and favorite those worksheets, as well

Sharing a Worksheet

The owner (creator) of a worksheet may share that worksheet with and users and/or groups.

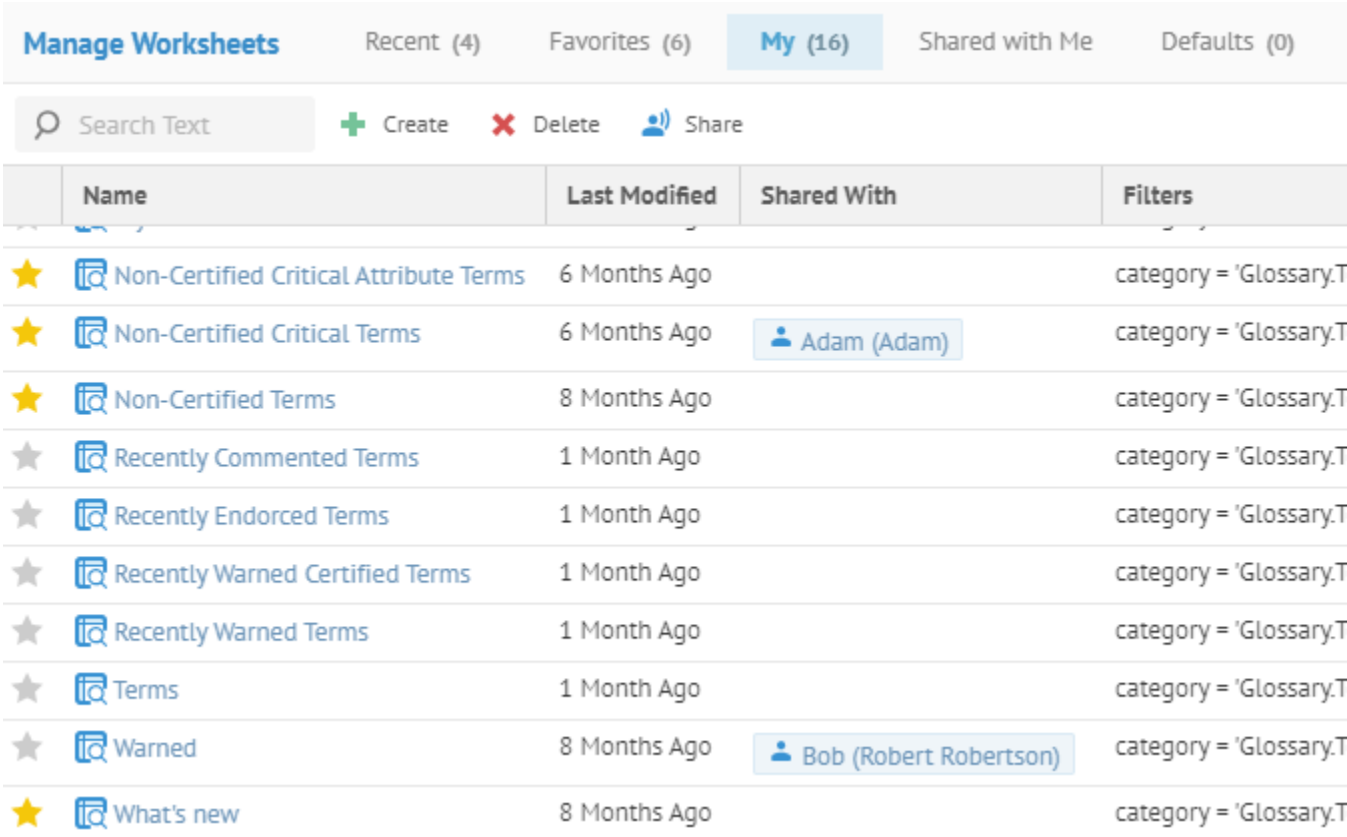
Steps

1. Go to **WORKSHEETS > Manage.**
2. Go to the **My** tab.
3. Select a worksheet.
4. Click **Share**.
5. Pick one or more users and/or groups to share the worksheet with.
6. To un-share a worksheet, simply remove the specific (or all of) users and/or groups.

Example

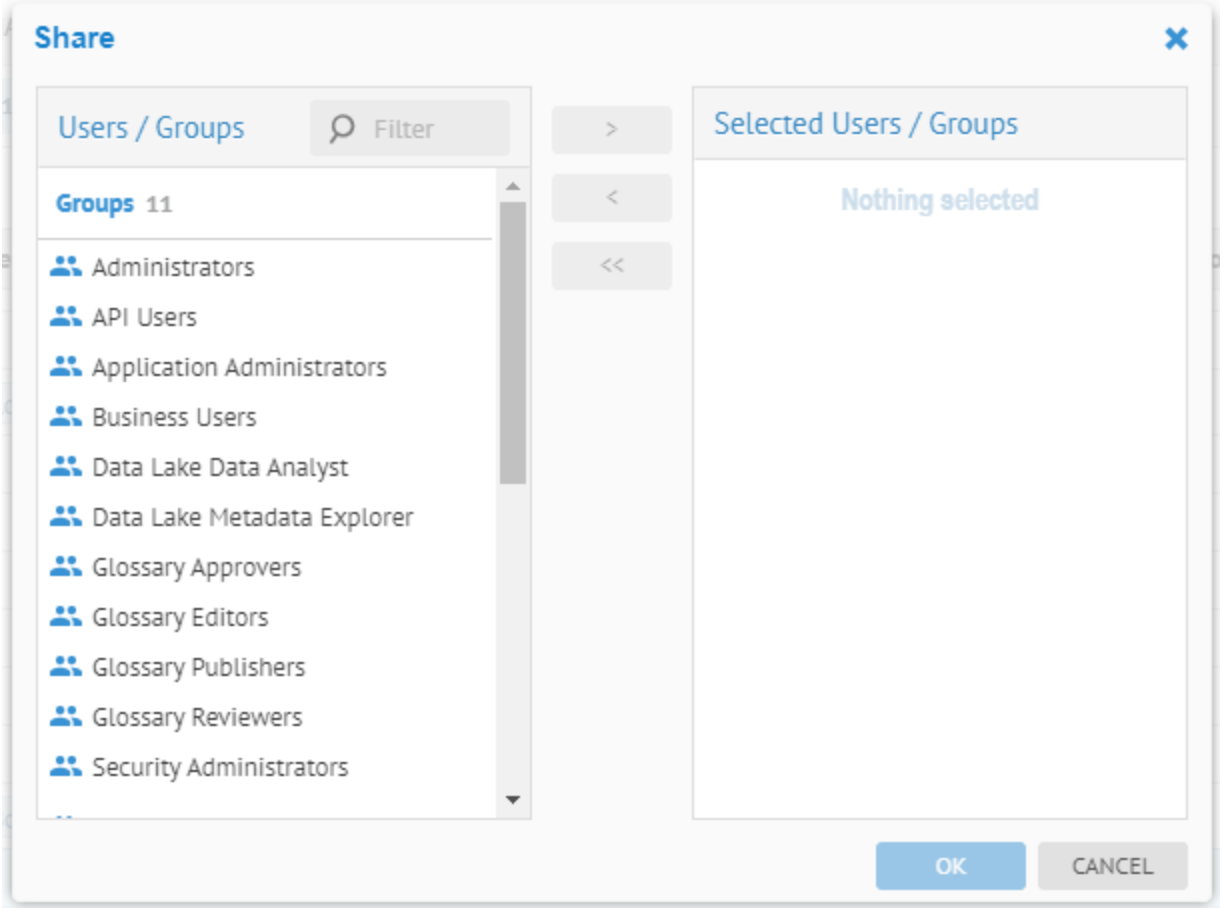
Go to **WORKSHEETS > Manage.**

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Go to the **My** tab and select a worksheet in the list.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click **Share** and you have shared that worksheet with those users.

You may save a shared worksheet before specifying whom to share it with. You may come back later and specify whom it will be shared with.

Using Shared Worksheets

Simply because you have shared a worksheet does not mean that all those other users can see it. They must first look it up in Shared with Me. Once they have done so, they may

- View it
- Favorite it
- Save As their own worksheet that they may edit.

Steps

1. Go to **WORKSHEETS > Manage.**

2. Go to the **Shared with Me** tab.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

This list will be empty at first. You must search for worksheets that are shared with you.

3. Enter text or just click **Search**.

4. From here you may:

   - Open/Edit the worksheet
   - Restrict the list by using the **Search Text**
   - **Favorite** or un-**Favorite** a worksheet

Default Worksheets

The details page for different types of objects (e.g., **Tables** or **Schemas**) contains a number of tabs which present the results of a default worksheet for that particular type of object represented by the tab (e.g., **Columns** for **Tables** or **Tables** for **Schemas**).

When viewing the details page results, say the **Columns** tab for a **Table**, you may designate an existing worksheet that you saved or that was shared with you as your personal default.

In addition, members of the Application Administrators Group may designate default worksheets for groups or users, which will be the system default, unless over-ridden, when one the details page for that type of object.

However, it would be awkward to require that one go to each type of details page and tab in order to manage defaults. Thus, you may manage all of your defaults in MANAGE > Default Worksheets.

System defaults are not shown on this page as you cannot edit them. It requires an Administrator to do so.

Steps

1. Go to **WORKSHEETS > Default Worksheets.**

2. Go to the **Defaults** tab.

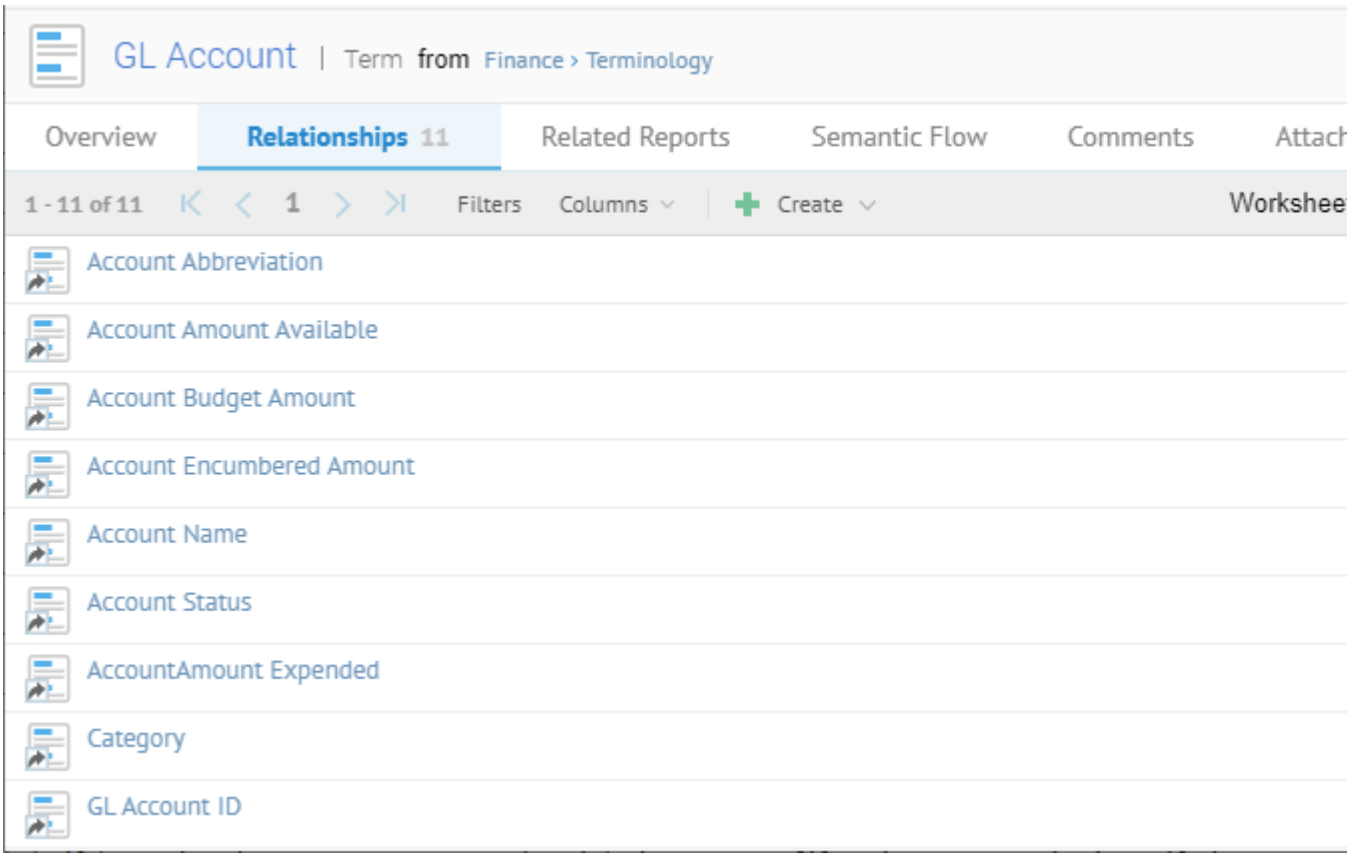
3. Click any item in the list and you may.

   - Click the **Name** or right-click and select **Rename** and type a new name.
   - Click **Delete or** right-click and select **Delete** to delete.

Example

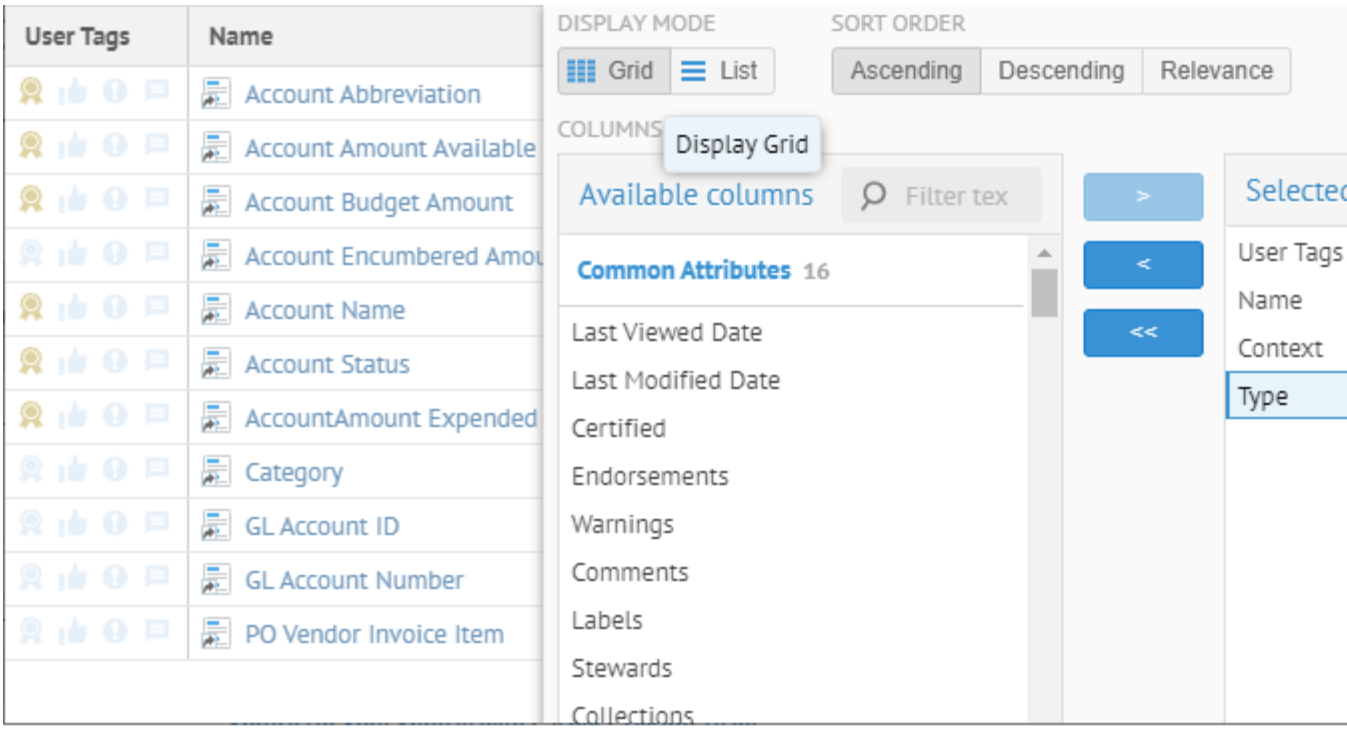
Go to the details page for the **GL Account** term in the **Terminology** category of the **Finance** glossary and go to the **Relationships** tab.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



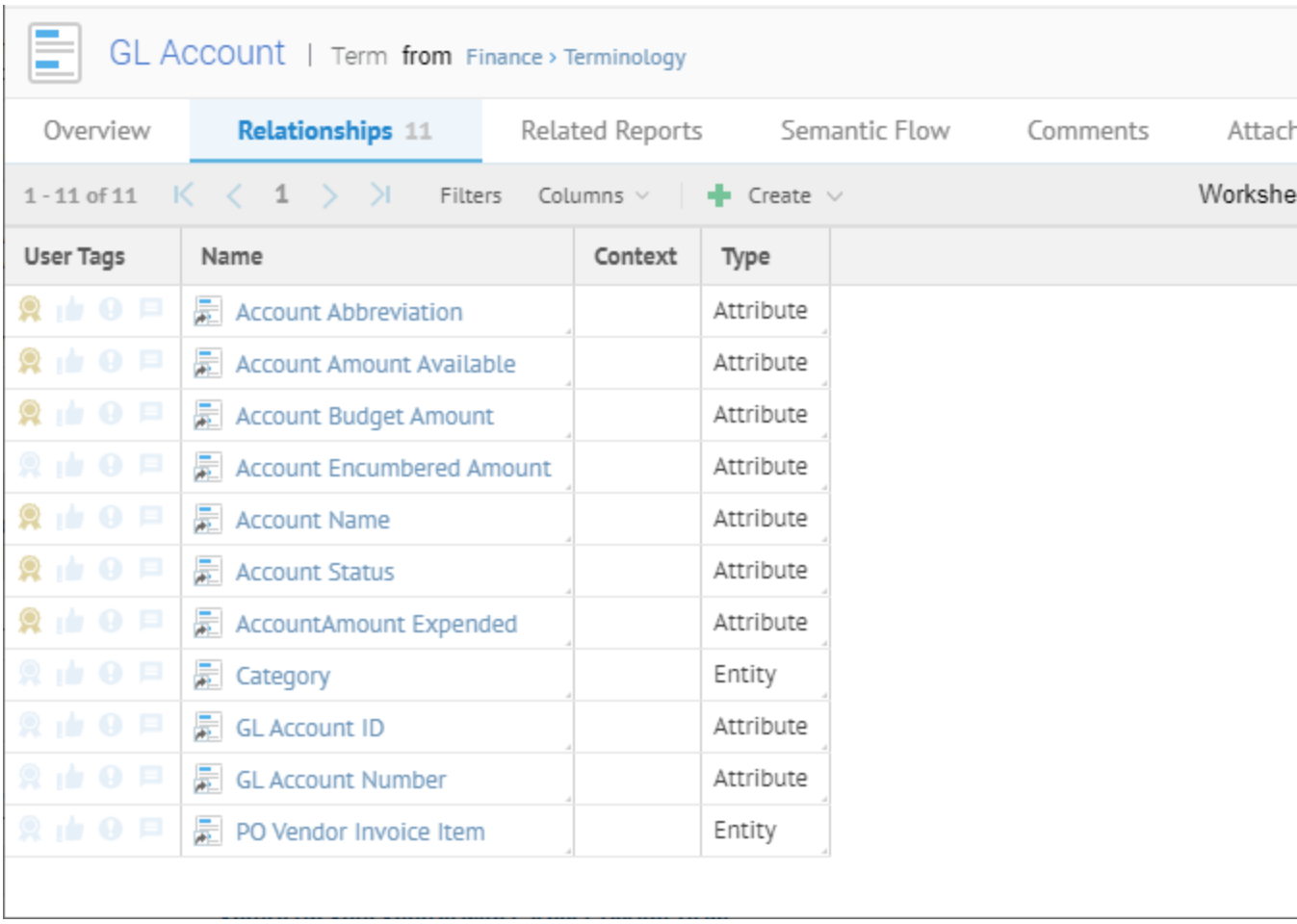
Click **Columns** and switch to **Grid** mode and include **Type** as a column.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

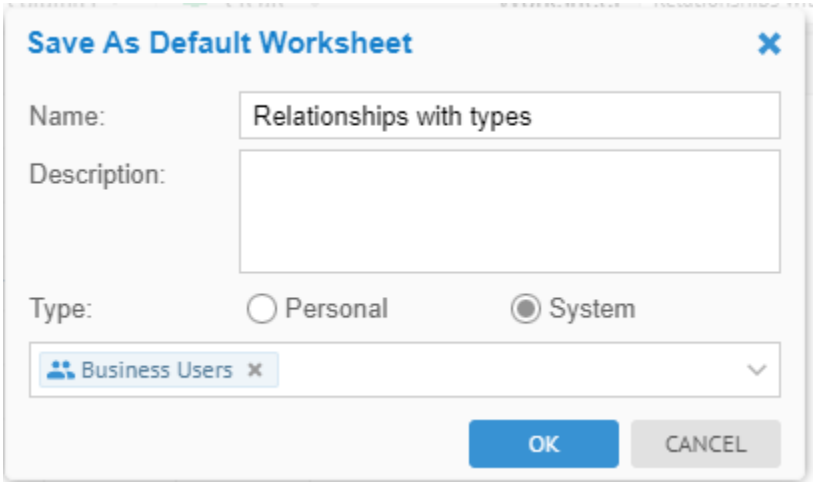


Click the background to remove the dialog.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

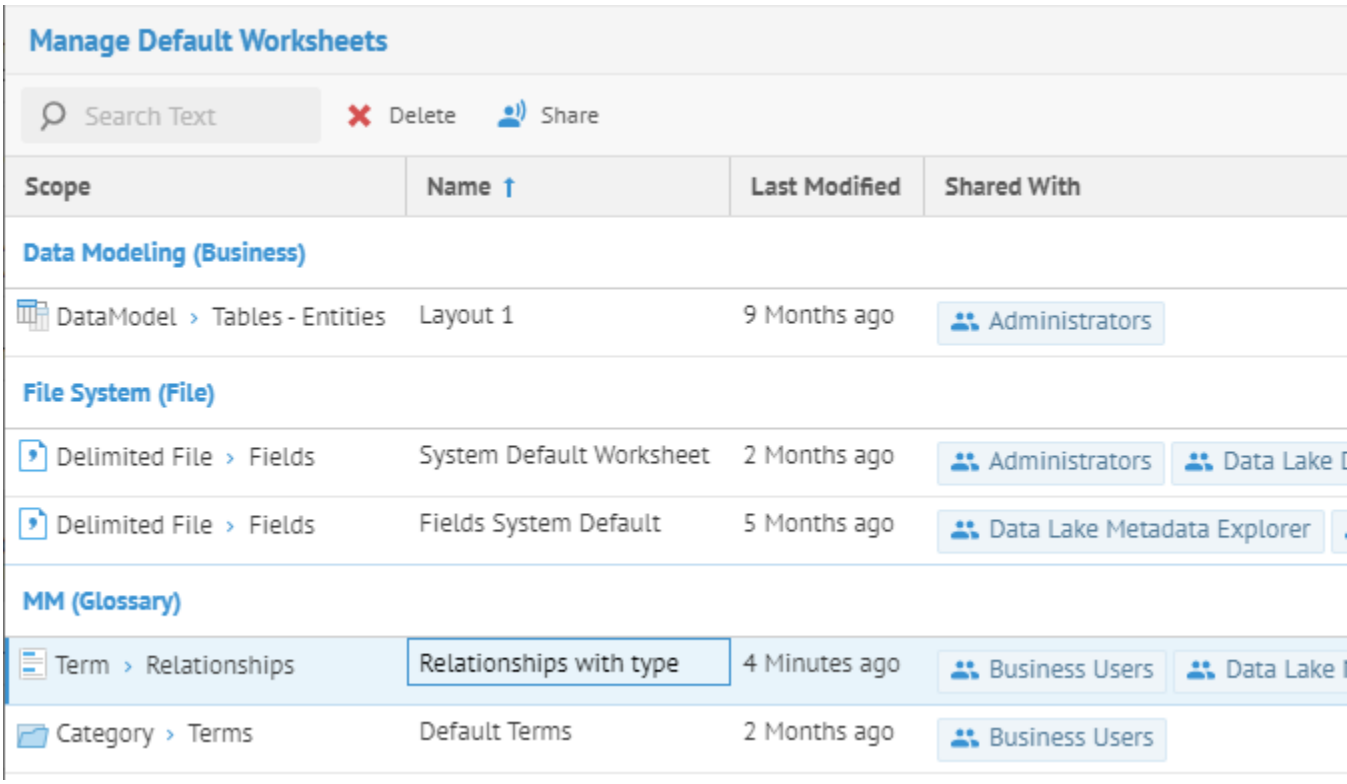


Click **SAVE AS** and create a system type worksheet and share it (make it a default for those users).



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Now this default worksheet is in the MANAGE > Default Worksheets and those users will see it by default.



Dashboards

Dashboards are a way for you to completely customize the content presented on a page in MIMM . They have full BI reporting dashboard capabilities (tile layout, widgets for containers, numbers, statistics such as grids, bar or pie charts, etc.) based upon Metadata Query Language (MQL) along with worksheets and collections.

As with Collections and Worksheets, users have the ability to save/manage/share Dashboards.

Explore Dashboards

You may use the dashboard explorer to select and present results according to the worksheets available.

Steps

1. Go to **DASHBOARDS > Explore**.

2. Select the dashboard to use from the pick lists:

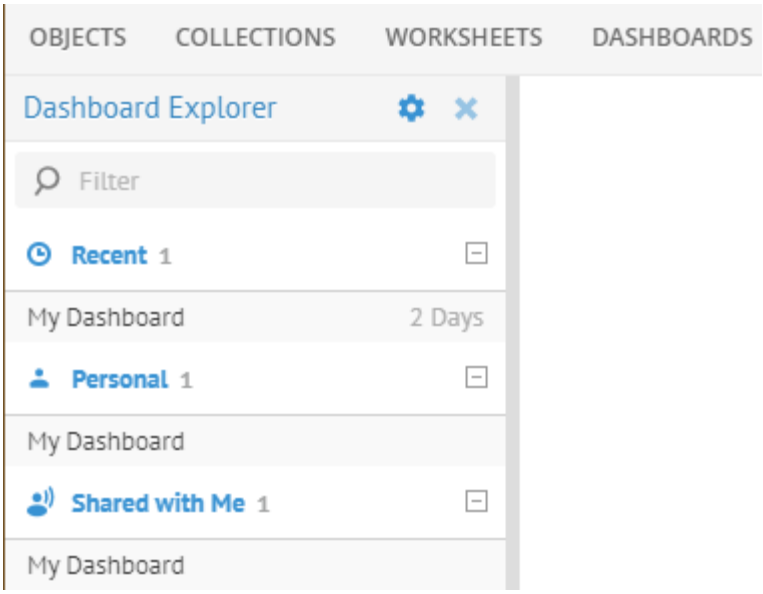
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

- **Favorites**
- **Recent**
- **Personal**
- **Shared with me**

3. You may filter the dashboard lists by entering text.
4. Click on any item results to edit and manage that dashboard.
5. Click on the Preferences ( ) icon to set the Maximum count for each presentation of dashboards.
6. Click the Close ( ) icon to close the explorer.

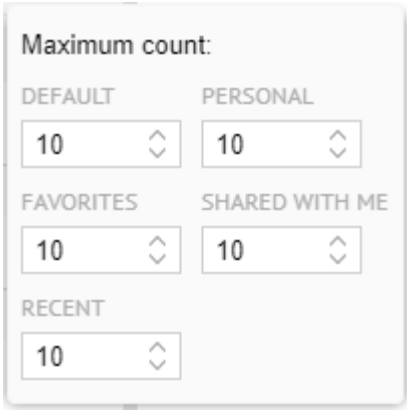
Example

Click **DASHBOARDS > Explore**.



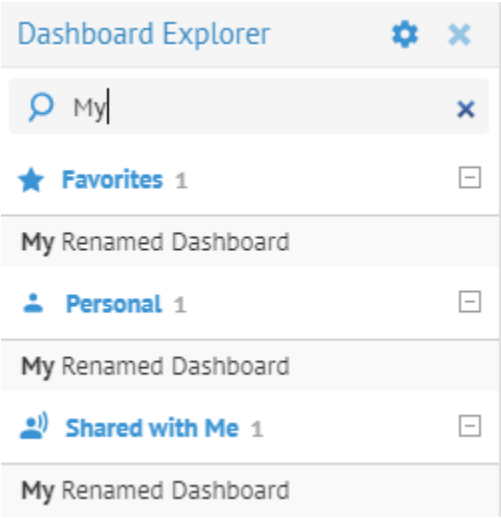
Click the **Preferences** icon.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Here you may specify the different counts of dashboards which you want to see in the explorer.

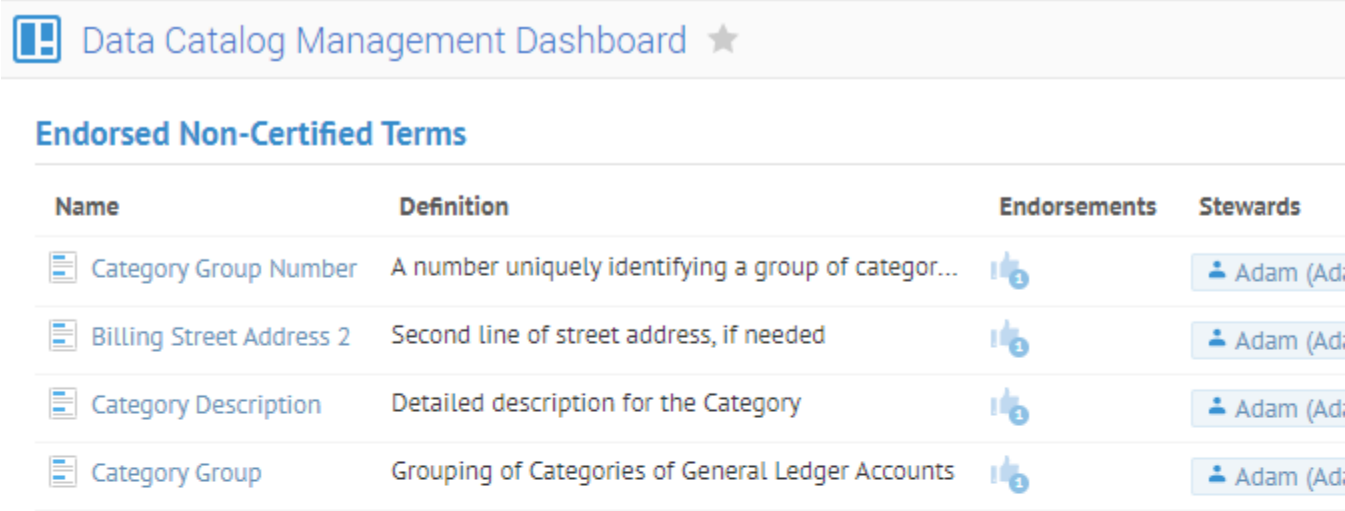
Click in the **Filter** text box and type "My".



*The **Filter** applies to all five groupings of dashboards in the explorer.*

Click the (✕) icon to clear the **Filter**. Click the **Data Catalog Management Dashboard**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click the **Close** icon to close the explorer.

Create a Dashboard

To build a dashboard, you will either start with an empty one (new) or Save As.. from and existing one.

Steps

1. Go to **DASHBOARDS > Manage** to begin working on a dashboard. You may also click

   DASHBOARDS > and select any of the options under

   - **Explore**
   - **Defaults**
   - **Favorites**
   - **Recent**

2. For a new dashboard, create it and specify the Name, Layout, Sharing and Description.

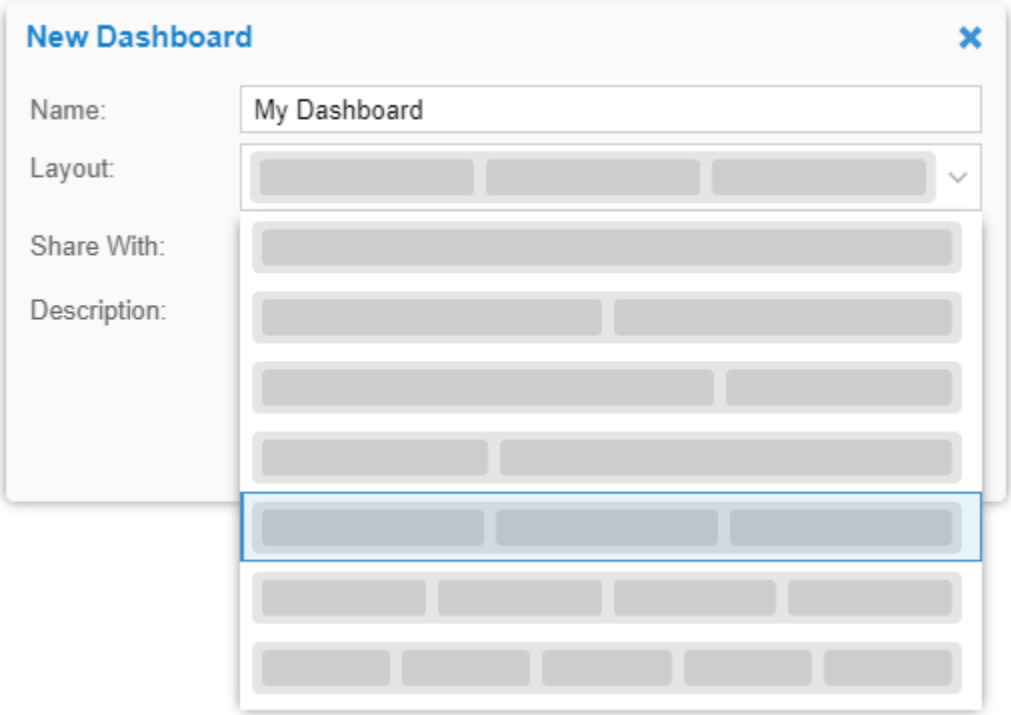
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Example

Here, we will create a new dashboard from scratch.

Log in as Administrator. Go to **DASHBOARDS** > **Manage** and click Create . Enter "My Dashboard" in the **Name** text field. Choose the three-column Layout.

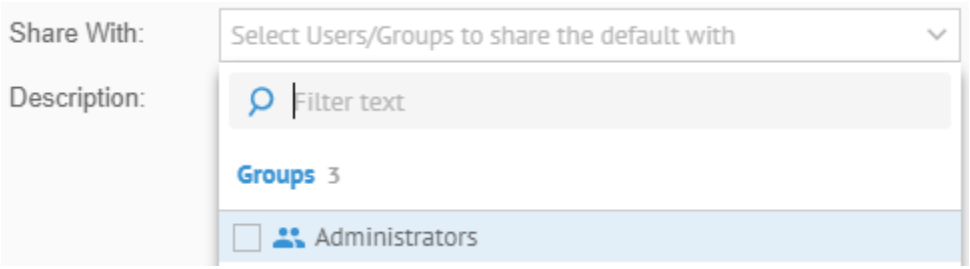
Layout the Dashboard



When laying out the dashboard you will not be able to add containers above the first one. Instead, you will have to copy the top one and then edit it to reflect the new design.

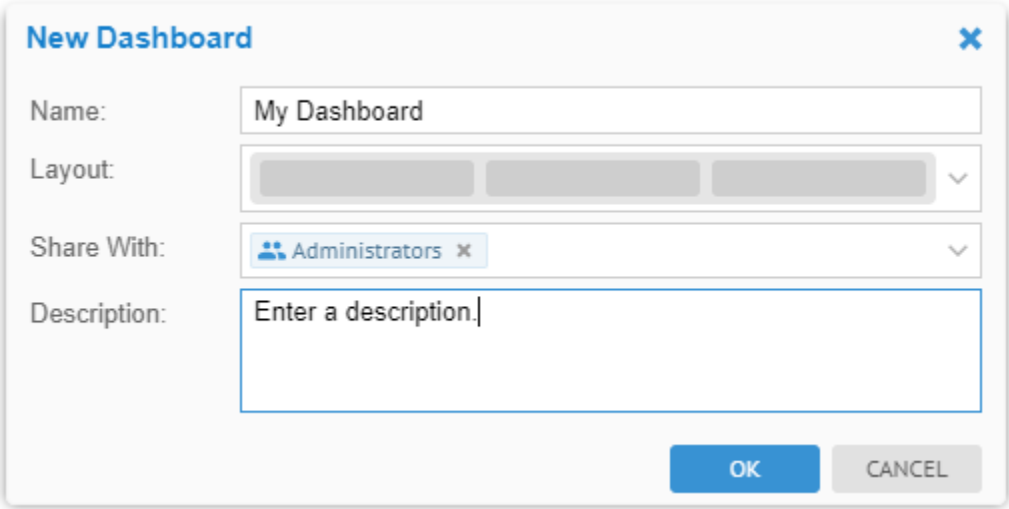
Share the Dashboard with Users and Groups

Share it with the **Administrators** Group.

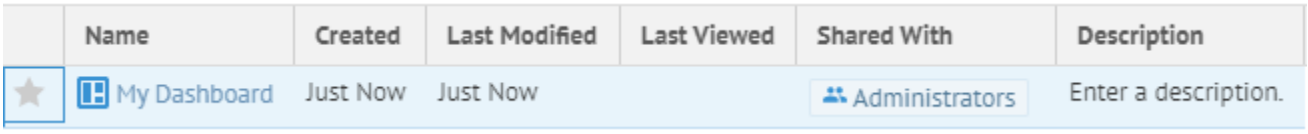


Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

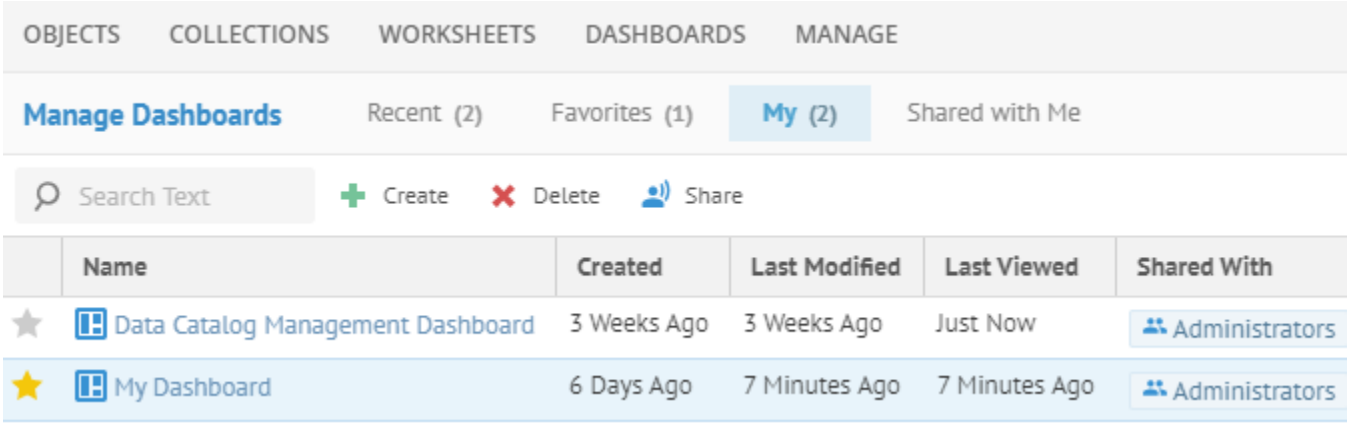
Enter a **Description** and click **OK**.



It is now in the list, and note it is shared.



Click on My Dashboard in the list to edit.



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Edit (Customize) a Dashboard

Whether editing a saved dashboard or simply working with a search result that is presented as a dashboard, this is the common environment for filtering and manipulating that dashboard.

Steps

1. For a new dashboard, specify the Name, Layout, Sharing and Description.

2. For an existing dashboard go to **More Actions > Customize** to start editing.

3. From here you may:

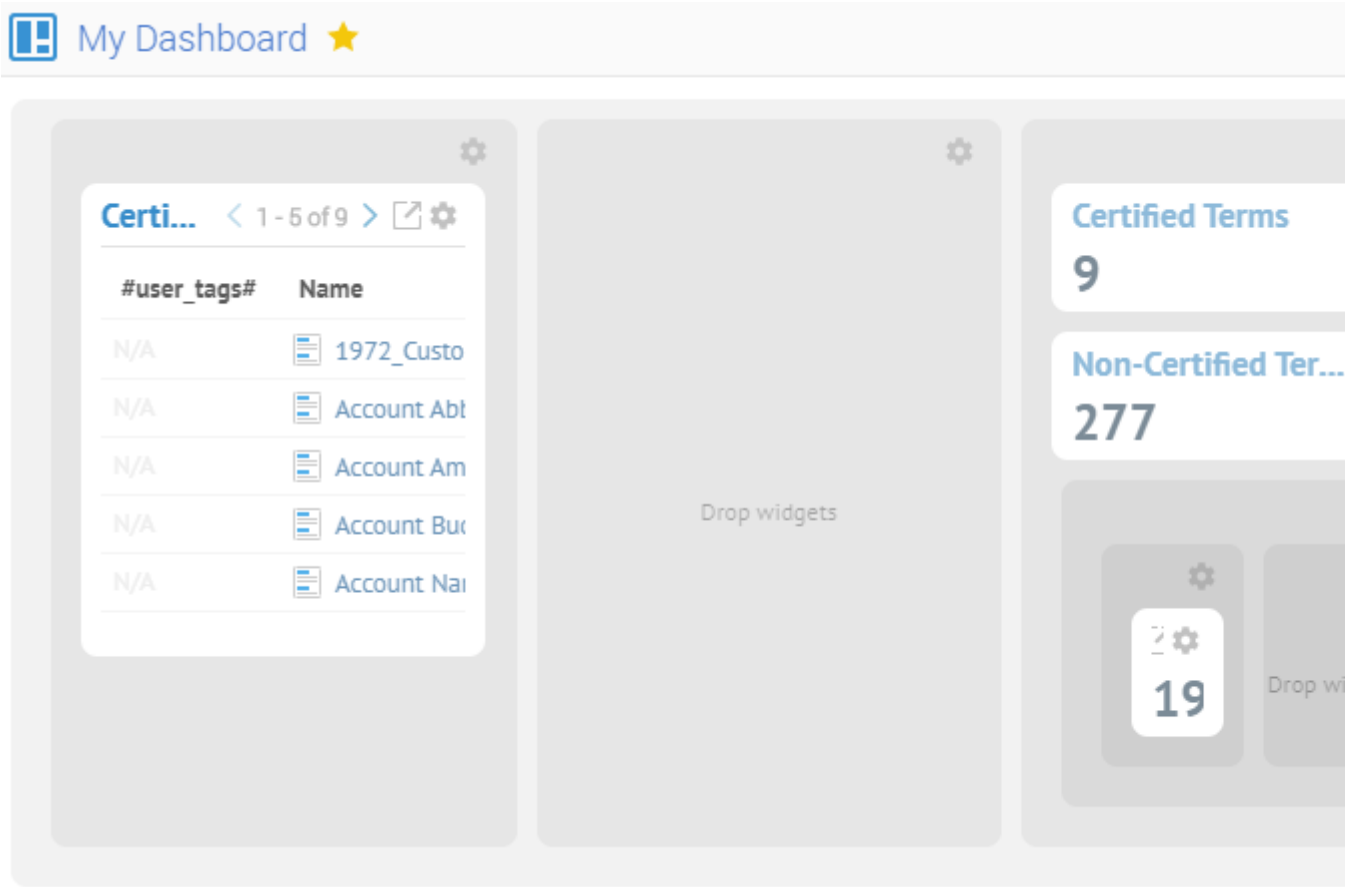
   - Populate cells: Drag any widget from the right panel into the left portion of the dashboard and then click **CONFIGURE**.
   - Add a container:
   - Rename a dashboard
   - Save
   - Save as a new dashboard

Examples

Click **DASHBOARDS > Explore**, and pick **My Dashboard**.

Go to **More Actions** (⋮) > **Customize**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



One may now edit the dashboard

Add a Container to a Dashboard

In order to place more horizontal structure into a cell in a dashboard, you may drag a container into any location a widget can be placed.

Containers may be placed to any level of depth inside of cells which are themsleves inside a container and so on.

Steps

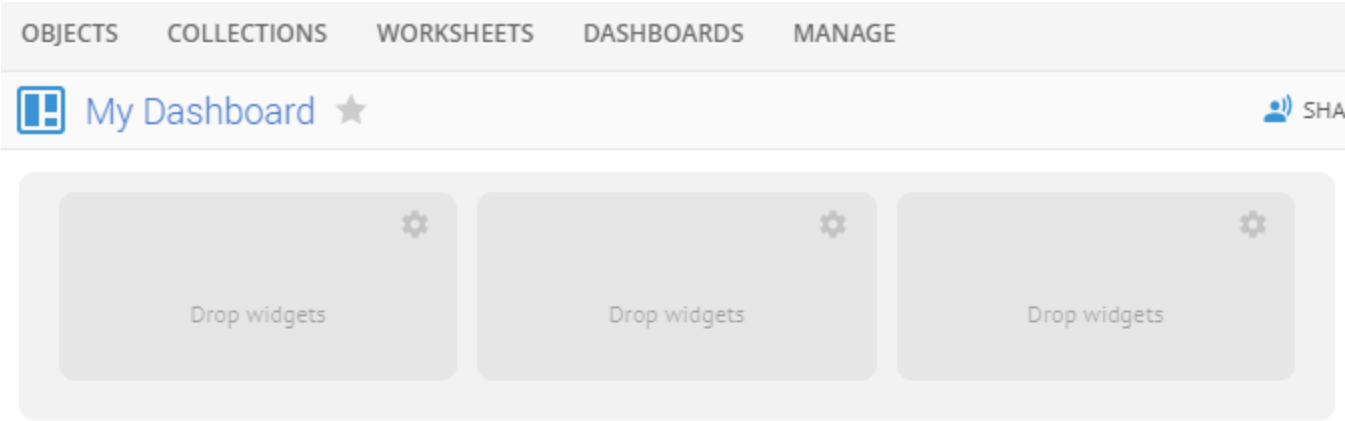
1. Navigate to the dashboard.
2. Click **More Actions** and then **Customize**
3. Drag the **Container** widget into the right portion of the dashboard and below the **Non-Certified Terms** worksheet counter widget.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Example

Navigate to **My Dashboard** and click **More Actions > Customize**. Drag the **Container** widget into the right portion of the dashboardAdd Widgets to a Dashboard

On the right you see the list widgets that may be included in the report.



Explorer Further

Add columns to a Container

Just as with a dashboard, you may insert columns before or after. This may be specified in the settings of the container

Steps

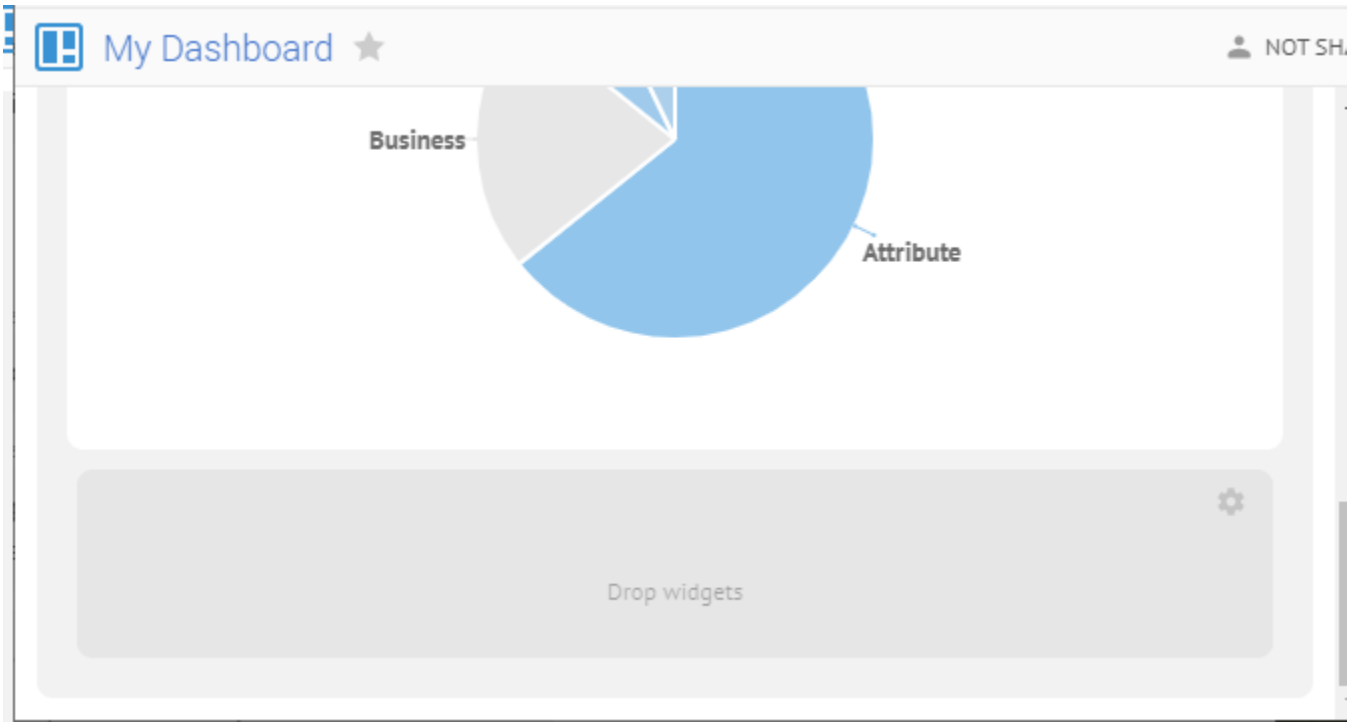
1. Navigate to the dashboard.
2. Click **More Actions** and then **Customize.**
3. Click the **Settings** icon for the container.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

4. Select **Insert column before** or **after.**

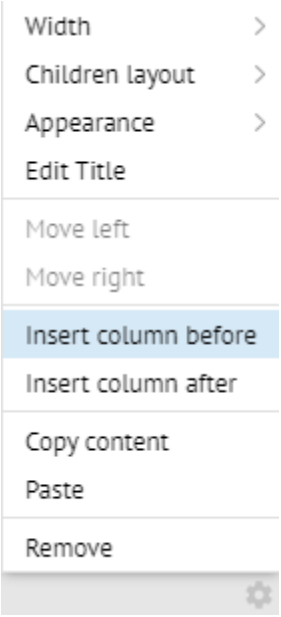
Example

Drag a container at the bottom of the dashboard.

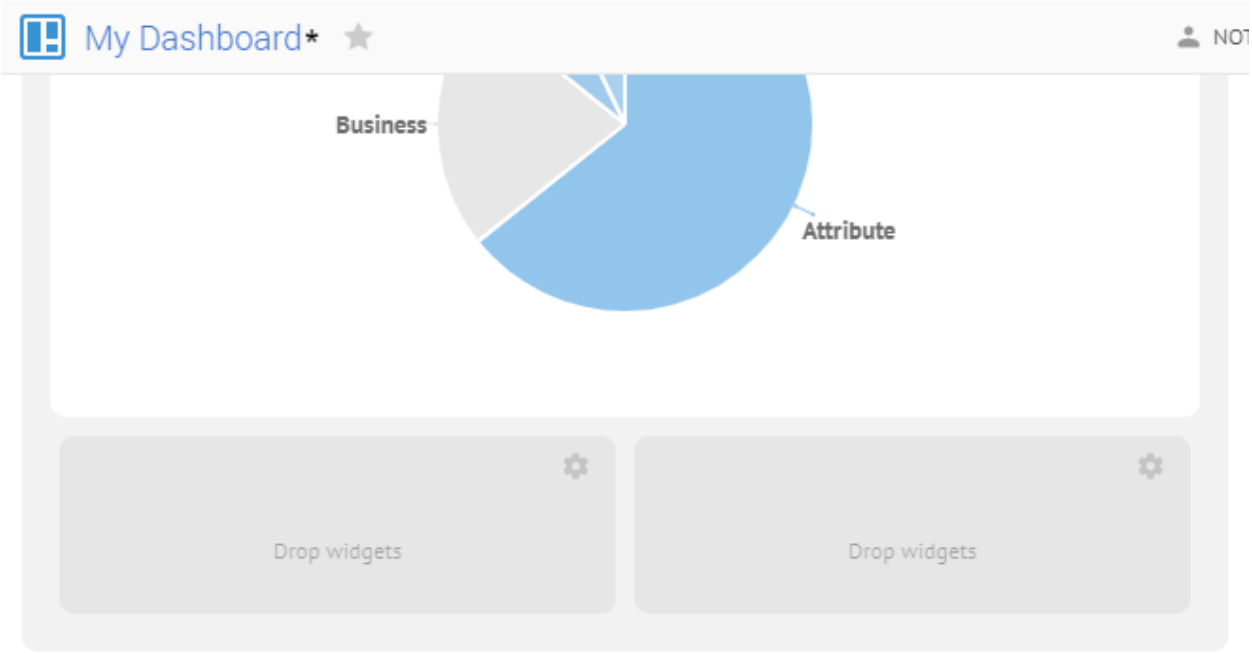


Click the **Settings** icon for the container.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Select Inser column before.

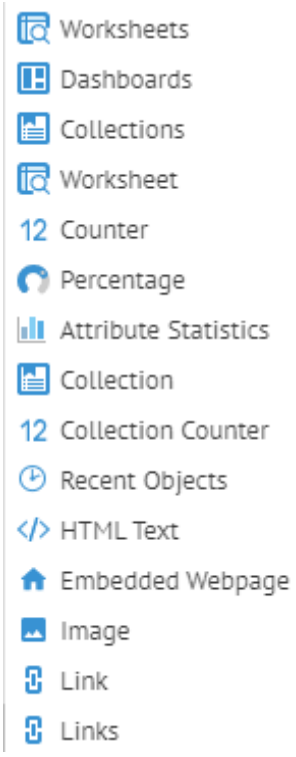


Wee have a new column.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Add a Widget to a Dashboard

You may include a variety of widgets in a dashboard or within Containers in a dashboard.



Steps

1. Drag the widget from the pallet on the right into below an object or inside a container.

Examples

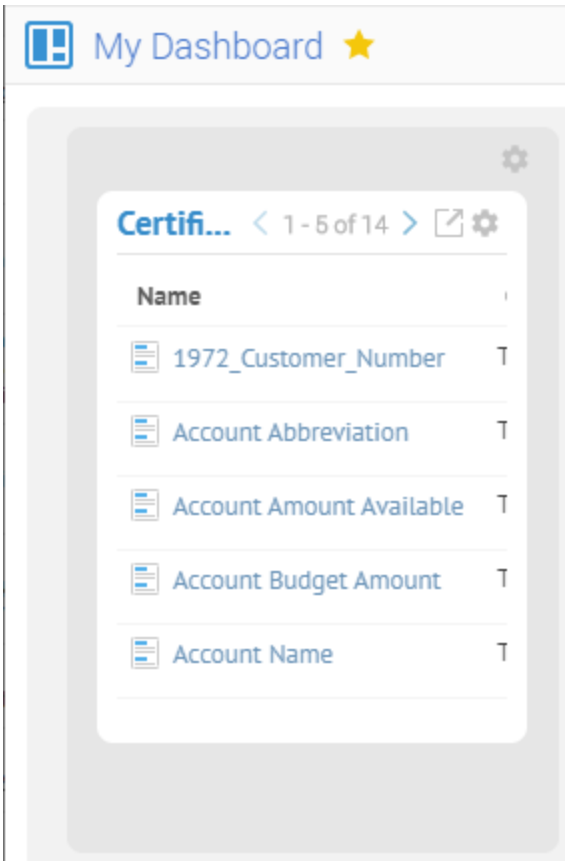
Common Widget Properties

Worksheets, Dashboards and Collections Widget

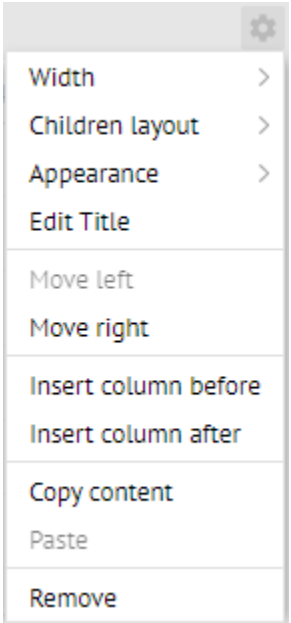
With one of these widgets you may embed a reproduction of the options under the **WORKSHEETS, DASHBOARDS** or **COLLECTIONS** menu inside a dashboard.

Drag the **Dashboards** widget into the center portion of the dashboard.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click **Settings** and note the options:



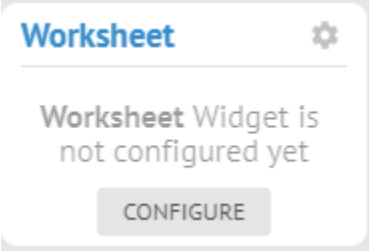
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

*We have a reproduction of the options under the **DASHBOARDS** menu.*

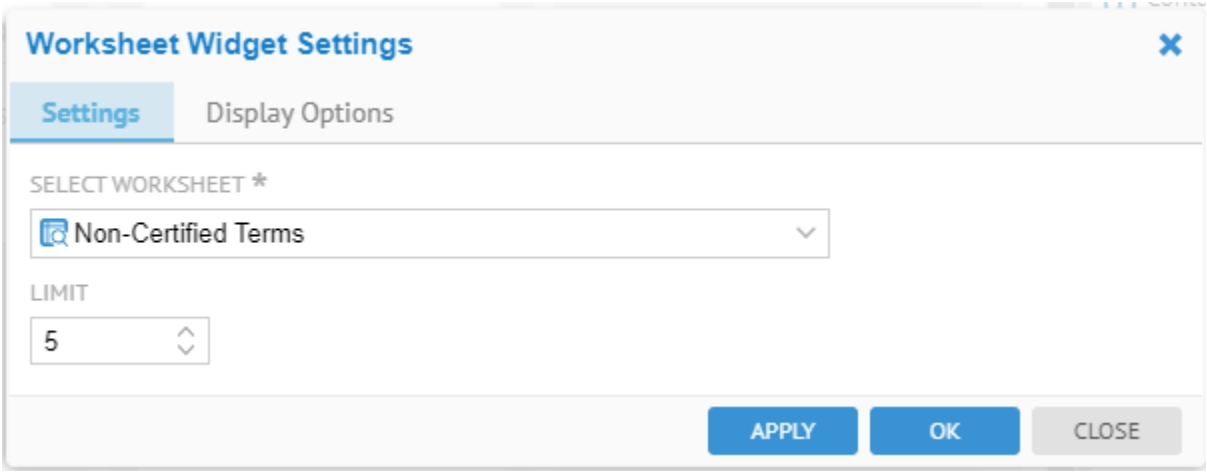
Worksheet Widget

With this widget you may embed the results of a worksheet into the dashboard.

Drag the **Worksheet** widget into the left portion of the dashboard.

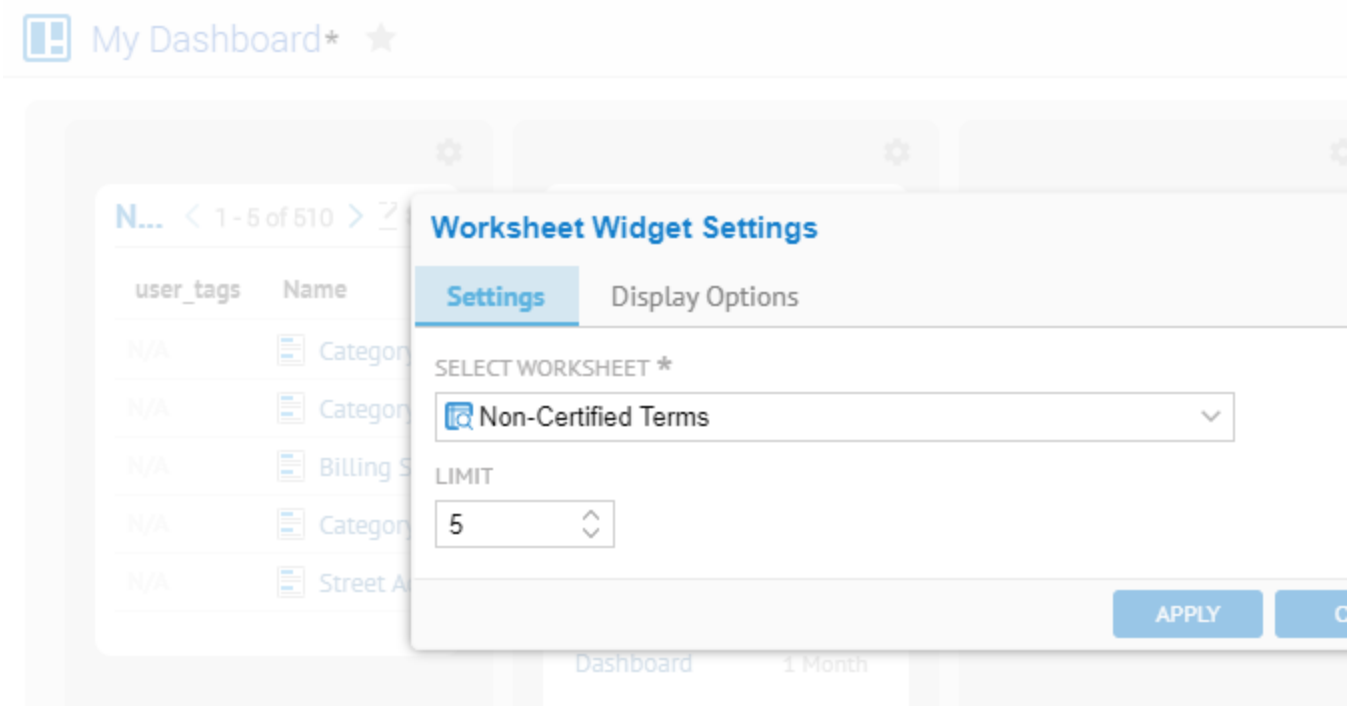


Click CONFIGURE and select **Non-Certified Terms** from the list.



Click **APPLY**.

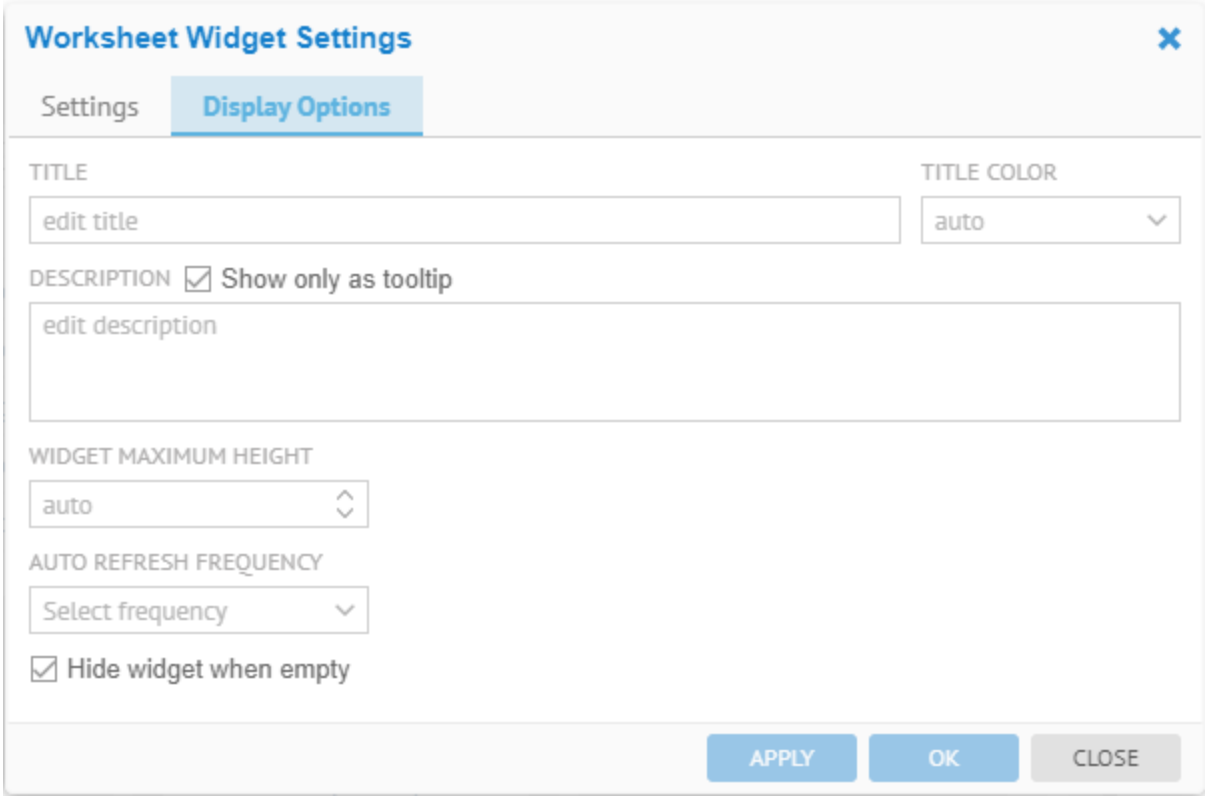
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



The Dashboard is updated in the background.

Click Display Options

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



These are the options you may specify on the widget.

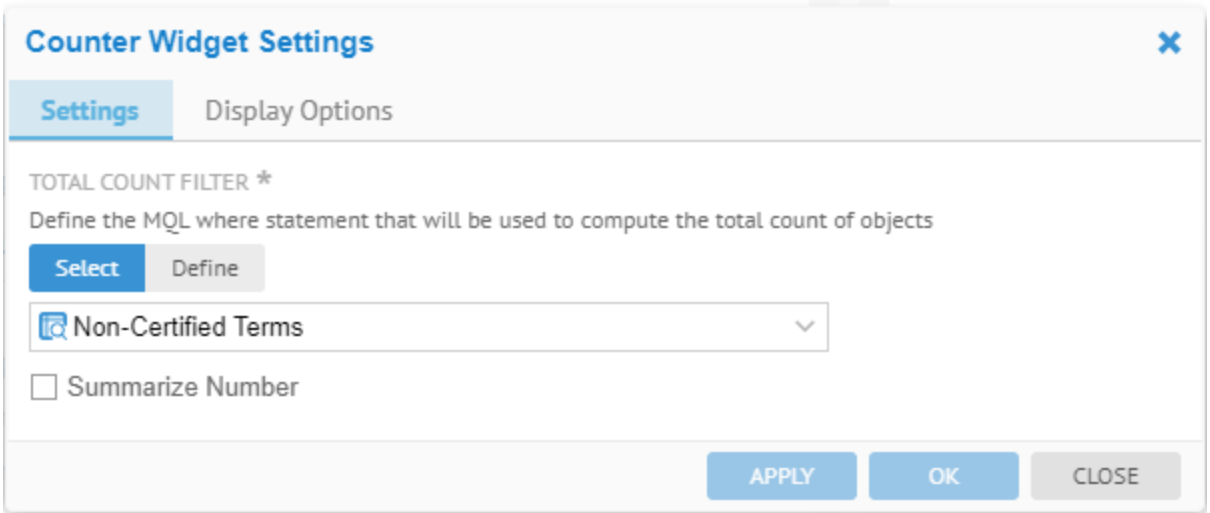
Click **CLOSE**.

Counter Widget

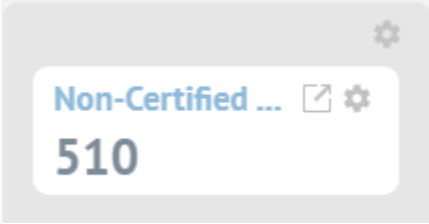
With this widget you may embed a count of the elements in a worksheet into the dashboard.

Drag the **Counter** widget into the right portion of the dashboard and click **CONFIGURE**. Select the **Non-Certified Terms** worksheet.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click OK



We have the total number of terms which have not been certified.

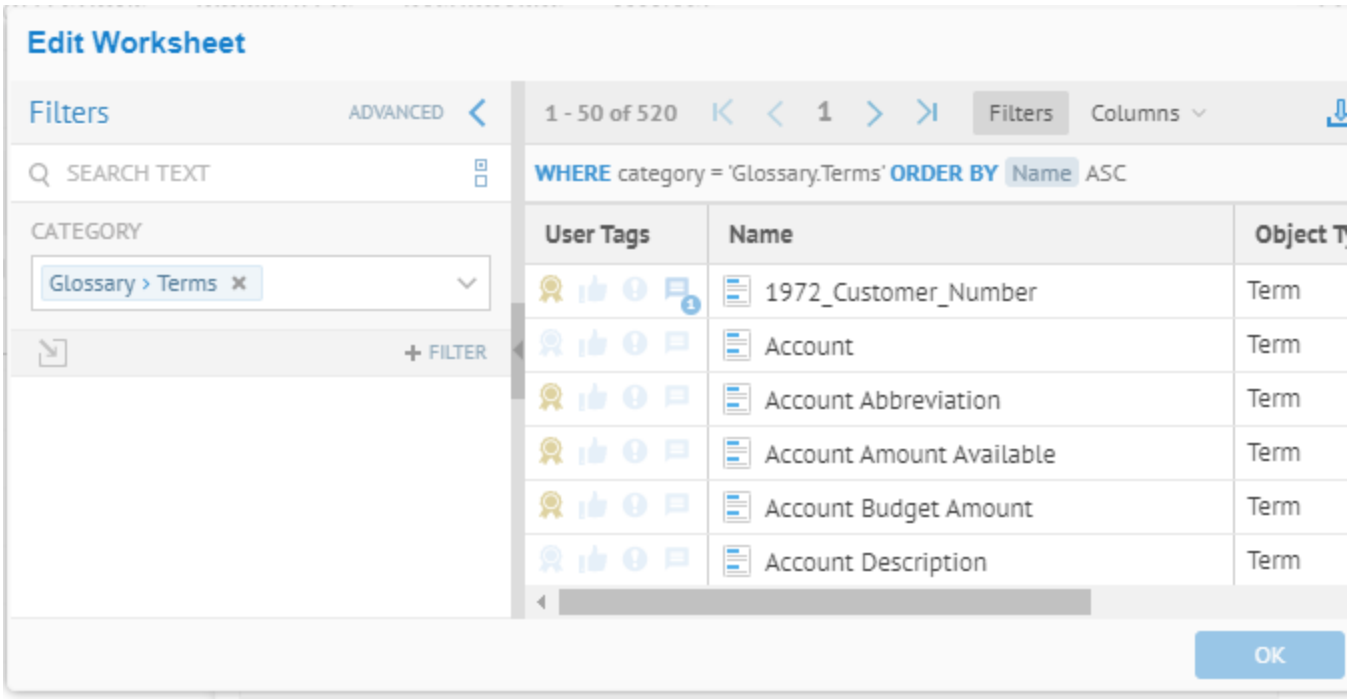
Percentage Widget

With this widget you may embed percentages based upon particular columns of a worksheet into the dashboard.

Drag the **Worksheet Percentage Statistics** widget into the bottom portion of the dashboard.

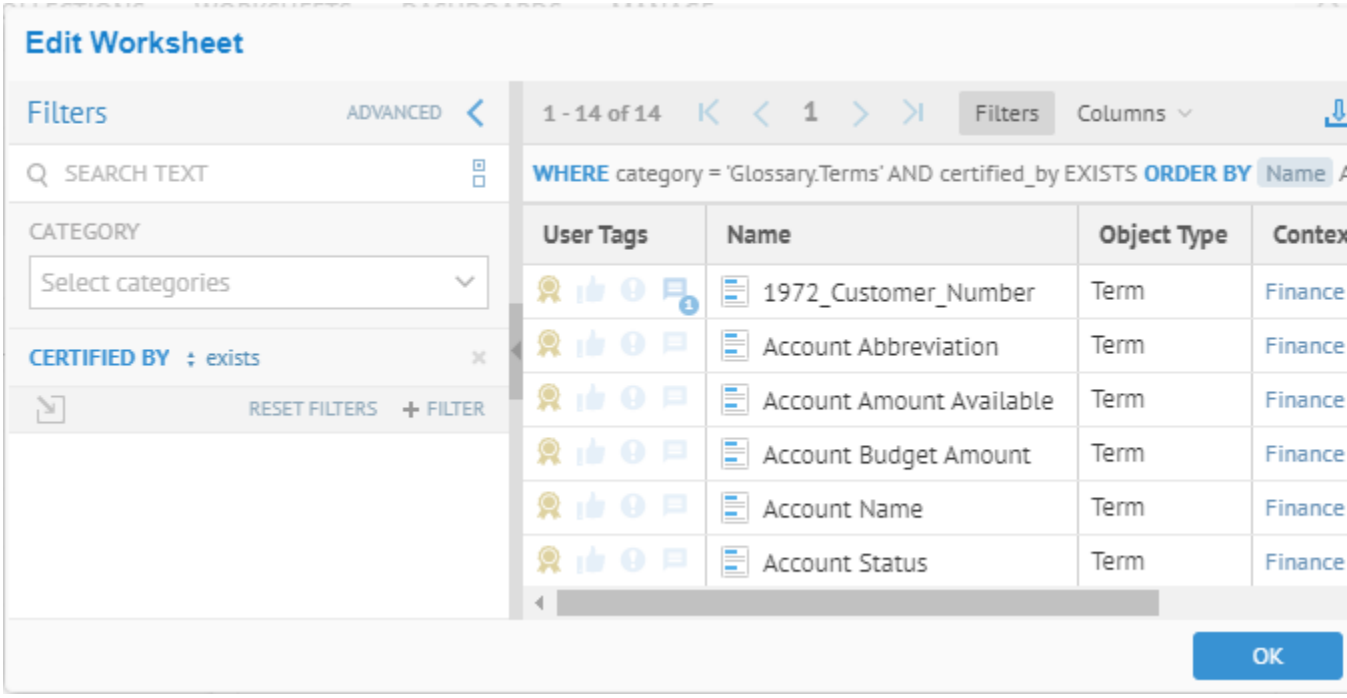
Click **Define** next to the **TARGET COUTN FILTER**. Click **EDIT** to create a query (worksheet equivalent) which contains all terms.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



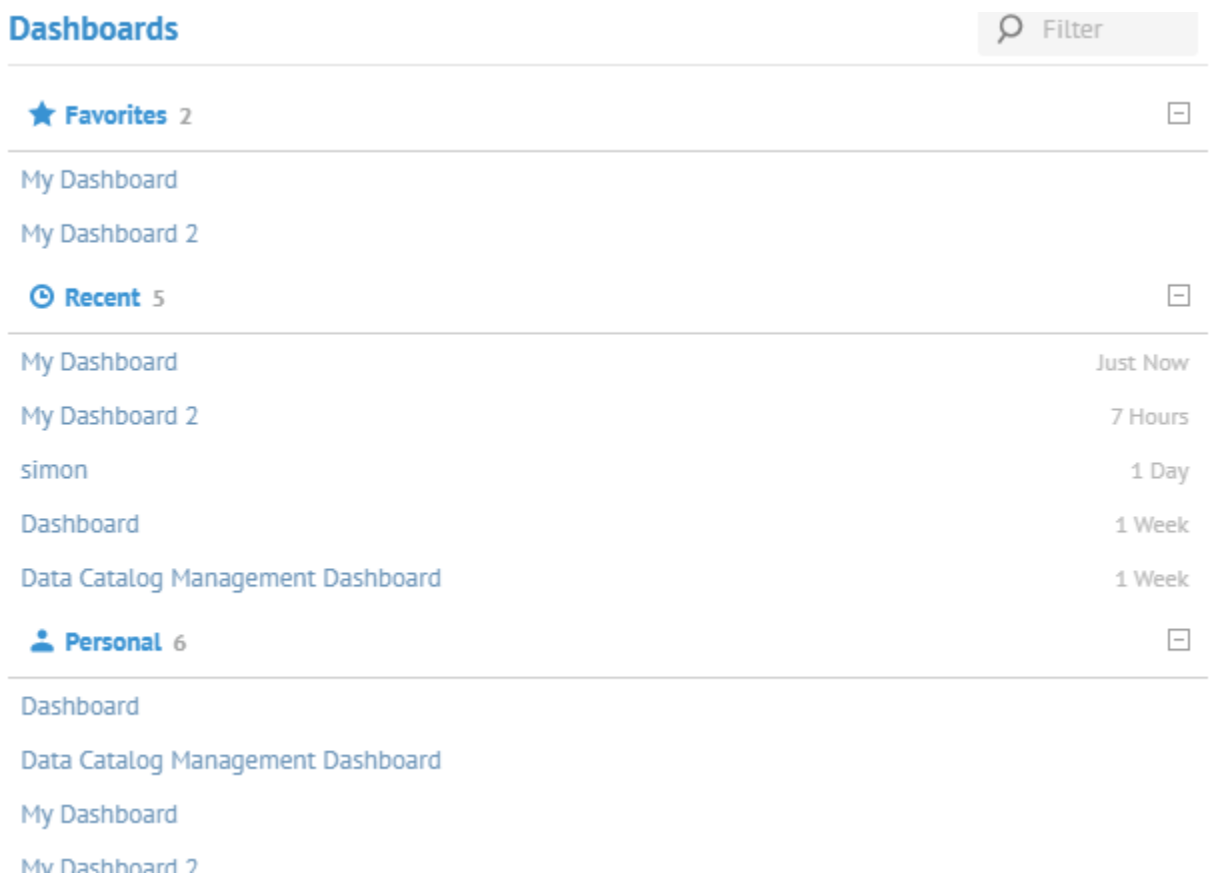
The Target is the set that designates completeness.

Click **EDIT** next to **ACTUAL COUNT FILTER** to create a query (worksheet equivalent) which will provide the actual count of objects to report.



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Click **Percentage**. Click **OK**. Click SAVE. Click STOP EDITING.



Attribute Statistics Widget

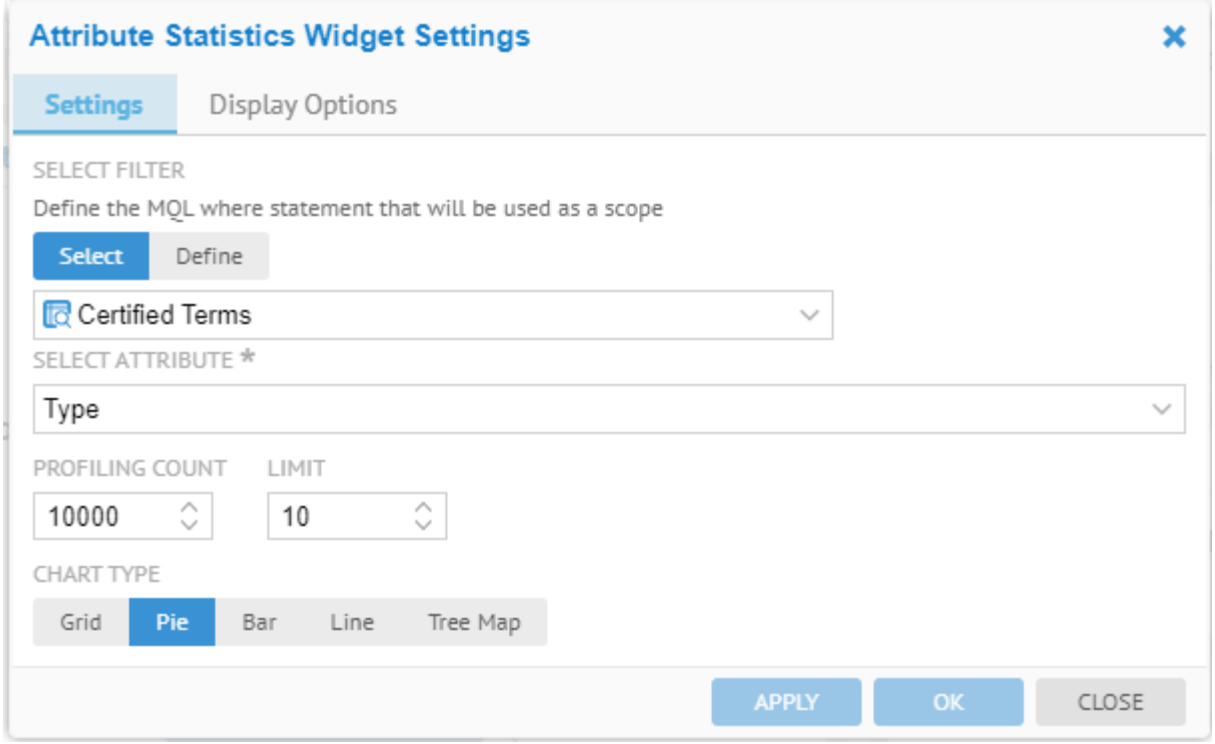
With this widget you may embed statistics based upon particular columns of a worksheet into the dashboard.

Drag the **Attribute Statistics** widget into the bottom portion of the dashboard.

Click **CONFIGURE**. Select the **Non-Certified Terms** worksheet and select the

- **Certified Terms** worksheet
- **Type** attribute
- **Pie** chart type.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



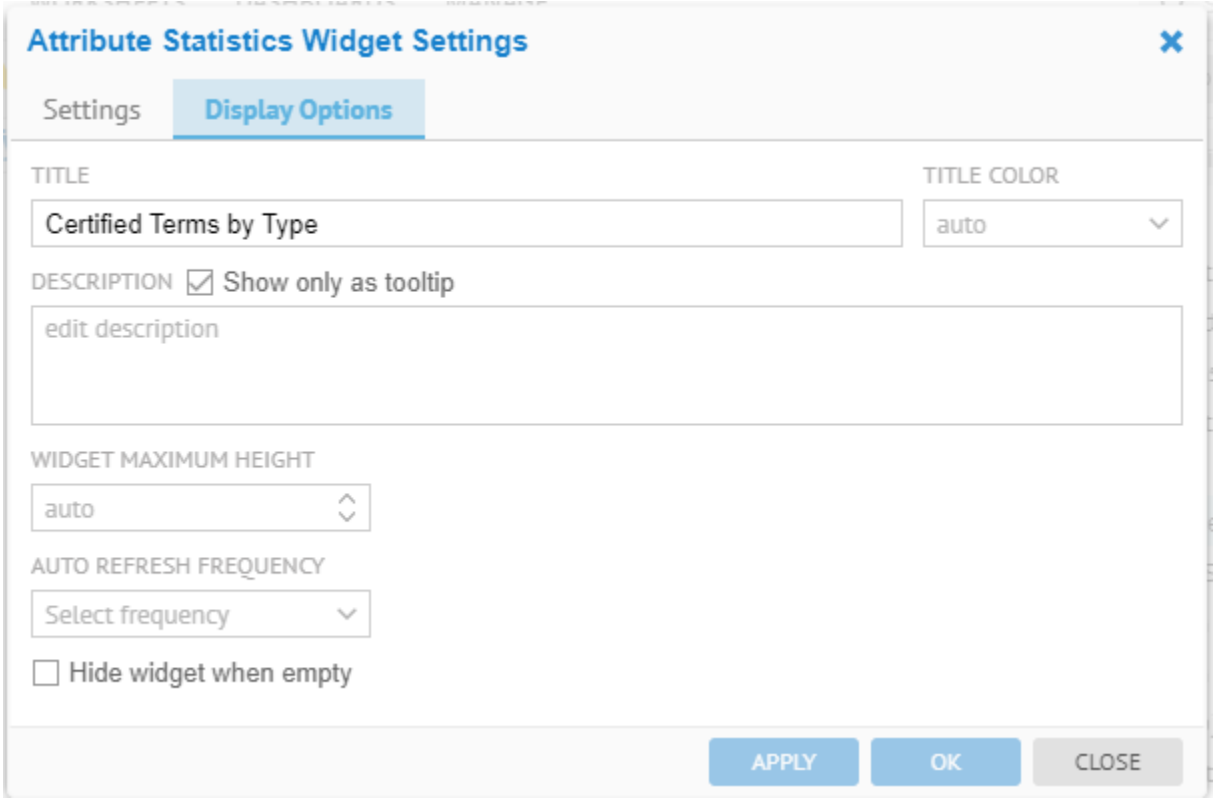
Click APPLY.

APPLY applies the changes immediately in the background.

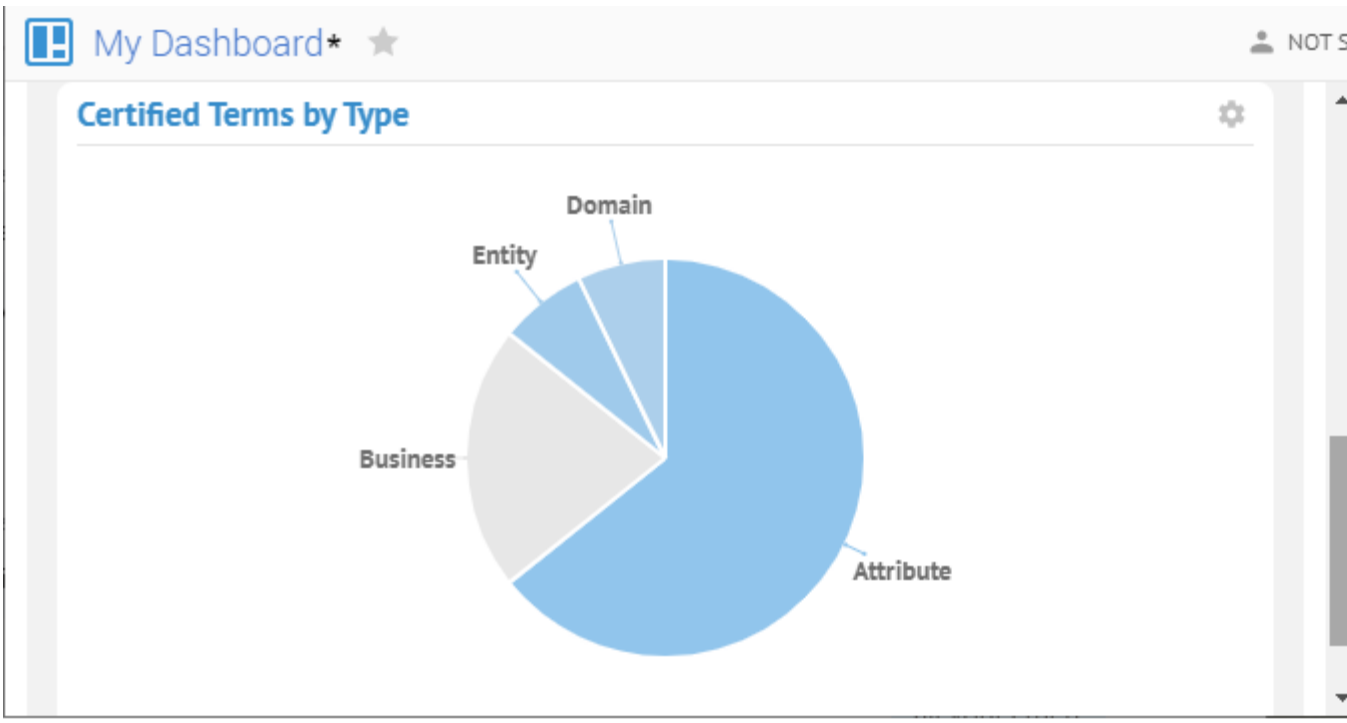
Go to the Display Options tab and:

- Enter “Certified Terms by Type” in the title
- Uncheck the Hide widget when empty checkbox.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



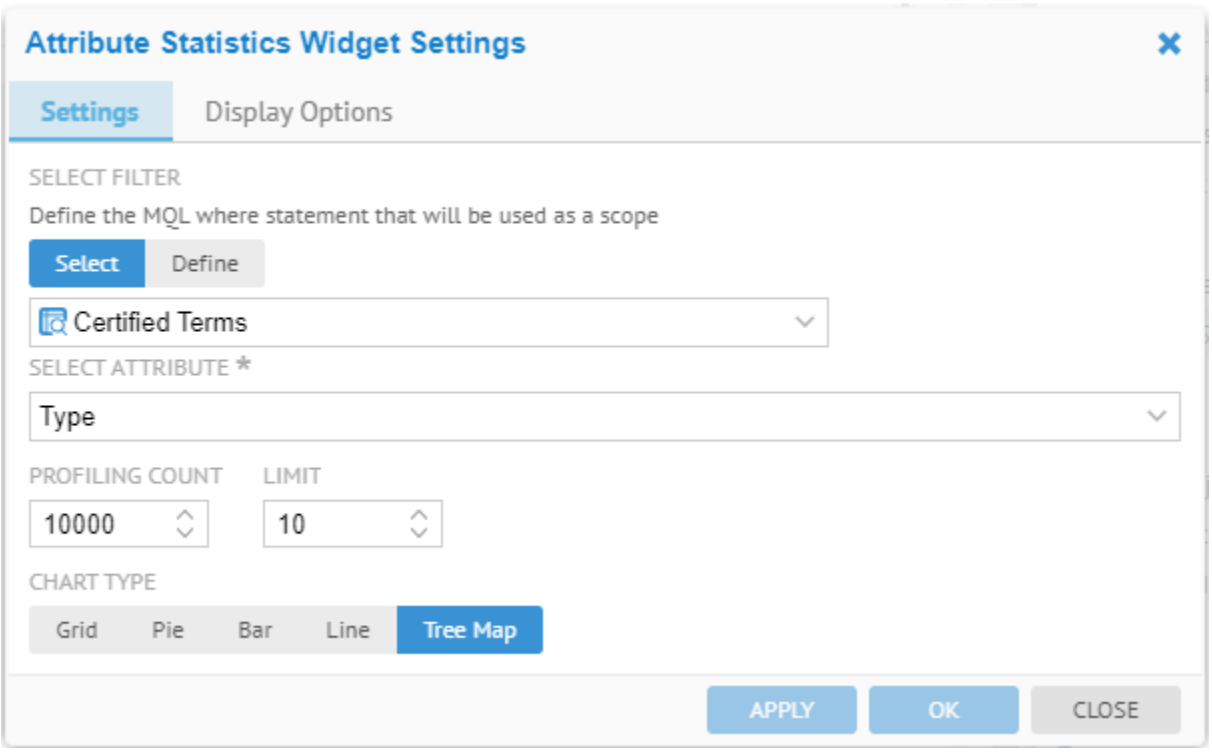
Click OK



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

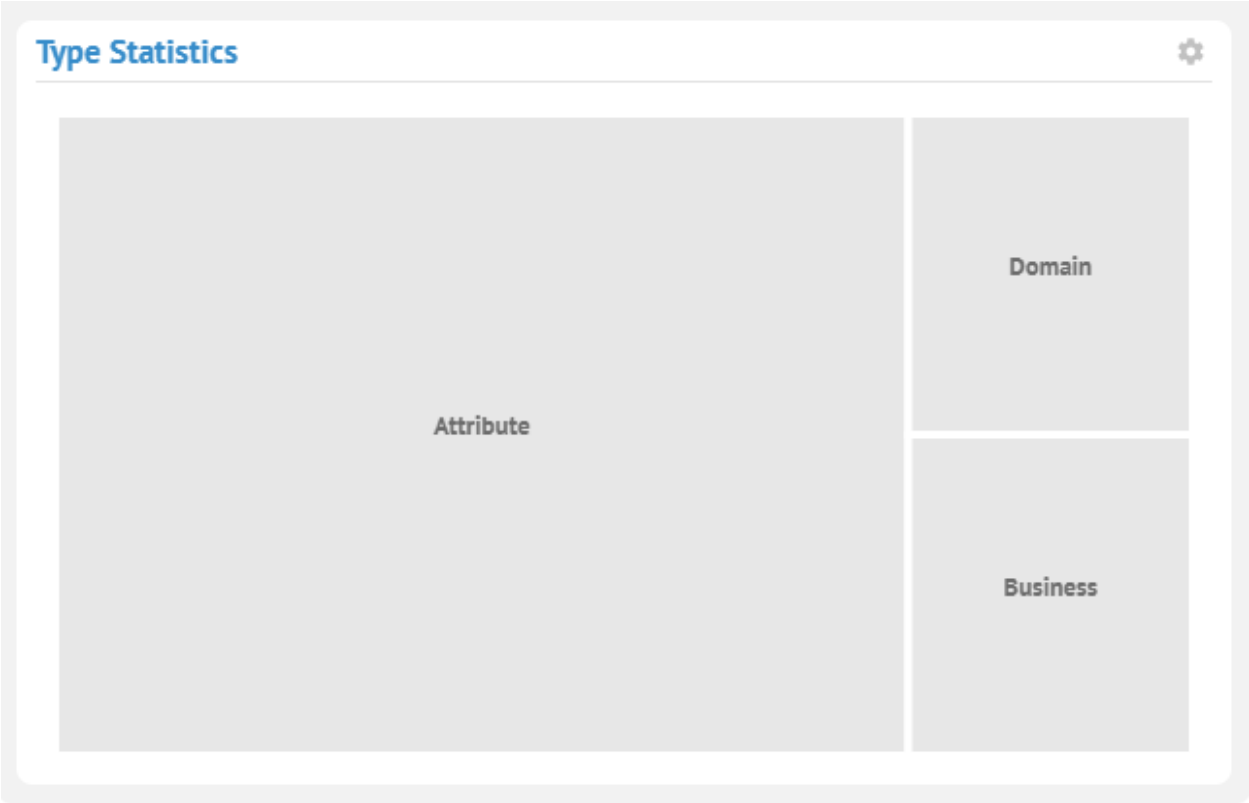
OK applies the changes and closes the dialog.

Now, lets Configure the widget again and specify a Tree Map, instead of the Pie.



And the result is:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



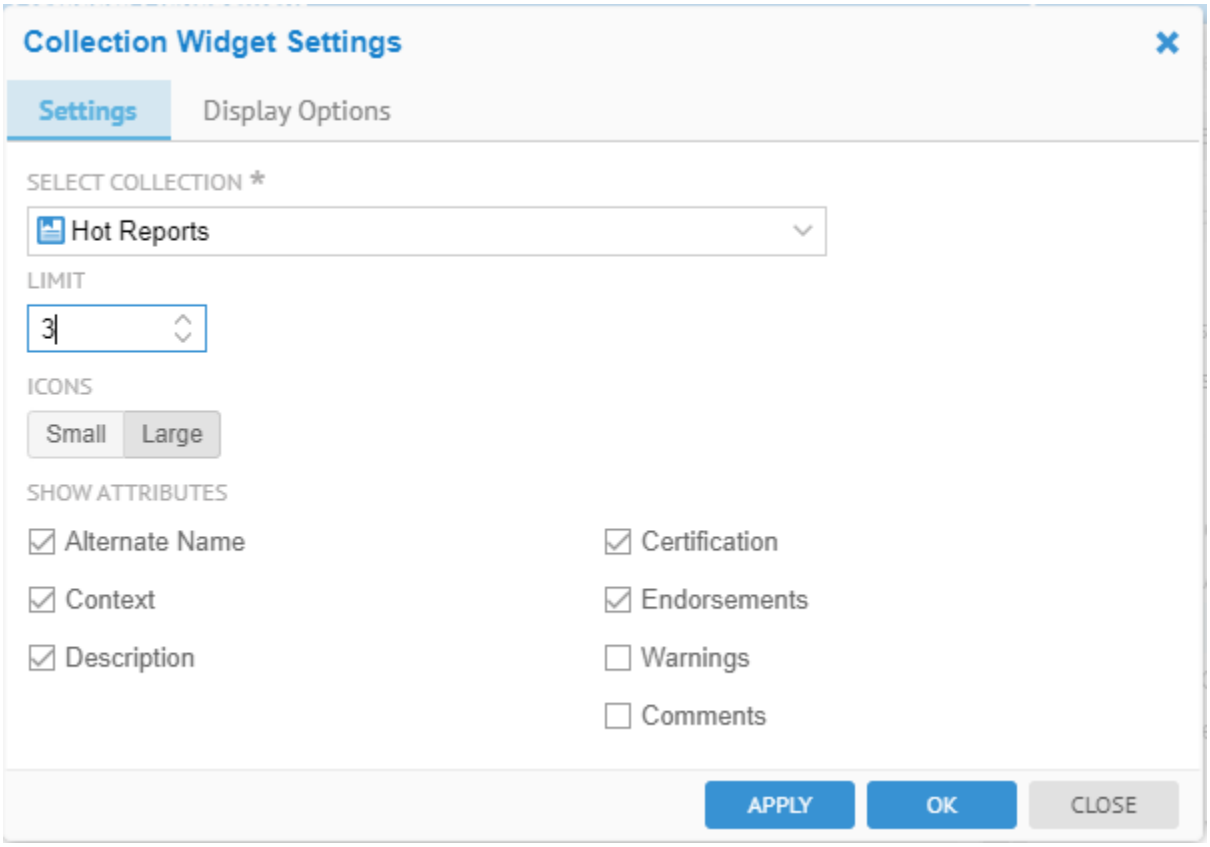
Collection Widget

With this widget you may embed the contents of a collection into the dashboard.

Create a **Container** at the bottom of the dashboard. Drag the **Collection** widget into the contaner and click **CONFIGURE**.

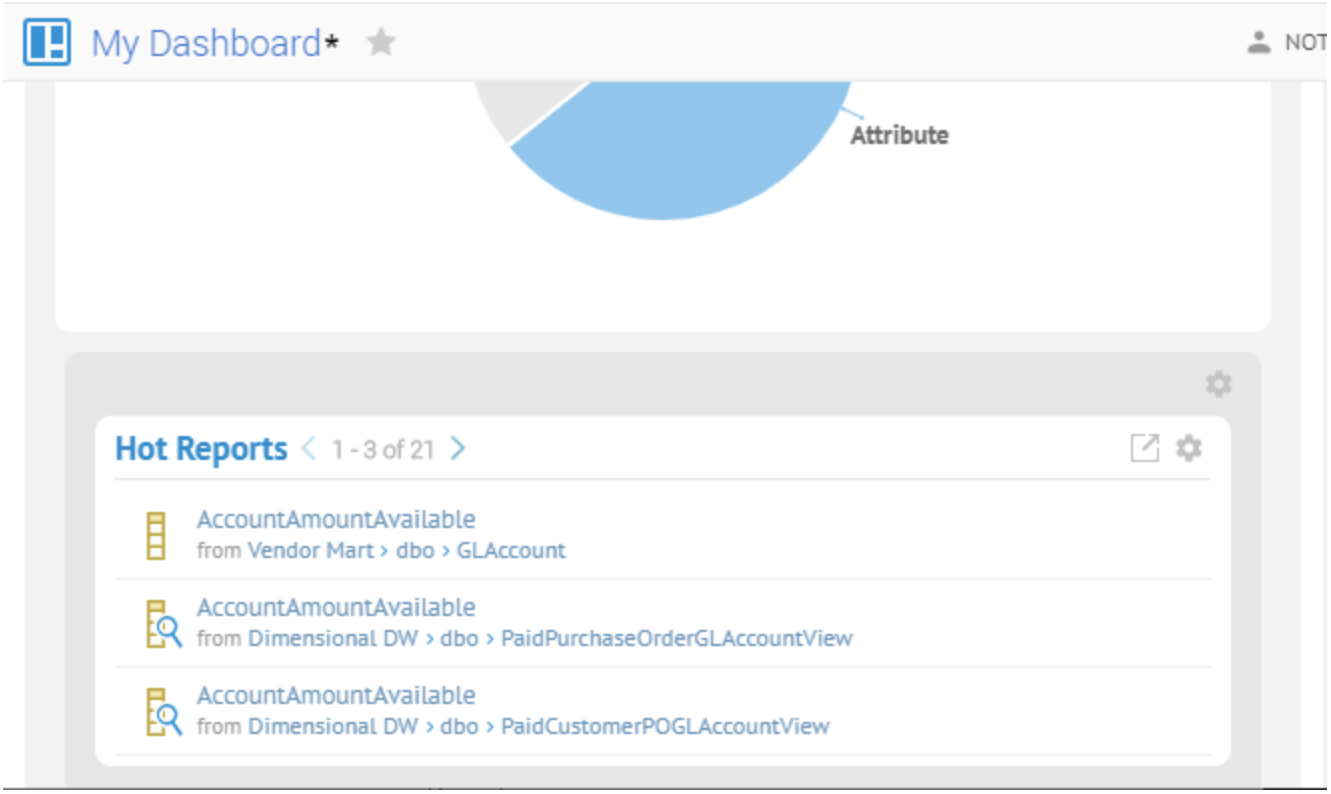
Select the **Hot Reports** collection. Set the **LIMIT** (number of lines) to **3**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click OK.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



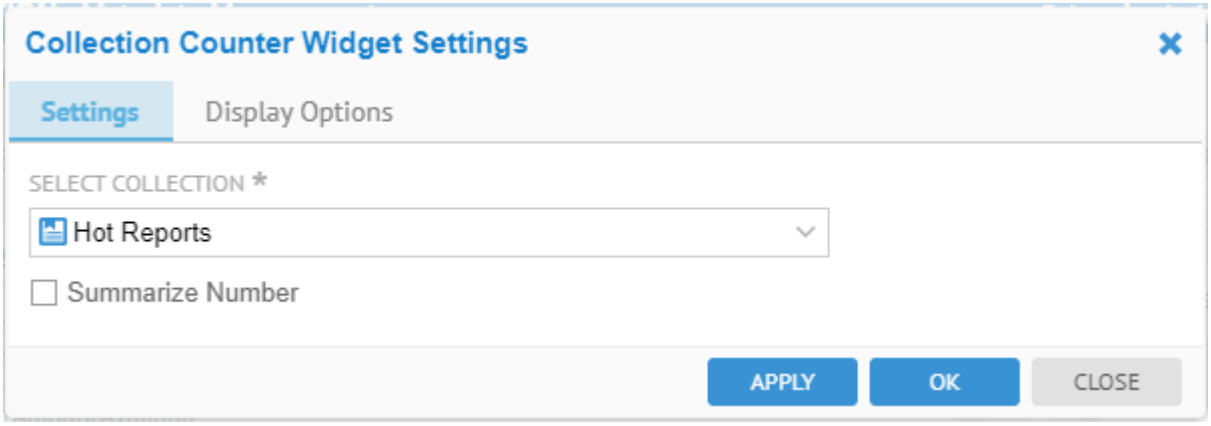
The top three Hot Reports are embedded in the dashboard.

Collection Counter Widget

With this widget you may embed a count of the elements in a collection into the dashboard.

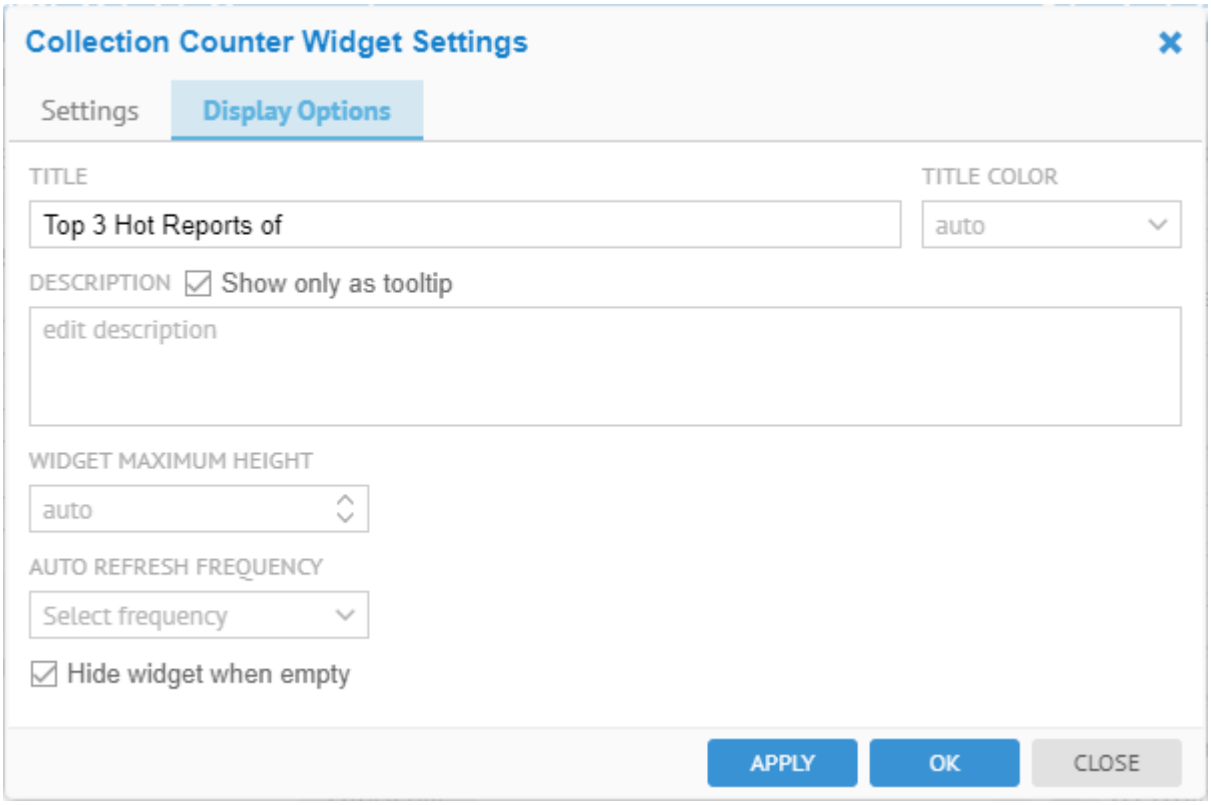
Drag the **Collection Counter** widget into the bottom portion of the container that the Hot Reports Collection widget is in dashboard and click **CONFIGURE**.

Select the **Hot Reports** collection.



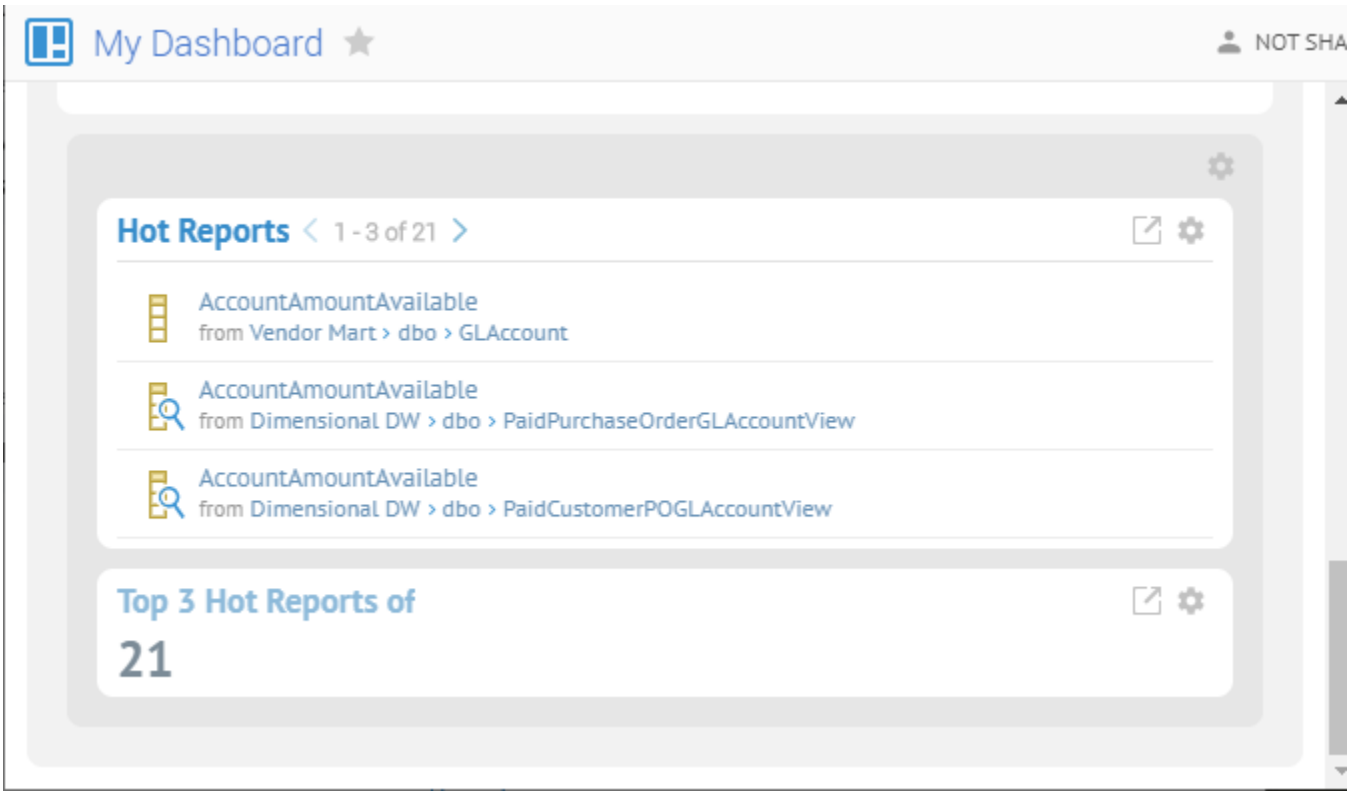
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Go to the **Display Options** tab and enter “Top 3 Hot Reports of “ in the **Title**.



Click OK.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



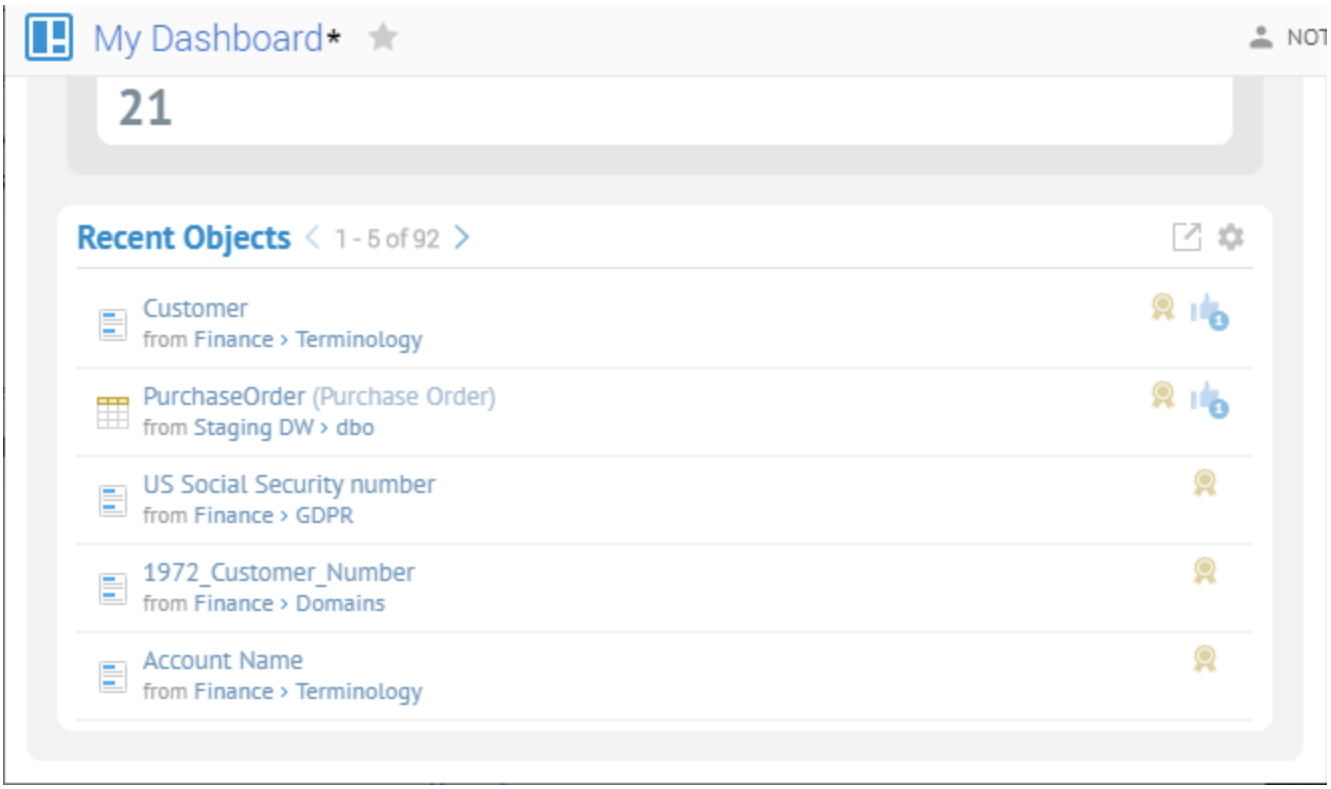
The number of Hot Reports is now embedded in the dashboard.

Recent Objects Widget

With this widget you may embed a reproduction of the OBJECTS > Recent menu list into the dashboard.

Drag the **Recent Objects** widget into the bottom portion of dashboard.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



A list of recently visited objects is now embedded in the dashboard.

HTML Text Widget

With this widget you may embed HTML formatted text into the dashboard.

*By default, the Tomcat server is configured to reject any image not hosted on the application server. As a result, the **link**, **html** and **image** widgets do not allow referencing external images.*

A simple change to the default tomcat configuration (in the \tomcat\conf\web.xml) can fix that. Change:

```
<filter><filter> <filter-name>SecurityHeadersFilter</filter-name> <filter-
class>MITI.tomcat.filter.SecurityHeaders</filter-class> <init-param> <param-
name>Content-Security-Policy</param-name> <param-value>default-src 'self';
child-src 'self' *; img-src 'self' data:; script-src 'self' 'unsafe-eval'
'unsafe-inline'; style-src 'self' 'unsafe-inline';</param-value> </init-param>
<init-param> <param-name>X-Content-Type-Options</param-name> <param-
value>nosniff</param-value> </init-param> <init-param> <param-name>X-XSS-
Protection</param-name> <param-value>1; mode=block</param-value> </init-param>
</filter>
```

To:

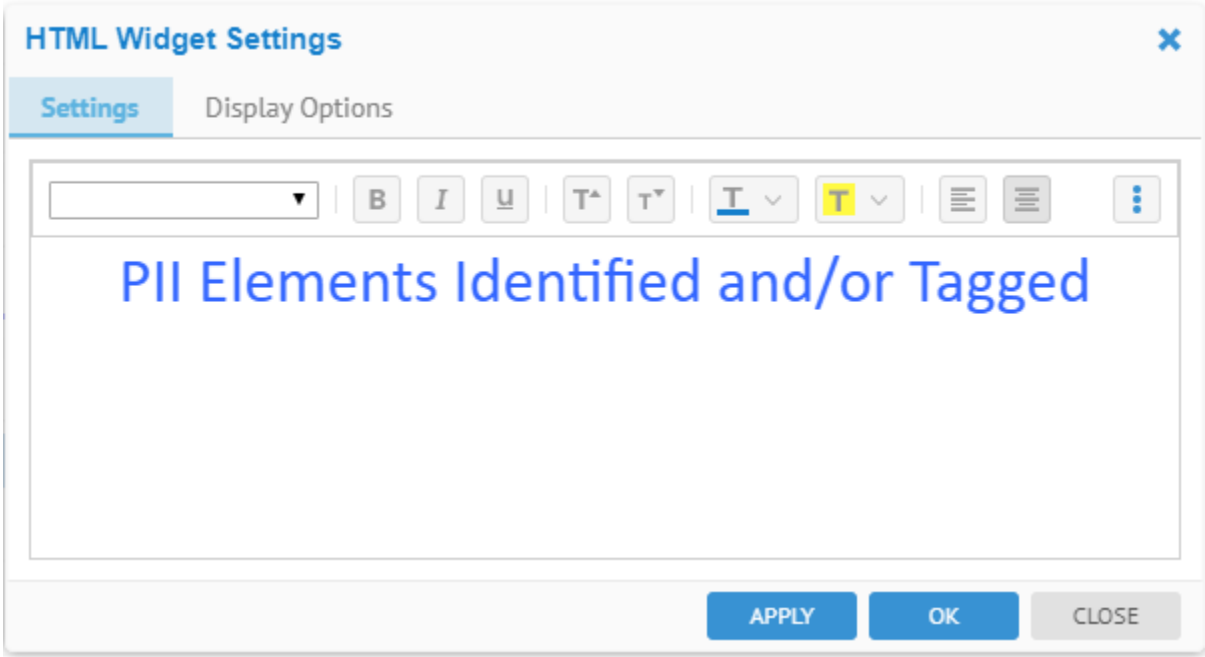
```
< filter><filter> <filter-name>SecurityHeadersFilter</filter-name> <filter-
class>MITI.tomcat.filter.SecurityHeaders</filter-class> <init-param> <param-
name>Content-Security-Policy</param-name> <param-value>default-src 'self';
```

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

```
child-src 'self' *; img-src {color:#FF0000}*'self' data: *; script-src
'self'*{color} 'unsafe-eval' 'unsafe-inline'; style-src 'self' 'unsafe-
inline';</param-value> </init-param> <init-param> <param-name>X-Content-Type-
Options</param-name> <param-value>nosniff</param-value> </init-param> <init-
param> <param-name>X-XSS-Protection</param-name> <param-value>1;
mode=block</param-value> </init-param> </filter>
```

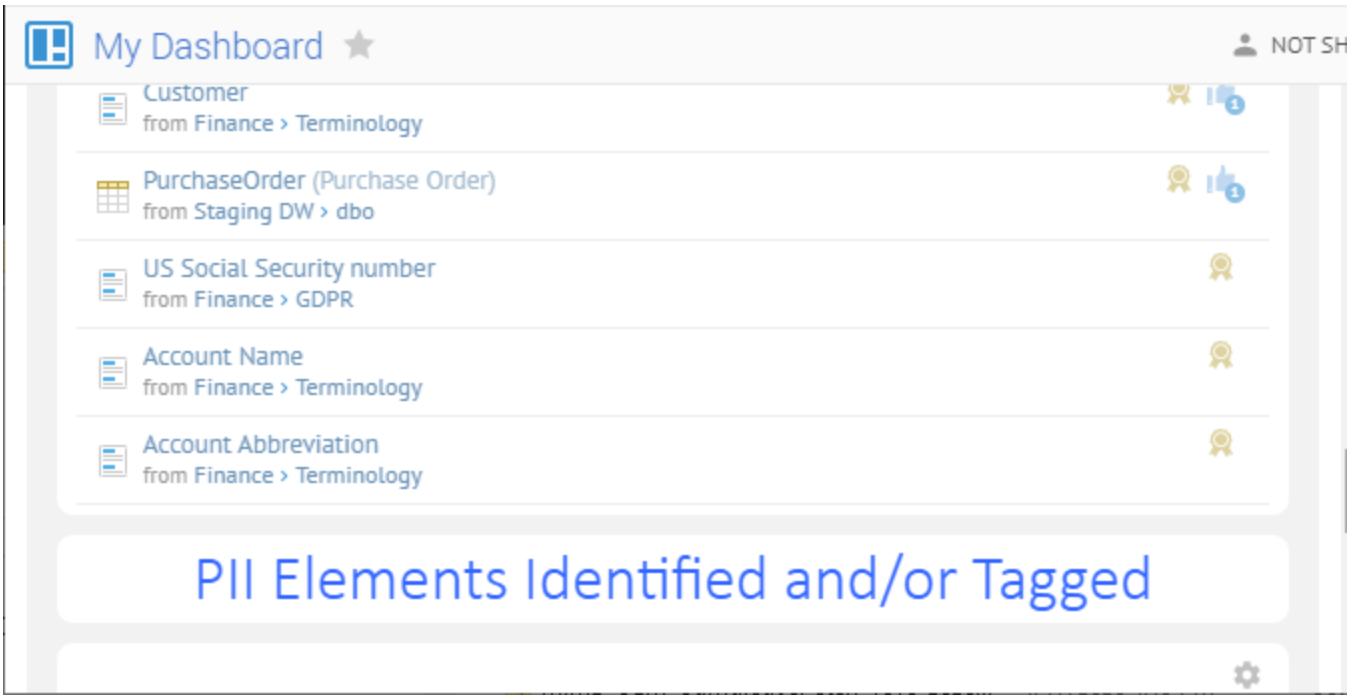
Create a **Container** at the bottom of the dashboard. Drag the **HTML Text** widget into the contaner and click **CONFIGURE**.

Enter the text "PII Elements Identified and/or Tagged" and format as below:



Click OK.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



The HTML text is now embedded in your dashboard.

Embedded Webpage Widget

With this widget you may embed any page referenced by a URL into the dashboard.

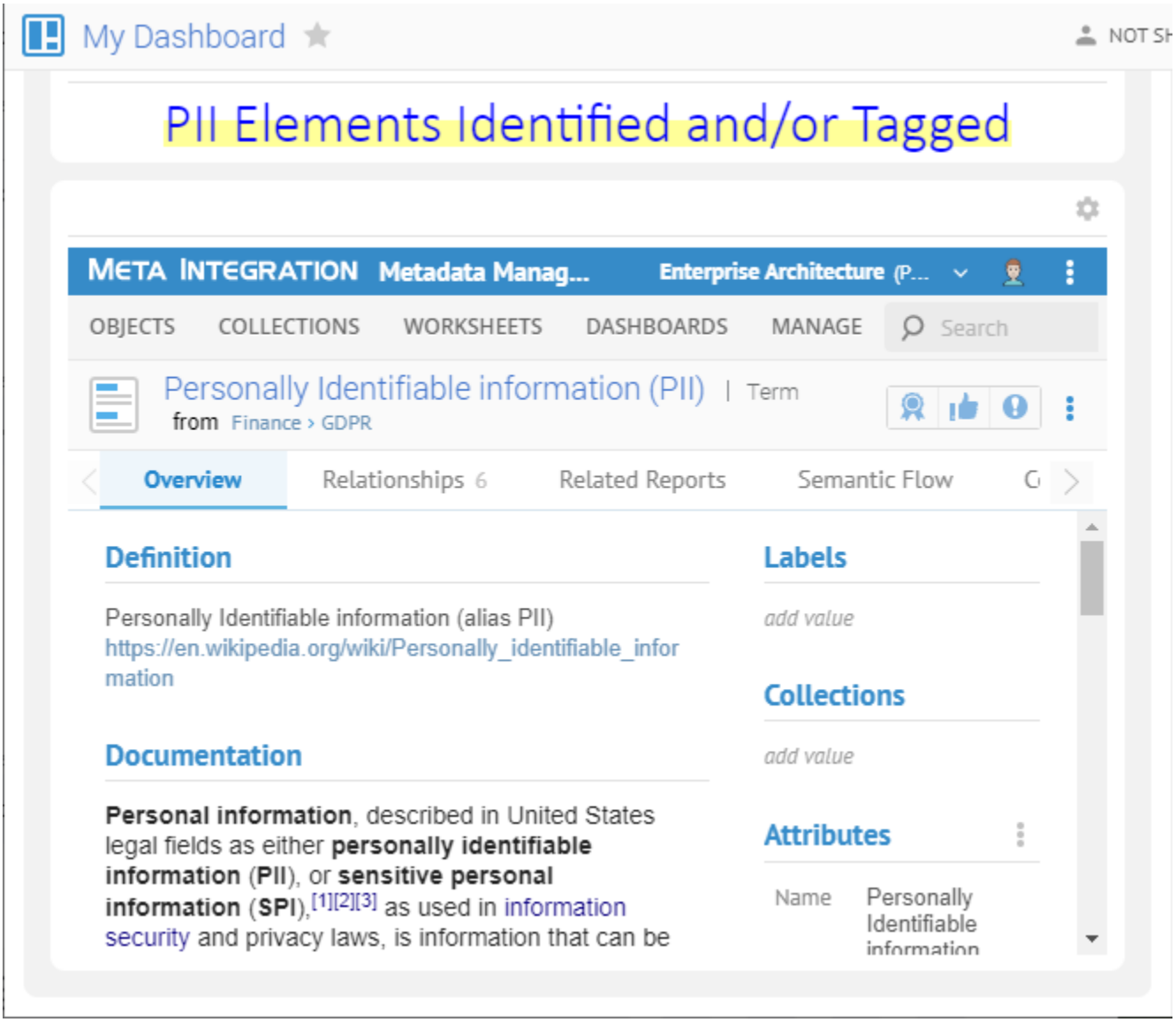
*You may even use variables pertinent to your current session to customize the URL using the **URL Builder**.*

Drag the **Embedded Webpage** widget into the bottom of the container with the HTML Text and click **CONFIGURE**. Then click URL BUILDER

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Click OK.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



An HTML page from the product itself is embedded in the dashboard.

Image Widget

With this widget you may embed an image into the dashboard.

The image must be referenced as a URL. The product does not store these images for you.

*By default, the Tomcat server is configured to reject any image not hosted on the application server. As a result, the **link**, **html** and **image** widgets do not allow referencing external images.*

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

A simple change to the default tomcat configuration (in the \tomcat\conf\web.xml) can fix that. Change:

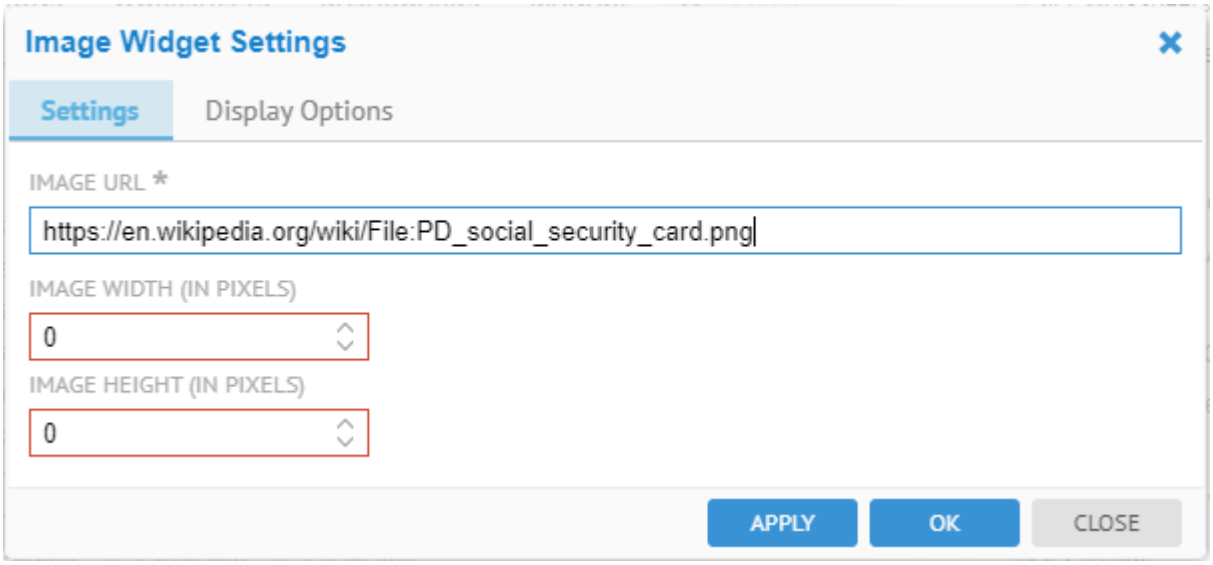
```
<filter><filter> <filter-name>SecurityHeadersFilter</filter-name> <filter-class>MITI.tomcat.filter.SecurityHeaders</filter-class> <init-param> <param-name>Content-Security-Policy</param-name> <param-value>default-src 'self'; child-src 'self' *; img-src 'self' data:; script-src 'self' 'unsafe-eval' 'unsafe-inline'; style-src 'self' 'unsafe-inline';</param-value> </init-param> <init-param> <param-name>X-Content-Type-Options</param-name> <param-value>nosniff</param-value> </init-param> <init-param> <param-name>X-XSS-Protection</param-name> <param-value>1; mode=block</param-value> </init-param> </filter>
```

To:

```
< filter><filter> <filter-name>SecurityHeadersFilter</filter-name> <filter-class>MITI.tomcat.filter.SecurityHeaders</filter-class> <init-param> <param-name>Content-Security-Policy</param-name> <param-value>default-src 'self'; child-src 'self' *; img-src {color:#FF0000}*'self' data: *; script-src 'self'*{color} 'unsafe-eval' 'unsafe-inline'; style-src 'self' 'unsafe-inline';</param-value> </init-param> <init-param> <param-name>X-Content-Type-Options</param-name> <param-value>nosniff</param-value> </init-param> <init-param> <param-name>X-XSS-Protection</param-name> <param-value>1; mode=block</param-value> </init-param> </filter>
```

Drag the Image widget into the bottom of the container with the HTML Text and click **CONFIGURE**.

Paste a **IMAGE URL**.



Click **OK**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Link Widget

With this widget you may embed a link into the dashboard.

Drag the **Link** widget into the bottom of the container with the HTML Text and click **CONFIGURE**. Then click URL BUILDER

You can build a link that works just like the embedded URL, but not embedded.

*By default, the Tomcat server is configured to reject any image not hosted on the application server. As a result, the **link**, **html** and **image** widgets do not allow referencing external images.*

A simple change to the default tomcat configuration (in the \tomcat\conf\web.xml) can fix that. Change:

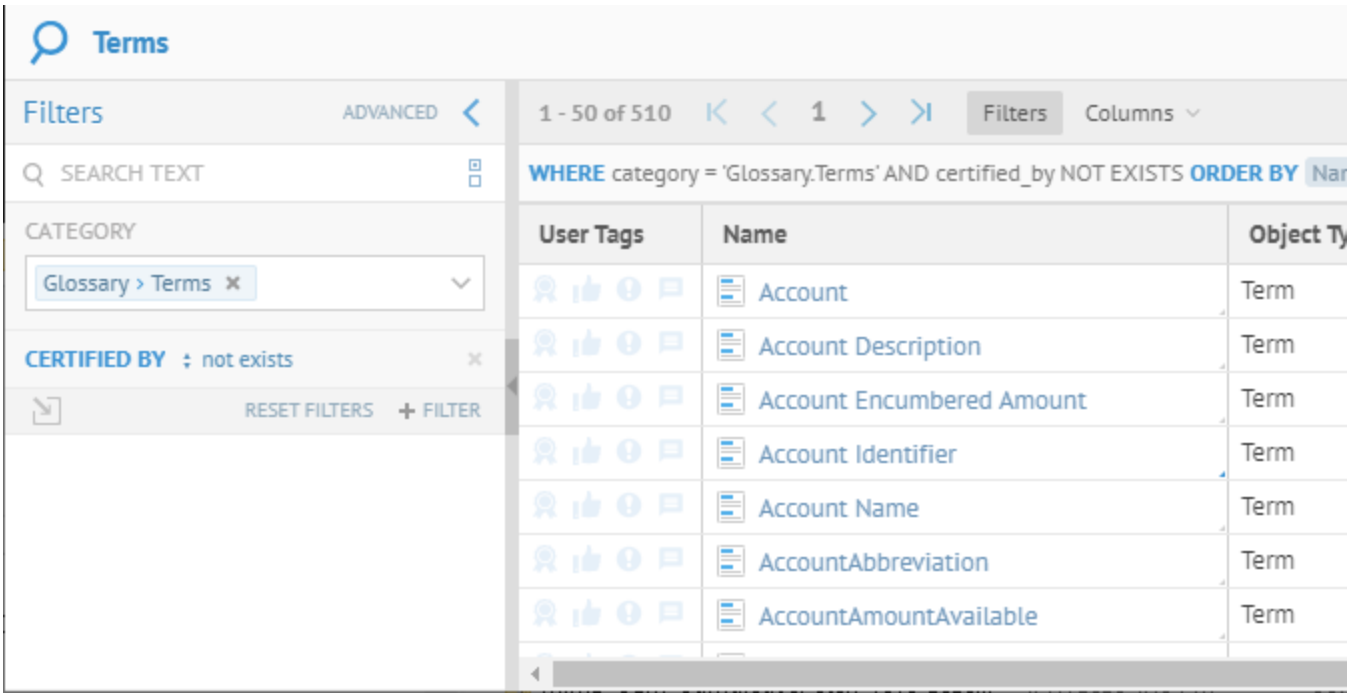
```
<filter><filter> <filter-name>SecurityHeadersFilter</filter-name> <filter-
class>MITI.tomcat.filter.SecurityHeaders</filter-class> <init-param> <param-
name>Content-Security-Policy</param-name> <param-value>default-src 'self';
child-src 'self' *; img-src 'self' data:; script-src 'self' 'unsafe-eval'
'unsafe-inline'; style-src 'self' 'unsafe-inline';</param-value> </init-param>
<init-param> <param-name>X-Content-Type-Options</param-name> <param-
value>nosniff</param-value> </init-param> <init-param> <param-name>X-XSS-
Protection</param-name> <param-value>1; mode=block</param-value> </init-param>
</filter>
```

To:

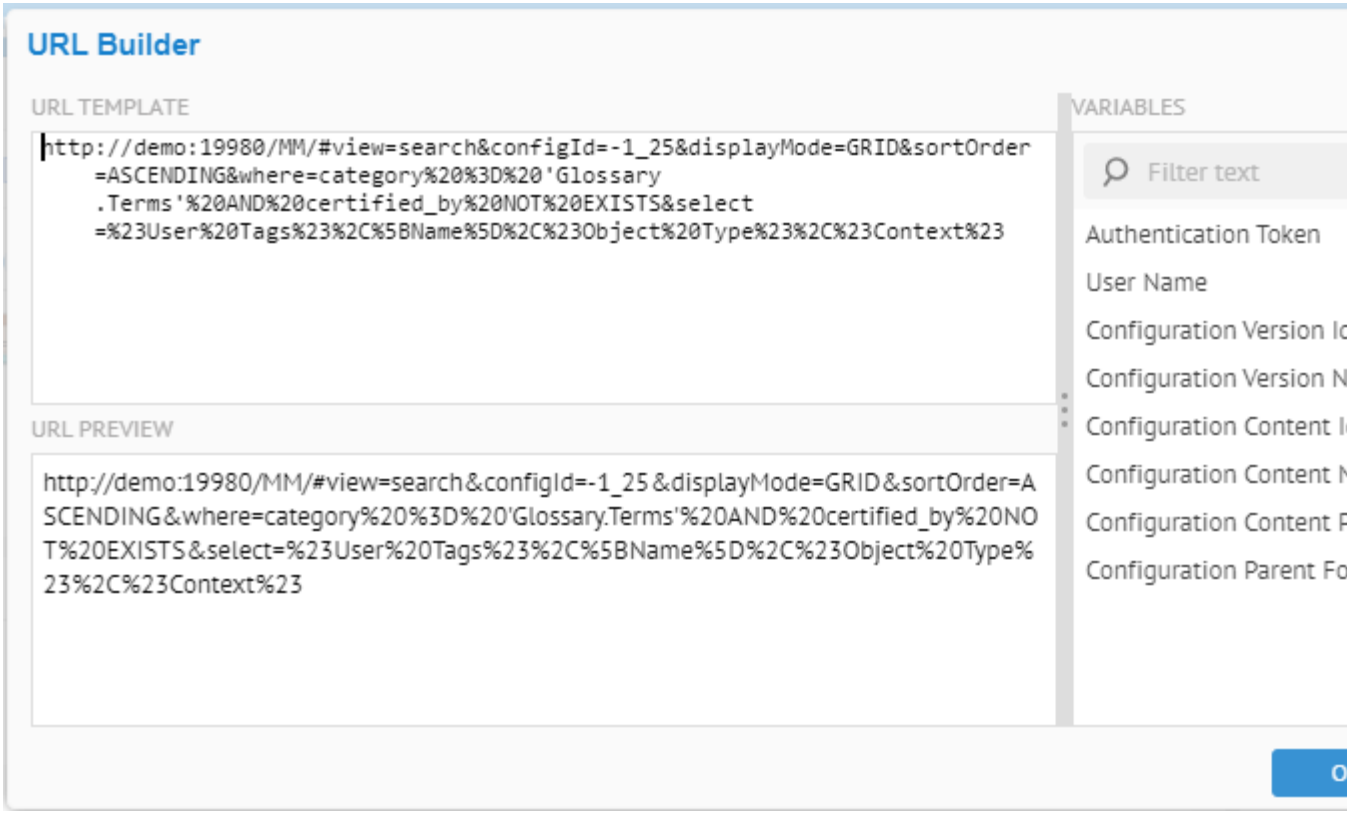
```
< filter><filter> <filter-name>SecurityHeadersFilter</filter-name> <filter-
class>MITI.tomcat.filter.SecurityHeaders</filter-class> <init-param> <param-
name>Content-Security-Policy</param-name> <param-value>default-src 'self';
child-src 'self' *; img-src {color:#FF0000}*'self' data: *; script-src
'self'*{color} 'unsafe-eval' 'unsafe-inline'; style-src 'self' 'unsafe-
inline';</param-value> </init-param> <init-param> <param-name>X-Content-Type-
Options</param-name> <param-value>nosniff</param-value> </init-param> <init-
param> <param-name>X-XSS-Protection</param-name> <param-value>1;
mode=block</param-value> </init-param> </filter>
```

So, let's get the structure of a URL. Open a new browser tab and go to WORKSHEETS > Glossary > Terms. Then specify a filter where Certified By does Not Exist.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Now, paste that link back into the **Link Widget Settings** dialog. Click **URL BUILDER**.



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Now, select the "-1_25" (i.e., the congfigId)in the URL and click on **Configuratoin Version Identier**.

The URL is replaced with variable. In this way, you may use this link in ANY configuraton, and it will always present the terms without certification.

Go to the Display Options tab and specify "Link to Terms to be Certificed" as the Title. Click **Save**.

Click **Save** for the dashboard.

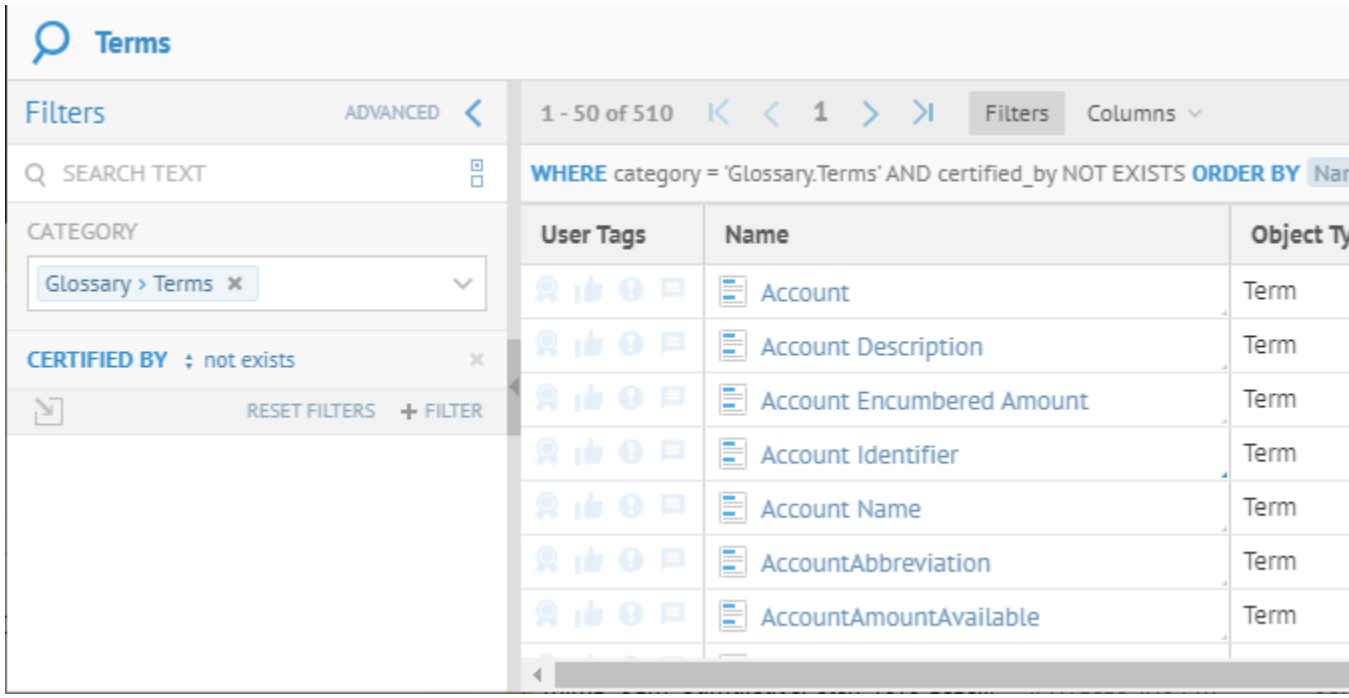
Links Widget

With this widget you may embed a link into the dashboard.

Drag the **Links** widget into the bottom of the container with the HTML Text and click **CONFIGURE**. Then click URL BUILDER

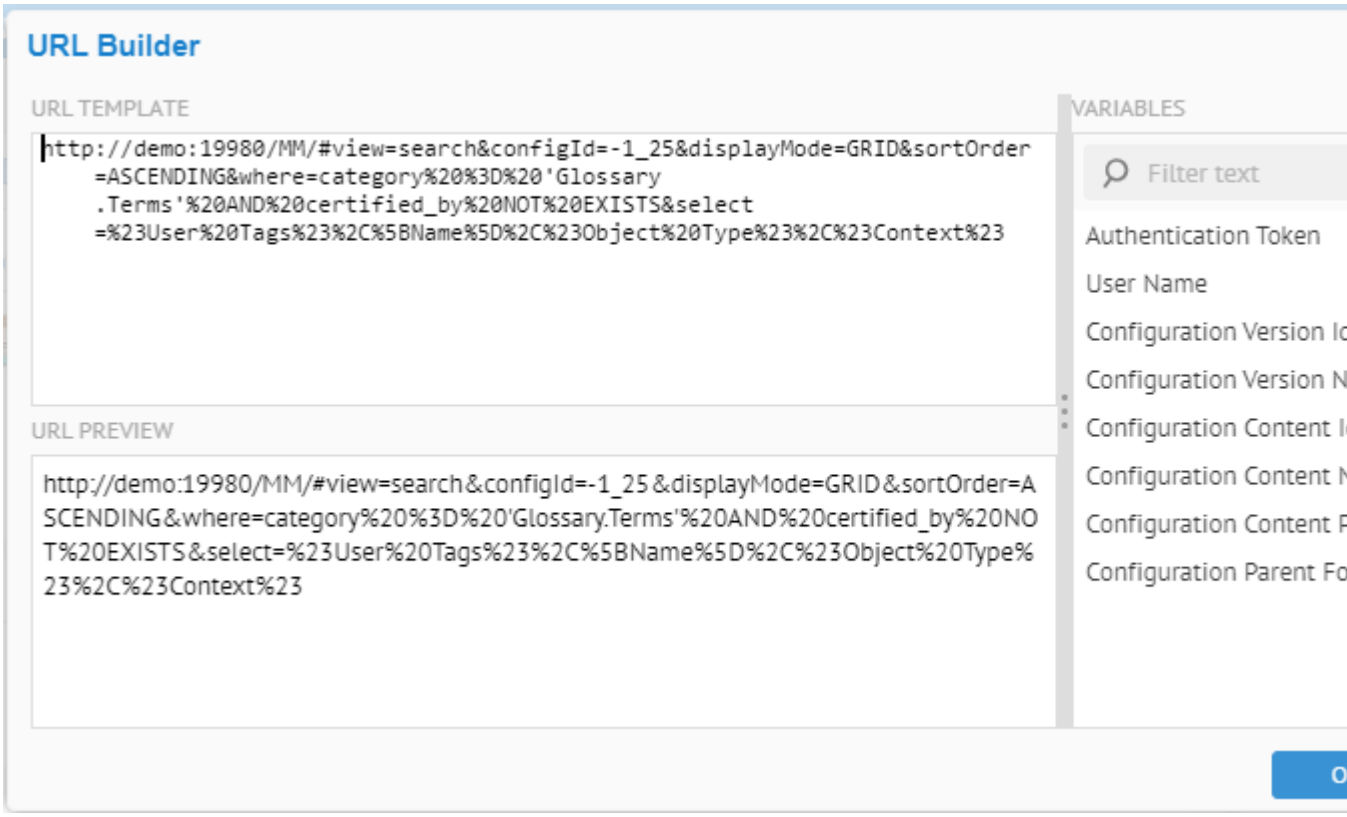
You can build a link that works just like the embedded URL, but not embedded.

So, let's get the structure of a URL. Open a new browser tab and go to WORKSHEETS > Glossary > Terms. Then specify a filter where Certified By does Not Exist.



Now, paste that link back into the **Link Widget Settings** dialog. Click **URL BUILDER**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Now, select the "-1_25" (i.e., the congfigId)in the URL and click on **Configuratoin Version Identier**.

The URL is replaced with variable. In this way, you may use this link in ANY configuraton, and it will always present the terms without certification.

Go to the Display Options tab and specify "Link to Terms to be Certificed" as the Title. Click **Save**.

Click **Save** for the dashboard.

Rename a Dashboard

When on the dashboards details page one may simply edit the name in place to rename a Dashboard.

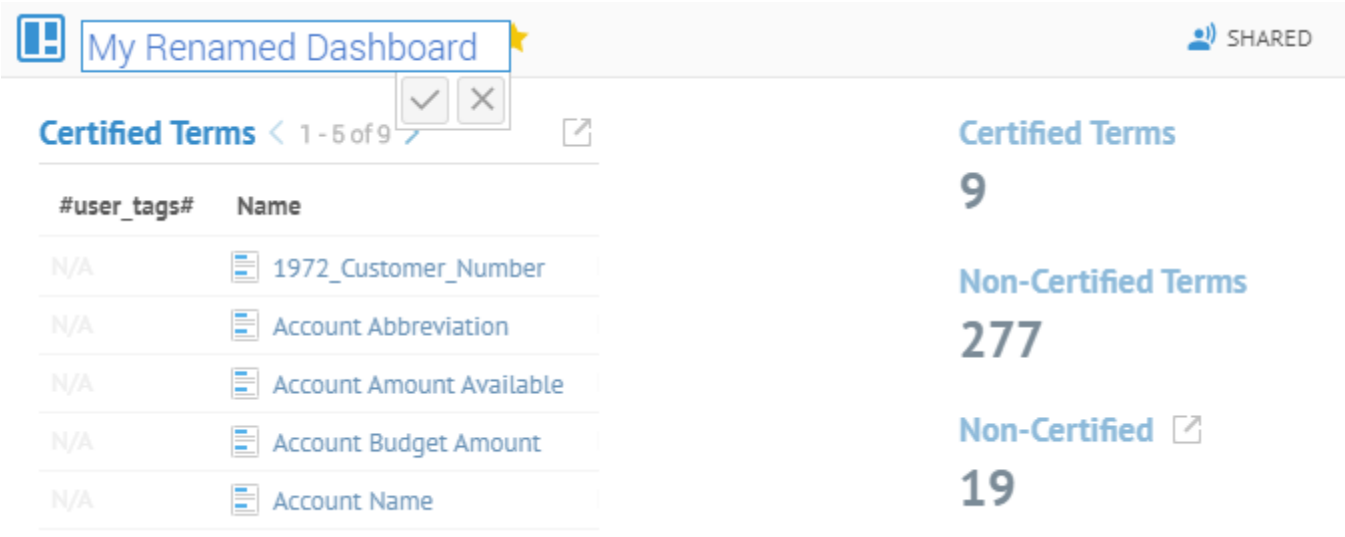
Steps

1. Navigate to **My Dashboard** and click on its name.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Example

Navigate to **My Dashboard** and click the name and type “My Renamed Dashboard”.



Copy a Dashboard Container

You may copy any container or widget and then paste into another that you have already included in a dashboard.

Steps

1. Navigate to **My Dashboard**
2. Click **More Actions** and then **Customize**
3. Click the **Settings** icon and select **Copy** for the container or widget you wish to copy from.
4. Include a new container or widget in the dashboard.
5. Click the **Settings** icon and select **Paste** for the new container or widget

Manage Dashboards

You may also select **DASHBOARDS > Manage** to manage your existing dashboards.

Steps

1. Go to **DASHBOARDS > Manage.**
    - You see the list of **Favorites**. It is the default tab.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

All the dashboards you have favorited are here.

- From here you may:
  - Open/Edit the dashboard
  - Restrict the list by using the **Search Text**
  - **Favorite** or un-**Favorite** a dashboard

2. Click the **My** tab.

All the dashboards you have created are here.

- From here you may:
  - Open/Edit the dashboard
  - Restrict the list by using the **Search Text**
  - **Create a new saved dashboard**
  - **Delete and existing saved dashboard**
  - **Favorite** or un-**Favorite** a dashboard
  - Share this dashboard with groups and/or users
  - Edit the **Name** or **Description** of a dashboard

3. Click the **Recent** Tab**.**

All the dashboards you have recently opened are here.

- From here you may:
  - Open/Edit the dashboard
  - Restrict the list by using the **Search Text**
  - **Favorite** or un-**Favorite** a dashboard

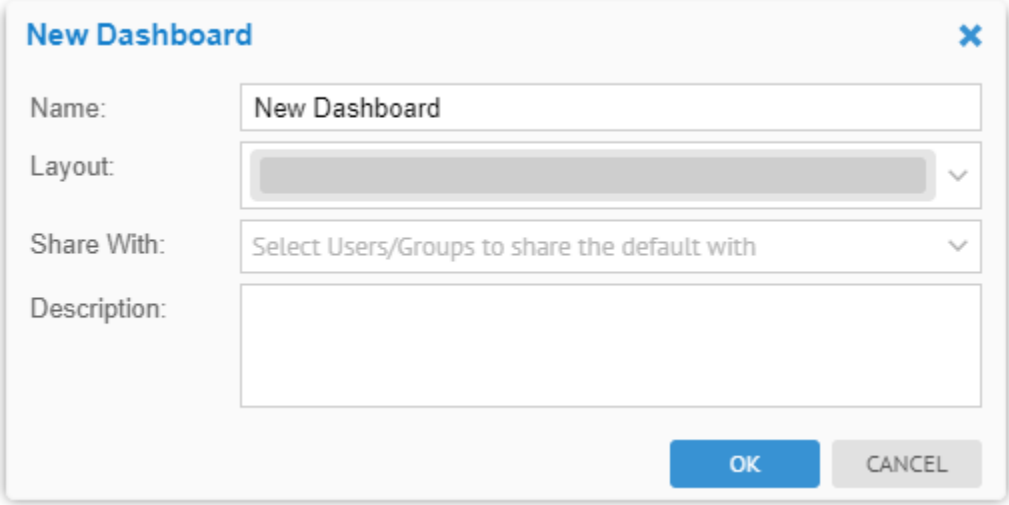
Example

Go to **DASHBOARDS > Manage**.

Click the **My** tab.

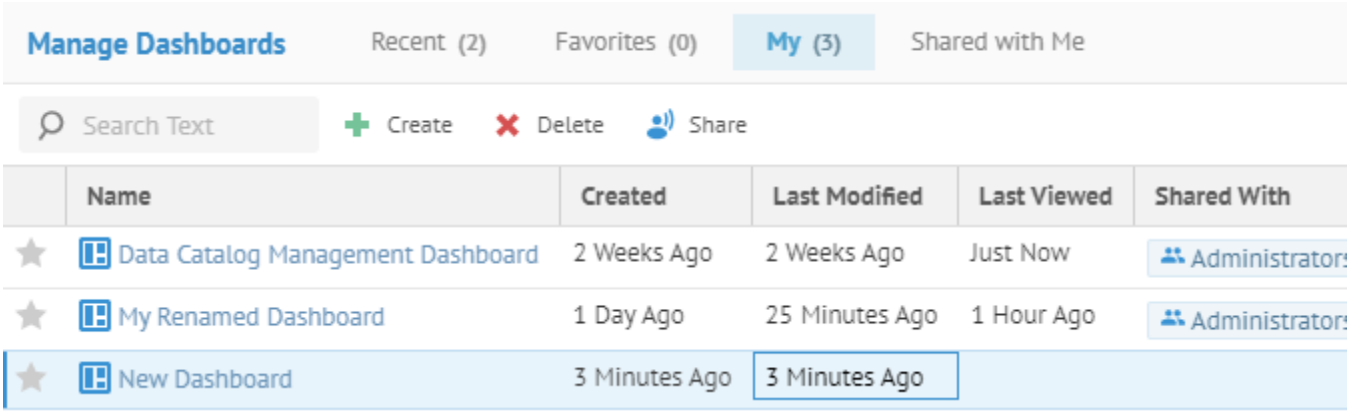
Click **Create.** Enter the name “New Dashboard” and press Enter.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



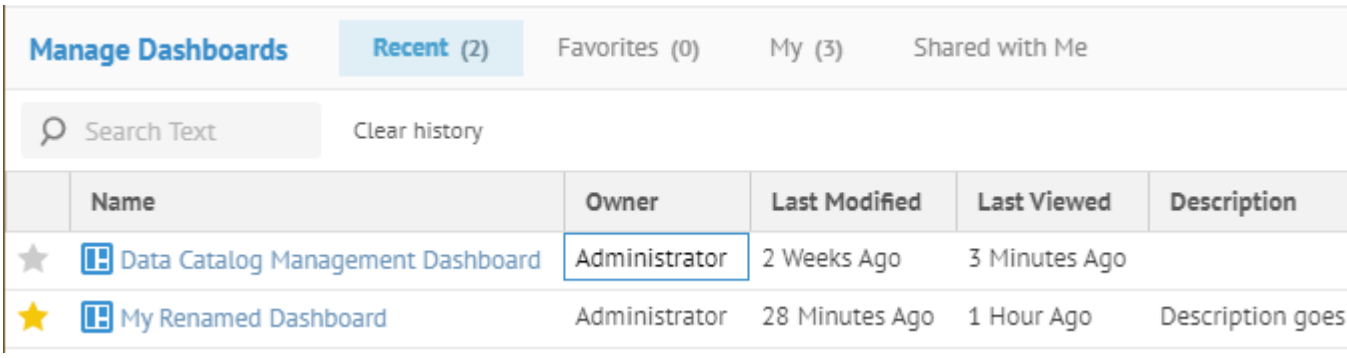
You will then have a dashboard actually saved but with no filters defined yet.

Click the **My** tab.



4. Click the **Recent** Tab**.**

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Delete a Dashboard

You may delete any dashboard that you created.

> *You may not "delete" dashboards created by others. However, you may simply unfavorite what is shared with you to remove them from your usual lists.*

Steps

1. Go to **DASHBOARDS > Manage.**

> *You may click the **My** tab in order to only see dashboards you may delete.*

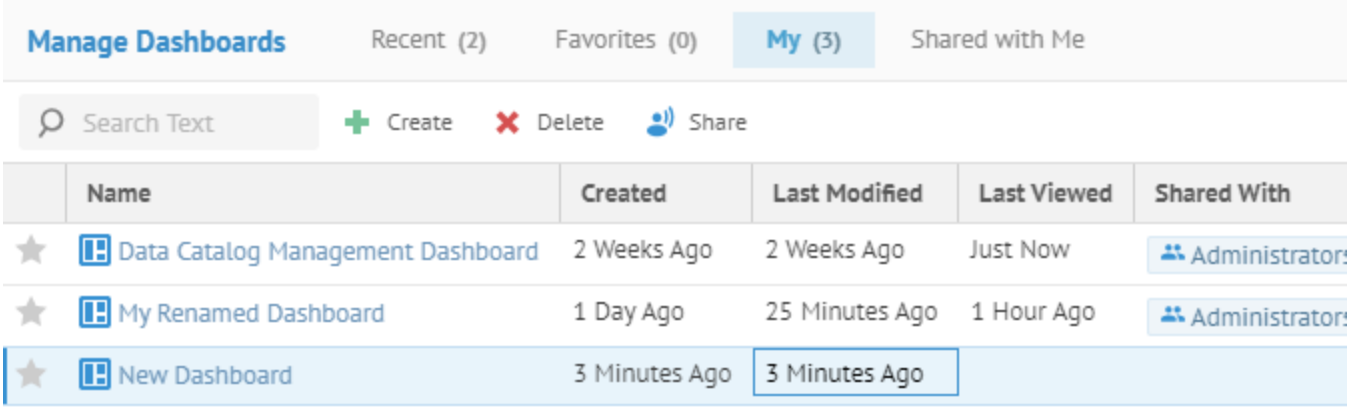
2. Select the line of the dashboard to delete.
3. Click **Delete**.
4. Click **Yes**.

Example

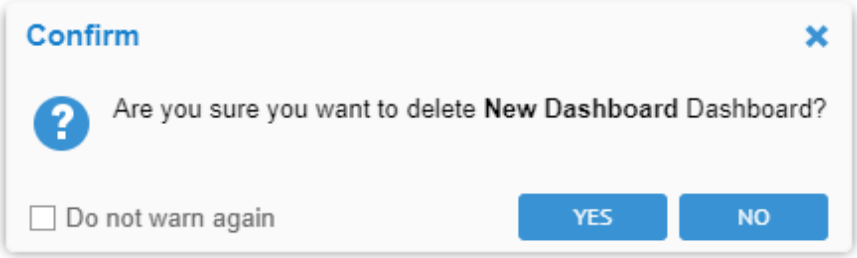
Go to **Dashboards > Manage**.

Click the **My** tab.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Select **New Dashboard** and click (✖) **Delete.**



Click **Yes.**

Explorer Further

Favorite a dashboard

You may favorite any dashboard that you created or is shared with you.

You may not "delete" dashboards created by others. However, you may simply unfavorite what is shared with you to remove them from your usual lists.

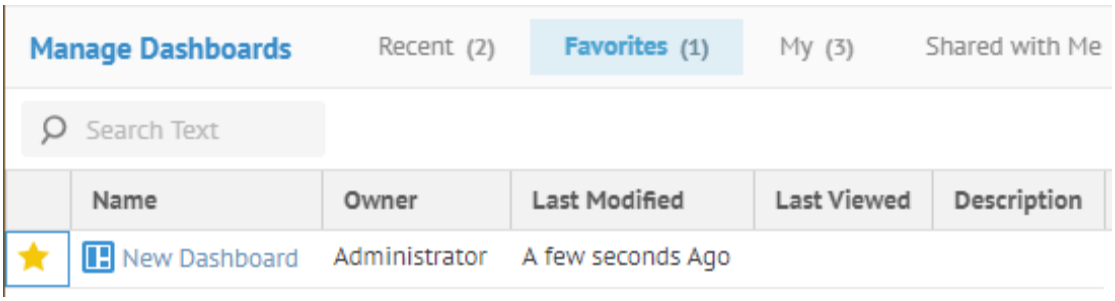
Steps

1. Go to **DASHBOARDS > Manage.**
2. Click the **Favorite** icon.
3. To un-favorite, click the **Favorite** icon.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Example

Go to **DASHBOARDS > Manage.** Click the **Favorite** icon next to **New Dashboard**. Then go to the **Favorites** tab.



Un-favorite New Dashboard by clicking the **Favorite** icon again.

*Now it is removed from the **Favorites** tab.*

Share a Dashboard

Dashboards have an owner who is the creator of the dashboard. The owner (creator) of a dashboard may share that dashboard with users and/or groups. That owner may open, edit and remove a dashboard. The dashboards that one owns may always be found in the **My** tab under **DASHBOARDS > Manage**.

In addition, a dashboard may be made public, or shared, with specific users and/or groups. Once shared, users that are in the sharing criteria specified may view and favorite those dashboards, as well.

Steps

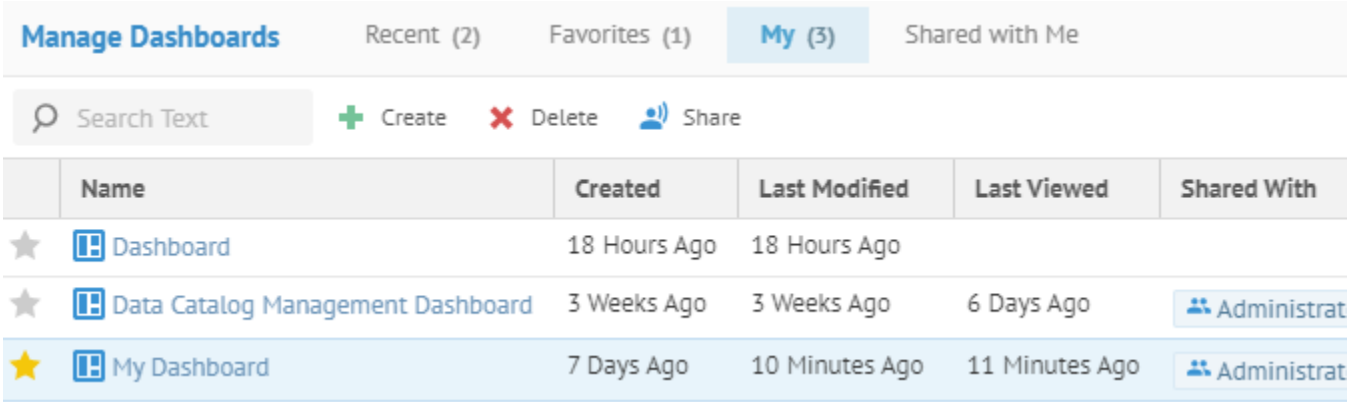
1. Go to **DASHBOARDS > Manage.**
2. Go to the **My** tab.
3. Select a dashboard.
4. Click **Share**.
5. Pick one or more users and/or groups to share the dashboard with.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

6. To un-share a dashboard, simply remove the specific (or all of) users and/or groups.

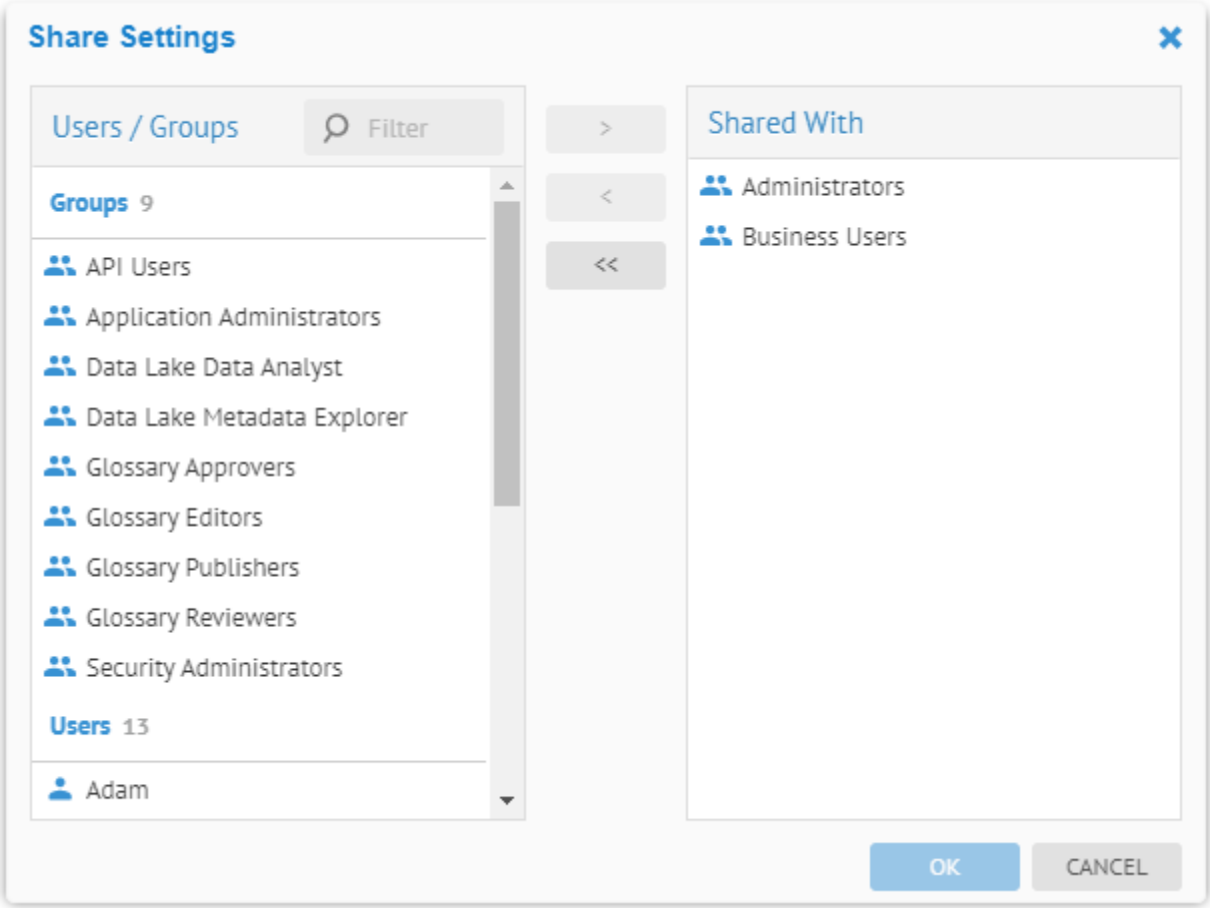
Example

Go to **DASHBOARDS > Manage.**



Go to the **My** tab and select a **My Dashboard** in the list.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click **Share**. Then pick the **Business Users** group along with **Administrators** and click **OK**. You have shared that dashboard with those users.

You may save a shared dashboard before specifying whom to share it with. You may come back later and specify whom it will be shared with.

Using Shared Dashboards

Simply because you have shared a dashboard does not mean that all those other users can see it. They must first look it up in Shared with Me. Once they have done so, they may

- View it
- Favorite it
- Save As their own dashboard that they may edit.

Steps

1. Sign in as a user in the group **Administrators**.

2. Go to **DASHBOARDS > Manage.**

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

3. Go to the **Shared with Me** tab.

This list will be empty at first. You must search for dashboards that are shared with you.

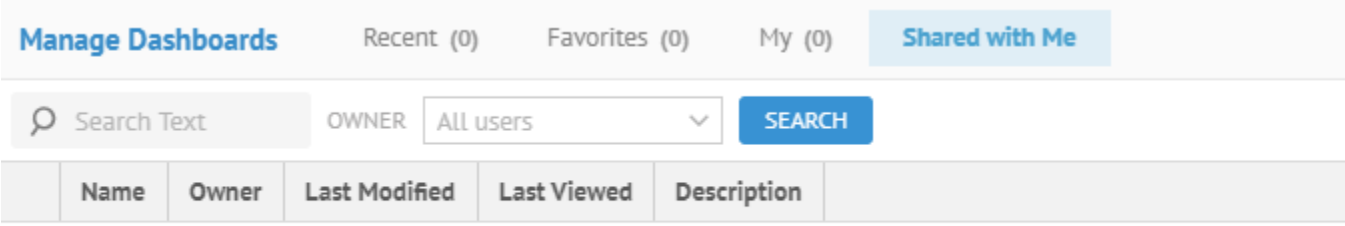
4. Enter text in **Search Text**, pick an **OWNER**, or just click **Search**.

5. From here you may:

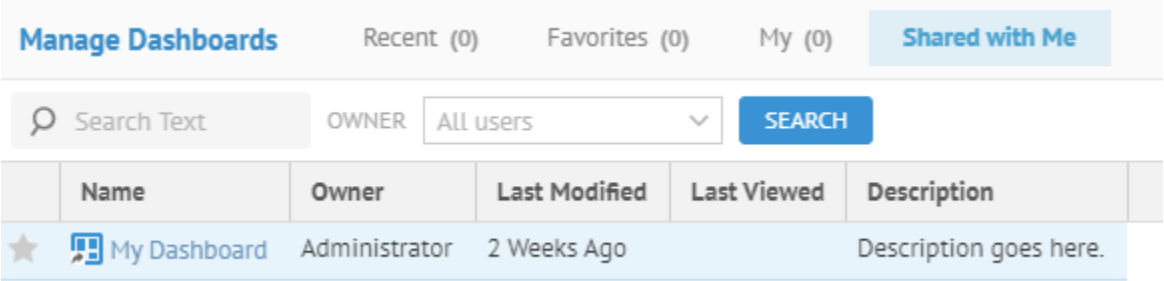
   - Open/Edit the dashboard
   - Restrict the list by using the **Search Text**
   - Restrict the list by using the **OWNER**
   - **Favorite** or un-**Favorite** a dashboard

Example

Sign is as **Bob**. Go to **DASHBOARDS > Manage**, then go to the **Shared with Me** tab.

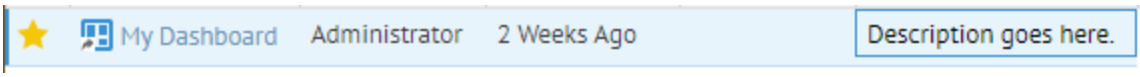


You may enter text, but in this case the list is short so just click **Search**.

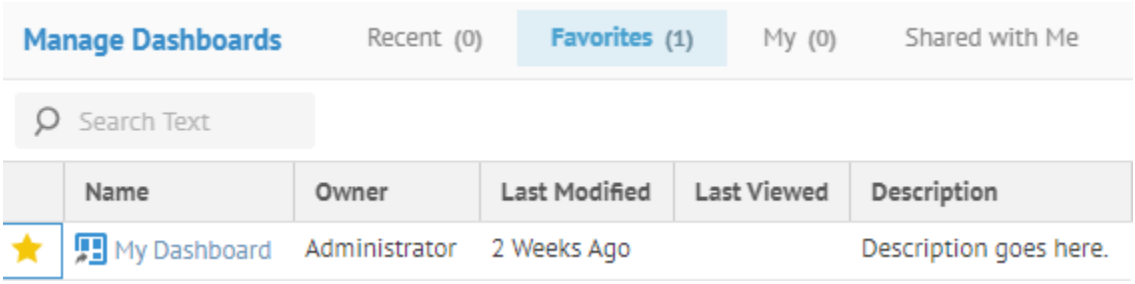


Select the My Dashboard and click the **Favorite** icon.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Go to the **Favorites** tab.



*The **My Dashboard** is now a part of your favorites.*

Default Dashboards

If you wish to customize the home page for MIMM , you may do so by defining default dashboard. If you create a dashboard as a **System** dashboard, then it may be used as the default home page for specific users and groups of users. You then Share one or more system dashboards with the users and groups of users you wish to make their homepage to be that system dashboard. You may manage the system dashboards as with any other dashboard.

You may manage the default dashboards uniquely using the MANAGE > Default Dashboards function.

Create a System Dashboard

Steps

1. Either Save As an existing dashboard or create a new default dashboard.

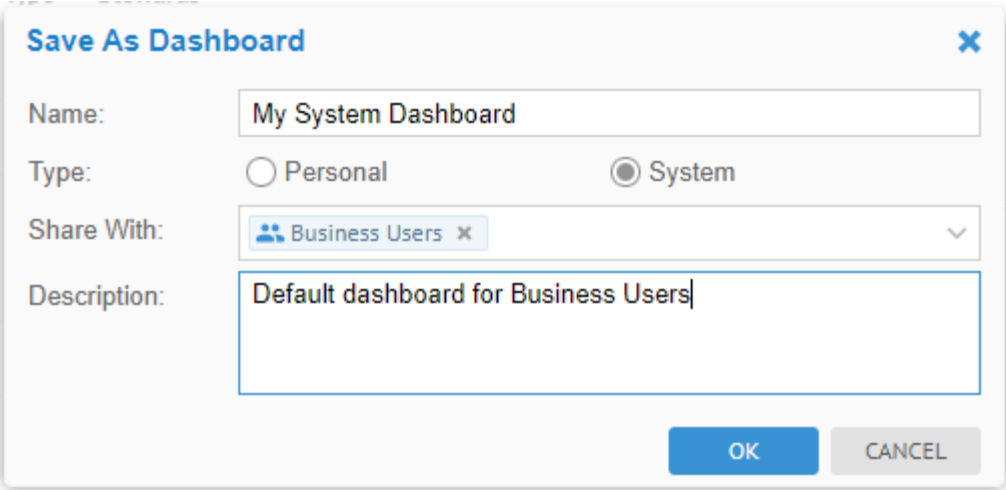
*When you **Save As** the dashboard, you may set the **System** radio button at that time.*

Example

Sign in again as **Administrator**,

Open **My Dashboard** and click **Save As**. Specify the name and other details as follows:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

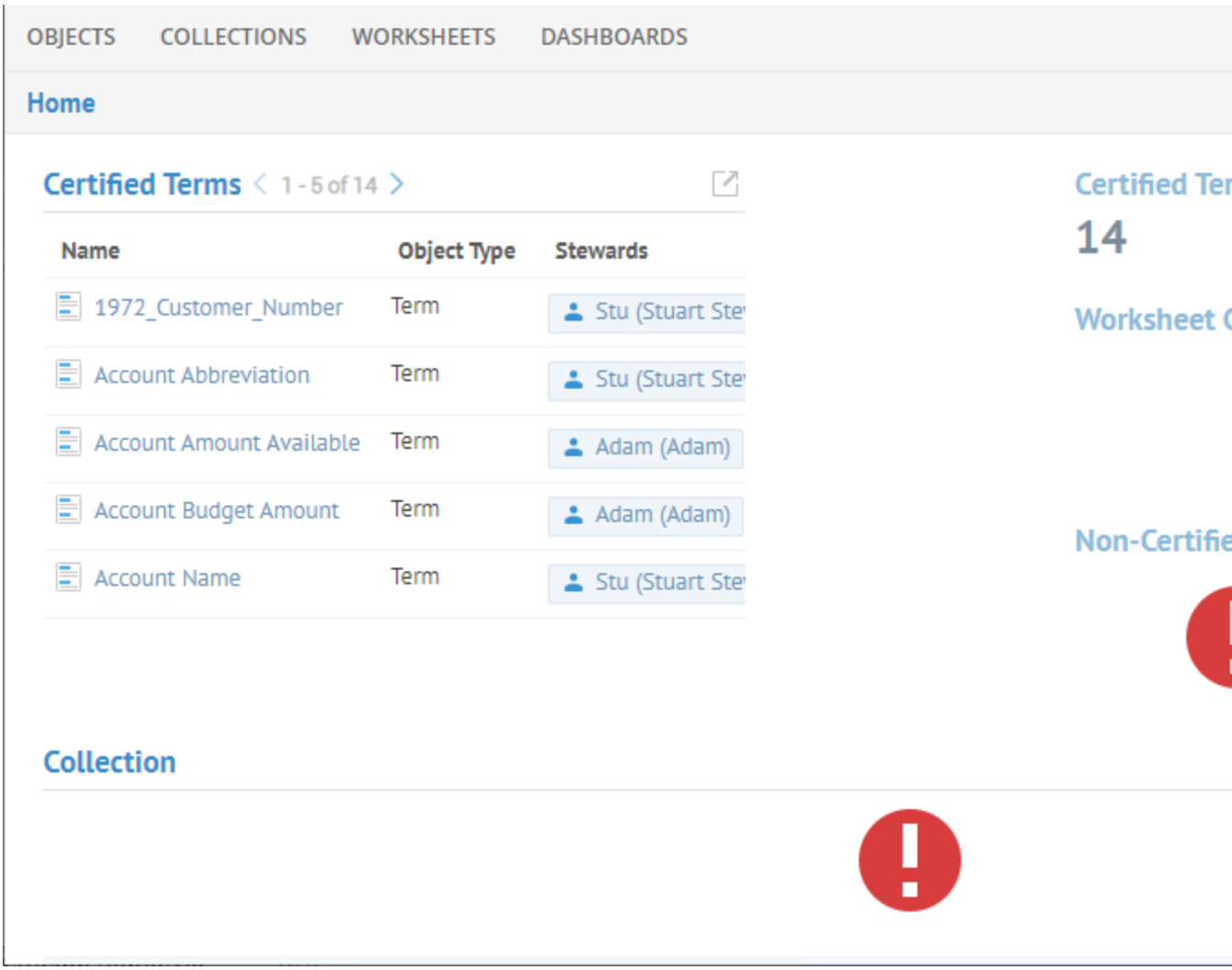


Then click the System radio button and click **OK**.

*The **System** radio button is only shown for users who are members of the group **Administrators**.*

Now, refresh the browser to update the cache, sign in as Bob, who is a member of the **Business Users** group.

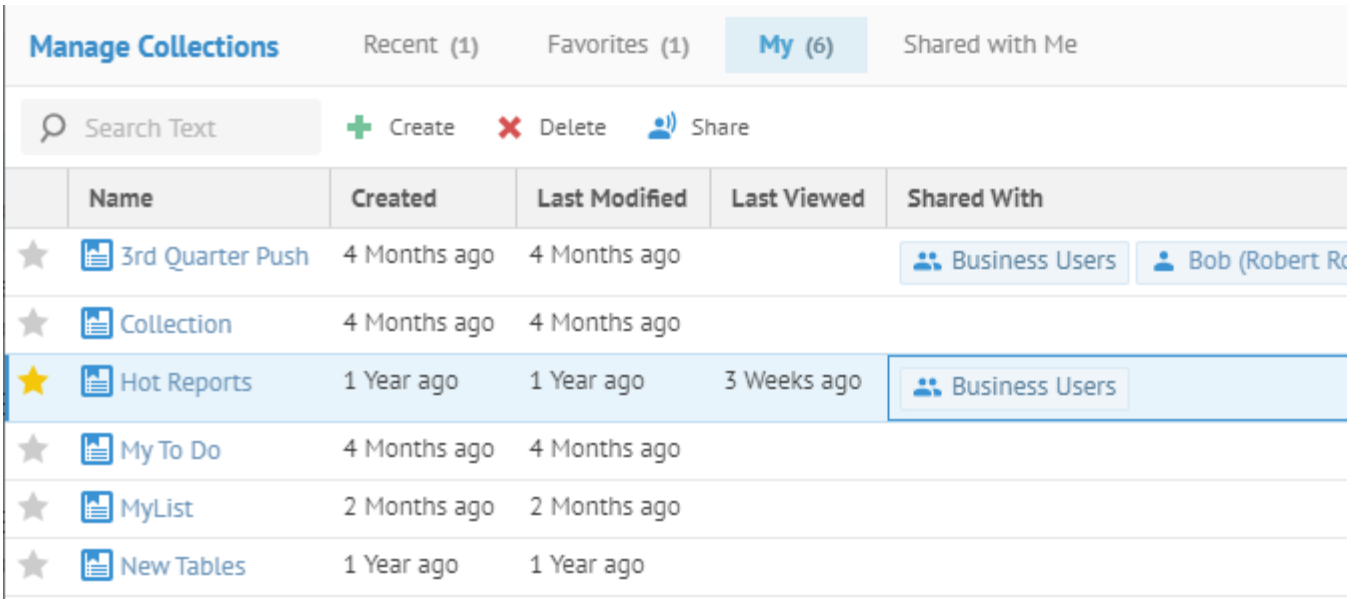
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Because some of the collections and worksheets used in this dashboard are not shared with Bob, or the Business Users group, there are warning symbols.

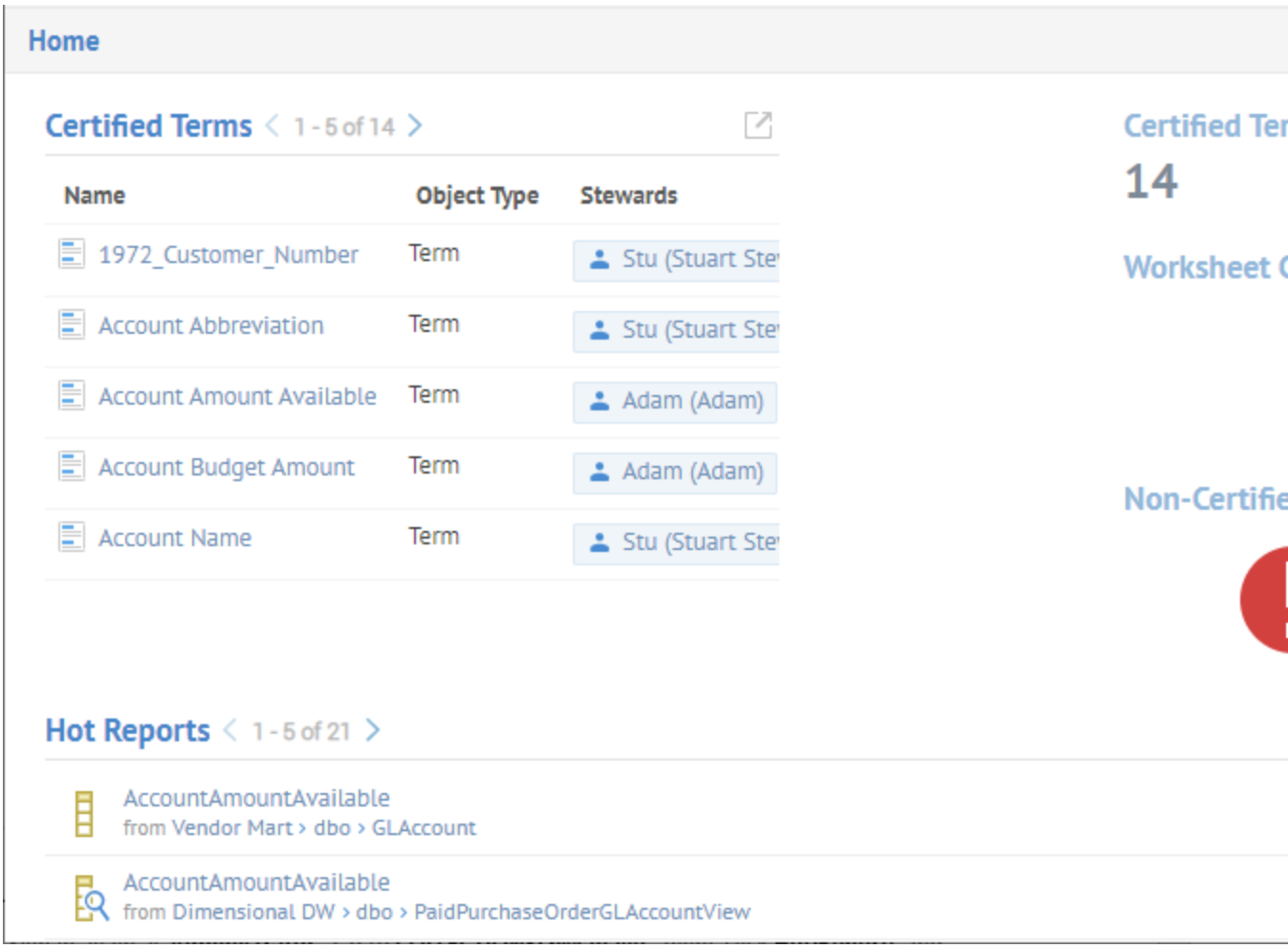
Sign in again as **Administrator**. Go to **COLLECTIONS > Manage**. Right-click **Hot Reports** and **Share** that report with **Business Users**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Now, sign in again as **Bob** and you see that the **Collection** list is working.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Enterprise Architecture (Configuration)

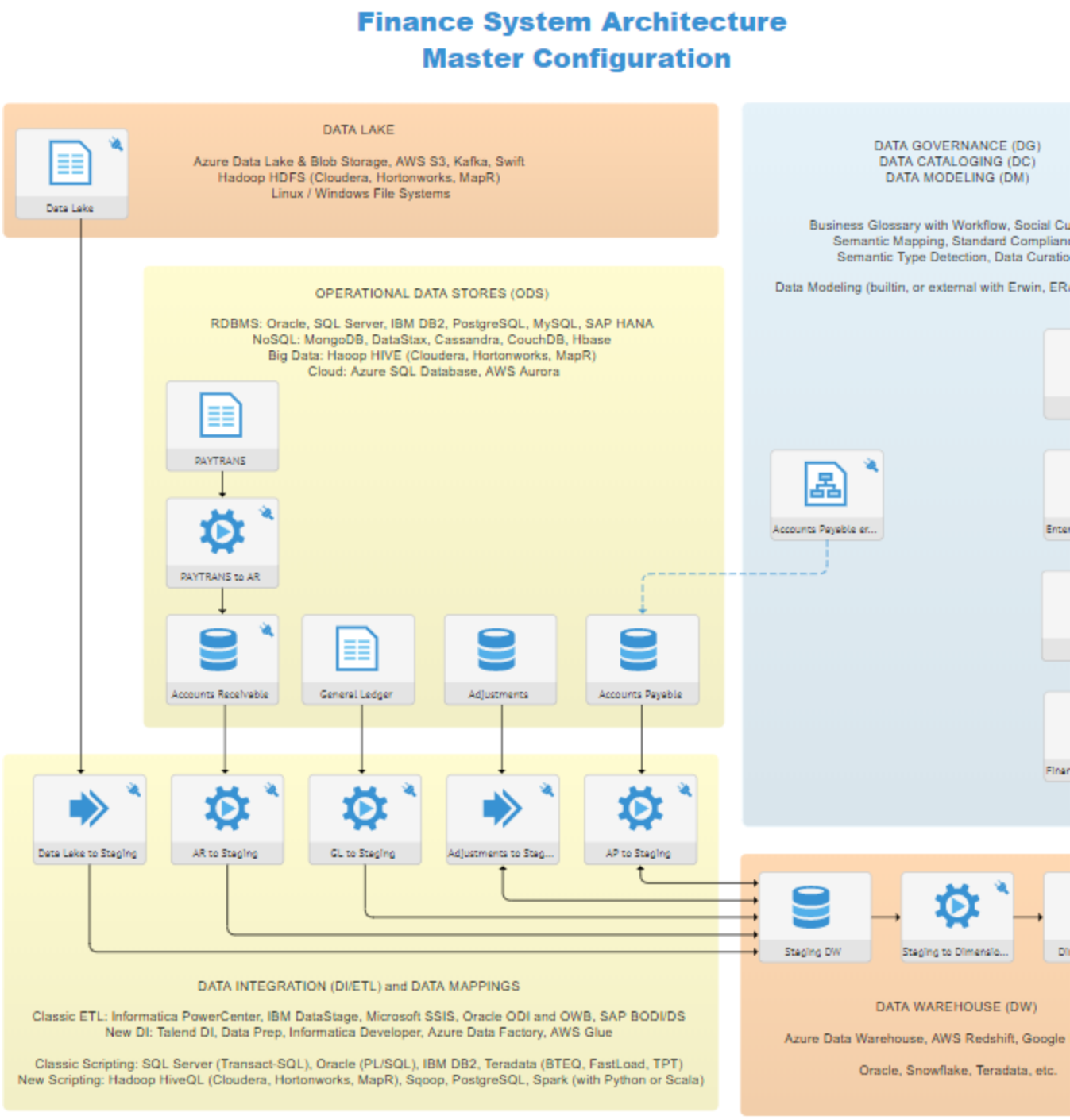
Once stitched, the relationships among Repository Objects in a Configuration can be visualized producing a data flow and semantic based architecture diagram. One may edit the layout and annotate these diagrams using the Configuration manager.

Steps

1. Either
   - Go to **OBJECTS > Architecture Diagram**.
   - Go to **MANAGE > Configuration** and click on the **Diagram** action icon.
2. Either
   - Double-click one of the objects
   - Right-click one of the objects and select **Open**

Example

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

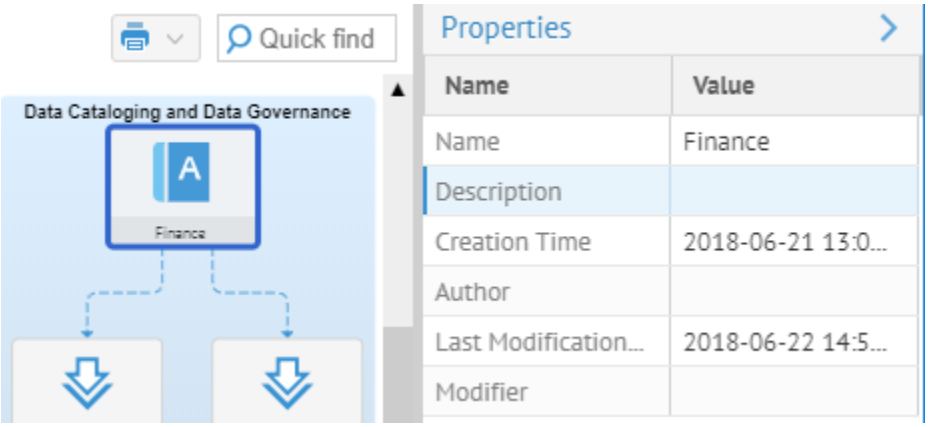


Explore Further

Properties Panel

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

There is a Properties Panel on the right. If you show this panel then you may click on an object and view its properties in the panel.



Overview

For especially large architecture diagram you may click on the (Overview) icon to show a reduced view of the entire architecture. You may click anywhere on the overview to immediately move to that portion of the diagram.

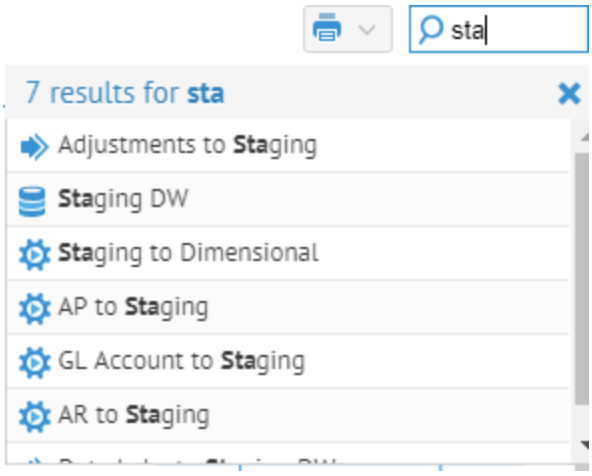
Zoom and Fit to Content

Use the zoom and Fit to Content controls to zoom in and out or fit the entire architecture diagram to the page.

Quick find

To quickly find an object in the diagram, the Quick Find feature will locate object that have a name match with the text you type.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Print the diagram

You may print the architecture diagram as either a PNG or SVG document which is downloaded to you.

Edit the diagram

With the appropriate permissions, you may edit the architecture diagram. To do so, simply drag any element to a new location, right-click for a menu of editing options, add annotations, or auto-layout the entire diagram. Click **Save** in order to commit your changes.

Configuration management

The Architecture diagram also provides access to the configuration management features of MIMM , including connection editing (stitching). For details go here.

- Search for specific objects within a Content in the displayed diagram.
- Right-click on an element or select the Actions ( ) icon for more options.
- Click on the Edit action and edit the diagram.

Recently Viewed

You may always return to objects you have recently viewed.

Steps

All Objects

1. Click **OBJECTS > RECENT** and pick one of the entries.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

2. Click **OBJECTS > More…** and you will have the complete history to pick from.

Worksheets

1. Any of the steps for all objects.
2. Click WORKSHEETS > RECENT and pick one of the entries.

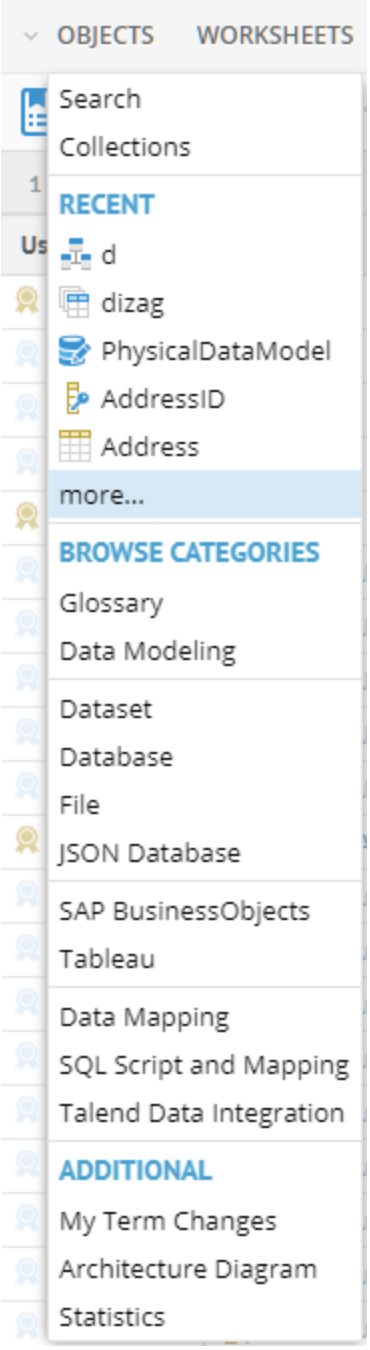
Collections

1. Any of the steps for all objects.
2. Click **OBJECTS > Collections**. Click the **Recent** tab and pick one of the entries.

Example

Click **OBJECTS > RECENT > More…**

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



You then have the complete history:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Recent Objects

1 - 55 of 55 Columns

User Tags	Name	Object Type	Context
	Glossary	Folder	
	AddressID	Column	AR to Staging › AccountsR
	AddressID	Column	AR to Staging › AccountsR
	Staging DW	Database	
	AccountCategory	Table	Staging DW › dbo
	Invoice	Table	Staging DW › dbo
	PurchaseOrder	Table	Staging DW › dbo
	ShippingPOC	Runtime Job	Staging to Dimensional ›
	GLAccount	Query Mapping	Adjustments to Staging
	PurchaseOrderAmount	Column	Dimensional DW › dbo › F
	Dimensional DW	Database	
	InvoiceAmount	Column	Dimensional DW › dbo › C
	AccountAmountAvailable	Column	Dimensional DW › dbo › G

Favorites

You may always return to objects you have recently viewed.

Steps

Worksheets

1. Click **WORKSHEETS > Favorites** and pick one of the entries.

Collections

1. Click **OBJECTS > Collections**. Click the **Favorites** tab and pick one of the entries.

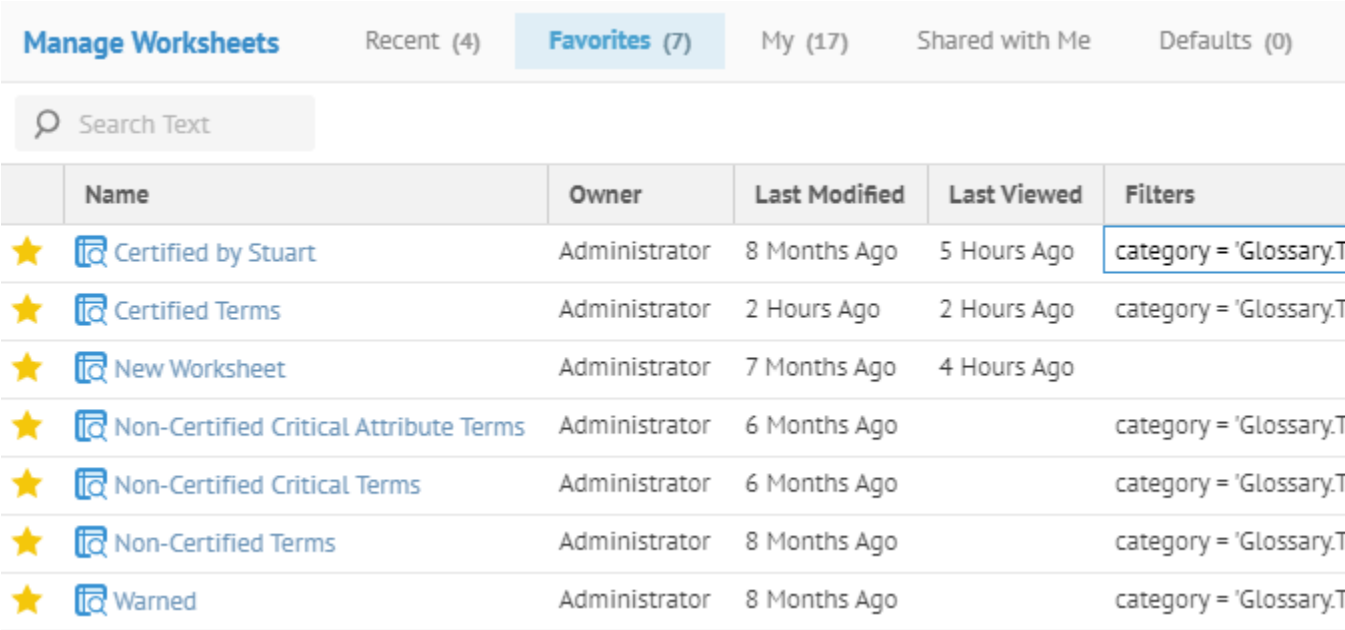
Dashboards

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

2. Click **OBJECTS > Dashboards**. Click the **Favorites** tab and pick one of the entries.

Example

Click **WORKSHEETS > Favorites > More**



You then have the complete list of your favorite worksheets.

Analyze Metadata

Metadata Details Page Default Presentation

Each metadata element in MIMM has a dynamically constructed details page. All the information about that metadata element is available from the details page.

Identifying Information such as sample data and profiling information may be hidden.

In the top left, you will see the Physical name, Business name, metadata element type and context or parent structure of where this element is in the Model it is contained in.

Social curation

In the top right you may curate this metadata element. You have the option to **Certify**, **Endorse** and/or providing a **Warning** for this metadata element.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Any user may Comment, Endorse or Warn. Users with the Manager security role may edit or removes those of other users. Only the steward and Administrators may certify.

More details on social curation.

Tabs

Several different tabs run across the top. Click on any of these tab to see details about the metadata element. The specific tabs will vary depending upon the type of metadata element you are looking at.

The presentation of elements in the object tabs, e.g. Tables in a schema, may be customized and published using the default worksheet capabilities.

Overview tab

The Overview tab contains general information about the metadata element, including:

- **Business Description** which is determined by description information in a related Business Glossary, or determined by semantic links and data flow lineage dependencies.
- **Data Profiling** information collected when harvesting the model, if specified and available
- **Labels** assigned to the metadata element
- **Semantic Types** that the metadata element is associated with
- Additional **Properties** defined for the metadata element

All of the contents of the Overview tab may be customized and published using the default dashboard capabilities.

Steps

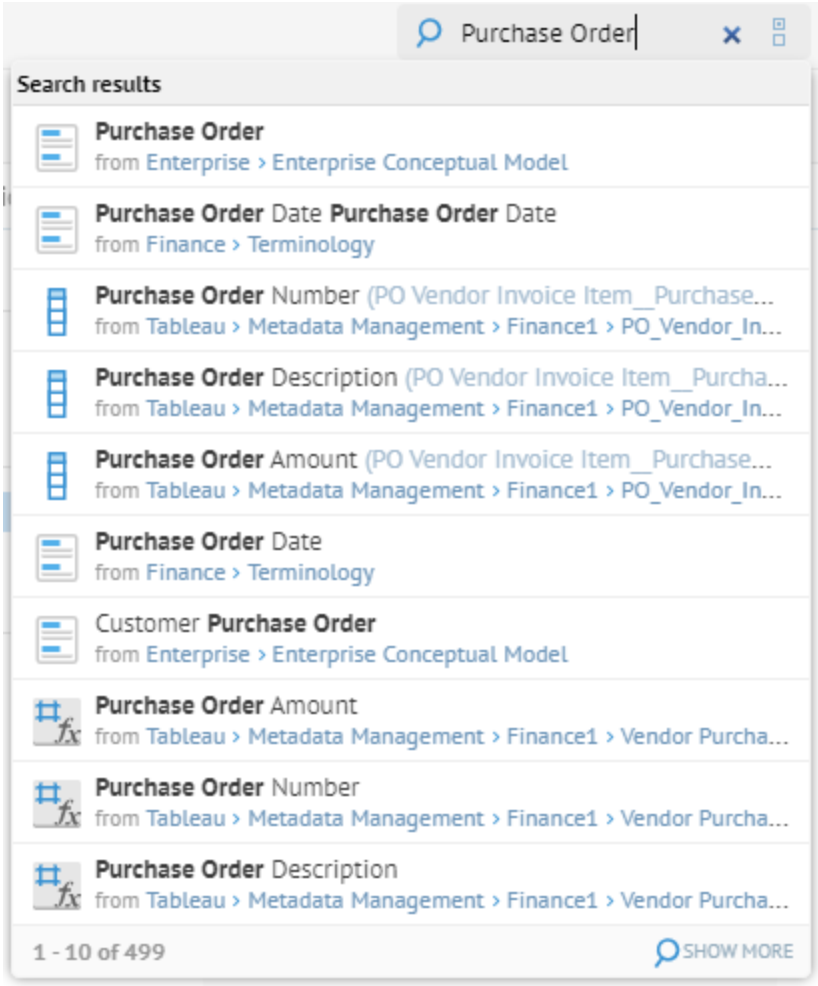
The details page for a given metadata element may be accessed by search, metadata category browsing or browsing the architecture diagram. In addition, anywhere a hyperlink with the name of that element appears (e.g., in a diagram, lineage trace, or other list or display) that link will take you to the details page. Going to the details page is the default action for any hyperlinked metadata element and is the default action for the **Open** icon and context (right-click) menu.

Examples

Database table

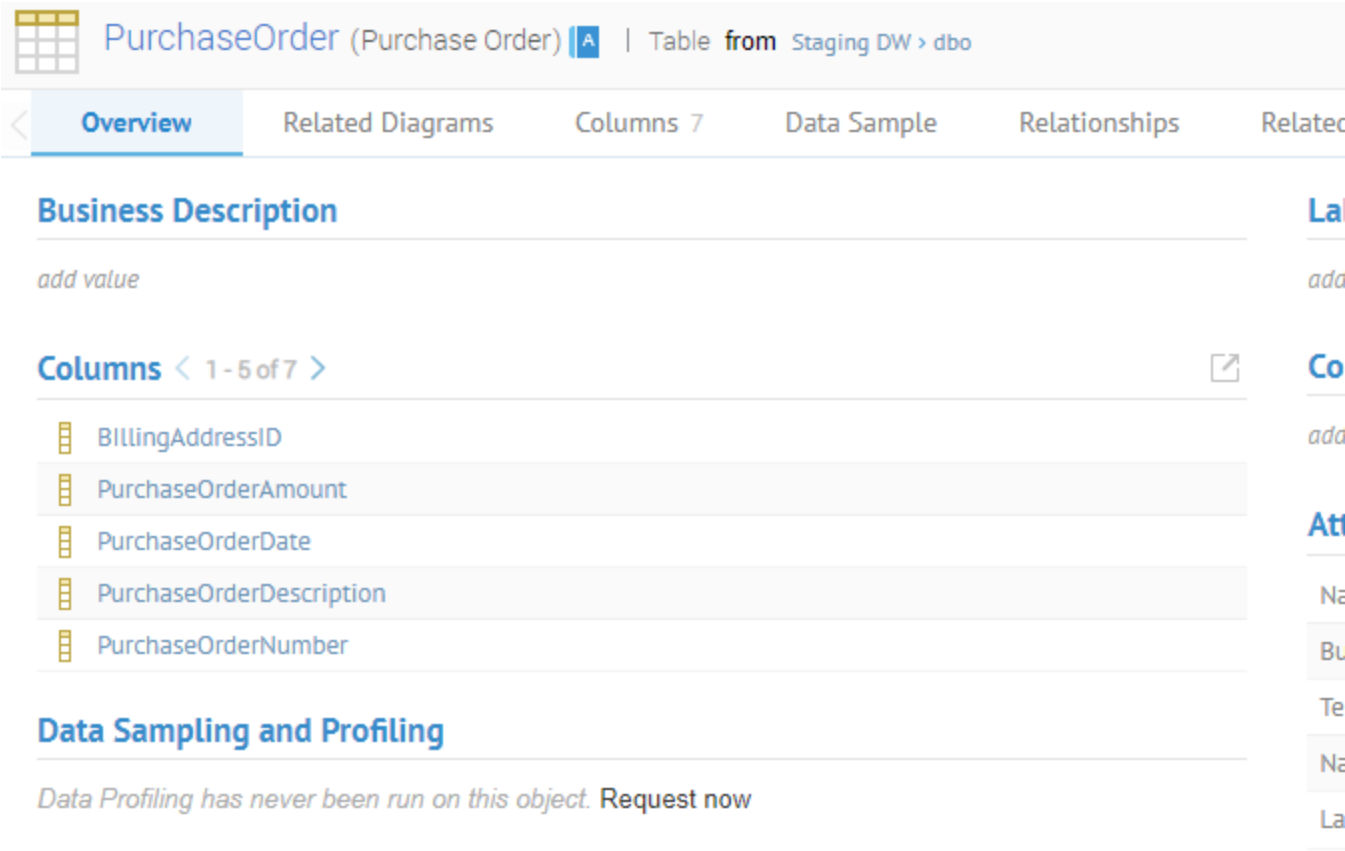
Enter “Purchase Order” in the **Search** text box in the upper right.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Select the **PurchaseOrder** table in **dbo** schema in the **Staging DW** model.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Tables in a database generally have a great deal of related information in tabs. For example, we have:

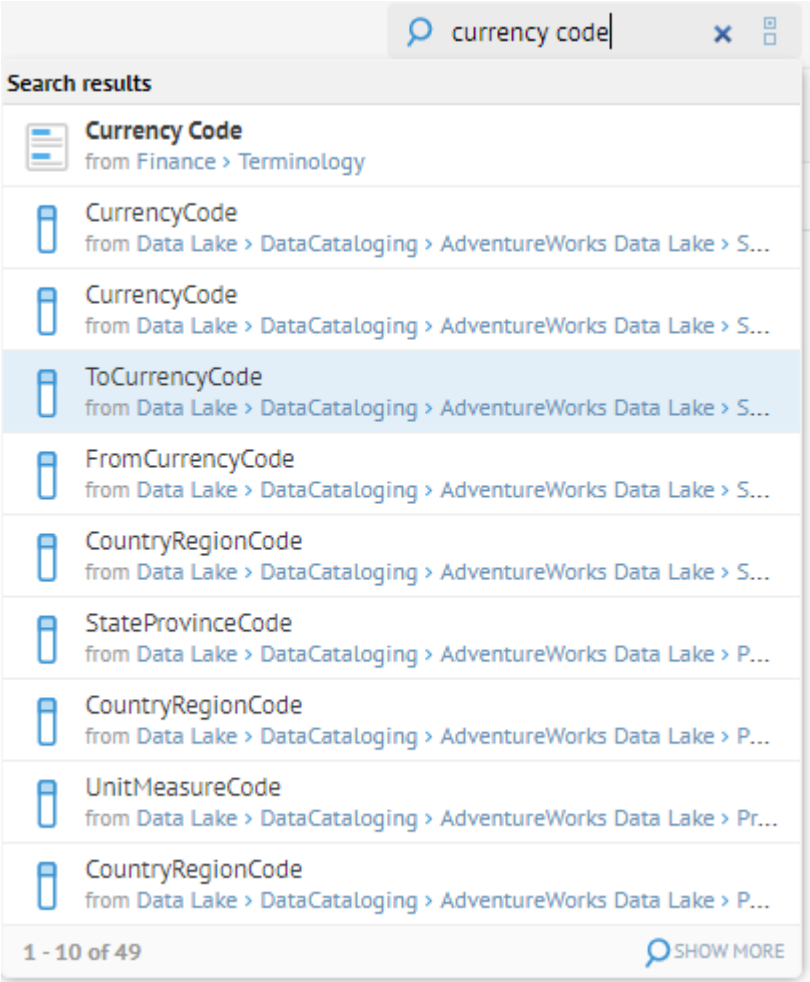
- **Related Diagrams** (or just Diagrams) with data modeling diagrams where available
- **Columns** contained within this table
- **Sample Data**
- **Relationships** including PK/FK, inferred and user-defined relationships with other tables. Especially important when joining this table with others, such as in a self-service BI tool.

*The numbers next to the tab headings, e.g., **Columns** 7, to indicate how many items are under that tab.*

Field in a file with profiling information

Enter "currency code" in the **Search** text box in the upper right.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Select the **Currency Code** field in the **CountryRegionCurrency.csv** file.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

CurrencyCode (*add business name*) | Field from CountryRegionCurrency.csv

Overview | Related Reports | Related Processes | Data Flow | Semantic Flow | Comme

Business Description

add value

Inferred Datatypes 1

STRING	100%

Inferred Semantic Types 5

Currency Code	73%
Airport Code	64%
Continent Code	11%
Country Code ISO3	4%
First Name	2%

Frequency 1 - 10 of 15

EUR	11%
USD	2%
FJD	1%
MXN	1%
LVL	1%
BBD	1%
GTQ	1%
CLP	1%
ZAR	1%
TND	1%

Patterns 1

AAA	100%

Data Profiling Statistics

Last profiled 9 Months Ago

Lab

Ho

Col

add

Ser

Cu

Air

Att

Na

Bu

Ter

Typ

Pos

Ste

Hic

Las

Copyright

Sample data is presented for the field. This data is obtained by sampling a subset of the records in the source. See harvesting and sampling for more details.

Click **CountryRegionCurrency.csv** in the breadcrumb area to the right of the name of the field:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

CountryRegionCurrency.csv (*add business name*) | Delimited File

from Data Lake › DataCataloging › AdventureWorks Data Lake › Sales

Overview | Fields 3 | Data Sample | Relationships | Related Reports | Related Pro

Business Description

add value

Fields 3

- CountryRegionCode
- CurrencyCode
- ModifiedDate

Data Profiling Statistics Last profiled 9 Months Ago

Row count	109

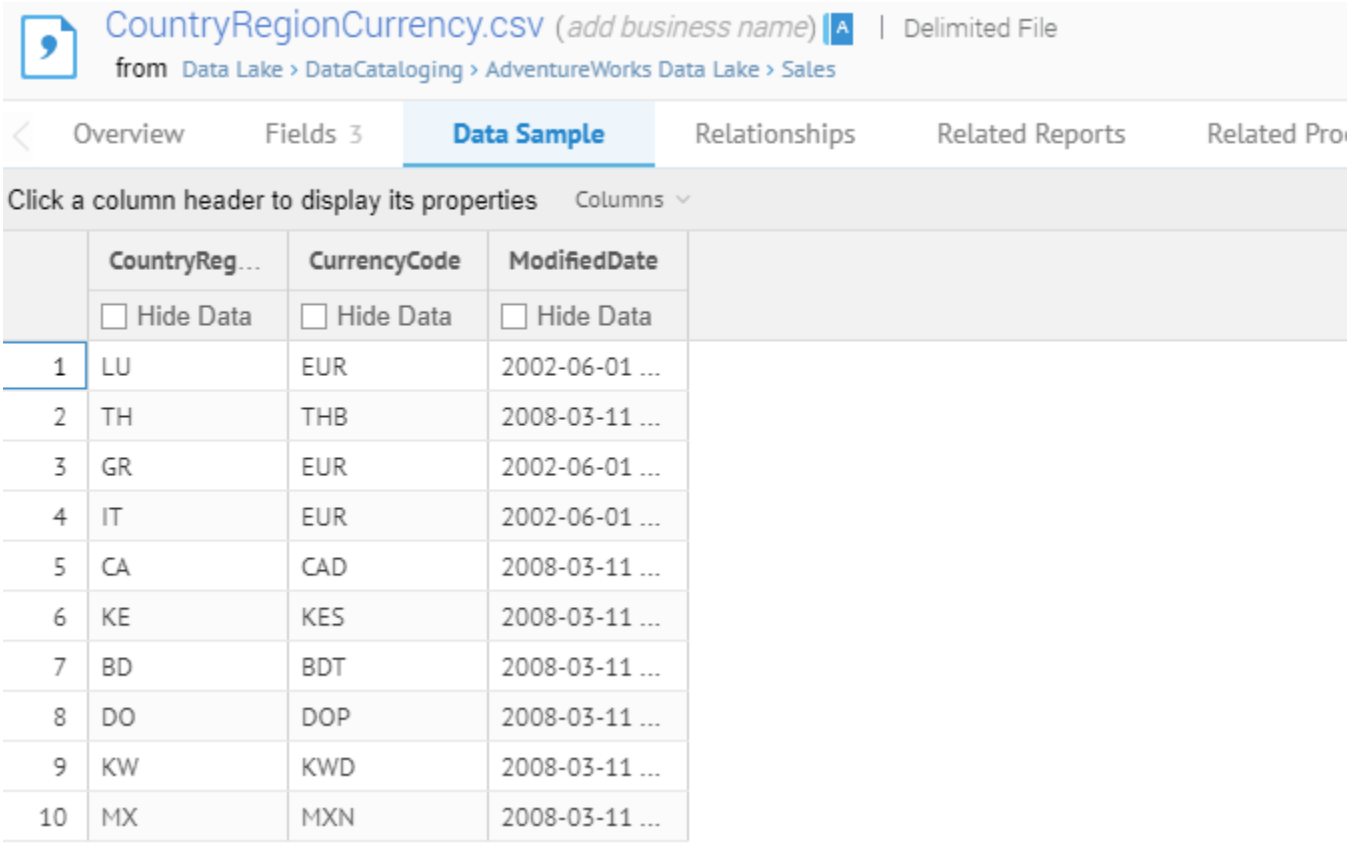
Data Sample 1 - 3 of 10

CountryReg...	CurrencyCode	ModifiedDate
MU	MUR	2008-03-11 ...
PL	PLN	2008-03-11 ...
LU	EUR	2002-06-01 ...

*This is the file containing the **Currency Code** field.*

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Then click the **Data Sample** tab.



	CountryReg...	CurrencyCode	ModifiedDate
	Hide Data	Hide Data	Hide Data
1	LU	EUR	2002-06-01 ...
2	TH	THB	2008-03-11 ...
3	GR	EUR	2002-06-01 ...
4	IT	EUR	2002-06-01 ...
5	CA	CAD	2008-03-11 ...
6	KE	KES	2008-03-11 ...
7	BD	BDT	2008-03-11 ...
8	DO	DOP	2008-03-11 ...
9	KW	KWD	2008-03-11 ...
10	MX	MXN	2008-03-11 ...

Tables in a database or fields in a file generally have a great deal of related information in tabs. For example, we have:

- **Fields** contained within this table
- **Sample Data**
- **Relationships** including PK/FK, inferred and user-defined relationships with other tables. Especially important when joining this table with others, such as in a self-service BI tool.

Reports

Go to **WORKSHEETS** > **Tableau** > **Dashboards** and select **Finance**.

There is a preview image of the dashboard (if specified when importing).

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Explore Further

Edit Business Name and Description

You may edit the **Business Name** and **Description** directly (with the proper permission) or classify the metadata element with a new or existing term in the Business Glossary. You may also semantically map the metadata element to any other object with a description to reuse by clicking the **Semantic Flow** tab.

This is a function of the larger features of data cataloging and data documentation.

Steps

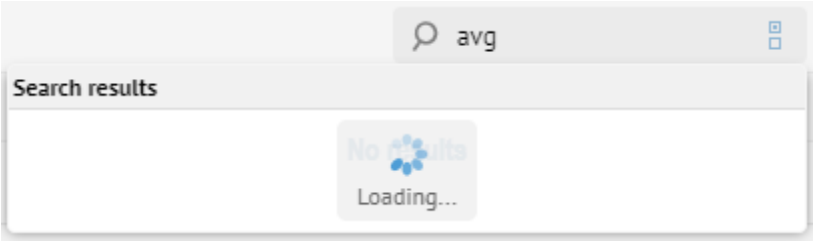
Direct Edit

1. Go to the details page for the data element.
2. Click **(add business name)** next to the name of the data element and enter a new name.
3. Click the **Business Description** text box and enter text.

Example

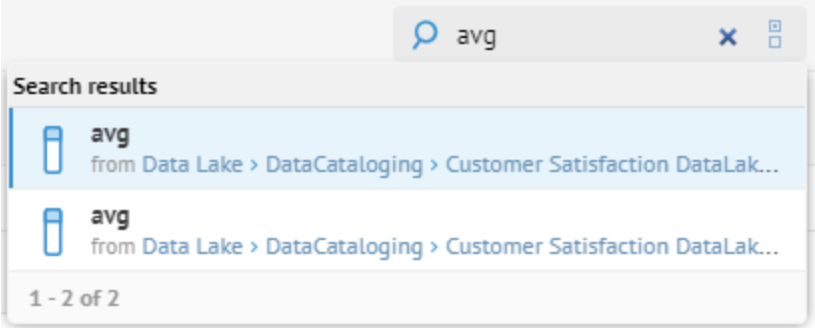
Direct Edit

Enter “avg” in the **Search** text box in the upper right.



Select the **avg** field in the **Satisfaction.json** file.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click **(add business name):**

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

avg (*add business name*) | Field **from** Support.json

Overview | Related Reports | Related Processes | Data Flow | Semantic Flow | Comme

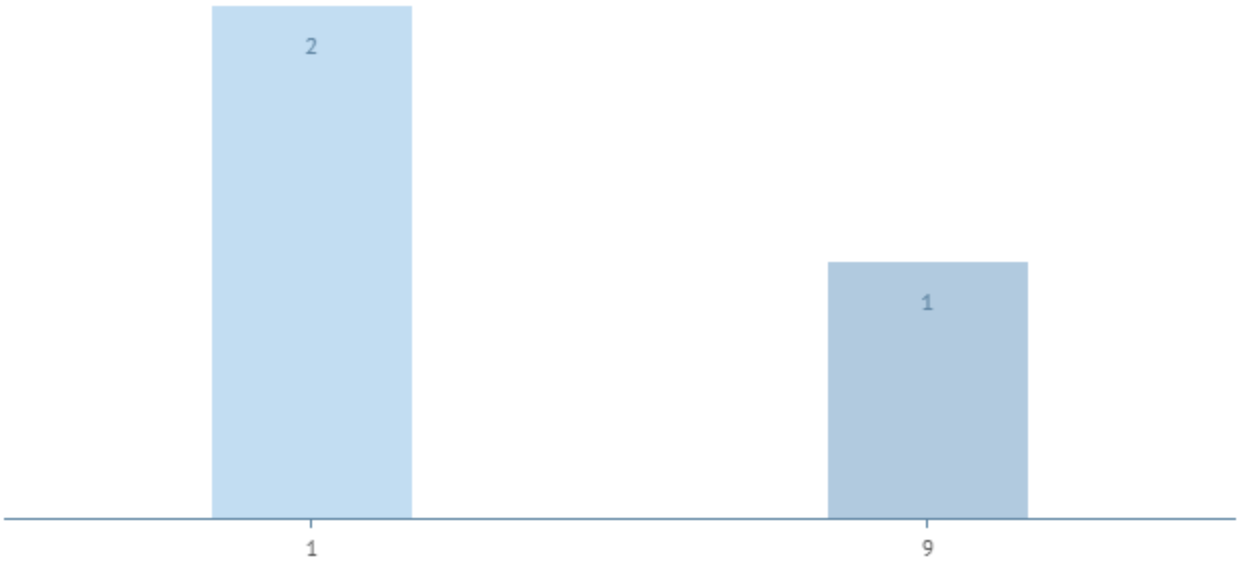
Business Description

add value

Inferred Datatypes 2

INTEGER	75%
DOUBLE	25%

Histogram



Patterns 2

9	75%
9.99	25%

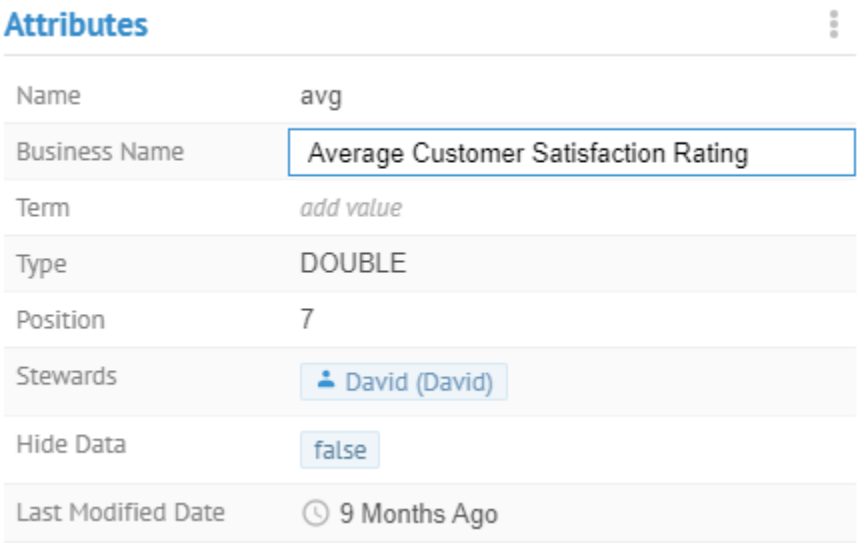
Data Profiling Statistics

Last profiled 9 Months Ago

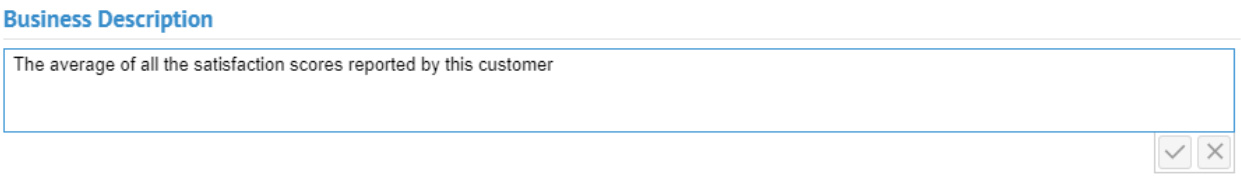
Count	4
Distinct	3
Duplicate	1
Valid	3
Empty	0
Invalid	1

Copyright

And enter “Average Customer Satisfaction Rating”.



Click the **Business Description** text box and enter “The average of all the satisfaction scores reported by this customer”.



Custom Attributes

Custom Attributes may be defined and associated with any type of metadata element. Once defined, you may add it to any example of that type of metadata element. Thus, a custom attributre may be applied or not applied to an object.

Set a Custom Attribute on an Object

Steps

1. If not already defined, create a new custom attribute.

2. Go to the details page for the data element.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

3. Go to the **Overview** tab.
4. Click on the **More Actions** icon next to **Attributes** and select **Add custom attribute(s)**.
5. Select the custom attribute(s) to include.
6. Edit their values in place.

Unlike labels and comments, custom attributes may only be assigned or edited with the proper permissions on the content that contains the metadata element.

You may also edit custom attributes using the context menu when you see an element in a list or do so in bulk.

Example

Create the **Verified** custom attribute as in the example in add a new custom attribute.

Go to WORKSHEETS > File > Fields and click ActiveFlag on the details page. Go to the **Overview** tab.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

ActiveFlag (*add business name*) | Field from Vendor.csv

Overview | Related Reports | Related Processes | Data Flow | Semantic Flow | Comm

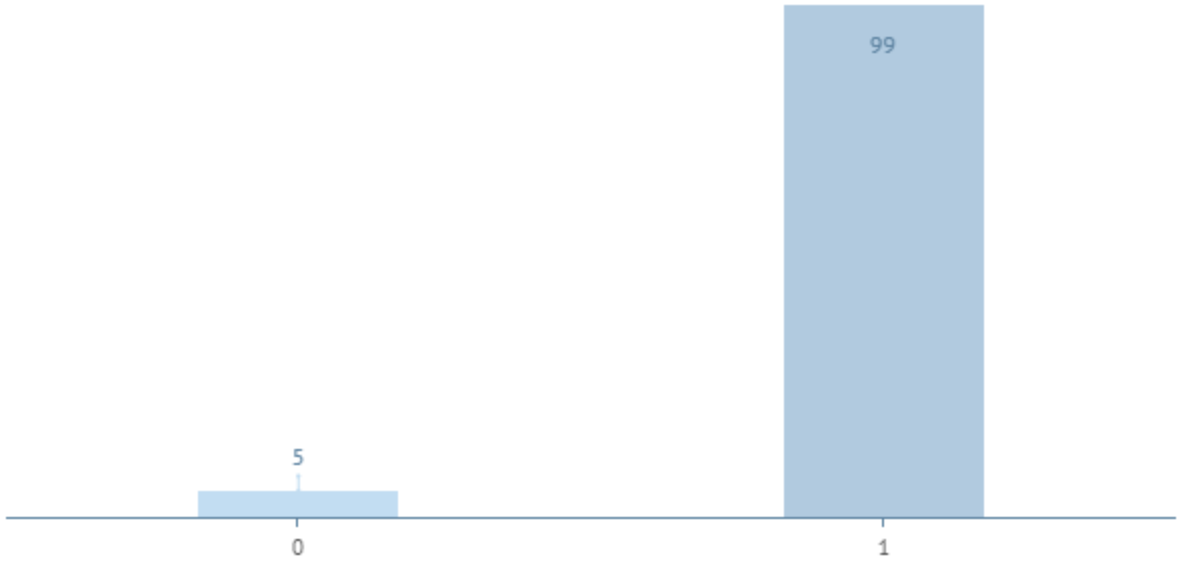
Business Description

add value

Inferred Datatypes 1

INTEGER	100%

Histogram



Patterns 1

9	100%

Data Profiling Statistics

Last profiled 9 Months Ago

Count	104
Distinct	2
Duplicate	102
Valid	104
Empty	0
Invalid	0
Min	0
Max	1
Mean	0.952

La

Ho

Co

add

Se

add

Att

Na

Bu

Te

Ty

Po

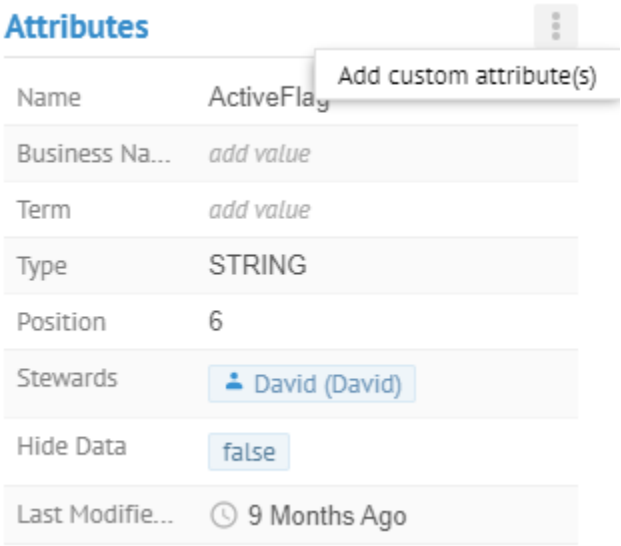
St

Hi

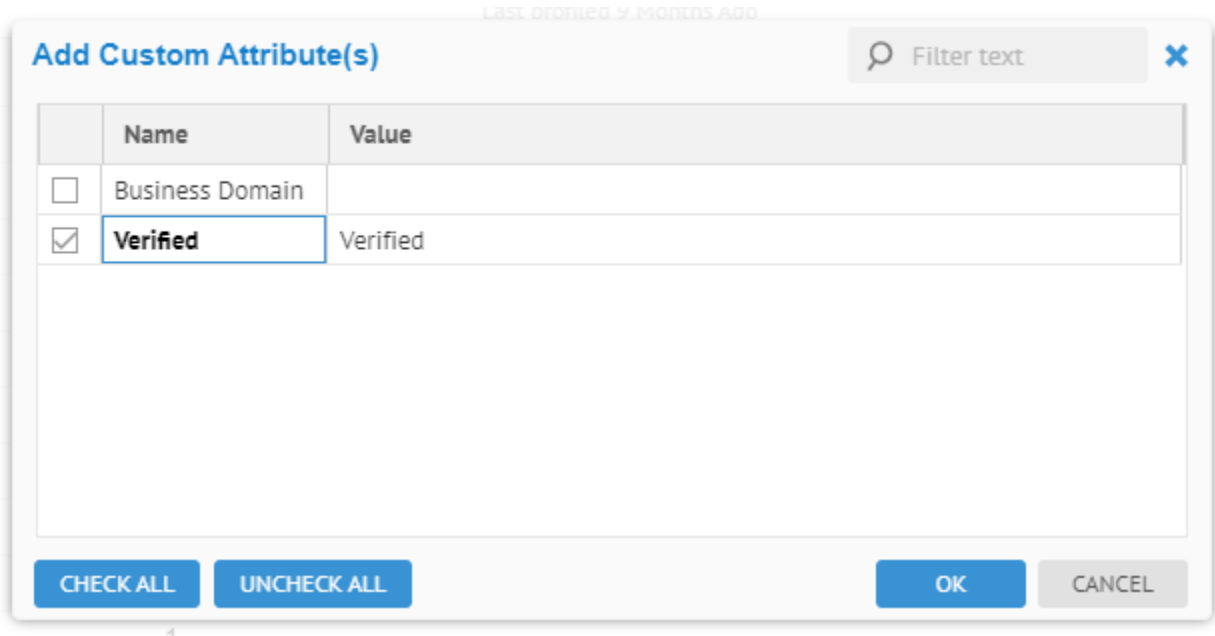
La

Copyright

Click on the **More Actions** icon next to **Attributes** and select **Add custom attribute(s)**.



Select **Verified**.



Edit the Value in place by selecting **Verified**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Remove a Custom Attribute Setting on an Object

Steps

1. Go to the details page for the data element.
2. Go to the **Overview** tab.
3. Click on the **More Actions** icon next to **Attributes** and select **Remove custom attribute(s)**.
4. Select the custom attribute(s) to remove.

> *You may also remove custom attributes using the context menu when you see an element in a list or do so in bulk.*

Example

Using the **Verified** custom attribute on the Active Flag field as in the example in Set a Custom Attribute on an Object.

Go to WORKSHEETS > File > Fields and click ActiveFlag on the details page. Go to the **Overview** tab.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

ActiveFlag (*add business name*) | Field from Vendor.csv

Overview | Related Reports | Related Processes | Data Flow | Semantic Flow | Comm

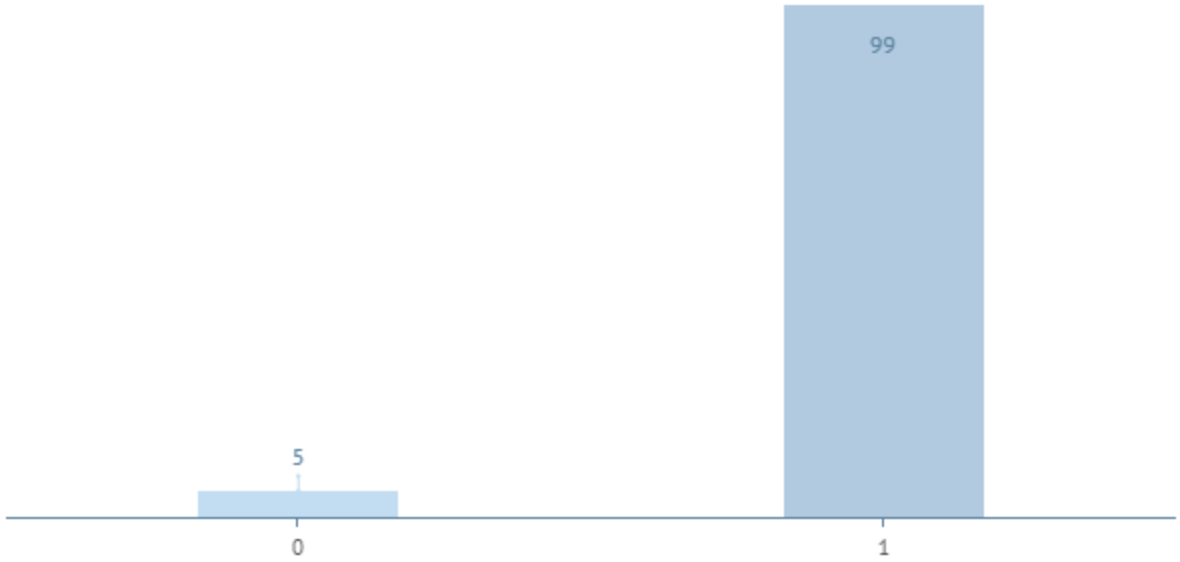
Business Description

add value

Inferred Datatypes 1

INTEGER	100%

Histogram



Patterns 1

9	100%

Data Profiling Statistics

Last profiled 9 Months Ago

Count	104
Distinct	2
Duplicate	102
Valid	104
Empty	0
Invalid	0
Min	0
Max	1
Mean	0.952

La

Ho

Co

add

Se

add

Att

Na

Bu

Te

Ty

Po

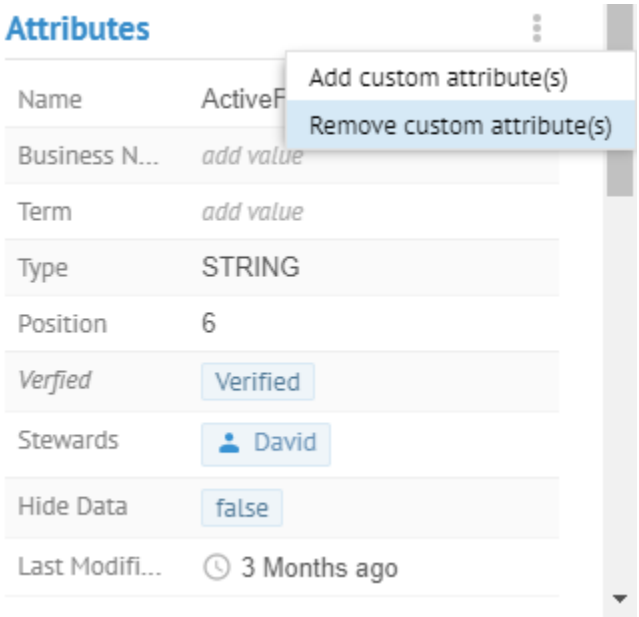
St

Hi

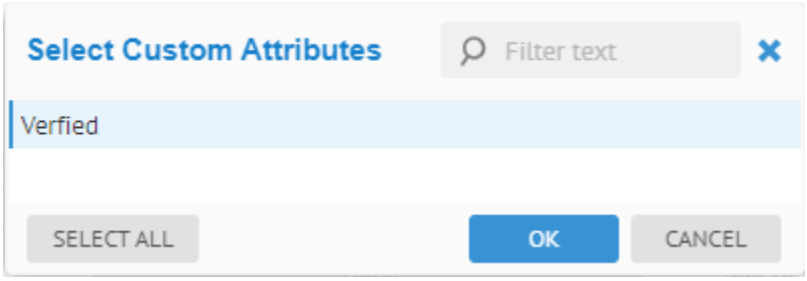
La

Copyright

Click on the **More Actions** icon next to **Attributes** and select **Remove custom attribute(s)**.



Select **Verified**.



Click **OK**..

Comments tab

Enter comments to this metadata element in the Comments tab. Everyone has permissions to comment.

Steps

1. Go to the details page for an object.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

2. Go to the **Comments** tab.

3. From here you may

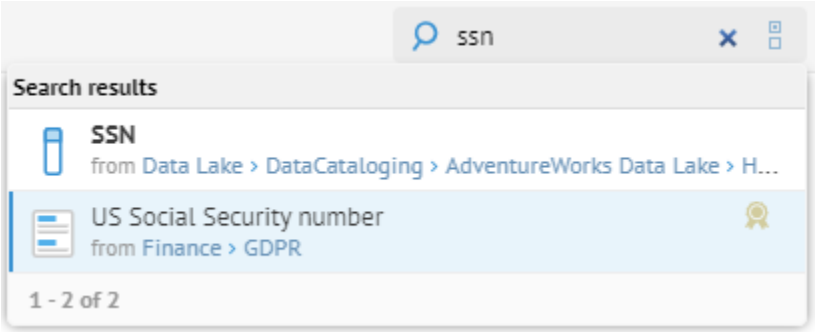
   - Add a new comment: Click in the text box labeled **Add Comment**,.enter your text and click **SUBMIT**.

   - Edit an existing comment: Click on the **More actions** icon () for that comment and select **Edit**, enter your text and click **SUBMIT**.

   - Delete an existing comment: Click on the **More actions** icon () for that comment and select **Delete** and click **YES**.

Example

Search for SSN.



Select the term name US Social Security Number.

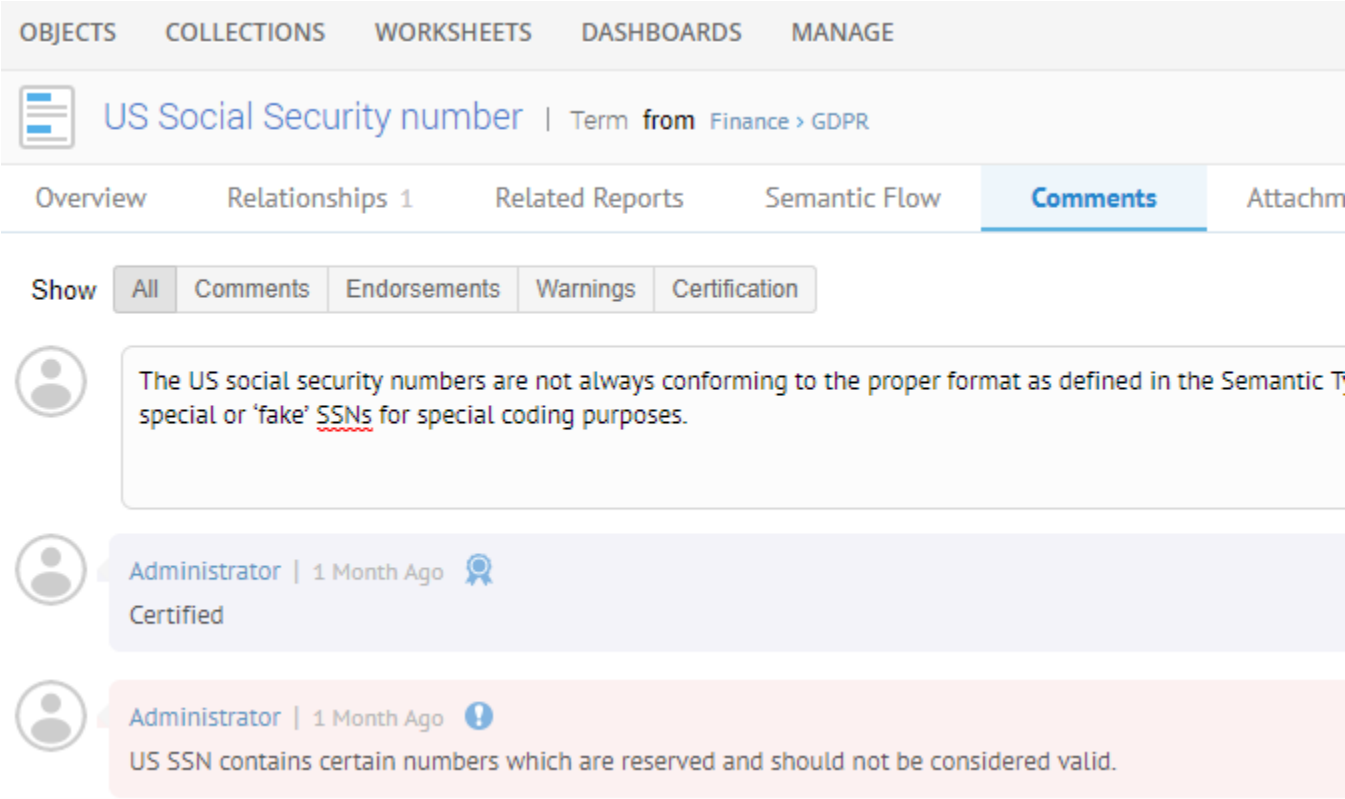
*You are presented with the **Overview** tab.*

Go to the **Comments** tab.

Add a new comment

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

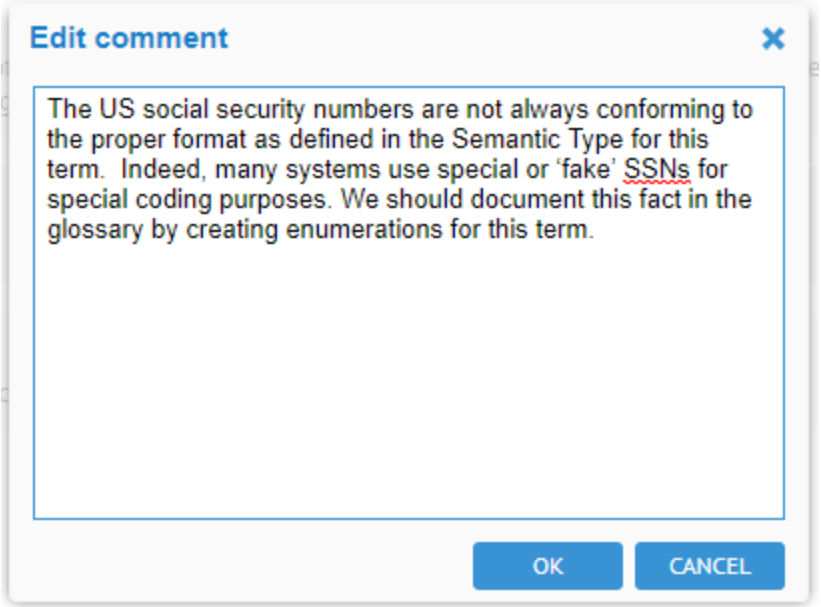
Click in the text box labeled **Add Comment**, enter "The US social security numbers are not always conforming to the proper format as defined in the Semantic Type for this term. Indeed, many systems use special or 'fake' SSNs for special coding purposes." and click **SUBMIT**.



Edit an existing comment

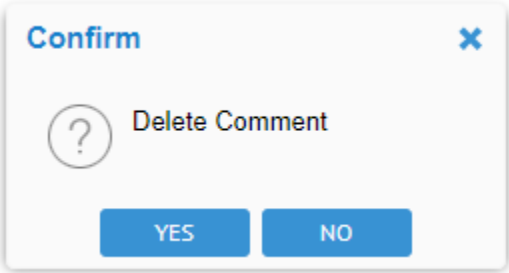
Click on the **More actions** icon (⋮) for the above comment and select **Edit**, append with "We should document this fact in the glossary by creating enumerations for this term." and click **OK**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Delete an existing comment

Click on the **More actions** icon (⋮) for the above comment and select **Delete** and click **YES**.



Related Reports

You may ask MIMM to interrogate the data flow and semantic lineage to determine what business reports a particular metadata element is used on. Simply click the **Related Reports** tab. For more details on the process go here.

Steps

1. Go to the details page for an object.

2. Go to the **Related Reports** tab.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Example

Search for “Account Amount”.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

OBJECTS COLLECTIONS WORKSHEETS DASHBOARDS MANAGE

Account Amount Available | Term from Finance › Terminology

Overview | Relationships 3 | Related Reports 4 | Semantic Flow | Comments | Attac

Definition

Dollar amount remaining in fund account, calculated as: Account Balance Amount - Account Amount Expended - Account Encumbered Amount

Documentation

add value

Relationships 3

+ CREATE

More Specific | Account Budget Amount | GL Account | Unified_Dollar_Amount

Audit Log 2

Administrator | 4 Weeks Ago
Comment was added:
> test

Administrator | 4 Weeks Ago
Added **Synonym** link to **Account Budget Amount**

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Select the term names Account Amount Available.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

OBJECTS COLLECTIONS WORKSHEETS DASHBOARDS MANAGE

Account Amount Available | Term from Finance › Terminology

Overview | Relationships 3 | Related Reports 4 | Semantic Flow | Comments | Attac

Definition

Dollar amount remaining in fund account, calculated as: Account Balance Amount - Account Amount Expended - Account Encumbered Amount

Documentation

add value

Relationships 3

+ CREATE

More Specific | Account Budget Amount | GL Account | Unified_Dollar_Amount

Audit Log 2

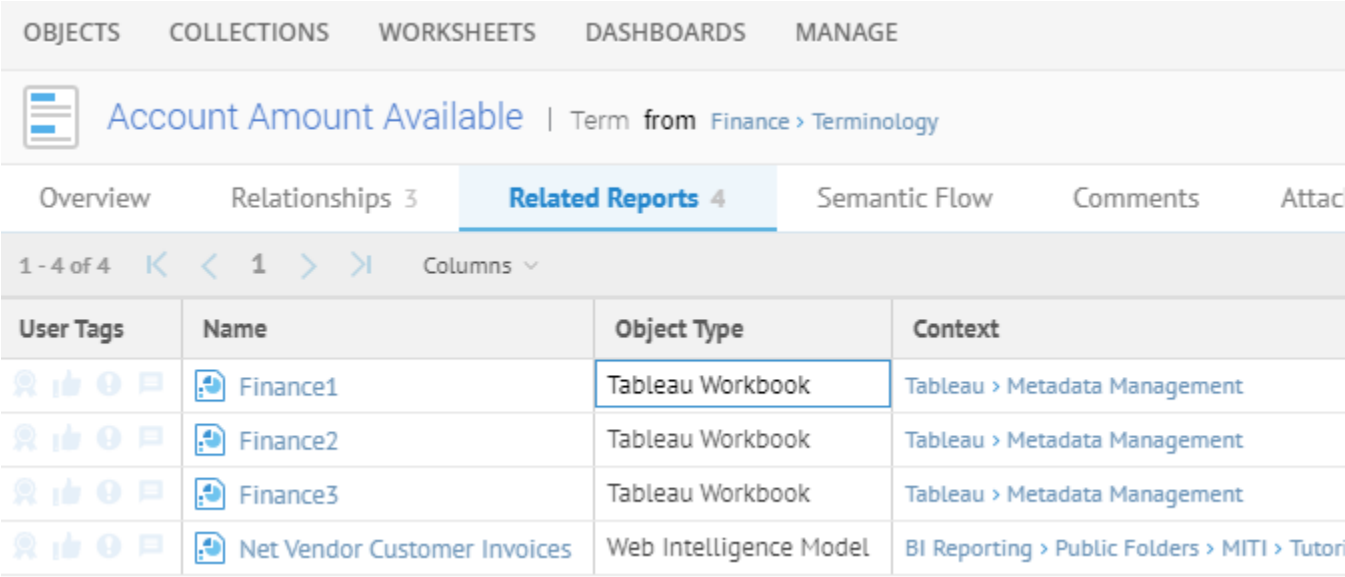
Administrator | 4 Weeks Ago
Comment was added:
> test

Administrator | 4 Weeks Ago
Added **Synonym** link to **Account Budget Amount**

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

*You are presented with the **Overview** tab.*

Go to the **Related Reports** tab.



There are four reports (three Tableau workbooks and one SAP Business Objecdts web intelligence report) which have fields that have the same meaning as (are classified or inferred in classification) this term.

Data Flow

Click the Data Flow tab to report on the different types of data flow lineage traces that may be initiated from this element. Data flow traces look at how data moves through the inter-connected (stitched) systems from which metadata has been harvested. Both impact (forward) and lineage (backward) data flow traces may be performed by selecting the **Type** of trace in the top right pull-down.

More details and examples are provided at Data and Semantic Flow.

Steps

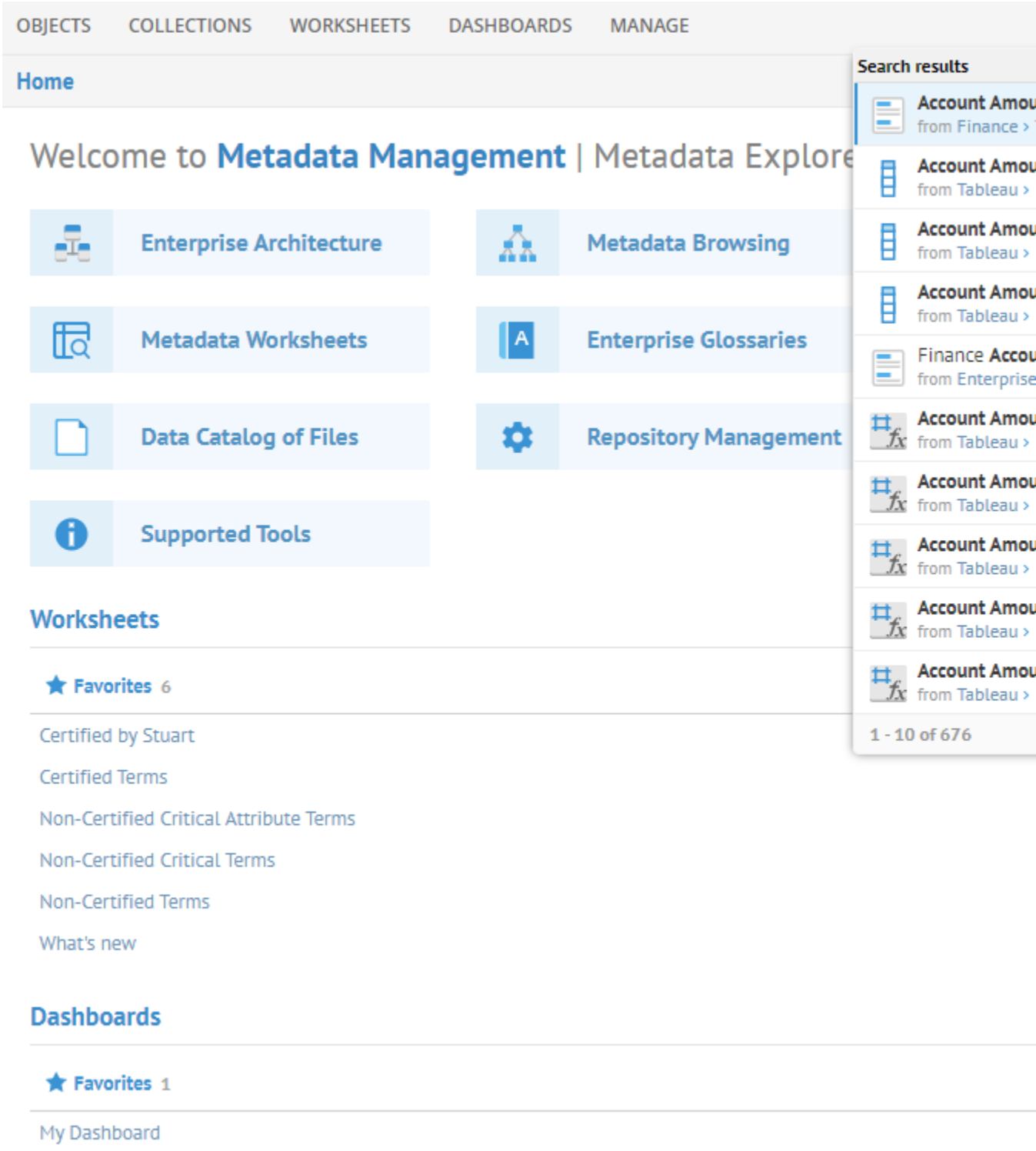
1. Go to the details page for an object.

2. Go to the **Data Flow** tab.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

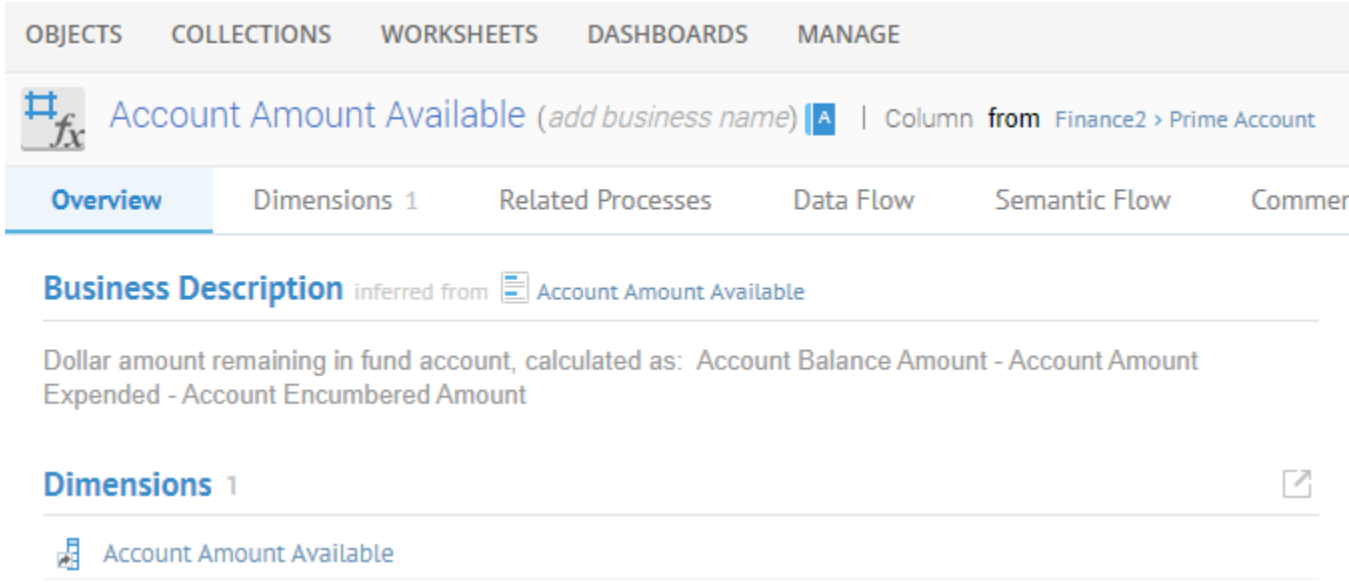
Example

Search for “Account Amount”.



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

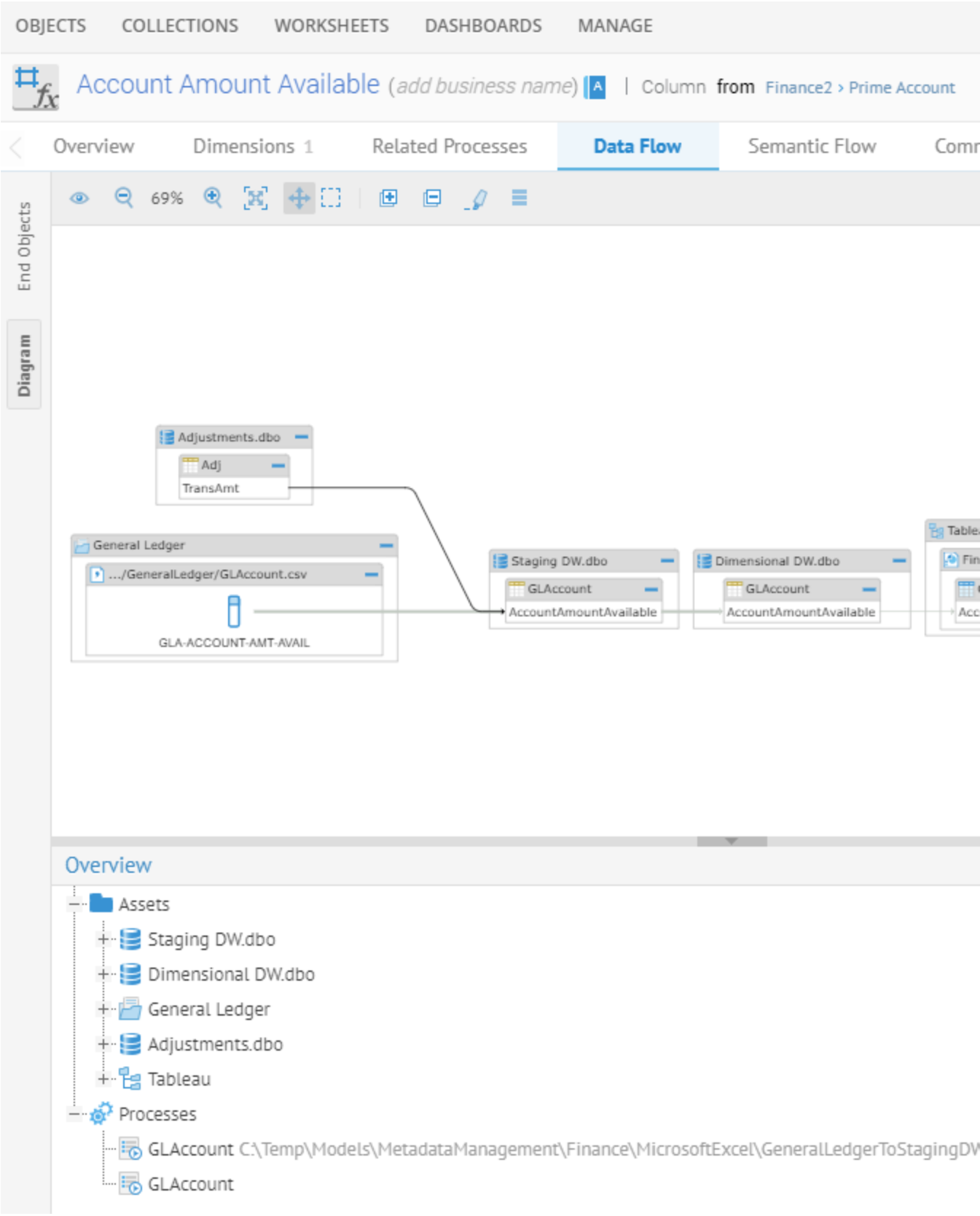
Select the column name Account Amount Available.



You are presented with the **Overview** tab.

Go to the **Data Flow** tab.

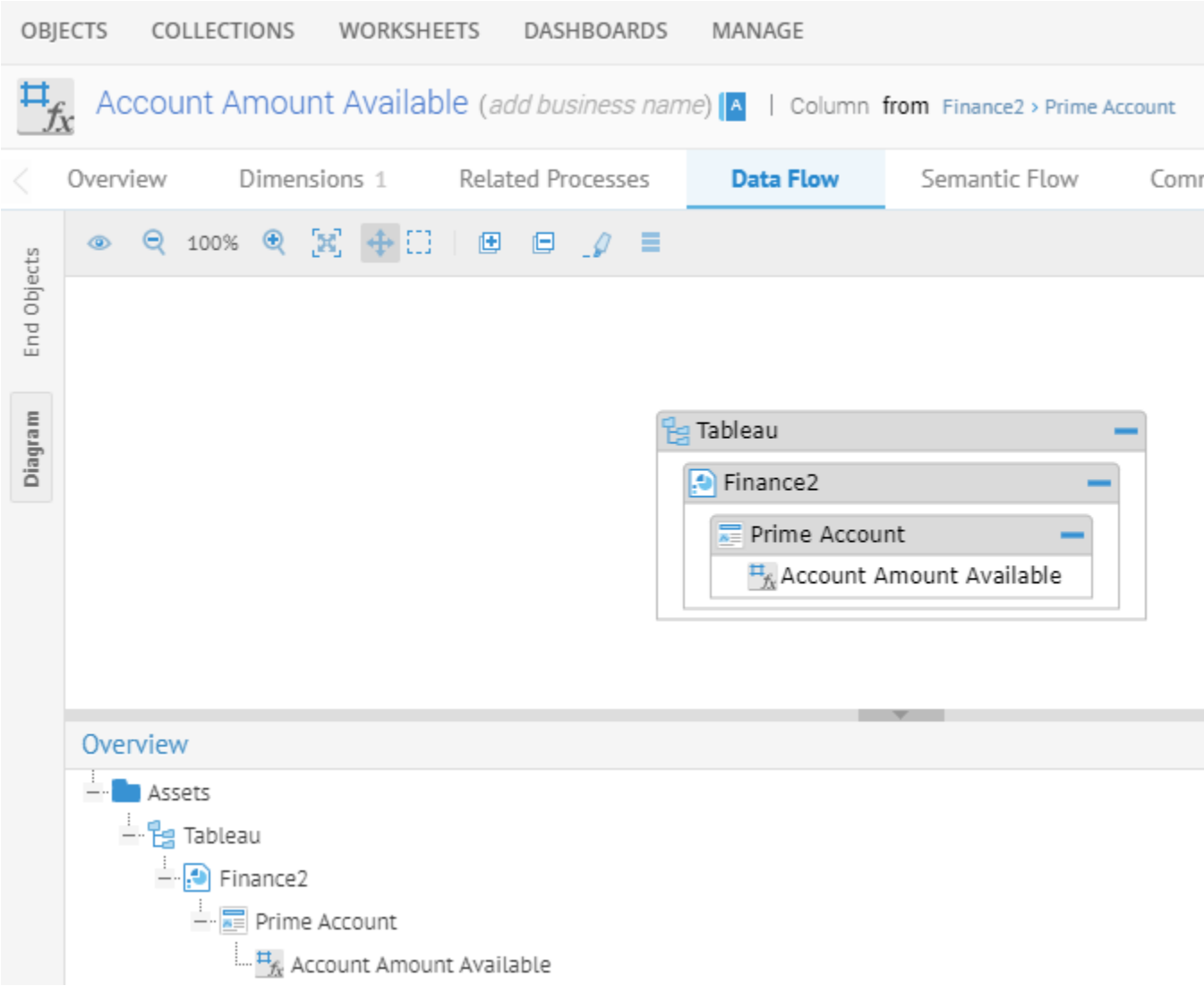
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

The display shows the Data Lineage or Data Impact by default depending on if this element is at the target or source end of the lineage.

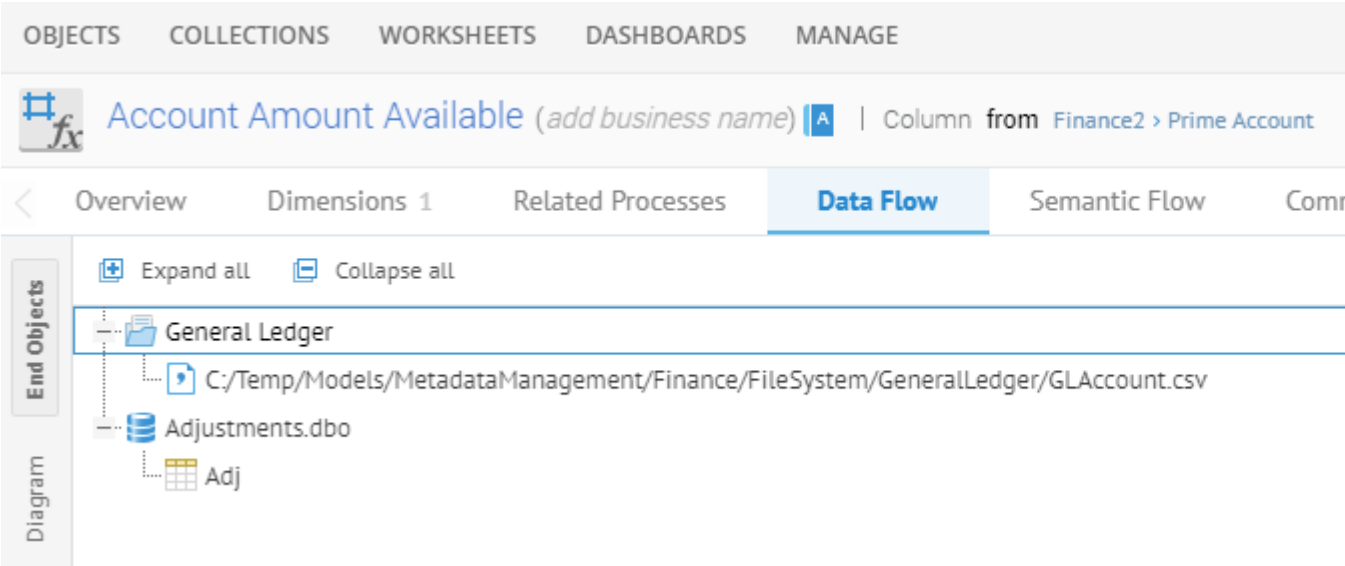
Select **Data Impact** in the the **Type**.



You may also zoom in/out, expand and collapse objects, highlight paths, show data flow transformation operations, show properties for selected objects, etc., by using the functions in the common trace controls.

You may also choose to present the lineage as a set of end objects by using the **End Objects** tab on the left.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



You may also download that report to CSV format.

Semantic Flow

Click the Semantic Flow tab to report on the different types of semantic lineage traces that may be initiated from this element. Semantic flow traces look at how metadata elements relate to each other semantically and reflect relationships of similar meaning, generalizations/specification, design vs. implementations, terminology to fields, etc. Both usage (downward) and definition lookup (upward) semantic traces may be performed by selecting the **Type** of trace in the top right pull-down.

Steps

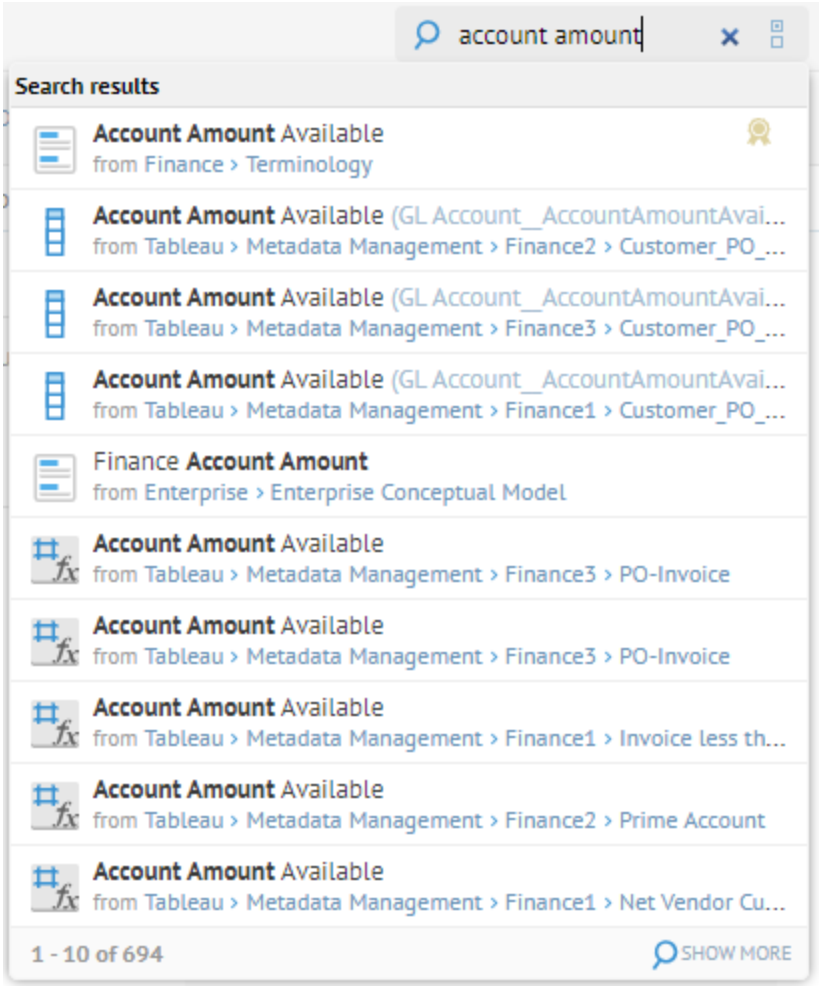
1. Go to the details page for an object.

2. Go to the **Semanic Flow** tab.

Example

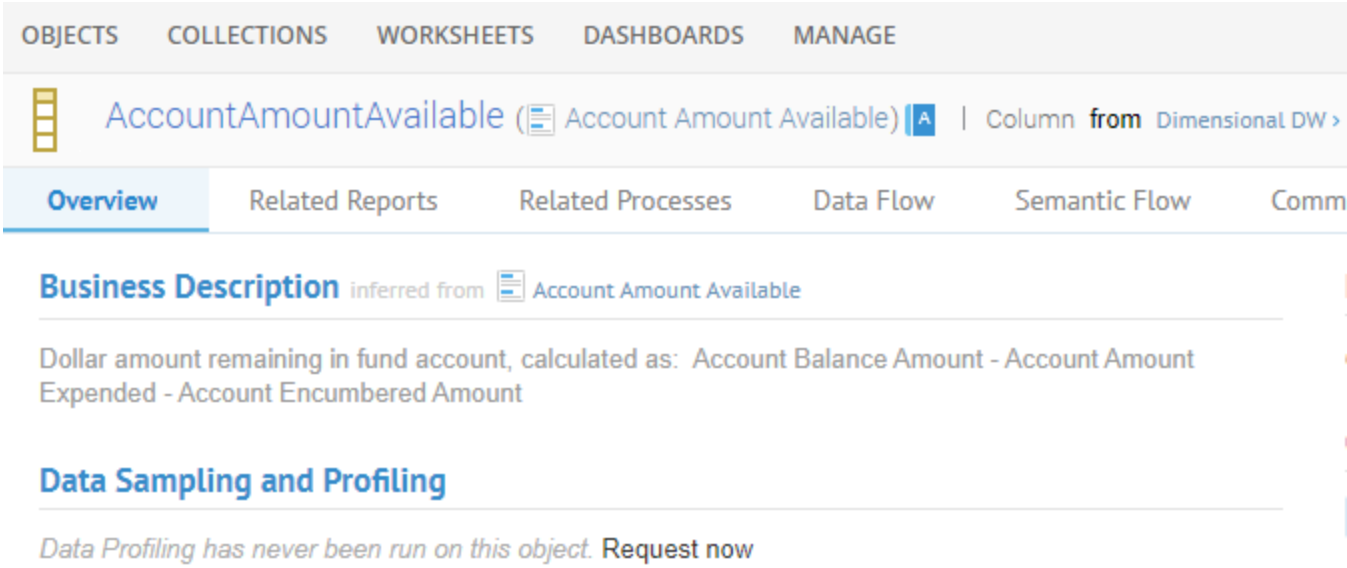
Search for “Account Amount”.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Select the colomn named **Account Amount Available** inside the table **GLAccount** in the **Dimensional DW** database.

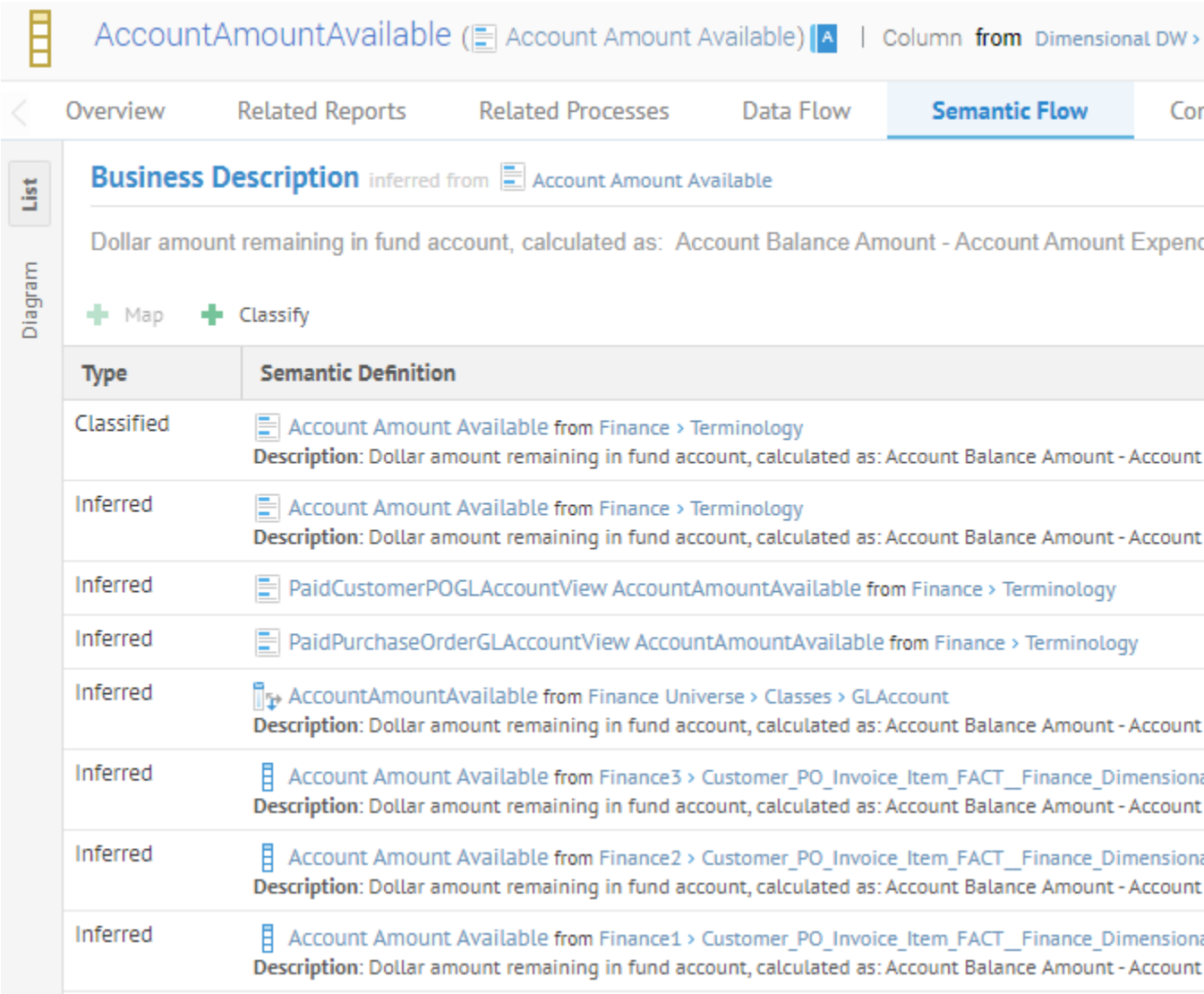
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

You are presented with the **Overview** tab.

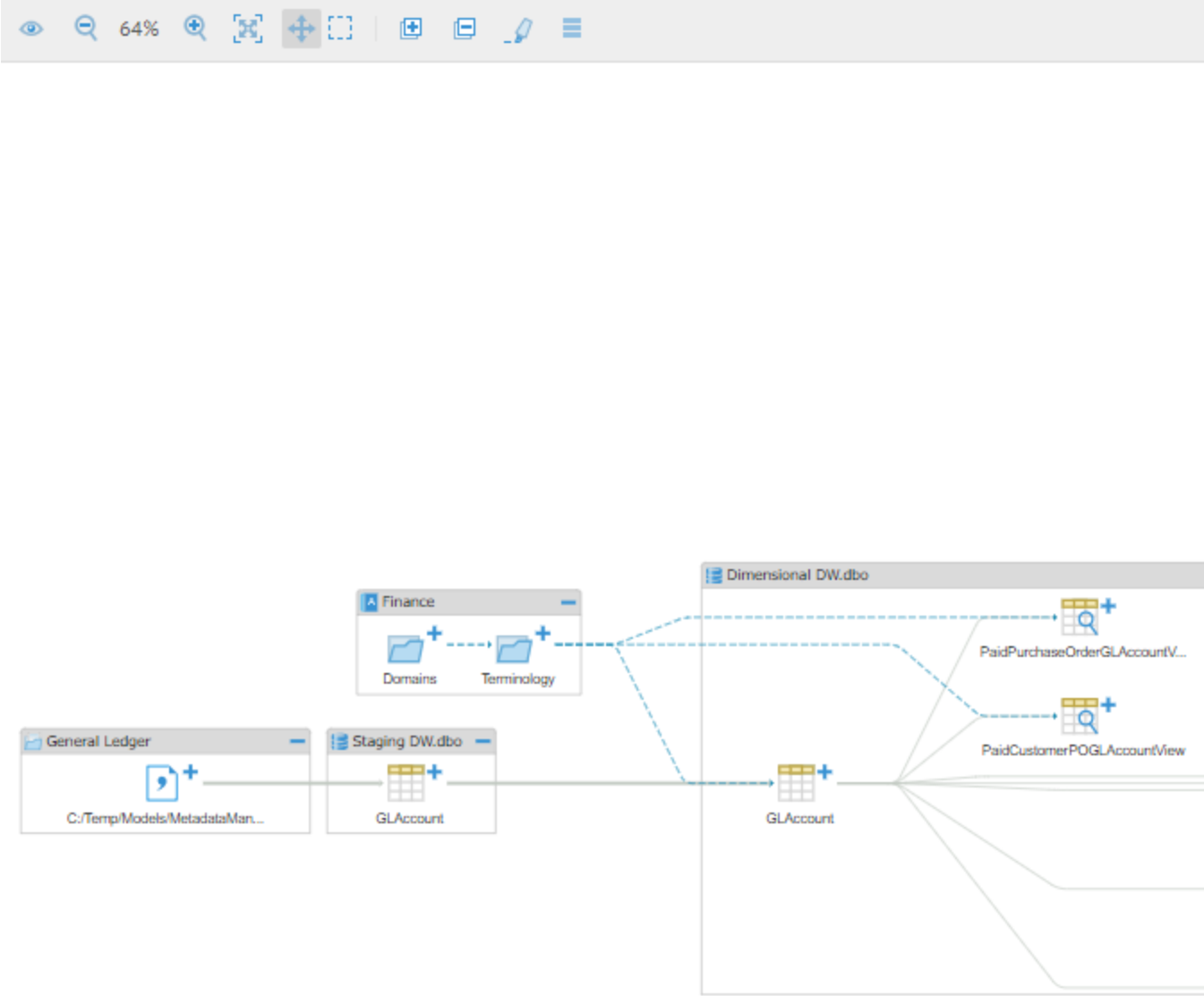
Go to the **Semanic Flow** tab.



The display shows a report of the objects in the semantic flow lineage.

Select the **Diagram** tab on the left.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



You now have a graphical representation of the same.

You may also zoom in/out, expand and collapse objects, highlight paths, show data flow transformation operations, show properties for selected objects, etc., by using the functions in the common trace controls.

You may also download that report to CSV format.

History tab

Review the changes that have occurred to this metadata element in the **Audit Log** tab.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

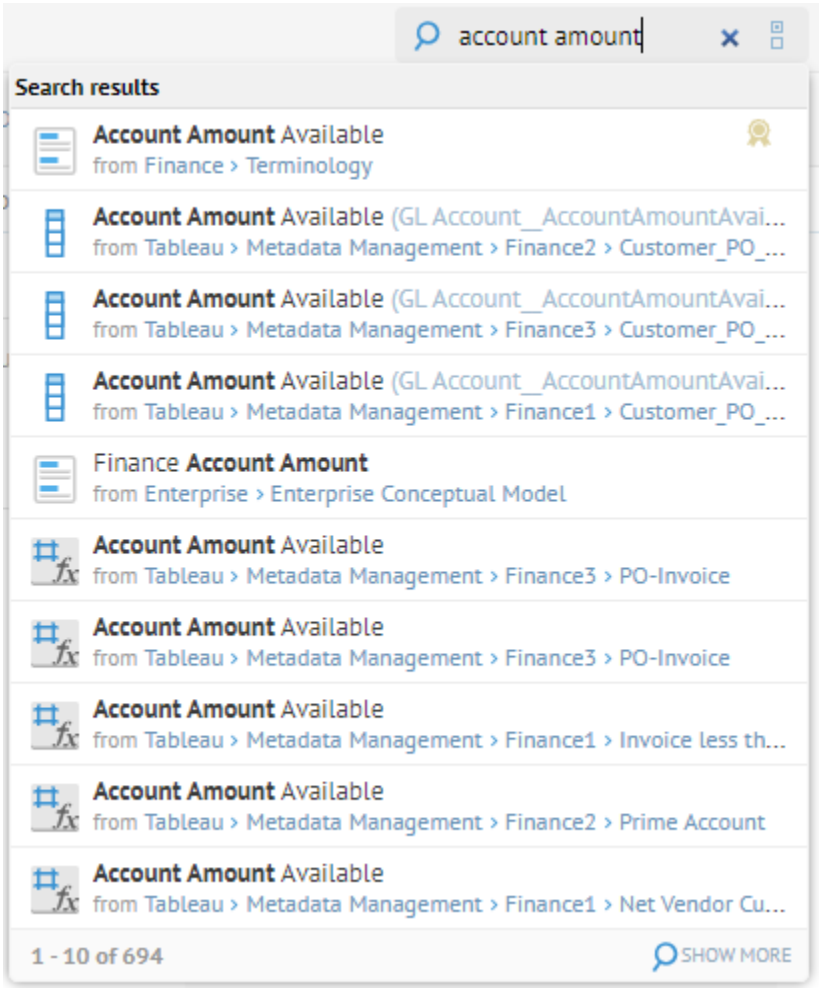
Steps

3. Go to the details page for an object.

4. Go to the **Semanic Flow** tab.

Example

Search for “Account Amount”.



Select the colomn named **Account Amount Available** inside the table **GLAccount** in the **Dimensional DW** database.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

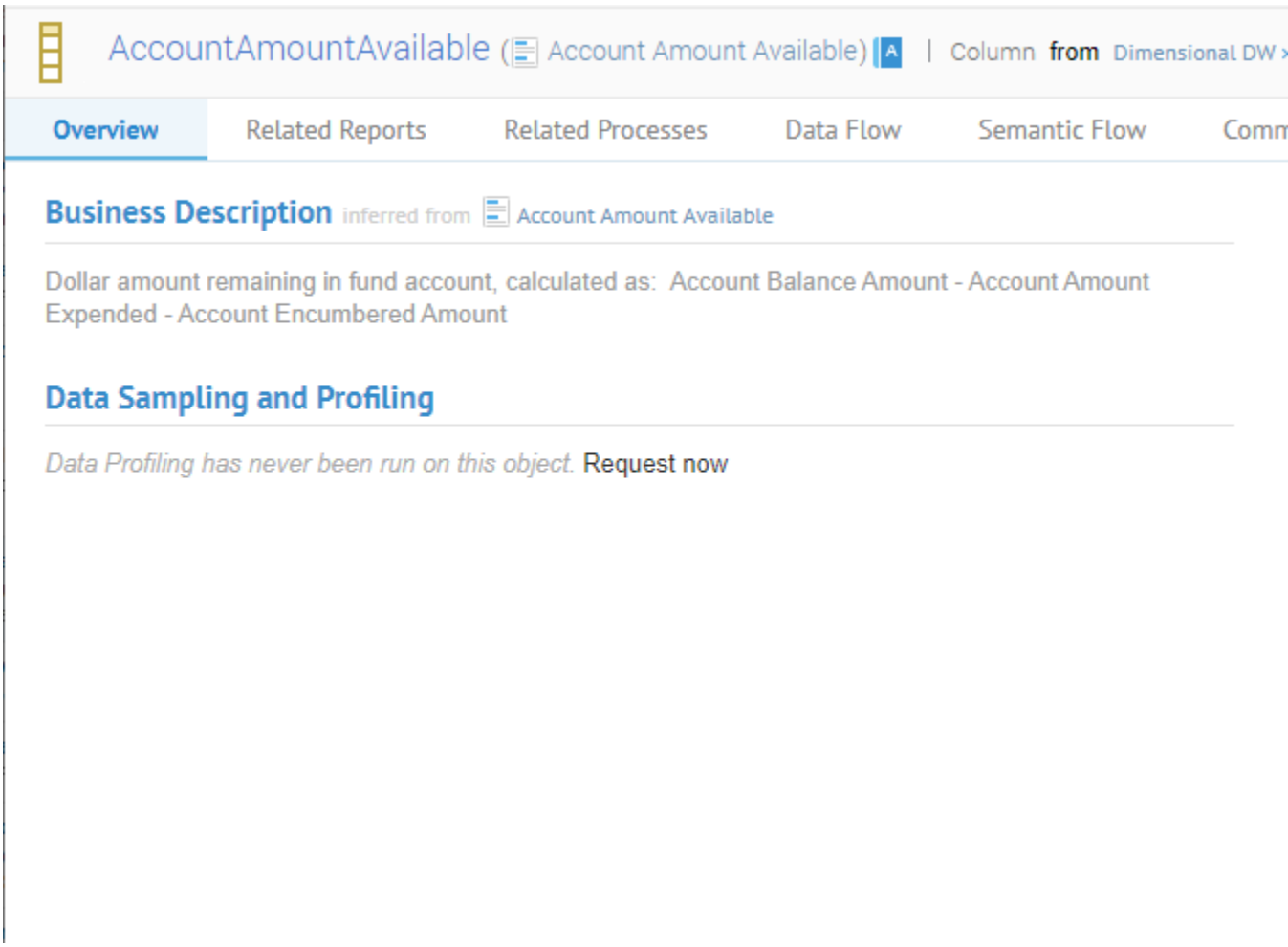
You are presented with the **Overview** tab.

Go to the **History** tab.

The display shows a report of the objects history log of changes, which is empty.

Click to add a comment, enter the text and commit.

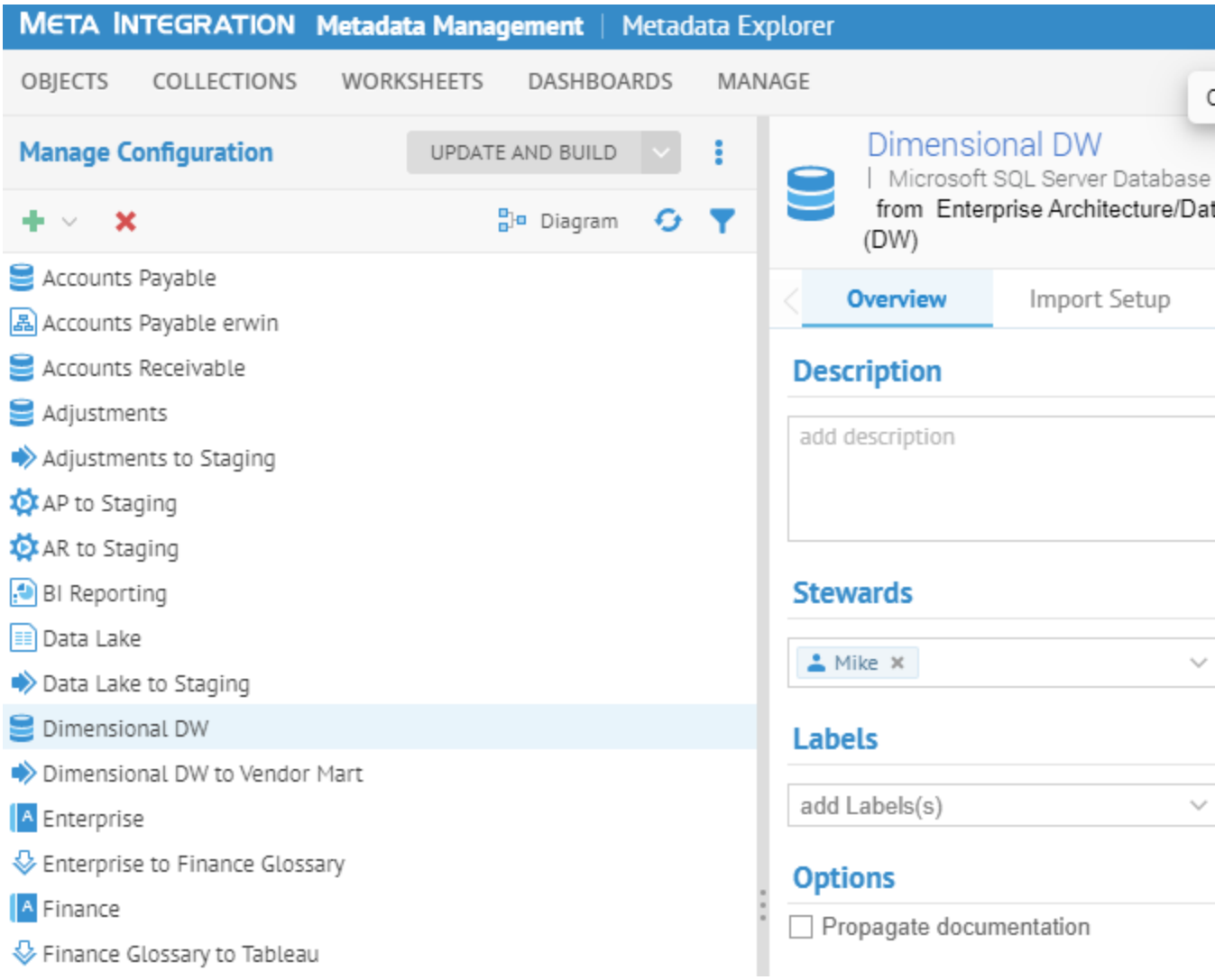
Go to the **History** tab.



The display shows the update with the comment.

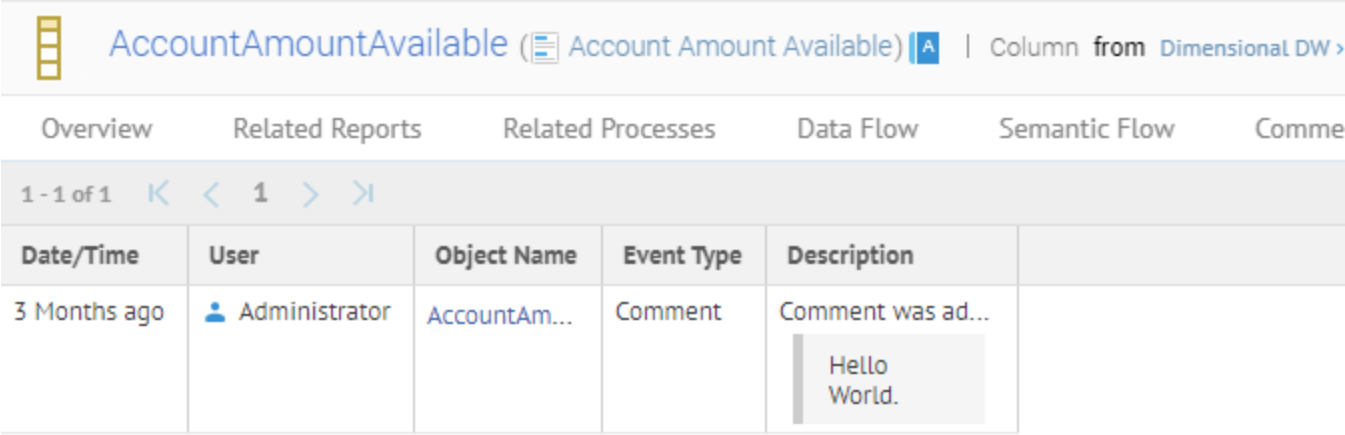
Re-harvest the content (Dimensional DW).

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Return to the colomn named **Account Amount Available** inside the table **GLAccount** in the **Dimensional DW** database and go to the **History** tab.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



The istory for the new content version is migrated from the older version.

You may also page through the results in the usual manner, and you may download that report to CSV format.

Note, audit log history

Customization of tabs using Worksheets

The details page has many tabs and among these are *child* tabs. Each child tab shows a group of related types of child objects. For example, a database **Table** details page has the **Columns** tab that shows regular and PK column objects.

A child tab shows its child objects using a worksheet. A worksheet allows you to change its filter conditions and columns. The child tab lets you to save and recall the worksheet configuration used.

MIMM supports system, personal and applicable worksheet views.

Associate a Worksheet with the tab on a Details Page

You may designate existing worksheets to be used for specific tabs in specific details pages by object type.

Steps

1. Save a worksheet or use an existing one that you either created or is shared with you. It must be filtered to the specific object type that you want to assign it to as the default.
2. Go to the details page of an object that would have a tab that matches the object type of the worksheet.
3. Go to the tab for that object type.

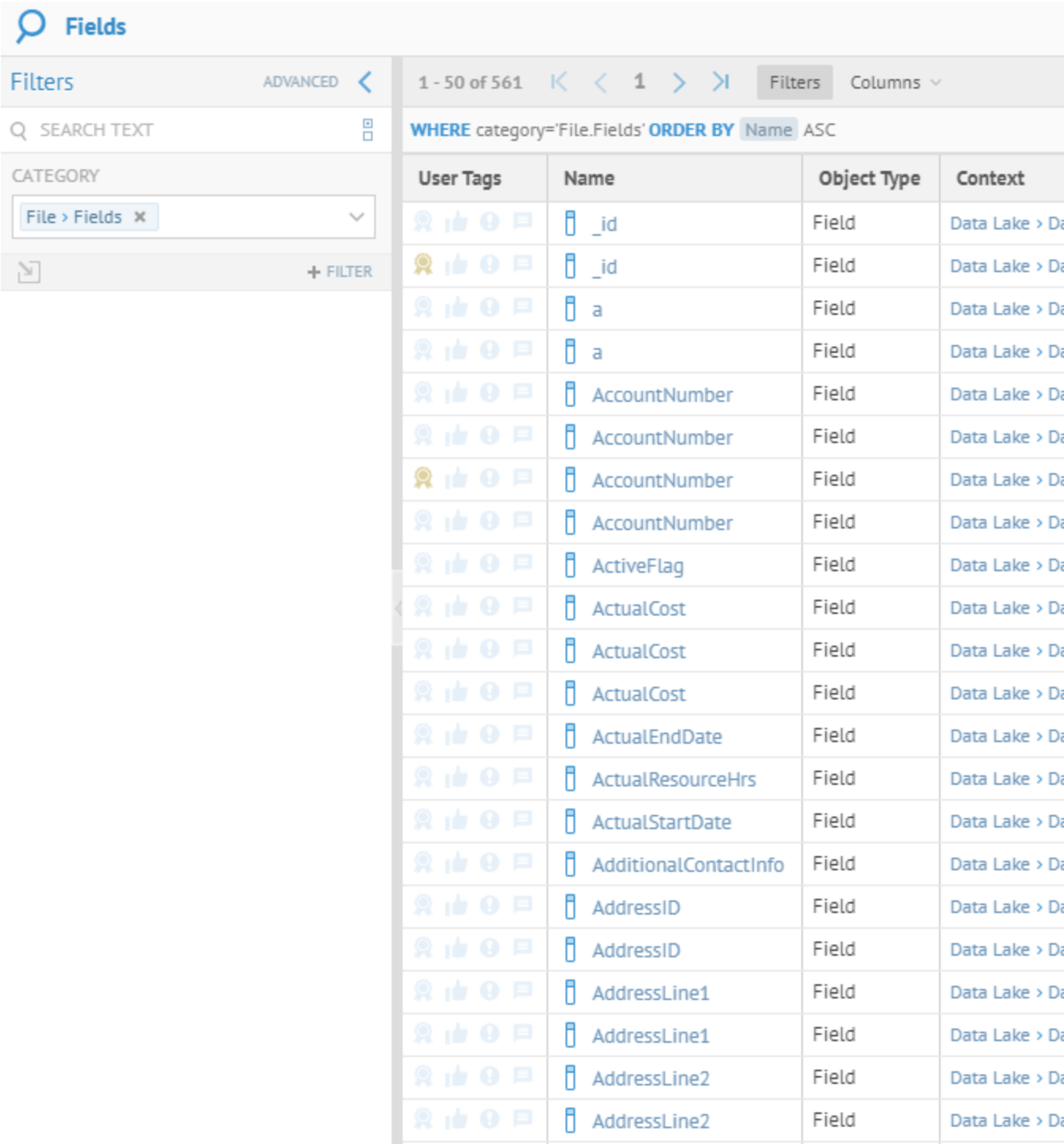
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

4. Pick the worksheet from the **Worksheet** pull-down list.

Example

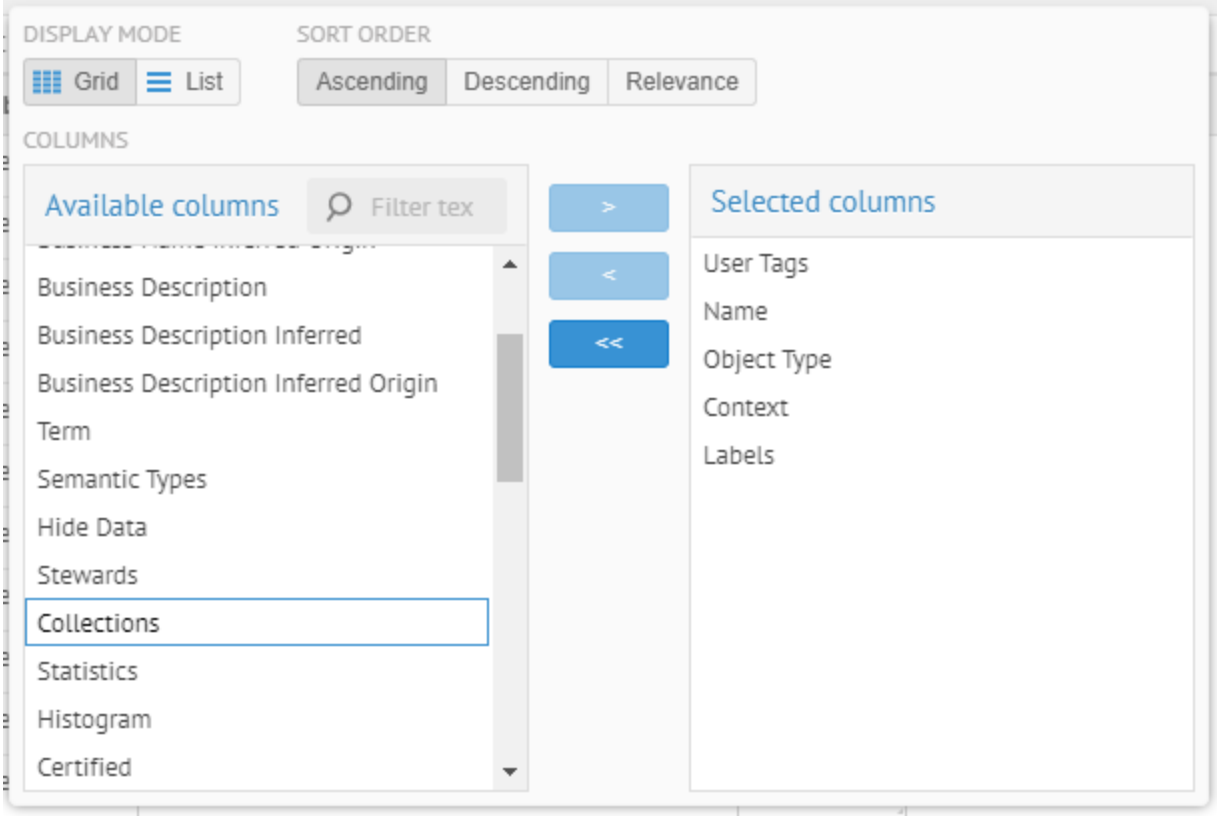
Go to **WORKSHEETS > File > Fields** to create a worksheet for the **Fields** tab in **File System** files.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

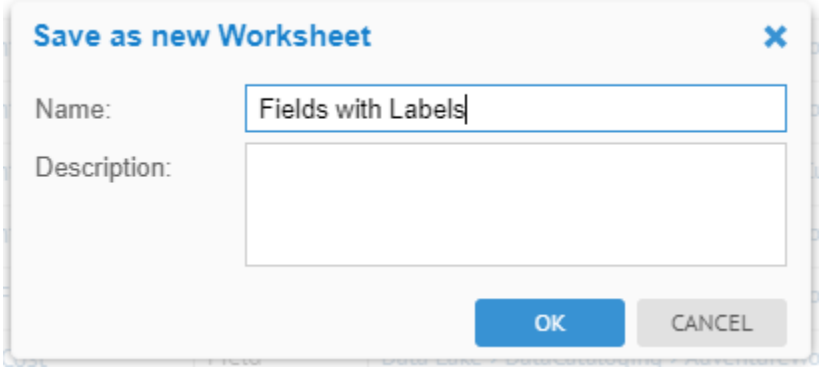


Click **Columns** and add Labels to the displayed columns.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



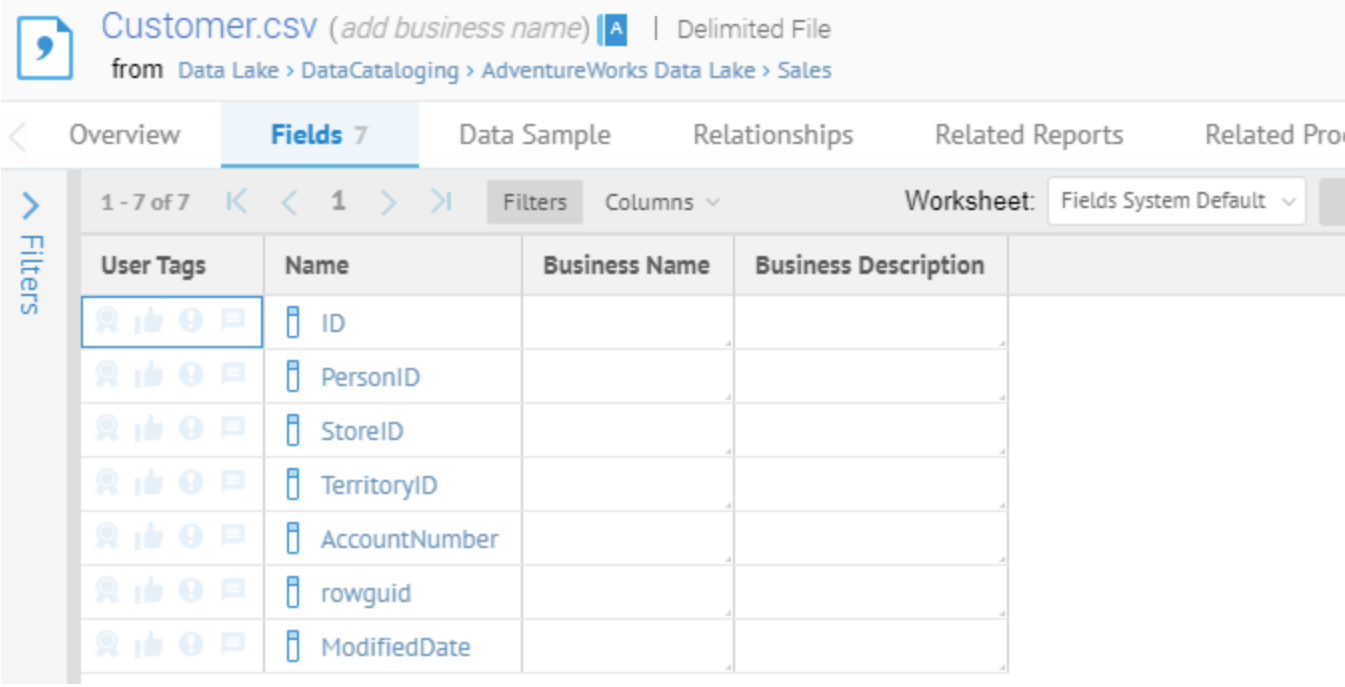
Save the worksheet as “Fields with Labels”.



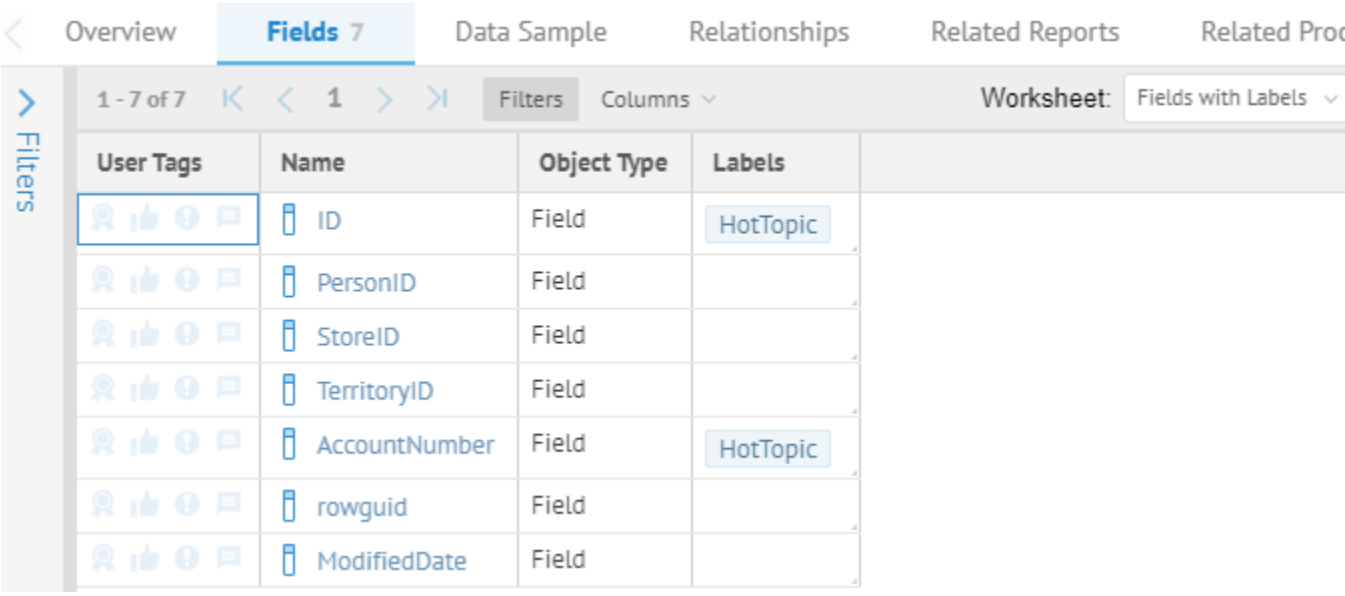
Now, search for **Customer.csv** and click to go to its details page. Go to the **Fields** tab.

Select **Fields with Labels** from the list of **Applicable** worksheets.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



An the result is the worksheets is used for the **Fields** tab.



*This will now the default presentation. You may always restore the original by select **Default1** from the **Worksheets** pull-down.*

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Personal Default Worksheets

You may take the current worksheet being used for a particular tab on the details pages and Save As a default worksheet for yourself as a **Personal Default Worksheet.** Any user can save and recall their personal defaults per child tab.

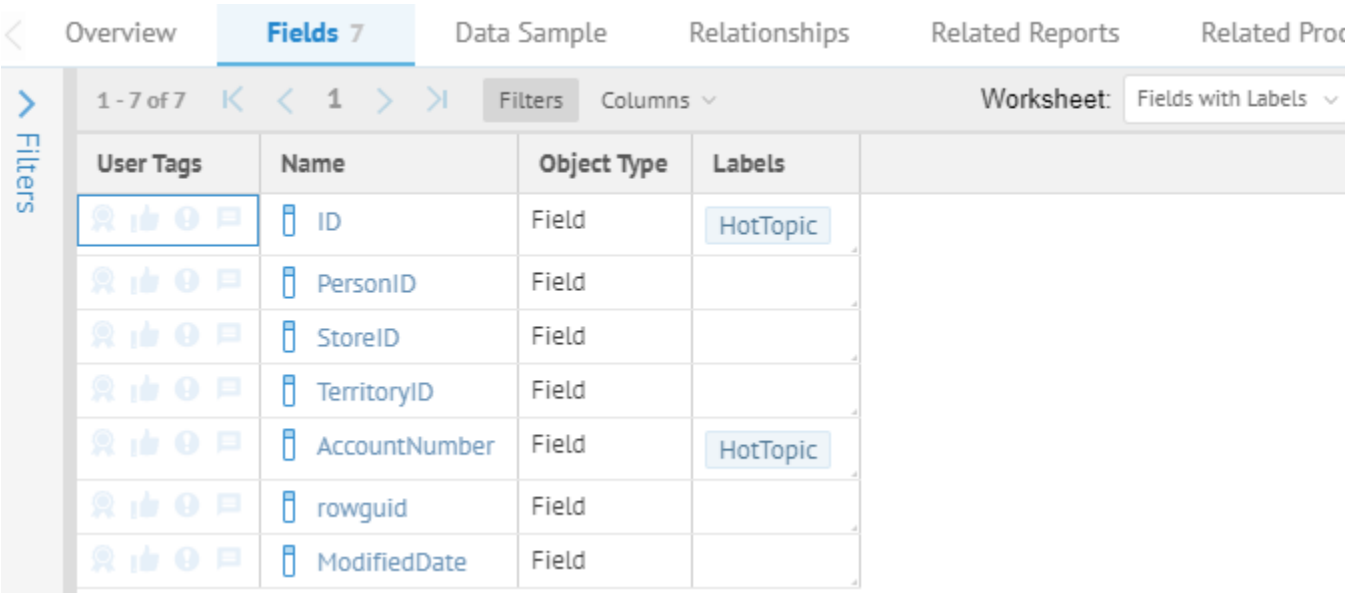
System and personal defaults apply to a particular tab only. When you need to have a default worksheet that applies to multiple tabs you can define a worksheet that applies to types of children objects these tabs shows.

Steps

1. Associate a worksheet with the tab for a details page.
2. Click **Save As**.
3. Click the **Personal** radio button and provide a **Name** and **Description** for the default worksheet.
4. Click **OK**

Example

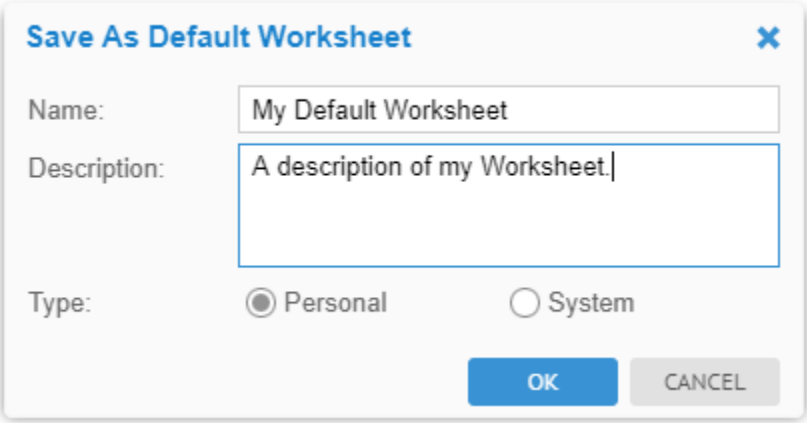
Follow the example to Associate a worksheet with the tab for a details page.



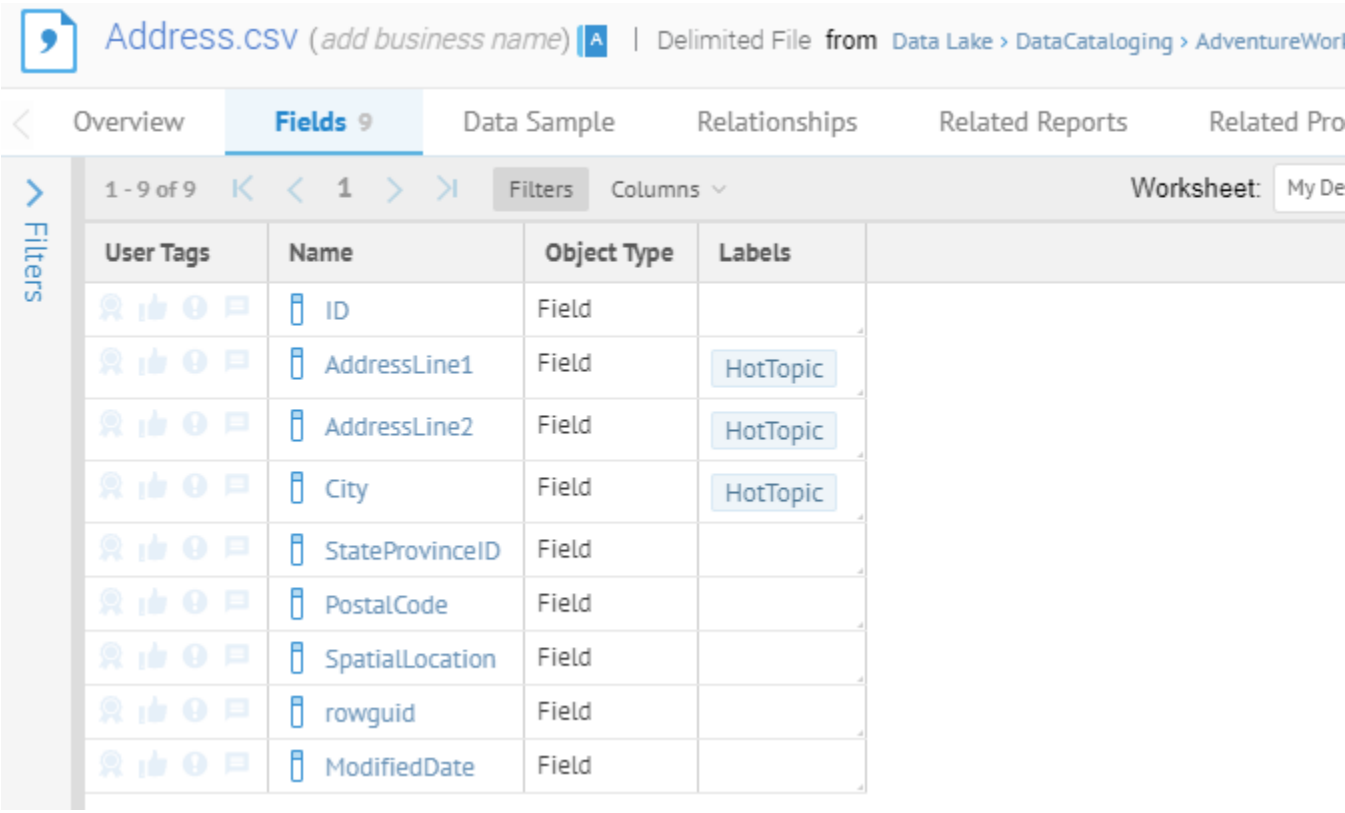
Click **Save As**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Click the **Personal** radio button and provide the below **Name** and **Description** for the default worksheet, and click **OK**:



It is now in the list of defaults.



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Now, search for **Address.csv** and click to go to its details page.

Go to the **Fields** tab.

The same Default Fields Worksheet to is the default presentation.

System Default Worksheets

An member of the Application Administrators group can Save As a system default worksheet for a child tab and share it with other users and/or groups. The child tab then shows the worksheet to any user in these groups by default. When a user is a member of different groups that have different defaults, the child tab makes all of these options available to the user. The child tab shows the first one (according to the alphabetical order) to the user, by default. In this way, you may published default presentations to these users.

System and personal defaults apply to a particular tab only. When you need to have a default worksheet that applies to multiple tabs you can define a worksheet that applies to types of children objects these tabs shows.

Steps

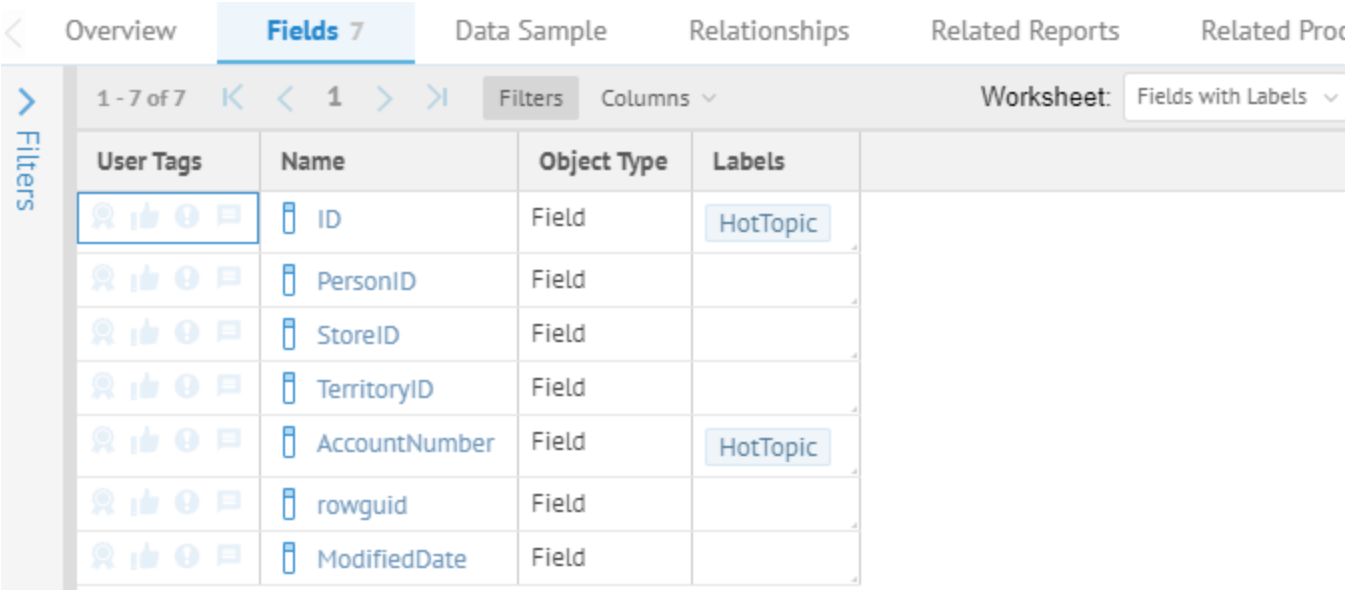
1. Sign in as a member of the Administrators group.
2. Associate a worksheet with the tab for a details page.
3. Click **Save As**.
4. Click the **System** radio button and provide a **Name** and **Description** for the default worksheet.
5. Specify the Users and/or Groups to assign this system default worksheet to.
6. Click **OK**

Example

Sign is as Administrator.

Follow the example to Associate a worksheet with the tab for a details page.

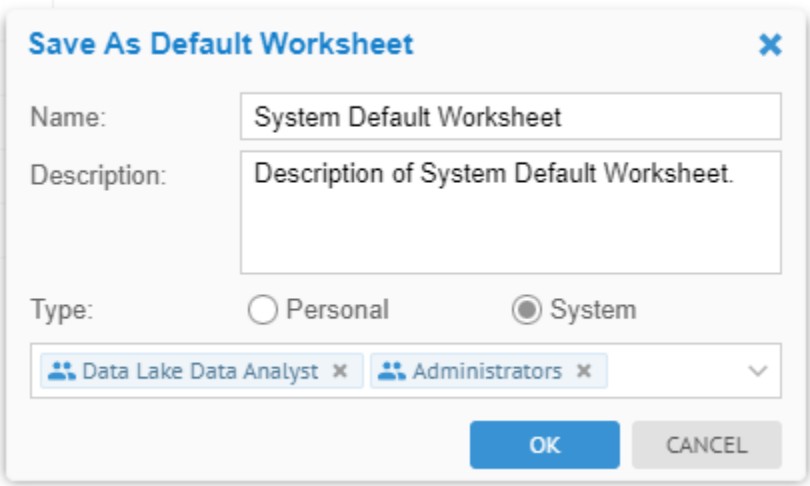
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click **Save As**.

Click the **System** radio button and provide the below **Name** and **Description** for the default worksheet.

Pick the below two Groups to assign the System Default to and click **OK**:



Sign out.

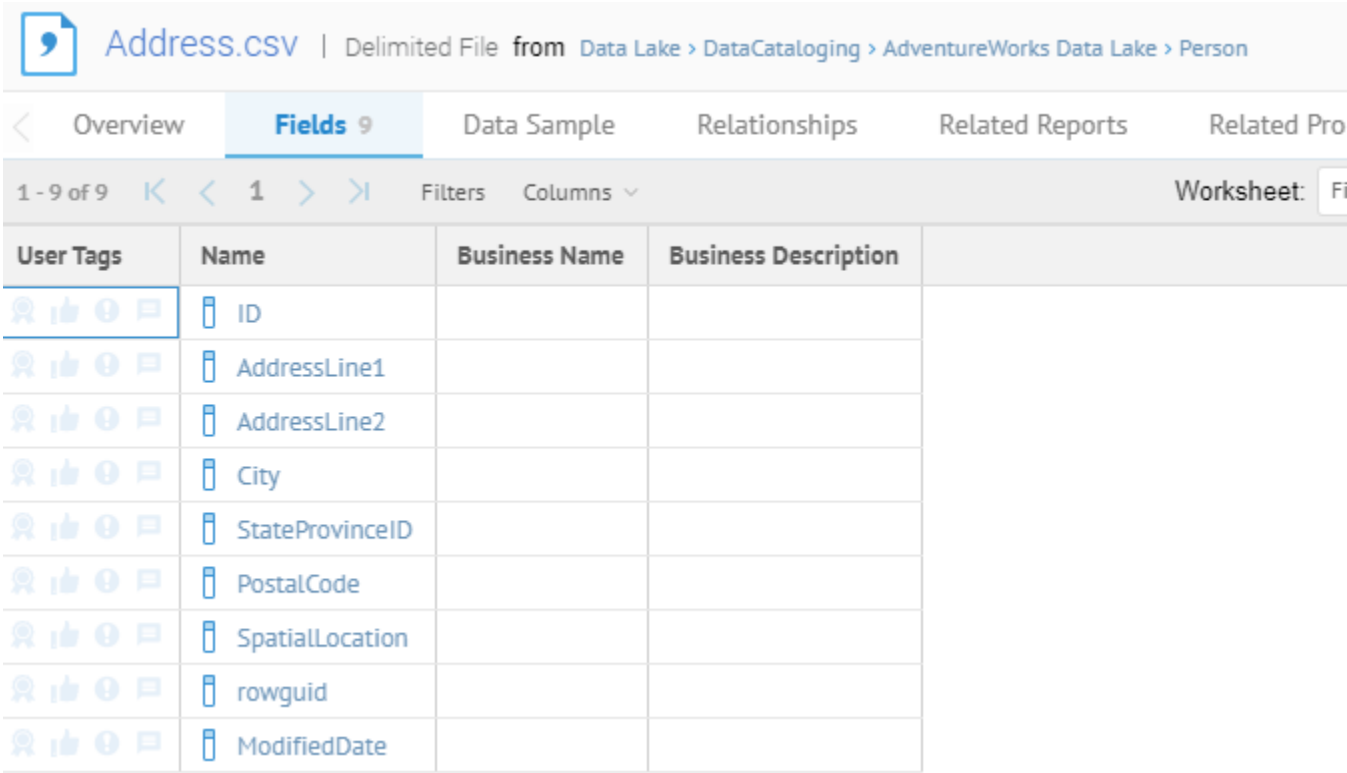
Sign in as David.

Now, search for **Address.csv** and click to go to its details page.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Go to the **Fields** tab.

*The same **Fields System Default** worksheet to is the default presentation.*



Metadata Details Page Customized Presentation

Customizing the Details Page Presentation

You may customize details page presentation entirely. You may

- Develop a **Presentation** of the details page **Overview** tab in a manner similar to creating a Dashboard
- Show/Hide the various details page tabs, e.g., **Columns**, **History**, **Data Flow**, etc.

Choose a Customized Presentation

For any object category (e.g., terms, fields, tables, etc.) you may pick an existing customized overview from a pool of ones you have created or have been shared with you.

Steps

1. Go to the details page for an object category.

2. Go to the **Preferences** menu in the upper right.

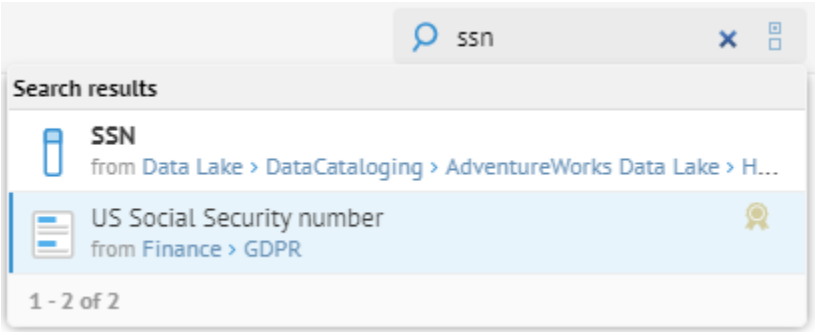
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

3. Select any overview presented there.

4. Select **Presentation** to create a copy of what is currently shown in order to edit that.

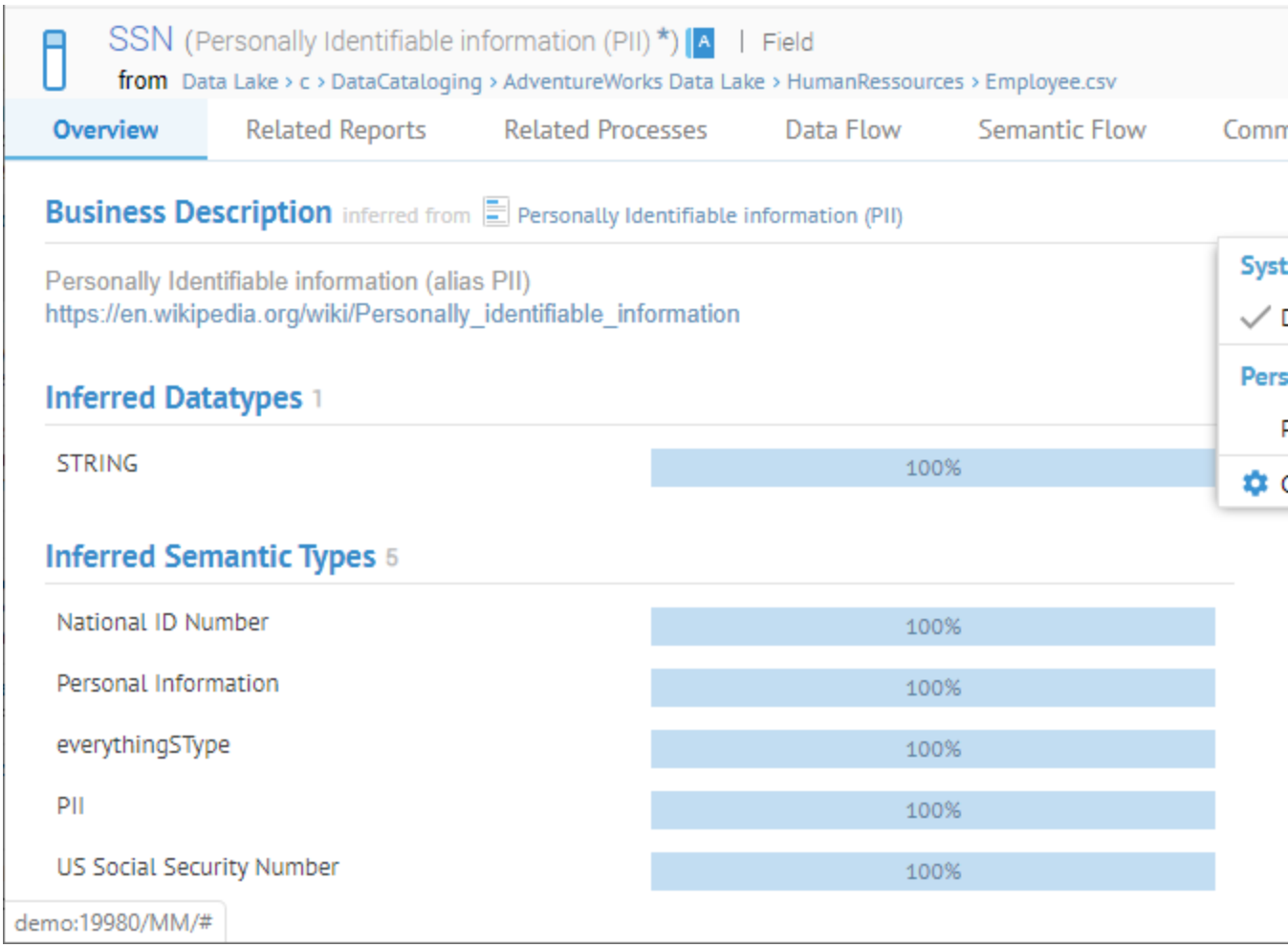
Example

Search for SSN.



Select the term name US Social Security Number.

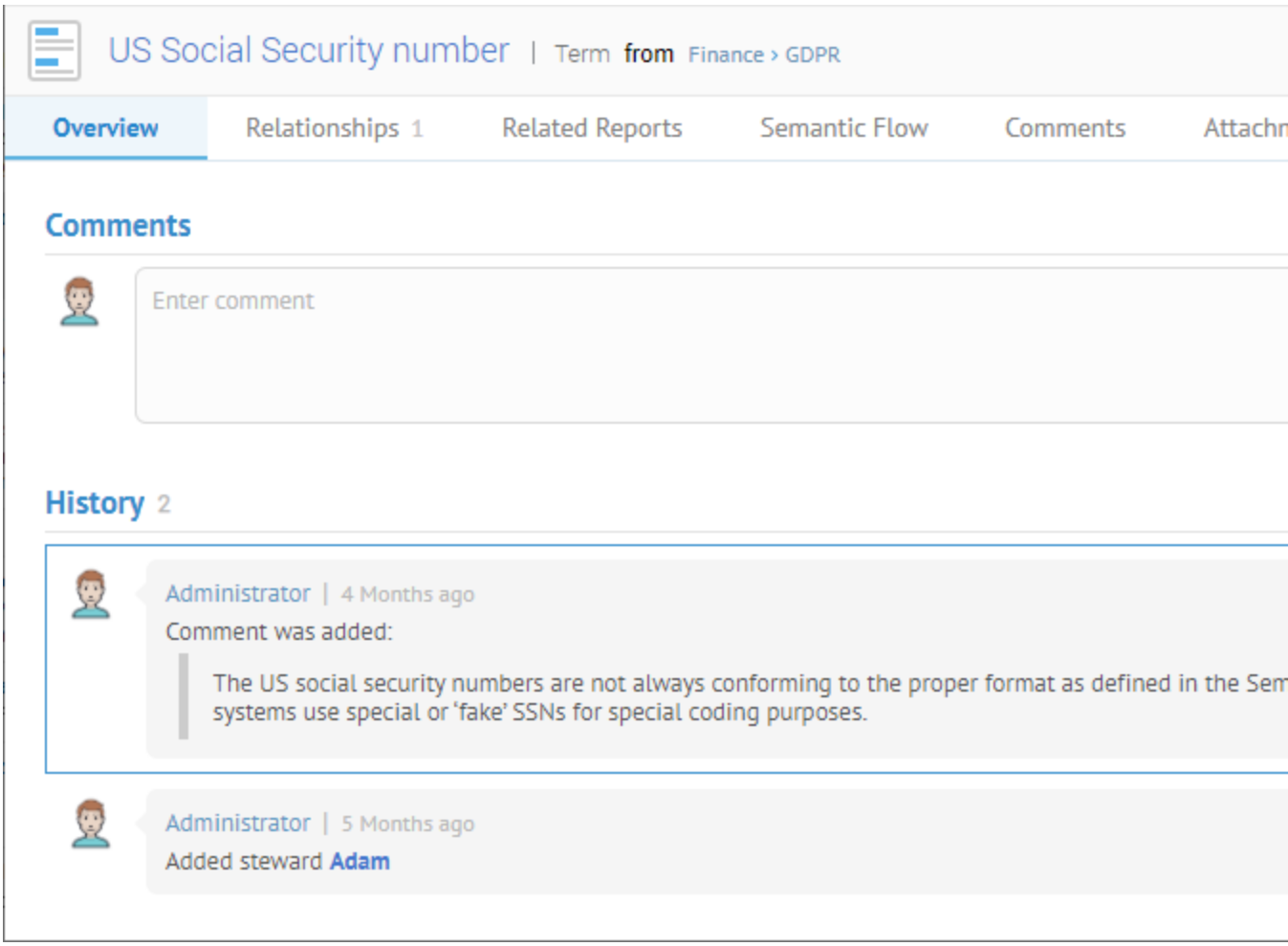
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



*You are presented with the **Overview** tab. Thus, we will be picking a customized presentation for any **term** (object category).*

Go to the **Preferences** ( ) menu in the upper right and select the **PII** presentation presented there.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



*We now see the history and social curation details in the **Overview** tab.*

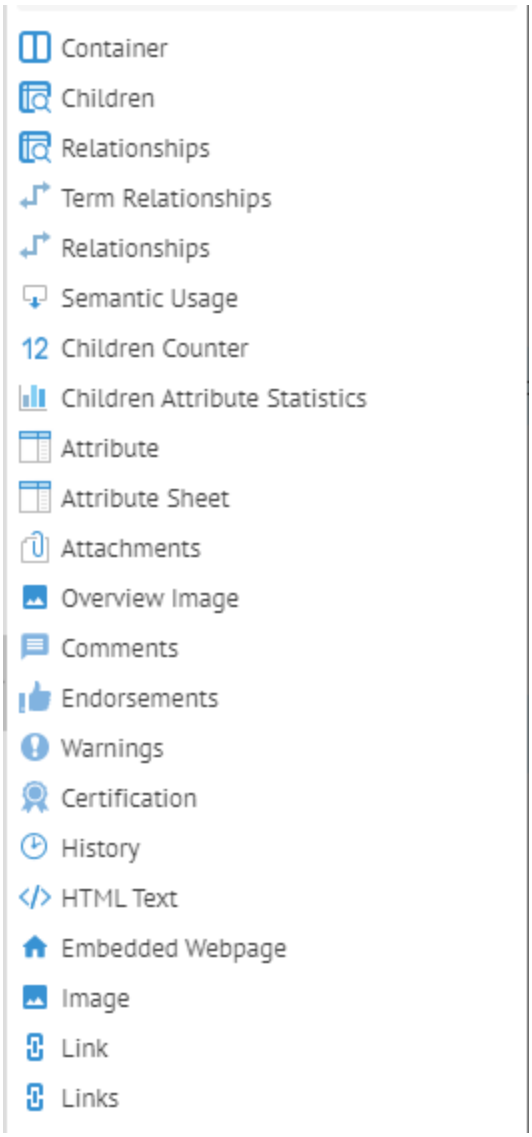
Customize a Presentation

For any object category (e.g., terms, fields, tables, etc.) you may start from an existing presentation and customize it. It may be a *system presentation* if you are an administrator.

Steps

1. Go to the details page for an object category.
2. Go to the **Preferences** menu in the upper right.
3. Select **Presentation** > **Customize**.
4. From here you may:
   - Add Widgets, including containers

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



- Customize existing widgets and containers
- Rearrange containers and widgets
- Close without saving.
- Save your work.
- Save your new work as a newly created overview.

Several wdgets are included by default, and vary by object category. Some are not included by default, generally as these would affect display performance significantly. In particular, ***History*** *and* ***Comments*** *(including endorcesments, warnings and certifications).*

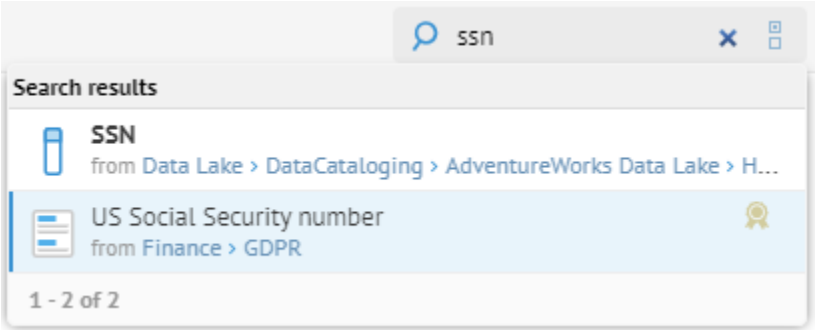
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Many of the widgest are also used in dashboards, and you may learn how to use them in the [edit dashboard widgets section](#).

Here are examples of the other widgest unique to presentations.

Example

Search for **SSN**.



Select the term name **US Social Security Number**.

*You are presented with the **Overview** tab. Thus, we will be customizing the **Overview** tab presentation for any **term** (object category).*

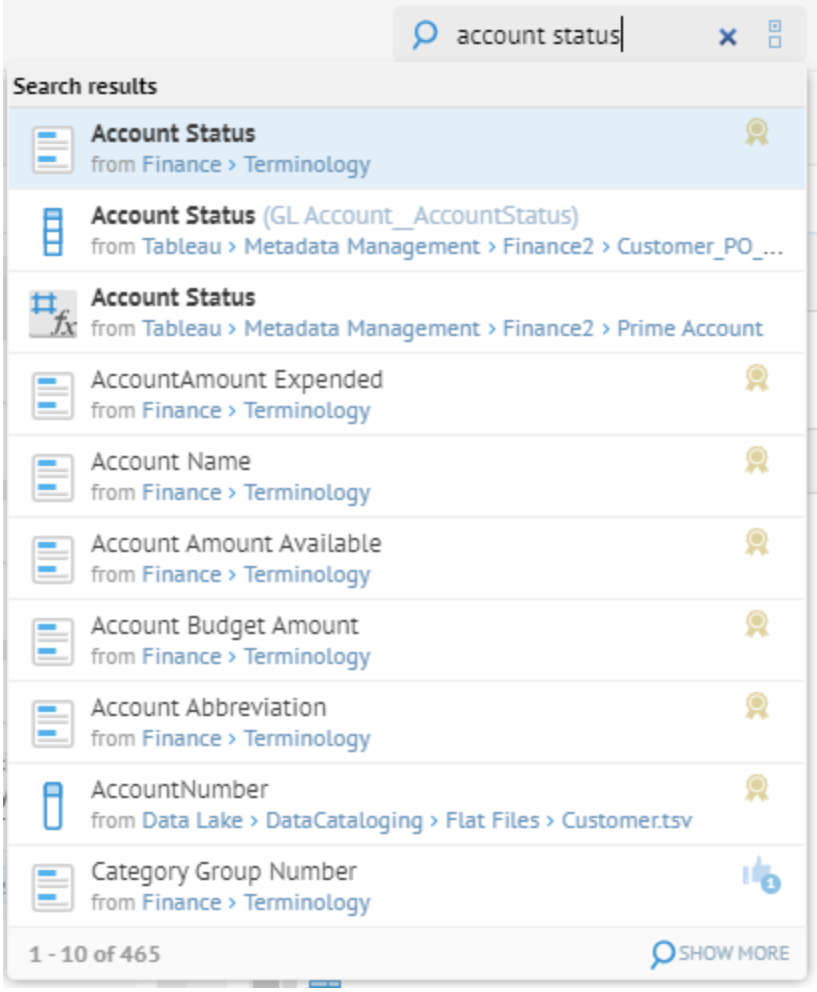
Go to the **Preferences** menu in the upper right and select the **Presentation > Customize**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

One generally begins with an existing presentation, not from scratch.

Now, search for **Account Status** and select the **Term** with that name.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



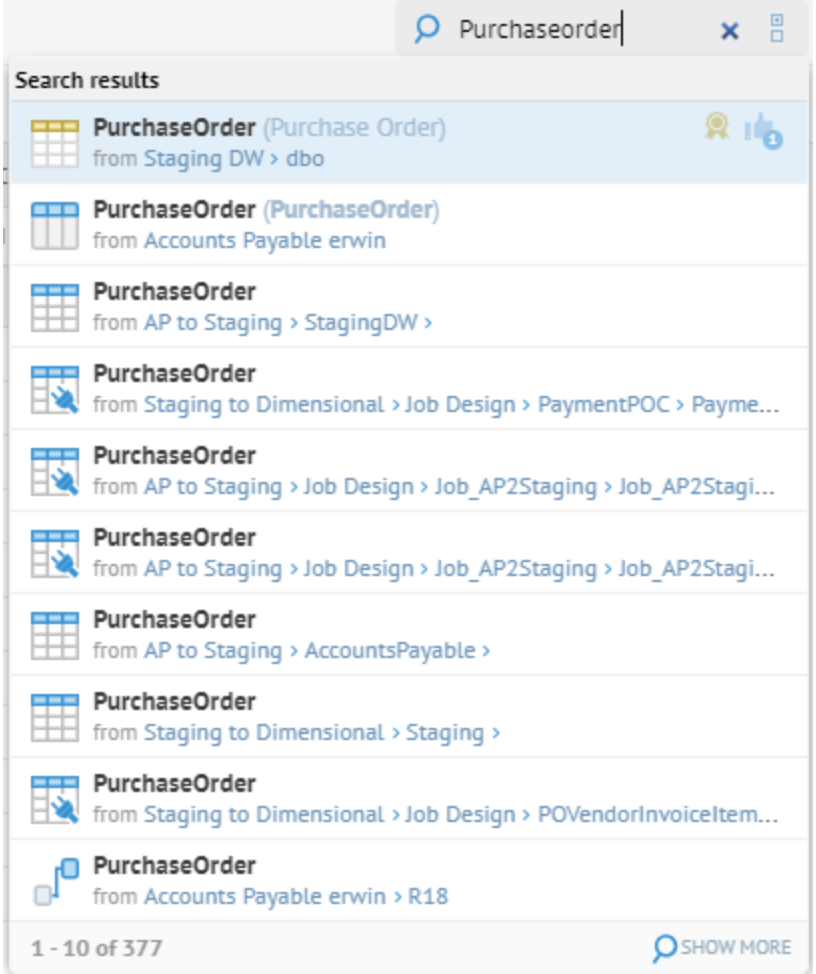
The same customized overview is shown. This will be true until you pick another one. There is a Certification shown, but no warnings.

Add Children Widget to a Presentation

With the children widget you may provide a display of the children of any category (e.g., columns in a table).

Search for **Staging DW.PurchaseOrder** and go to the details page.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

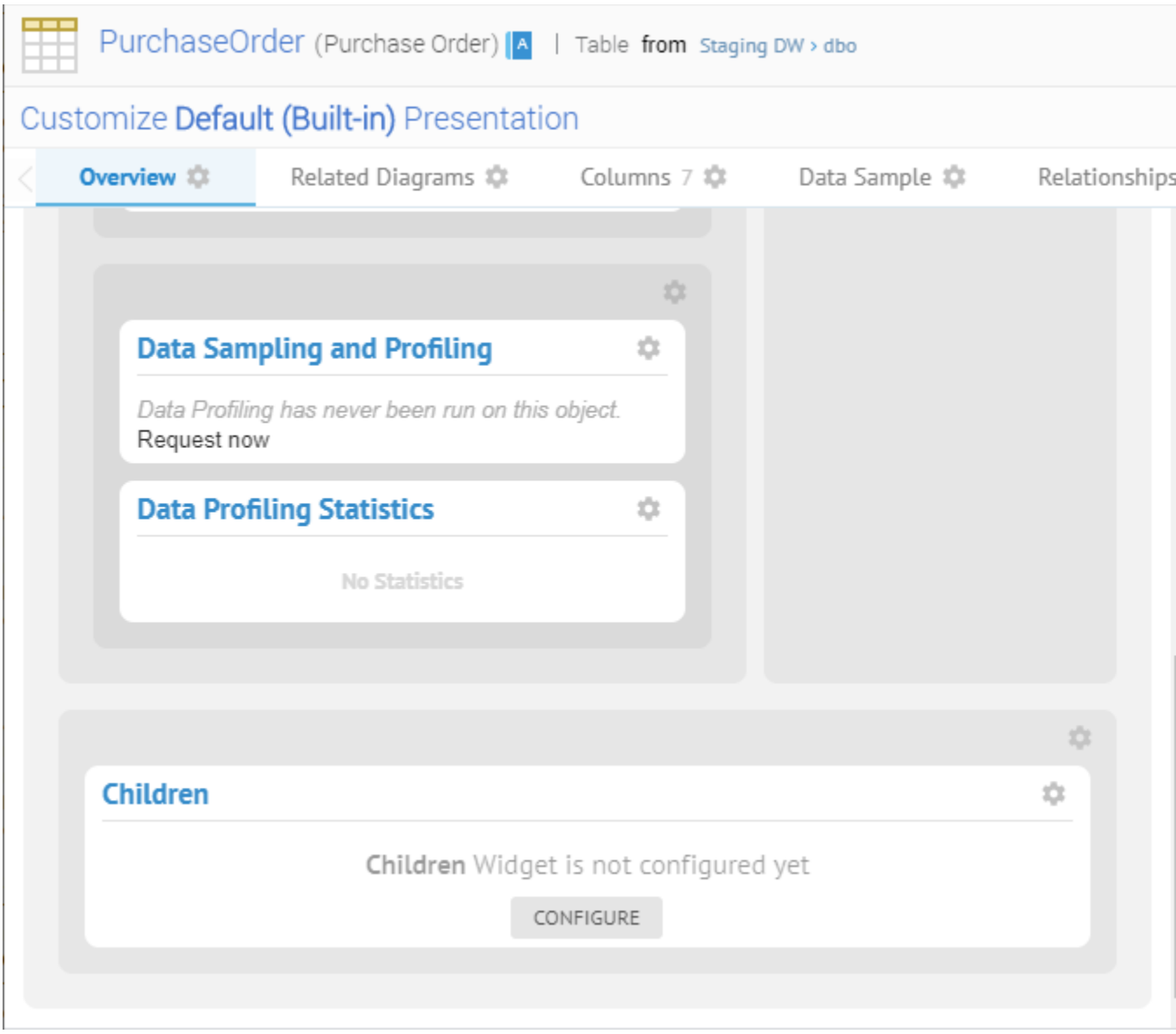


*Wwe will be customizing the **Overview** tab presentation for any **term** (object category).*

Go to the **Preferences** menu in the upper right and select the **Presentation > Customize**.

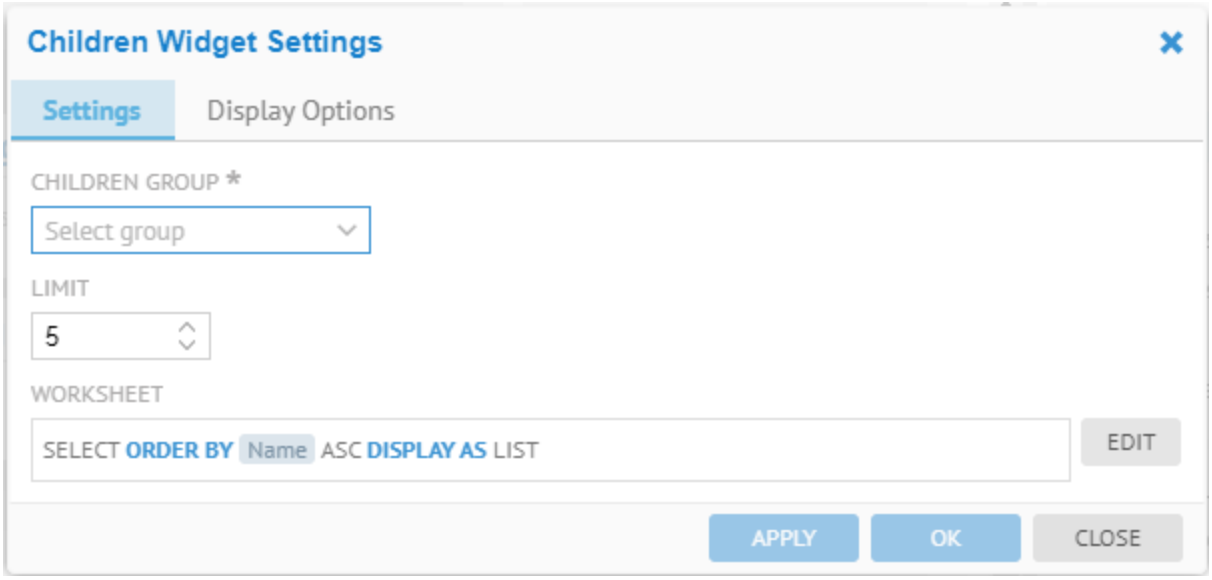
Drag the **Presentation** widget into the lowest container.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

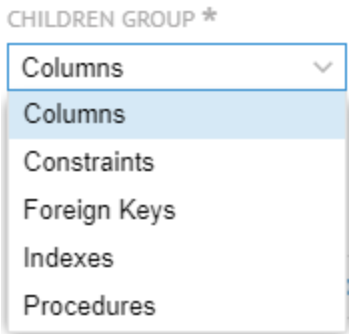


Click **CONFIGURE**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

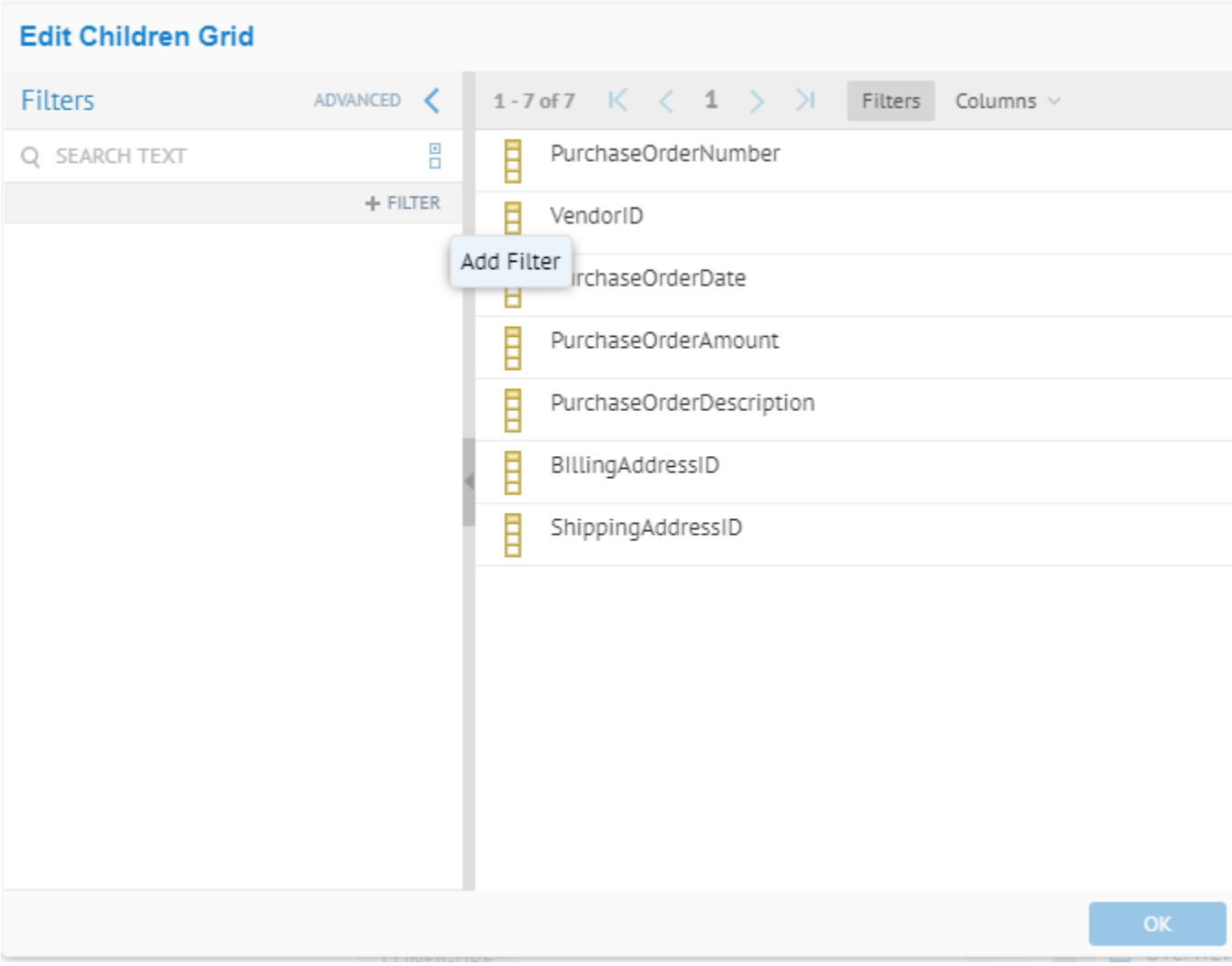


Select **Columns** from the **CHILDREN GROUP** pull-down.



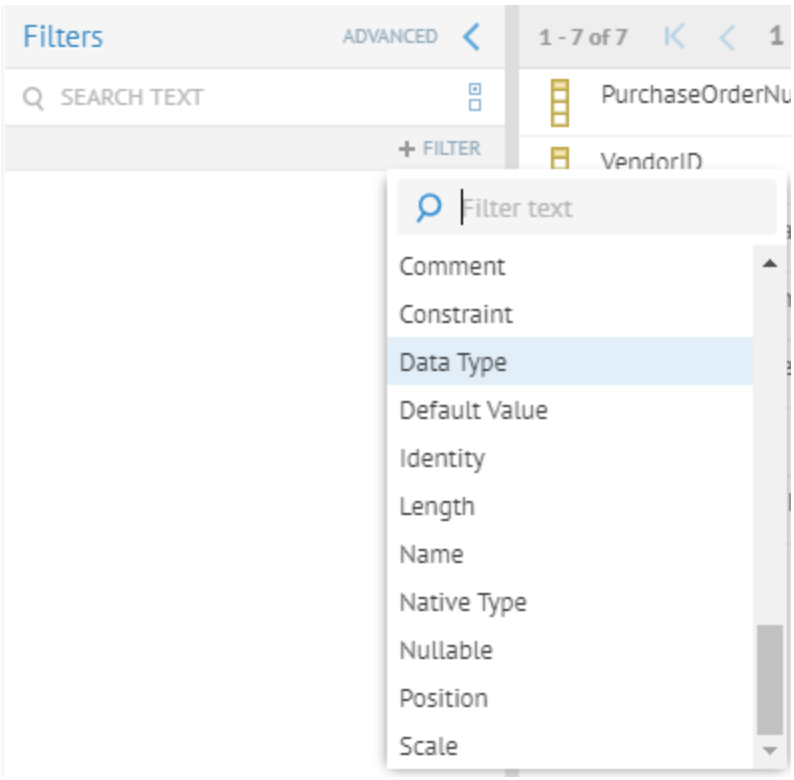
Click EDIT for the WORKSHEET statement.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

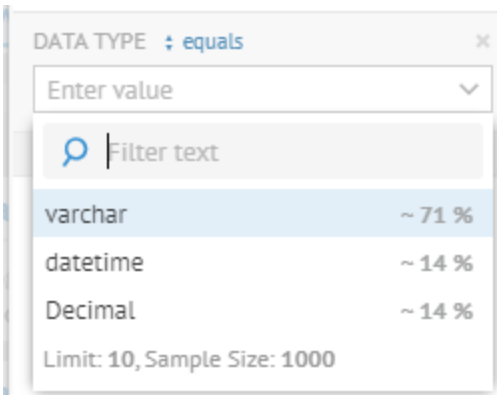


Add a **FILTER** on **Data Type**.

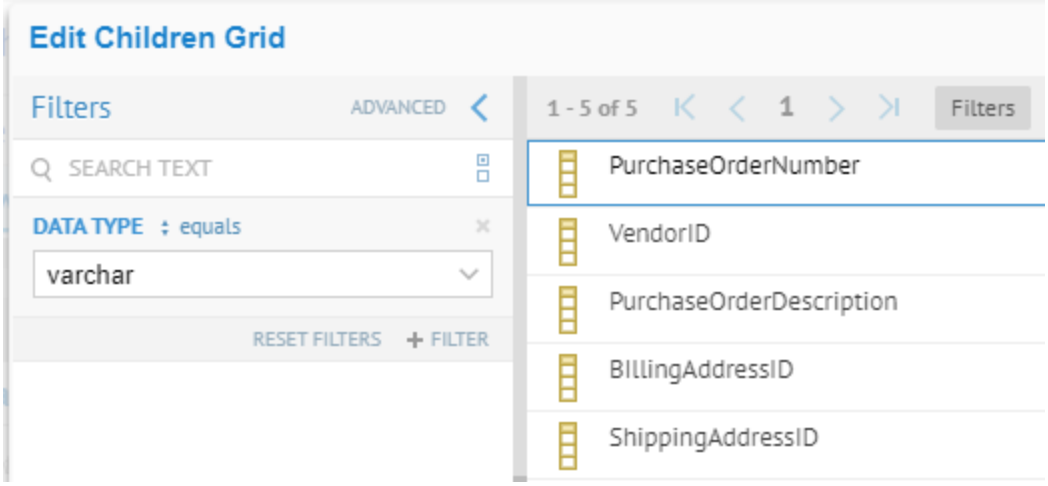
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Specify **varchar**.



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



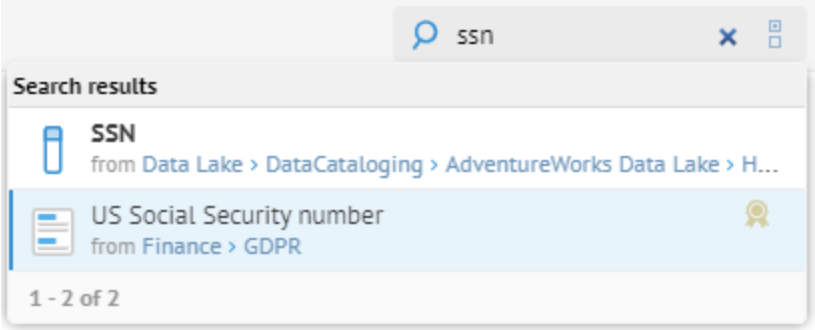
Go to the Display Options tab and rename the TITLE to “Text Columns”.

Click **OK**.

Add History Widget to A Presentation

Search for SSN.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



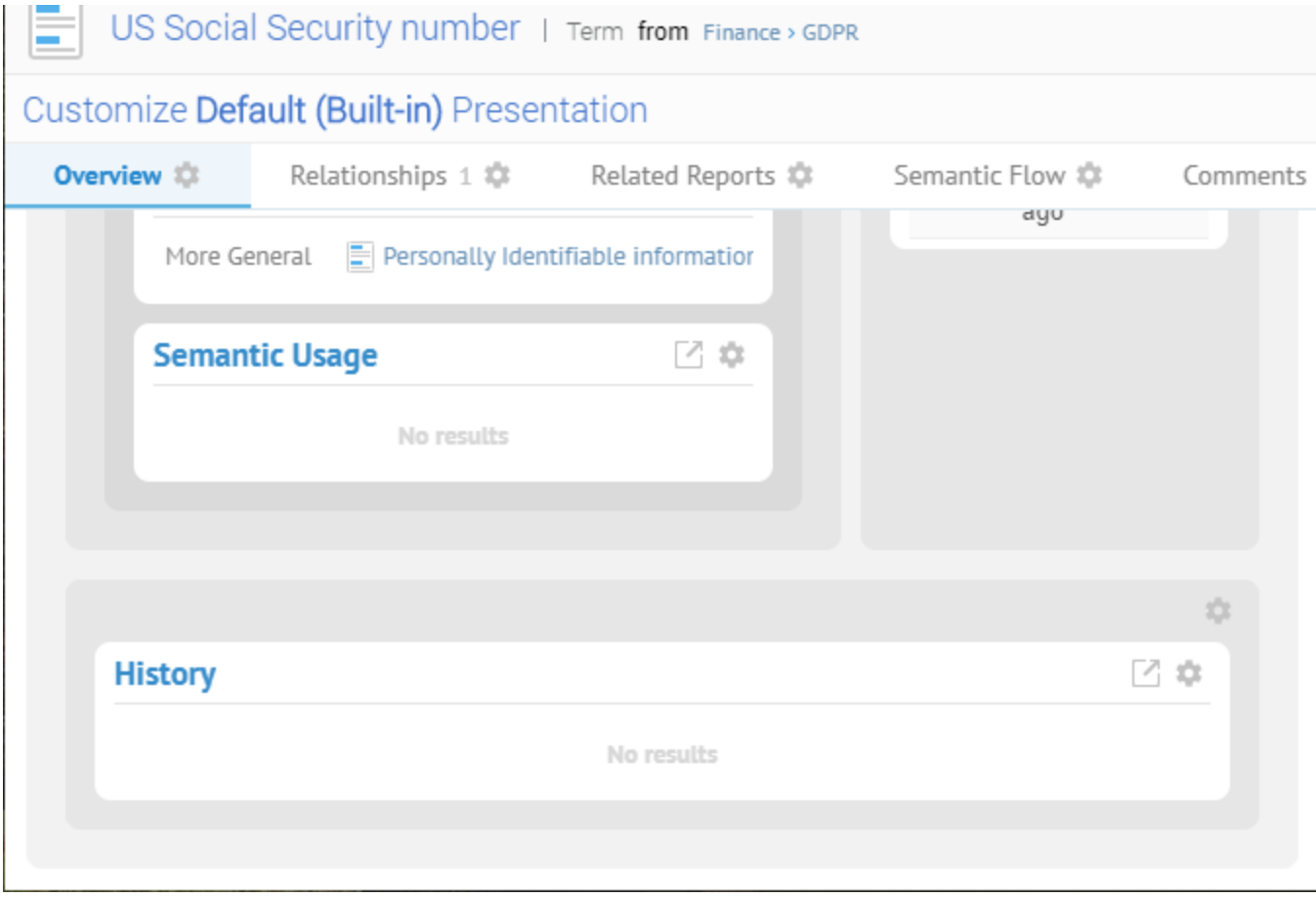
Select the term name US Social Security Number.

*You are presented with the **Overview** tab. Thus, we will be customizing the **Overview** tab presentation for any **term** (object category).*

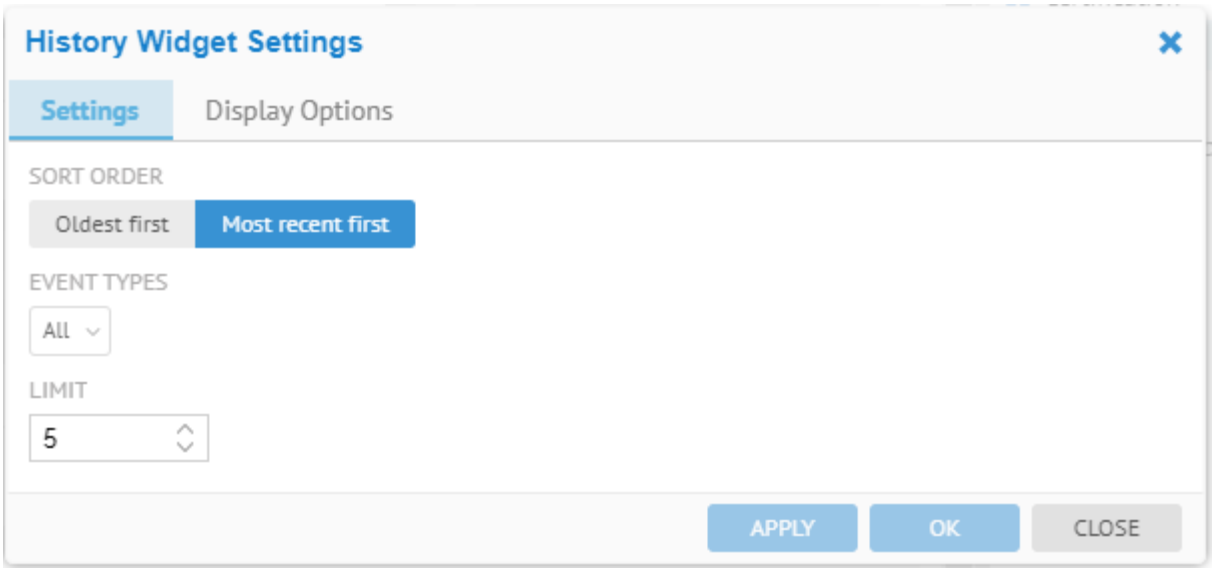
Go to the **Preferences** menu in the upper right and select the **Presentation > Customize**.

Drag the **History** widget into the lowest container.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



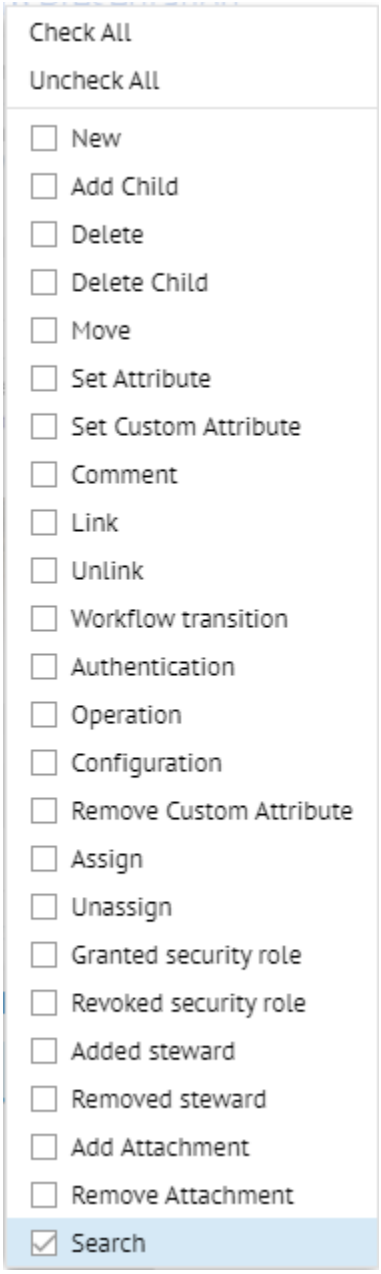
Click **Configure** for the new widget.



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Speciy **Most recent first** as the **SORT ORDER**.

Click on the **EVENT TYPES** pull down and select **Search**.



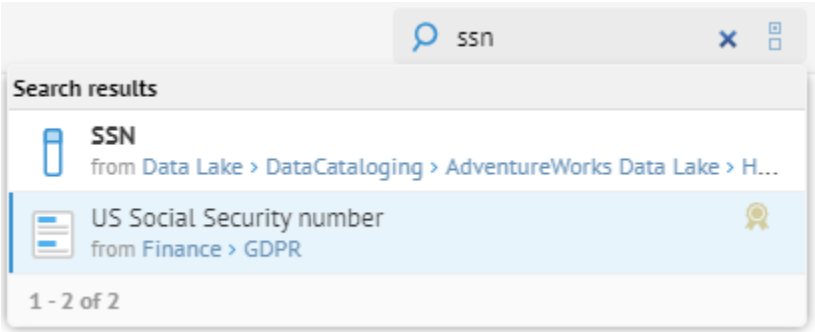
Click **OK**

Click SAVE AS.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Add Comments to the Details Page

Search for SSN.



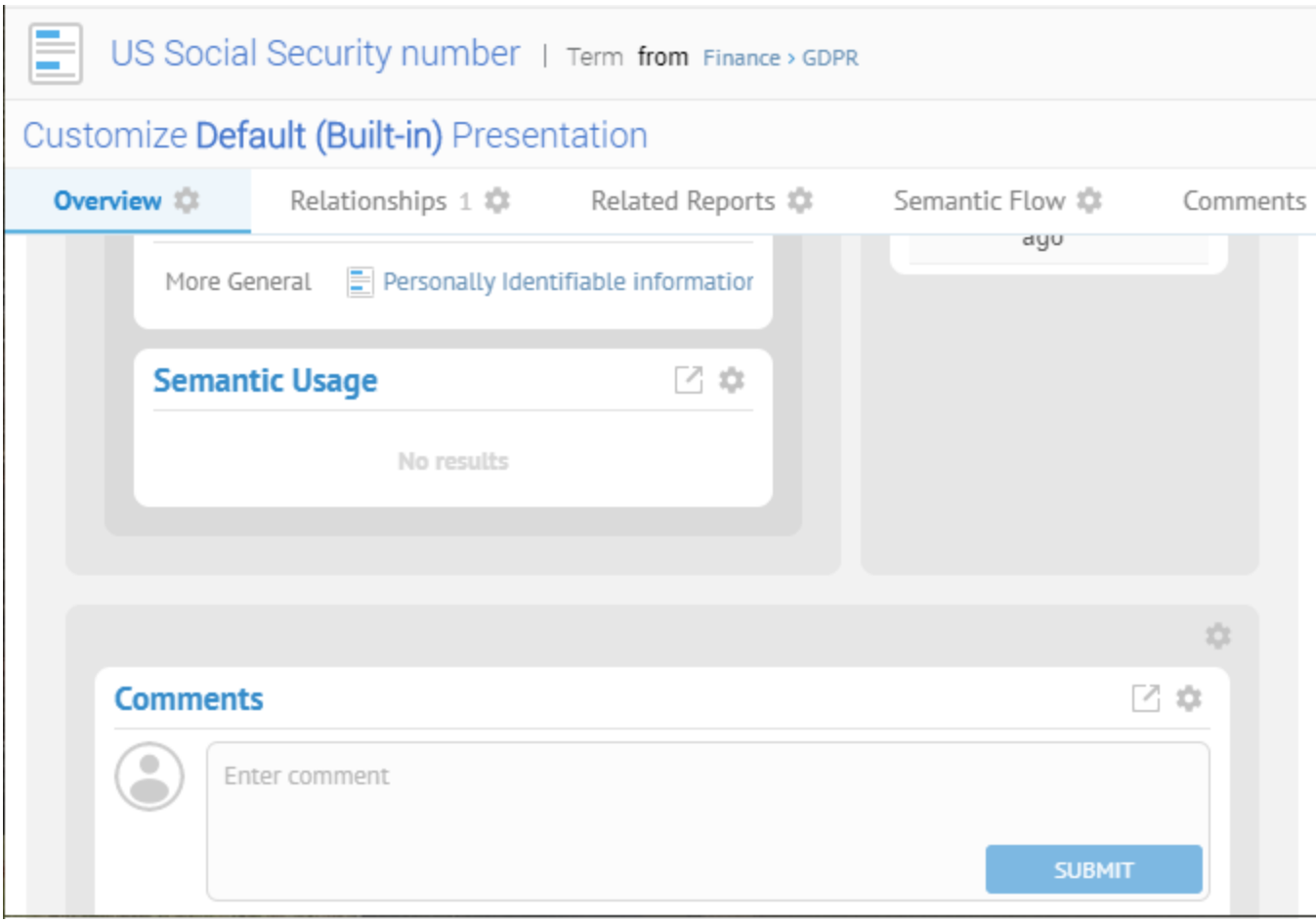
Select the term name US Social Security Number.

*You are presented with the **Overview** tab. Thus, we will be customizing the **Overview** tab presentation for any **term** (object category).*

Go to the **Preferences** menu in the upper right and select the **Presentation > Customize**.

Drag the **Comments** widget into the lowest container.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click **SAVE AS**.

Manage Default Presentations

You may manage your overviews and define default (system) overviews by going to MANAGE > Presentations.

Show / Hide Details Page Tabs

Along with customizing the layout of the Overview tab of the details page, you may also control whether a particular tab is shown or not (hidden) in a particular presentation.

Steps

1. Customize a presentation.
2. Click the customize icon next to the tab header you wish to show or hide.
3. Check or clear the **Hide** checkbox.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Data Sampling and Profiling

While technical and descriptive metadata contain a great wealth of information about metadata elements, this is only true if the information has been documented on those elements. In many cases, that metadata is incomplete and the best way to determine what that metadata should be (e.g., semantic data type, valid values, etc.) is to look at the data itself.

MIMM provides the option to sample and/or profile the actual data contained in files and tables, in addition to the metadata captured from a source format or tool, as part of the harvesting process. At harvesting time one may specify the number of records to profile and how many should be maintained as a sample for visualization later.

Data sampling will provide sample rows from the dataset. One may specify the number and the result is the first row through that number specified.

Data profiling helps to discover business knowledge embedded in data itself, improve users' understanding of the data and enables them to classify data with certainty. The data profiling process creates a summary of a data a content has. The summary has mainly statistics and charts. It helps users to find out if the correct data is available at the appropriate detail level.

That information is then available when one navigates to the file or table's details page or when looking at individual fields or columns from the file or table. The application can store and display the following data profiling details for table/view and column objects:

- Counts (standard and custom counts, like empty and valid rows)
- Values (distinct values and their counts)
- Patterns (patterns and their counts)
- Data types (inferred data types and their counts)

Sampled data and the profiling results are hidden from most users by default. One must be assigned the Data Viewer or Data Administer security role for the model in question, or be a member of the Administrators group (see permissions and role assignments). One may also hide the sample data and profiling results for specific models.

Data sampling and data profiling can be defined and performed independently.

Data sampling and data profiling can be performed as part of the model harvesting or on demand, e.g. on a table.

Data sampling and data profiling is available on all dedicated database bridges (e.g., Oracle, SQL Server, Hive, Teradata, etc.). It is implemented by automatically including the following options in the Miscellaneous bridge parameter:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Miscellaneous = -dp 1000 -dps 10

Which would be data profiling based upon 1000 rows and sampling of 10 rows.

However, the generic database JDBC import (e.g., HP Vertica) cannot predict the proper query to access data, and therefore does not support data profiling and sampling. However, the user may try by specifying the special option in the ***Miscellaneous*** *bridge parameter. This is as follows:*

Miscellaneous = -dp.query-template <SQL Query>

Examples for specific databases (to replace <SQL Query>):

HP Vertica:

SELECT @column FROM @schema.@table LIMIT @recordsLimit

IBM DB2 ISeries (AS/4oo):

SELECT @column FROM @schema.@table FETCH FIRST @recordsLimit ROWS ONLY

Microsoft SQL Server:

SELECT TOP @recordsLimit [@column] FROM [@schema].[@table]

Oracle database:

SELECT "@column" FROM "@schema"."@table" WHERE ROWNUM <= @recordsLimit

Oracle MySQL:

SELECT `@column` FROM `@schema`.`@table` LIMIT @recordsLimit

Data profiling and sampling requires access to the data in the data store. Thus, you must specify a user name / password with the appropriate access rights. For example:

SAP HANA database:

GRANT the SELECT privileges to a role the user has.

https://help.sap.com/viewer/4fe29514fd584807ac9f2a04f6754767/2.0.03/en-US/20f674e1751910148a8b990d33efbdc5.html

Steps

1. Specify profiling information when harvesting the metadata source

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

2. Execute the harvest or **Refresh profiling data** on the table or file details page

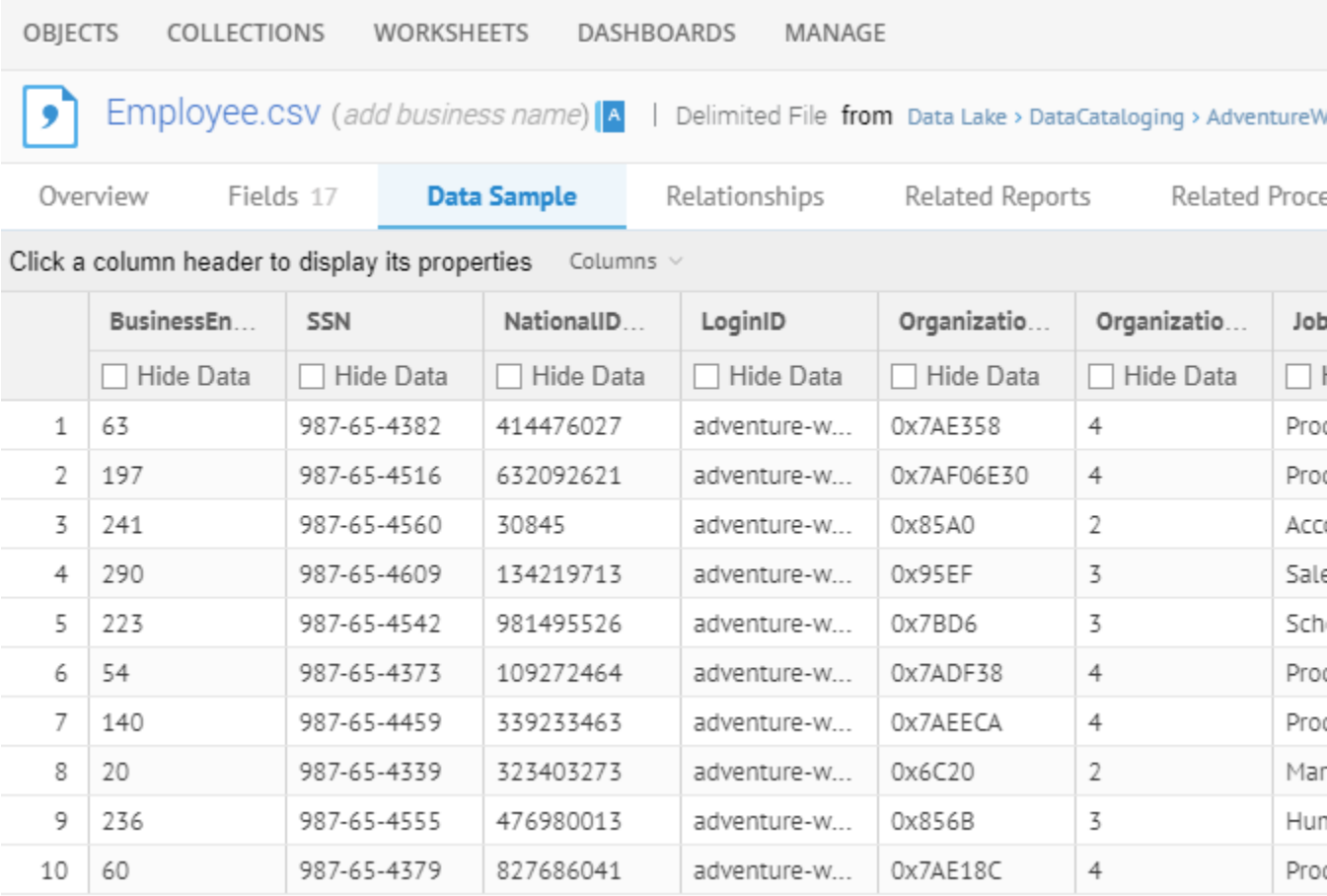
3. Go to the table or file details page.

Example

Table or file sample data

Log in as a user with the **Data Viewer** security role assignment for the **Data Lake**.

Viewing the sample data records for the **Employee.csv** file on its details page in the **Sample Data** tab.



	BusinessEn...	SSN	NationalID...	LoginID	Organizatio...	Organizatio...	Job
	Hide Data	Hide Data	Hide Data	Hide Data	Hide Data	Hide Data	
1	63	987-65-4382	414476027	adventure-w...	0x7AE358	4	Proc
2	197	987-65-4516	632092621	adventure-w...	0x7AF06E30	4	Proc
3	241	987-65-4560	30845	adventure-w...	0x85A0	2	Acc
4	290	987-65-4609	134219713	adventure-w...	0x95EF	3	Sale
5	223	987-65-4542	981495526	adventure-w...	0x7BD6	3	Sch
6	54	987-65-4373	109272464	adventure-w...	0x7ADF38	4	Proc
7	140	987-65-4459	339233463	adventure-w...	0x7AEECA	4	Proc
8	20	987-65-4339	323403273	adventure-w...	0x6C20	2	Mar
9	236	987-65-4555	476980013	adventure-w...	0x856B	3	Hun
10	60	987-65-4379	827686041	adventure-w...	0x7AE18C	4	Proc

*The **SSN** and **Gender** fields are obfuscated. This is an option at the property level for a field and may be updated on the details page for the field.*

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Field or column profiling data

Now, log in as a user with the **Data Manager** security role assignment for the **Data Lake** or one that is a member of the **Administrators** or **Data Administrators** group.

Then, click the **Fields** tab and click **Gender**

Go to the **Employee.csv** file details page and then the **Fields** tab.

Click on the **Gender** field to go to its details page.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

OBJECTS COLLECTIONS WORKSHEETS DASHBOARDS MANAGE

Gender (*add business name*) | Field **from** Employee.csv

Overview Related Reports Related Processes Data Flow Semantic Flow Comm

Business Description

add value

Inferred Datatypes 1

STRING	100%

Inferred Semantic Types 3

Gender	100%
Civility	71%
Title	71%

Frequency 2

M	71%
F	29%

Patterns 1

A	100%

Data Profiling Statistics

Last profiled 4 Weeks Ago

Count	290
Distinct	2
Duplicate	288
Valid	290
Empty	0
Invalid	0
Avg length	1
Min length	1
Max length	1

Copyright

Semantic types

A field or column may be assigned one or more semantic types. E.g., the field in the example above is assigned the semantic type Gender. Once that semantic type is assigned, it is a property of the element and may be searched on, filtered by and further edited (remove the assignment).

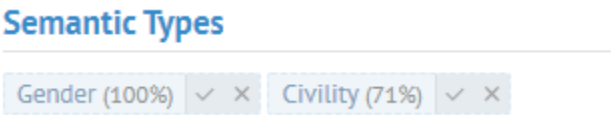
Some actions can apply to all metadata elements of a certain semantic type. In particular the Hide/Show property referenced above.

You may manage the list of semantic types with proper admin privileges.

Inferred semantic types

As part of the profiling function, MIMM attempts to infer the semantic type of fields and columns. The list of known semantic types may be updated here along with the algorithms used to identify them.

Once inferred, a semantic type may be assigned to a field or column by clicking the checkbox next to the semantic type. Click the "x" to reject the inference.



Further Exploration

Profile Data Attributes

The MIMM repository, API and UI support the following profiling details (row counts):

- **Total Profiled rows**: number of rows actually profiled, which is either the total number in the source or the limit set when defining the harvesting options)
- **Empty rows:** null in database or empty in files
- **Distinct rows:** non-distinct=total-distinct-empty. For example, when there is one million rows and the column has much less (e.g. 10) distinct values, the data is considered to be distinct.
- **Min value:** lowest value
- **Max value:** highest value
- **Values [value, rows]:** distribution of values and their frequency
- **Patterns [pattern, rows]:** list of different patterns of data presentation discovered in the source and frequency

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

- **Data Types [type, rows]:** list of data type matches and frequency. The column data type detected by the profiler. When a column has data of different data types the profiler pick the most used one. You can overwrite the value manually. The value could contradict the data type declared by the database. For example, when VARCHAR database column contains only date values, the profiler sets the DATE data type. Here is the list of supported types:

  - Text
  - Date
  - Time
  - DateTime
  - Geographical
  - No Percentiles
  - Means, Median
  - Variance
  - Std. Deviation
  - Number

- Semantic Types: list of semantic types matched and likelihood as a percentage.

Data Sampling and Profiling Sources

MIMM allows you to profile the data of database and file system contents. See harvesting metadata for details.

Data Sampling and Profiling process

When you enable profiling during import , MIMM incrementally profiles all tables in the import scope and collects sample rows. Data profiling and metadata import processes share the datastore connectivity and scope details. You do not need to configure the data profiling connectivity explicitly.

The data profiling process collects information that can contains data values. MM makes an effort to protect the information and show it to authorized users only. MM encrypts the information in its database. You need to have special Data View privileges to look at the information. Generic profiling statistics, like “% of distinct values” are available to all users that can view the content.

Showing and Hiding Sample data and Profiling Results

Sampled data and the profiling results are hidden from most users by default. One must be assigned the Data Viewer or Data Administer security role for the model in question, or be a member of the Administrators group (see permissions and role assignments).

One may even mask or hide this information even from a **Data Viewer** or show the actual data values and identifying profiling results. To do so, one must have the Data Manager role for that metadata source (see how to assign roles and permissions here).

Manual Show / Hide flag settings

The actual hide or show option is a property the field and may be updated on the details page for the field.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Steps

1. Log in as a user with the **Data Manager** security role assignment for the model in question or one that is a member of the **Administrators** or **Data Administrators** group.
2. Go to the details page for the feature (e.g., column, field).
3. Assign **True** or **False** to the **Hide Data** property.
4. One may also set the Hide Data property in the grid view in worksheets and other results.

Example

Log in as a user with the **Data Manager** security role assignment for the **Data Lake**.

Go to the details page for the **NationalIDNumber** field in the **Employee.csv** file.

Assign **True** to the **Hide Data** property.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

OBJECTS COLLECTIONS WORKSHEETS DASHBOARDS MANAGE

NationalIDNumber (*add business name*) | Field from Employee.csv

Overview | Related Reports | Related Processes | Data Flow | Semantic Flow | Comm

Business Description

add value

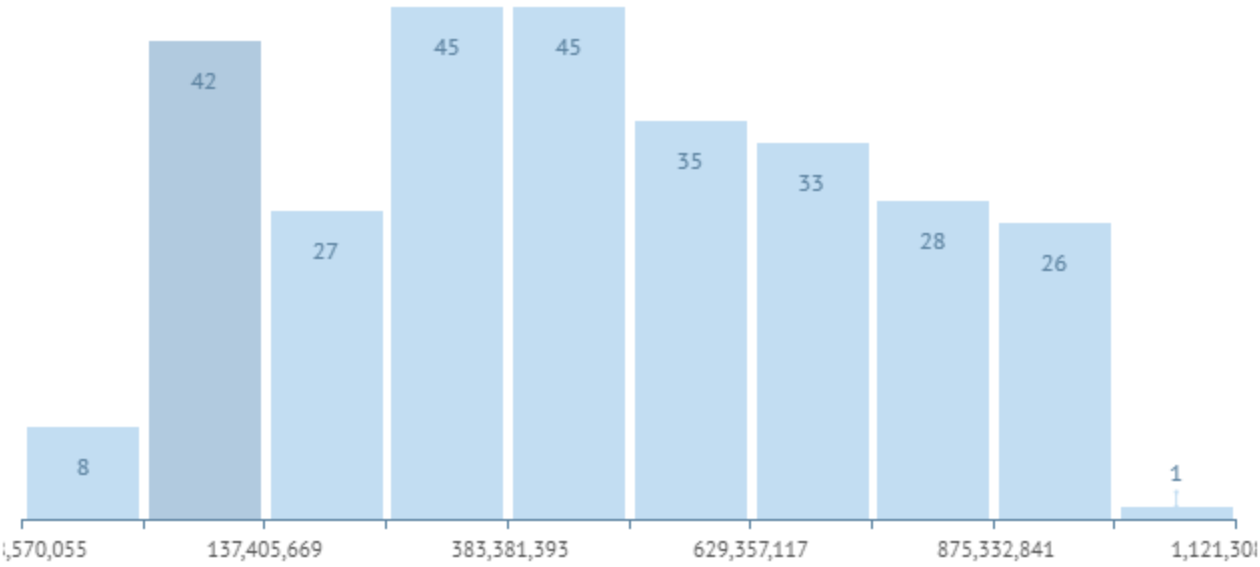
Inferred Datatypes 1

INTEGER	100%

Inferred Semantic Types 5

Bank Routing Transit Number	24%
US Phone	1%
Phone number	1%
FR Postal Code	0%
FR Insee Code	0%

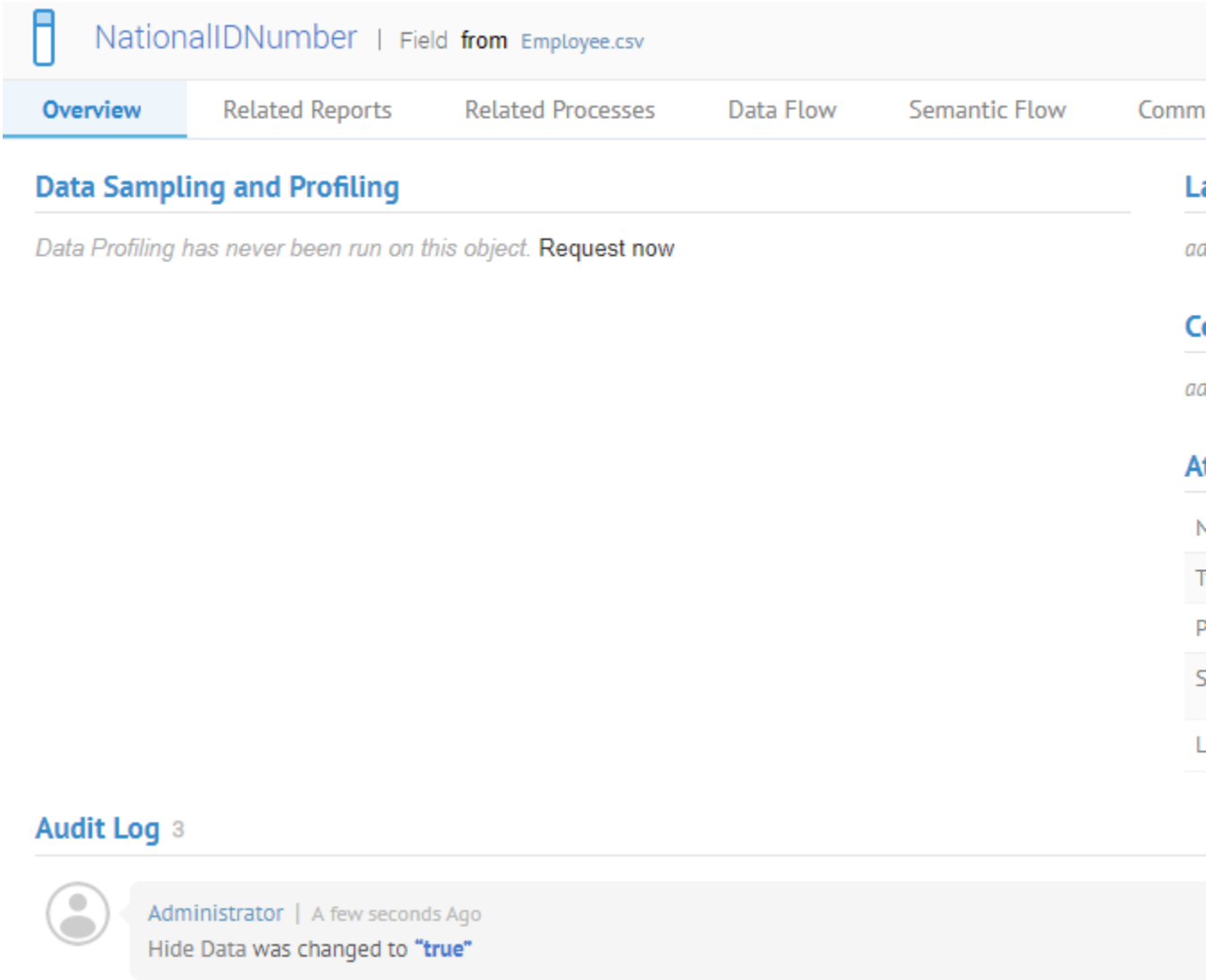
Histogram



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Now, sign in as a user with the **Data Viewer** security role assignment for the **Data Lake**.

Go to the details page for the **NationalIDNumber** field in the **Employee.csv** file.



Now, the profiling data is not shown.

Go to the details page for the **Employee.csv** file as a whole.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Employee.csv (*add business name*) | Delimited File from Data Lake › DataCataloging › AdventureW

Overview | Fields 17 | Data Sample | Relationships | Related Reports | Related P

Business Description

add value

Fields 1 - 5 of 17

- BusinessEntityID
- SSN
- NationalIDNumber
- LoginID
- OrganizationNode

Data Profiling Statistics

Last profiled 1 Week a

Row count	290

Data Sample 1 - 3 of 10

BusinessEnt...	SSN	NationalID...	LoginID	Organizatio...	Organizatio...	JobTitl
186	987-65-4505	551834634	adventure-w...	0x7AF064	3	Producti
239	987-65-4549	284149651	adventure-w...	0x7C2B68	4	Janitor

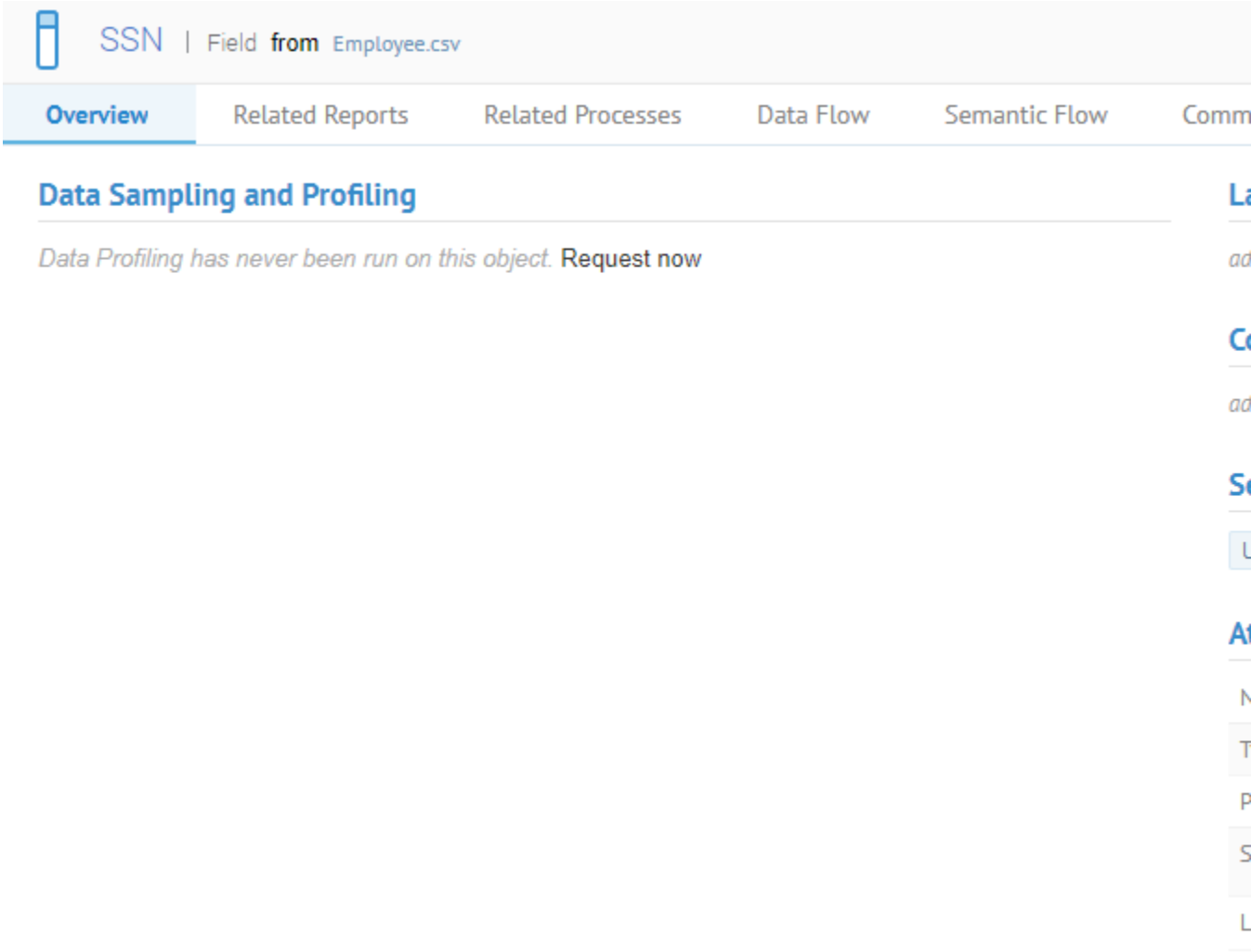
Copyright

*The sample data for the **NationalIDNumber** field is obfuscated.*

A summary of the unique semantic types identified in the fields in this file are summarized at this level, just as for tables (and their columns).

Semantic Type Data Hiding

*The **SSN** field is already obfuscated and profiling is hidden because it is of semantic type **PII**. See semantic types and data hiding for more details.*



Data Hiding by default

One may also show or hide ALL fields or columns of a particular *semantic type*. Once a model is created and specified to imported with data hiding, the next scheduled or executed harvest (profile) all fields and columns will be hidden, and any new fields in subsequent harvests will also be hidden.

Steps

1. Go to **MANAGE > Configuration** and click on the model to set to hide the data sampling and profiling by default.
2. Go to the **Import Options** tab.
3. Check the **Data Hiding** checkbox.
4. Click **Save**.

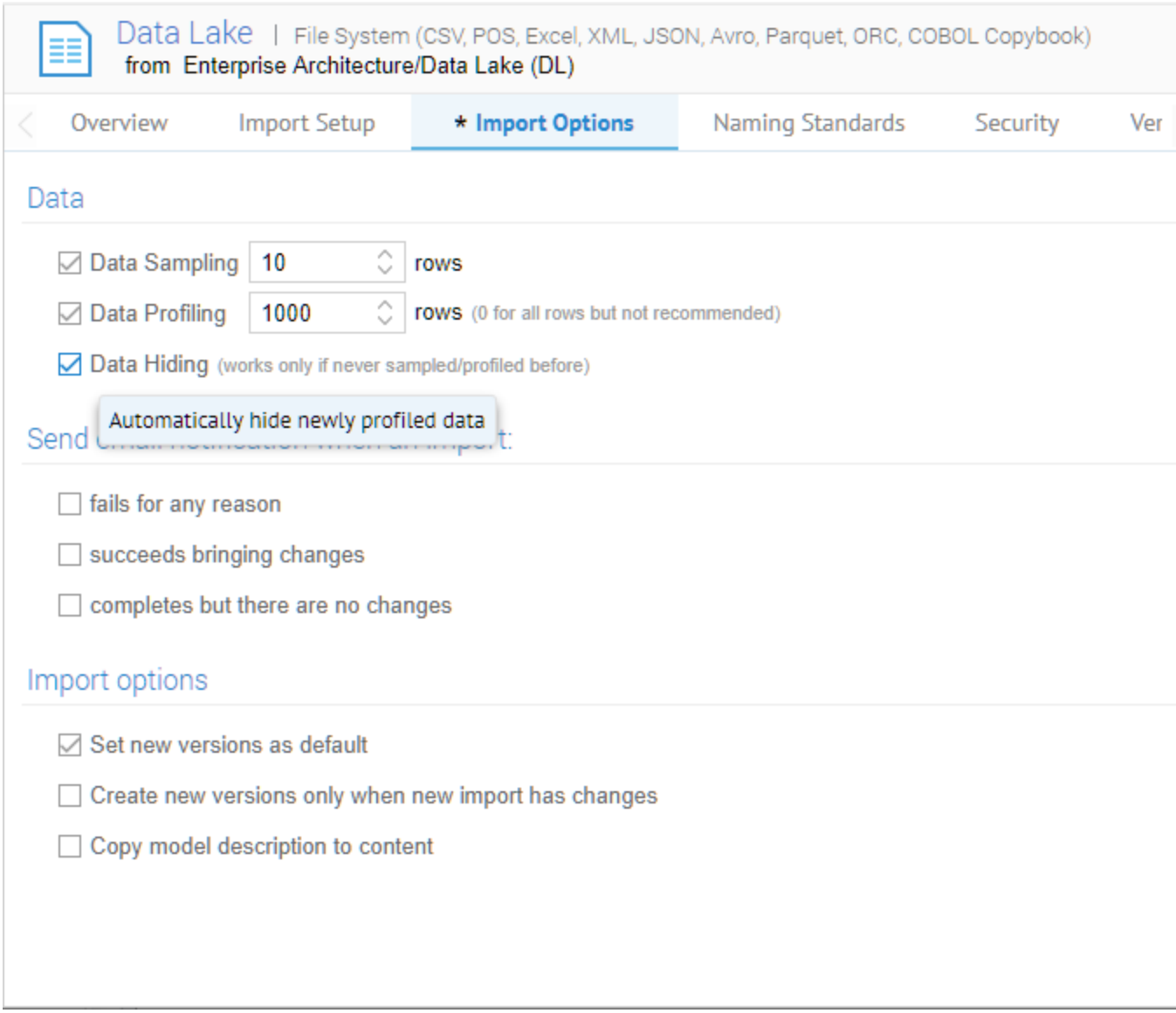
Example

Go to **MANAGE > Configuration** and Create a new model.

Go to the **Import Options** tab.

Specify data profiling and sampling. Check the **Data Hiding** checkbox.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

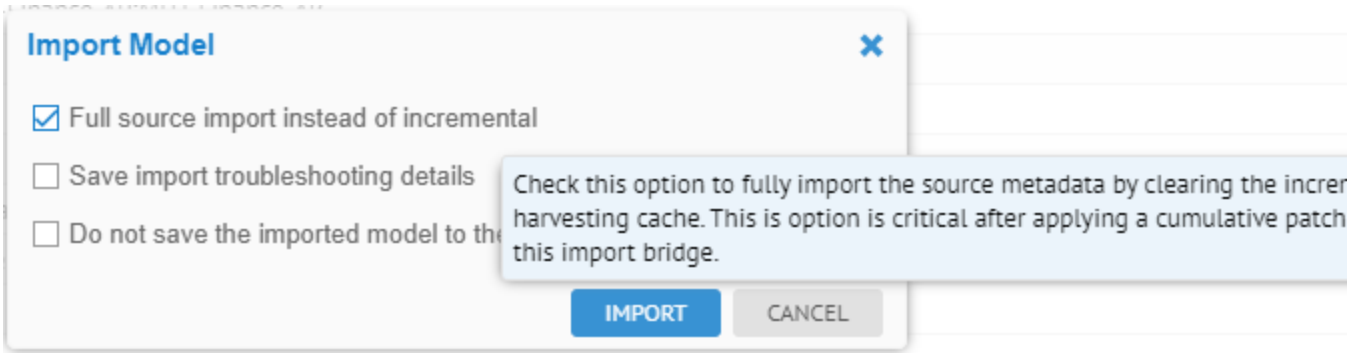


Also, uncheck the **Create new versions oonly when new import has changes**, as you want to create a new version with the profiling and sampling information.

Save your changes and harvest the metadata.

Click **IMPORT**.

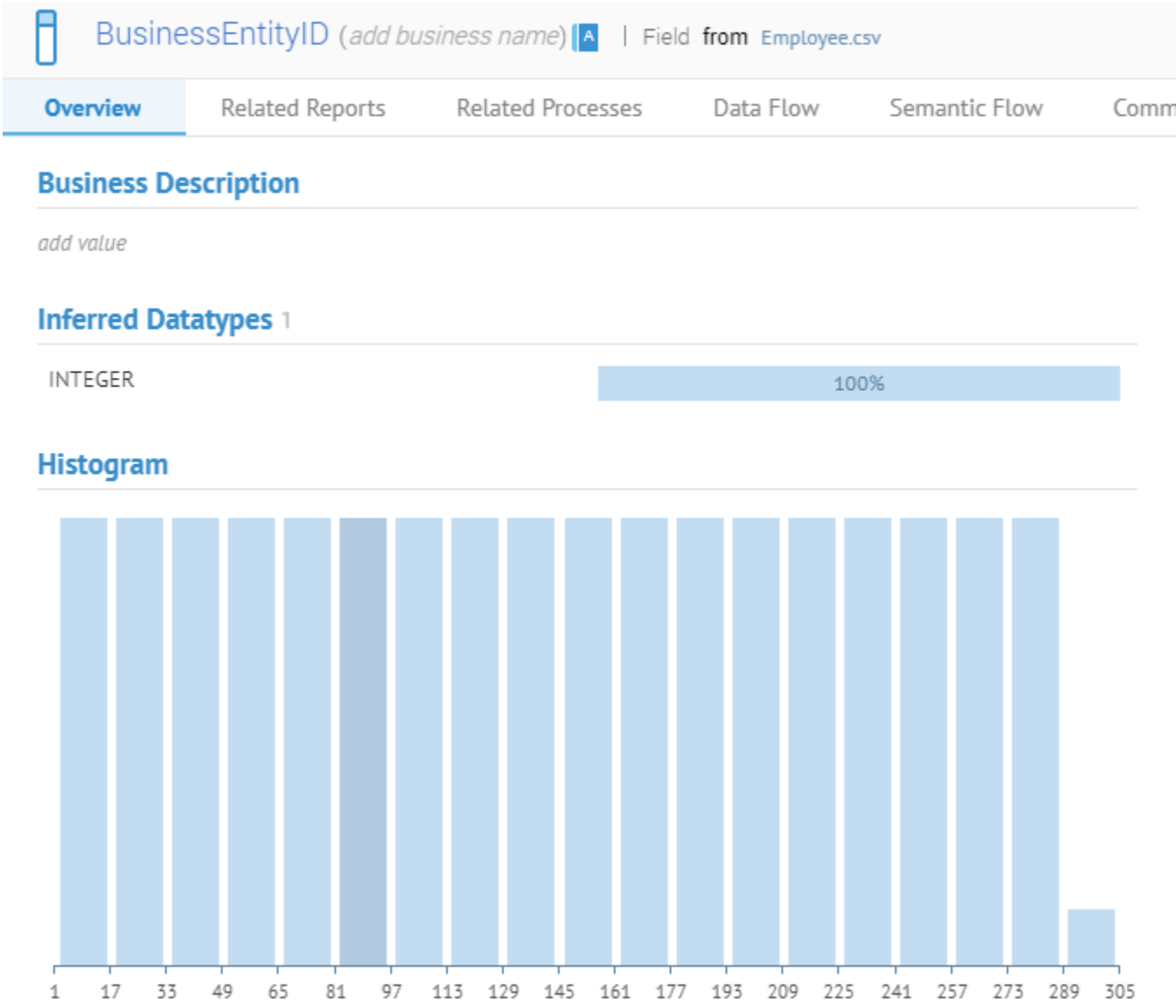
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Be sure to check the **Full source import instead of incremental** checkbox in order to avoid incremental harvesting.

After the import is completed, navigate to the **Employee.csv** file and then **BusinessEntityID**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

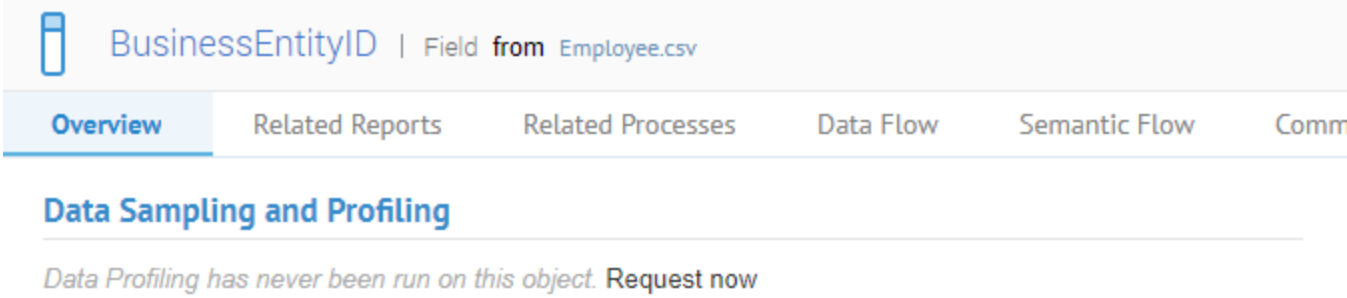


*The Hide **Data flag** is set to **true**.*

Now, sign in as a user with the **Data Viewer** security role assignment for the **Data Lake**.

Go to the details page for the **Employee.csv** file.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



All the fields are obfuscated.

Data Sampling and Profiling Technical Details

MIMM reuses the model bridge infrastructure and metamodel for data profiling. Database and file system bridges provide "concealed" support for data profiling. They run in the metadata import mode by default. You can run them in the profiling mode by specifying dedicated Miscellaneous options.

When the bridges are running in the metadata mode they import not only basic structural details, like tables and columns but also advanced details, like keys and indexes. When they are running in the profiling mode they import the same basic structural details to carry profiling statistics (e.g. UDPs on MIR Attribute). It allows MM to integrate the profiling statistics into already loaded metadata using basic structure.

The bridges use the data profiling library. The library is derived and depends on the open source Talend data quality library. When the bridge runs in the metadata mode it does not depend on the data profiling library.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

On Demand Data Sampling and Profiling

The profiling process can take a lot of resources and time. You can schedule to run the process periodically and limit it either by maximum duration (e.g. 2h) or amount of data (e.g. 300Mb). The bridge saves profiling results in the MIMB cache as soon as possible. When it profiles multiple files it saves profiling results of each file as soon as they are ready. If the bridge fails it can restart at the latest point available in the cache. When the bridge detect the file did not change (e.g. checksum is the same) it can update the profile time for the file.

The bridge tries to return as much as possible to the caller when it:

- Completes
- Fails
- Reaches the time or volume limit

Data and Semantic Flow

Once well managed, metadata is then open for detailed analysis, and true business level use cases may be solved. MIMM supports full business level lineage and impact analysis down to the classifier (table/entity/dimension) and feature (column/attribute/measure) level.

Generally, there are two types of lineage: Data Flow and Semantic Flow. MIMM can allow users to display and analyze both types of lineage.

Data flow

Based upon connection definitions to data stores and physical transformation rules which transform and move the data

Semantic flow

Detailing the relationships from a conceptual to logical Model, or a logical to physical Model.

Data Flow

This method of analysis presents either graphical or textual representation of the flow of data through connection definitions to data stores and physical transformation rules which transform and move the data. In order to see data flow lineage, one must

- Define a configuration that contains all of the models potentially in the data flow
- Stitch the models together by resolving connection definitions and Build the configuration

Once the configuration is ready, then you are ready to report on lineage.

Steps

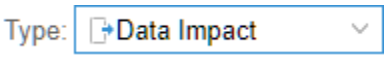
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

1. Sign in as a user which has at least the **Reader** security role to the configuration and all its contained models.

*Without the **Reader** security role to all the configuration's contained model, you will see a dialog indicating that you do not have sufficient privileges.*

2. Find a starting point for lineage by either
   - Navigating to that element's details page and select the **Data Flow** tab
   - Or, for lists of elements, click the line the element is on and click the appropriate **Trace Data Flow** icon
   - Or, right click on the element in a diagram (architecture diagram, lineage diagram or model diagram) and select **Trace Lineage > Data Flow**
3. From here you may
   - Use the common lineage trace functions
   - Switch to Data Lineage (trace from an object upstream to objects that provide data flow to that object)
   - Switch to Data Impact (trace from an object downstream to objects that are impacted via data flow by that object)

Data Flow Lineage (sources)



These are the worksheet analysis type use cases, generally posed as questions such as:

- Given an item on a report, what data entry system fields impact these results?
- Why are the numbers on this report the way that they are?
- How to change the system data to get the correct results for this report?

This type of analysis, i.e., asking where the information comes from, is a question posed "upstream" in the dataflow. We refer to it as a reverse lineage question. When consumers of these reports ask these questions, a correct and responsive answer may be the most valuable information provided by a metadata management environment.

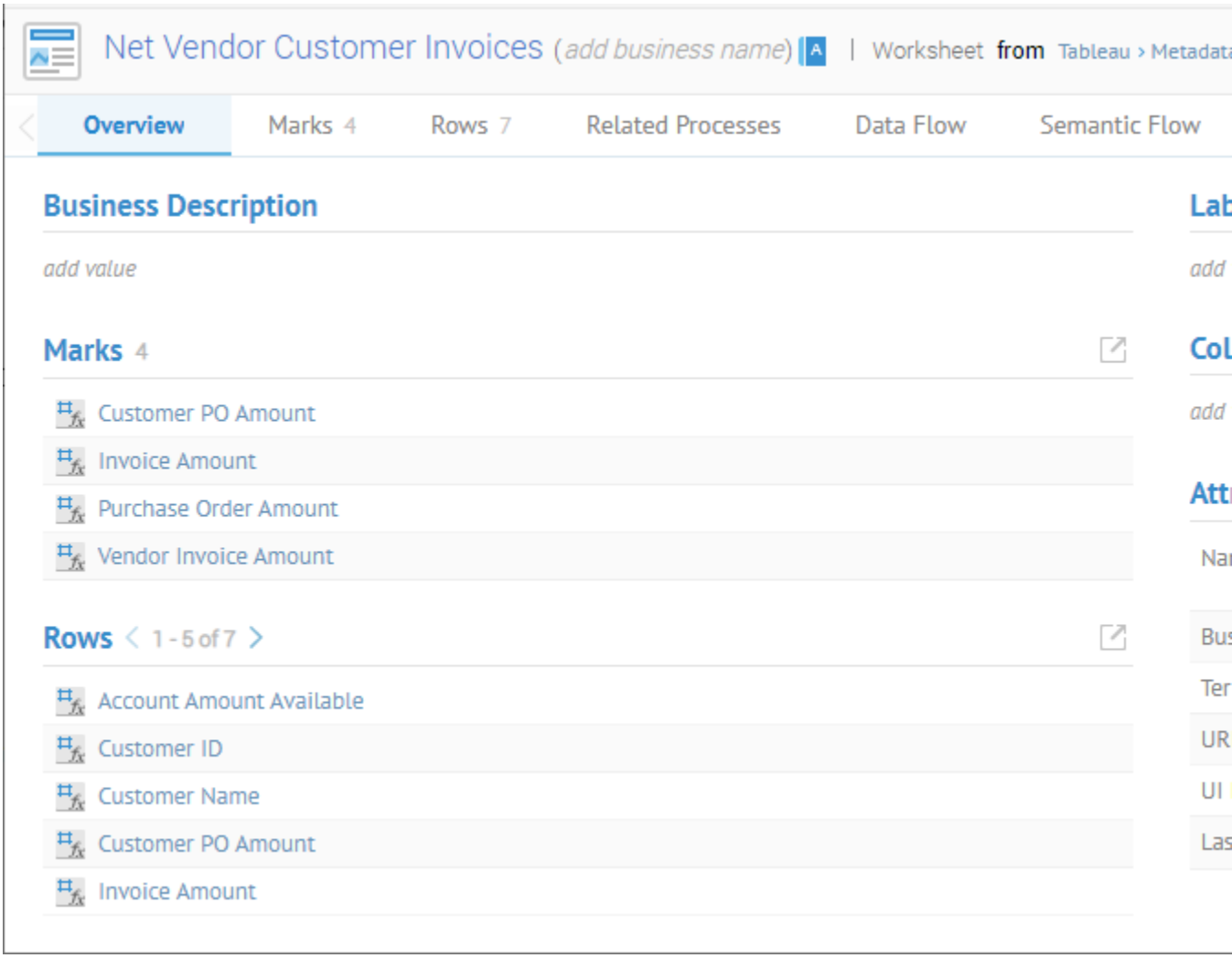
Steps

1. Trace data flow lineage.
2. Click **Data Impact** in the **Type** pull-down in the upper right.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

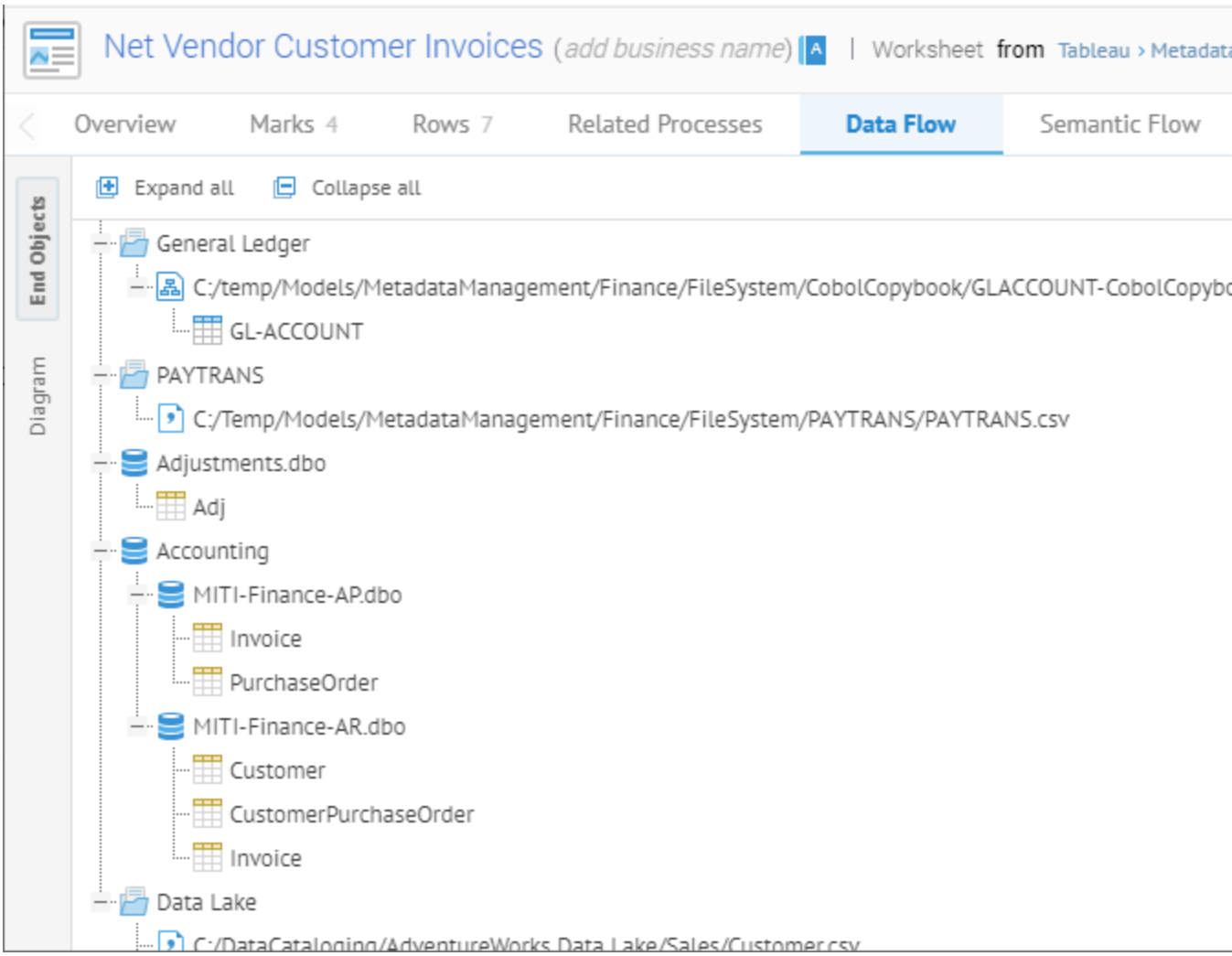
Example

Search for the Net Vendor Customer Invoices worksheet and open it.



Go to the **Data Flow** tab.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

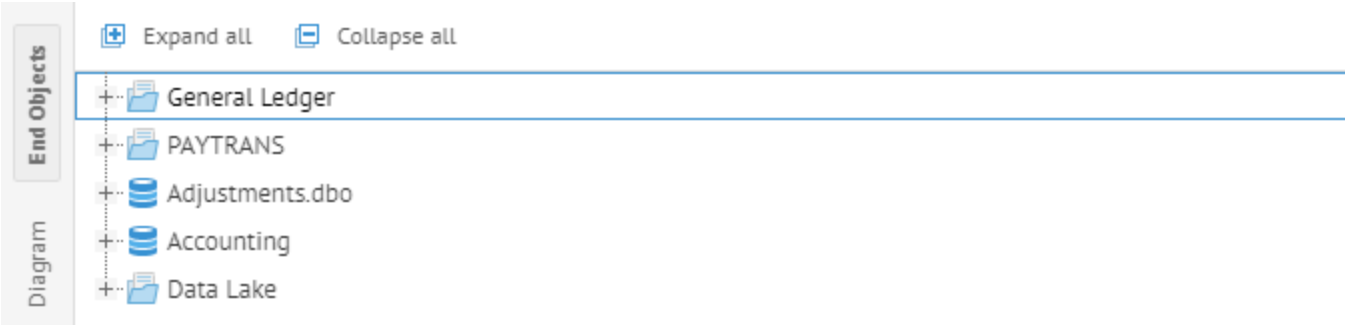


This is a business intelligence report and thus is at the end of the lineage, so MIMM *automatically chooses* ***Data Lineage*** *for lineage* ***Type****.*

The End Objects tab on the left is selected in this case, so we see the textual tree-based report.

Click the Collapse all to reduce the tree to the top five elements in the lineage.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

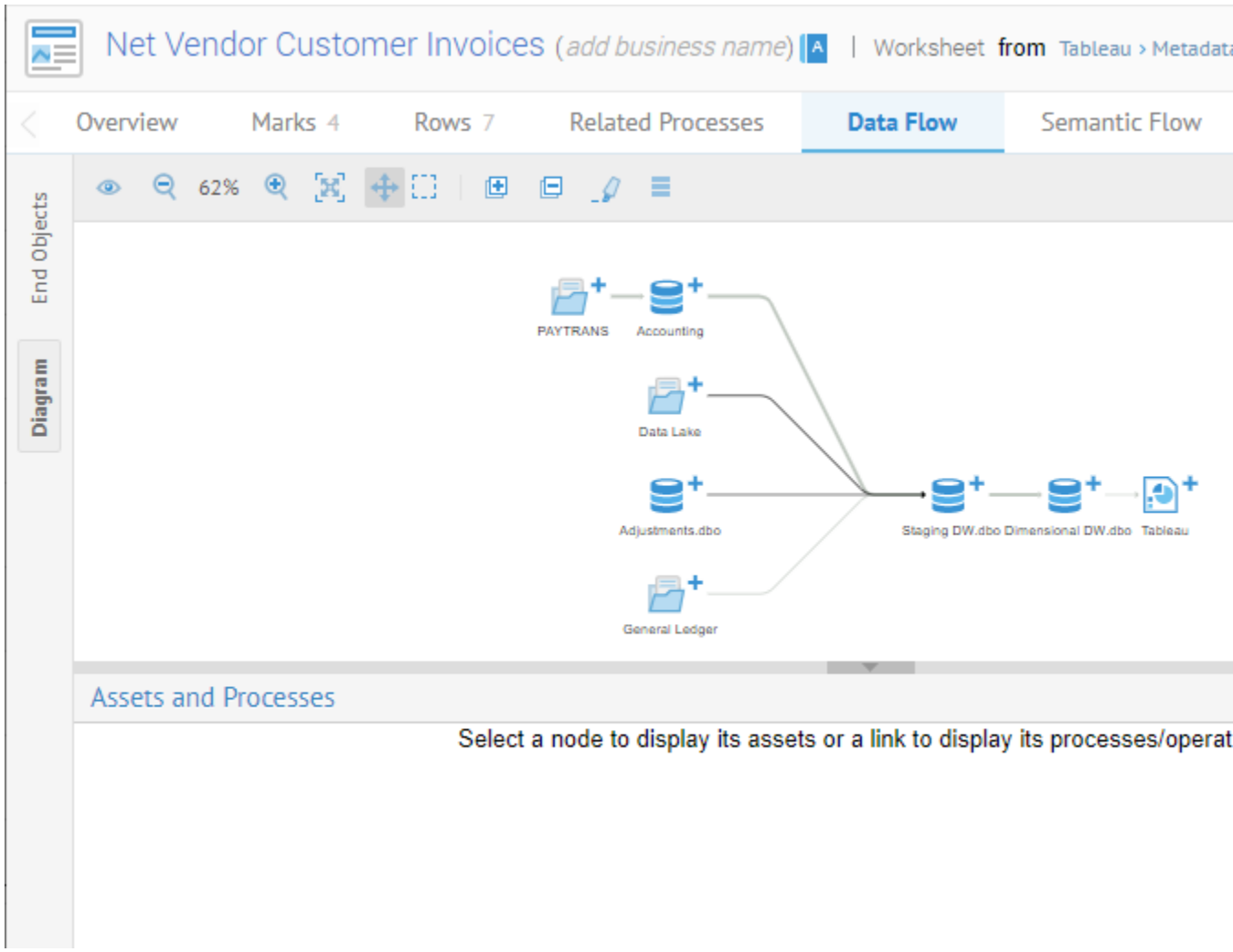


Now, click the **Diagram** tab on the left. Click the **Collapse Selected node completely** ( ) icon.

The different lineage indicate different types of data flow processes

Click the plus sign ( ) next to **Invoice** in **Accounts Payable**.

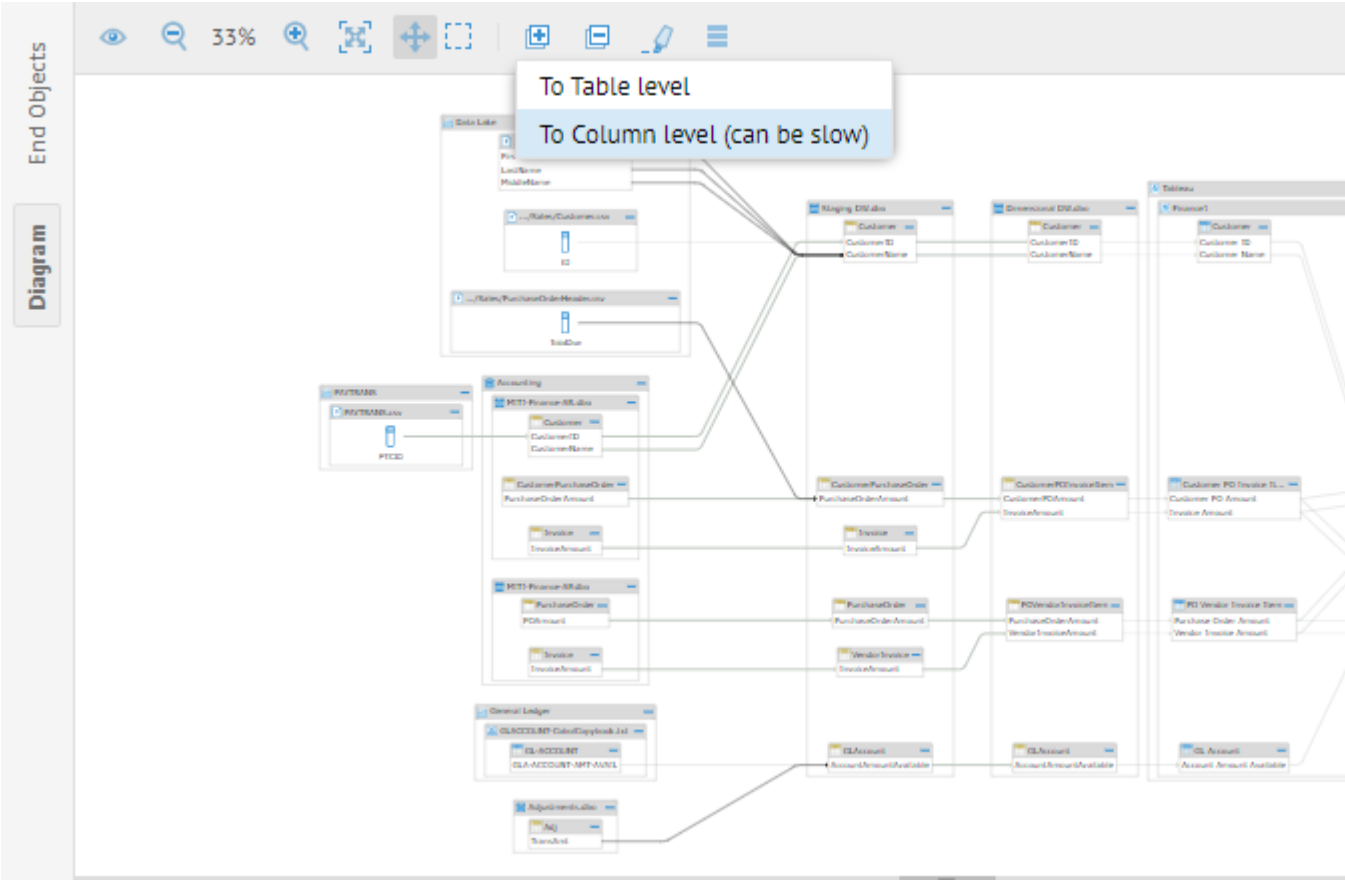
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



You then see the exact column that is a source in the lineage trace.

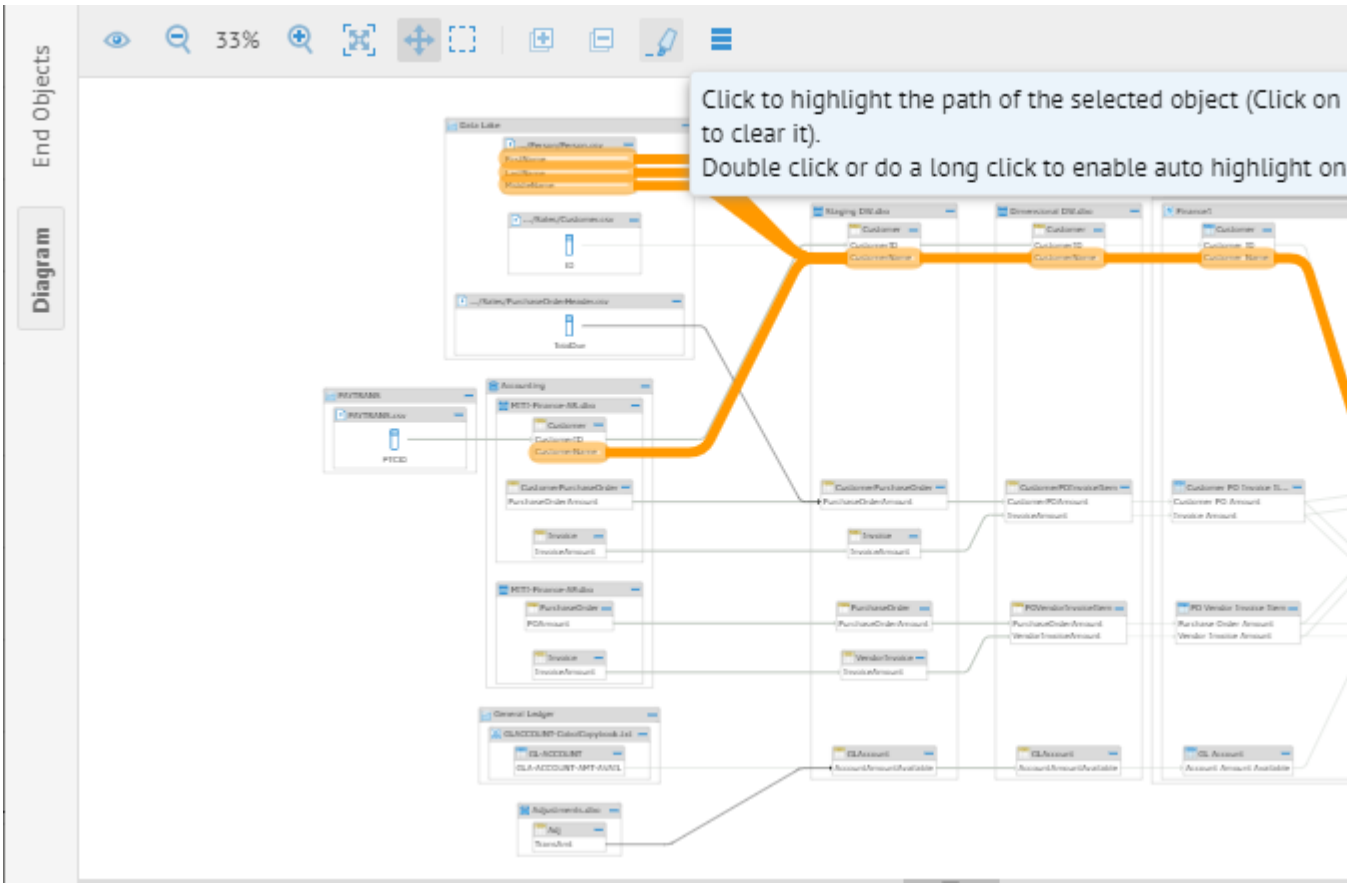
Click in an empty space in the diagram to de-select Invoice, then select the **To Column level** expansion, which will now apply to all objects.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



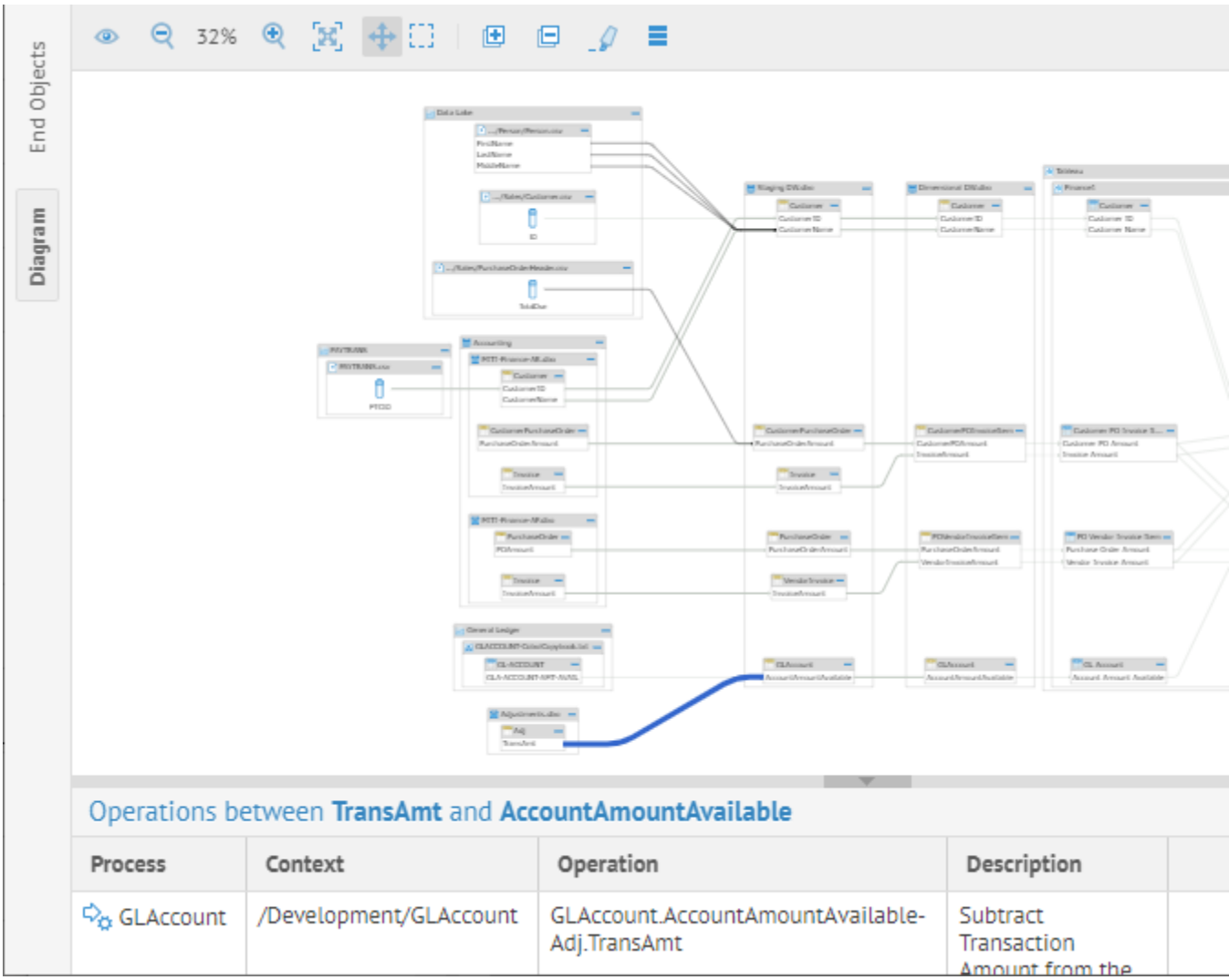
Select a column, then click Highlight ( ) to outline the paths through that object.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click the black line between Adjustments.Adj.TransAmt and Staging DW.dbo.GLAccount. AccountAmountAvailable.

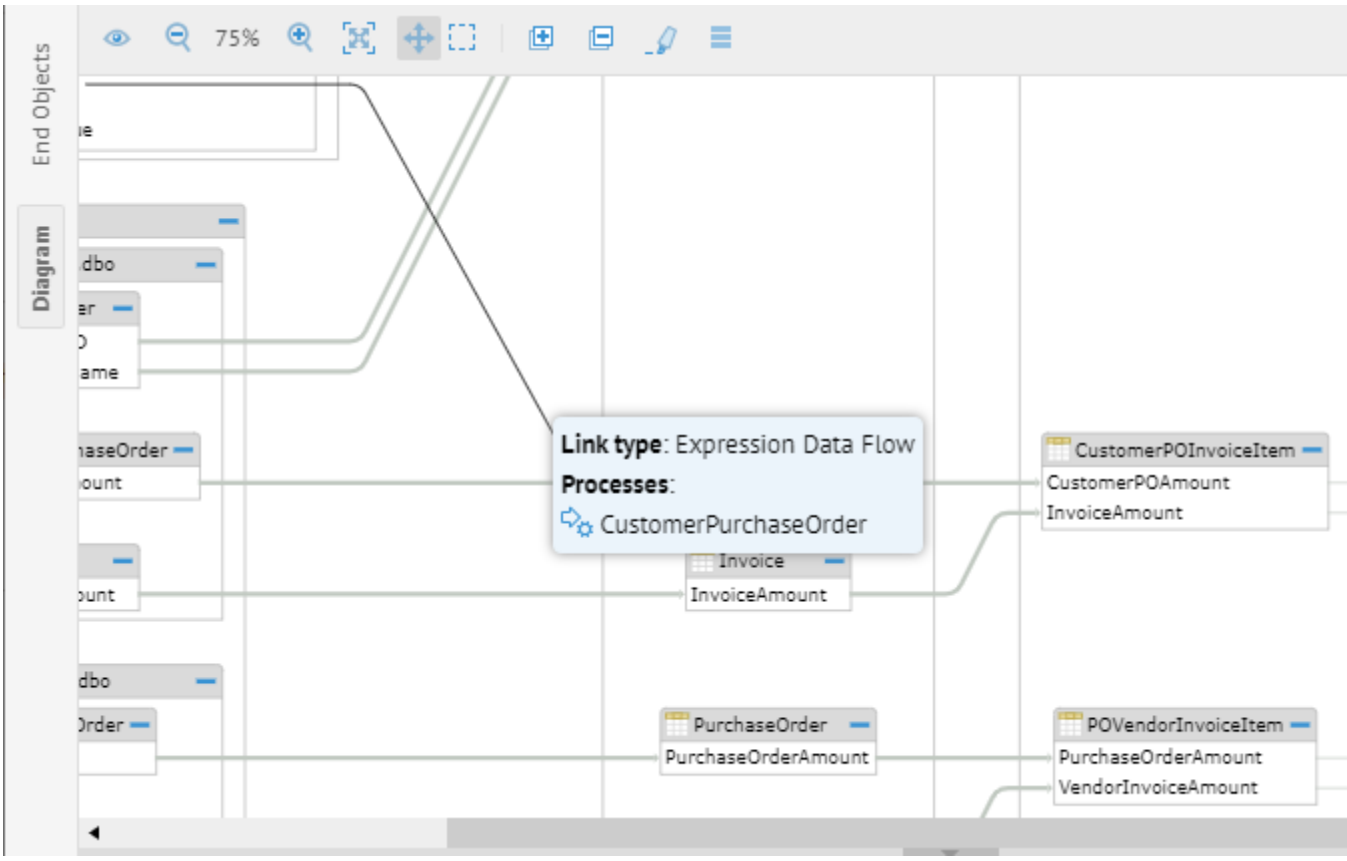
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



And you see the transformation at the bottom of the page.

You may also simply pass the pointer over a link and see similar information.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Data Flow Impact

Type: Data Impact

Many times one may ask these forward lineage or impact analysis type of questions:

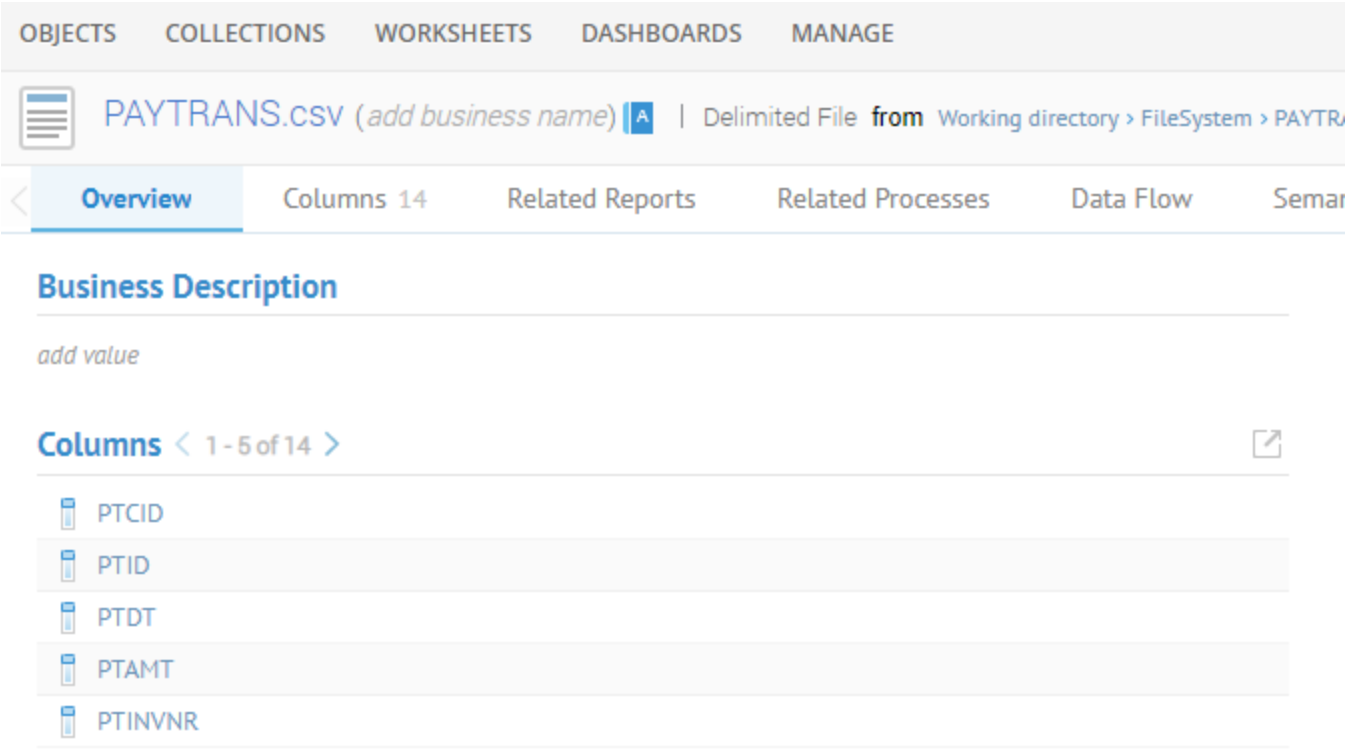
- If I make a change to this field, what reports will be impacted?
- How is this identity information merged with the personnel system information on these other reports?

A data flow impact report traces the manner in which data flows from source to destination.

Example

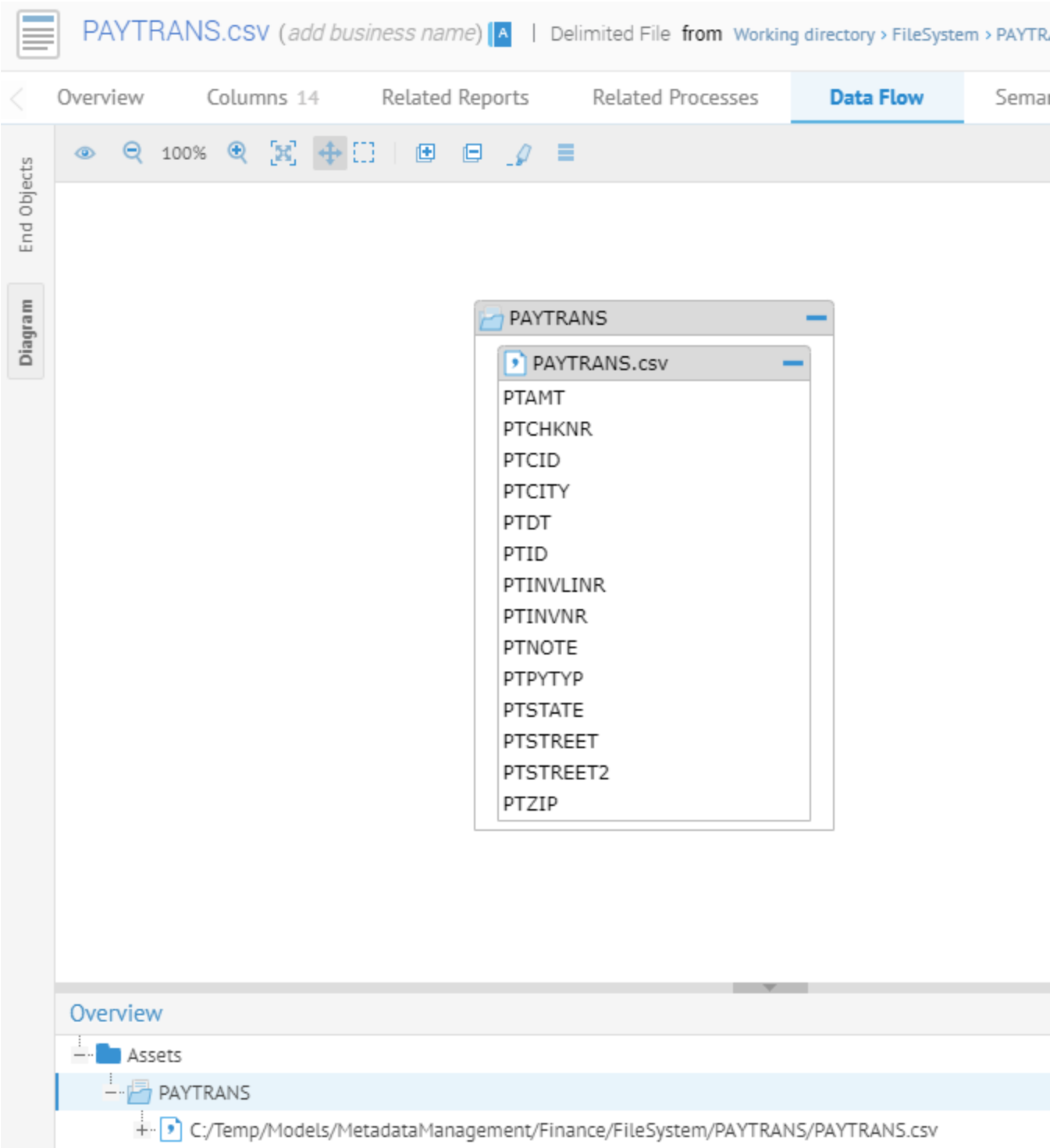
Navigate to the details page for the file **PAYTRANS.csv (a search string must be enclosed in quotation marks as the period (.)** has special meaning in the search syntax, e.g. **"PAYTRANS.csv"**).

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Then click the **Data Flow** tab and **Diagram** tab on the left. Note, the **Impact** type is automatically selected, as the PAYTRANS.csv file is an ultimate source in the configuration, so it does not have any source lineage.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Semantic Flow

Semantic Definition Lookup

In this use case, one has found a data element (a column in a table in a database for example, or a field in a report) and wants to understand what it means. By defining the semantic links properly, MIMM can trace back through the physical data flow (as long as there is no transformation which would change the meaning) to an element that is mapped to a term in the Business Glossary and thus find a useful definition.

The caveat that the above only works "as long as there is no transformation which would change the meaning" implies that some subset of the fields in your reports will not provide a semantic definition. The trace will simply stop at the transformation and never get to a model (again likely the data warehouse) that has semantic lineage.

So, in addition to this method of "trace through the dataflow as long as there is no transformation which would change the meaning", there is another which is search based or name matching based. In this case, if there is a field in a report named "Net Account Amount" and it does not have a good data flow trace without transformation, one could still create a term in the Business Glossary named "Net Account Amount". When requesting a data element definition lookup in that case, MIMM will perform a search for that term and report its definition, even without a clean lineage trace. In most case, it will be necessary to fill in the blanks in some of these cases by adding terms to the Business Glossary.

Of course, it is quite possible that no term directly matches the report field by name. In this case, one may define a direct semantic mapping from a term in the Business Glossary to the field in the report. The advantage of this approach is that one may control precisely what the preferred definition will be versus the name matching method. Also, it provides a definition, even though there may not be a data flow trace that does not contain transformations. Hence, it is the preferred method for fields for which there is no equivalent in the warehouse or lake (i.e., calculated in the report) and there is no term or multiple terms that match by name.

There are 5 types of semantic definition that MIMM considers in the following order:

- Local semantic link (from a semantic mapping or the PDM) to any object
- Closest remote semantic link
- Local definition
- Closest remote definition
- Glossary lookup by name

"Local" means on the starting object for the trace. "Remote" means from an object traced through a pass through data flow link.

All these types of semantic definitions can be turned on/off in the UI, meaning the users can select what kind of semantic definition they want to see.

To summarize, there are three methods used to provide an answer to a definition lookup, applied in the following order:

- Direct semantic link from a term in a Business Glossary

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

- Data flow lineage to the warehouse (or some other data store in the physical architecture) and semantic up to a Business Glossary
- Name match between Business Glossary term and field name

Example

Navigate to **AccountAmountAvailable**, which is a view column in the **Dimensional DW** in the demo.

Then you see:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

OBJECTS COLLECTIONS WORKSHEETS DASHBOARDS MANAGE

AccountAmountAvailable (Account Amount Available) | Column from Dimensional DW ›

Overview | Related Reports | Related Processes | Data Flow | Semantic Flow | Comm

Business Description inferred from Account Amount Available

Dollar amount remaining in fund account, calculated as: Account Balance Amount - Account Amount Expended - Account Encumbered Amount

Data Sampling and Profiling

Data Profiling has never been run on this object. Request now

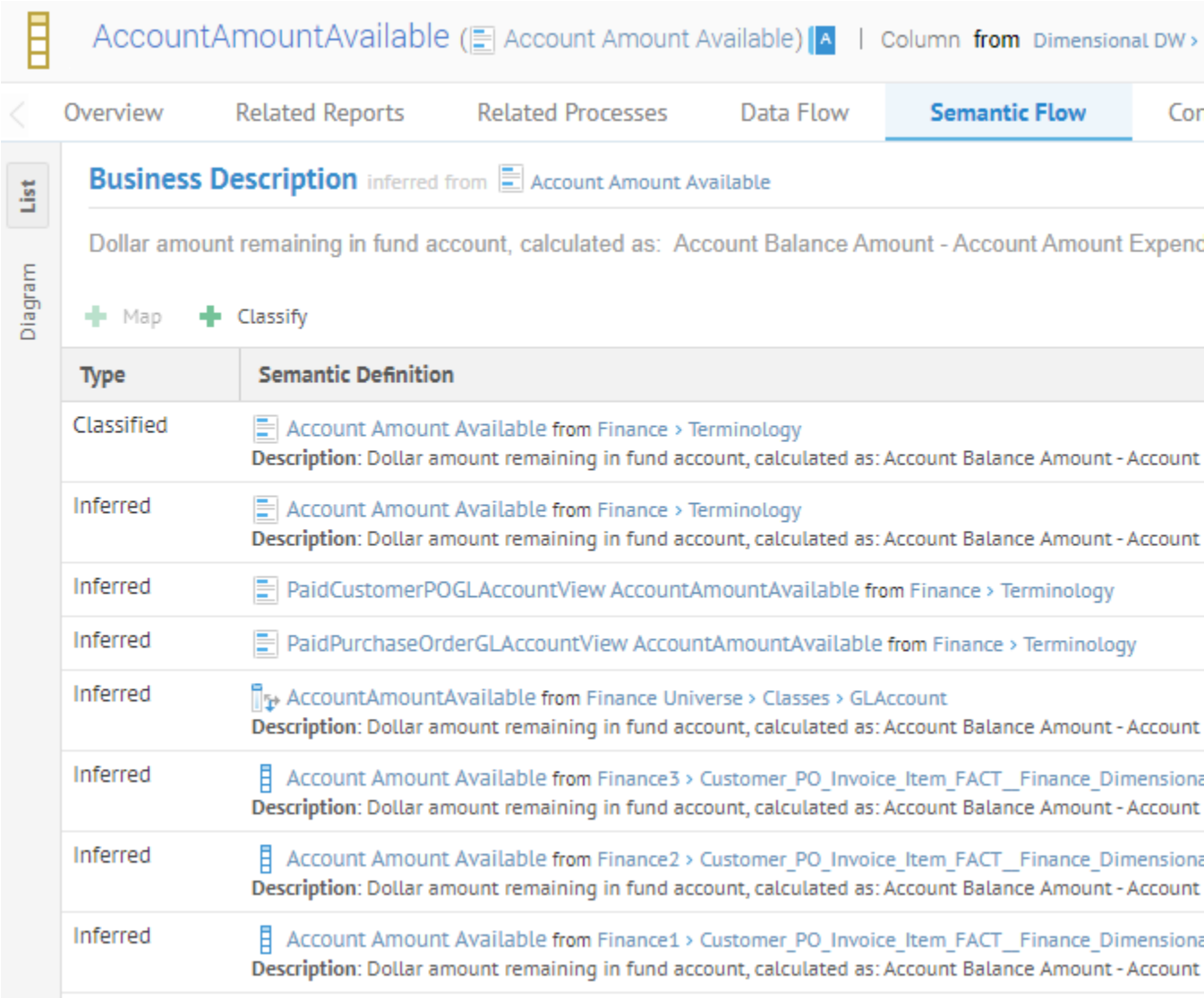
Copyright

Comments 1

Administrator | 1 Day Ago

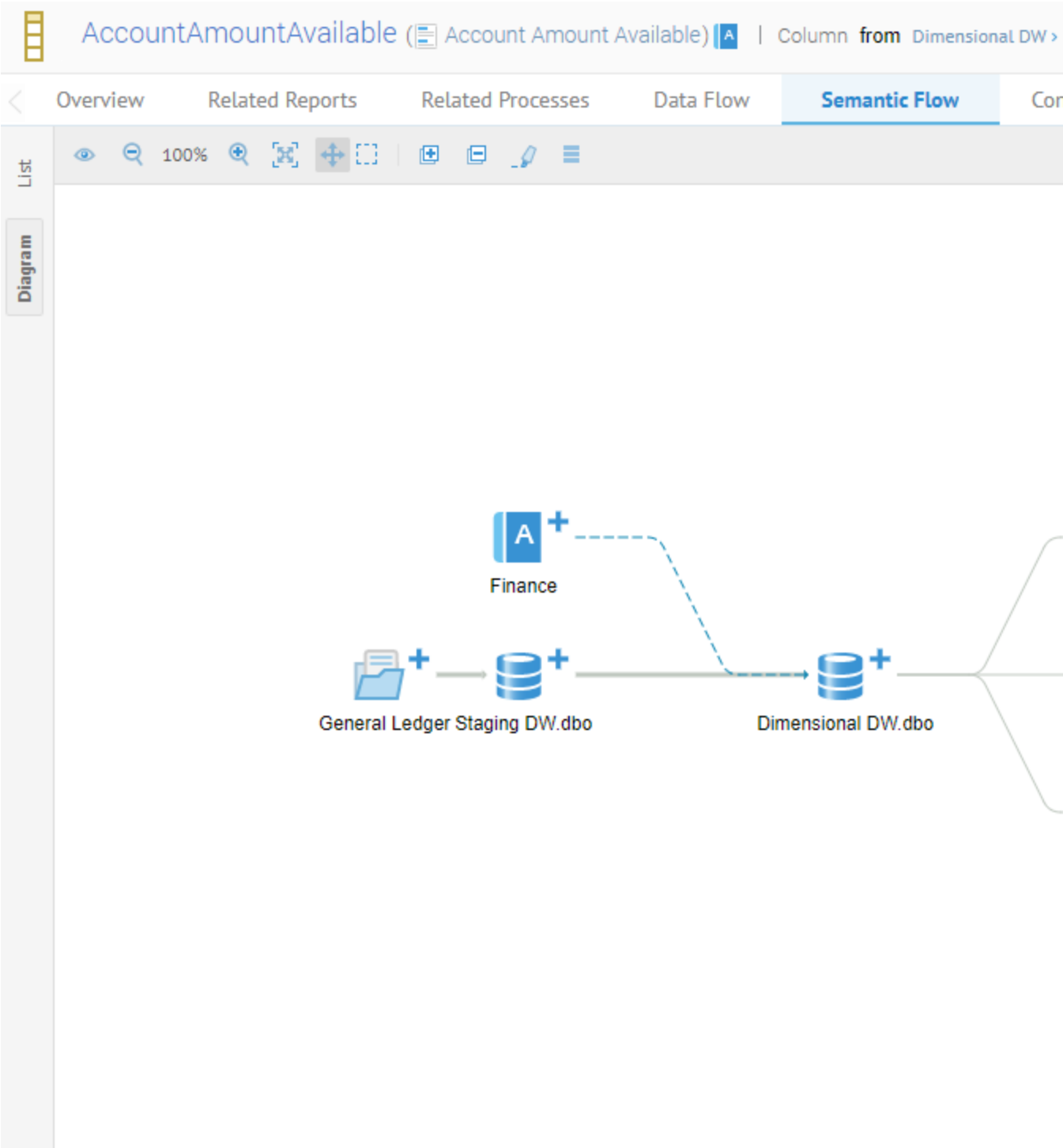
*The **Business Description** for the view column is already populated. It was inferred through semantic definition lookup.*

Click on the **Semantic Flow** tab and you see the inferred semantic definition from a term in the Glossary:



Then click the Diagram tab on the left and you see the actual semantic lineage trace that got to the term.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Semantic Usage

In this scenario, one may wish to see the usage of the semantic element (e.g., Business Glossary term) in the architecture.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

In this scenario, from a Business Glossary term or conceptual/logical model element one may wish to simply discover what data element are semantically mapped in the data flow architecture and thus would be impacted by a change to the term or model element.

A semantic usage lineage trace is nearly the reverse of semantic definition lookup. In general it is requested from a term's or logical model element's details page. The usage trace itself proceeds down each semantic link and then traces the data flow where there are no transformations (pass-through lineage) to all metadata elements which may be reached in this manner.

Example

Navigate to the term **Account Amount Available** in the **Finance Glossary**. Then click the **Semantic Flow** tab and **List** tab on the left.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

OBJECTS COLLECTIONS WORKSHEETS DASHBOARDS MANAGE

Account Amount Available | Term from Finance › Terminology

Overview | Relationships 3 | Related Reports | **Semantic Flow** | Comments | Attac

List | Diagram

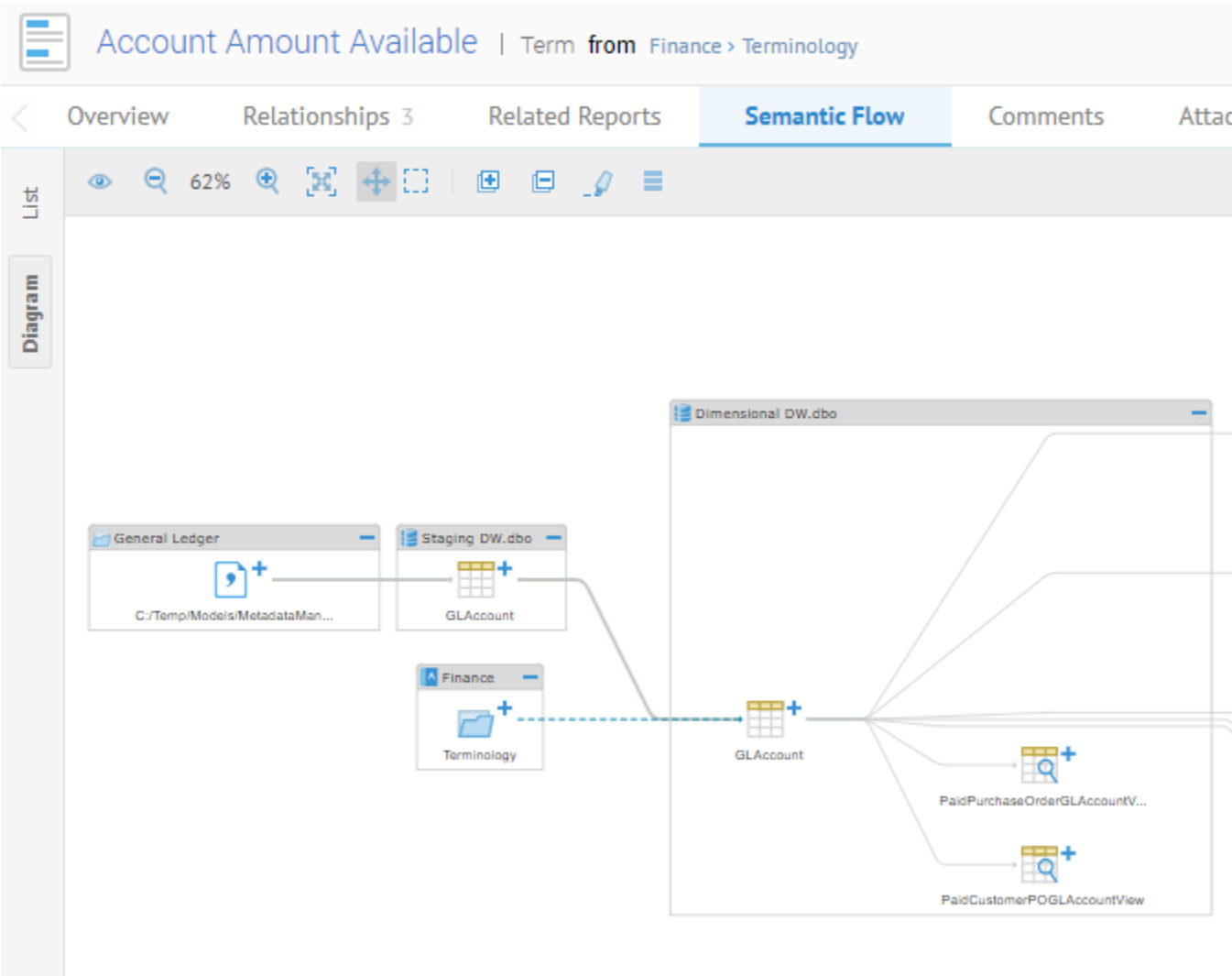
Map | Classify | Search

Type	Semantic Usage
Classified	AccountAmountAvailable from Dimensional DW › dbo › GLAccount
Inferred	AccountAmountAvailable from Staging DW › dbo › GLAccount
Inferred	AccountAmountAvailable from Vendor Mart › dbo › GLAccount
Inferred	GLA-ACCOUNT-AMT-AVAIL from GLAccount.csv
Inferred	AccountAmountAvailable from Net Vendor Customer Invoices › Query 1 › Query
Inferred	AccountAmountAvailable from Net Vendor Customer Invoices › Query 1
Inferred	AccountAmountAvailable from Net Vendor Customer Invoices › Net Vendor Customer Invoices › Net Vend
Inferred	AccountAmountAvailable from Finance Universe › Classes › GLAccount **Description**: Dollar amount remaining in fund account, calculated as: Account Balance Amount - Account Amou
Inferred	Account Amount Available from Finance3 › Customer_PO_Invoice_Item_FACT__Finance_Dimensional_DW_ **Description**: Dollar amount remaining in fund account, calculated as: Account Balance Amount - Account Amou
Inferred	Account Amount Available from Finance3 › PO-Invoice
Inferred	Account Amount Available from Finance3 › PO-Invoice
Inferred	Account Amount Available from Finance2 › Customer_PO_Invoice_Item_FACT__Finance_Dimensional_DW_ **Description**: Dollar amount remaining in fund account, calculated as: Account Balance Amount - Account Amou
Inferred	Account Amount Available from Finance2 › Prime Account
Inferred	Account Amount Available from Finance1 › Customer_PO_Invoice_Item_FACT__Finance_Dimensional_DW_ **Description**: Dollar amount remaining in fund account, calculated as: Account Balance Amount - Account Amou
Inferred	Account Amount Available from Finance1 › Invoice less than PO
Inferred	Account Amount Available from Finance1 › Net Vendor Customer Invoices
Inferred	AccountAmountAvailable from Dimensional DW › dbo › PaidCustomerPOGLAccountView
Inferred	AccountAmountAvailable from Dimensional DW › dbo › PaidPurchaseOrderGLAccountView

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

You see a list of all the metadata elements that express the term **Account Amount Available**, whether by direct classification (semantic) link (**Classified**), by a link in a semantic mapping (**Mapped**) or by inferred equivalence due to pass-through lineage in the data flow (**Inferred**).

Click the Diagram tab to see these traces:



Semantic Relationship Types

Semantic and data flow lineage traces report a number of elements in the semantic definition lookup and usage reports. Here is a concise list of those types and their meaning:

- DOCUMENTED: local documentation in MM (BusinessDescription)
- CLASSIFIED: remote documentation found through a classified Term
- TYPE: remote documentation found through a SemanticType
- IMPORTED: original tool documentation (imported from MIMB)
- MAPPED: remote documentation found through a semantic mapping

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

- INFERRED: remote documentation found through lineage links (data and semantic)
- SEARCHED: documentation found through search

Related Reports

If you wish to see the business reports that use fields which are semantically related to a particular semantic element (e.g., Business Glossary term) , you may go to the **Related Reports** tab. In this case MIMM will use the semantic usage trace (if a term or logical element), then identify those metadata elements that are fields on business reports, and provide an answer that is the list of those business reports which are impacted by the physical data elements determined from usage or that you are on.

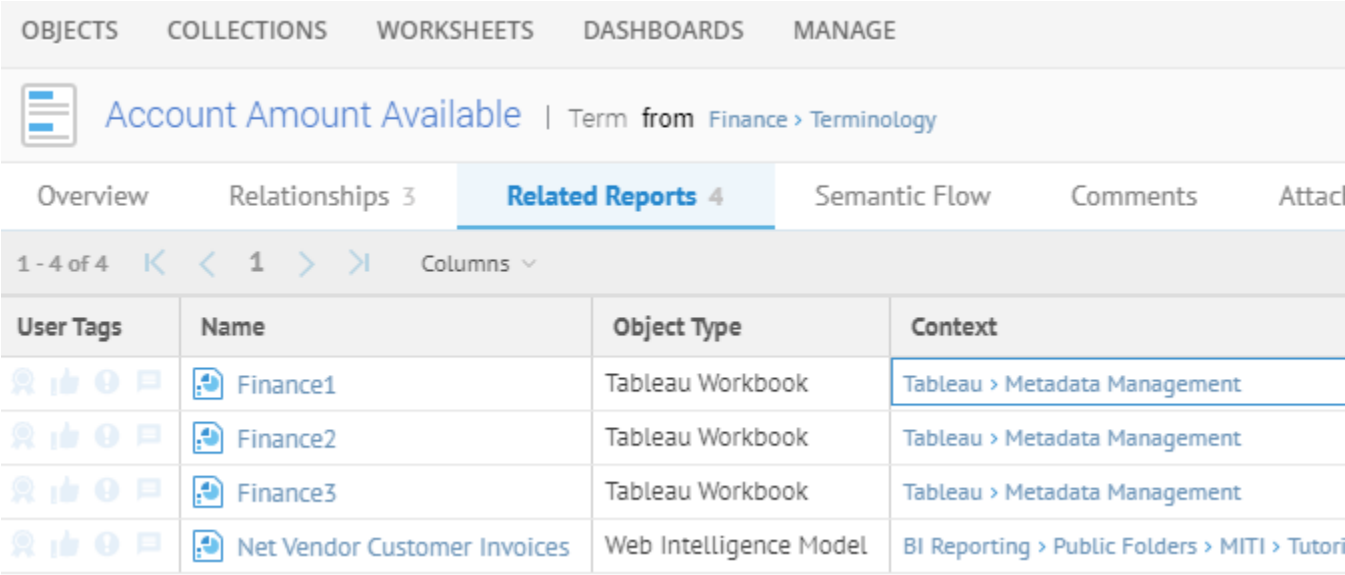
Steps

1. Navigate to the details page for the metadata element you wish report from.
2. Click the **Related Processes** tab.

Example

Navigate to the term **Account Amount Available** in the **Finance Glossary**. Then click the **Related Reports** tab.

You will then see the list of all such reports for that metadata element.



From here you may click on any report in the list to view metadata details page

Explore Further

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Related Reports from a data element

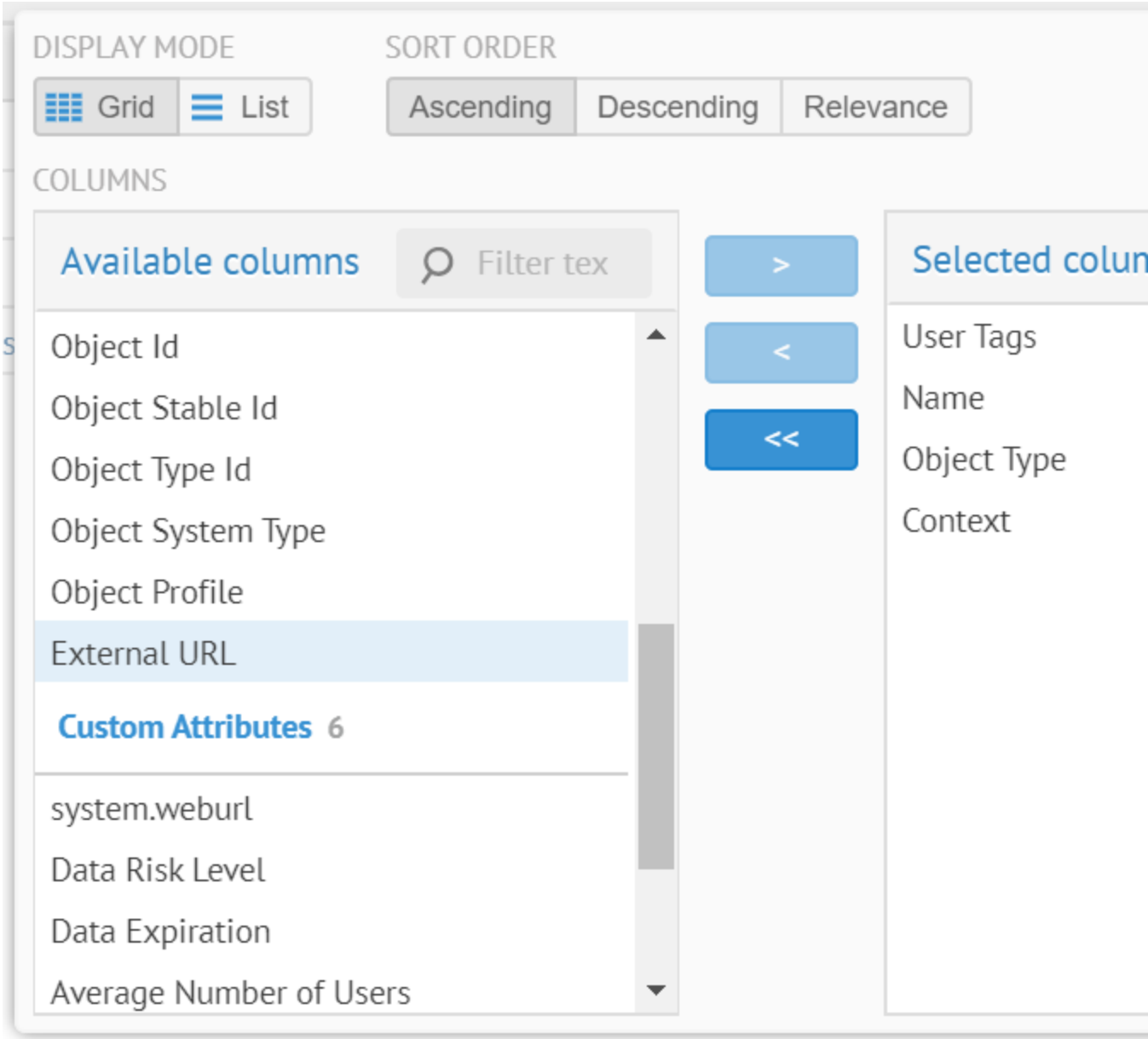
While the most common use of the Related Reports is to invoke it from terminology in a Business Glossary, this feature is also available from other metadata elements such as columns in a database or a report field. In this case, the result contains all reports which:

- Are impacted without transformation (data flow impact trace only via pass-through lineage)
- Are part of the semantic usage trace for terms which classify the original metadata element

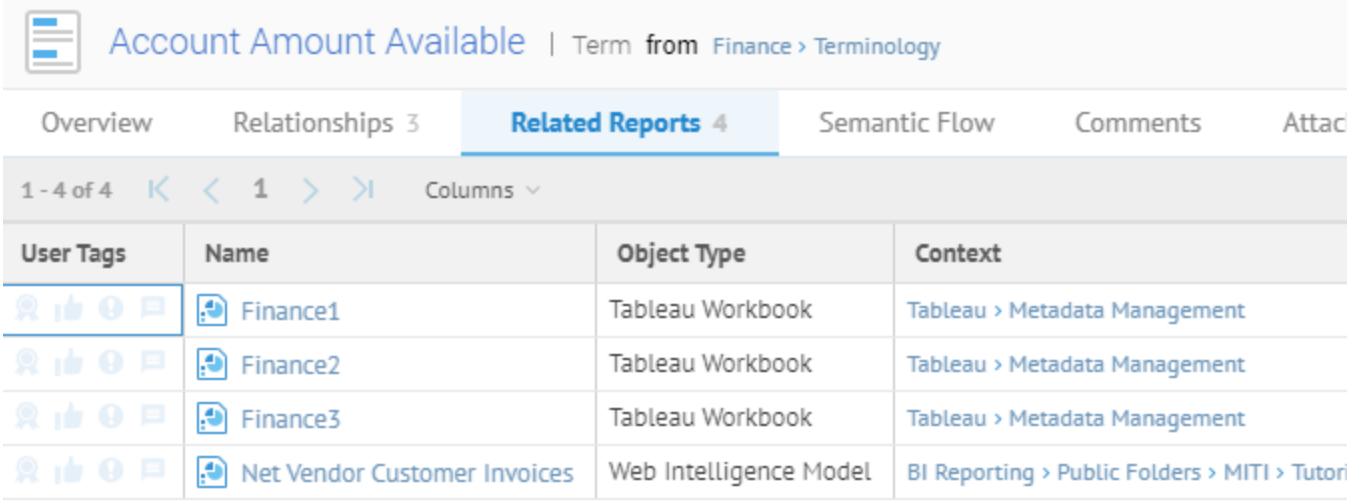
Open in source tool

You may add a column in the grid view to see actions (like Open) that you may click to act on this report without going to the report's details page. In particular, there is the **External URL** column which will open the report in the 3rd Party tool.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Related Processes

If you wish to know what processes (e.g., ETL jobs) access a data store object, like table or stored procedure, you may go to the **Related Process** tab. In this case MIMM will provide an answer that is the list of those data flow processes use the physical data element you are on. This process "usage" report shows processes that touch/access the current object that can involve create, alter, delete, read and write operations.

Steps

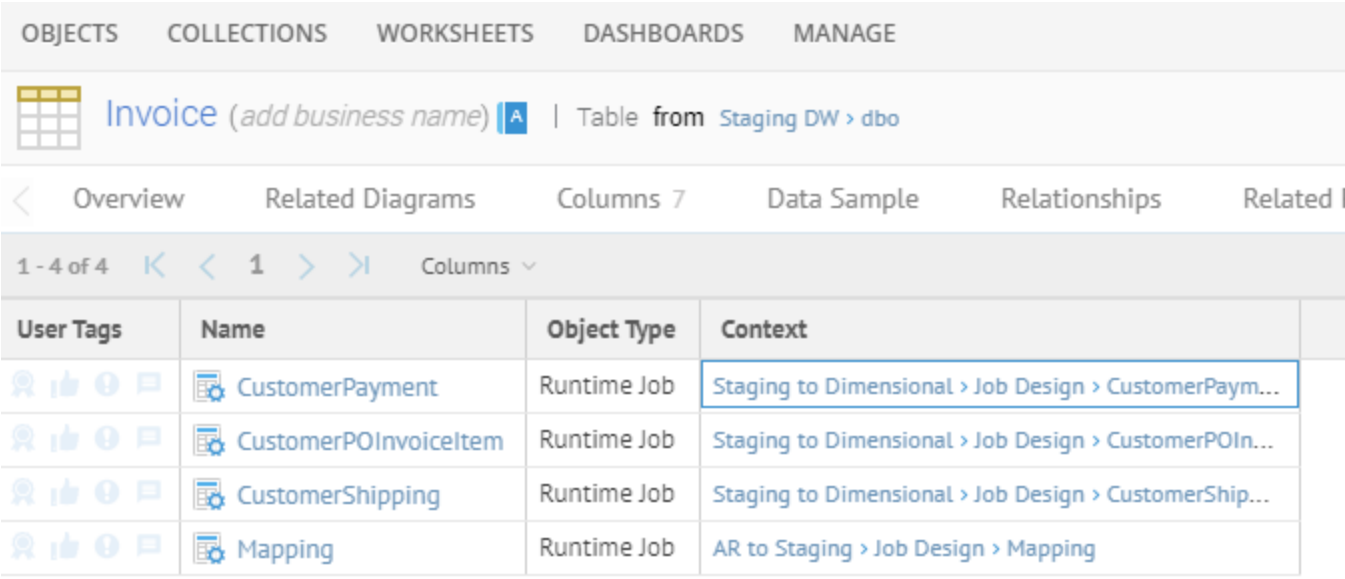
1. Navigate to the details page for the metadata element you wish report from.
2. Click the **Related Processes** tab.

Example

Go to the details page for the **Staging DW.dbo.Invoice** table.

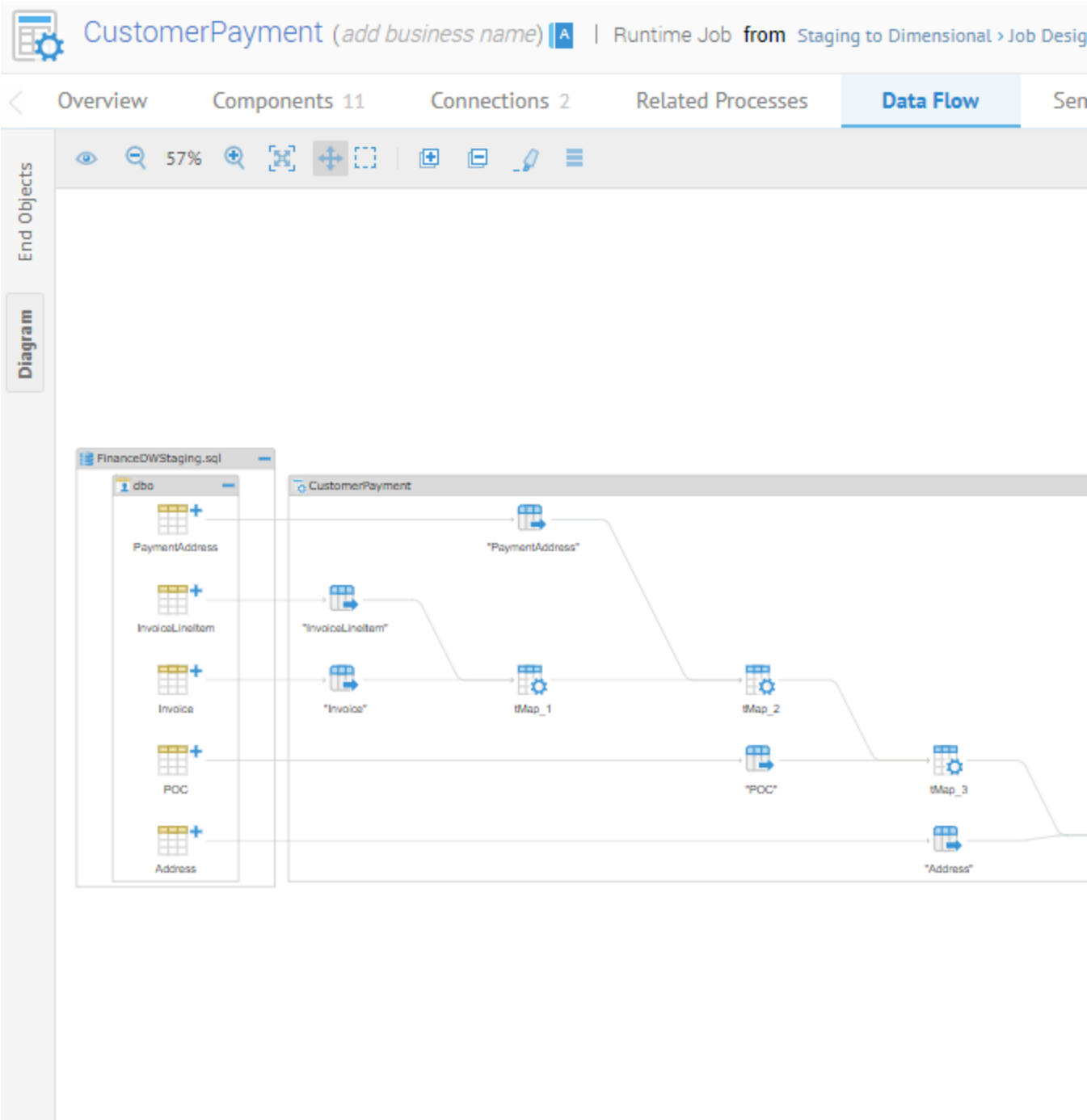
Go to the **Related Processes** tab.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click the **Customer Payment** process to open it. Then go to the Data Flow tab. Select the **Transformation Overview** for the **Type** of diagram.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



The Invoice table is used by this process, thus it appears in the Related Processes list.

Lineage Trace in General

A lineage trace will always have a point of origin, and also has a **Type** or direction. For the Data Flow lineage tab,

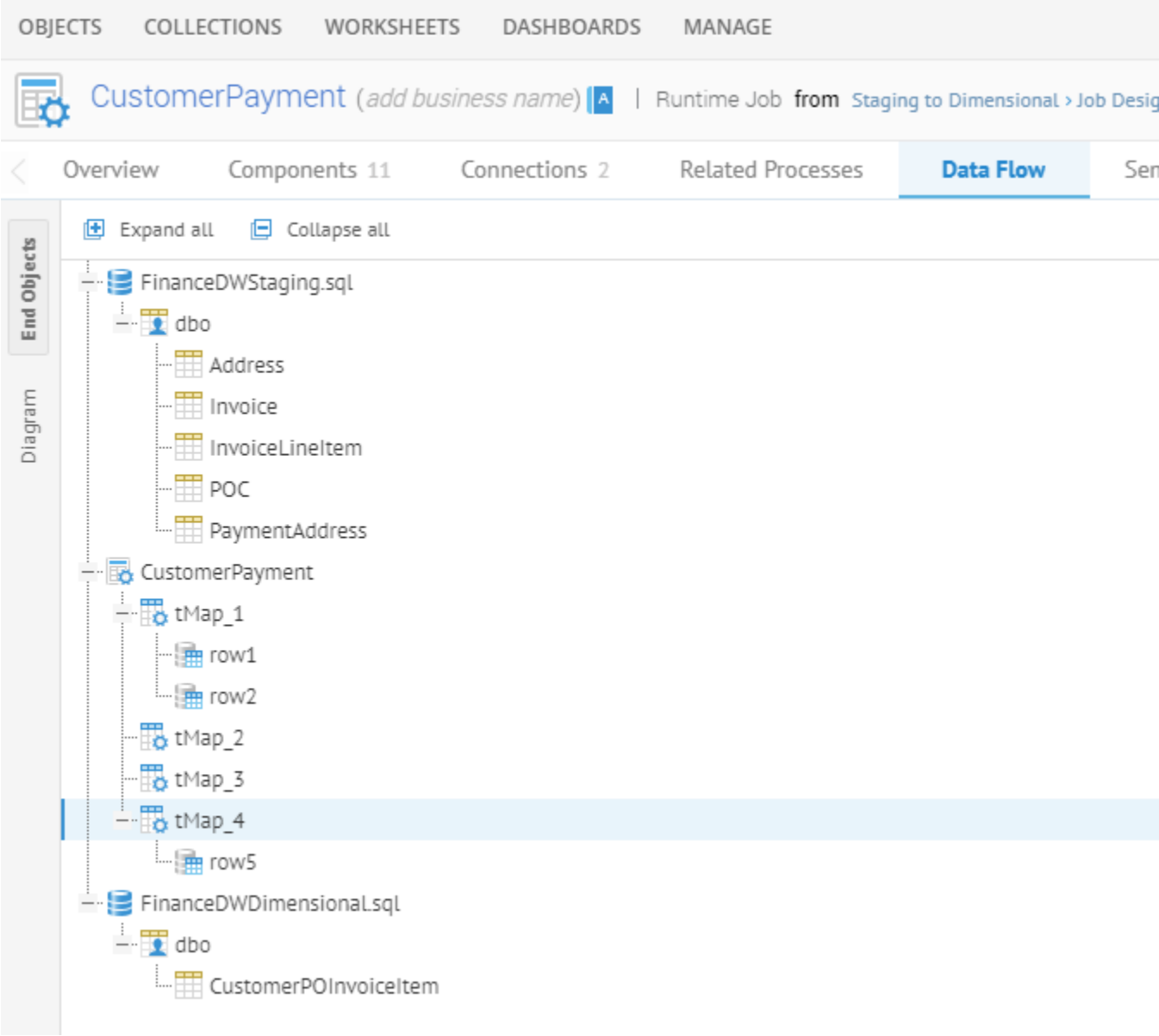
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

there are a number of common features and tools available when visualizing a lineage trace. Reporting on lineage will bring you to the Lineage Trace Page.

First, though, you must choose to see the **Diagram** or the **End Object** (list view), by clicking the tabs on the left.

Data Flow Setting

You may control the level of detail in both the lineage diagram and tree report (End Objects) using the Data Flow Settings menu.



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

The last selection is what will be presented for that object type in the future, until you select otherwise.

Show Internal/External Objects

Lineage reporting may

- either Show Internal Objects within a model (e.g., interim steps in transformations) or just the objects stitched to other model objects.
- either Show External Objects that are not directly material to the lineage trace (such as the link from files in HDSF to the tables representing them in Hive) or not show these objects.

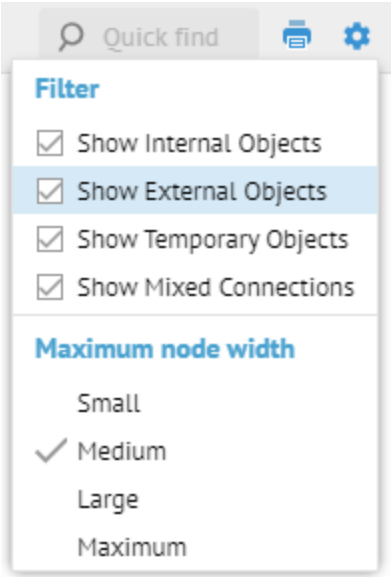
Steps

1. Begin a lineage trace.
2. Click **Data Flow Settings** >**Show Internal Objects** to show objects within a model (e.g., interim steps in transformations) or just the objects stitched to other model objects
3. Click **Data Flow Settings** >**Show External Objects** to show objects that are not directly material to the lineage trace (such as the link from files in HDSF to the tables representing them in Hive) or not show these objects.
4. You may uncheck either to hide the corresponding objects.

Show Temporary Objects

Big data solutions and other ETL/DI processes use temporary files and tables routinely. When harvesting, MIMM detects temporary files and marks them as TEMPORARY in their lineage characteristics. This fact means that you can distinguish temporary objects from permanent/stitchable ones in a lineage diagram and, optionally hide/show them.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

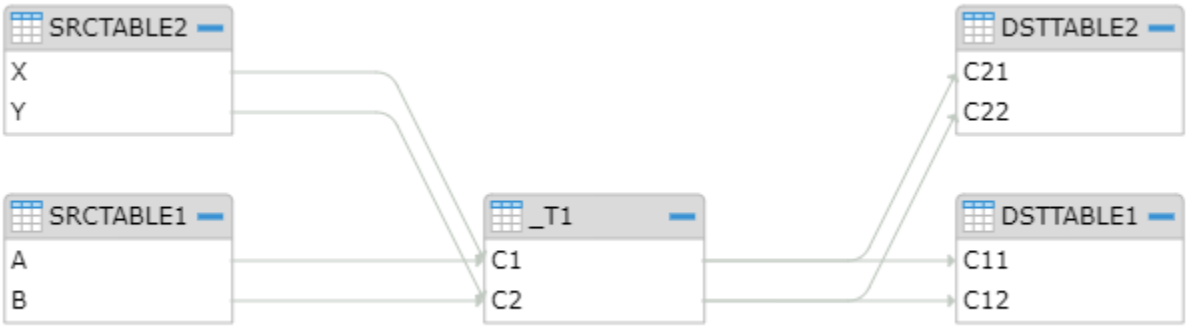


Steps

1. Begin a lineage trace.
2. Click **Data Flow Settings** > **Show Temporary Objects** to show these objects
3. You may uncheck to hide these objects.

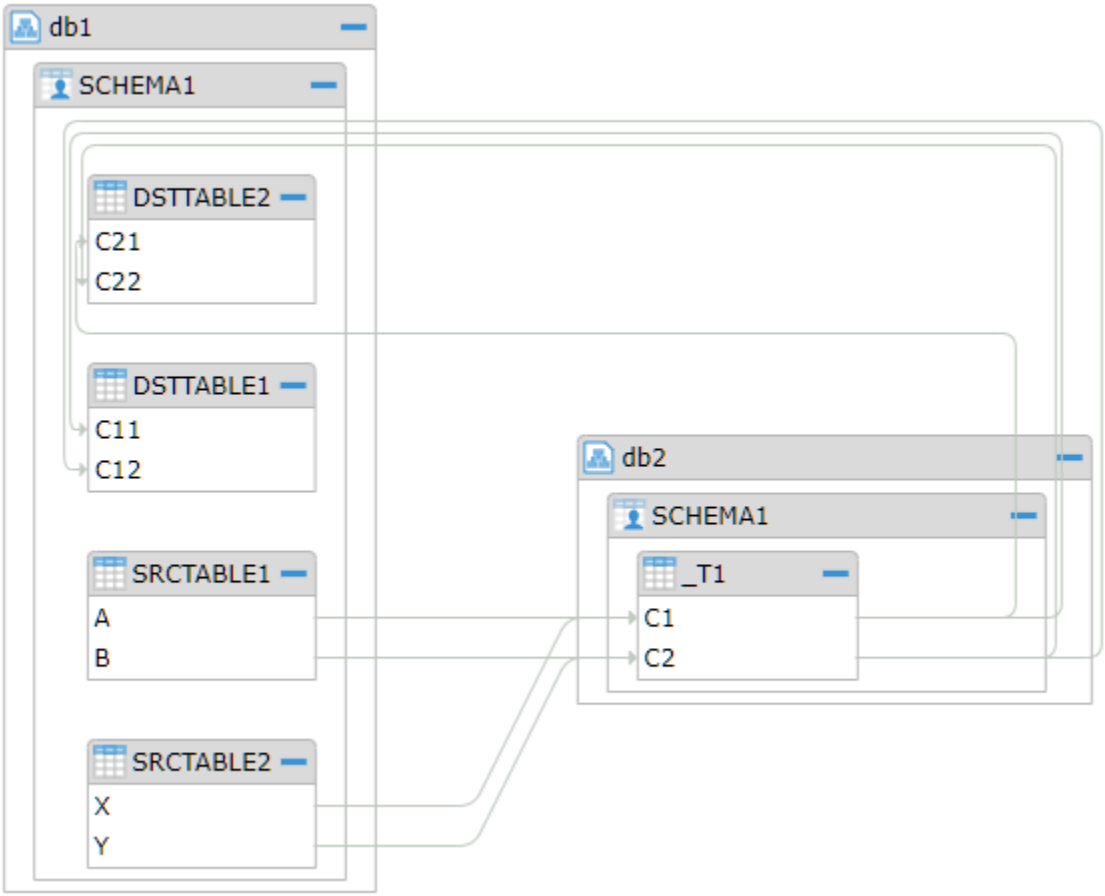
Show Mixed Connections

Sometimes an ETL/DI process will read from one table and write to another table in the same database. In this case, the lineage will often show process arrows that loop back because the normal presentation is to group tables inside their respective schemas. However, by default, the lineage in the Data Flow tab will attempt to produce a continuous diagram from left to right through the lineage by breaking up these tables giving a more understandable lineage picture.



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

When you click this checkbox the lineage is returned to the mode where all tables are grouped into their respective schemas and thus loops are shown.



Steps

1. Begin a lineage trace.

The default setting where this option is not checked is presented.

2. Click the Click **Data Flow Settings** > **Show Mixed Connections** to show these objects

The lineage is returned to the mode where all tables are grouped into their respective schemas and thus loops are shown

3. You may uncheck to return to the default.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Control Flow Details

Control flow is lineage that traces from an object used as part of a selection WHERE clause or similar structure that impacts what data is moved but is not itself directly moved to the target. There are two types of control flow:

- Column control flow where the control flow directly impacts values of column (e.g., lookup)
- Row control flow where the control flow does not directly impact values of columns (e.g., filters).

Steps

1. Begin a lineage trace.
2. Setting options, you may:
   - Click **Data Flow Settings** >**Control Flow/None** to hide any object which are only connected via control flow and not show any control flow links.
   - Click **Data Flow Settings** >**Control Flow/Limited** to show any objects which are directly connected to the origin object via control flow and show those control flow links.
   - Click **Data Flow Settings** >**Control Flow/Complete** to show any objects which are connected via control flow to the origin object and any subsequent objects and show those control flow links.
3. Once control flow display is enabled, then go to the lineage Diagram and click on target

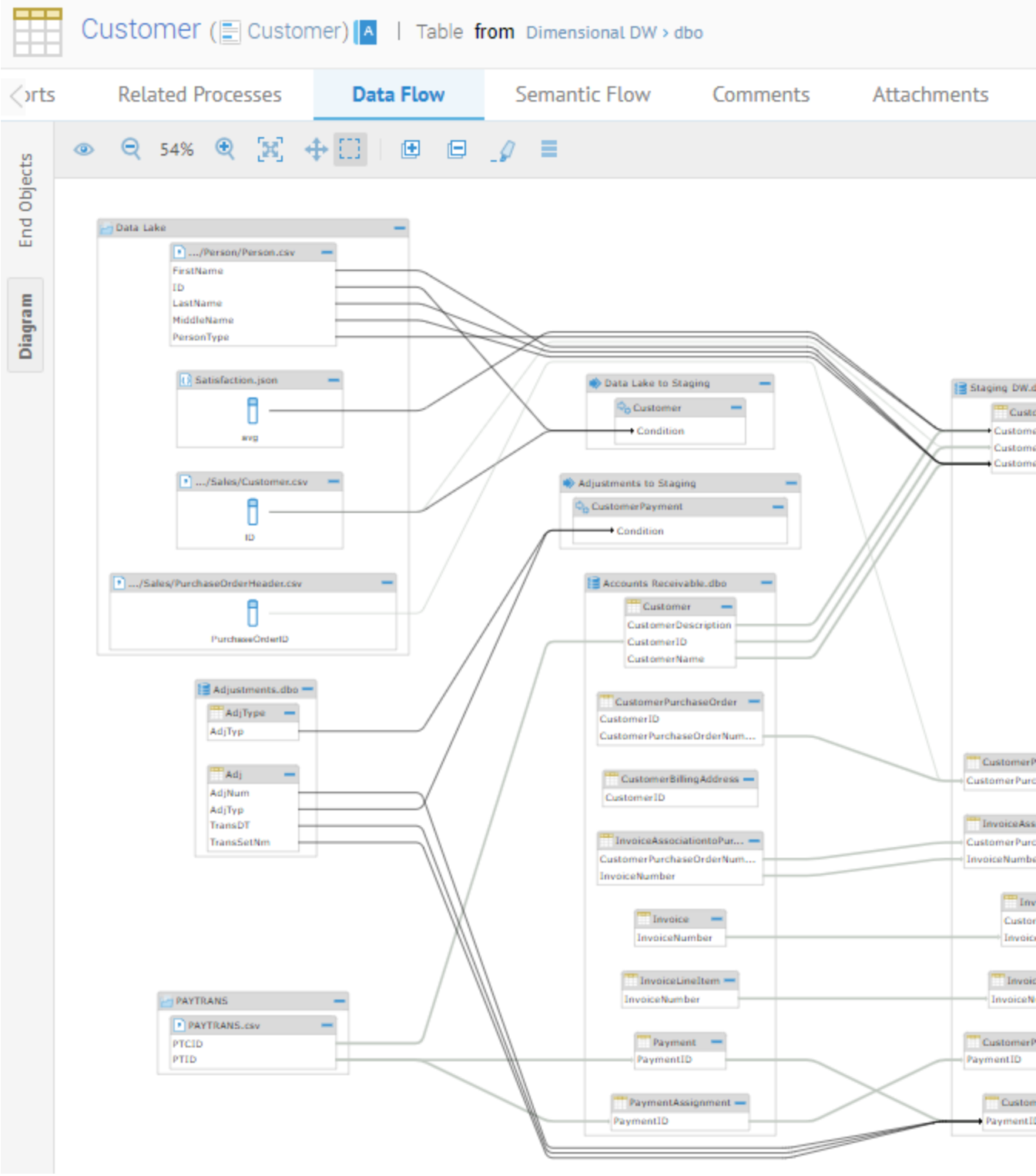
   elements and the control flow that the target depends upon will appear.
4. Trace data flow lineage.
5. Click **Data Impact** in the **Type** pull-down in the upper right.

Example

Search for the **Dimensional DW**, **Customer** table and open it.

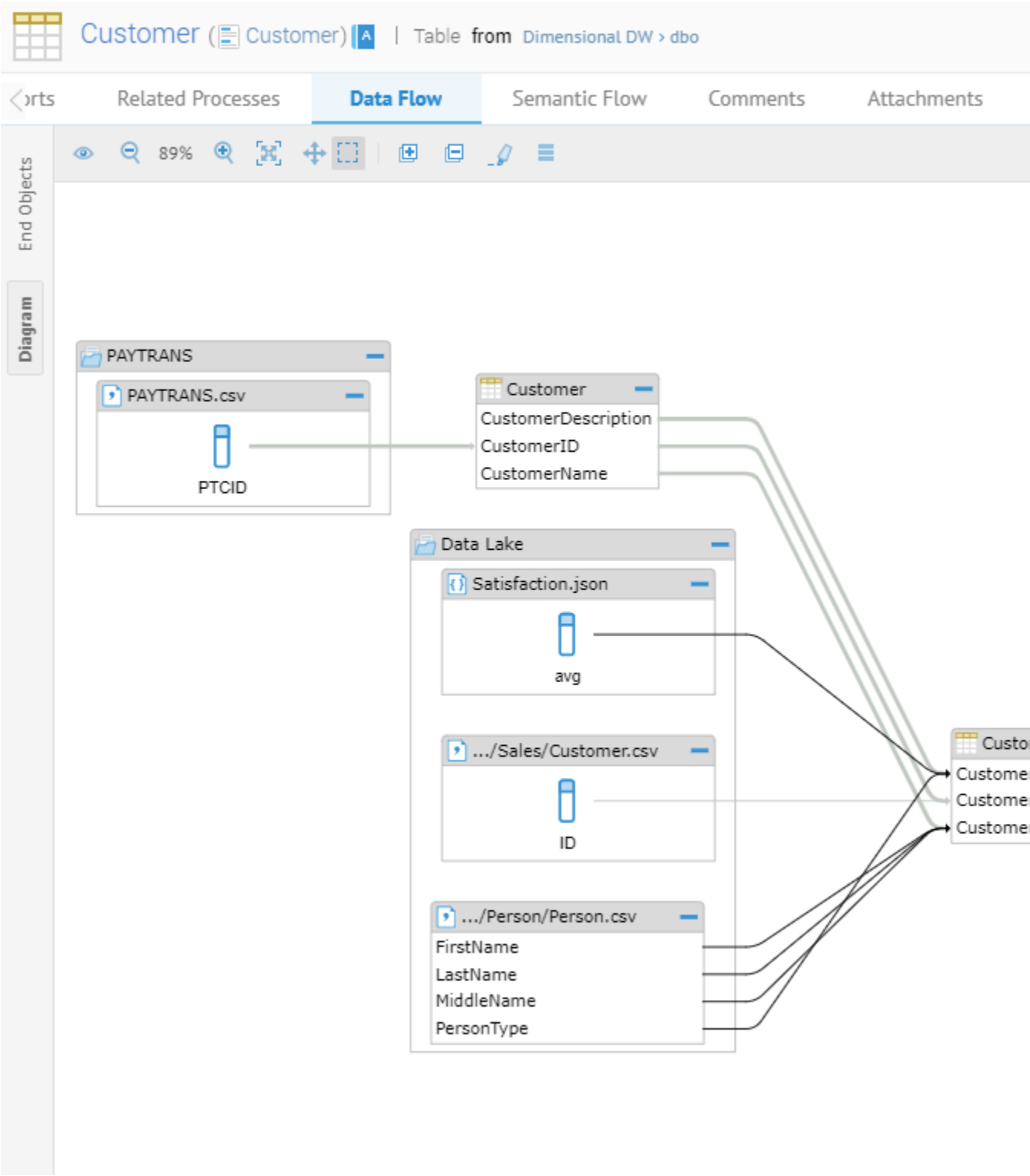
Go to the **Data Flow** tab and ensure that the **Type** is **Data Lineage** and the **View** is **Diagram**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



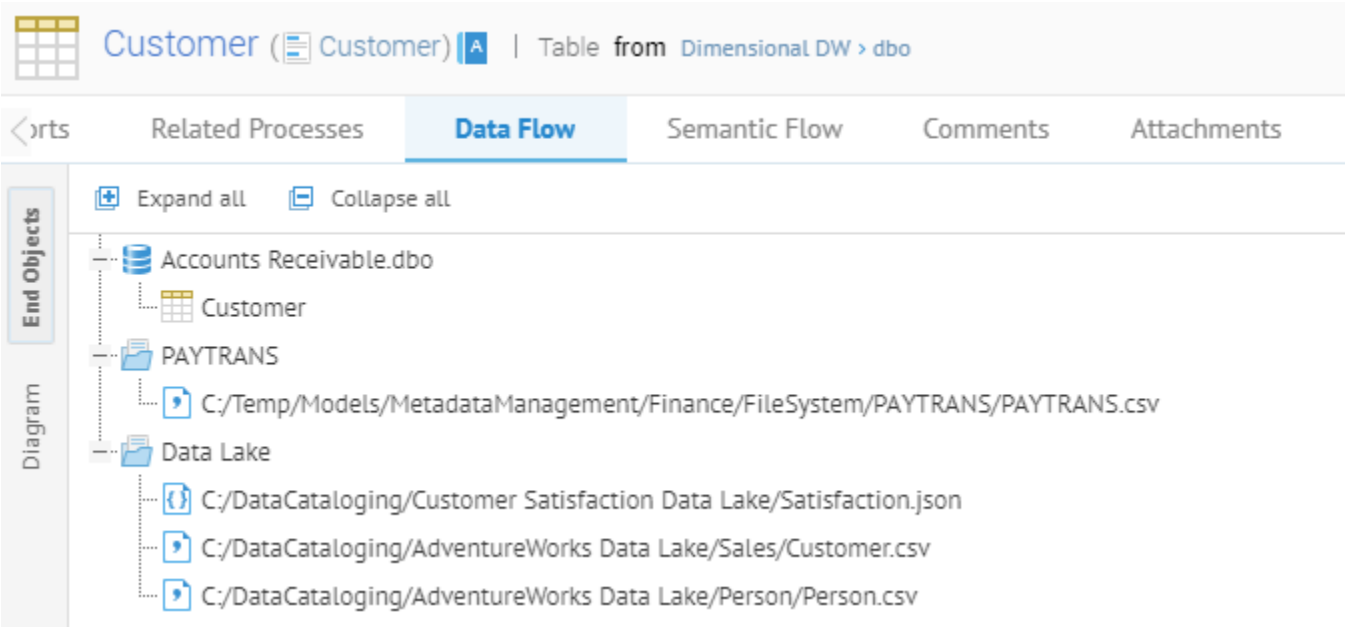
Finally, ensure that the **Display Options** are all unchecked,and **Data Flow Settings** are **None** and **End Objects**:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



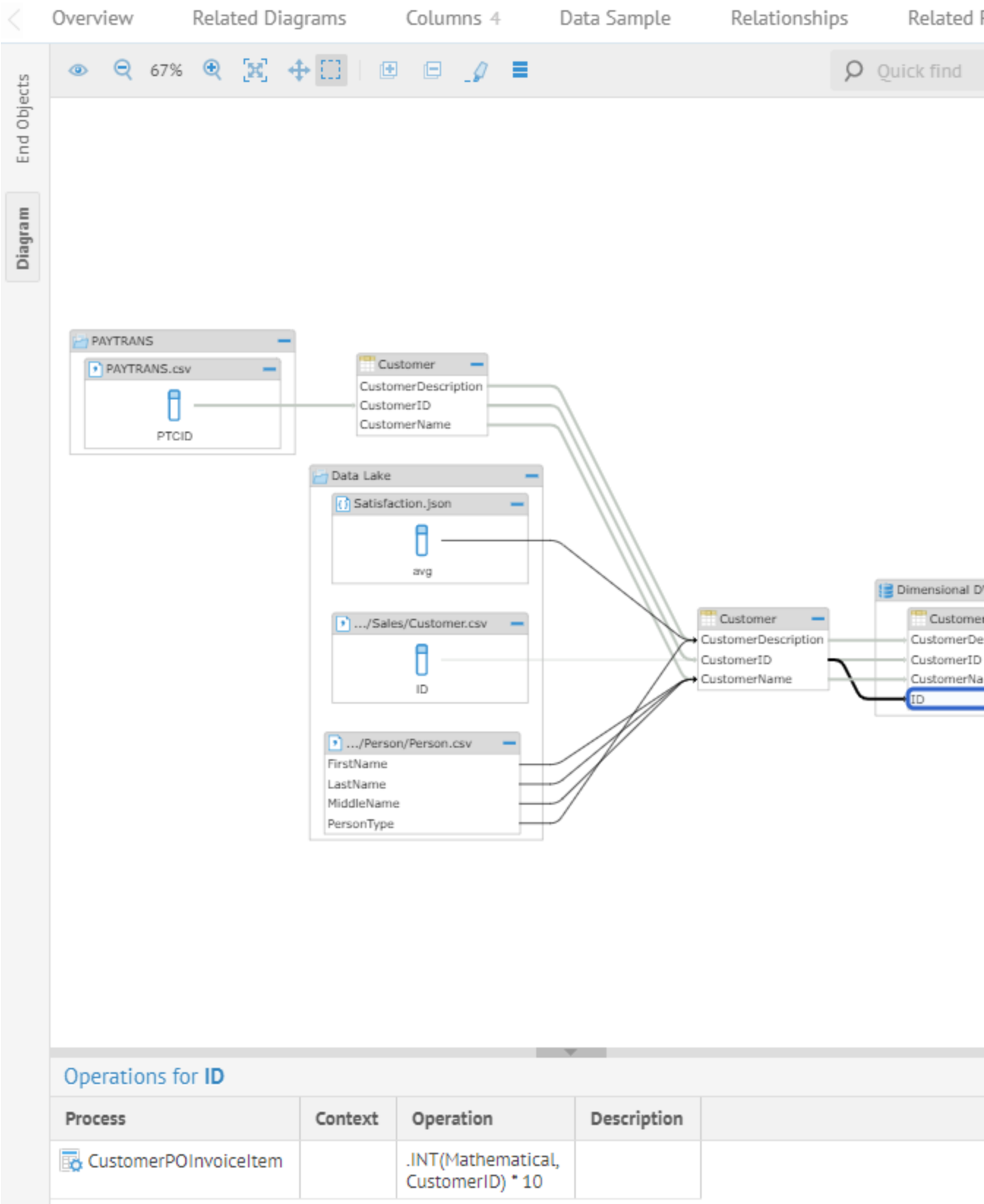
And we have a simple lineage:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click **Dimensional DW.dbo.Customer.ID** to show the Properties at the right and the Operation in the Process Details at the bottom of the page.

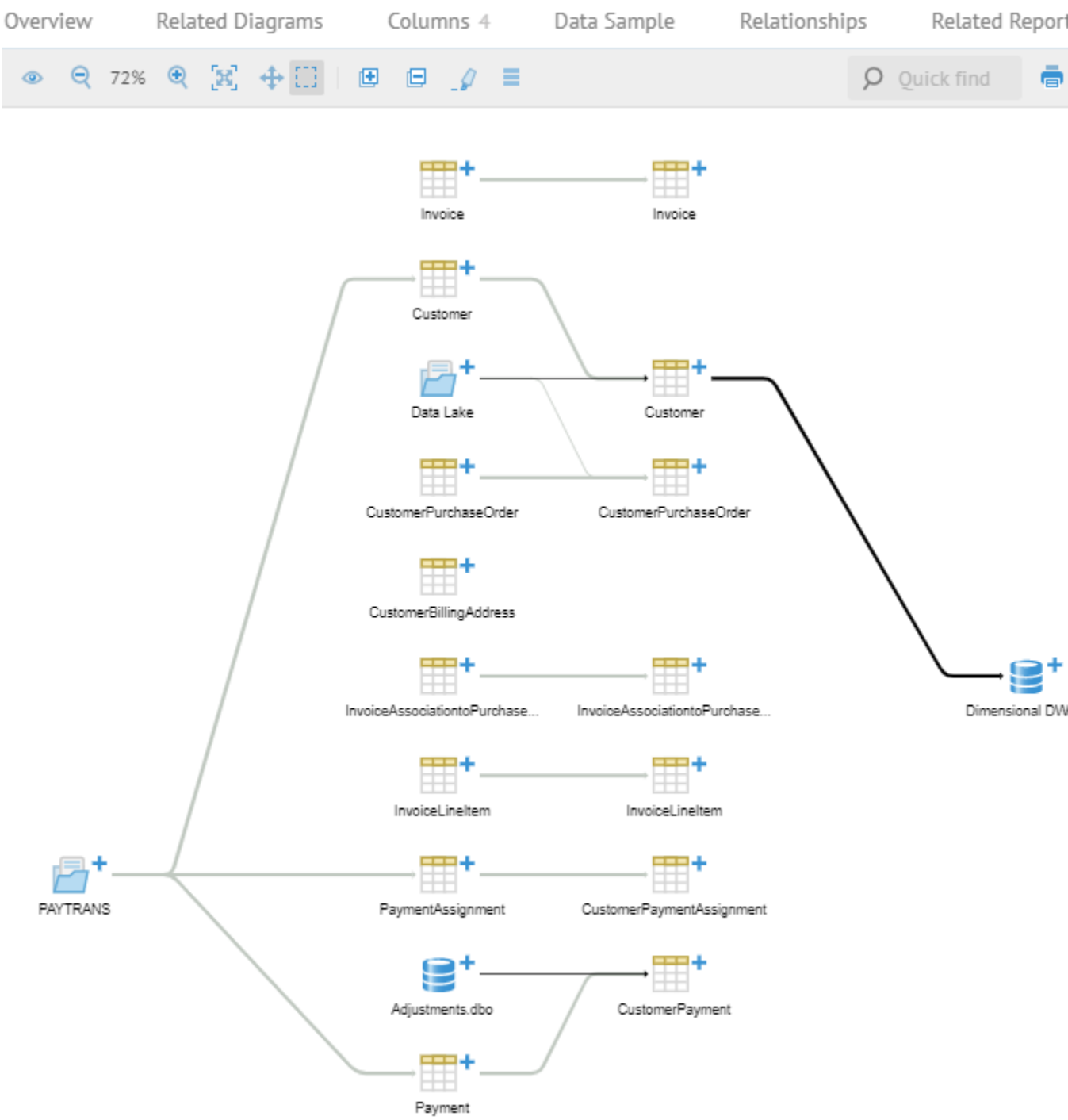
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

At this time, the diagram does not contain any control lineage artifacts, as we specified.

Now, update the **Data Flow settings** with **Control Flow** as **Limited**:

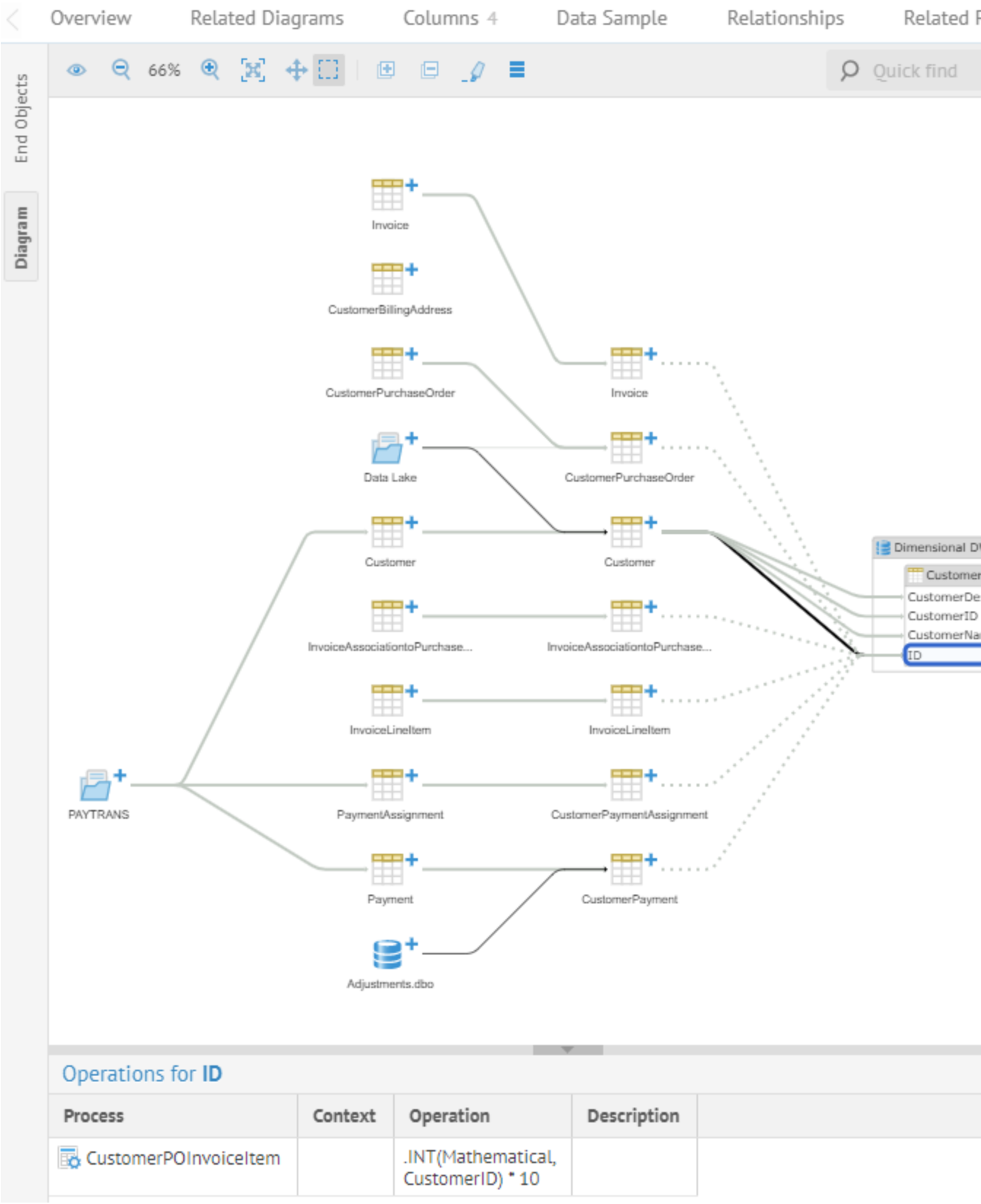


Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

*Many new objects, which are not directly connected by data flow links now appear. Selecting **Data Flow Settings** >**Control Flow/Limited** shows any objects which are directly connected to the origin object via control flow.*

Now, again click the **Dimensional DW.dbo.Customer.ID** column.

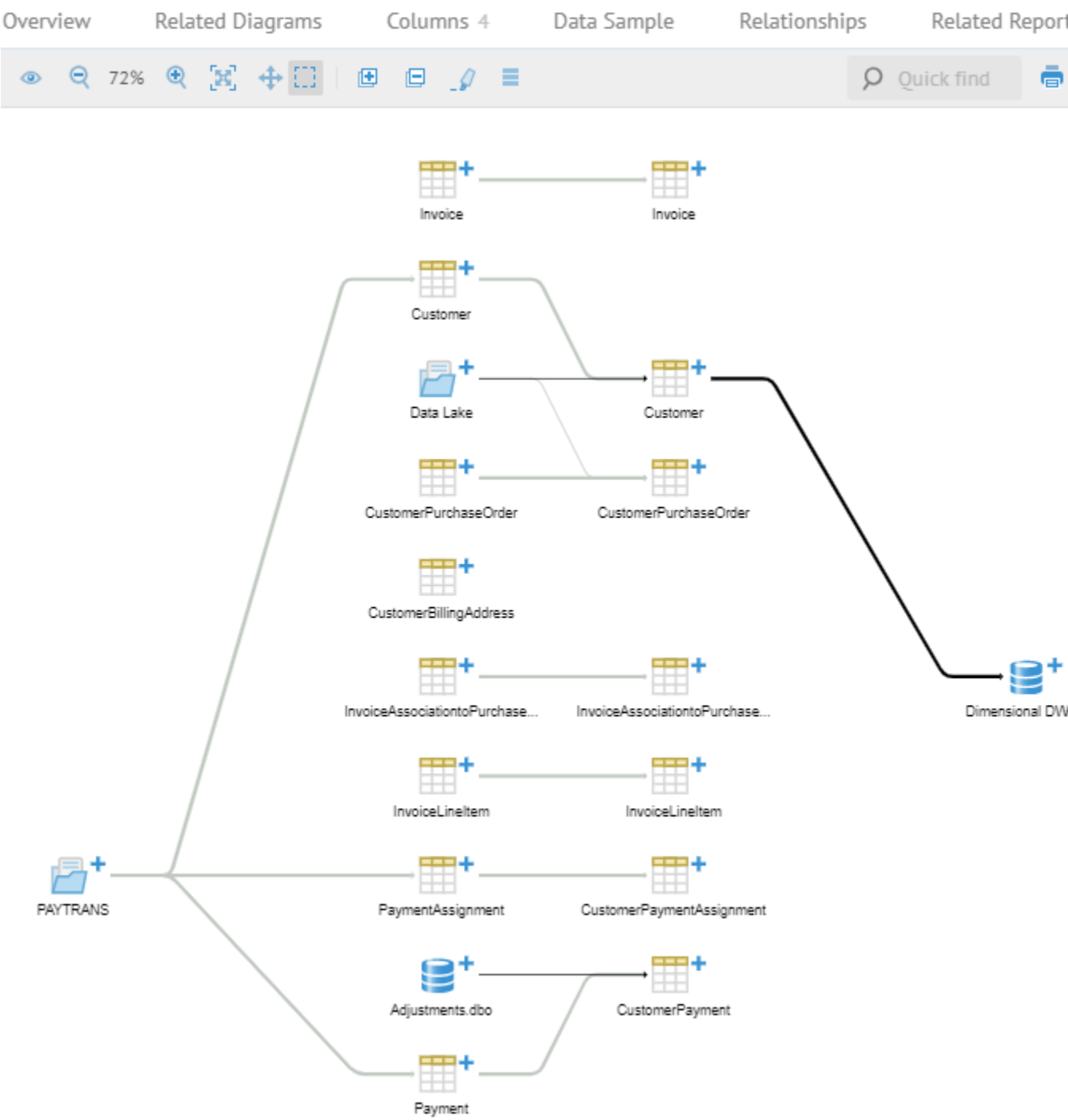
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

And we see control lineage as different lines.

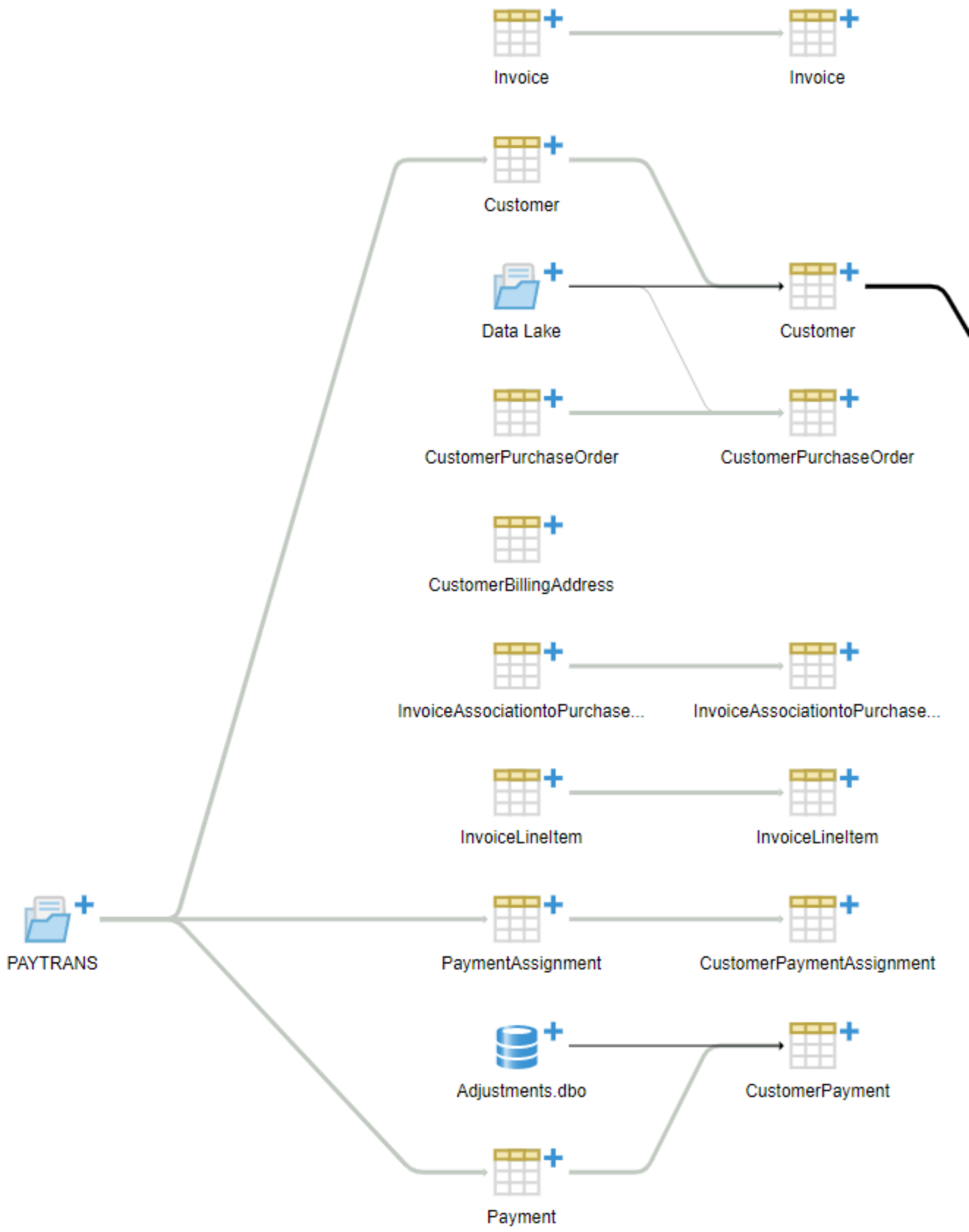
Now, update the **Data Flow settings** with **Control Flow** as **Complete**:



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Then select **Show Mixed Connections** from the Filter, and expand **Staging DW.dbo.CustomerPayment** and select **PaymentID**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Overview Related Diagrams Columns 4 Data Sample Relationships Related Report

56%

Data Lake
C:/DataCataloging/Adventure...
C:/DataCataloging/Adventure...
C:/DataCataloging/Customer ...
C:/DataCataloging/Adventure...

Staging DW.dbo
Customer
CustomerPurchaseOrder
CustomerPaymentAssignment
InvoiceAssociationtoPurchase...
InvoiceLineItem
Invoice
CustomerPayment
PaymentID

Accounts Receivable.dbo
Customer
CustomerBillingAddress
CustomerPurchaseOrder
PaymentAssignment
InvoiceAssociationtoPurchase...
InvoiceLineItem
Invoice
Payment

PAYTRANS
C:/Temp/Models/MetadataMan...

Adjustments.dbo
AdjType
Adj

Operations for **PaymentID**

Copyright

*Many new objects, which are not directly connected by data flow links now appear. Selecting **Data Flow Settings** >**Control Flow/Limited** shows any objects which are connected via control flow to the origin object and any subsequent objects.*

Default View

This option toggles the default view presented when looking at lineage:

- show the lineage trace as a graphical diagram
- show the lineage trace as a textual tree.

Semantic Flow Setting

Lineage Diagram Trace in General

Select the Diagram tab on the left to obtain this presentation. You will see a graphical presentation of the lineage (data impact or data source) with round edges boxes representing nodes, many contained within larger boxes (container structures, e.g., a schema contains several tables). Then, connecting lines denote the lineage flow. In general, the lineage tools within MIMM function identically whether one is analyzing data flow lineage, semantic lineage or both. However, the presentation is different, as follows:

		Thick Line	Thin Line
		Expandable (Click for details)	Not expandable
Black	Data Flow with Expression/ Transformation	Summary of Underlying Data Flow with Transformation of the Data	Transformation of the data without an underlying data flow
Gray	Pass-Through Data Flow	Summary of Underlying Data Flow resulting in a simple pass-through	Simple pass-through without an underlying data flow
Grey Doted	Column Control Flow	Summary of Control Flow which directly impacts values of columns (e.g. lookups) where there is an underlying process	Control Flow which directly impacts values of columns (e.g. lookups) without an underlying process
Grey Dashed	Row Control Flow	Summary of Control Flow which does not directly impact values of columns (e.g. filters) where there is an underlying process	Control Flow which does not directly impact values of columns (e.g. filters) without an underlying process
Blue Dashed	Semantic Link	N/A	Semantic link such as a derivation

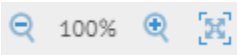
Overview

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

You may click this icon to show or hide an **Overview** panel of the lineage trace diagram. Click in the overview to quickly move to a portion of the full diagram.

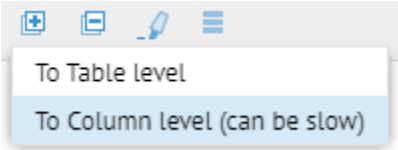
Zoom In/Out and Fit to content

Click **Zoom in** or **Zoom out** icons to adjust the aspect ratio of the diagram. Also, you may click on the **Fit to content** icon to view the entire diagram at the best zoom that will fit.

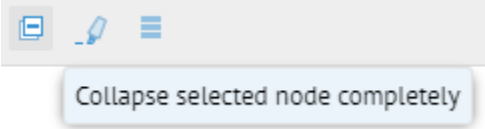


Collapse / Expand

Click **Expand to Table level** or **Column level** icons to expand the entire diagram (ensure that you do not have an object selected, otherwise the action will only apply to that object).



Click on Collapse to collapse all objects to the highest level.

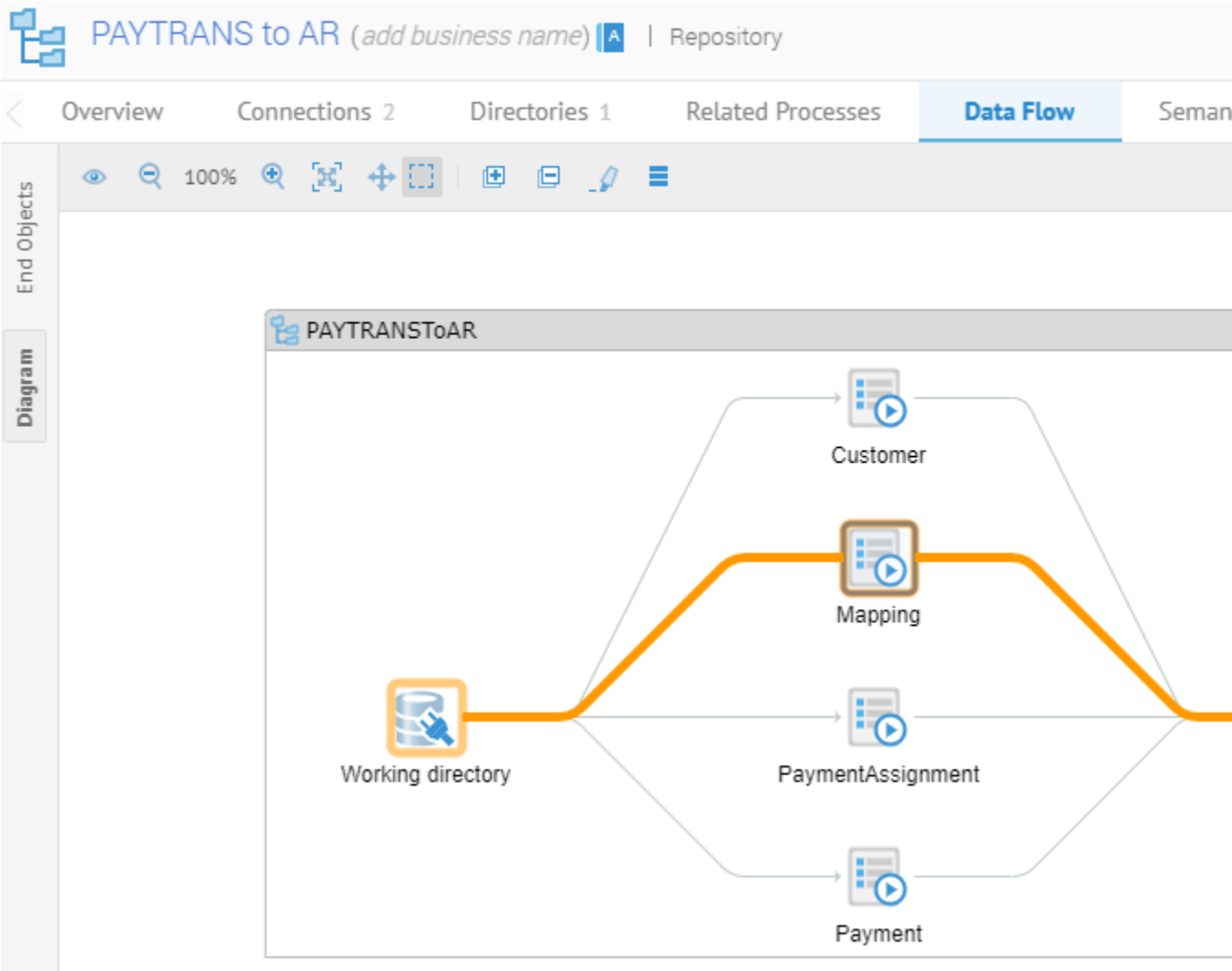


Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

You may also click on the plus sign for an object to expand and the minus sign to collapse just that object.

Highlight

Click to select an object in the trace and then click the **Highlight** ( ) icon to highlight the path through that selected object.



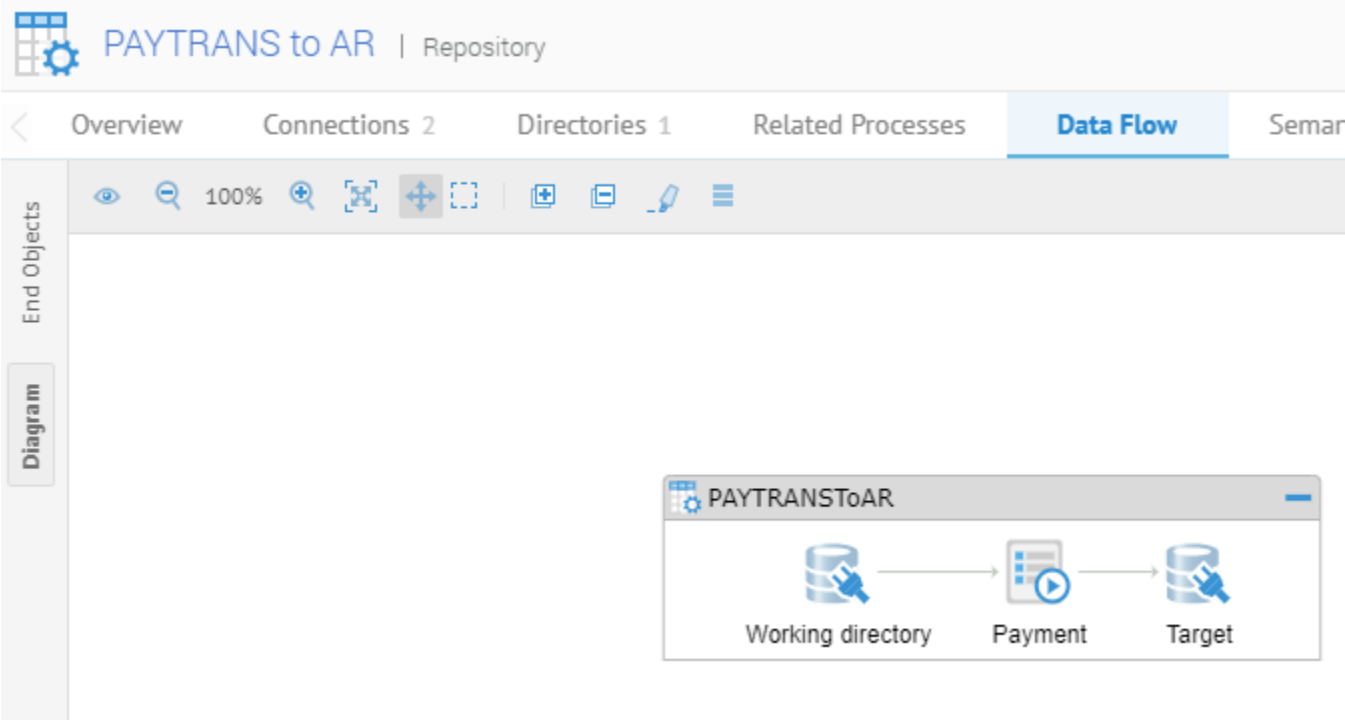
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

You may double-click or perform a long click on the Highlight icon to lock it in place and the path will highlight for any subsequently selected object.

Focus the lineage trace

Focus on Path

You may focus the lineage trace to only include that portion of the trace that passes through another object in the diagram. Click to select an object, click the more actions icon ( ) and click on the **Only show the selected node ancestors and descendants** icon ( ).



To remove the focus and return to the entire lineage diagram simply click to close the dialog stating "Currently focusing on…"

Open the object's details page

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Open

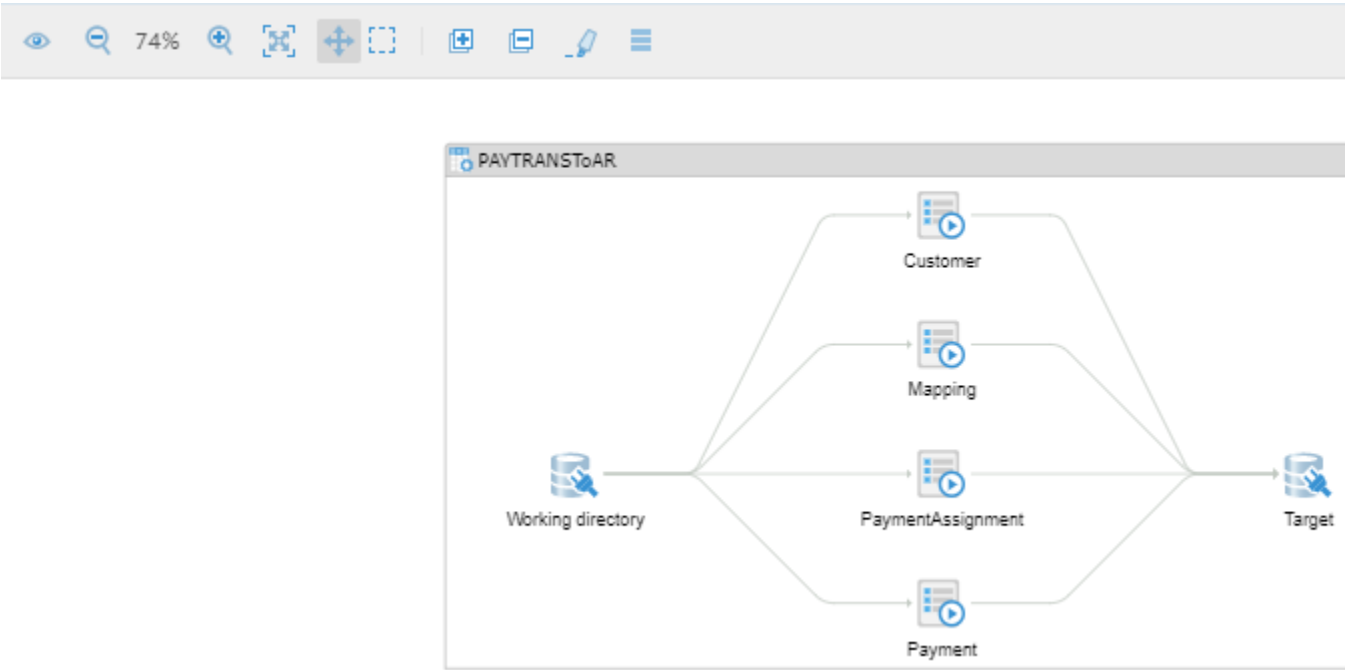
You may double-click, right-click and select **Open** ( ), or select the object and use the **Open** icon to navigate to the object's details page.

Trace lineage from another object

You may re-trace the lineage from any object in the diagram. Select the object and use the **Trace Lineage** icon ( ) to restart the trace from that point with that type of trace.

Maximum node width

In many cases, names of objects may be too long to fit into the objects in the diagram. You may specify several different node width maximums to make the diagram more readable. Click on the Display Options ( )

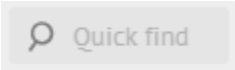


Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Print

You may download a PNG or SVG image of the diagram.

Quick find

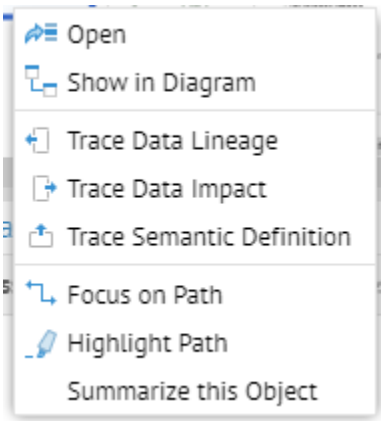


In the upper right, there is a search text box that will provide a quick list of object names that contain the text you type. You may click on any of the results to select that object in the diagram and moving the focus there.

Explore Further

Invoking a lineage trace from any reference to a metadata element

You may invoke a lineage trace from any diagram or any list of results (e.g., from a Browse or Search), either via right-click context menu



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Interpreting the graphical lineage

In general, the lineage tools within MIMM function identically whether one is analyzing data flow lineage, semantic lineage or both. However, the presentation is different, as follows:

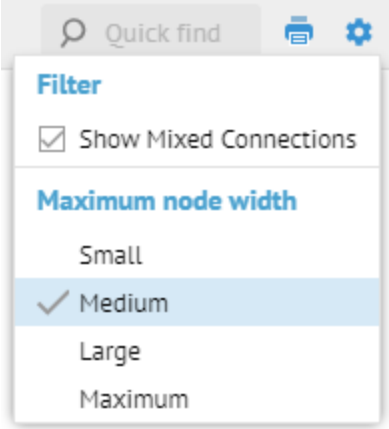
		Thick Line	Thin Line
		Expandable (Click for details)	Not expandable
Black	Data Flow with Expression/ Transformation	Summary of Underlying Data Flow with Transformation of the Data	Transformation of the data without an underlying data flow
Gray	Pass-Through Data Flow	Summary of Underlying Data Flow resulting in a simple pass-through	Simple pass-through without an underlying data flow
Grey Doted	Column Control Flow	Summary of Control Flow which directly impacts values of columns (e.g. lookups) where there is an underlying process	Control Flow which directly impacts values of columns (e.g. lookups) without an underlying process
Grey Dashed	Row Control Flow	Summary of Control Flow which does not directly impact values of columns (e.g. filters) where there is an underlying process	Control Flow which does not directly impact values of columns (e.g. filters) without an underlying process
Blue Dashed	Semantic Link	N/A	Semantic link such as a derivation

In addition, MIMM has four levels of presentation:

- Configuration Model Connections Overview – which is a diagram representing the various Models contained within a configuration and how they are related (or stitched) to each other based upon connection definitions manually assigned to MIMM .
- Model Connections Overview – which is a diagram representing the various Models contained within the directory of an external repository and how they are related (or stitched) to each other based upon connection definitions already provided in the external metadata repository.
- Model Lineage Overview – which is a diagram representing an overview of the lineage within a given Model.
- Lineage Trace analysis at the configuration or Model level – which is a fully detailed trace of semantic and/or data flow lineage for detailed analysis.

Display Options

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



There are additional options to show **Internal**, **External** or **Temporary objects** and **Mixed Connections** in the lineage along with **Maximum node width**.

Limit Control Flow Lineage

It is easy to imagine a common scenario where you trace data impact and your impact trace affects a commonly used (in terms of joins and WHERE clauses) dimension, e.g., the time dimension in the warehouse, mart or otherwise. Just about every report will be using that dimension in some way, and thus the impact lineage is basically everything. In this case the diagram size quickly grows out of the capability of your browser to present the lineage let alone navigate and analyze it.

For this and other similar reasons, the same menu as above includes options to limit the lineage.

MIMM may be used as an active data catalog, providing:

Control Lineage Option	Description	Delay in Presentation
None	No control flow data impacts are traced	None
Limited	Limited control flow data impacts are traced	May be slow
Complete	A control flow data impacts are traced	Likely slow or unresponsive

Click on the level next to **Show** at the bottom of the Log Message dialog to pick the log level being displayed.

Properties Panel

Click to select a metadata element and view its properties in the **Properties Panel** on the right. You may show and hide this panel as needed.

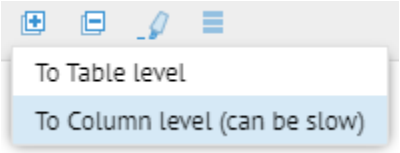
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Lineage End Objects Trace in General

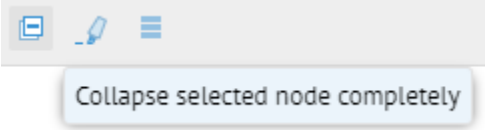
Select the Diagram tab on the left to obtain this presentation. You will see a list of the End Object for the lineage. End objects are the final nodes in the lineage where the trace stops. For impact, this often means report fields, for source lineage it often means operational system tables and columns.

Collapse / Expand

Click **Expand to Table level** or **Column level** icons to expand the entire diagram (ensure that you do not have an object selected, otherwise the action will only apply to that object).



Click on Collapse to collapse all objects to the highest level.



You may also click on the plus sign for a node to expand and the minus sign to collapse just that node.

Properties Panel

Click to select a metadata element and view its properties in the **Properties Panel** on the right. You may show and hide this panel as needed.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Data Flow Overview for Models

Data Integration and ETL/ETL data processes contain lineage within the model, even without sitting them to other models. In addition, data store models such as databases with views and/or stored procedures also present lineage in this fashion.

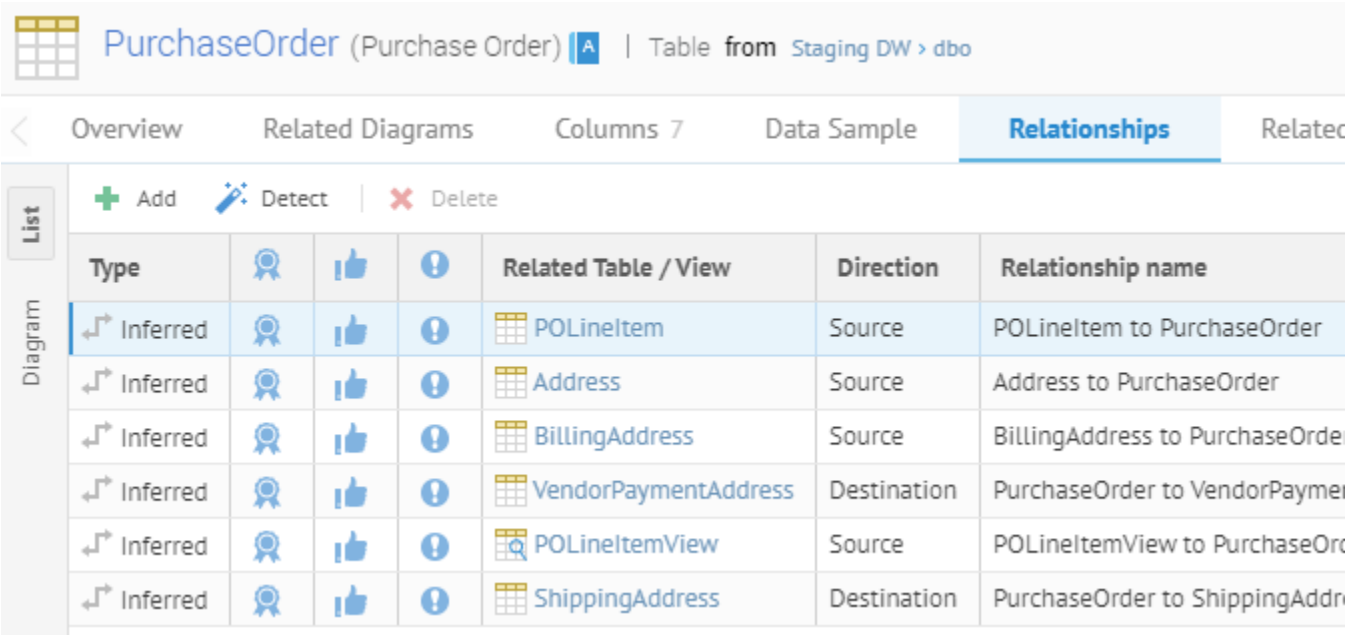
> *You may even use the lineage overview on models not in the current configuration using the **MANAGE > Repository** function.*

Relationships

Critical to any use of the data in tables and views that are cataloged within a data stores (e.g., hive data lake, relational data warehouse, NOSQL databases, etc.), is the ability to correctly and effectively join the information together. One may catalog and curate these join conditions by identifying and managing *relationships* in your data stores.

Example

In this case we will navigate to the details page of the **PurchaseOrder** table in the **Staging DW** database model, and click the **Relationships** tab.



In this instance there is one relationship defined in the source database by a Primary Key – Foreign Key relationship.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

*The operation (VendorID=VendorID) describes how the two tables should be joined, i.e., in this case each table has a column named **VendorID** and the data from these two tables should be joined only where the values in the **VendorID** column match.*

Each of the other relationships is inferred from the ETL process that takes the **PurchaseOrder** table and joins it with others to produce the **Dimensional DW** database. The second relationship with **POLineItem** has a **Usage Count** of 1. This means there is one join in subsequent ETL jobs or business intelligence reports that use this table from which MIMM inferred this relationship

Click the line where relationship with **POLineItem** is and the **Usage** information appears for that relationship, listing the single usage of this table and **POLineItem**. It is in the BillingPOC ETL mapping.

Click this mapping and then the **Data Flow** tab and you will see the join between the **PurchaseOrder** and **POLineItem** tables.

Returning to the list of relationships, click the certify icon for one of the inferred relationships, enter a justification and note the relationship is now **User defined**.

Discovering Relationships

After harvesting a model, one may navigate to the details page for any classifier level metadata element (e.g., table, view, entity, etc.) and click the **Relationships** tab. Here you will be presented with pre-defined, user-defined and inferred relationships relating this table to others in the data store.

PK/FK relationships

In some cases there is little to do as some databases will already have a very complete set of primary/foreign key relationships defined and thus this information is harvested as relationships in the model, such as the first one above between the **PurchaseOrder** and **Vendor** tables.

Inferred relationships

The ability to infer relationships that are not already defined within a data store is incredibly valuable. Referred to as metadata usage driven inference, MIMM will automatically deduce

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

these relationships by using the surrounding data flow usage such as joins in data integration (ETL Tools, SQL Scripts or Data Prep) and business intelligence (traditional or self-service) activities.

These relationships are always presented in the **Relationships** tab. They may be made user-defined by certifying them or by providing an **Operation** signature

Detected relationships

MIMM is able to detect further potential relationships in an interactive fashion. You may request to detect these relationships by specifying an initial table and column. This, on demand detection is based on:

- Metadata Name Matching: for example PurchaseOrder.SKU = Product.SKU or Customer.AccountId = Account.Id)
- Semantic Definition Matching: classified by users to the same Business Glossary term
- Semantic Type Matching: discovered through data profiling (e.g. SSN syntax or VIN number)

Managing and Curating Relationships

User defined relationships

You may also define relationships from scratch and these become user-defined.

Any inferred relationship becomes user-defined once it is certified or is given a new operation signature.

When deleting these user-defined relationships, the inferred relationship will re-appear as it is still inferred.

Social curation

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

You may endorse, certified (with appropriate permissions) and/or providing warnings on the relationships above.

Dynamic Data Model diagram generation from Relationships surrounding any object (e.g. table or file).

Dynamic Relationship Diagram

You may visualize these key, inferred and user defined relationships using the Diagram tab on the left when using the Relationships tab. Many of the controls that are provided to visualize the diagram of a model are available here, as well.

Forward Engineering to Business Intelligence Tools

See exporting to a 3rd party tool.

Key and User defined relationships are the only one to be forward engineered or be automatically included in a model diagram. Inferred relationships may be manually added to diagrams.

Visualize the Diagram of a Model

From the details page for a model you may click on Diagrams or Related Diagrams to see and edit diagrams for a model.

You may create new diagrams here as well.

Once you have opened a diagram you may visualize it in a non-permanent manner, or you may save what you changed.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

A number of tools are available for visualization, analyzing and editing these diagrams, described in detail here.

You may always return to the original published layout by clicking on the **Show original** button.

Including relationships in the diagram

You may select a relationship in any diagram and perform the following analysis:

- The associated primary keys and foreign keys are highlighted in the associated tables in the diagram. If there is more than one PK/FK pair, each will be highlighted in a different color.
- In the **Properties Panel** you may copy and paste the Related Columns to be used to define the equivalent join directly in a reporting.

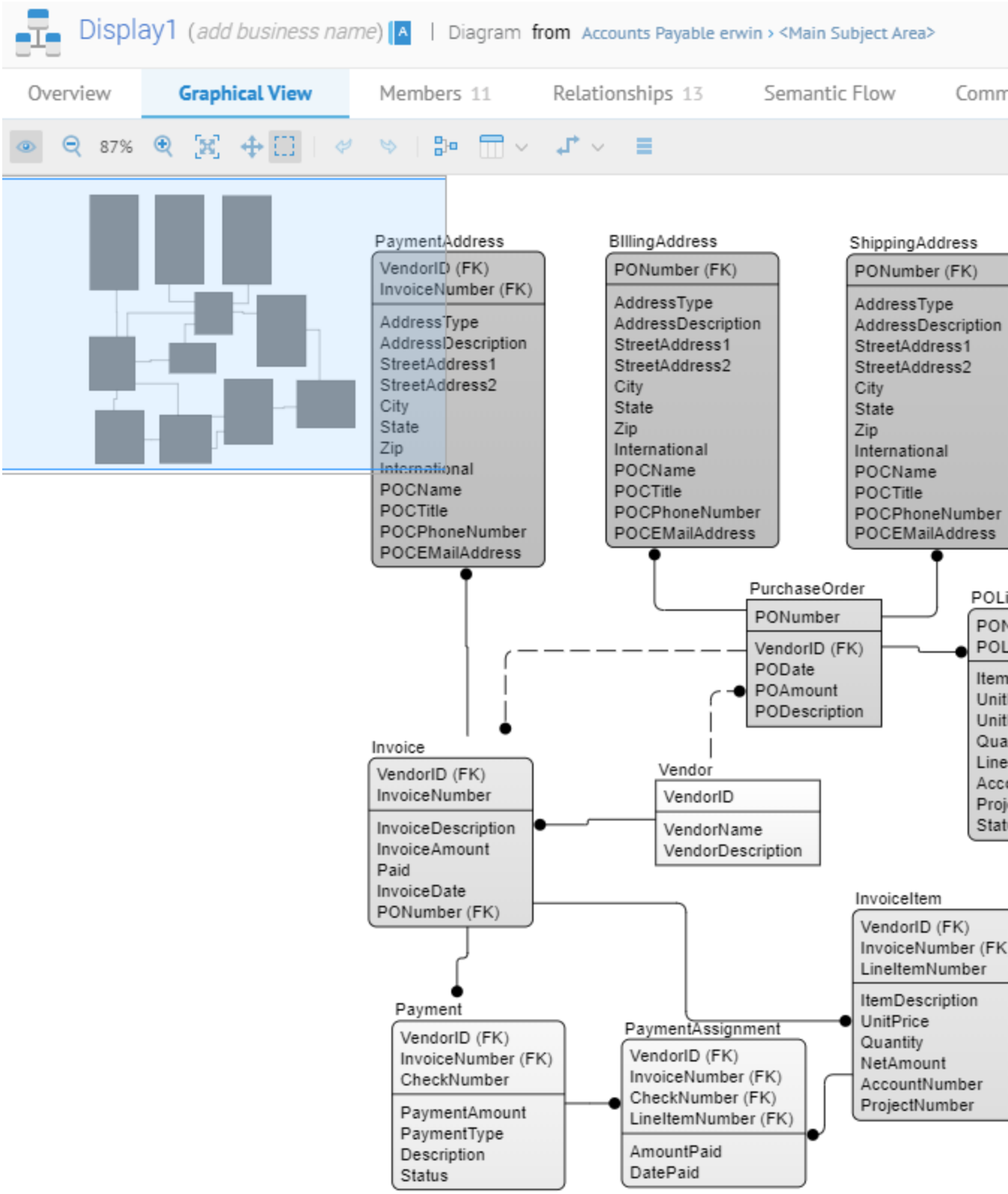
Data Model Diagram Visualization Common Features

There are a number of common features and tools available when visualizing a lineage trace. Reporting on lineage will bring you to the Lineage Trace Page.

Overview

You may click this icon ( ) to show or hide an **Overview** panel of the model diagram. Click in the overview to quickly move to a portion of the full diagram.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Zoom In/Out and Fit to content

Click **Zoom in** ( ) or **Zoom out** ( ) icons to adjust the aspect ratio of the diagram. Also, you may click on the **Fit to content** ( )icon to view the entire diagram at the best zoom that will fit.

Panning vs. Marquee

By default, you may pan through the diagram by dragging the pointer around. However, you may change this behavior for diagrams you are editing by clicking the **Marguee selection mode**.

Undo / Redo

When editing a diagram, you may use the **Undo** and **Redo** icons to undo or redo changes to a diagram.

Click on Show original to undo all changes since you last saved

Show original

Layout diagram

You may click the **Auto Layout** Diagram icon to clean up an entire diagram.

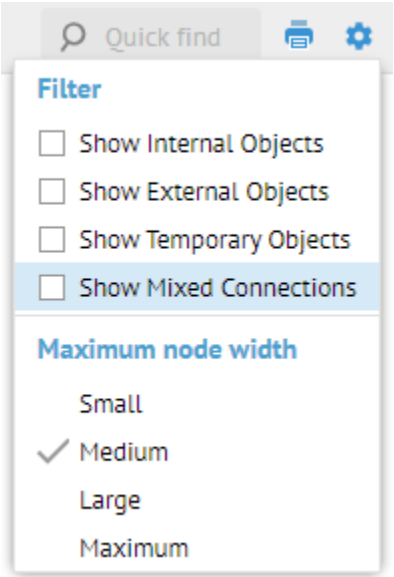
When editing you may use the Undo to revert back to the diagram before layout.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Display properties

Click **Diagram properties** to specify the preferences for the diagram display, including methodology, colors/fonts/graphical elements, and defaults.

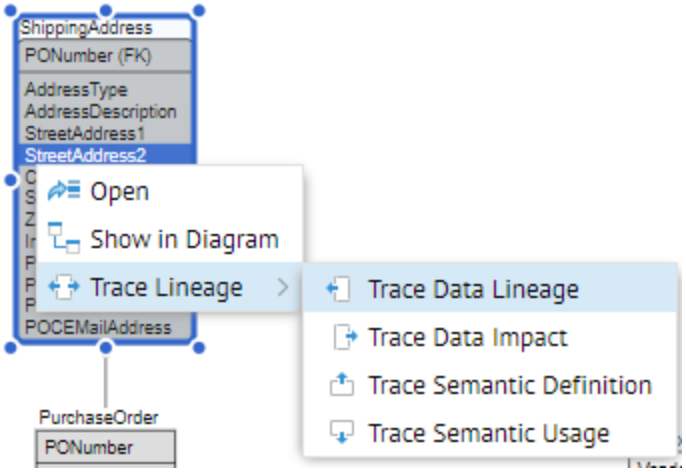
Relationship display options



Here you may specify relationship label options, cardinality and label display, and layout the labels.

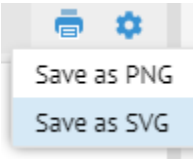
Trace lineage from an object

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



You may trace the lineage from any object in the diagram. Right-click and select **Trace Lineage,** or select the object and use the **Trace Lineage** icon to restart the trace from that point with that type of trace.

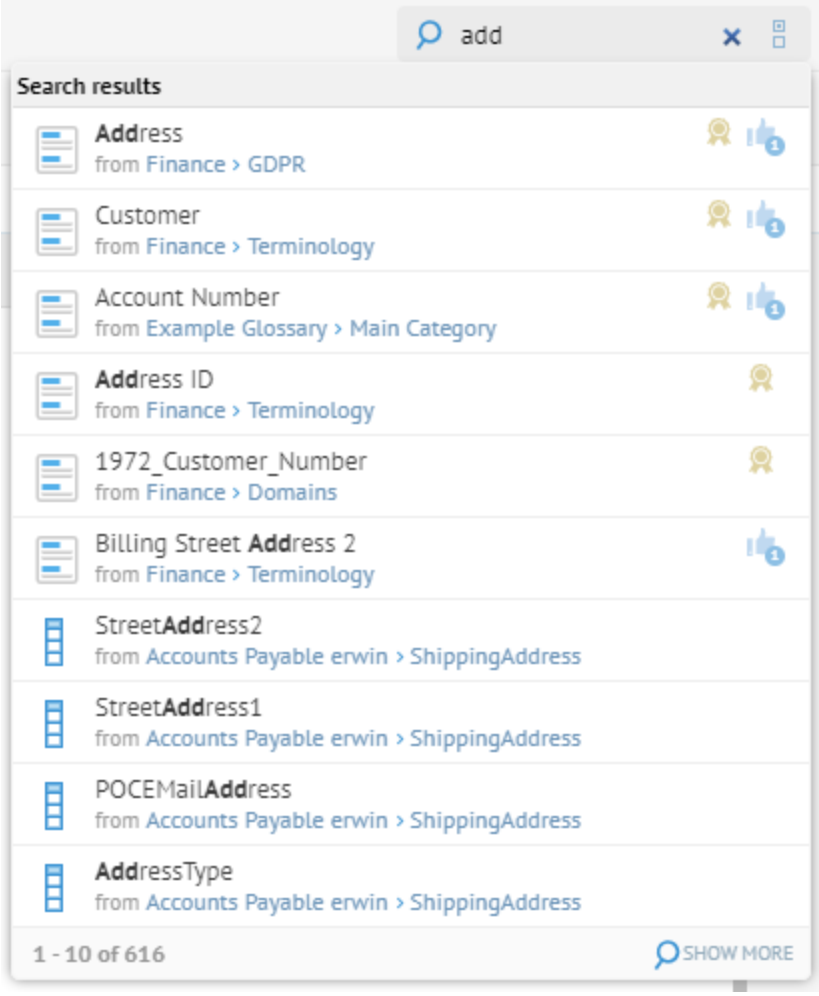
Print



You may download a PNG or SVG image of the diagram.

Quick find

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



In the upper right, there is a search text box that will provide a quick list of object names that contain the text you type. You may click on any of the results to select that object in the diagram and moving the focus there.

Properties Panel

Click to select a metadata element and view its properties in the **Properties Panel** on the right. You may show and hide this panel as needed.

Explore Further

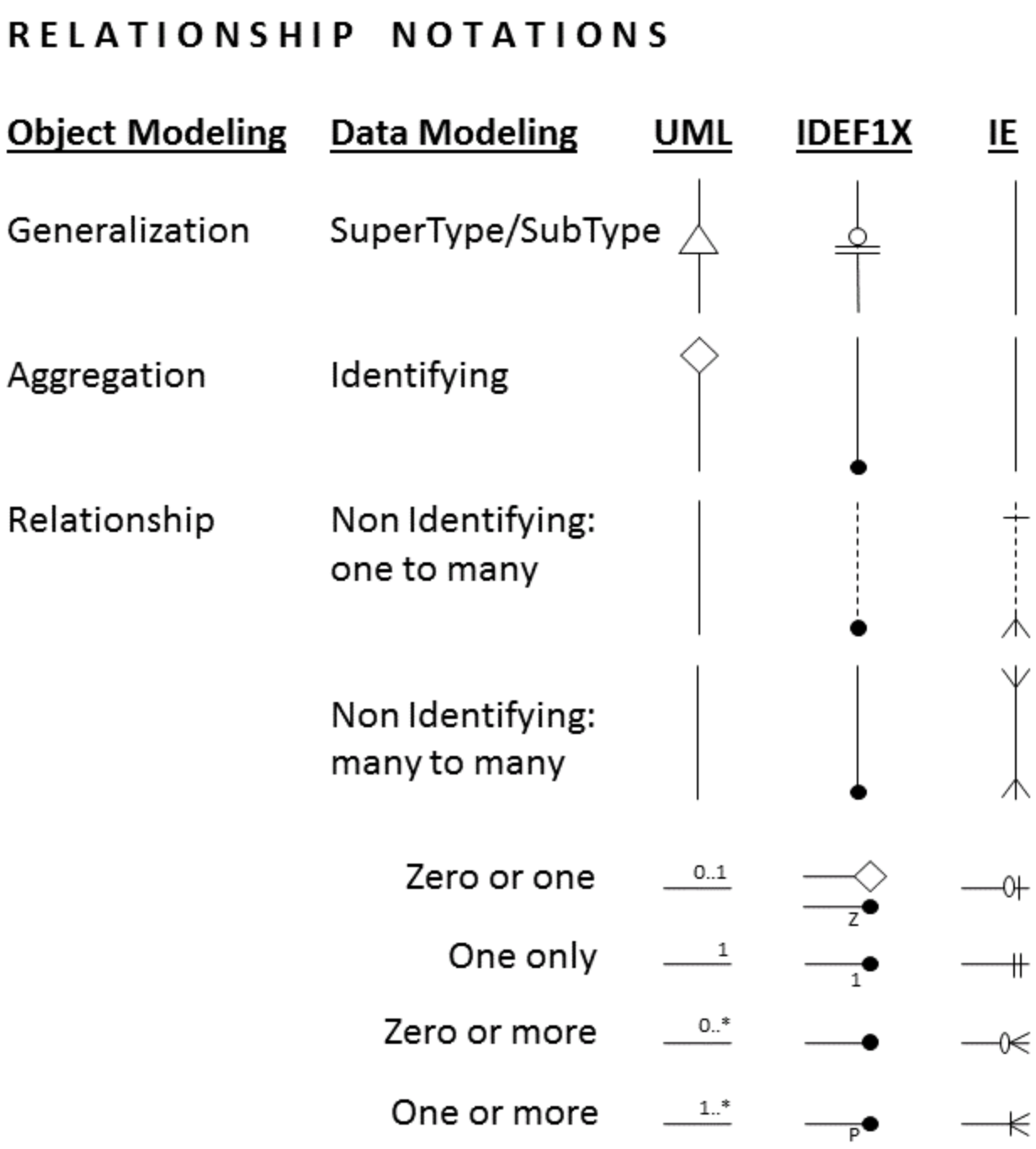
Invoking a lineage trace from any reference to a metadata element

You may invoke a lineage trace from any diagram or any list of results (e.g., from a Browse or Search), either via right-click context menu

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Interpreting the graphical diagram

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Label Metadata

Labels are single word MIMM wide meta tags which may be applied to any object in a Model, then searched on, reviewed and/or managed centrally within a configuration.

Steps

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

To tag a metadata element with a label:

1. Navigate to the details page for the metadata element you wish to label.
2. Click the combo box underneath **Labels**
3. Add a new label by typing it in.
4. Assign already defined labels to this metadata element by typing one or more letters of that label and selecting from the resulting pick list.
5. Unassign a label by clicking in the combo box and click the "x" next to the label you wish to unassign.

Labels are defined MIMM *wide. Please keep in mind that the pool of labels defined by all users is shared across* MIMM

Once you have unassigned a particular label to all elements in the repository, the label is deleted from the pool. You, of course, may simply type it in to assign it to a new object and it is again a part of the label pool.

Explore Further

Permissions

To make label assignments, one must only have the ***Viewer*** *Security role on the content that contains the metadata element you are labelling. No special permissions are required, unless your group assignment Properties restricts the* ***Can Label Property***

Multi-item or Tabular assignment of labels

When browsing in the grid or list mode label assignments may be entered just as one would update a spreadsheet. See bulk editing.

Review label assignments

One may review the label assignments across an entire configuration.

1. Start a worksheet.
2. Filter by **Label** and specify the label you wish to manage.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

You are presented with all the objects with that (or a combination of) label assignment(s).

3. To remove a label, simply remove all of the assignments. When the last one is removed, the label will no longer be known by the system.

Search for Label Assignments

When searching you may specify particular labels to filter the results by as a part of the advanced search or you may filter the results of any search (or browse) using the **Filters** panel to specific labels.

Compare Metadata

One may compare two different models, configurations or glossaries or two versions of the same model using the compare and merge facility.

Steps

1. Sign in as a user with at least the **editor** security role on the semantic mapping.

2. Go to **MANAGE > Repository.**

3. Either:

   - Right click any model, configuration or glossary in the **Repository Panel**, and select **Compare with…**.
   - Or, one may select a version of a content in the **Repository Panel** where you want the model to be located, and select **Compare with Previous…**

4. You are presented with the **Compare and Merge** utility panel.

5. From here you may:

   - Drag and drop any other matching model, configuration or glossary into the **Target** or **Source**.
   - **Swap** ( ) the Target and Source
   - Specify the option for the comparison, including

     - **Match** Type
     - Objects to **Detect**
     - Additional **Compare** options
     - **Case Sensitive** comparison
     - Specific **Comparison Scope**

   - **Expand** ( ) or **Contract** ( ) objects in the tree
   - **Download** ( ) the results as a CSV file

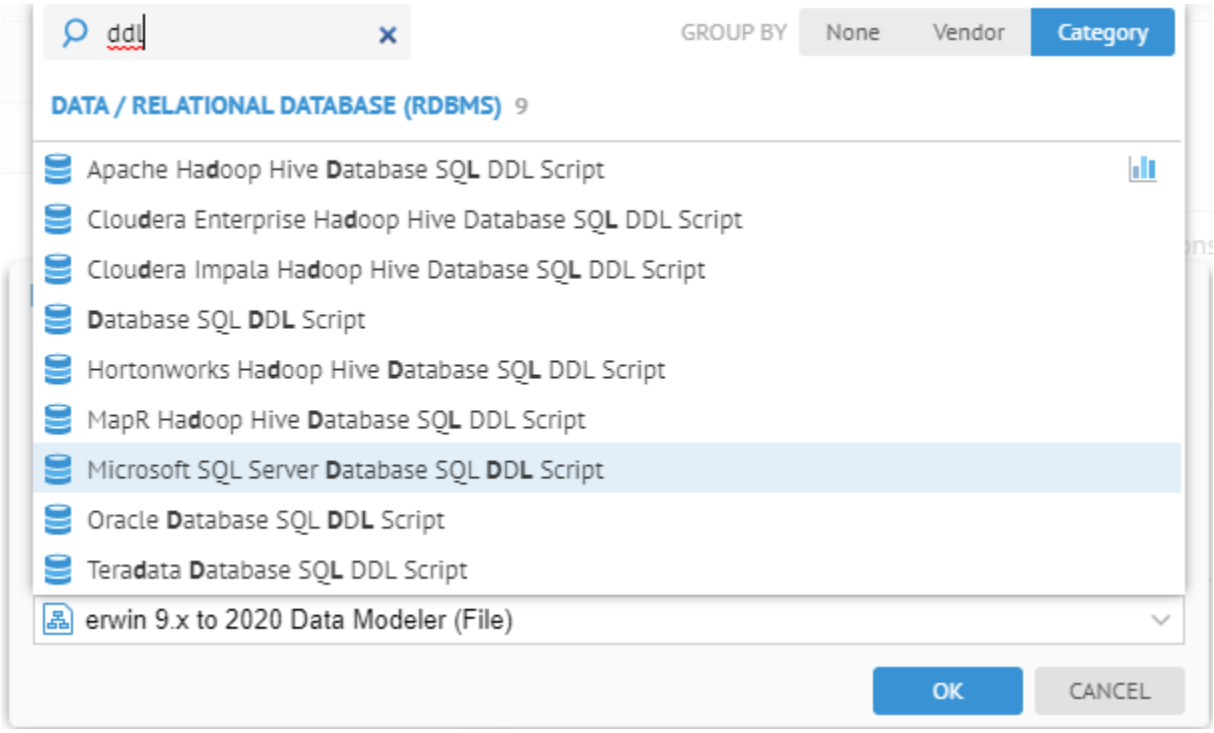
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

- **Filter** ( ) the results
- **Match** (Match) objects
- **Switch to Merge** if comparing two versions of a Physical Data Model.

Compare Data Store Model Versions

In this example, we will compare two single-model data source models. There are several versions of the ddl for the models in the models folder.

Create a new model. Complete the dialog as follows:

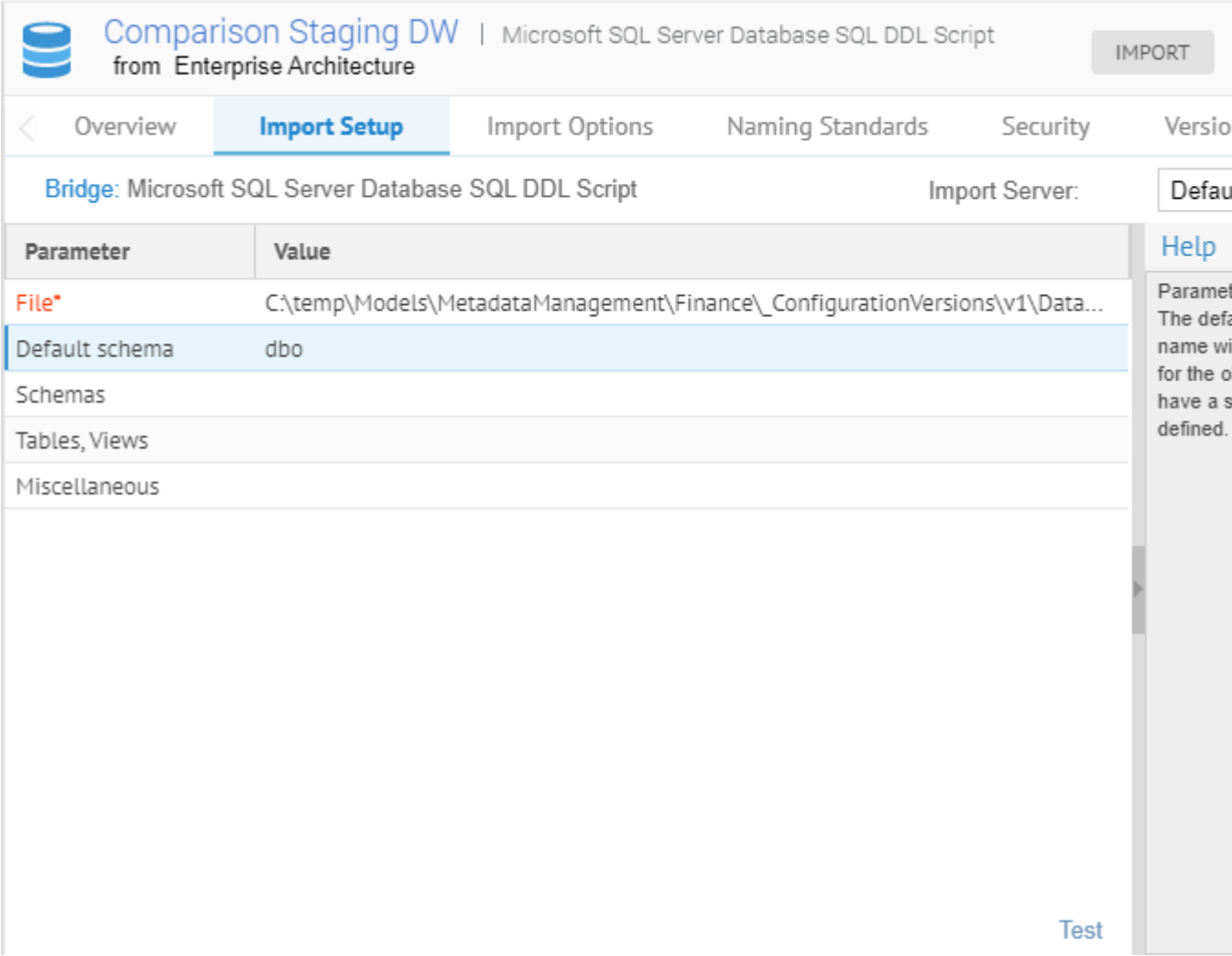


In the **Import Setup** tab specify in the **File** parameter the location:

```
C:\temp\Models\MetadataManagement\Finance\_ConfigurationVersions\v1\DatabaseDDL\FinanceDWStaging.sql
```

And “dbo” as the **Default schema**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click **SAVE** and then **IMPORT**. Click **IMPORT** again without checking any boxes.

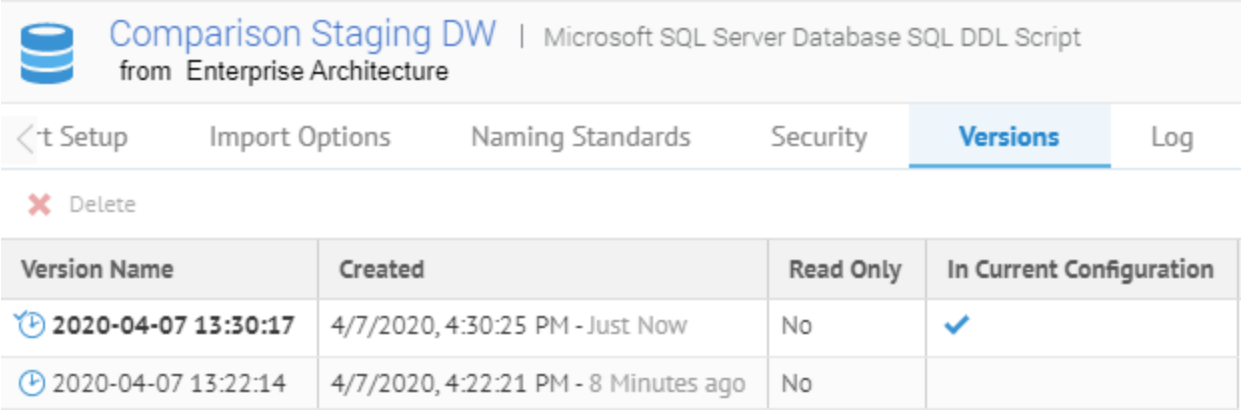
When the import has completed, in the **Import Setup** tab update in the **File** parameter with the location:

C:\temp\Models\MetadataManagement\Finance_ConfigurationVersions\vComplete\Database DDL\FinanceDWStaging.sql

And again click **Save** and then **IMPORT**. Click **IMPORT** again without checking any boxes.

Go to the **Versions** tab.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

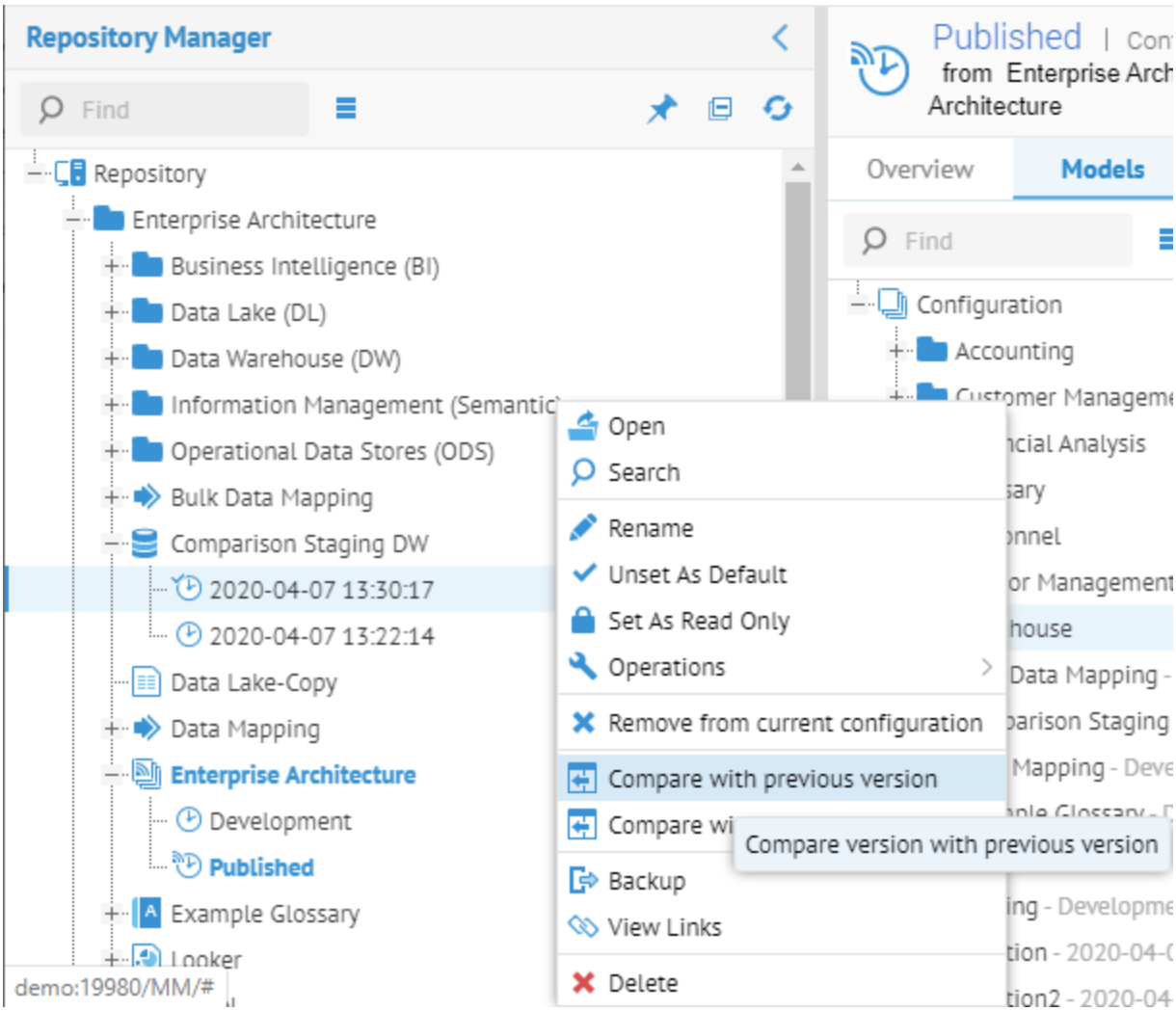


There are now two different versions of this model in the repository. The latest one is in the current configuration.

To compare the two versions you must step outside the configuraton, so as to see all the versions of the model.

Go to **MANAGE** > **Repository**, expland the **Comparison Staging DW** model, right-click the latest version, and select **Compare with previous version**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)


Repository Manager
Find
Repository
Enterprise Architecture
Business Intelligence (BI)
Data Lake (DL)
Data Warehouse (DW)
Information Management (Semantic)
Operational Data Stores (ODS)
Bulk Data Mapping
Comparison Staging DW
2020-04-07 13:30:17
2020-04-07 13:22:14
Data Lake-Copy
Data Mapping
Enterprise Architecture
Development
Published
Example Glossary
Looker
demo:19980/MM/#
Open
Search
Rename
Unset As Default
Set As Read Only
Operations
Remove from current configuration
Compare with previous version
Compare version with previous version
Backup
View Links
Delete
Published
from Enterprise Arch
Architecture
Overview
Models
Find
Configuration
Accounting

Compare Comparison Staging DW › 2020-04-07 13:30:17 (target) with Comparison Staging DW > 20

Show Match

Changed objects	Source (2020-04-07 13:22:14)	Target (2020-04-07 13:30:17)
Database	FinanceDWStaging.sql	FinanceDWStaging.sql
Schemas		
Schema	dbo	dbo
Tables		
Table	CustomerPayment	CustomerPayment
Columns		
Column	PaymentAmount	PaymentAmount
Table	CustomerPaymentAssignment	CustomerPaymentAssignment
Columns		
Column	PaymentAssignmentAmount	PaymentAssignmentAmount
Table	CustomerPurchaseOrder	CustomerPurchaseOrder
Columns		

Changes

Property name	Source value	Target value	Action

No differences to show

Click the row for the PayementAmount column with the difference icon .

Changes

Property name	Source value	Target value	Action
Length	8	10	HIGHLIGHT DIFFERENCES

The difference is in the Length of the data type.

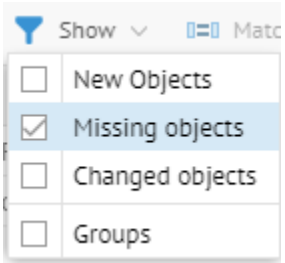
Scroll down to the bottom of the comparison.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Changed objects	Source (2020-04-07 13:22:14)	Target (2020-04-07 13:30:17)
Columns		
Column	InvoiceAmount	InvoiceAmount
Table	InvoiceAssociationtoPurchaseOrder	InvoiceAssociationtoPurchaseOrder
Columns		
Column	InvoicePurchaseOrderAssociationAmount	InvoicePurchaseOrderAssociationAm
Table	InvoiceLineItem	InvoiceLineItem
Columns		
Column	InvoiceLineItemUnitPrice	InvoiceLineItemUnitPrice
Column	InvoiceLineItemAmount	InvoiceLineItemAmount
Table		AccountCategory
Table		Category
Table		CategoryGroup

We see three table (AccountCategory, Category and CategoryGrup) have been added with the latest version.

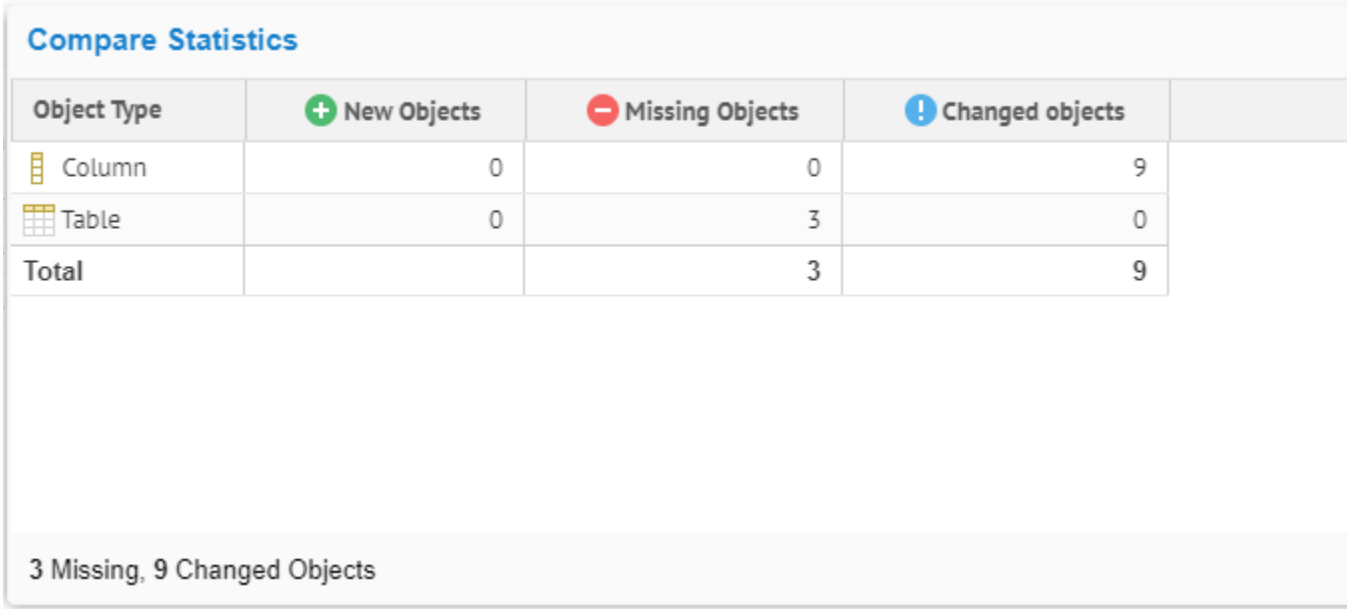
Click the **Filter** icon to show only **Missing Objects**.



Changed objects	Source (2020-04-07 13:22:14)	Target (2020-04-07 13:30:17)	
Database	FinanceDWStaging.sql	FinanceDWStaging.sql	
Schema	dbo	dbo	
Table		AccountCategory	
Table		Category	
Table		CategoryGroup	

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Click **Show Statistics**:

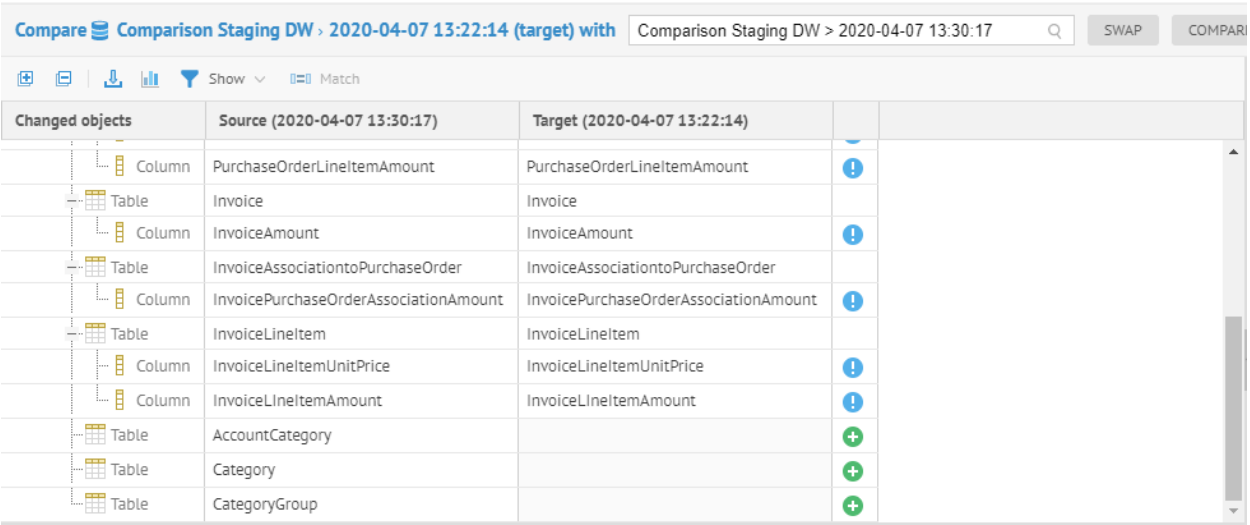


Compare Statistics

Object Type	New Objects	Missing Objects	Changed objects
Column	0	0	9
Table	0	3	0
Total		3	9

3 Missing, 9 Changed Objects

Click **SWAP** to change the order of the comparison:



Compare Comparison Staging DW › 2020-04-07 13:22:14 (target) with Comparison Staging DW > 2020-04-07 13:30:17 SWAP COMPARE

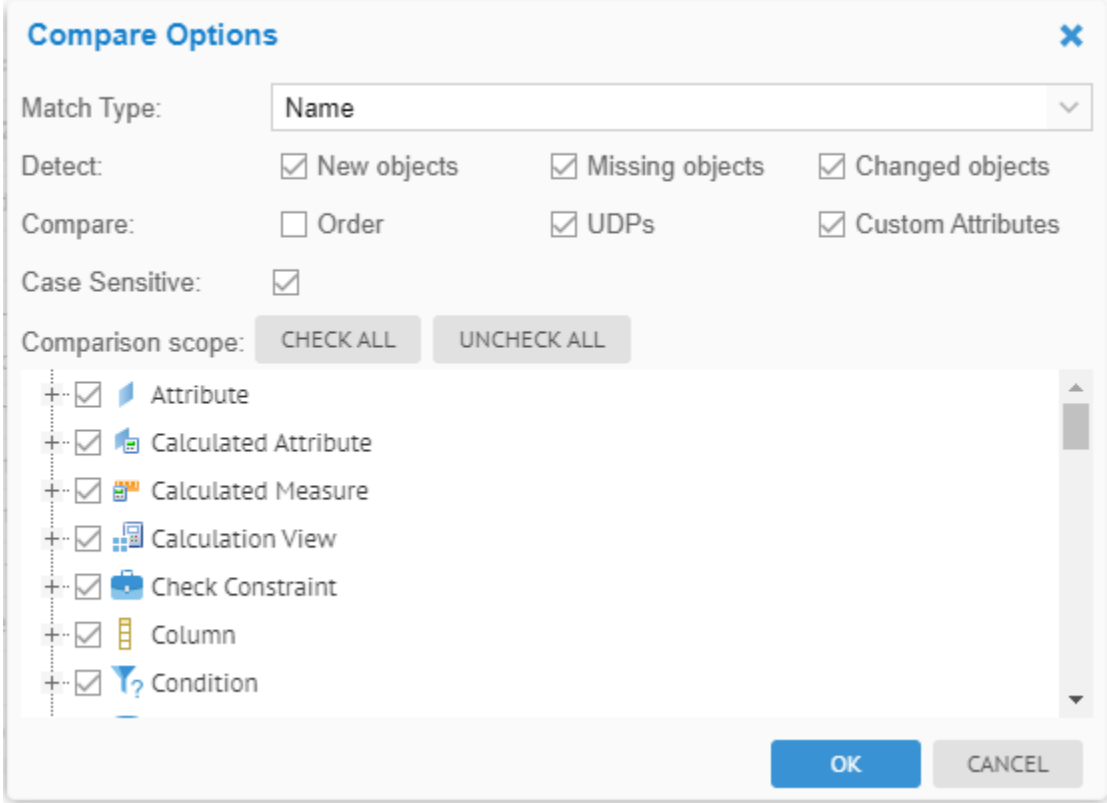
Show Match

Changed objects	Source (2020-04-07 13:30:17)	Target (2020-04-07 13:22:14)
Column	PurchaseOrderLineItemAmount	PurchaseOrderLineItemAmount
Table	Invoice	Invoice
Column	InvoiceAmount	InvoiceAmount
Table	InvoiceAssociationtoPurchaseOrder	InvoiceAssociationtoPurchaseOrder
Column	InvoicePurchaseOrderAssociationAmount	InvoicePurchaseOrderAssociationAmount
Table	InvoiceLineItem	InvoiceLineItem
Column	InvoiceLineItemUnitPrice	InvoiceLineItemUnitPrice
Column	InvoiceLineItemAmount	InvoiceLineItemAmount
Table	AccountCategory	
Table	Category	
Table	CategoryGroup	

*The three tables are now **New Objects**, rather than **Missing Objects**.*

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Click COMPARE OPTIONS.



One may control the different options of the comparison.

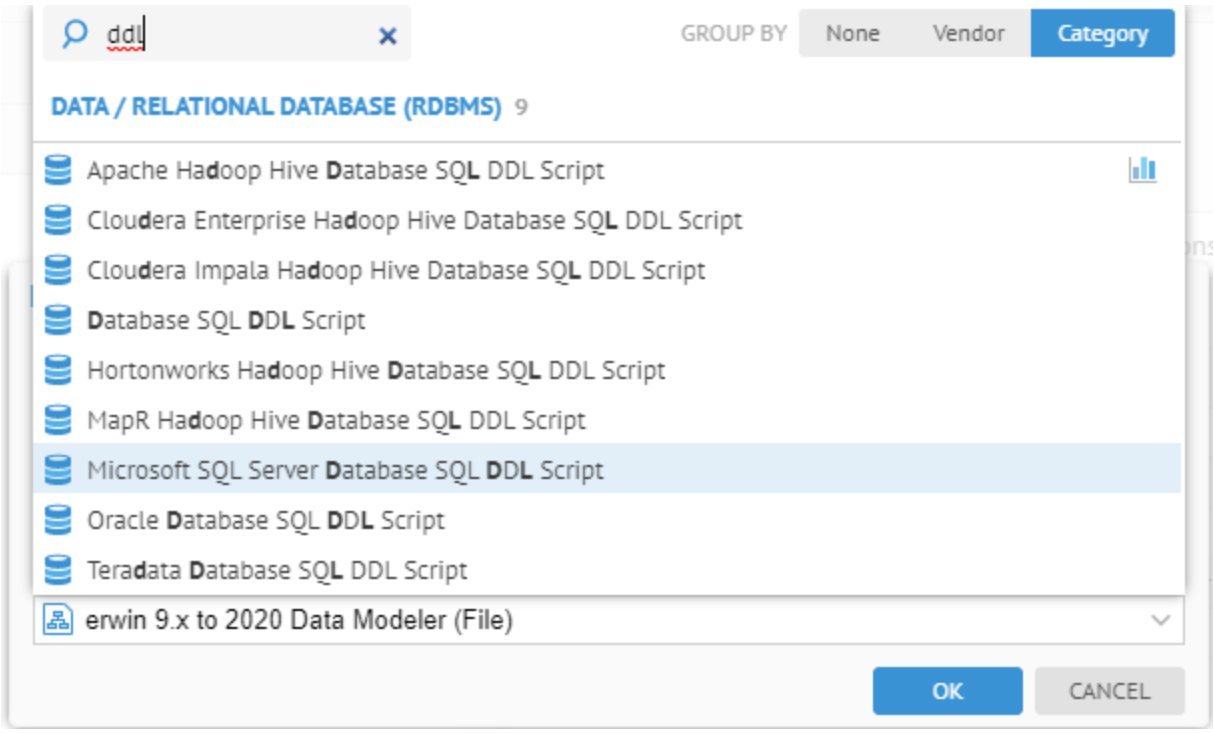
Compare Multi-Model Versions

In this example, we will compare two multi-model data source models. In this case, the model content will have a directory structure and the comparison will be performed at two levels (the directory structure and at individual leaves that are internal models).

We will use the data lake as the multi-model. However, there are no additional versions of the data lake in the models folder, so we will edit one of the files.

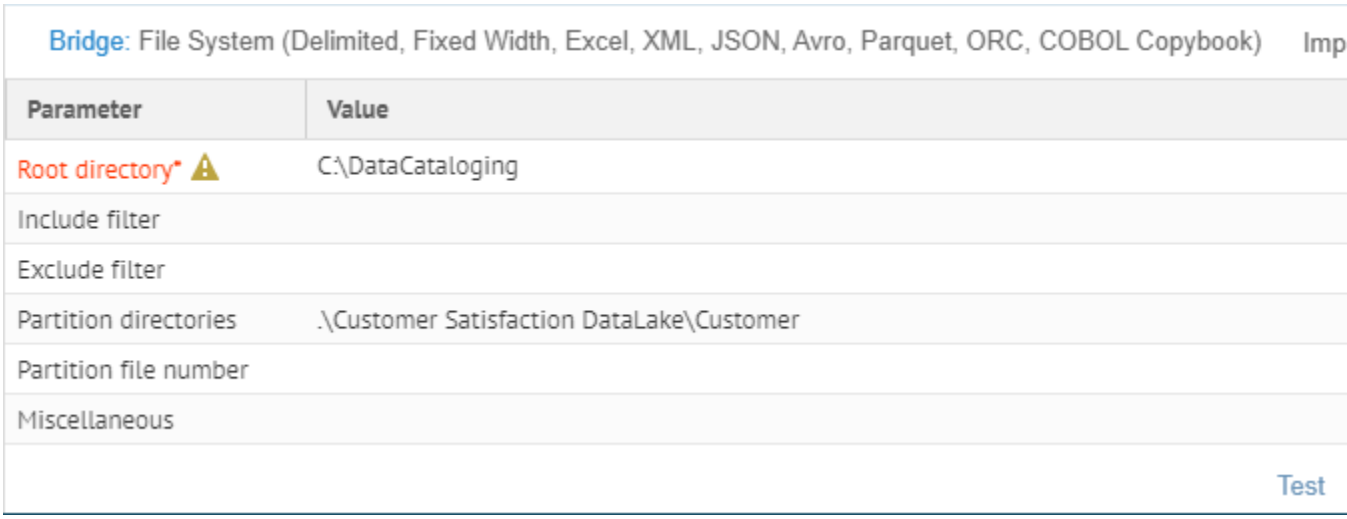
Create a new model. Complete the dialog as follows:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



In the **Import Setup** tab specify in the **File** parameter the location:

C:\temp\Models\DataCataloging



Click **Save** and then **IMPORT**.

When the import has completed, we will now make some changes for the comparison.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

C:\temp\Models\DataCataloging\AdventureWorks Data Lake\HumanRessources

And rename **Department.csv** to be **Dept.csv**.

Edit **Shift.csv** and do the following:

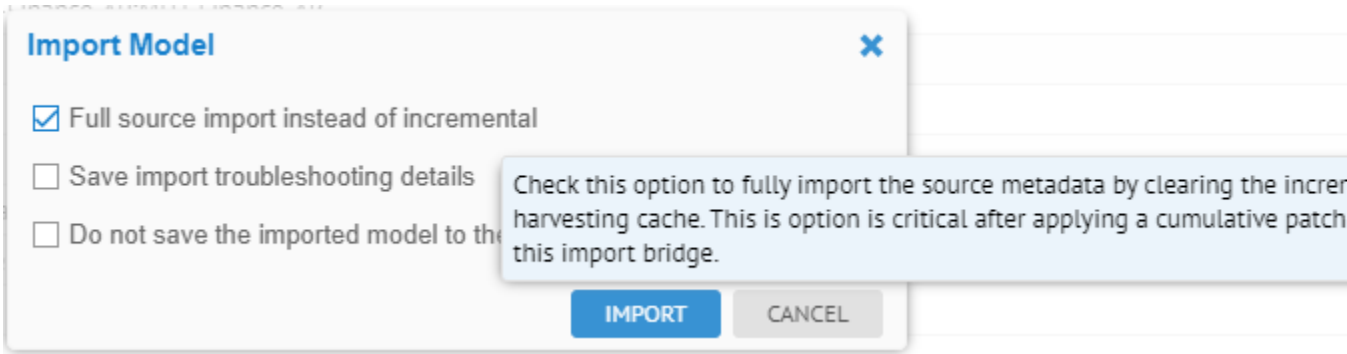
- Change the data values for the first column (**ShiftID**) to “S1”, “S2” and “S3”
- Rename **Name** to **ShiftName**
- Add a column **Hours** at the end of all the lines in the file.

The result should be like this:

ShiftID	ShiftName	StartTime	EndTime	ModifiedDate	Hours
S1	Day	00:00.0	00:00.0	00:00.0	8
S2	Evening	00:00.0	00:00.0	00:00.0	8
S3	Night	00:00.0	00:00.0	00:00.0	8

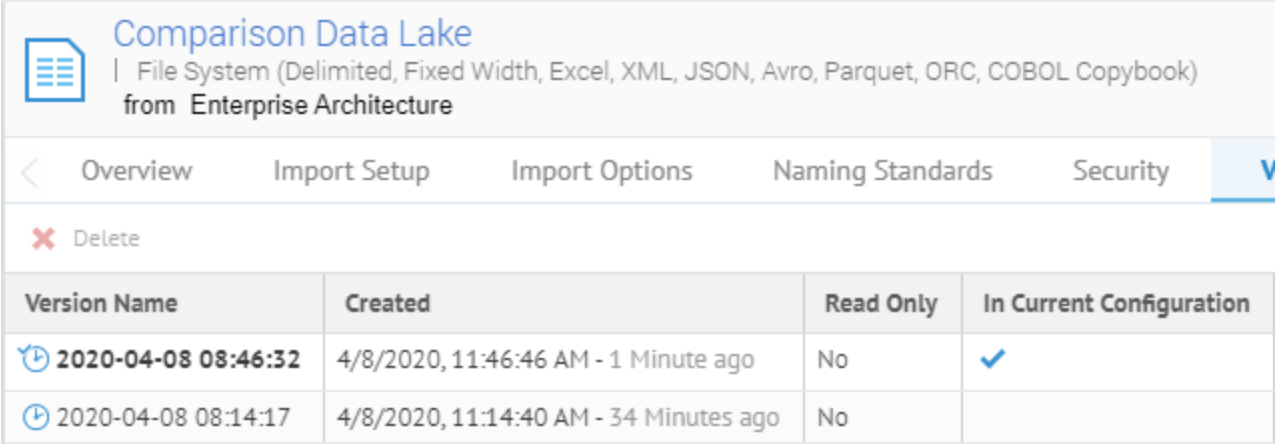
Now, again click **IMPORT** on the model to import a new version.

Be sure to check the **Full source import instead of incremental** checkbox in order to avoid incremental harvesting.



Go to the **Versions** tab.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

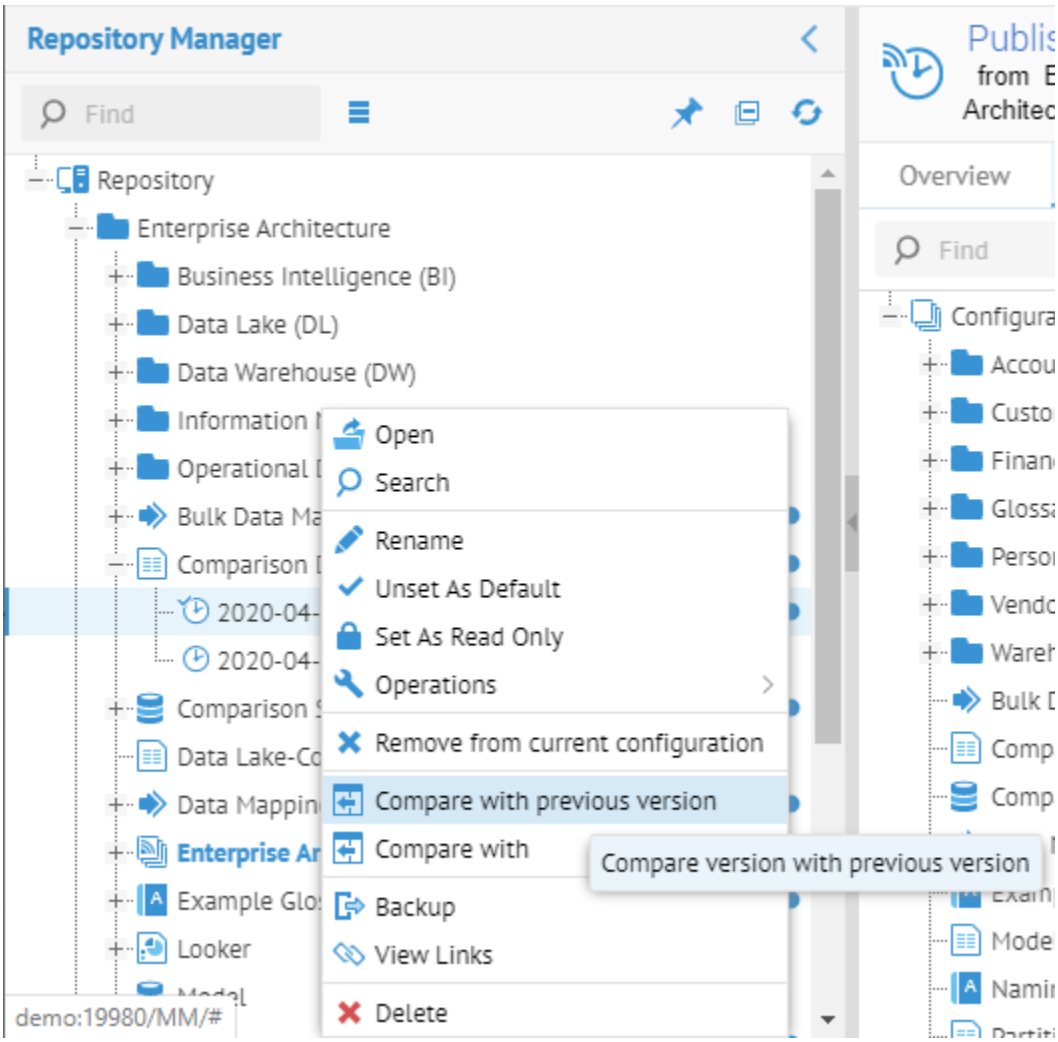


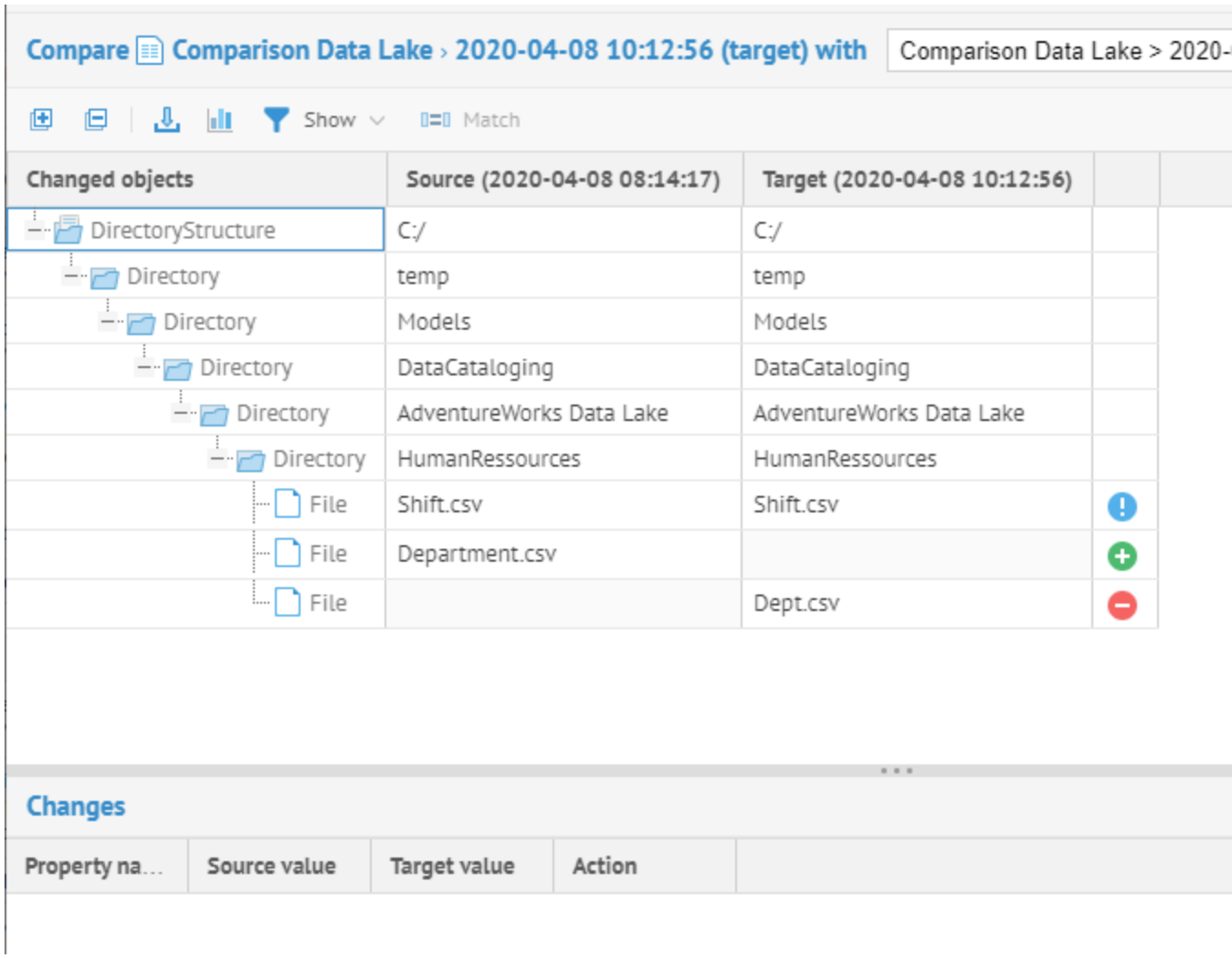
There are now two different versions of this model in the repository. The latest one is in the current configuration.

To compare the two versions you must step outside the configuraton, so as to see all the versions of the model.

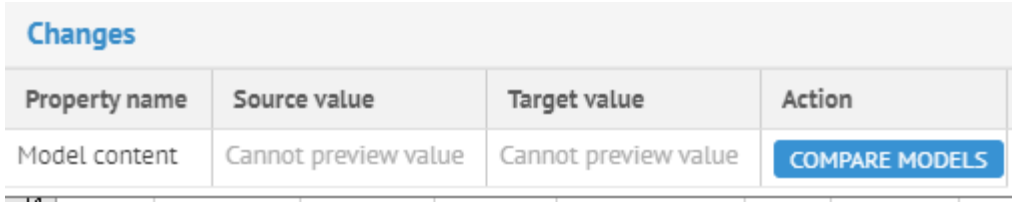
Go to **MANAGE** > **Repository**, expland the **Comparison Data Lake** model, right-click the latest version, and select **Compare with previous version**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)


Repository Manager
Find
Repository
Enterprise Architecture
Business Intelligence (BI)
Data Lake (DL)
Data Warehouse (DW)
Open
Search
Rename
Unset As Default
Set As Read Only
Operations
Remove from current configuration
Compare with previous version
Compare with
Backup
View Links
Delete
Compare version with previous version
Overview
Find
demo:19980/MM/#



Click the row for the **Shift.csv** column with the difference icon .



*The differences are in the model representing the **Shift.csv** file.*

Click **COMPARE MODELS**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Changed objects	Source (2020-04-08 08:14:43)	Target (2020-04-08 10:13:14)	
Delimited File	Shift.csv	Shift.csv	!
Field	ShiftID	ShiftID	!
Field	ModifiedDate	ModifiedDate	!
Field	Name		+
Field		ShiftName	−
Field		Hours	−

Click the row for **ShiftID**.

Changes

Property name	Source value	Target value	Action
Type	INTEGER	STRING	HIGHLIGHT DIFFERENCES

The data type changed, as we did in the file earlier.

*We see also **Name** was added and **ShiftName** removed. The comparison direction is critical to the presentation and determines whether something is considered added or removed.*

Click SWAP.

Changed objects	Source (2020-04-08 10:13:14)	Target (2020-04-08 08:14:43)	
Delimited File	Shift.csv	Shift.csv	!
Field	ShiftID	ShiftID	!
Field	ModifiedDate	ModifiedDate	!
Field	ShiftName		+
Field	Hours		+
Field		Name	−

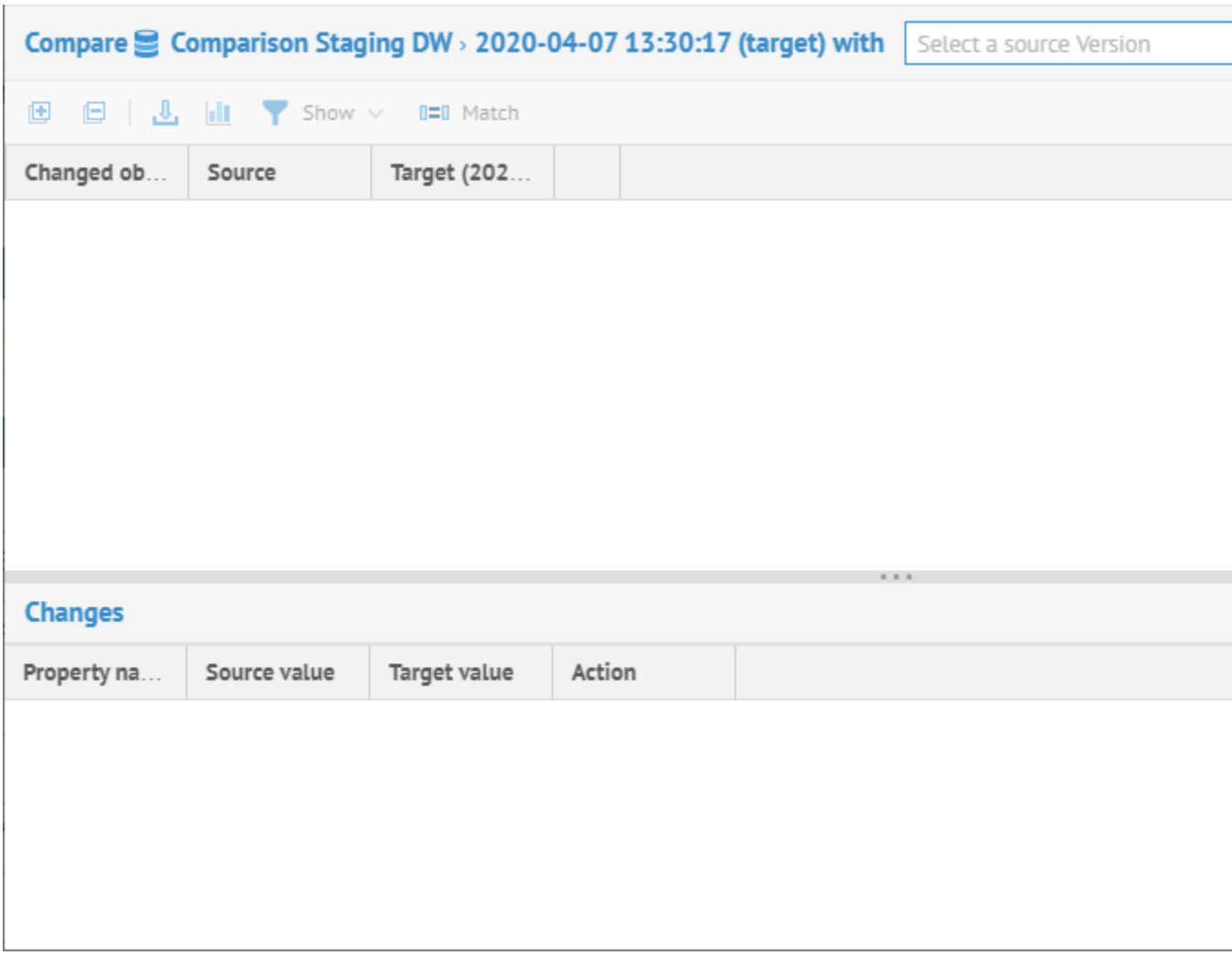
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

*Now, we see the added and removed icons in a more appropriate order, where we added the **Hours** column as well as renaming **Name** to **ShiftName**.*

Comparing Different Models

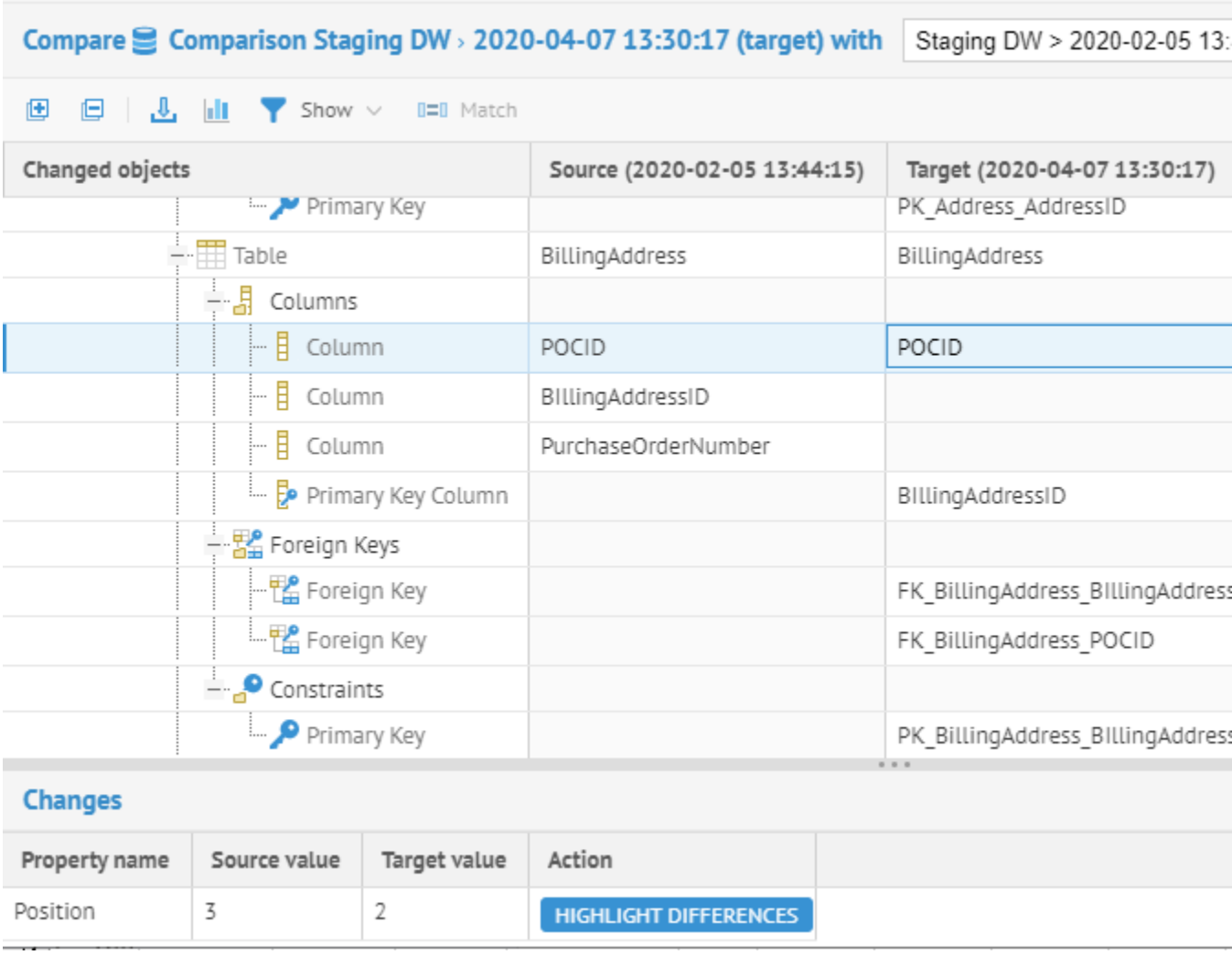
In this example, we will compare two different model versions, rather than versions of the same model. Obviously, unless the models are relatively similar, the report will not be that effective.

Go to **MANAGE** > **Repository**, expland the **Comparison Staging DW** model, right-click the latest version, and select **Compare with**.



Use the **Select a source Version** navigation to pick the **Staging DW** model.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

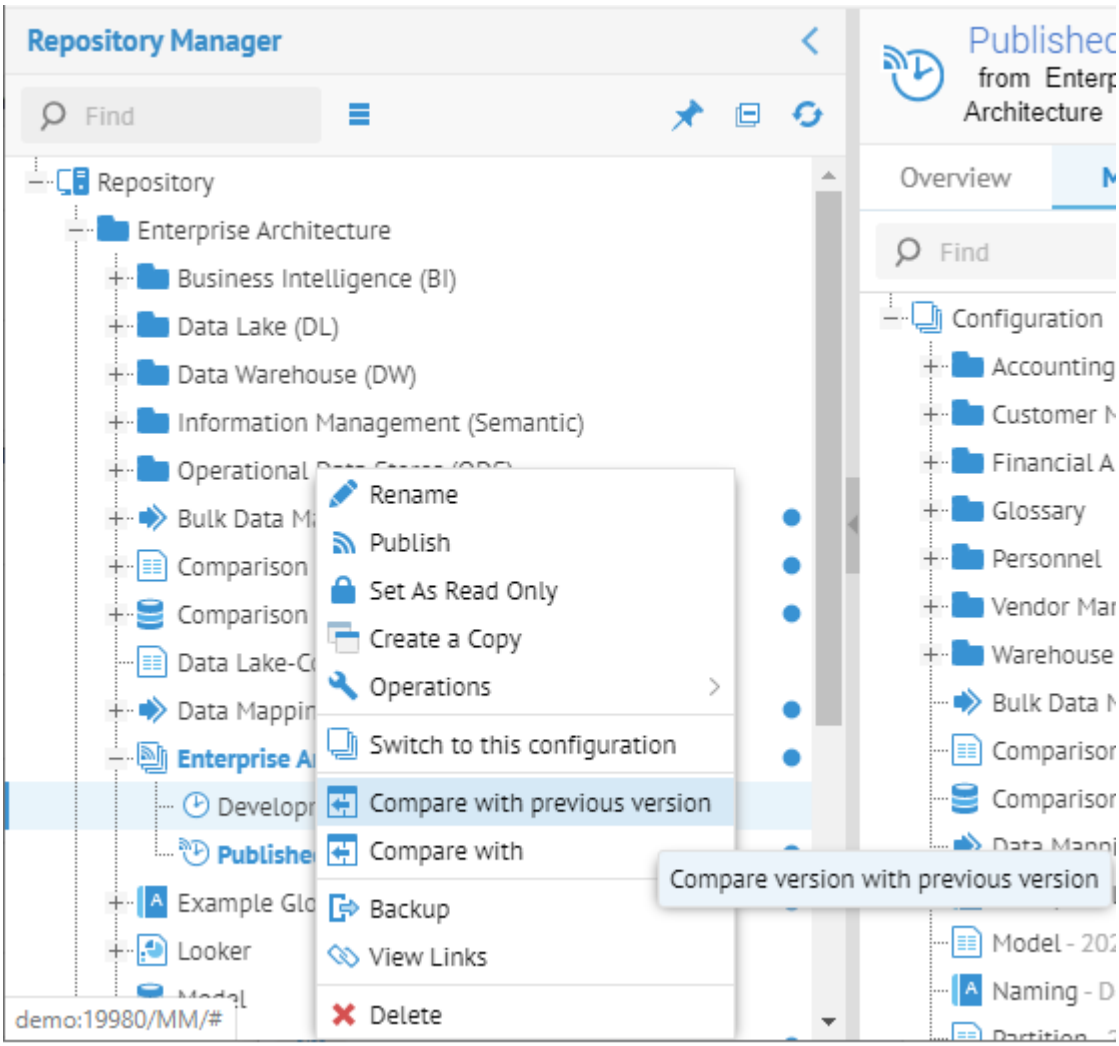


Comparing Configurations

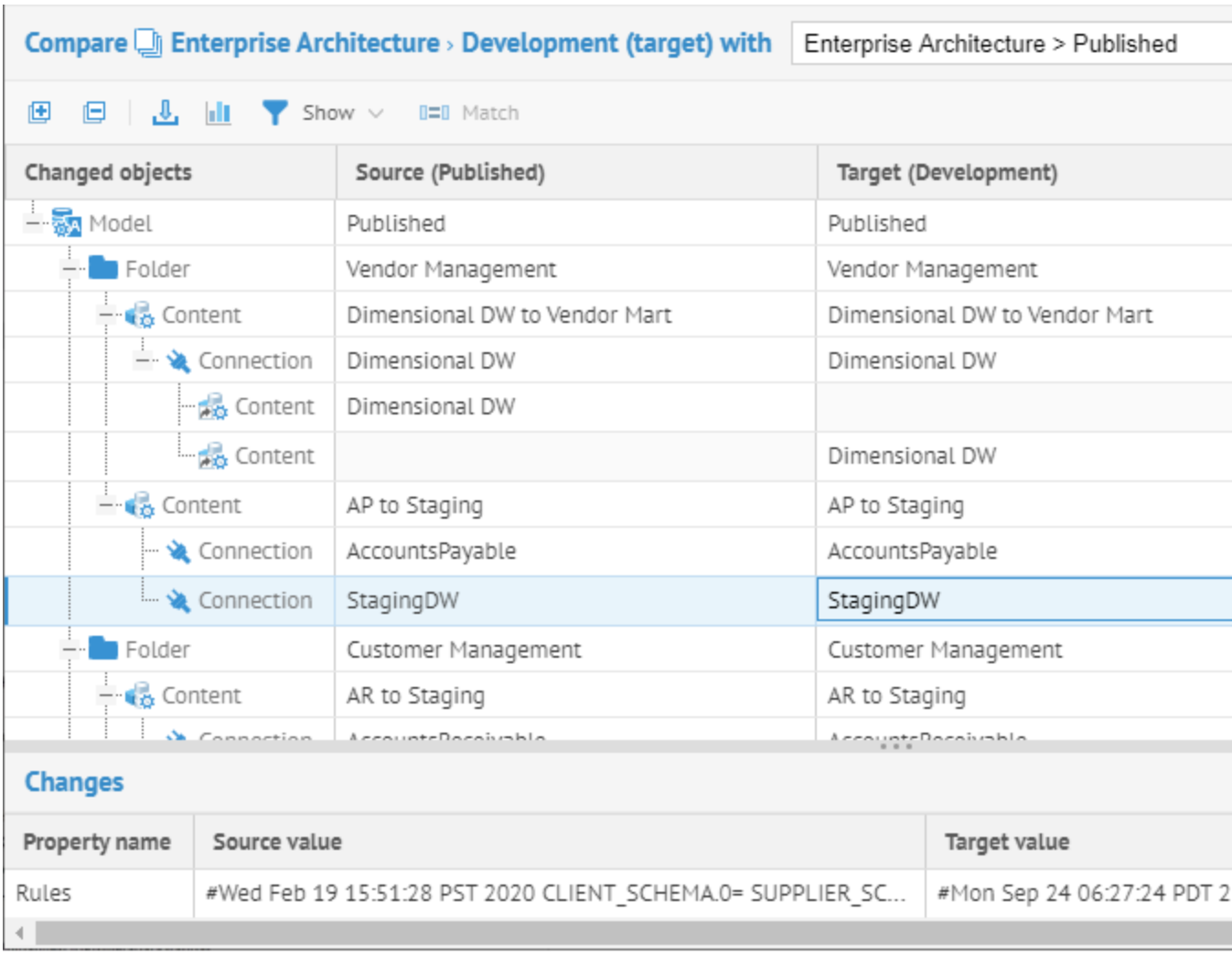
In this example, we will compare two different configuraton versions, rather than models.

Go to **MANAGE** > **Repository**, expland the **Enterprise Architecture** configuration, right-click the **Development** version, and select **Compare with previous version**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Collaboration with URL Bookmarks

The URL in the header of your browser is an effective bookmarking link. It is defined to identify the exact place you are in the MIMM UI and the exact object.

Permanence of links (support for change)

Indeed, this object identifier is also designed to outlive the metadata it is a part of. As new versions of a model are harvested or what would normally be considered identifying information (e.g., Name) are updated, this URL will still take you to that same element you were viewing before, but just with the latest information available.

Comments and review

Comments are free-form text notes which may be queried for, reported on, reviewed and managed by Model. A comment tracks its author, creation time, update time, importance and status. One can leave one or more comment(s) per object and see comments made by others.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

The user can attach any file including pictures and multimedia to the Model and refer to them in a comment.

*Everyone has permissions to comment, unless your group assignment Properties restricts the **Can Label Property**. Unlike labels, comments only apply to the specific Version of the Model they were entered in. However, they are generally migrated forward and harvest and thus have a sense of permanence. Still, if you make a change, older versions will show the older comment.*

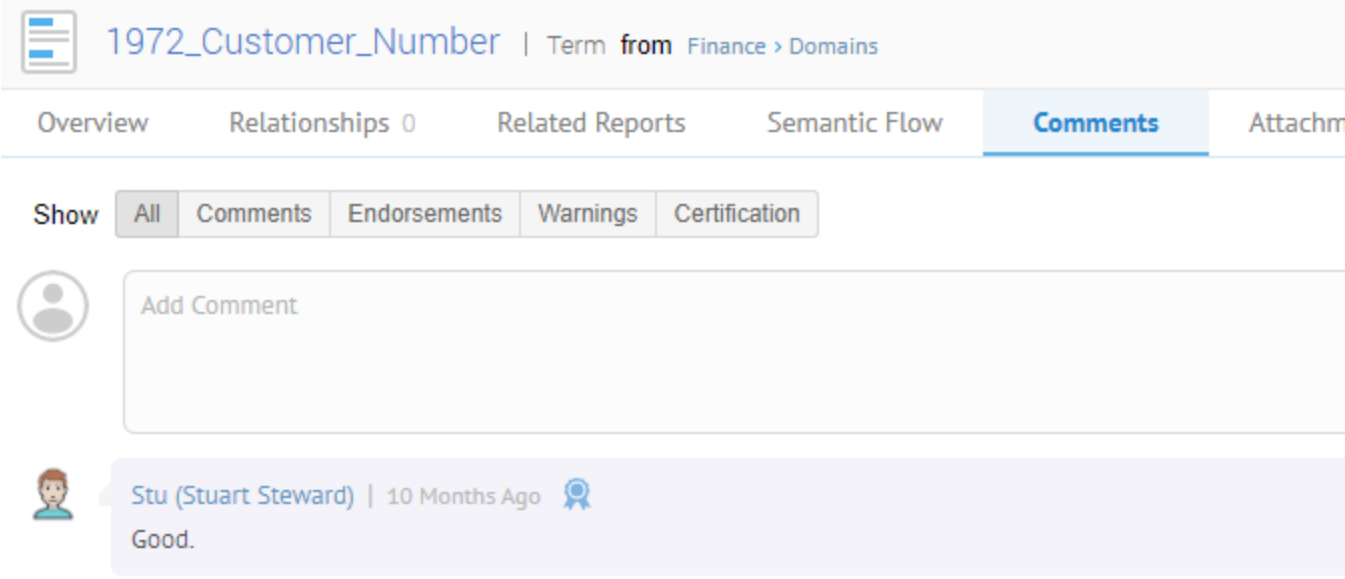
Steps

1. Navigate to the details page for the metadata element you wish to label.
2. Go to the **Comments** tab
3. Click the **All** or **Comments** button.
4. To add a new comment, click in the **Add Comment** text box, enter your text and click **SUBMIT**.
5. To edit an existing comment, in the upper right of the existing comment, go to **More actions > Edit**, update the text and click **SUBMIT**.
6. To delete an existing comment, in the upper right of the existing comment, go to **More actions > Delete**, and click **YES**.

Example

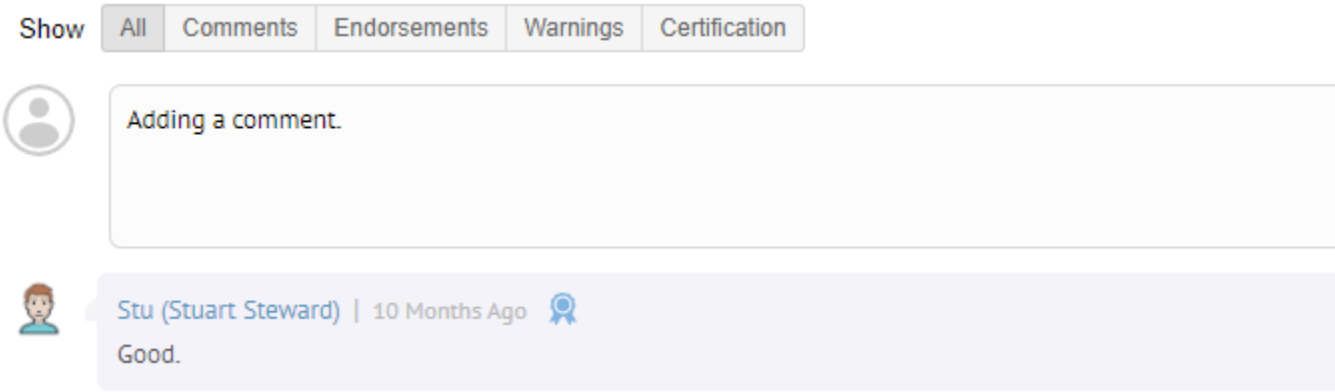
Navigate to the details page for the term **1972_Customer_Number**. Go to the **Comments** tab and click the **All** or **Comments** button

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



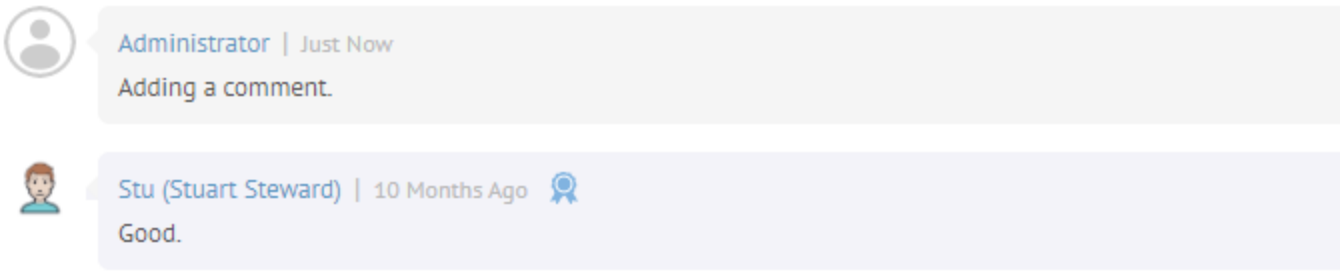
*There is already a comment from **Stu**.*

Click in the **Add Comment** text box, enter the below text and click **SUBMIT**.

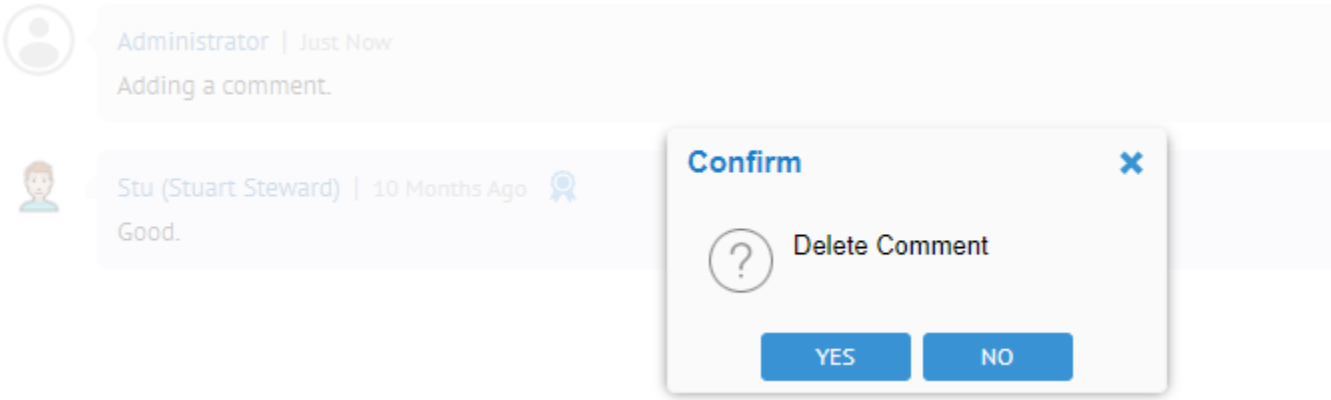


In the upper right of the existing comment, go to **More actions > Edit**, update the text and click **SUBMIT**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



In the upper right of the existing comment, go to **More actions > Delete**.



Click **YES**.

File Attachments

You may attach any file including pictures and multimedia to any object. Comments are free-form text notes which may be queried for, reported on, reviewed and managed by Model. A comment tracks its author, creation time, update time, importance and status. One can leave one or more comment(s) per object and see comments made by others.

The user can attach any file including pictures and multimedia to the Model and refer to them in a comment.

Everyone has permissions to comment. Unlike labels, comments only apply to the specific Version of the Model they were entered in. However, they are generally migrated forward and

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

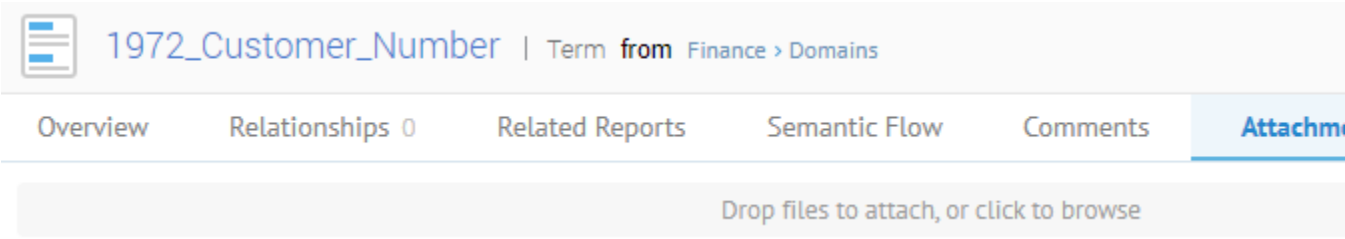
harvest and thus have a sense of permanence. Still, if you make a change, older versions will show the older comment.

Steps

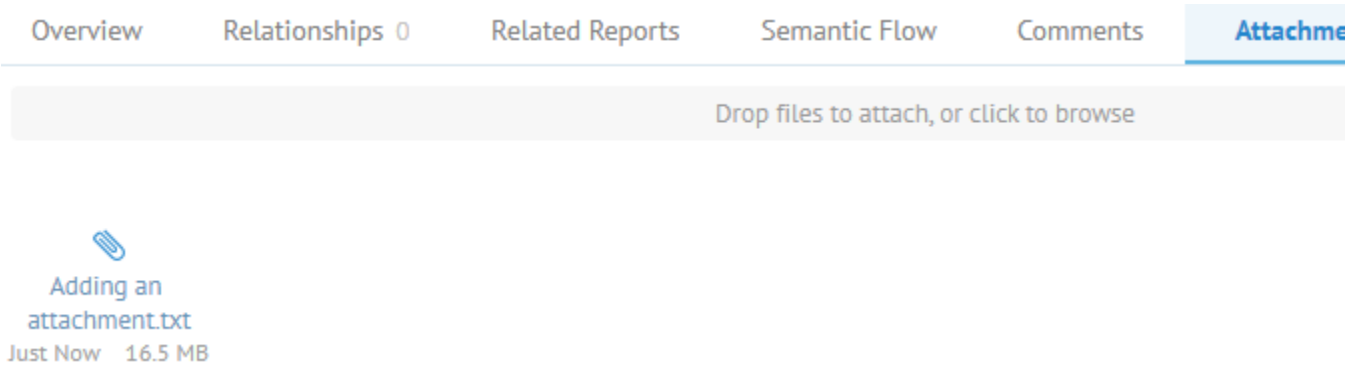
1. Navigate to the details page for the metadata element you wish to attach a file to.
2. Go to the **Attachments** tab
3. To add a new attachement, drag it into in the page.
4. To delete an existing attachment, select the attachment and go to **More actions > Delete**, and click **YES**.

Example

Navigate to the details page for the term **1972_Customer_Number**. Go to the **Attachments** tab.



Drag a new attachment in.



You may then refer to attachments in a comment.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Manage Metadata Content

A fundamental feature of MIMM is the ability to Harvest or import metadata from hundreds of different source tools, environments and formats. These may be databases, file systems, a data lake, data integration tools like ETL, business intelligence reporting environments, etc. Harvesting the metadata from these sources is a necessary step to constructing a complete picture of the existing information architecture. Along with stitching (configuration management) the result is an end-to-end understanding allowing for data flow impact and source lineage analysis.

*One may create, harvest and analyze metadata (model contents) from the **MANAGE > Repository** tree. However, generally it is best to create a configuration to work in (and to define the scope of analysis and search) and then go to MANAGE > Configuration and create and harvest there.*

Metadata Harvesting General Principles

When harvestings a model from source tools and formats, there are several considerations:

- Ensuring that one has proper connectivity to the external format metadata source. This could be:
  - One or more files
  - An external tool application programming interface (API)
  - An external tool API based upon a client installation
- Ensuring that one has full access to any auxiliary resources as need. This depends upon the external format one is attempting to connect to, but general examples include:
  - Substitution parameter definition files for tools where substitution variables may be defined in the source metadata and are required in order to parse it successfully
  - Connection information to data sources like database connection names

Many harvest actions will require pointing to files on the MIMM application server. The drives available for browsing are controlled by the conf.properties file. More details may be found in the MIMM ReadMe.html file on the application server.

Harvesting always captures the metadata of the source. In addition, in the case of data stores (e.g. File systems, databases, etc.) May also include sampling and profiling the data contained within these sources. It is optional and requires greater access to the source systems.

All these requirements are documented in the bridge tool tips, which are available in the Help panel on the Import Setup tab. A harvested model may also be used at the basis for a Documentable Physical Data Model.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Create a Model and Import Metadata

Steps

Ensure proper permissions

1. Sign in as a user with at least the **Manage** security role on the Configuration you are in.

Create the configuration (as needed)

*One may create, harvest and analyze metadata (model contents) from the **MANAGE > Repository** tree. However, generally it is best to create a configuration to work in (and to define the scope of analysis and search) and then go to **MANAGE > Configuration** and create and harvest there.*

Create the content

2. Go to the **MANAGE** > **Configuration** in the banner.
3. Click the plus sign under Manage Configuration and select **Model**.
4. Provide a name for the model and pick the surce technology / format to import from.

The list of available bridges will be quite long. However, you may use the search to find text in the name of the bridge, not just the beginning. In addition, you may click on Vendor or Category to filter to specific groupsngs of bridges.

*You may always harvest using a remote harvesting server by specifying it here under **Import Server**.*

5. Click **OK**.
6. In the **Overview** tab you may again enter a **Name** and **Description** for the model.
7. You may associate Stewards and/or Labels here.
8. Check the checkbox for **Propagate Documentation** as needed.

This is a property on the content that allows you to control the propagation of data documentation from the latest version only (by default) or from any older version when set to

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

true. This only applies to documentation: diagrams, join relationships, business names and descriptions, as well as custom attributes.

9. If you make any changes, click **SAVE**.

Configure the import bridge parameters

10. Click the **Import Setup** tab.

11. Here there will be a set of parameters which are unique to each import bridge. For each

    Parameter, click in the **Value** column and enter the appropriate value.

Each bridge parameter is extensively documented in the UI. Click the caret ( ) above Help on the right hand side of the parameter list. Click a parameter to see the tool tip for that parameter. Click the Bridge name to see the tool tip for the bridge as a whole.

12. Be sure to click **SAVE** if you make any changes.

*It is **imperative** that you read these "tool tips" when using a new bridge or diagnosing an issue with the import.*

You may click in the empty space below the list bof bridge parameters to return to the tool tip for the bridge as a whole.

You may click the TEST button in the upper right to attempt a connection to the source metadata tool.

Configure the import options

13. Click the **Import Options** tab.

14. Specify data sampling and data profiling options, as desired.

15. Click all checkboxes that apply to send eMail notification on import.

16. Click all other import options that apply

    - **Set new versions as default**: ensures that each new version when harvested will be designated as the default version.
    - **Create new versions only when new import has changes**: means that a new version will not be created after the import if no changes are detected on the new

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

metadata. This option applies to all bridges independently of the incremental harvesting capability of some bridges.

- **Copy model description to content**: in this case, as a model is harvested and a new version is stored, the description given internally for the model (from the source metadata) is also applied to the content version itself.

Some bridges are capable of incremental harvesting as they can detect what has changed in the source technology and therefore only harvest what has changed (updated or new. Enabling this feature offers much faster subsequent harvesting, and much less space used. in produced new versions has it can reuse everything that has not changed. This is primarily available in bridges from repositories of business intelligence tools (e.g. IBM Cognos, SAP BusinessObects, Tableau) and data modeling tools (Erwin mart, ER/Studio repository, based on the repository API. This is also available in data lake crawlers (e.g. File Systems, Amazon S3, Microsoft Azure Data Lake, Hadoop HDFS) based on directory/file date changes combined with other criteria specific to those technologies.

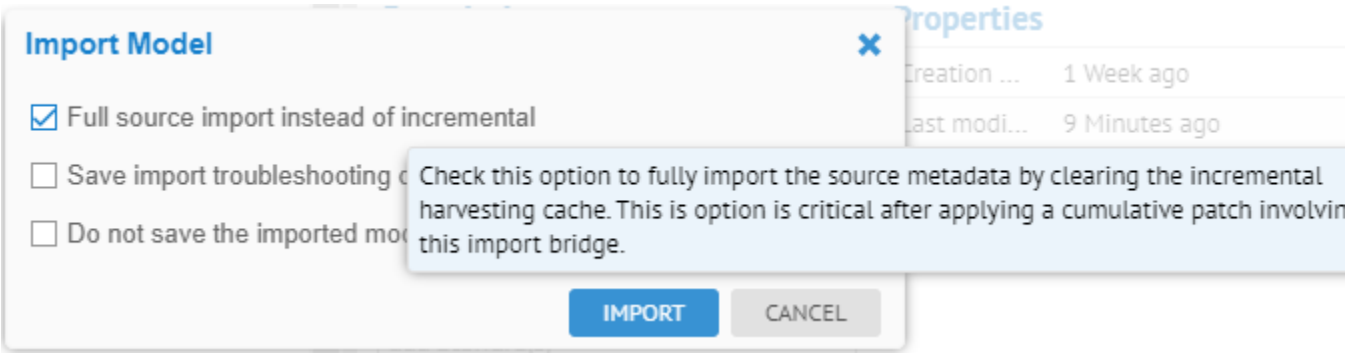
17. Be sure to click **SAVE** if you make any changes.

Special version management options will be presented in the multi-version editions of MIMM *. Please see [version management](#) for details.*

Import (a Version) of the model

18. Click **IMPORT**.

19. Check the **Full source import instead of incremental** checkbox and click **IMPORT** if you wish to clear any cached metadata and thus force a complete re-harvest.



*The **Full source import instead of incremental** option is a necessary choice for full re-harvesting (without any incremental harvesting reuse of the cache)*

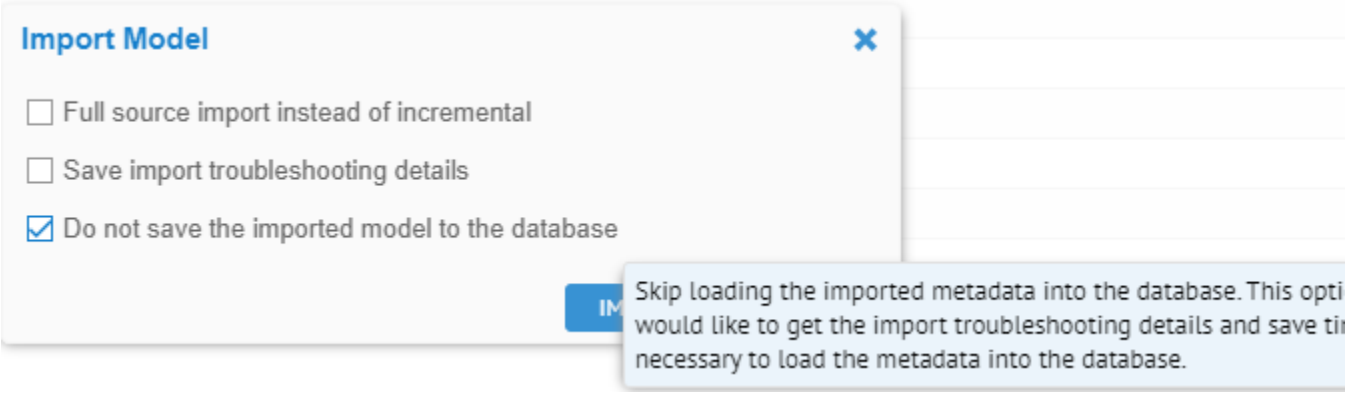
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

- *after deploying a new bridge (MIMB cumulative patch)*
- *changing the bridge parameters (e.g. moving the source from dev to prod)*

Because of this option, all Incremental import parameters of any import bridge have been hidden, in order to simplify the user experience.

Therefore, any scheduled import is always using incremental harvesting on multi models.

20. Check the **Do not save the importe model to the database** checkbox.



This is not a common selection, but can be handy when testing bridges in terms of their logs but not wishing to actually load the model into the repository.

In some cases, you will see in the resulting log that the process ran out of memory. Please be sure to set the appropriate amount of memory using the bridge Miscellaneous option (see the bridge tool tip) or the conf.properties file (see the ReadMe). There are two places to increate memory, potentially, though. In addition to the bridge requires (above), the Application Server will also need to have at least the same amount of memory available, but whatever is need to produce the UI. Please see the ReadMe for details how to increase this memory.

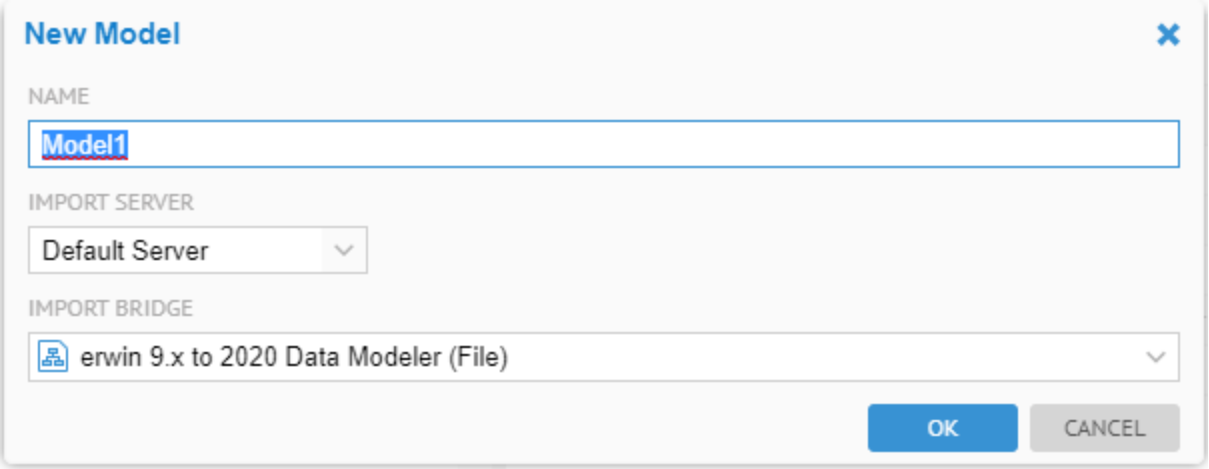
Example

Sign in as Administrator.

Create the folder and configuration (as needed).

Go to the **MANAGE** > **Configuration**. Click the plus sign ( ) to create a model.

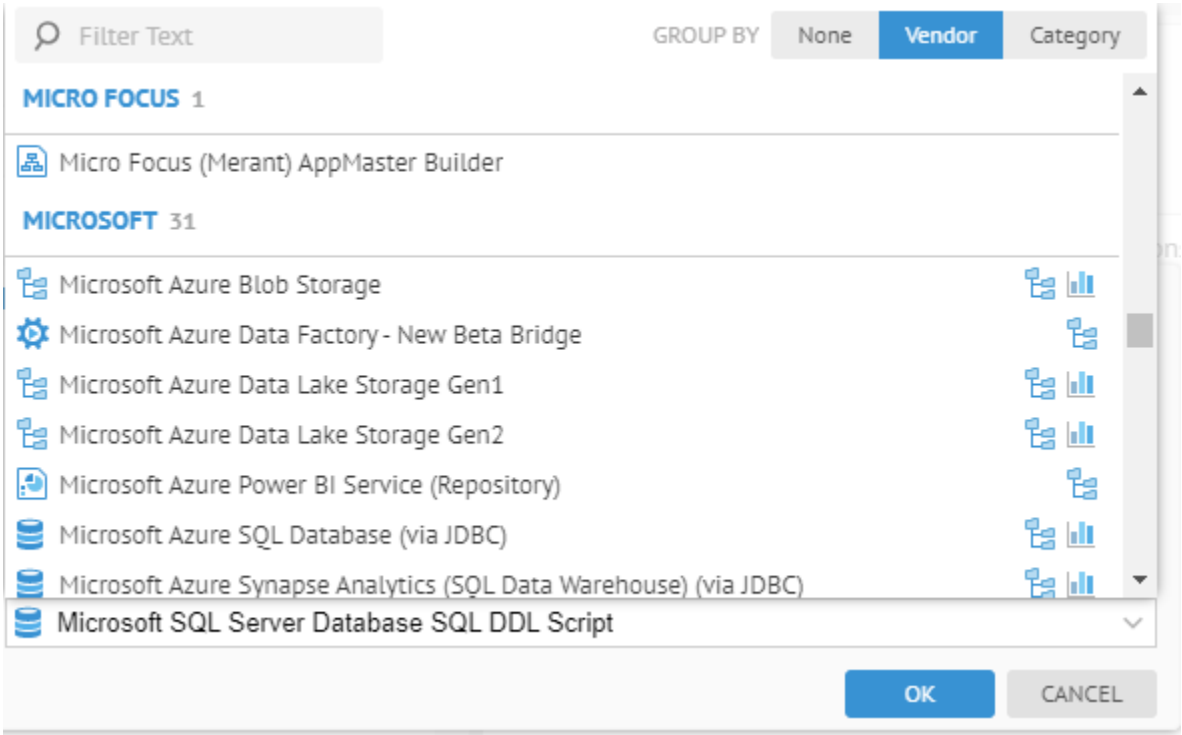
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Named the model "New Model", and choose the **Microsoft SQL Server Database SQL DDL bridge**.

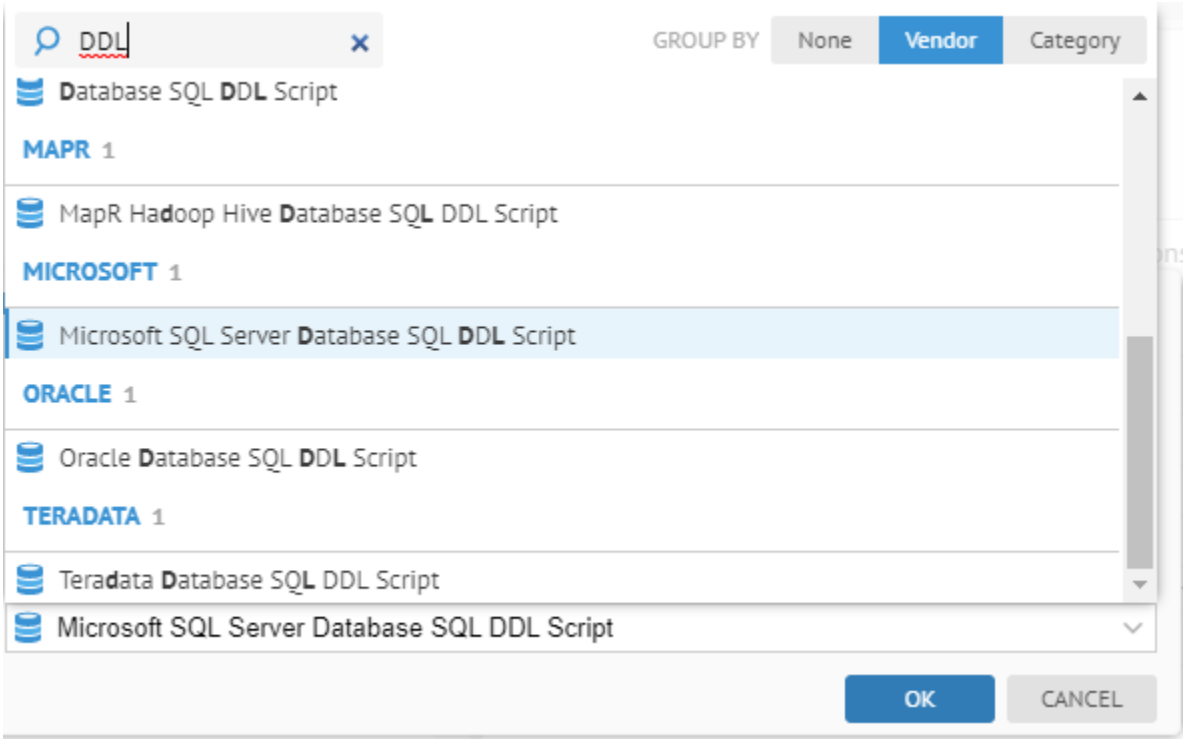
The list of available bridges will be quite long. However, you may use the search to find text in the name of the bridge, not just the beginning. In addition, you may click on Vendor or Category to filter to specific groupsngs of bridges.

In this case, click **Vendor** then scroll to Microsoft.



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

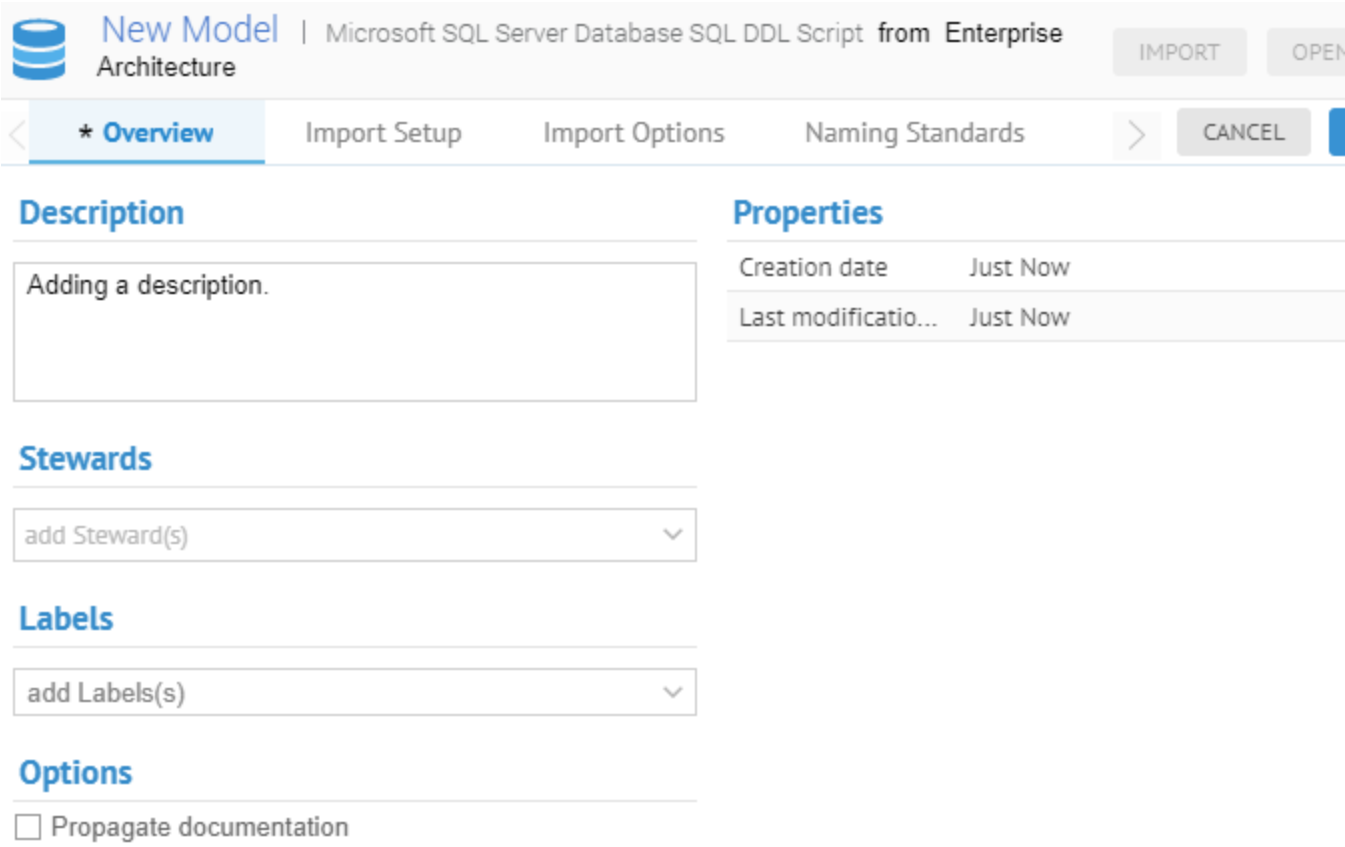
It is still a bit long, so type “DDL” into the search box and note the list only includes those bridges.



Click **OK**

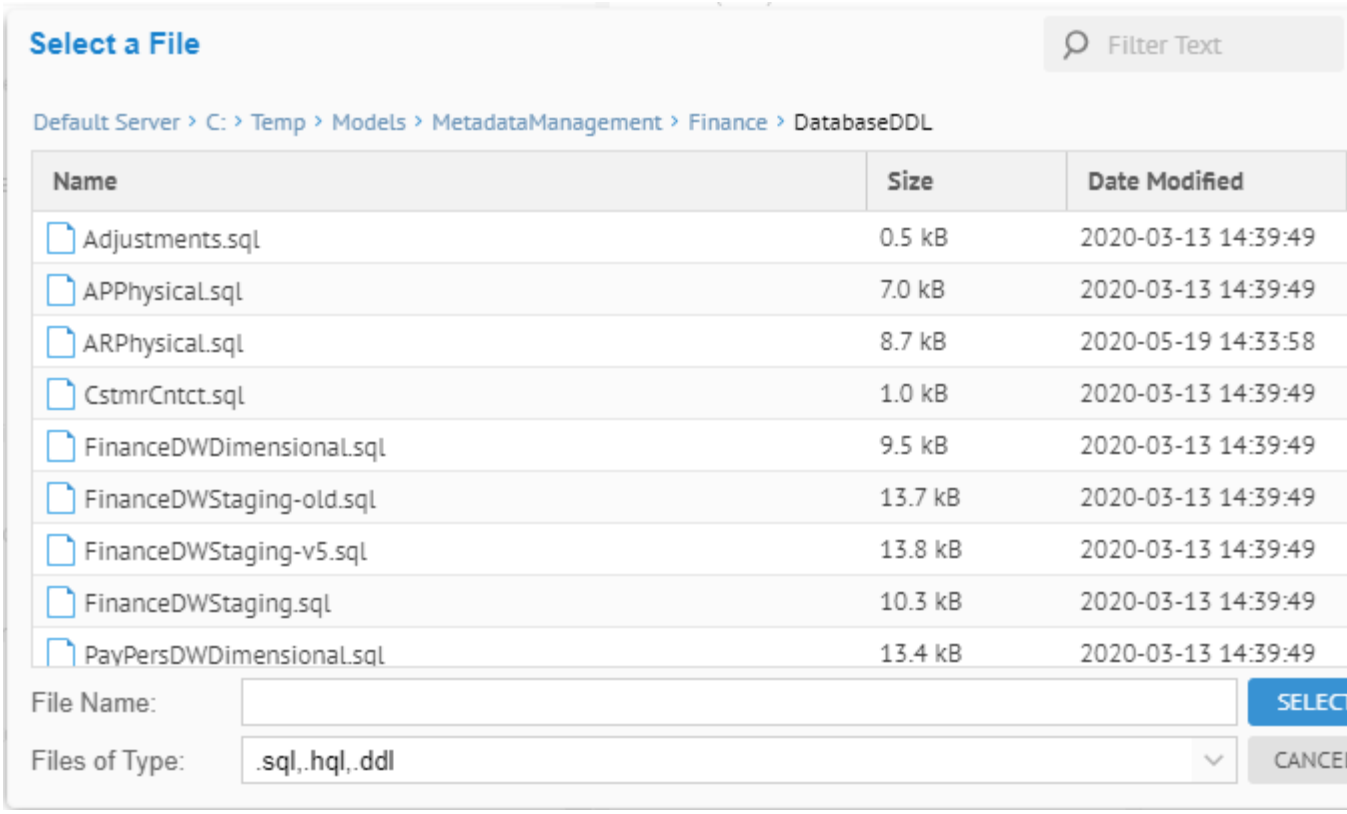
Enter a description in the **Overview** tab and click **SAVE**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



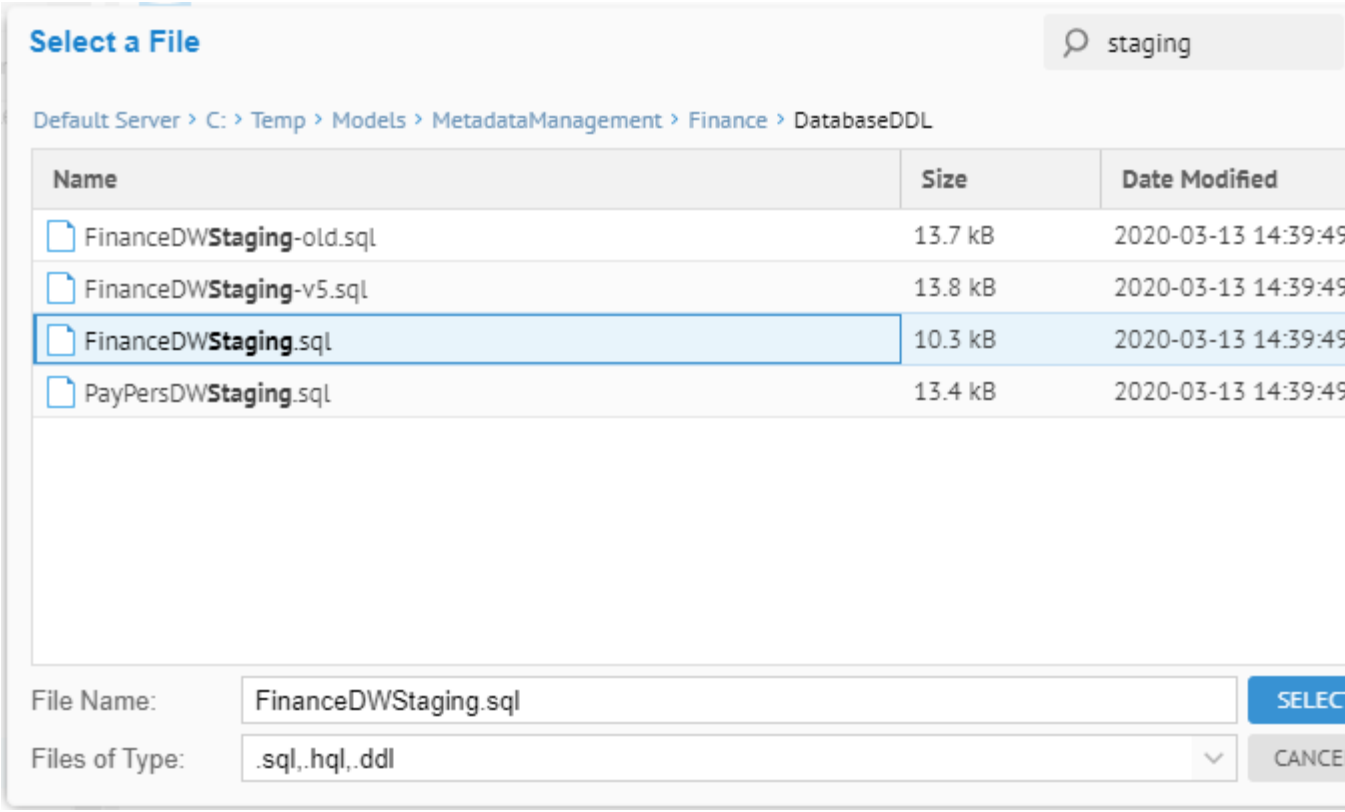
In the **Import Setup** tab, use the ( ) **Browse** icon to navigate to **C:\Temp\Models\MetadataManagement\Finance\DatabaseDDL**. Select the **FinanceDWStaging.SQL** file. Specify "dbo" as the **Default Schema**. Be sure to click **Save**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

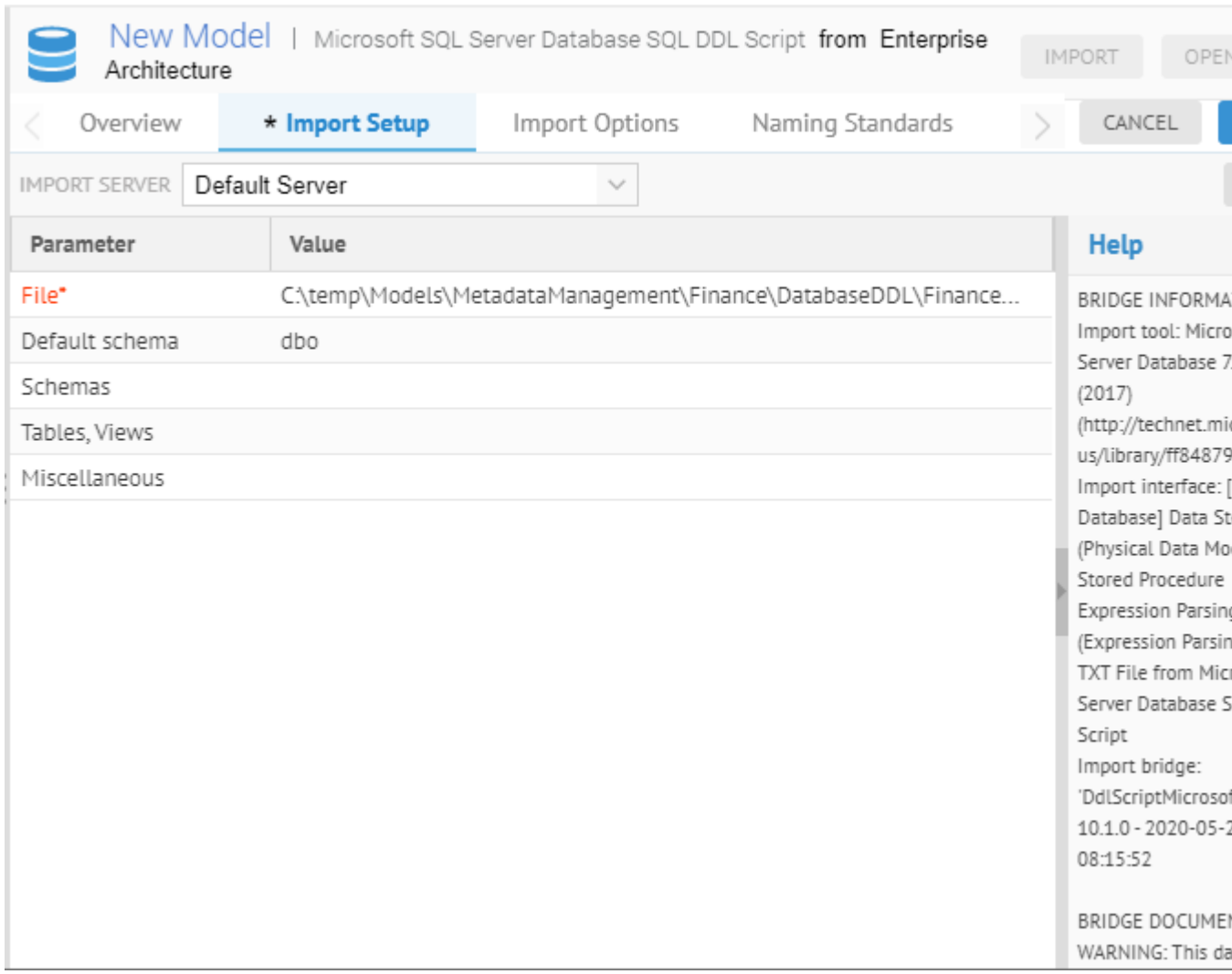


*You may use the text **Search** box to quickly find a file or folder you are looking for.*

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

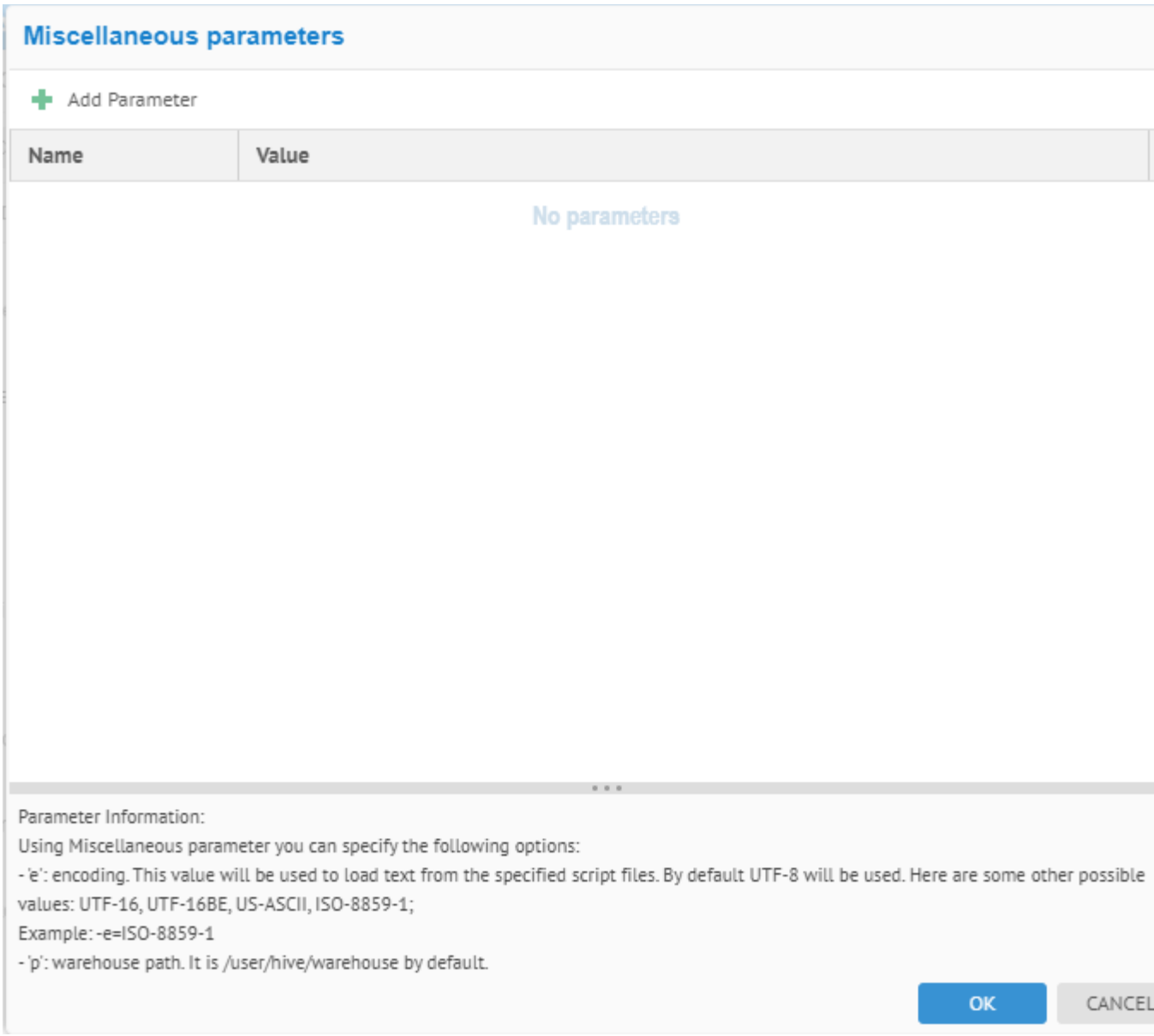


Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click to edit the **Miscellaneous** bridge parameter and expand ( ).

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



*You are presented with the multi-line **Miscellaneous** bridge parameter editor.*

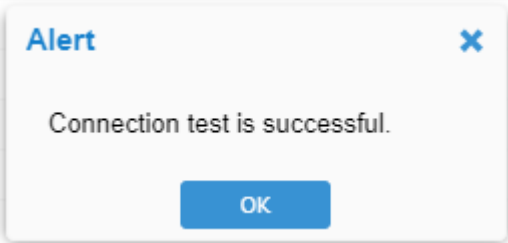
The tool tip with options is provide below, but also you may select the options from the pull-down.

Click Add Parameter and enter the following in the **Miscellaneous** bridge options:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Name	Value
-m	2G
-e	UTF-8

Click **OK**. Click **TEST** in the upper right.



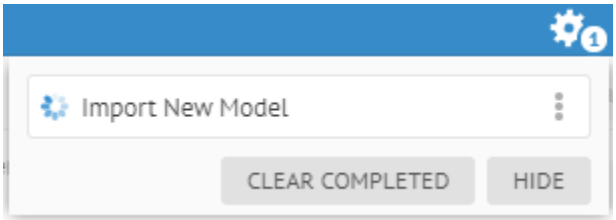
Click **OK**.

Required bridge parameters are shown in red and have an asterisk (*) appended to the parameter name.

Click **SAVE**. Click **IMPORT**.

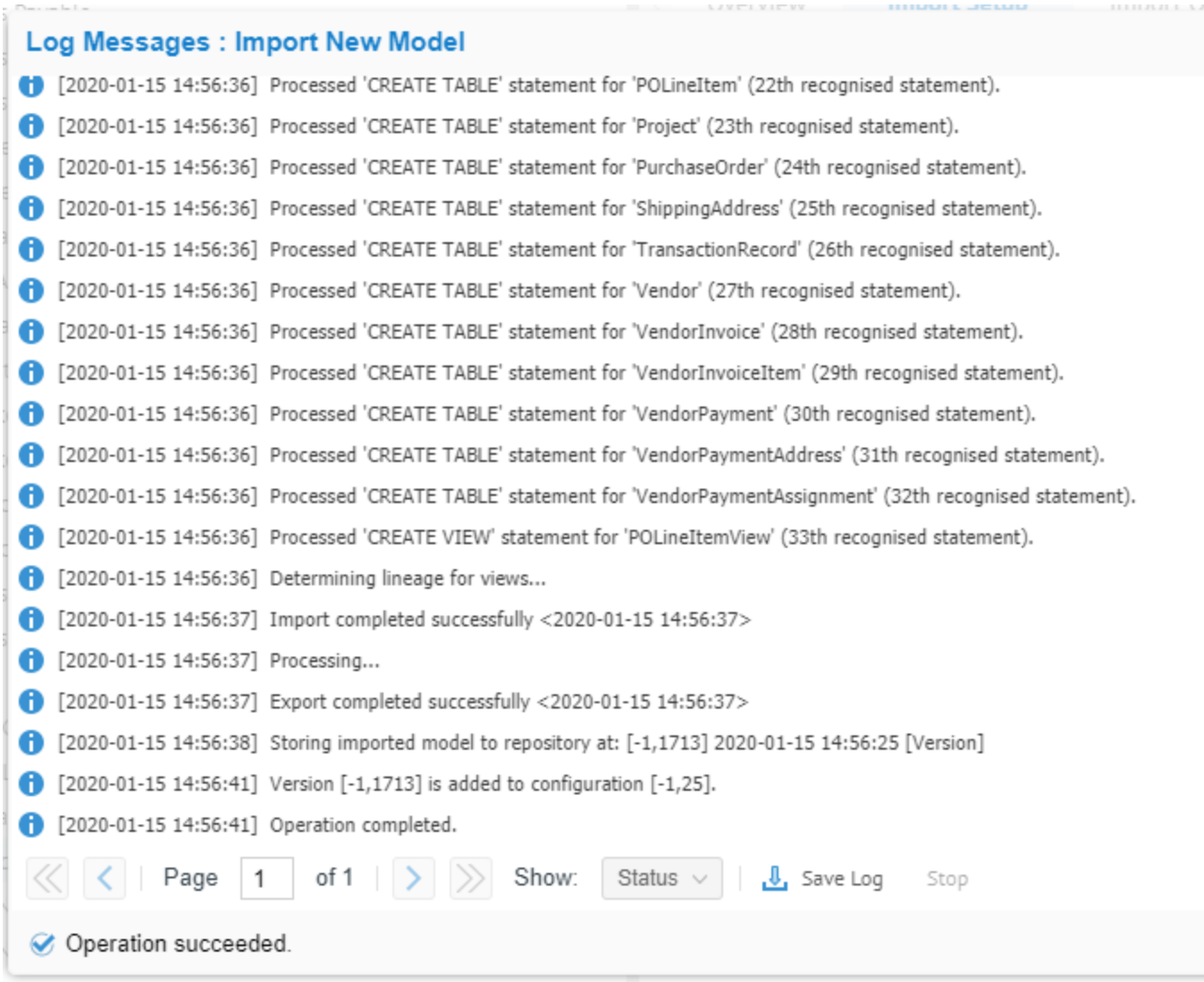
Leave the **Full source import instead of incremental** unchecked and click **IMPORT**.

Also, there is an indicator in the upper right banner showing an active operation



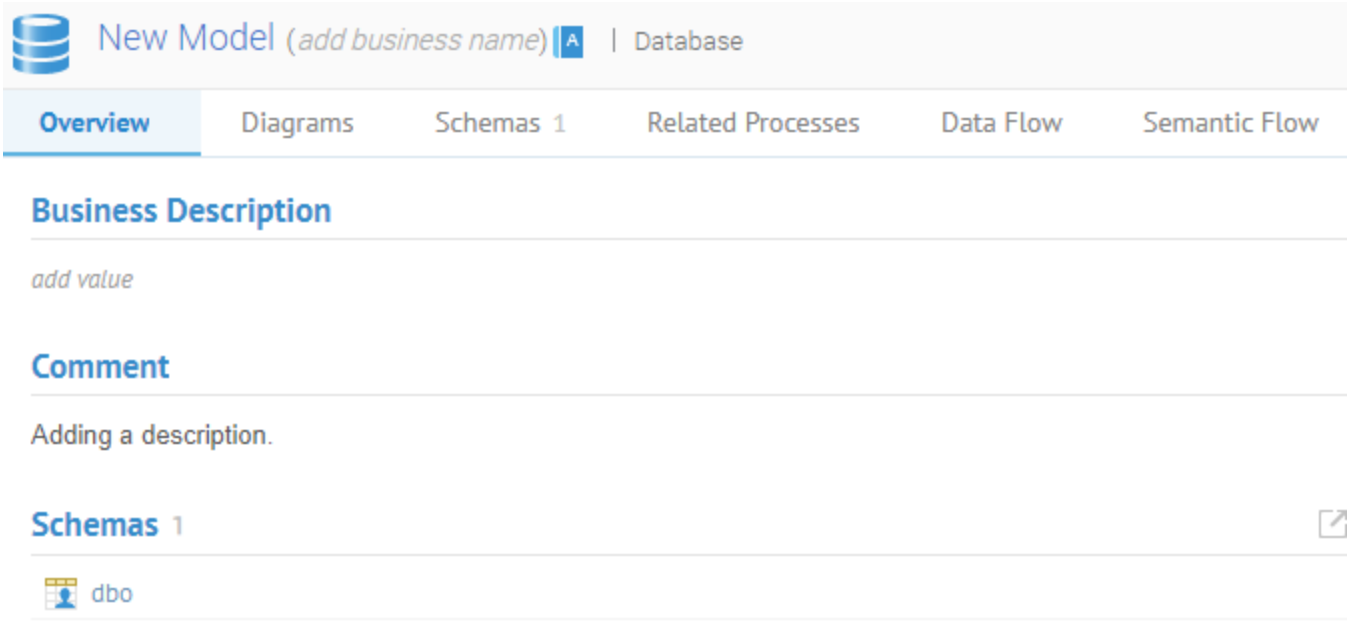
Click on the active operation.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Refresh until you see the Operation succeeded check mark, you have a successful import. So, select the **New Model** in the Manage Contents panel and click OPEN to open the model's details page, or navigate to the model or its contents.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Explore Further

Analyze the log

With the **Operation completed** box is not checked at the end of the import of you see **Import Unsuccessful** in the log, you do not have a successful import, and you will need to investigate

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

the log to address any errors. Even without that indication, there may still be informational messages and warning that you will want to investigate.

The log messages are self-documenting and should provide enough information to analyze and correct the issue. If you must report an issue to the MIMM support, be sure to include this log. Click Save Log to download the log file.

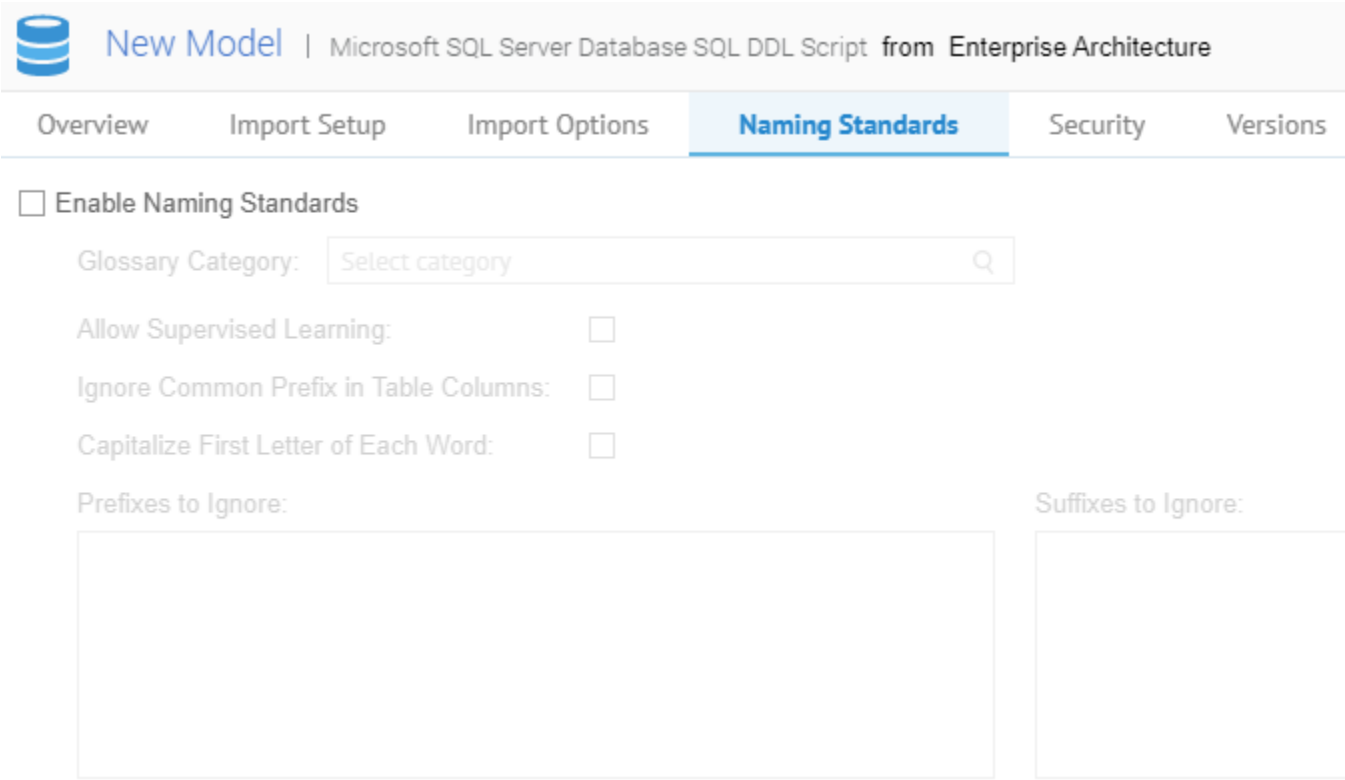
How to use the UI to analyze a log.

Connections and Configuration Management

As you have imported the model into the current configuration that you are operating under, once you have imported a model, it then must be stitched to surrounding models in the architecture of the configuration.

Configure naming standards

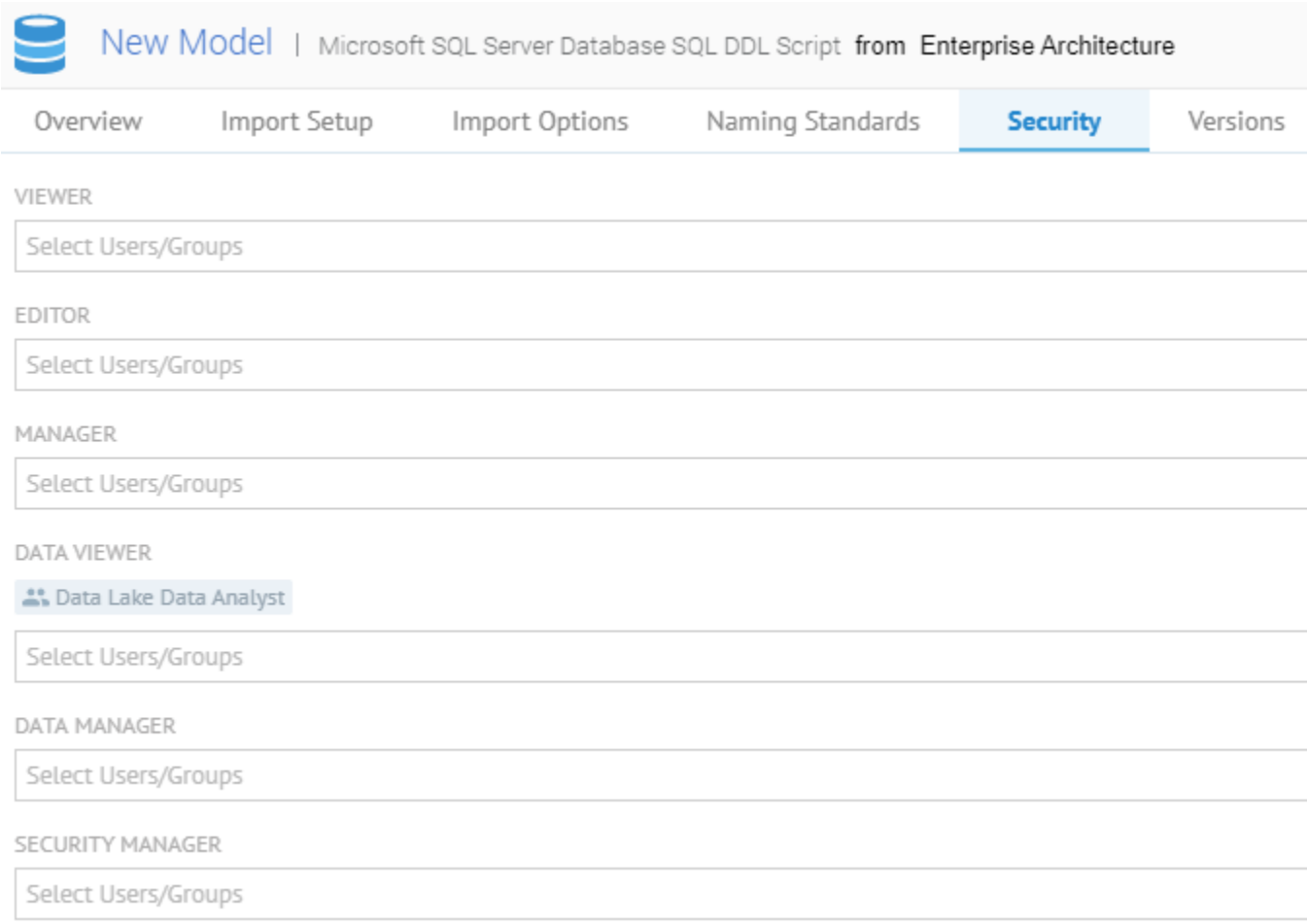
Click the **Naming Standards** tab to define Naming Standards.



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Assign security roles

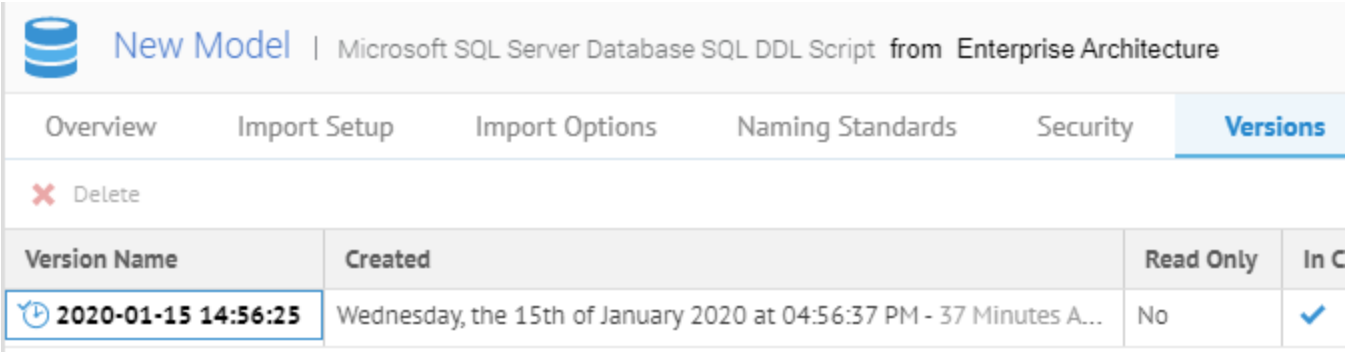
Click the **Security** tab and associate the security roles with users or groups.



Versions

Click the Versions tab to see current and historical versions of the content.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



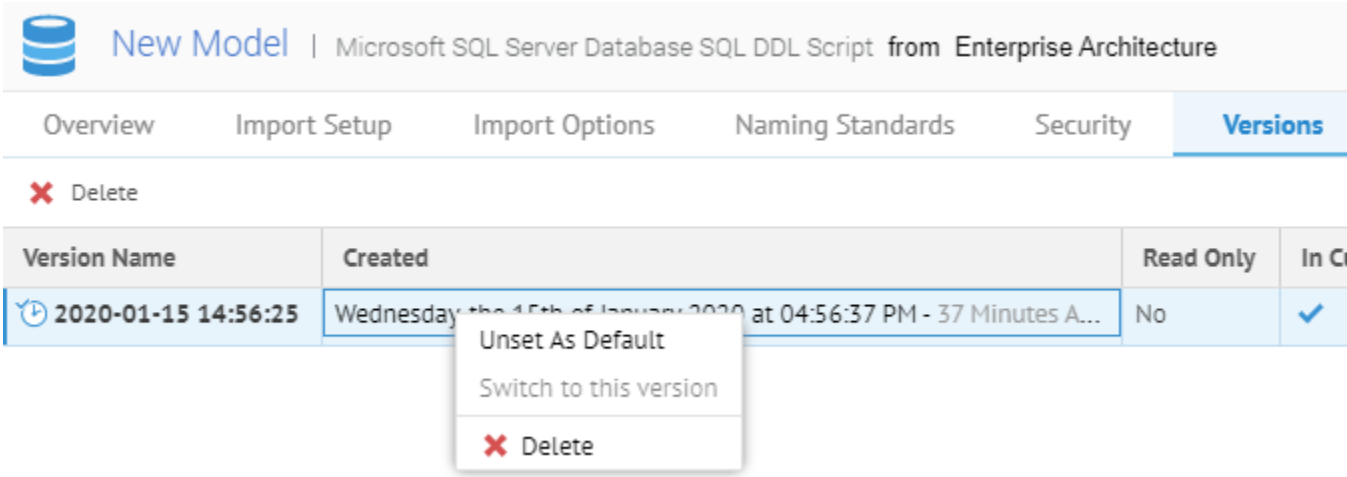
Set new versions as default

When importing a model, if a new version is to be created, then this new version can either be the default version or not. Initially, the new version is set to be the default version of the model.

The default version is the one that:

- Is acted upon when you act on a content as a whole (e.g., if one opens a content, but not a specific version, in the metadata manager user interface, then it is the default version that is opened
- Is included in a configuration that is set to **Auto Update**.

Click the Versions tab and right-click on the only version in the list.



As this is the only version, it is already the default. If you import again and create a new version as part of that process, you may assign defaults.

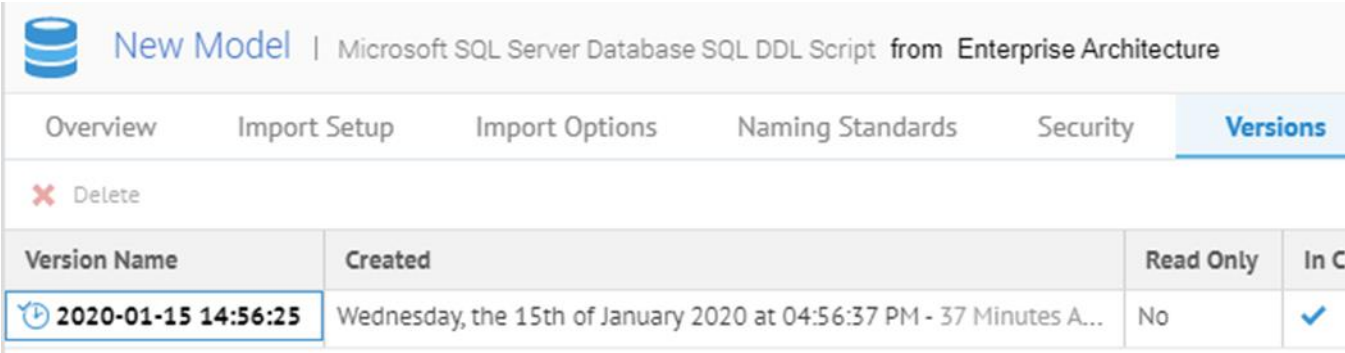
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Create new versions only when new import has changes

Checking this box means that a new version will only be created if changes are detected. This generally only applies to BI tools, DI tools and data modeling tools. Differences are detected using various methods depending upon the specific technology imported from.

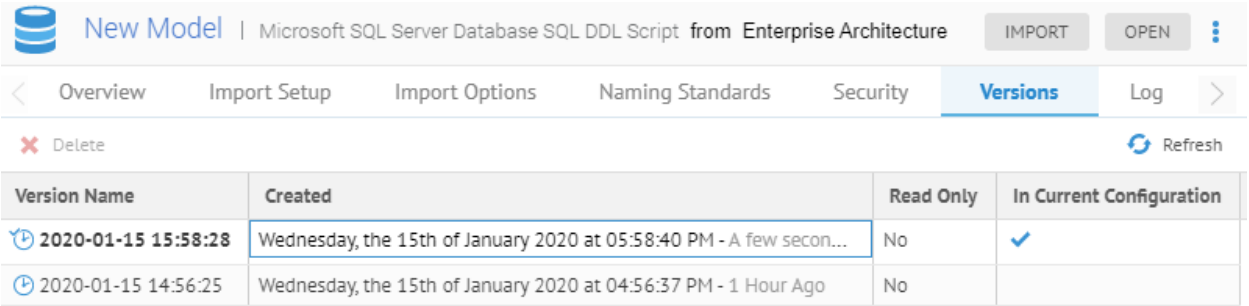
Import the model again.

Go to the **Versions** tab and note that no new version is created.



Now, go to the Import Options tab and uncheck **Create new versions only when new import has changes**. Click **Save**. Click **Import**. Click **IMPORT** again without checking any boxes.

Go to the **Versions** tab and note that now a new version is created.



Propagate documentation

MIMM allows you to enable and disable the propagation of documentation (including **Business Name** and **Description, diagrams, join relationships** and custom attributes) from older versions of a content. You can decide to enable the feature when you need to fix an old version and would like the fix to be propagated to future versions as they are harvested. When you check the **Propagate documentation** checkbox, MIMM propagates documentation changes made to any historical version to new versions as they are harvested.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

If you leave this checkbox unchecked, then propagation of documentation will occur from the latest (last imported) version only (this is the default).

> *This feature can produce conflicts and unexpected results. For example, when you edit the same piece of documentation in different versions the latest edit wins. It is true even when you edit the latest version first and an old version later. You should disable the feature after you finish making future-proof changes to older versions to avoid unnecessary conflicts.*

Data Sampling and Profiling

You may configure the harvest to perform data sampling and/or profiling when importing the metadata.

Steps

1. Configure a model to be harvested.
2. Click the **Import Options** tab.
3. Specify data sampling and data profiling options, as desired.
4. Click **SAVE**.
5. Click **IMPORT**.

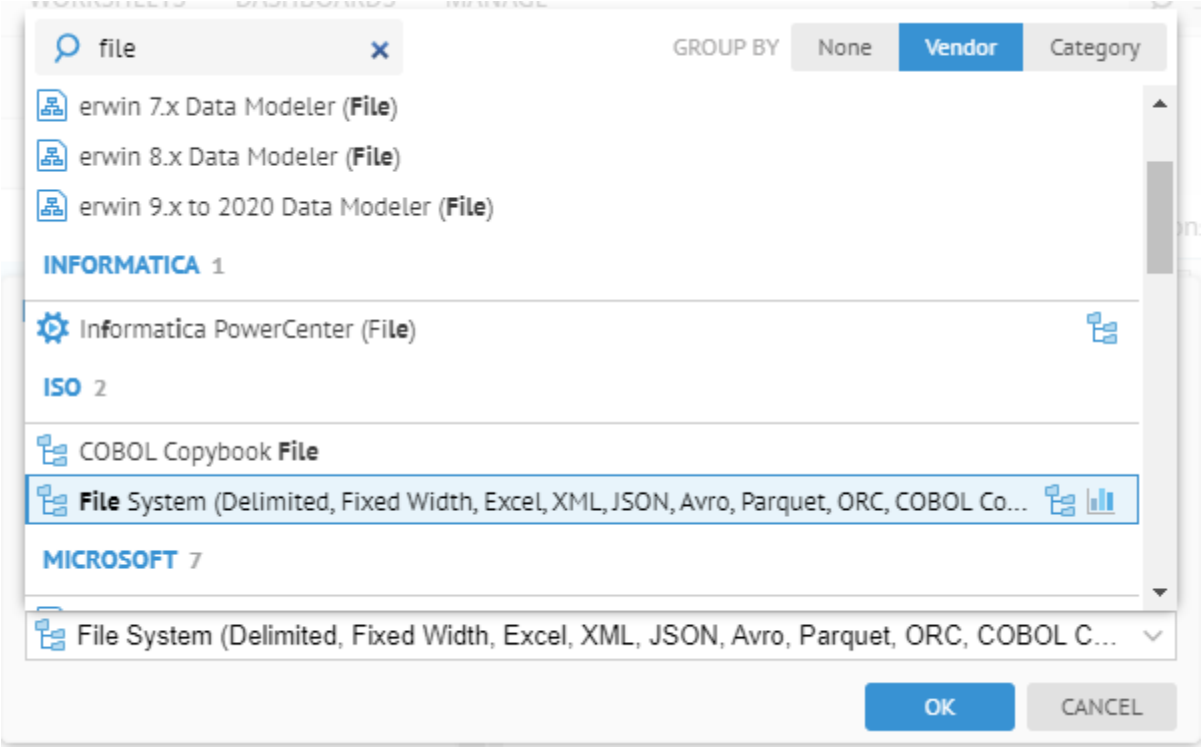
Example

Sign in as Administrator.

Create the folder and configuration (as needed).

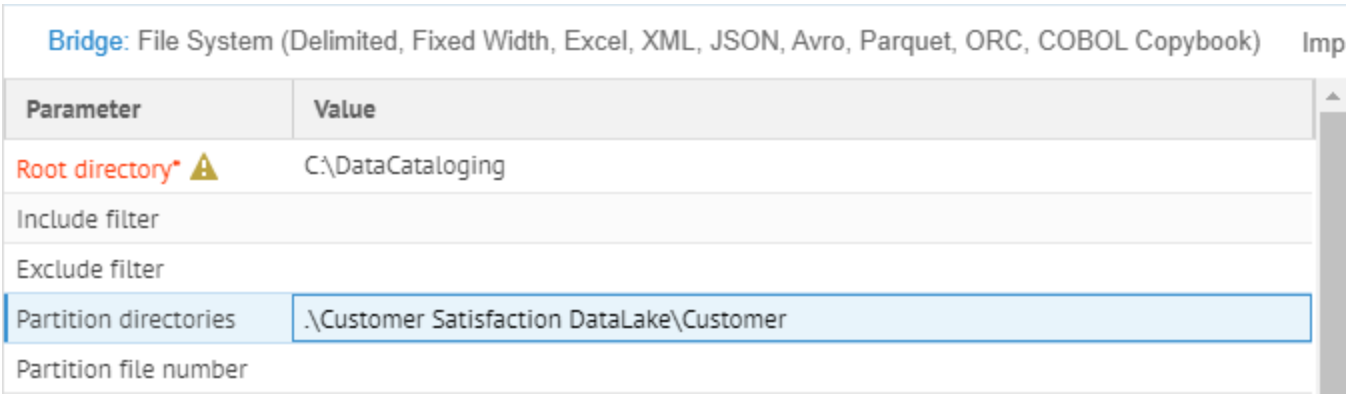
Go to the **MANAGE** > **Configuration**. Click the plus sign ( ) to create a model named **Data Lake** that is using the **File System** bridge.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



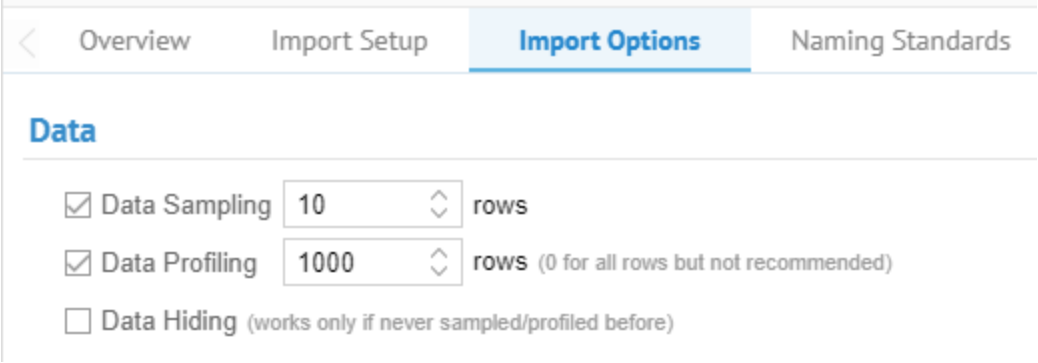
In the **Import Setup** tab, use the ( ) **Browse** icon to navigate to **C:\DataCataloging**. Specify ".\Customer Satisfaction DataLake\Customer" as the **Partition directories**.

Click **Save**.



In the **Import Options** tab, specify **Data Sampling** and **Data Profiling** with the default number of rows.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click **SAVE**.

Click **IMPORT**.

Email Notification

Configure the email server settings

1. Sign in as a user with security management or administrator privileges.
2. Go to **MANAGE > Email** and configure the email server information.

Configure the model for notification

3. Configure a model to be harvested.
4. Go to **MANAGE** > **Configuration**
5. Select the model to be notified on import.

Set the stewardship

6. Go Click the **Overview** tab.
7. Include user or group you wish to receive notification in the **Stewards** list.

Be sure the user or group has an email address defined for it.

Set the notification criteria

8. Click the **Import Options** tab.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

9. Specify **Send email notification when an import** options, as desired.

Send email notification when an import:

- ☑ fails for any reason
- ☑ succeeds bringing changes
- ☑ completes but there are no changes

Commit the changes

10. Click **SAVE**.

11. Allow a scheduled import to occur or manually click **IMPORT**.

Example

Sign in as Administrator and configure the email server information.

Go Click the **Overview** tab and Include a user or group (one you know has an email address you will receive notification at) in the **Stewards** list.

Go to **MANAGE** > **Configuration**. Select the **Accounts Payable** model and go to the **Import Options** tab.

We will not update the model for this first update, so we will specify all three email notification options.

Send email notification when an import:

- ☑ fails for any reason
- ☑ succeeds bringing changes
- ☑ completes but there are no changes

Click **SAVE** and then **IMPORT**. Click **IMPORT** again without checking any boxes.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

From: <DataCatalog@MyCompany.com>
Date: Wed, Apr 29, 2020 at 11:44 AM
Subject: [MyCompany Data Catalog] Notification: Import Successful
To: <bob@MyCompany.com>

MyCompany Data Catalog Notification of Successful Import

Users can explore the new /Enterprise Architecture/Operational Data Stores (ODS)/Accounts Payable which was imp

Repository managers can review the version details and content preview.

Here is a detailed comparison report from the previous version.

Here is a summary of differences detected:

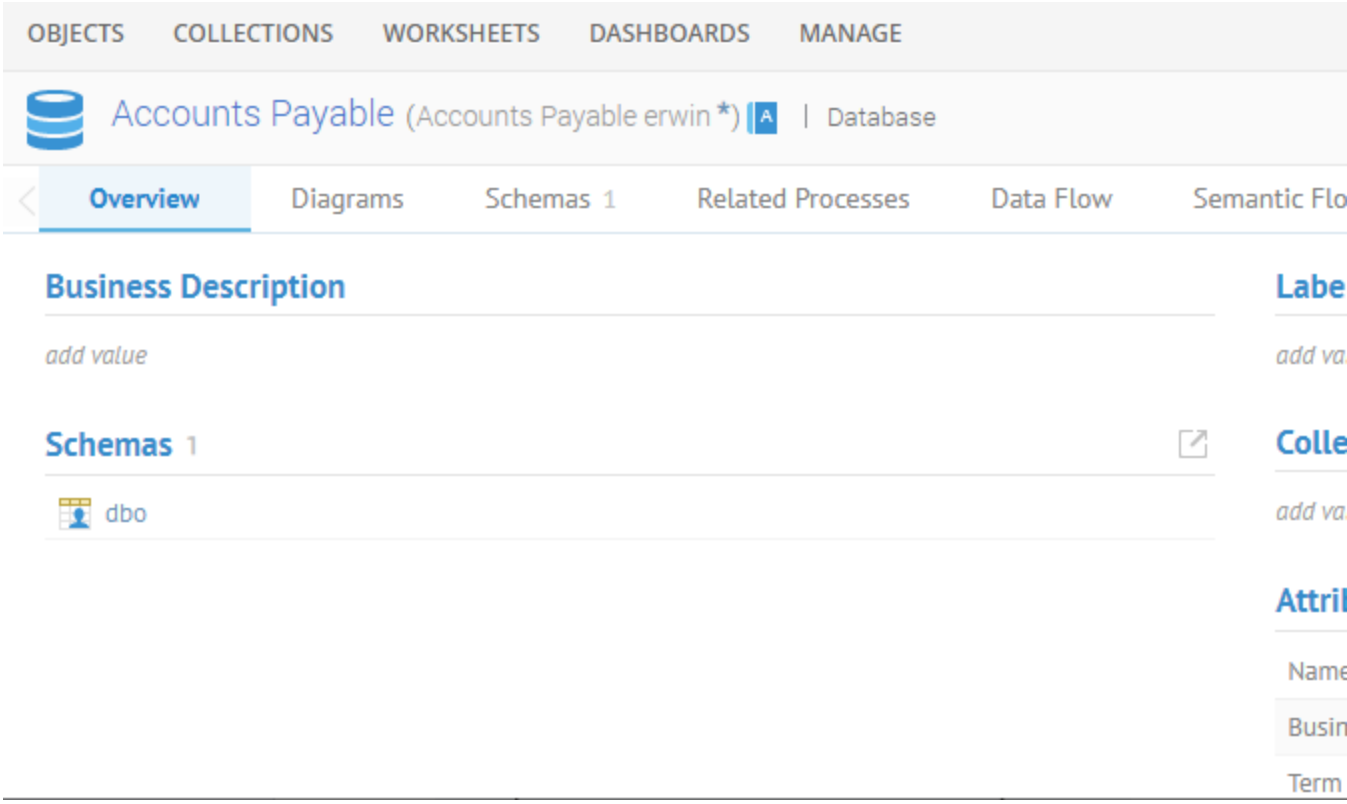
Object Type	Number Added	Number Removed	Number Changed
Column	0	0	8

No connections were added or removed. There is no error in the import log.

You have received an email notification.

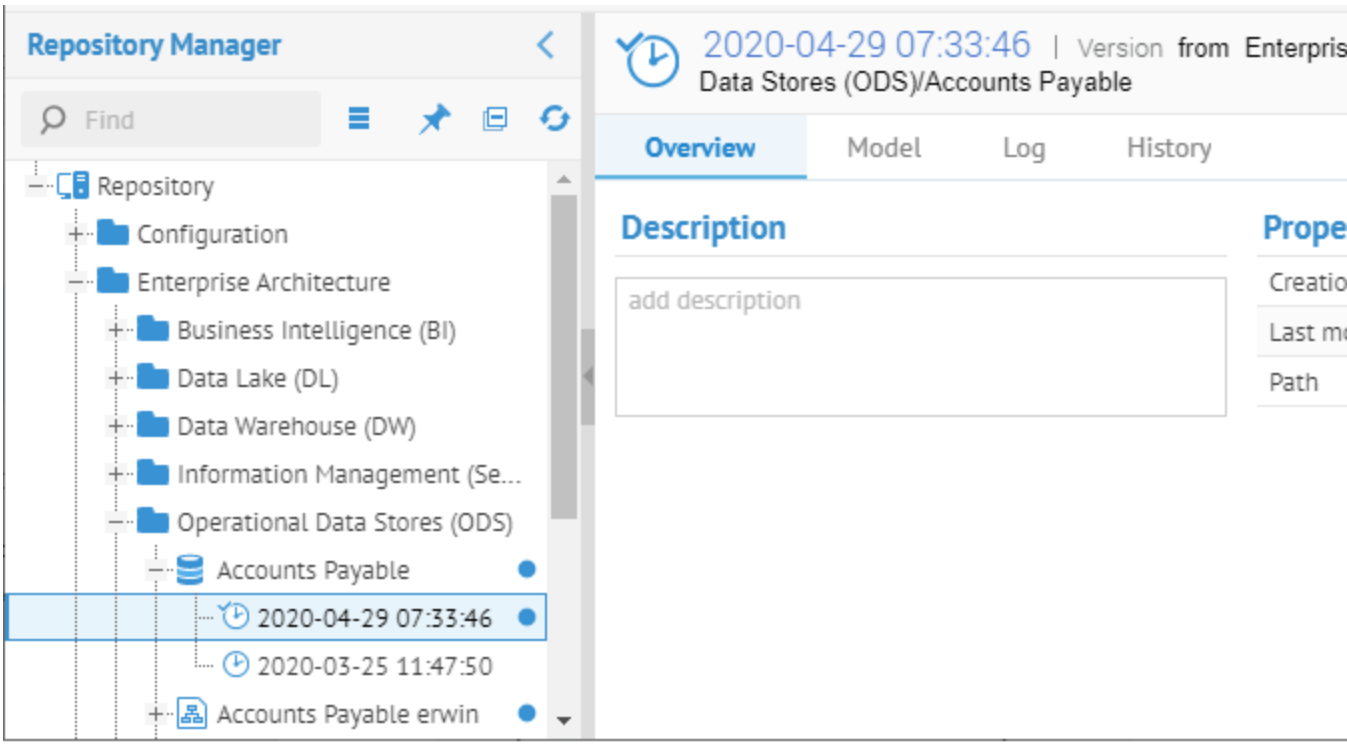
Click the link for the content and you are taken to the details page for the version of the model in your configuration.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click the link for the version and you are taken to the Repository Manager details page for the version of the model.

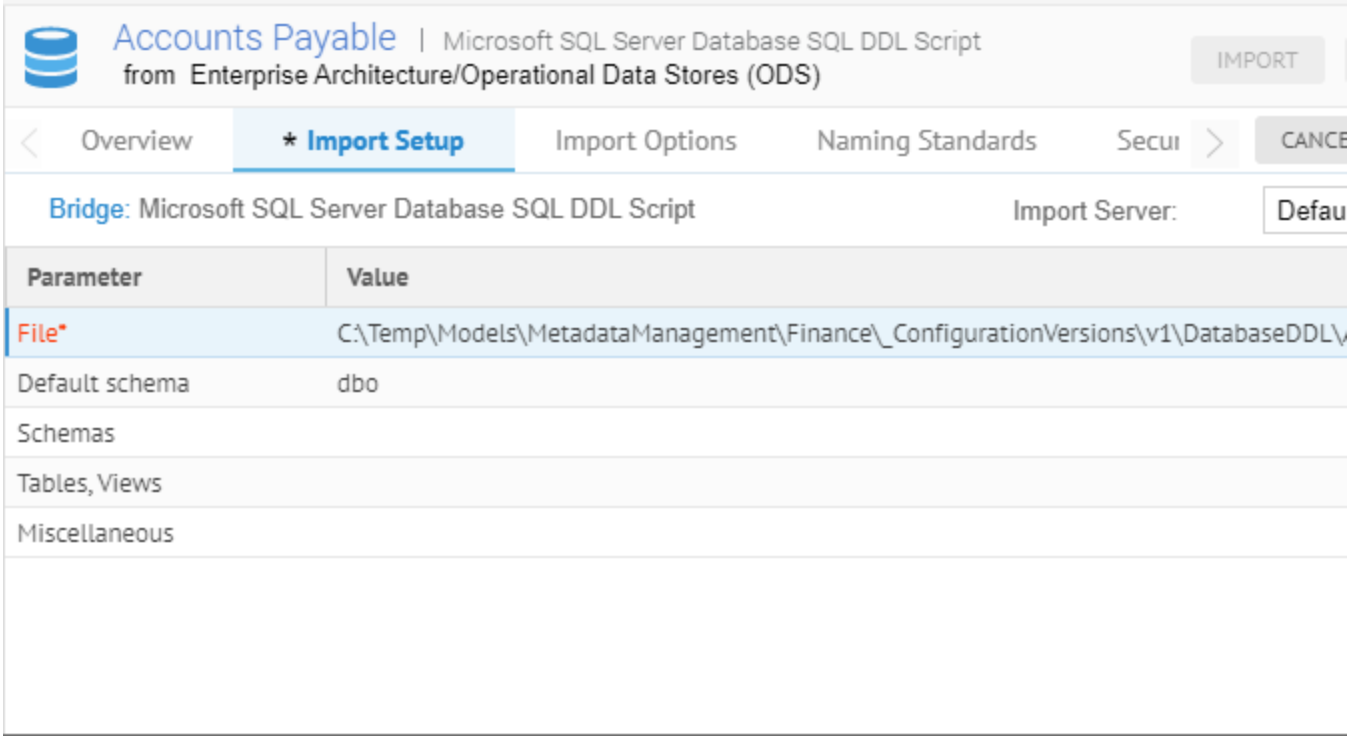
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



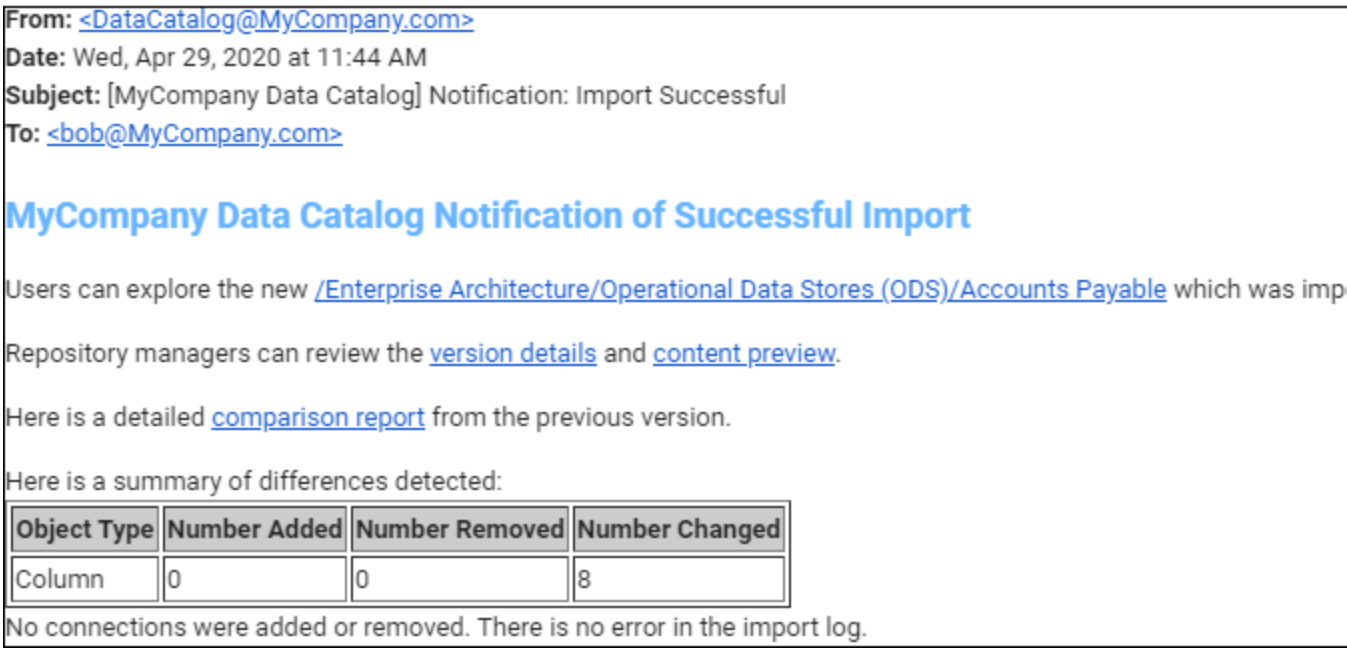
Now, click **the Import Setup** tab and point to a different ddl to import:

C:\Temp\Models\MetadataManagement\Finance_ConfigurationVersions\v1\DatabaseDDL\APPhysical.sql

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click **SAVE** and then **IMPORT**. Click **IMPORT** again without checking any boxes.



From: <DataCatalog@MyCompany.com>
Date: Wed, Apr 29, 2020 at 11:44 AM
Subject: [MyCompany Data Catalog] Notification: Import Successful
To: <bob@MyCompany.com>

MyCompany Data Catalog Notification of Successful Import

Users can explore the new /Enterprise Architecture/Operational Data Stores (ODS)/Accounts Payable which was imp

Repository managers can review the version details and content preview.

Here is a detailed comparison report from the previous version.

Here is a summary of differences detected:

Object Type	Number Added	Number Removed	Number Changed
Column	0	0	8

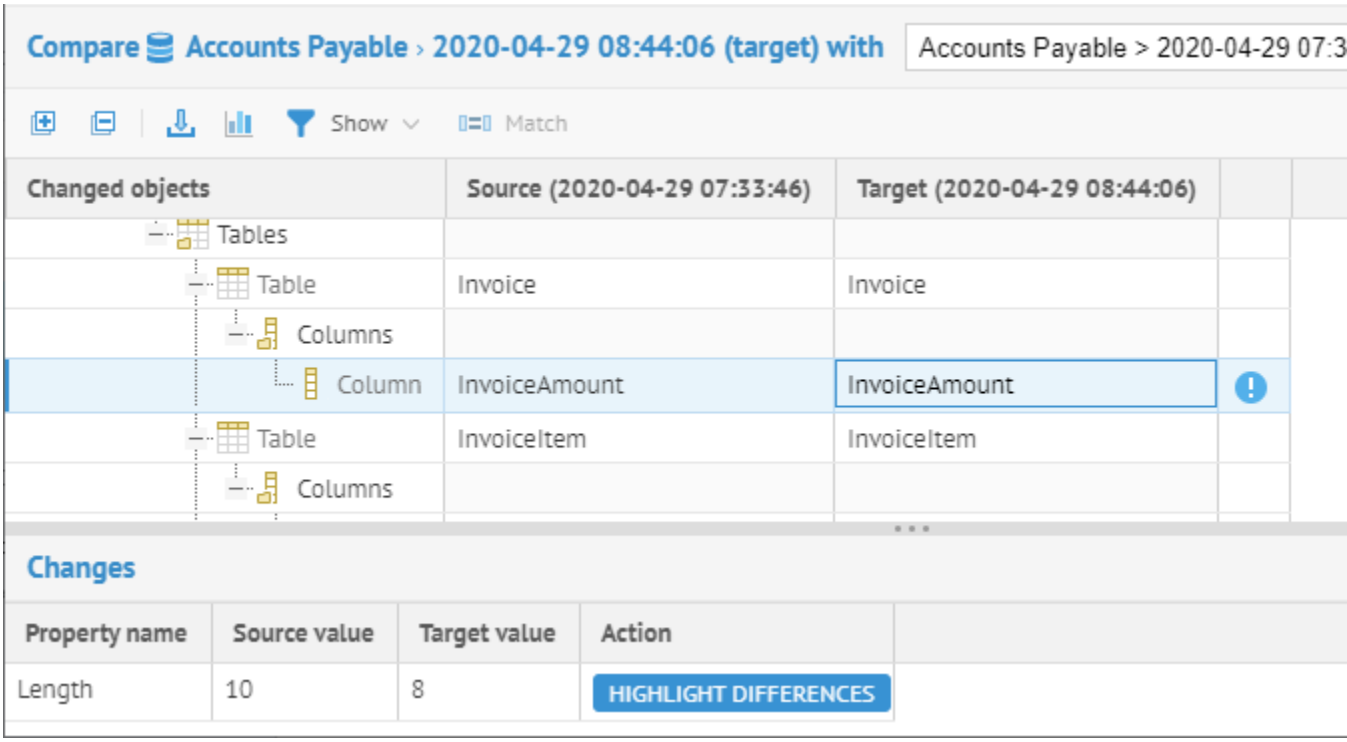
No connections were added or removed. There is no error in the import log.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

You have received an email notification.

Where the email title and subject [MyCompany Data Catalog] comes from the customized name set to miti.mimm.title in conf/resources/MM.properties.

Click the link for the version and you are taken to comparator for this and the previous versions of the model.



Naming Standards

One can associate naming standards with a model or a physical data model.

Harvest several Models from a directory of external metadata files.

It is common for an organization to have a large number of external metadata files, but does not use an external metadata repository. Often, this organization would like to import the files into MIMM in batch in an automated fashion. MIMM has the ability to support this scenario with the help of a harvesting script.

In this case, the files are stored under a file directory which is accessible to the MIMM application server. The script scans the directory and its subdirectories for files of the particular external metadata type and finds matching Models under a particular folder in MIMM . The MIMM repository folder and model structure will match the structure of files and their

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

directories on the file system. When the necessary Model does not exist the script creates one and imports the file. When the content is present the script will re-import it if the file's version has not been harvested yet.

One can schedule MM to run the script periodically. It should allow customers to place files under the directory and be assured that MIMM will import them automatically. It will work for any single model file-based bridges.

A special Model named **Settings** must also be defined in order to control how the files will be imported (what source tool and what bridge parameters).

Ensure proper permissions

1. Sign in as a user with at least the **Manage** security role on the Configuration you are in.

Create the configuration (as needed)

*One may create, harvest and analyze metadata (model contents) from the **MANAGE > Repository** tree. However, generally it is best to create a configuration to work in (and to define the scope of analysis and search) and then go to **MANAGE > Configuration** and create and harvest there.*

Create the MIMM folder

2. Go to the **MANAGE > Repository**
3. Right click on a folder in the **Repository Tree** where you want to place the folder containing the results of the import and select **New** > **Folder**.
4. Name the folder accordingly.

Create the Settings file to control the import of Models:

1. Right click on that new folder in the **Repository Tree** and select **New** > **Model**.
2. Select the **General** tab in the **Create Model** dialog.
3. Enter "Settings" in the **Name** for the Model.
4. Select the correct source format in the **Import From** pull-down.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

5. Select the **Import Setup** tab.
6. For each of the Parameters, complete according to the tool-tips displayed in the right hand panel of the dialog. In particular, for the File: parameter :
7. Click on the icon and browse for a file inside the directory structure on the file system.
8. Update the File: parameter to so that the path only refers to the top level of the directory structure on the file system (i.e., remove the file name and any sub-directory names).
9. Click the check box Set as default if you wish to automatically set any new imported Version as the default Version.
10. Click **Create**.
11. A dialog will appear asking to import the Model. This is very important: Click **No**.

Harvest the Models on demand:

1. Right click on that new folder in the **Repository Panel** and select **Scripts** > Import new versions from folder.
2. Click on the **Run Script** button.
3. The **Log Messages** dialog then appears and log messages are presented as the import process proceeds.
4. If you receive the **Import Successful** result, click Yes to open the Model. If instead you see the **Import Failed** result, inspect the log messages and correct the source Model file accordingly.
5. Be sure to include those new models in the configuration.

You may now browse the Models.

Including Models from an erwin Mart

The erwin Data Modeler Mart is a repository of erwin Data Modeler models. One may connect to the Mart and harvest any subset (or all of those models) as needed.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

In addition, one may include separate models in a configuration (see configuration management) using the **MANAGE > Repository** and picking those individual models then dragging the Mart model into the configuraton.

Since these individual models appear as stand-alone model in the metadata explorer UI, scheduling, logging, etc., will refer back to the Mart model as a while.

Picking Individual Mart Models

You may include separate models in a configuration (see configuration management) using the metadata manager UI and picking those individual models when dragging the Mart model into the configuraton.

Steps

1. Sign in as a user with at least the **editor** security role on the configuration.
2. Go to the **MANAGE > Repository**.
3. Right click on a folder in the **Repository Tree** where you want to place the model containing the results of the import and select **New** > **Model**.
4. Import the model from the Mart.
5. Go to MANAGE > Configuration for the configuration you wish to add individual models to.
6. Click **Add > External Model** and select the Mart model in the **Repository Tree**.
7. Select the option to include individual models.
8. Pick the models you wish to include.

You may always repeat this process to include more models. To remove one, simply remove it from the configuration.

Add a New Custom Attribute

Export to a 3rd Party Tool

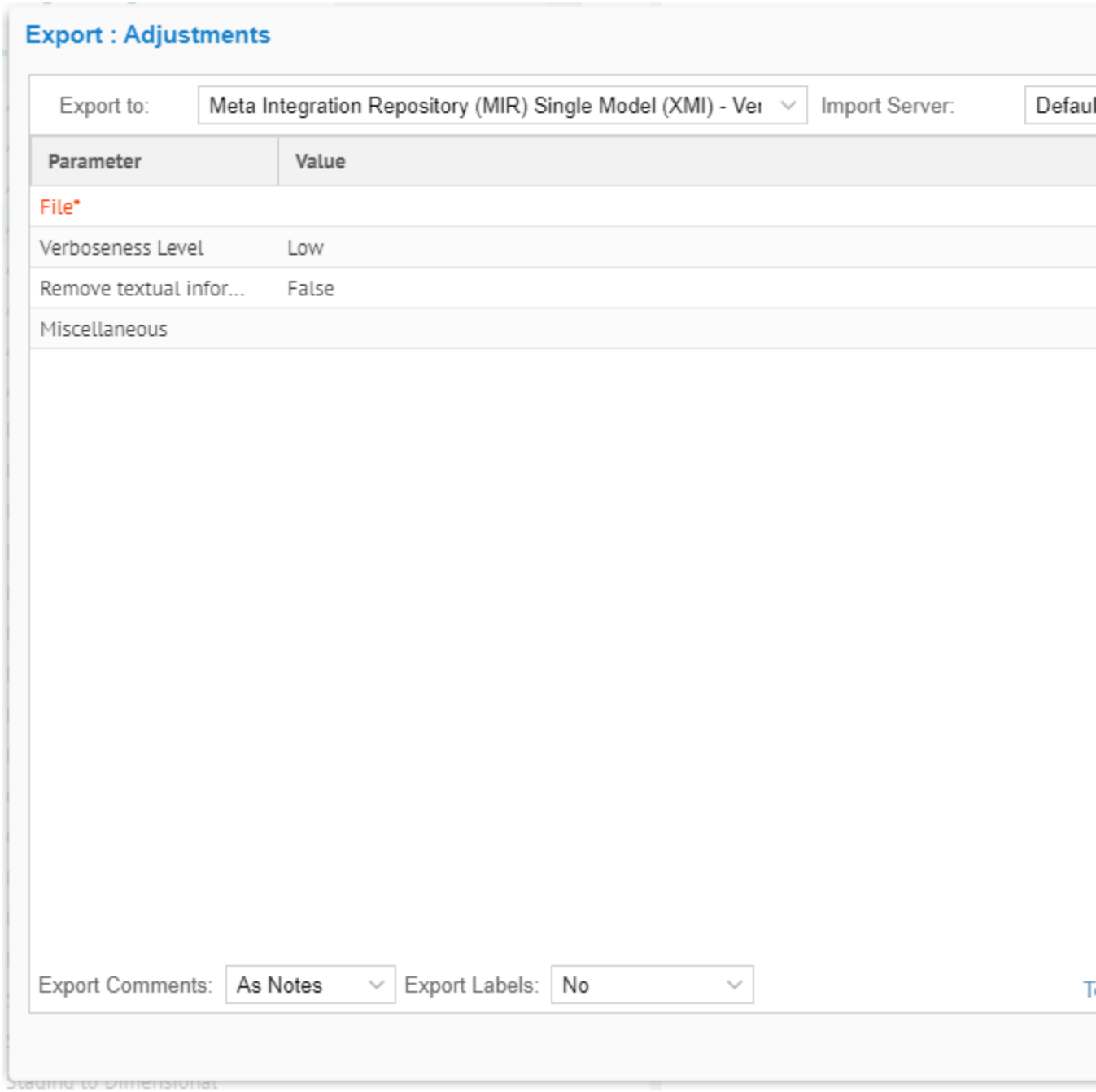
In addition, these comments may then be exported out of MIMM and opened in the external metadata tool, there to be reviewed and edited in the original external metadata model format (where supported in the external metadata tool user interface).

1. Sign in as a user with at least the **Reader** security role on the model.
2. Go to the **MANAGE > Configuration**.
3. Right click on a model and select **Export**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

4. Choose the export bridge and provide the bridge parameters as need.

5. Click **Export**.



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Assign Security Roles

Please see user role security.

Analyze Versions

In some cases, one may wish to use the Repository to maintain a Version history for each Harvest or Upload of a Model. These Versions are individual objects within the Repository and represent the object's contents at a specific point in time.

The Administrator may manage any number of Versions. When using the MIMM UI, you will always be working with one version at a time. Because of this feature of this user interface MIMM also provides additional repository management functions. Creating configurations and version management of existing configurations (including publishing) may only be accomplished using the **MANAGE > Repository** feature, but is also available in the **MANAGE > Configuration** for contents already included in that configuration.

Viewing the Version History

Steps

1. Sign in as a user with at least the **Manage** security role on the Configuration you are in.
2. Go to the **MANAGE** > **Configuration**.
3. Click the **Versions** tab.

The list will show the version history.

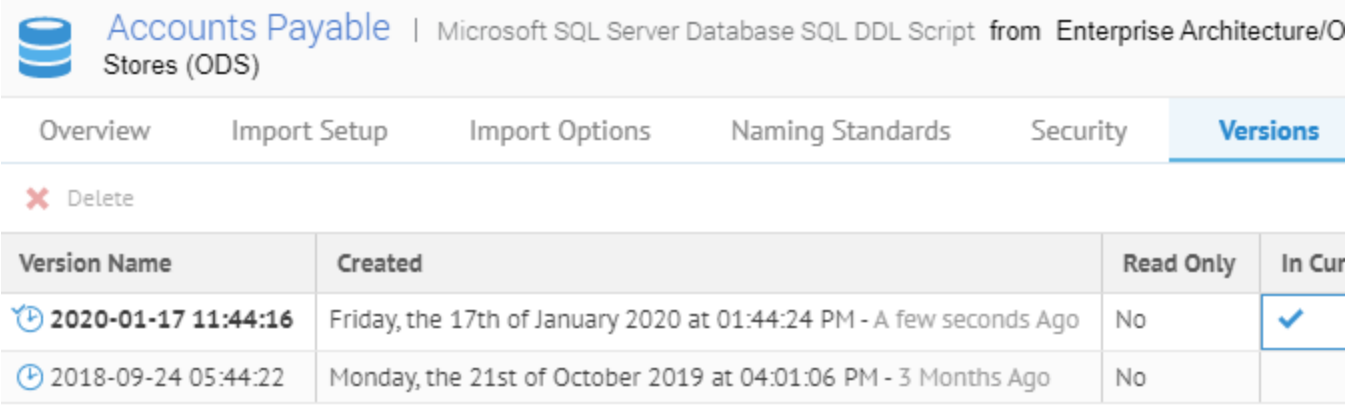
Example

Sign in as Administrator and go to Go to the **MANAGE** > **Configuration.**

Click the **Accounts Payable** model.

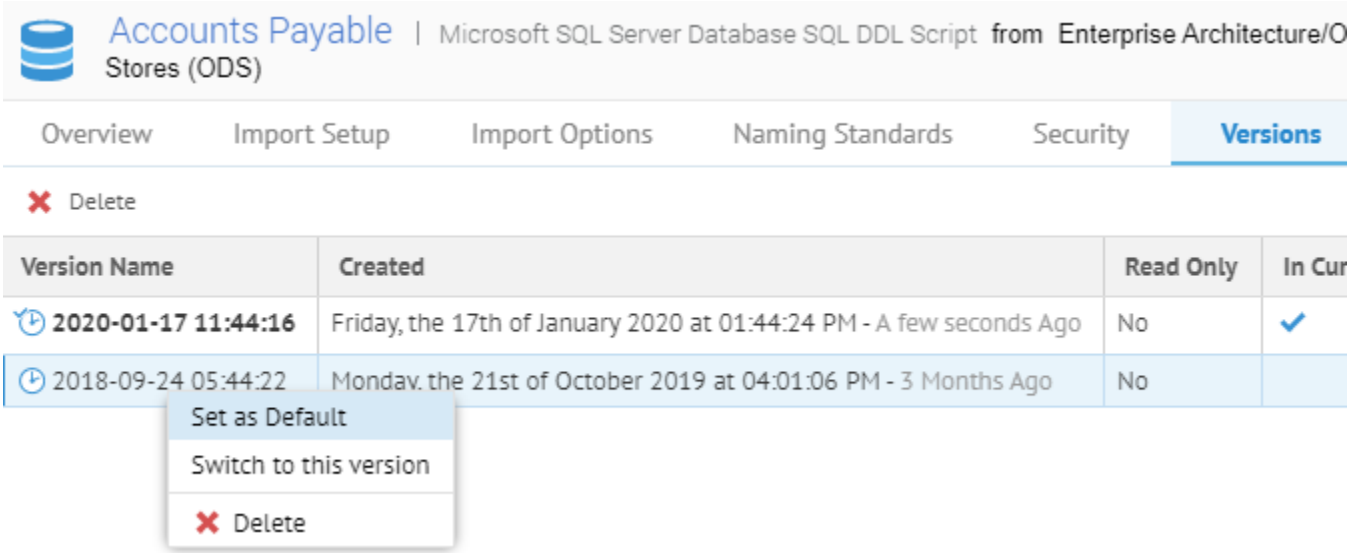
Click **IMPORT**. Click **IMPORT** again without checking any boxes. After the process has completed, go to the **Versions** tab.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



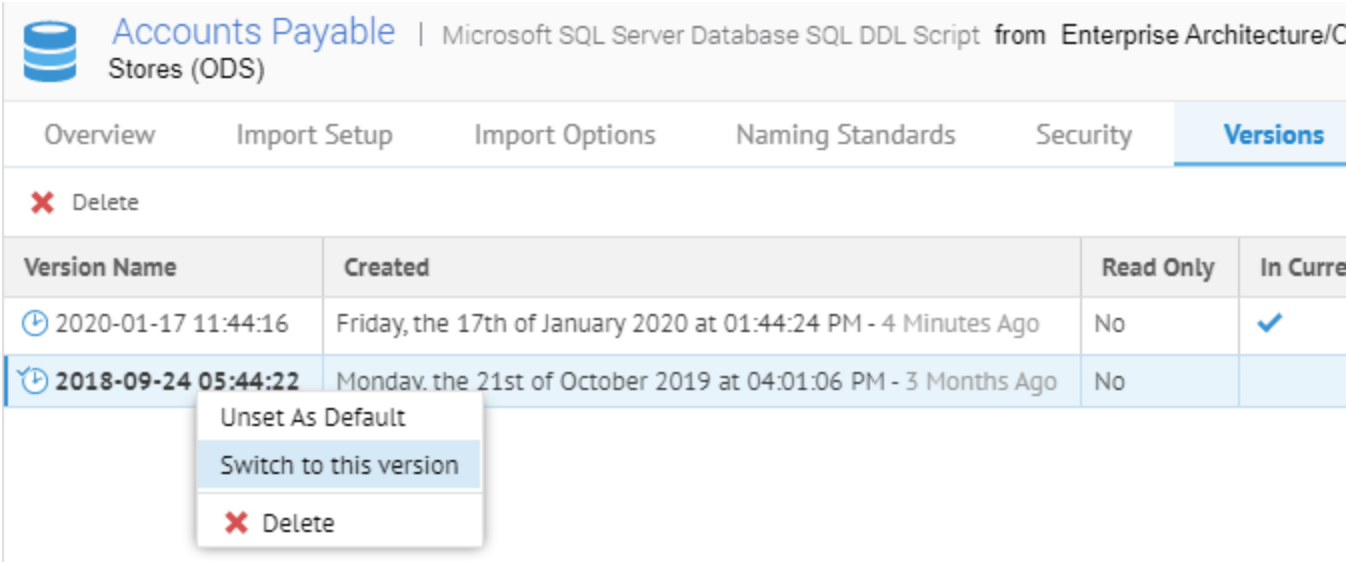
*The current version (in **bold**) in the current configuration that you are viewing is generally automatically updated to include the latest version of a contained model. This automation may be turned off by an Administrator.*

Right-click the older version and specify it as the default.



Right-click on the older version and click Switch to this version.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Analyze the Log

Log files are generated by MIMM for most process such as model import.

Steps

To review a process log

1. Go to the **MANAGE** > **Configuration**.
2. Select the content for which the process occurred (e.g., the model for a model import process)
3. Click on the **Log** tab.
4. Select the specific process log you wish to review.

There may be several logs for the same type of process, e.g., repeated imports of a model, so knowing the date and time is crucial. Generally, though, one will want the latest log at the end of the list.

You may delete a log at this time. All deleted logs are removed from the database and cannot be retrieved.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

*You may also schedule a regular maintenance task called **Purge failed logs** to clean up older logs of processes that failed.*

Log level messages

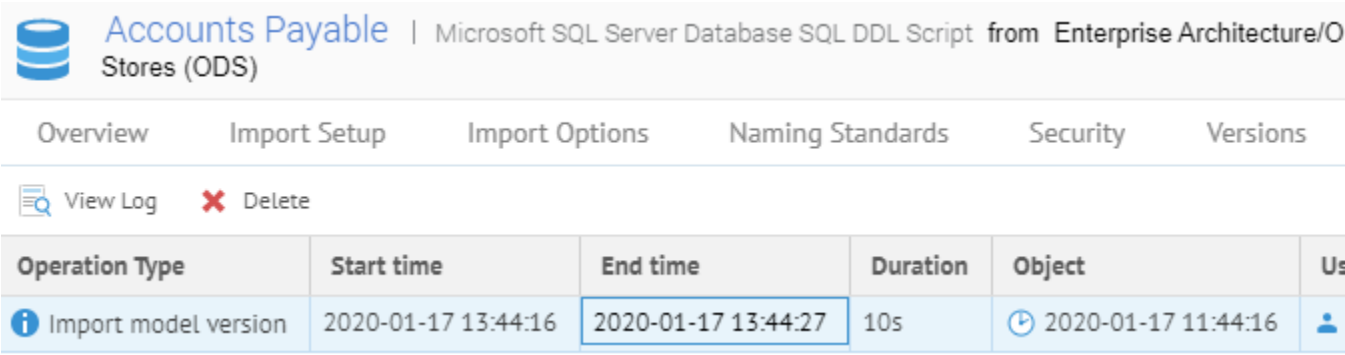
Log messages come in five levels:

Level	Description
Debug	Special diagnostic messages
Information	Basic informational message (e.g., parameter settings, connection events, etc.)
Status	Process step status messages (e.g., Importing model…)
Warning	Lower level issues identified which may compromise the results of the process
Error	Higher level issues identified which do compromise the results of the process and potentially cause it to fail entirely

Click on the level next to **Show** at the bottom of the Log Message dialog to pick the log level being displayed.

Example

After importing a model, you go to **MANAGE** > **Configuration** and select the model. Then click on the **Log** tab and select the latest timestamped log and click View Log.



Here we have selected All in the Show level pick list ensuring that all levels of log message are displayed.

*To search a log, click **Save Log** to download the log to a text editor.*

Explore Further

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Enabling debug level log messages

You may do this in the **MANAGE > System** option.

Stopping the process

You may stop any logged process by simply opening its log and clicking **Stop**.

System Log

The system as a whole also logs information after it is a process. Only those who are in the group **Administrators** may view the system log.

Open Reports in a Business Intelligence Tool

MIMM provides a mechanism for opening harvested reports imported from business intelligence (BI) / reporting tools in the actual tool itself. To do so, you must:

- Have a valid, successfully harvested model from the BI tool (e.g., Tableau, SAP Business Objects, or IBM Cognos)
- Have defined the URL to connect to the tool (which you may do here in **MANAGE > Configuration > Tools**)
- Optionally, you may add a column in the grid view to see actions (like **Open**) that you may click to **Open** the report in the 3rd Party BI tool directly.

Steps

1. Go to **MANAGE > Configuration > Tools for the BI model you wish to enable for the Open in External Tool** action**.**
2. Complete the URL (generally just the server IPname and maybe the port if not standard) and click **Save**.
3. Navigate to the details page of the report, or Navigate to the details page of another object and go to the Related Reports tab.
4. On the details page of the report, go to **More Actions > Open with External Tool**.

Example

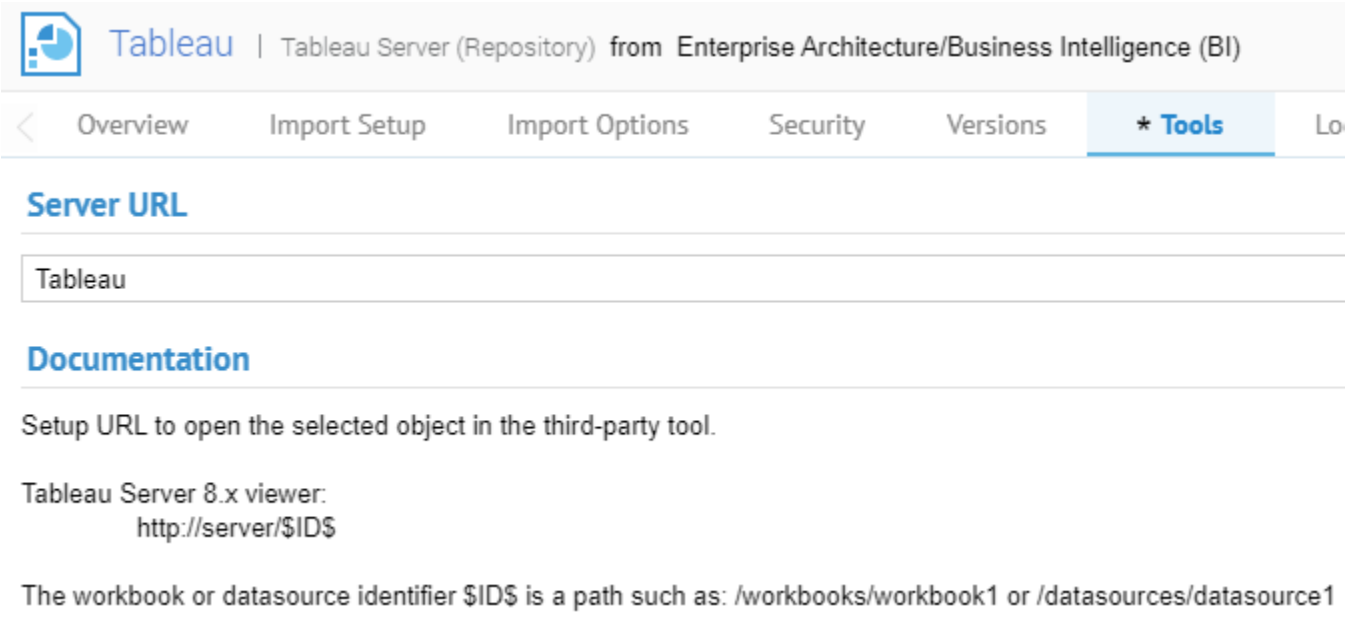
Go to **MANAGE > Configuration.**

Select the **Tableau** model.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Go to the **Tools** tab.

Update the URL to reflect the proper IPname and port for your environment.

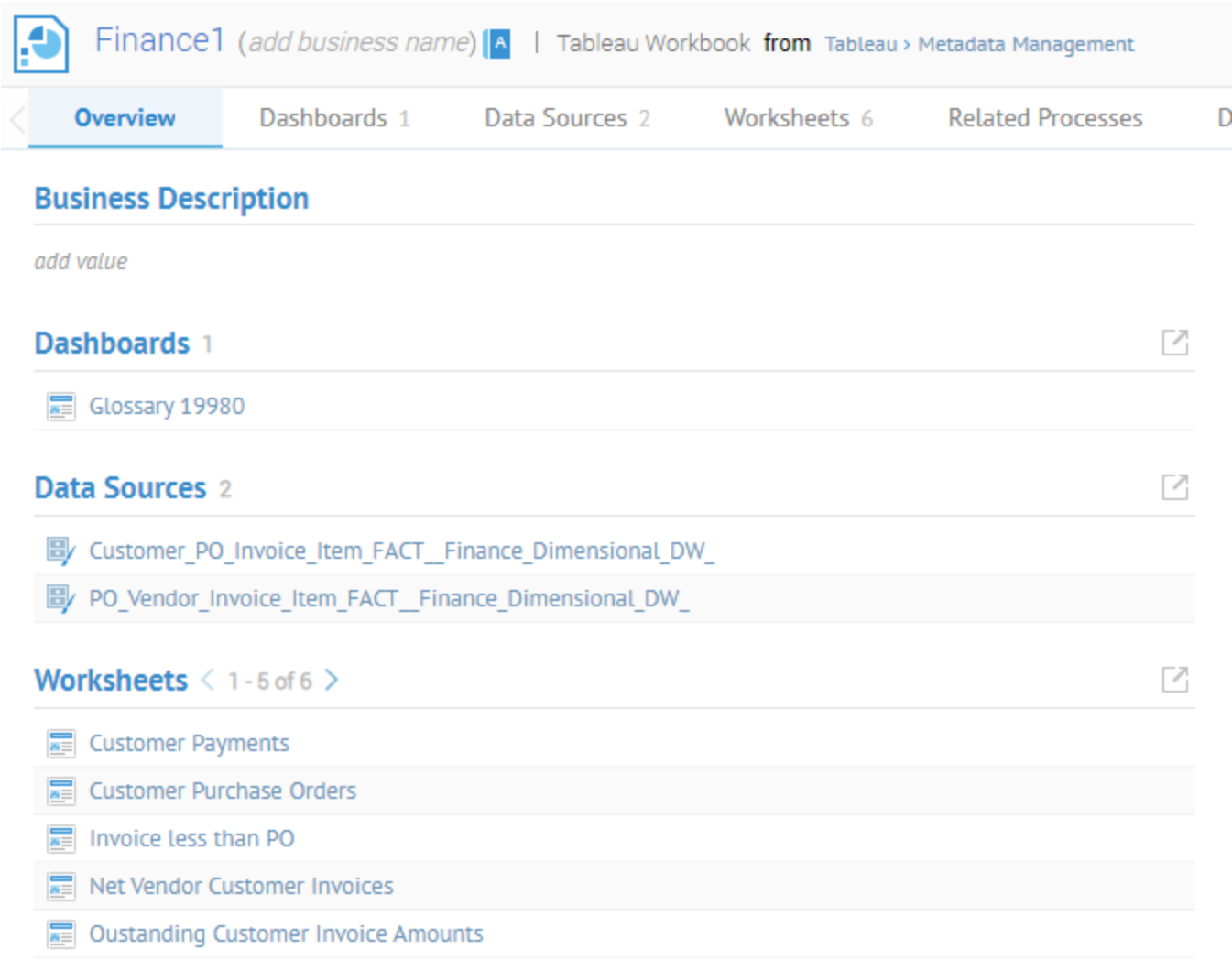


Click **Save**.

Now, search for Finance1 and open its details page.

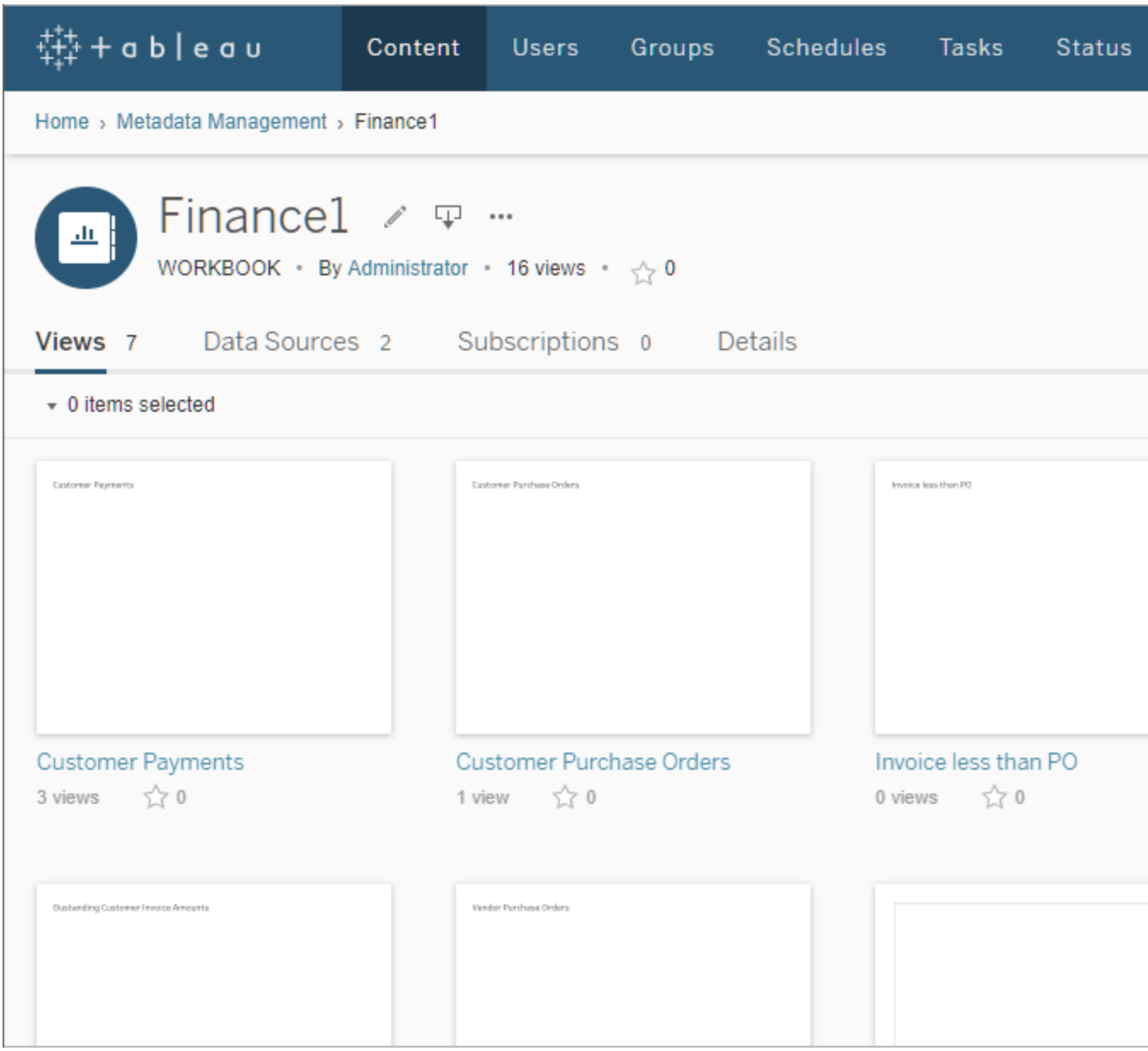
Select **More Actions > Open with External Tool**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



And the Tableau report opens in that product.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Manage Enterprise Architecture (Configuration)

The Configuration is an extremely important concept. It is the scope for many operations, including lineage analysis, search, Version management, etc. In this way, what would otherwise be an overload of information (everything in the repository) is instead well managed according to the Configuration of metadata one is interested in analyzing or working with. The name Configuration comes from the concept of "Version & Configuration Management" where a Configurations a collocation of particular version of Models.

A valid Configuration consists of a collection of Model Versions, mapping Versions, glossaries and stitchings. The model versions relate to data stores and data processes that have been harvested into MIMM .

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

A Configuration may be understood as any of the following:

- Repository workspace - a collection of Repository Objects to be analyzed together (search, browse, reports, etc.) as a technical scope, or business area under the same access permission scope.
- Enterprise architecture - a collection of data store Models (ODS, data staging areas, data warehouses, data marts, etc.) and data process Models (ETL/DI, and BI) connected together through data flow stitching.
- Design workflow - a collection of conceptual, logical and physical Models connected (semantically stitched) together through semantic mappings modeling the design process.

A Configuration will have one or more Configuration Versions. Configuration Versions may be understood each as a different collection of versions of Repository Objects. In this way, one can define several Configuration Versions, each containing various Versions of the Repository Objects. As a result, one may perform.

- Historical analysis using Configuration Versions containing older Versions of Models which were deployed at some time in the past
- What-if analysis using Configuration Versions containing the Versions of Models which may be deployed in the future.

When using the MIMM UI, as you are now, you will always be working with one configuration (version) at a time. Because of this feature of this user interface MIMM also provides additional **MANAGE > Repository** features. Creating configurations and version management of existing configurations (including publishing) may only be accomplished using the **MANAGE > Repository** feature.

Explore Further

Assign a group to a configuration

Groups may be assigned to a particular configuration. In this way, any users who are associated with that group are provided with the default (published) (or the latest if no version is published) configuration version.

The checkbox is part of the group definition.

Changing the Current Configuration

When using the MIMM UI, as you are now, you will always be working with one *configuration* at a time. The Configuration is an extremely important concept. It is the scope for many operations, including lineage analysis, search, version management, etc. In this way, what would otherwise be an overload of information (everything in the repository including all historical and future versions of models, etc.) is instead well managed according to the configuration of metadata one is interested in analyzing or working with.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

The configuration you are currently working in is displayed on the right in the header just after the name you logged in as.

Steps

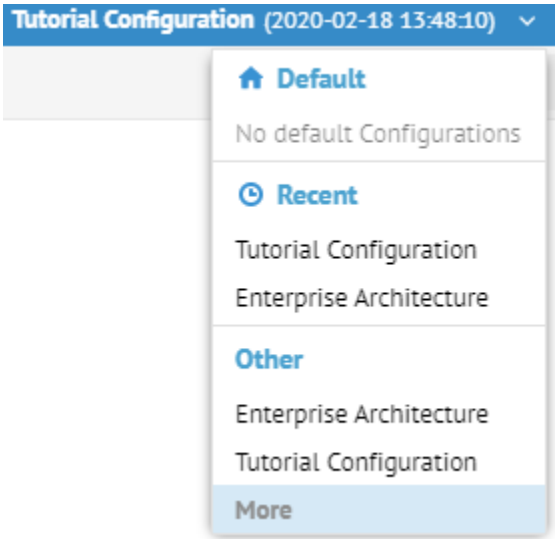
To change the configuration:

1. Click the name of the current configuration.
2. Select **Change Configuration**.
3. Double-click he configuration you wish to be in or select one and click on OK.

In the multi-version editions of MIMM *, configurations can have a* Published *(or default) version. This is the version you are selecting above. If you wish to open a different version, click* Choose Version *and select the specific version of the configuration you want to open.*

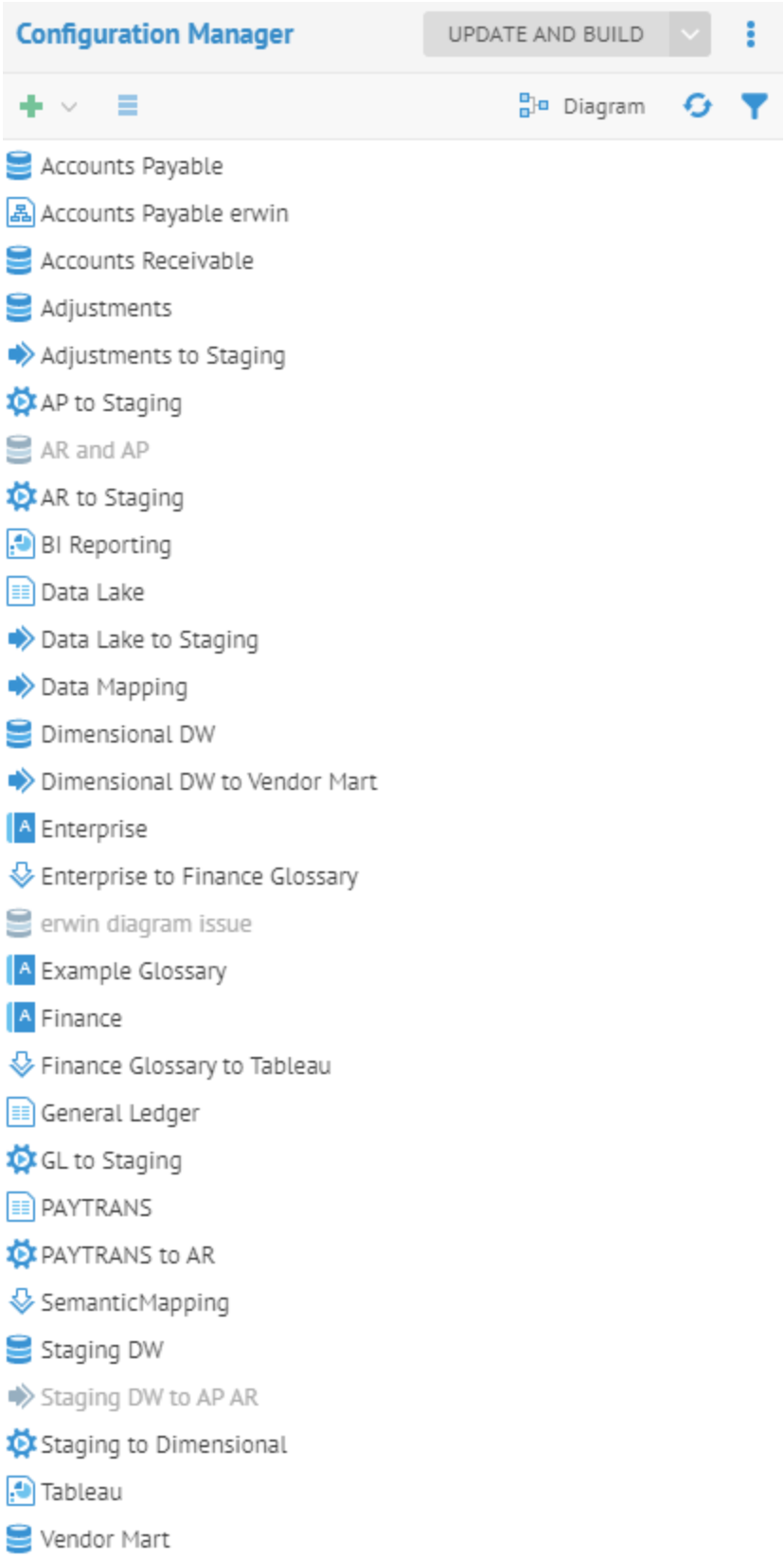
Example

Click the configuration name in the header and select **More**.



Pick the **Published** configuration and go to **MANAGE > Configuration**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Stitching Models Together for Data Flow Tracing

Some external metadata Models may contain data movement source specifications and data movement rules. These are in turn imported into MIMM . In many cases, these data movement source specifications may match up with another external metadata Model which was imported separately. Such data movement specification Models may then be added to a configuration and may be "stitched" together with that second Model, where one Model is the complete representation of a source that is defined in another with data movement specifications.

Steps

Ensure proper permissions

1. Sign in as a user with at least the **Manager** security role on the Configuration you are in.

View the configuration architecture

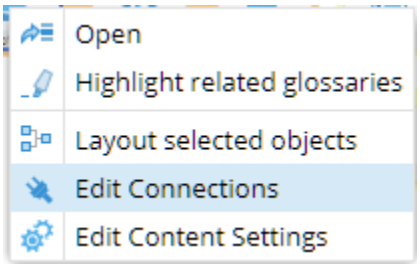
2. Go to the **MANAGE > Configuration** in the banner.
3. Click Diagram.

> *You can do the same steps below right in the **MANAGE > Configuration** page, but it is generally easier to identify the connection issues and especially the (as of yet) unconnected models that should be a part of a stitching when viewing the architecture diagram.*

Identify stitching candidates

> *The contents in the diagram require stitching when they have a warning symbol like* ⚠

4. Right-click on any content in the diagram with a warning and select **Edit Connections**



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Stitch the connections

5. In the Connections tab, associate each Connection Name with a Model which represents or matches that connection by double-clicking that row under the heading Store.
6. If necessary, double-click the row under the heading Schema/Path to resolve any ambiguities in the harvested connection definition.

Once you choose from the list of possible models to stitch to, MIMM *will compare the schemas with the connection definition, table by table, and suggest a match.*

7. If necessary, click Edit Schemas to connect specific schemas as defined in the data process model connection (model with a warning) and how that schema is defined in the data **Store** selected.

Edits to the connection stitching are immediate. There is no need to commit them afterwards.

*If you wish to simply ignore a connection so that {MIMM] will not present a warning that it is not stitched, then click the **Ignore connection** checkbox.*

8. Return to the architecture diagram.
9. Repeat for all other connections with a warning.

*You may also define the connection stitchings by clicking on the model under **MANAGE > Configuration** and go to the **Connections** tab.*

10. Click Build.

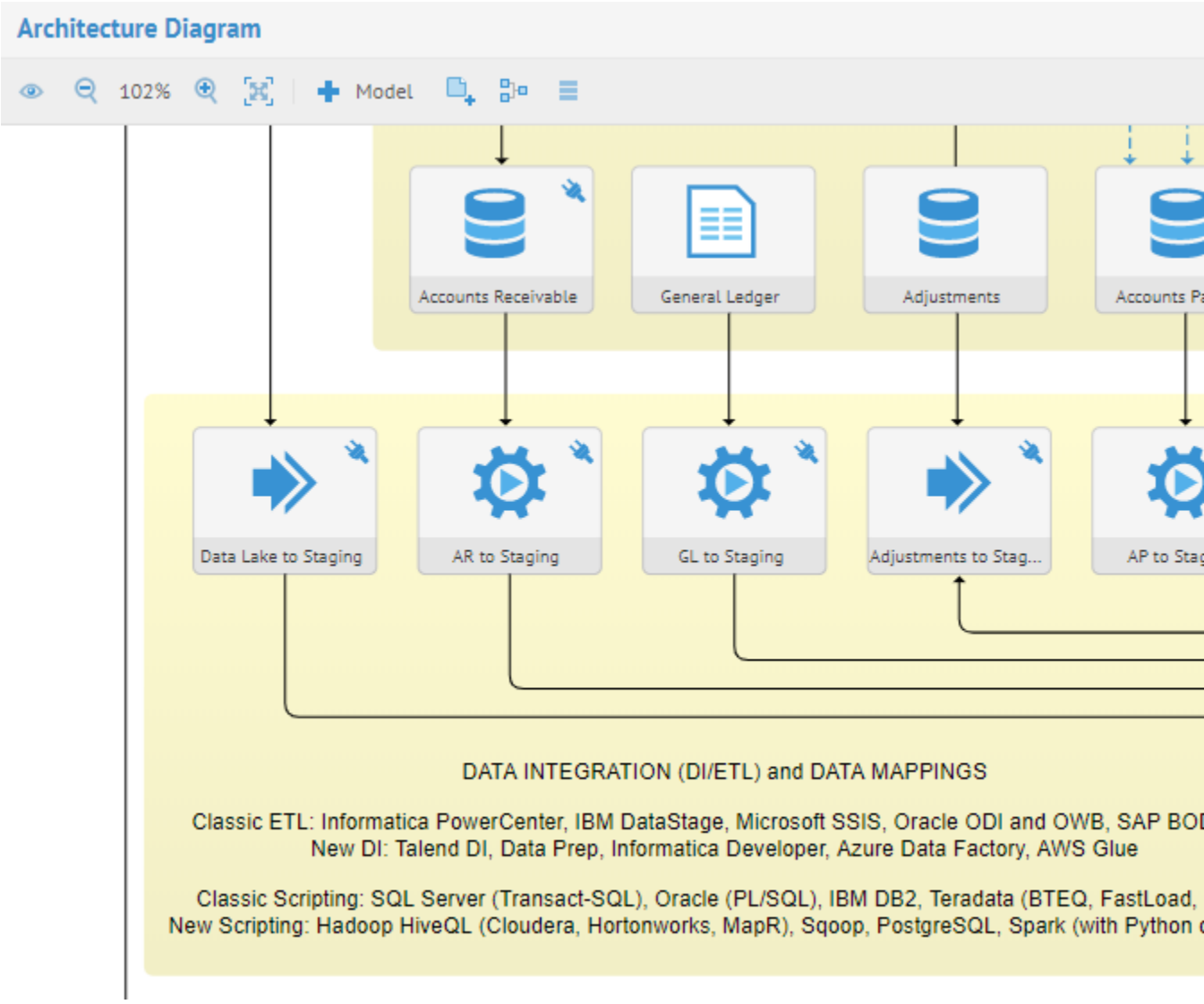
Build validates the stitchings in the configuration and then builds indexes for lineage traces.

Example

You sign in as a user with at least the **Manage** security role on the Configuration you are in and go to the **MANAGE** > **Configuration** in the banner. Click Diagram.

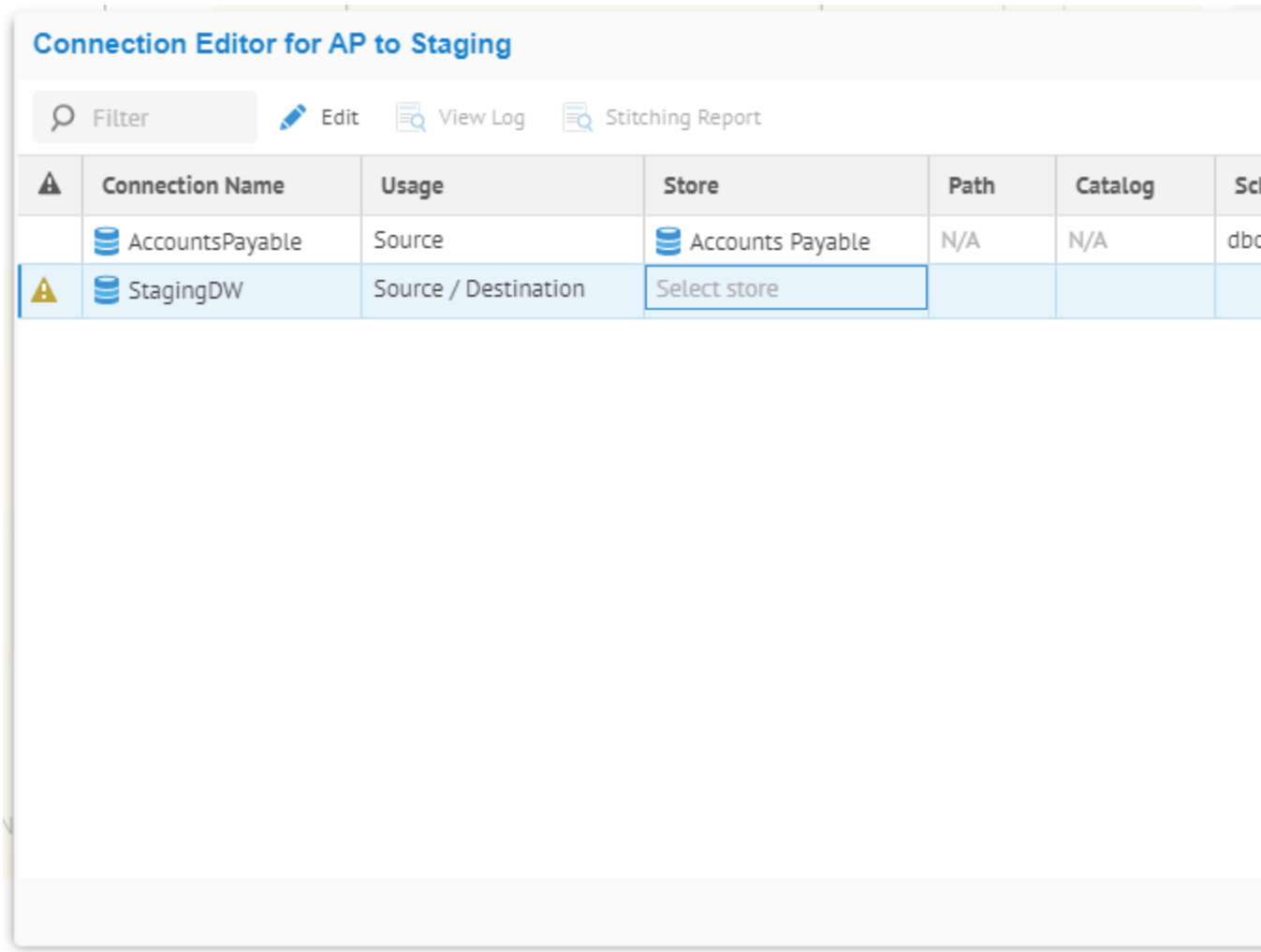
There is one content in the diagram with a warning, so right-click and select **Edit Connections.**

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



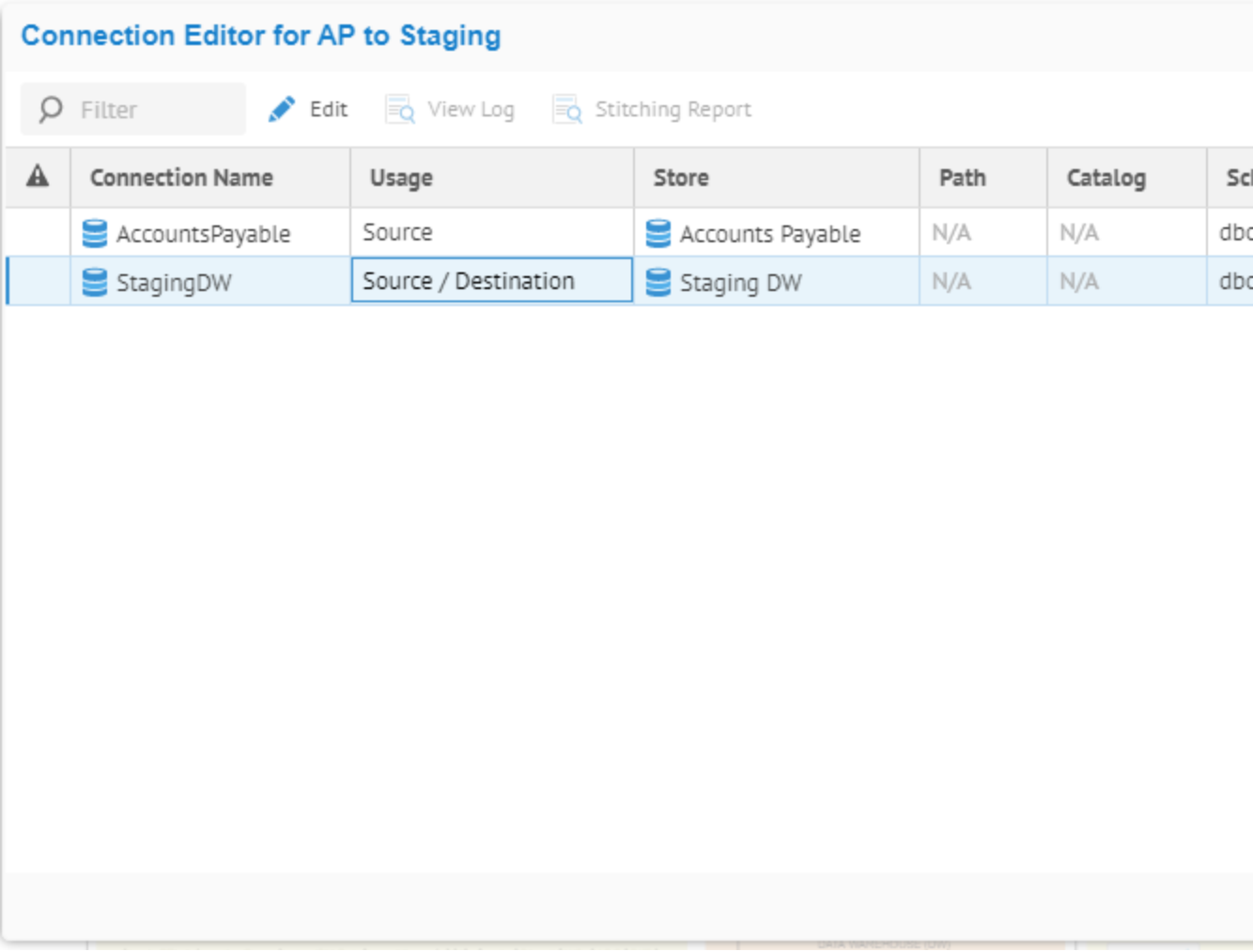
Then double-click on the second connection (**StagingDW**) line and select the correct matching data store model.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Note, {MIMM} picks the dbo schema as the best match.

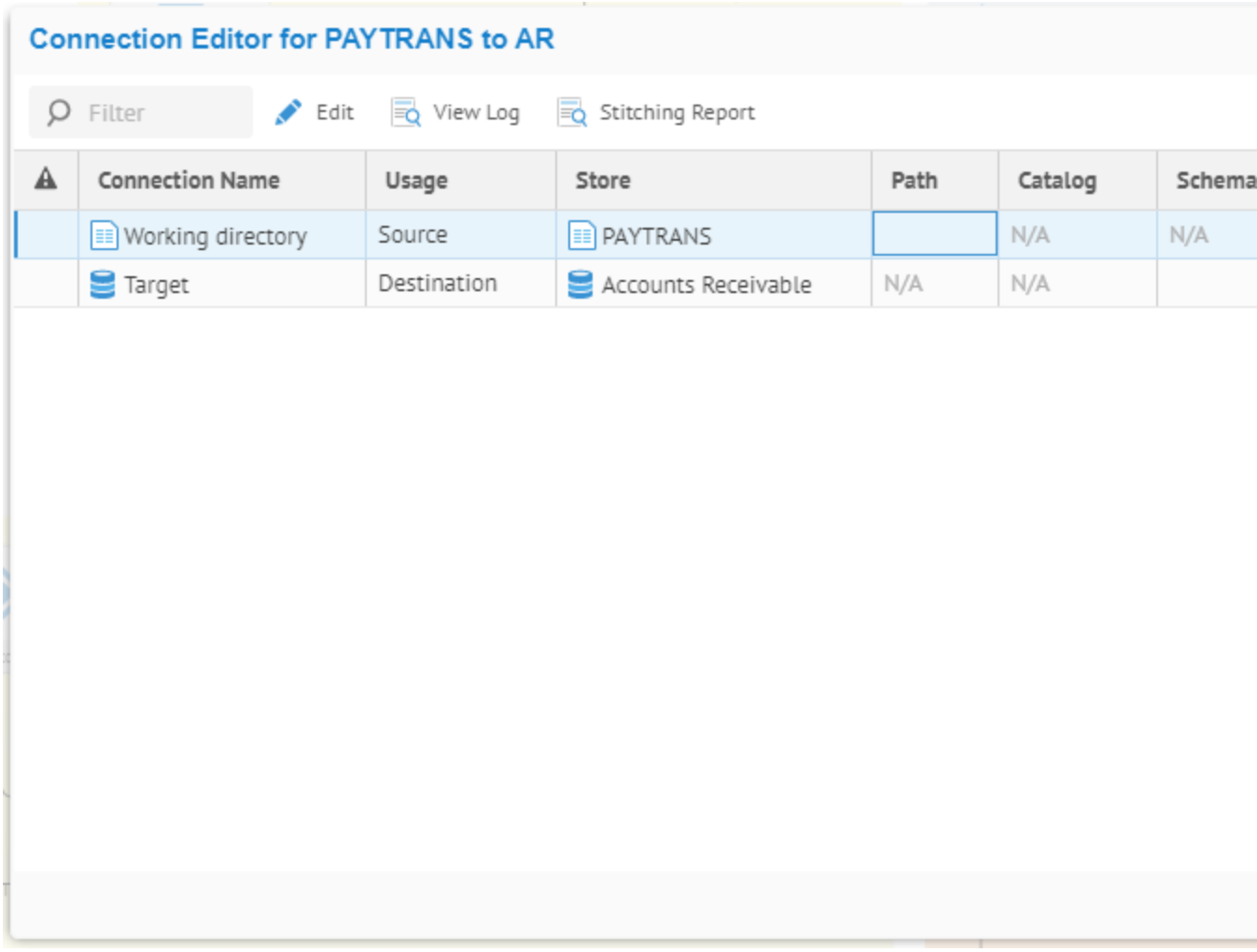
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Now, let's stitch the ETL process PAYTRANS to AR, to the PAYTRANS model as the source (flat file) and the Accounts Receivable model as the target.

The first line, for the Target connection is as above. However, the second connection is a flat file and this will have a path structure from which it was harvested. Double-click on the second line and pick the PAYTRANS model.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



MIMM picks a path for you based upon the level in the hierarchy structure that best matches the connection definition

You may always edit this path manually, or simply ignore the value.

Click **Build** and return to the diagram.

Explore Further

View Log

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

View Log presents the Log Message dialog for the selected connection. You may see any connection errors documented as log messages.

Stitching Report

Stitching Report presents a complete report on what was and was not stitched between the connection and the data store. It is presented as a flat list that you may drill down in (e.g., schema > table > column)

Stitching Models Together for Semantic Tracing

Some external metadata models may contain semantic information (logical names, descriptions, domains, types, etc.) that are related to a faithful picture of an underlying data store, such as a database schema (e.g., as logical/physical models from data modeling tools). These may in turn be imported into MIMM . If the physical database specification is a faithful (name or position matching, depending upon the implementing technology) representation, then they may be semantically stitched together with a model harvested directly from the datastore.

Steps

Ensure proper permissions

1. Sign in as a user with at least the **Manager** security role on the Configuration you are in.

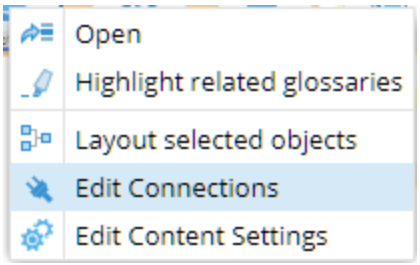
View the configuration architecture

2. Go to the **MANAGE > Configuration** in the banner.
3. Click Diagram.

*You can do the same steps below right in the **MANAGE > Configuration** page, but it is generally easier to identify the connection issues and especially the (as of yet) unconnected models that should be a part of a stitching when viewing the architecture diagram.*

4. Right-click on any data model content in the diagram and select **Edit Connections**

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Stitch the connections

5. In the Connections tab, associate the Physical Semantic Connection with a model harvested directly from the datastore.
6. If necessary, double-click the row under the heading Schema/Path to resolve any ambiguities in the harvested connection definition.

Once you choose from the list of possible models to stitch to, MIMM *will compare the schemas with the connection definition, table by table, and suggest a match.*

7. If necessary, click Edit Schemas to connect specific schemas as defined in the data process model connection (model with a warning) and how that schema is defined in the data **Store** selected.

Edits to the connection stitching are immediate. There is no need to commit them afterwards.

*If you wish to simply ignore a connection so that {MIMM] will not present a warning that it is not stitched, then click the **Ignore connection** checkbox.*

8. Return to the architecture diagram.

*You may also define the connection stitchings by clicking on the model under **MANAGE > Configuration**, select a content and go to the **Connections** tab.*

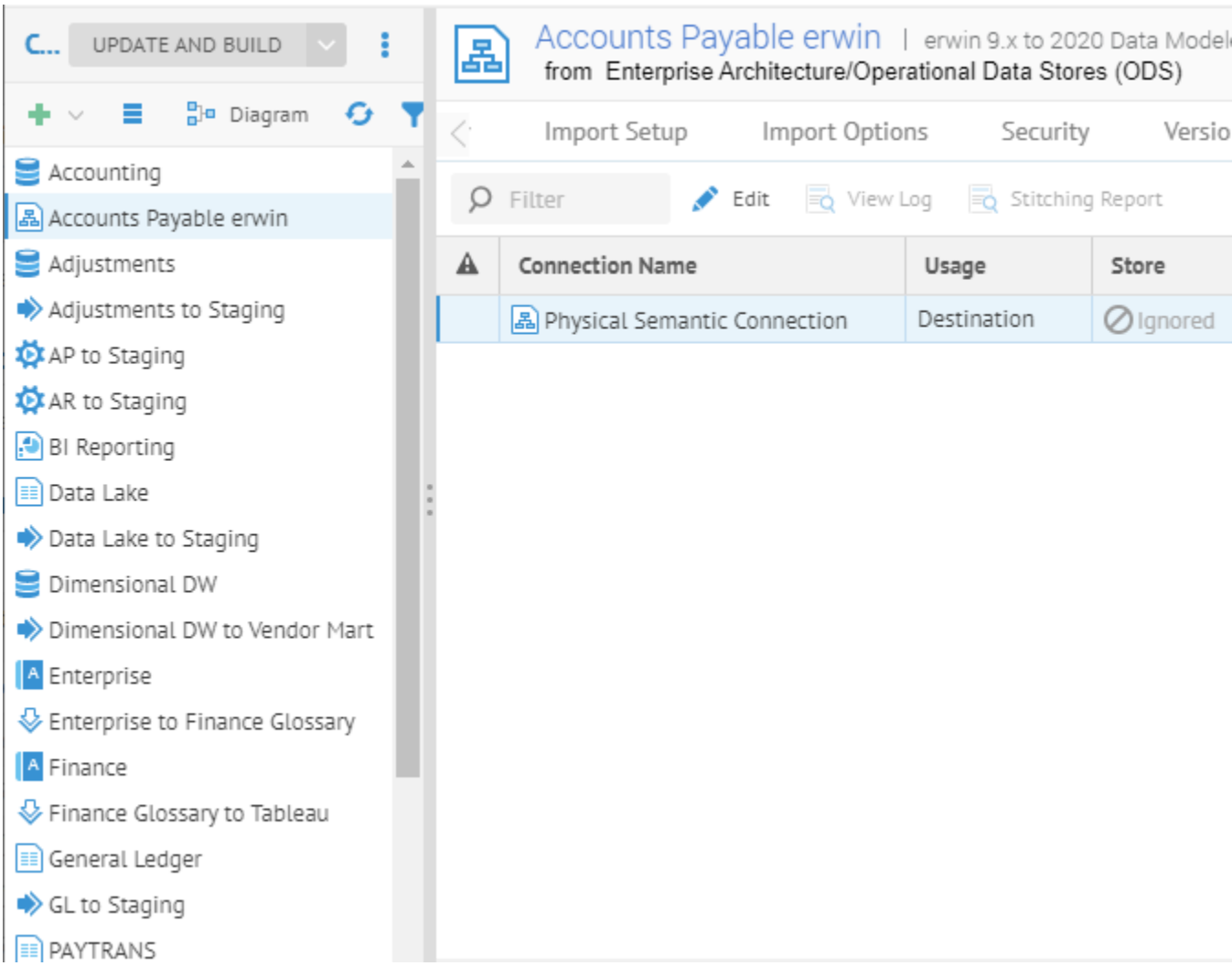
9. Click **Update and Build**.

***Update and Build** validates the stitchings in the configuration and then builds indexes for lineage traces.*

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

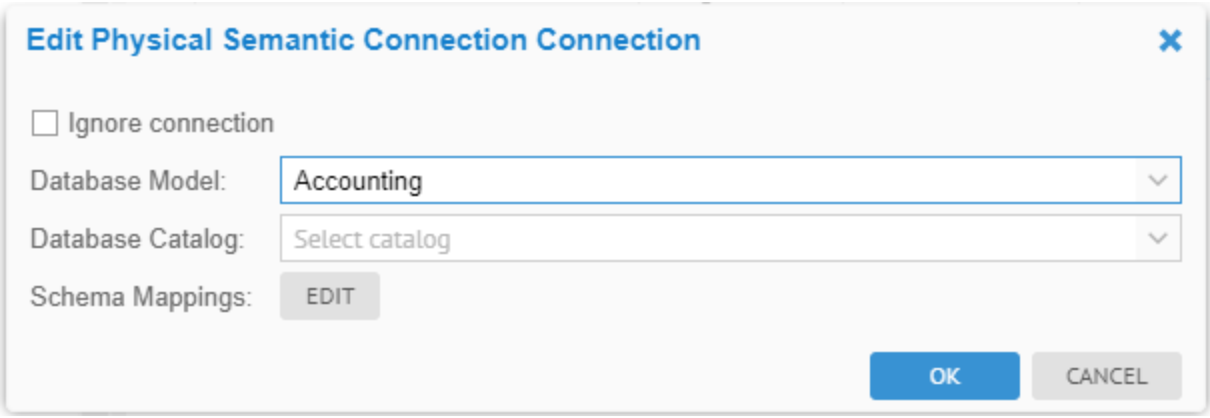
Example

You sign in as a user with at least the **Manage** security role on the Configuration you are in and go to the **MANAGE** > **Configuration** in the banner. Select the Accounts Payable erwin model and go to the **Connections** tab.

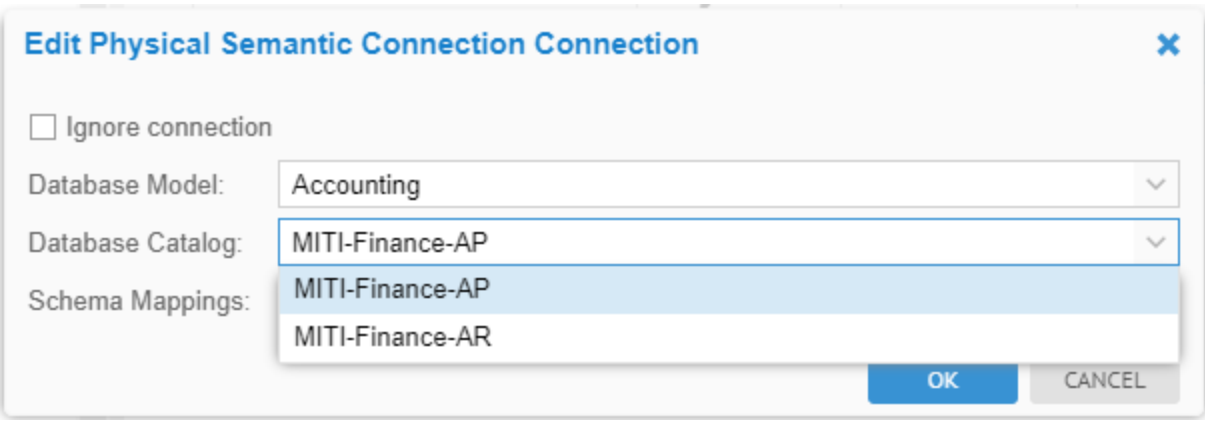


Then double-click on the connection (**Physical Semantic Connection**) line and select the correct matching data store model: **Accounting**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Select the **MITI-Finance-AP** in the **Database Catalog** pull-down and click OK.



Click **Update and uild** and return to the diagram.

Architecture Diagram

Once stitched, the relationships among Repository Objects in a Configuration can be visualized producing a data flow and semantic based architecture diagram. One may edit the layout and annotate these diagrams using the architecture diagram feature to obtain a high-level configuration overview of the architecture defined by a configuration.

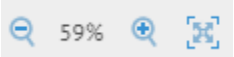
Overview

You may click this icon to show or hide an **Overview** panel of the architecture diagram. Click in the overview to quickly move to a portion of the full diagram.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Zoom In/Out and Fit to content

Click **Zoom in** or **Zoom out** icons to adjust the aspect ratio of the diagram. Also, you may click on the **Fit to content** icon to view the entire diagram at the best zoom that will fit.



Add Annotation

Click **Annotation** then click in the diagram where you want the annotation to be placed to create annotations for a diagram. You may then right-click on the resulting object to edit further, including text content, style, color, etc.

Layout diagram

You may click the **Layout Diagram** icon to clean up an entire diagram.

Layout *will undo any editing you have performed since the last* ***Save***

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Layout Selected Objects *is a context menu (right-click) option that lays out only the selected objects.*

Print

You may download a PNG or SVG image of the diagram.

Quick find

In the upper right, there is a search text box that will provide a quick list of object names that contain the text you type. You may click on any of the results to select that object in the diagram and moving the focus there.

Properties Panel

Click to select a metadata element and view its properties in the **Properties Panel** on the right. You may show and hide this panel as needed.

Explore Further

Highlight Related Glossaries

The architecture diagram does not show the classification links between a Business Glossary and another model as a semantic lineage line. Otherwise, there would be such lines all over the diagram that one would have to maintain, even though these are system maintained links. Use the **Highlight Related Glossary** context menu option (right-click) to identify which Business Glossary (or more than one) is being used to classify terms in the selected model.

Edit Connections

As seen in the example above, **Edit Connections** is available in the Architecture Diagram itself.

Edit Content Settings

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Edit Content Settings will take you back to the **MANAGE** > **Configuration** page for the object that is selected (or right-clicked on).

Business Glossary

Data Governance

Critical to the development and management of complete data architecture is a Business Glossary. MIMM provides an ISO 11179 based Business Glossary to capture, define, maintain and implement an enterprise Business Glossary of terminology, data definitions, code sets, domains, validation rules, etc. In addition, semantic mappings describe how elements in a source Model (more conceptual like the Business Glossary) define elements in a destination Model (closer to an implementation or representation).

The Business Glossary helps an enterprise to reach agreement between all stakeholders on their business assets (e.g. terms) and how they relate to data assets (e.g. database tables) and technology assets (e.g. ETL mappings). The Business Glossary can be used to document logical/physical data entities and attributes across IT collaboratively. Again, it involves tracing dependencies between business and technical assets.

The Business Glossary

In MIMM , a Business Glossary is a self-contained collection of categories and the terms sub-categories contained within each category. In turn, the terms may be semantically mapped to objects throughout the rest of the repository, such as tables and columns in a data model. Once mapped, one may perform semantic lineage traces such as definition lookups and term semantic usage across any configurations containing the Business Glossary, mappings and mapped objects.

Building a Business Glossary can be as simple as dragging in an existing well documented data model, via import from other sources via CSV file format, or can be populated directly via the user interface as well as during the process of classifying objects in other data store models. In general, a combination of such methods is employed in conjunction with one another.

In order to ensure that the Business Glossary is accurate, up-to-date, available to all who need access to it and integrated properly with the rest of the metadata in the repository, MIMM also provides a robust collection of Data Governance tools and methodologies. The MIMM Business Glossary provides a very flexible workflow and publication process that may alternatively be quite sophisticated or quite simple depending upon one's needs. In addition, one may maintain any number of business glossaries, each with different workflow and publication characteristics.

Stewards

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Stewards are users or groups of users who are assigned as point of contact to answer questions for specific terms or entire categories. In addition, they may be notified when changes are made to terms as part of the workflow. Finally, as a special case, one may restrict update to Stewards (Allow only stewards to edit terms).

Categories

A Business Glossary is organized into categories, which may then contain terms or other categories. Categorization can help with:

- Subset by subject matter or organizational structure
- Managing stewardship assignments (at the category level).

Relationships

Terms may be cross-linked in a wide variety of relationship types, including:

Business Glossary Relationship Type	Description	Effect on definition lookup	Effect on semantic usage
Synonyms			
See Also			
More General			
More Specific			
Contains			
Contained By			
Represents			
Represented By			

Simply edit a specific term to do so.

Glossary Workflow

By default, a Business Glossary will have no workflow requirement (including no approval process). In this simple state changes made to the Business Glossary are reflected immediately throughout the system. This is a very useful mode for organizations that did not want the complexity of a workflow process. It is also useful for other organizations when they are first building and populating a Business Glossary and related semantic mappings.

MIMM also provides a very flexible and complete set of possible workflow and publication processes that you may employ. Choose these processes carefully, as once selected they cannot be undone or changed.

When your company would like to have a formal Business Glossary development process that involves multiple users you can enable the Business Glossary workflow. The workflow is prepackaged sequence of Business Glossary activities around term proposal, review, acceptance, publishing and depreciation. It is a flexible process that can be customized to

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

require only publishing activity, approval with or without review, approval and review by one or multiple users, etc.

The glossary must have a default version before workflow may be enabled.

Workflow roles

A user with the Administrator security role can enable the workflow and assign the following workflow roles to Categories:

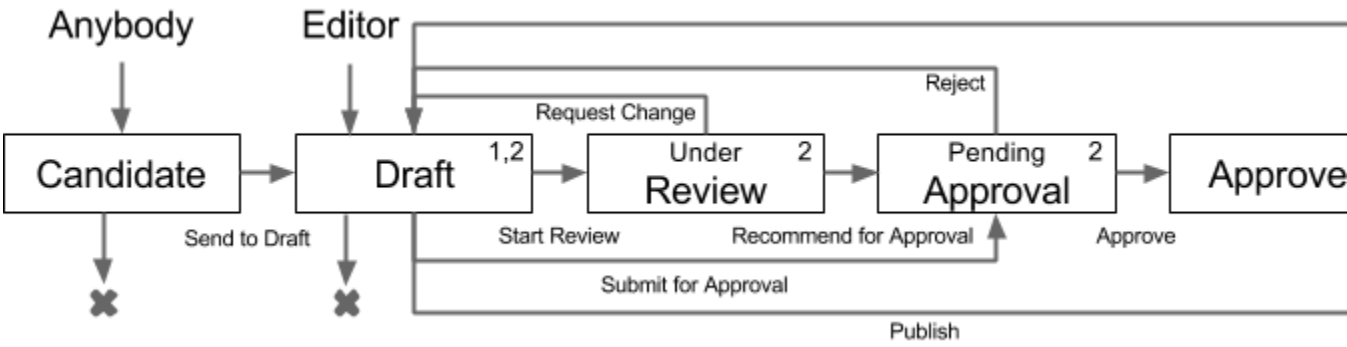
- Editor
- Reviewer
- Approver
- Publisher

A workflow role can be assigned to users and applies to all terms in the category. A Category inherits all user-to-role assignments from the parent category and can have additional ones.

Workflow process options

The workflow process applies to terms, but not categories. All changes to Categories are immediately visible (published) in the **Published** configuration. When the workflow is enabled you cannot delete a category that has published terms.

The most complete workflow possible is in the diagram below:



You can enable the workflow when you create the Business Glossary or after. You cannot disable the workflow after it has been enabled.

Workflow Action	Workflow Role			
	Editor	Reviewer	Approver	Publisher
Propose Candidate	X	X	X	X
Create Draft	X			
Discard	X			

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Start Review	X			
Mark for Deprecation	X			
Submit for Approval	X			
Send to Draft	X			
Recommend Approval		X		
Request Change		X		
Reject (Awaiting Approval)			X	
Approve			X	
Reject (Approved)				X
Publish				X
Publish (Deprecate)				X
Create, edit or remove attributes and relations	X	X		
Create comments	X	X	X	X
Edit or remove comments	X	X	X	
Create, edit or remove attachments	X			
Assign roles to users and groups			X	
Start/stop workflows and reassign tasks	X		X	

Term management dashboard

My Workflow Tasks provides an interactive dashboard identifying terminology and the actions that need to be taken for business glossaries by the logged in user in a configuration.

Workflow transition

When working with individual terms which are at some point in the workflow process, workflow transition buttons prompt you with possible actions, e.g., if a term is in Draft status, then the icons would include:

- Start Review
- Submit for Approval
- Mark for Deprecation
- Discard

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Versioning and workflow

When you enable workflow MIMM creates another version of the Business Glossary named Published. The Published version is the one that is to be presented to most of the users. Its contents are not directly editable (with or without permission). Instead, one edits the Development version and then uses the Publish workflow step to change what is in the Published Business Glossary.

Thus, one will have access to the Published version of the Business Glossary by opening the Published version of the Configuration. One will have the ability to edit the Business Glossary only by opening the Development version of the Configuration. In this way, general users are given access to the Published Configuration, and users who are editing the workflow enabled Business Glossary will also be given access to the Development Configuration.

Create and Manage a Business Glossary

Create a Business Glossary

Steps

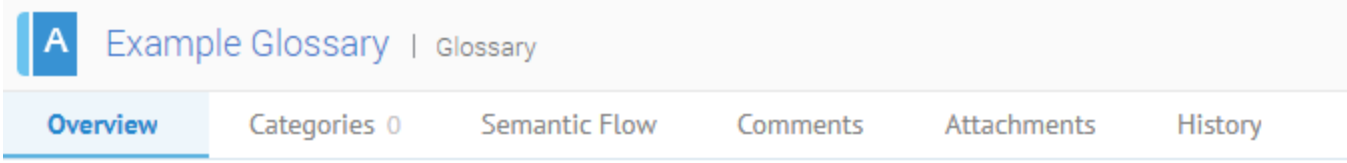
1. Sign in as a user with at least the **Manage** security role on the Configuration you are in.
2. Go to **MANAGE > Configuration** in the banner.
3. Click the plus sign ( ) under Manage Configuration and select **Glossary**.
4. Enter a Name and Description for the glossary and click OK.

Example

Sign in as **Administrator**. Go to the **MANAGE > Configuration** and click the plus sign ( ) under Manage Configuration and select **Glossary**.

Enter “Example Glossary” for the **Name** and “Help Glossary” for the **Description** for the glossary and click OK.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



You must [have at least one category](#) in a glossary in order to further populate it as terminology cannot be added at the root.

Explore Further

Add, Review and Edit Terminology

Note for business glossaries with workflow, general users are given access to the Published Configuration which contains the Published version of the Business Glossary. In order to edit (following the workflow process) a Business Glossary which is managed under workflow, you must also have access to the Development Configuration containing that same Business Glossary. Please see more details here.

Without Workflow

*Sign in as a user with at least the proper [security role](#) (e.g., **Viewer** or **Editor**) on the Business Glossary you wish to view or edit terms from.*

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Add a new term

Steps

A new term must be a part of a particular Business Glossary category.

1. Sign in as a user with at least the proper security role (**Editor**) on the Business Glossary you wish to view or edit terms from.
2. Navigate to that category you wish to place the term in. If the category does not exist, Navigate to the details page of the business glossary and create a new category.

The new category may be part of an existing category or at the root of the business glossary

This interface is simply the standard details page and all the same features are available.

3. Click the **Terms** tab.
4. Click the plus sign (**Add a new term**).
5. Enter the **Name** and **Description**

*You may click on Add another term to cause the **Add a Term** dialog to stay open for adding additional terms each time you click OK.*

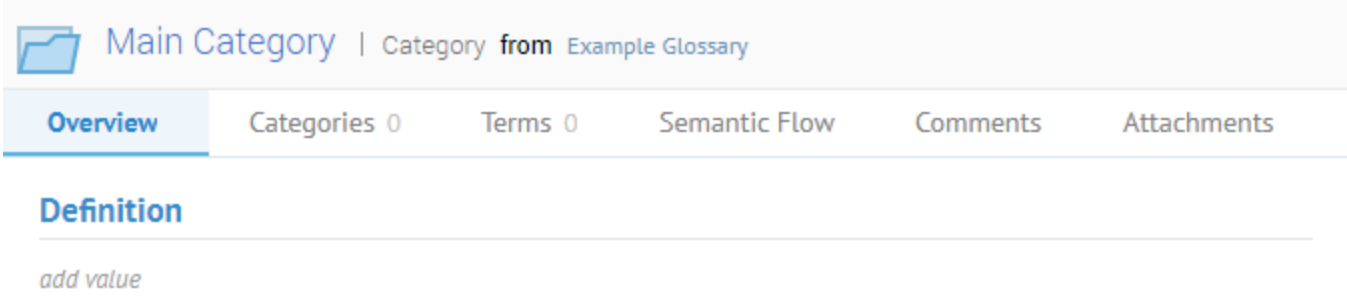
6. Click **OK**.

Example

Sign in as Administrator.

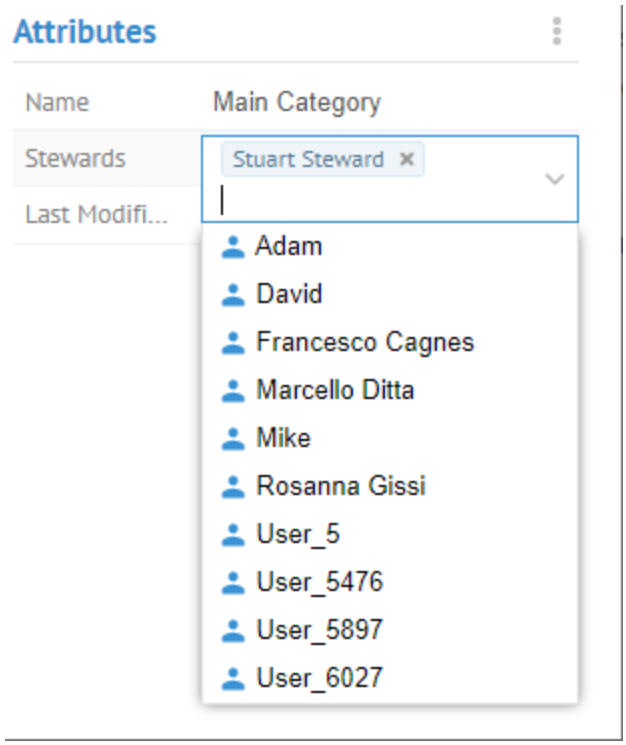
Navigate to the **Example Glossary** and the **Main Category** details page.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Add **Stuart Steward** as a **Steward**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



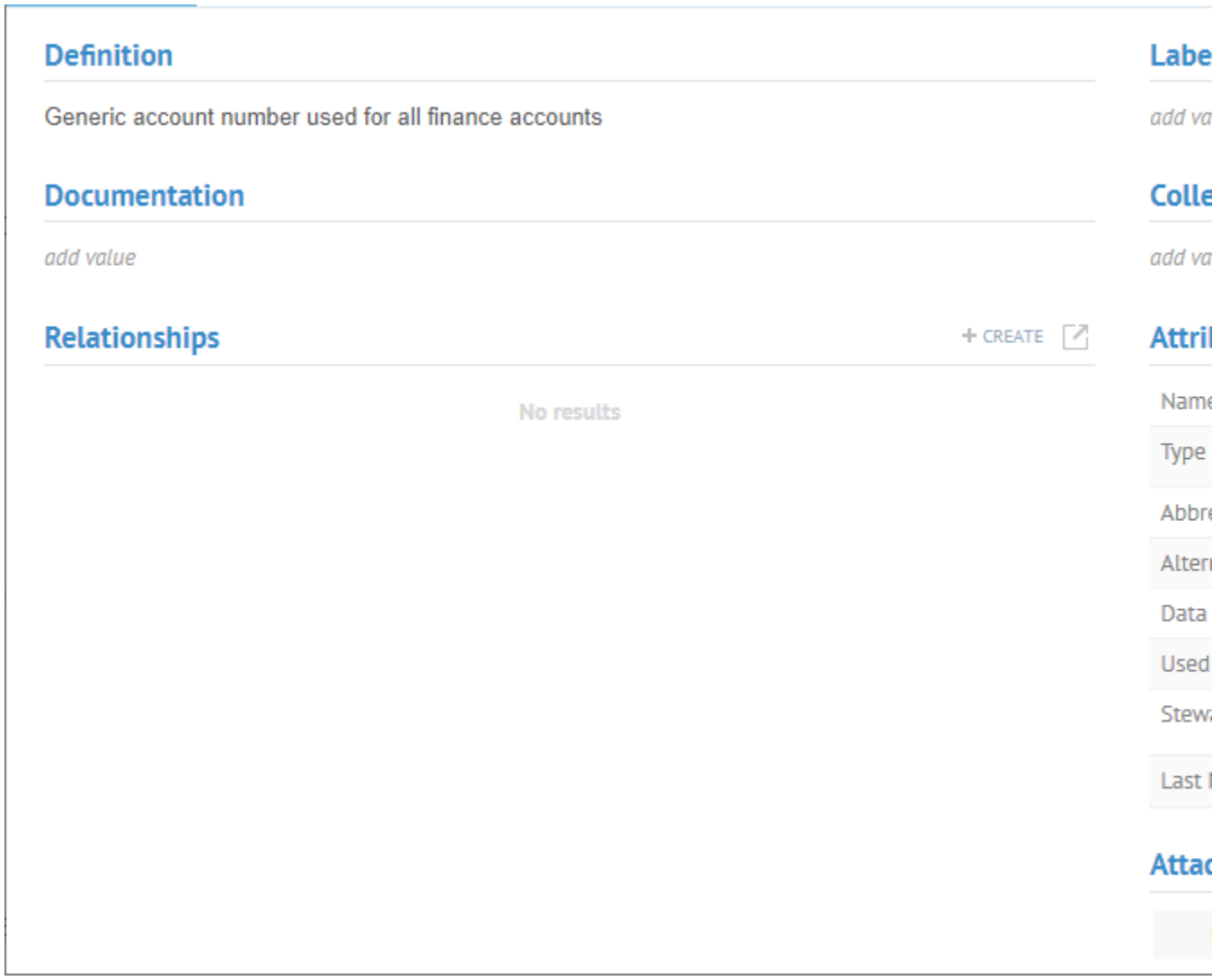
Click the **Terms** tab.

Click the plus sign (Create).

Enter “Account Number” as the **Name** and “Generic account number used for all finance accounts” in the **Description**.

Click **OK**, and click on the **Account Number** term.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



*The **Steward** is automatically set to Stewart because he is already the **Steward** of the containing category.*

Edit a term

Steps

1. Sign in as a user with at least the proper security role (**Editor**) on the Business Glossary you wish to view or edit terms from.
2. Navigate to the details page of the term or use the Grid Mode to in the Terms tab to edit the properties of the term or terms you just created.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

3. In the Grid View, one may edit in place any property associated with any of the rows (or list items in the list view).

Explore Further

Move a term to a new category

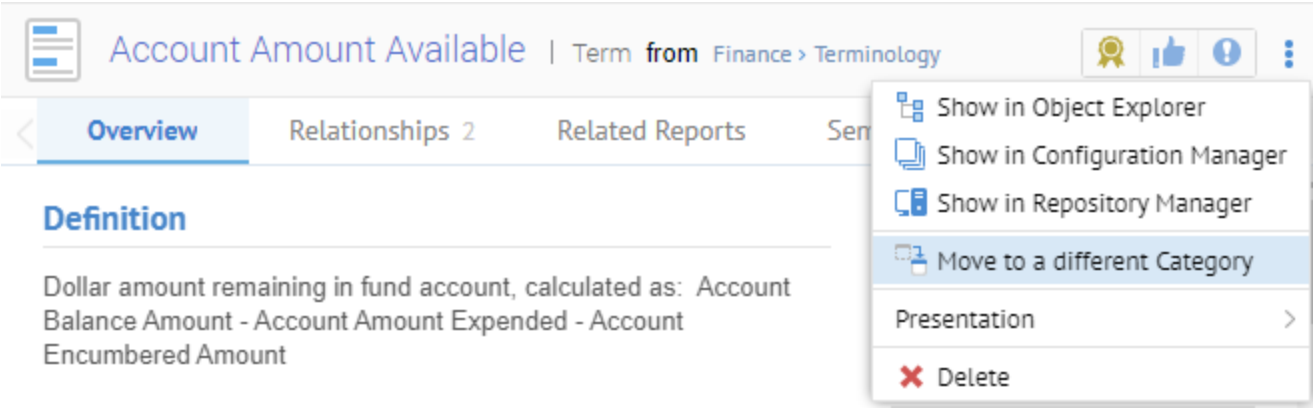
Term may be moved from one category to another within a glossary. The category path that a term is in uniquely identifies the term in the glossary.

Steps

1. Navigate to the details page of the term.
2. Go to **More actions** and select **Move to a different category**.
3. Browse to the new category and click **OK**.

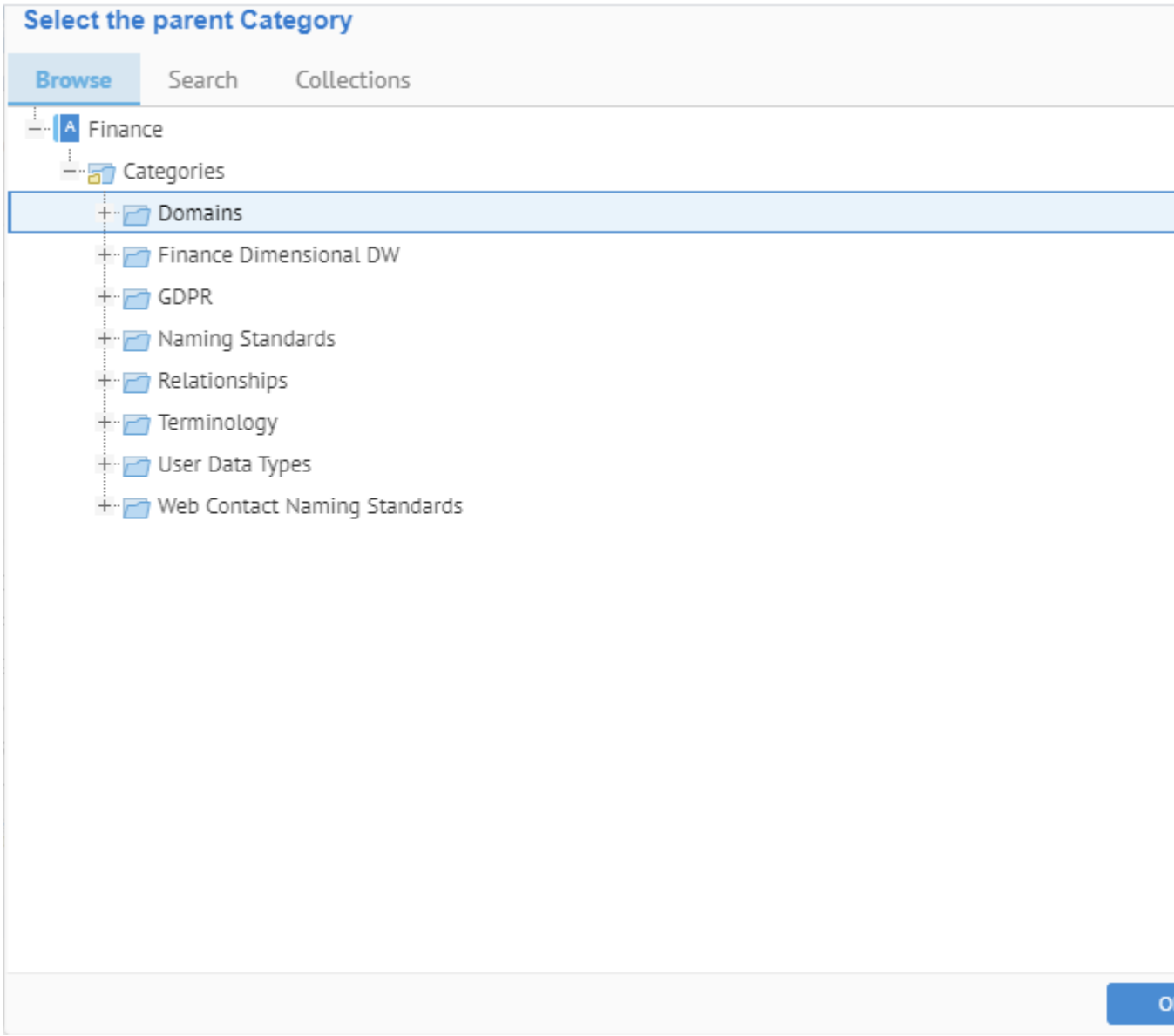
Example

Navigate to the details page of the term **Account Amount Available** In the **Finance** glossary. Go to **More actions** and select **Move to a different category**.

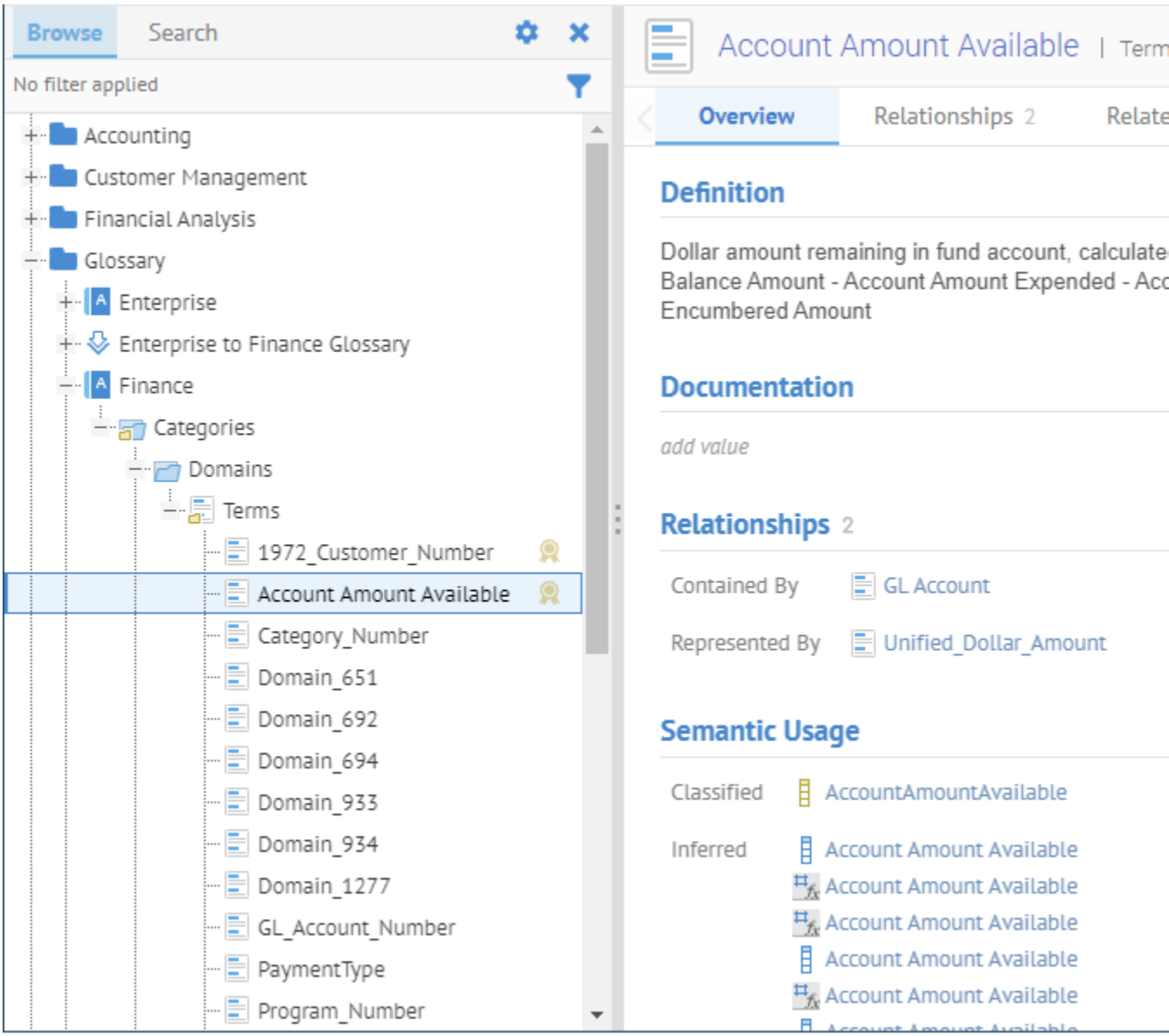


Then browse to the **Domains** category and click **OK**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Add term relationships

Term may be related to each other internally within a glossary. The relationships have an impact on both semantic usage and semantic definition reporting

Steps

4. Navigate to the details page of the term.

5. Go to the **Relationships** tab.

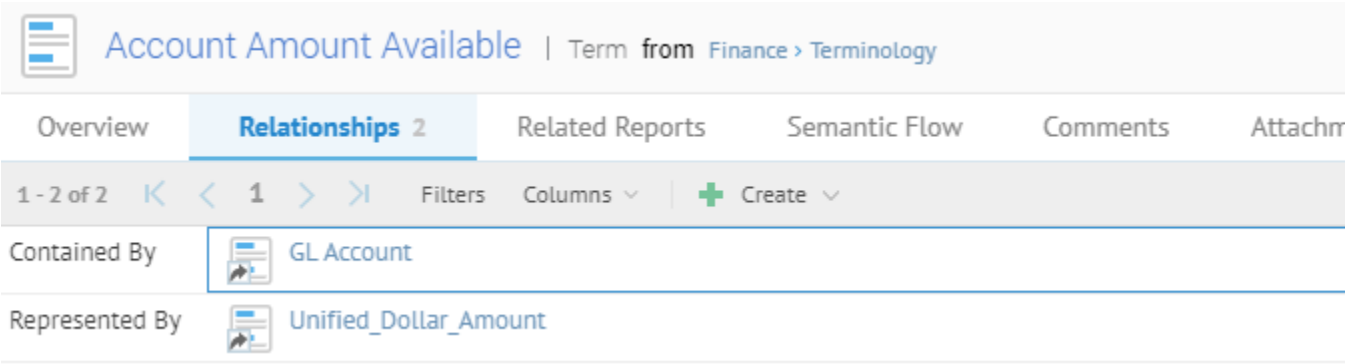
6. Click the **Create** (Create) icon.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

7. Pick the type of relationships, then pick the term.

Example

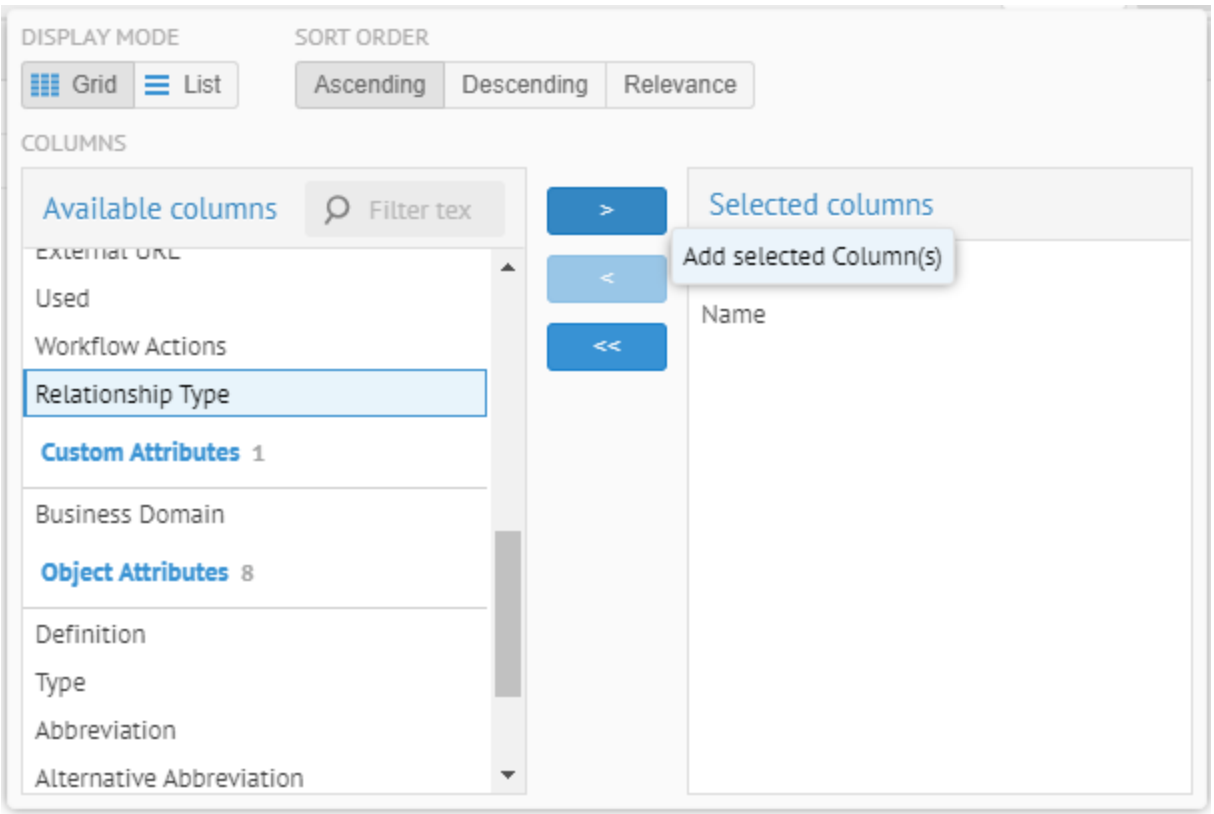
Navigate to the details page of the term **Account Amount Available**. Then click the Relationships tab.



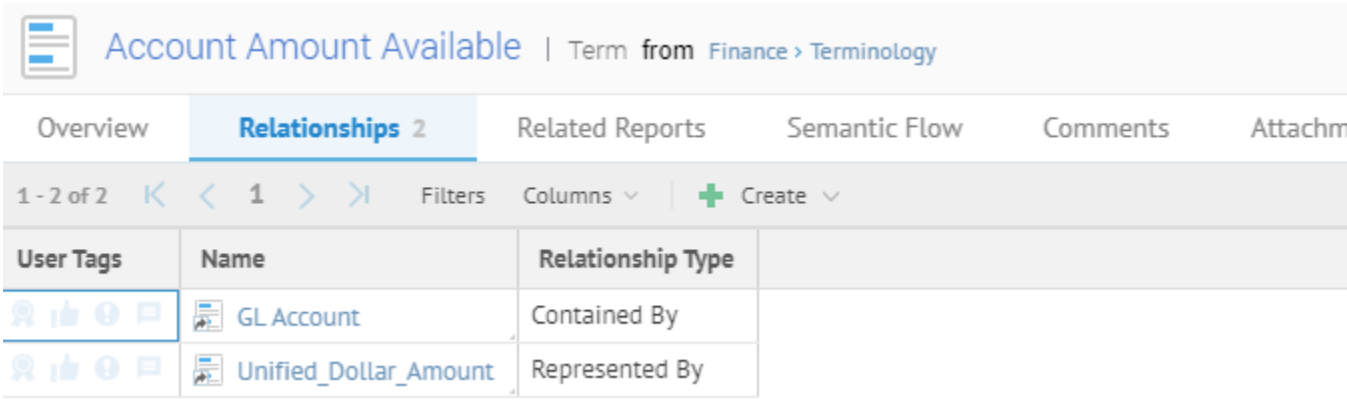
*There are two relationships defined for this term with other terms in the same **Finance** glossary.*

Select **Columns > Grid**. Then select the Relationship Type column and add it to the list of columns to display.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

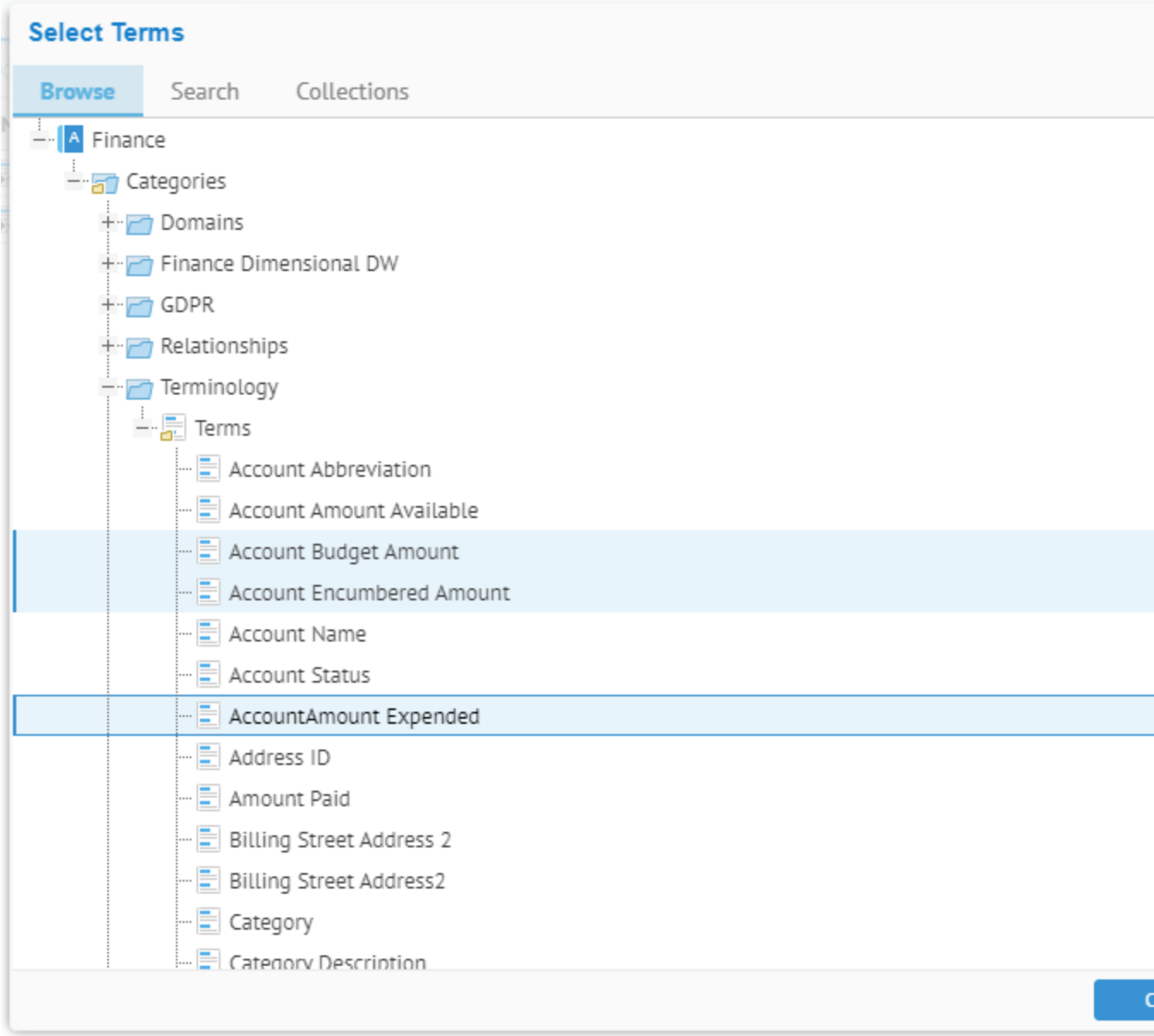


And now we see the **Relationship Type**.



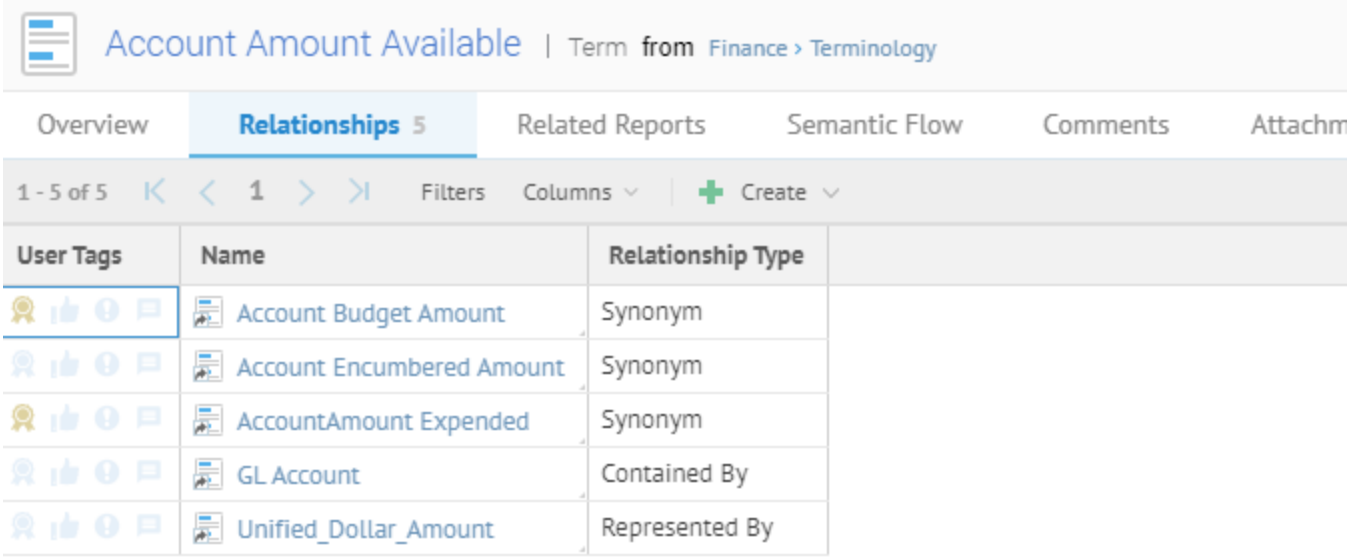
Click the **Create** (Create) icon. Choose **Synonym** for the **Relationship Type**. Pick the three terms below.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



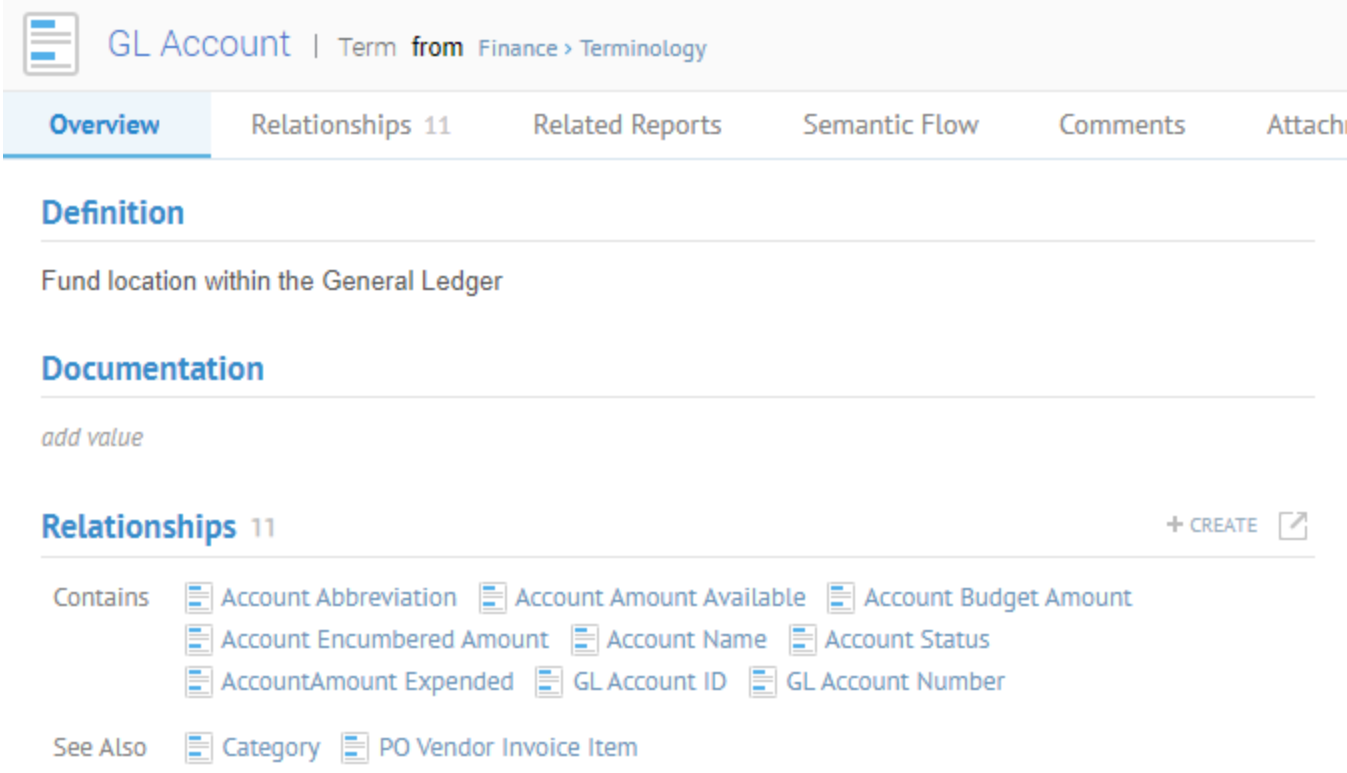
Click **OK**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click the **GL Account** term that **Contains** this term (**Account Amount Available**).

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



There are a number of other terms Contained by GL Account, as it is a concept (General Ledger Account) that contain many attributes, such as Account Amount Available, or Account Name, etc.

Term Relationship Types

There are 5 term relationship types:

- Synonym – identifying terms with the same meaning
- See Also – identifying terms related as a reference

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

- More General / More Specific – Generalization / Specification type relationship, e.g., Vehicle is More General than Car or Truck
- Contains / Contained By – Containership type relationships, e.g., GL Account contains a Name, and Abbreviation, and Amount Available, etc.
- Represents / Represented By – Relationship defining a representation or domain for a term, e.g., Account Amount Available is Represented By the Unified Dollar Amount which expresses the number of digits to use, etc.

Term Relationships and Semantic Lineage

Just like semantic links, term relationships within a glossary can have an impact on both semantic usage and semantic definition reporting.

The Semantic impact is as follows:

Relationship Type \ Semantic Lineage Direction	Usage	Definition Lookup
Synonym	No	Yes
More General	No	Yes
More Specific	Yes	No
Represented By	No	Yes

Delete a term

1. Sign in as a user with at least the proper security role (**Editor**) on the Business Glossary you wish to view or edit terms from.
2. Navigate to the details page of the term or use the Grid Mode to in the Terms tab to edit the properties of the term or terms you just created.
3. Click **Delete**.
4. In the grid view, one may select and delete in place any of the rows (or list items in the list view).

With Workflow

With Workflow

Add a new term with workflow

A new term must be a part of a particular Business Glossary category.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

1. Sign in as a user which had editor permissions to the business glossary you wish to document and has **Editor Workflow Role** assigned for one or more categories.
2. Be sure to open the **Development** configuration which contains the **Development** version of the business glossary.
3. Navigate to that category you wish to place the term in. If the category does not exist, Navigate to the details page of the business glossary and create a new category.

The new category may be part of an existing category or at the root of the business glossary

This interface is simply the standard details page and all the same features are available.

4. Click the **Terms** tab.
5. Click the plus sign (**Add a new term**).
6. Enter the name and description.

*You may click on Add another term to cause the **Add a Term** dialog to stay open for adding additional terms each time you click OK.*

7. Click **OK**.
8. After creating, you must move the term through the workflow before the results are visible in the **Published** configuration.

Edit a term with workflow

1. Sign in as a user which had editor permissions to the business glossary you wish to document and has **Editor** Workflow Role assigned for the parent category.
2. Be sure to open the **Development** configuration which contains the **Development** version of the business glossary.
3. Navigate to the details page of the term or use the Grid Mode to in the **Terms** tab to edit the properties of the term.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

4. You may also use the Term Management Dashboard to manage terminology.
5. In the Grid View, one may bulk update any property associated with any of the rows (or list items in the list view).
6. After editing, you must move the term through the workflow before the results are visible in the **Published** configuration.

This interface is simply the standard details page and all the same features are available. However, according to the workflow steps one must first place the term in Draft status. To do so for an Approved term, click on the Create Draft button in order to place the term in draft mode and allow editing. One may also create a new term which will be placed in Draft status using one of the methods below.

Move a term to a new category with workflow

Steps

1. Sign in as a user which had editor permissions to the business glossary you wish to document and has **Editor** Workflow Role assigned for the parent category.
2. Be sure to open the **Development** configuration which contains the **Development** version of the business glossary.
3. Navigate to the details page of the term.
4. Go to **More actions** and select **Move to a different category**.
5. Browse to the new category and click **OK**.
6. You may also use the Term Management Dashboard to manage terminology.
7. In the Grid View, one may bulk transition from any one workflow state to another for any of the rows (or list items in the list view) which are in the same state.
8. After editing, you must move the term through the workflow before the results are visible in the **Published** configuration.

This interface is simply the standard details page and all the same features are available. However, according to the workflow steps one must first place the term in Draft status. To do so for an Approved term, click on the Create Draft button in order to place the term in draft

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

mode and allow editing. One may also create a new term which will be placed in Draft status using one of the methods below.

Move a term through the workflow

Steps

1. Sign in as a user which had editor permissions to the business glossary you wish to document and has the proper (Reviewer, Approver, Publisher) Role assigned for the parent category.
2. Be sure to open the **Development** configuration which contains the **Development** version of the business glossary.
3. Navigate to the details page of the term or use the Grid Mode to in the **Terms** tab to edit the properties of the term.
4. You may also use the Term Management Dashboard to manage terminology.
5. In the Grid View, one may bulk transition from any one workflow state to another for any of the rows (or list items in the list view) which are in the same state..

This interface is simply the standard details page and all the same features are available. However, according to the workflow steps one must first place the term in Draft status. To do so for an Approved term, click on the Create Draft button in order to place the term in draft mode and allow editing. One may also create a new term which will be placed in Draft status using one of the methods below.

Delete a term with workflow

You may not simply delete a term. Instead, you must move it through the defined workflow process until it is Deprecated.

Add, Review and Edit Categories

Note for business glossaries with workflow, general users are given access to the Published Configuration which contains the Published version of the Business Glossary. In order to edit (following the workflow process) a Business Glossary which is managed under workflow, even though categories are not managed under workflow, you must still have access to the Development Configuration containing that same Business Glossary. Please see more details here.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Steps

1. Sign in as a user with at least the proper security role (e.g., **Viewer** or **Editor**) on the Business Glossary you wish to view or edit terms from.

Without Workflow

Add a new category

Steps

1. Sign in as a user with at least the proper security role (**Editor**) on the Business Glossary you wish add a category to.
1. Navigate to the details page for the category you wish to place the new category in or the root of the glossary.

The new category may be part of an existing category or at the root of the business glossary

This interface is simply the standard details page and all the same features are available.

2. Click the **Categories** tab.
3. Click the plus sign (**Add a new category**).
4. Enter the name and description.

*You may click on Add another term to cause the **Add a Category** dialog to stay open for adding additional categories each time you click OK.*

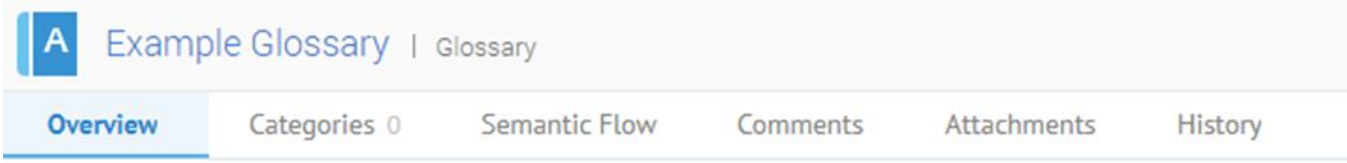
5. Click **OK**.

Example

Sign in as Administrator.

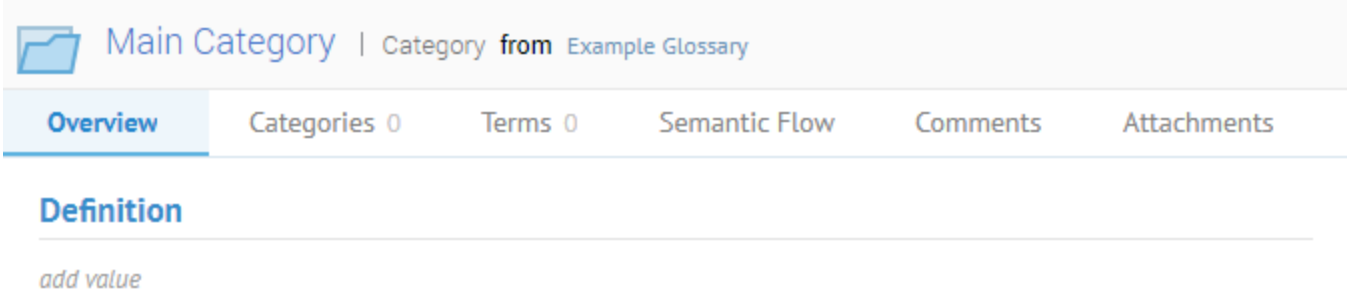
Navigate to the **Example Glossary** details page.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Go to the **Categories** tab and and **c**lick the plus sign (**Add**). Enter “Main Category” as the **Name**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Edit a category

Steps

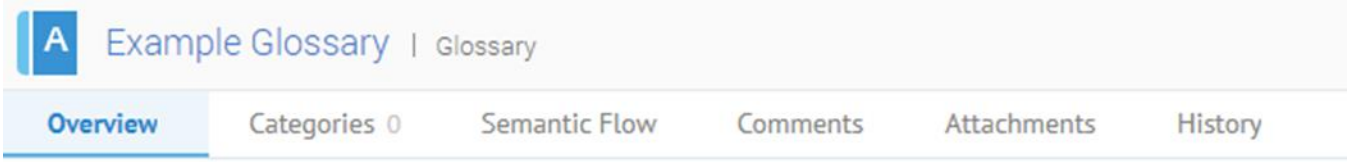
1. Sign in as a user with at least the proper security role (**Editor**) on the Business Glossary you wish edit categories in.
2. Navigate to the details page of the category or use the Grid Mode to in the **Categories** tab to edit the properties of the term or terms you just created.
3. In the Grid View, one may edit in place any property associated with any of the rows (or list items in the list view).

Example

Sign in as Administrator.

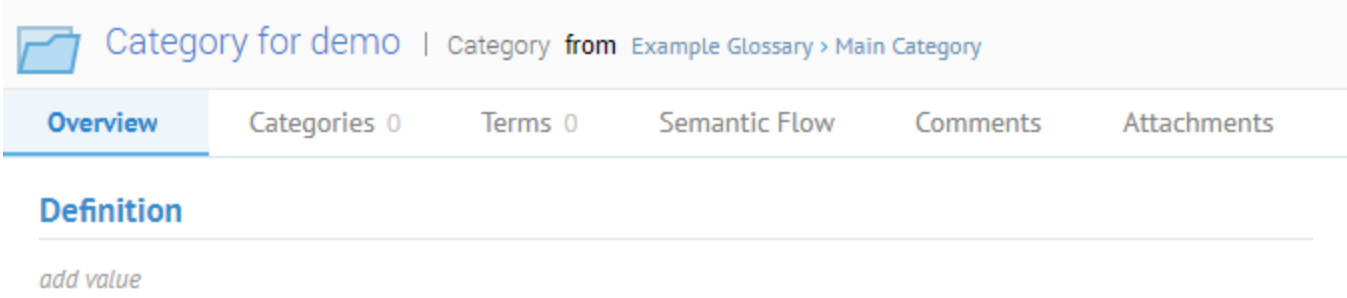
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Navigate to the **Example Glossary** details page.



Go to the **Categories** tab and and click the category you wish to edit. Click the ( ) Edit icon and enter "Category for demo" to the **Description**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Delete a category

1. Sign in as a user with at least the proper security role (**Editor**) on the Business Glossary you wish to delete categories from.

Only empty categories (those which do not contain any terms of further categories) may be deleted.

2. Navigate to the details page of the category or use the Grid Mode to in the **Categories** tab to edit the properties of the term or terms you just created.
3. Click **Delete**.
4. In the grid view, one may select and delete in place any of the rows (or list items in the list view).

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

With Workflow

1. Sign in as a user with at least the proper security role (**Editor**) on the Business Glossary you wish edit categories in, and ensure the user has access to the Development configuration which contains the Development version of the Business Glossary.

Add a new category with workflow

Adding a new category when workflow is enabled is that same as adding a new category without workflow. Just and ensure the user has access to the Development configuration which contains the Development version of the Business Glossary.

Edit a category with workflow

Editing a category when workflow is enabled is that same as editing a category without workflow. Just and ensure the user has access to the Development configuration which contains the Development version of the Business Glossary.

Delete a category with workflow

Deleting a category when workflow is enabled is that same as deleting a category without workflow. Just and ensure the user has access to the Development configuration which contains the Development version of the Business Glossary.

Specify the Workflow Process for a Business Glossary

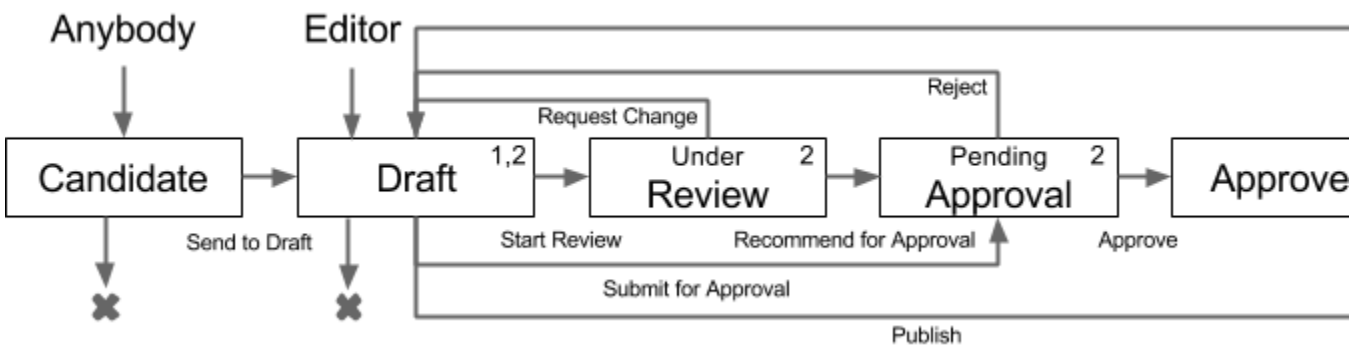
By default, a Business Glossary will have no workflow requirement (including no approval process. MIMM also provides a very flexible and complete set of possible workflow and publication processes that you may employ. When your company would like to have a formal Business Glossary development process that involves multiple users you can enable the Business Glossary workflow. The workflow is prepackaged sequence of Business Glossary activities around term proposal, review, acceptance, publishing and depreciation. It is a flexible process that can be customized to require only publishing activity, approval with or without review, approval and review by one or multiple users, etc.

Steps

1. Sign in as a user with at least the **Manage** security role on the Business Glossary you are in.
2. Go to the **MANAGE > Configuration** in the banner.
3. Click the **Workflow** tab.
4. Check the workflow entries you wish to specify.

The most complete workflow possible is in the diagram below:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



5. Click Save.

Choose these processes carefully, as once selected they cannot be undone or changed.

Example

Populate (Bootstrap) a Business Glossary from a Model

You may take an already well documented model and use it to bootstrap a Business Glossary, creating categories, terminology and relationships based upon what is already well-defined in the original model.

Steps

1. Be sure the model you are going to bootstrap from is already imported.
2. Sign in with at least the **Manage** security role on the Business Glossary you are going to populate.
3. Go to **OBJECTS** > **Glossaries** > and pick the business glossary to bootstrap.
4. Navigate to the proper subset (**Category**) to place the new categories and terms in or create a new one.

The category to bootstrap to must be empty.

5. Go to **More Actions > Bootstrap** from model (even contained within a multi-model) and select the model to bootstrap from.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

6. Specify the Stewards you wish to assign to all the new terms and categories to be created.

7. You select:

   - **None** to not create any links back to the source model
   - **Classification** to create a classification mappings between the new glossary terms and the original model data element (from where all the populated terms will be derived) so that semantic lineage may be traced to and from the terms and data elements. You have the option to overwrite any existing classifications of the model data elements.
   - **Semantic Mapping** to create a semantic mapping between the new glossary terms and the original model data element (from where all the populated terms will be derived) so that semantic lineage may be traced to and from the terms and data elements. You must provide the semantic mapping content with a name.

8. Click **IMPORT**.

9. The Log Messages dialog then appears and log messages are presented as the import process proceeds.

10. If you receive the Import Successful result, click Yes to open the model. If instead you see the Import Failed result, inspect the log messages and correct the source model file accordingly.

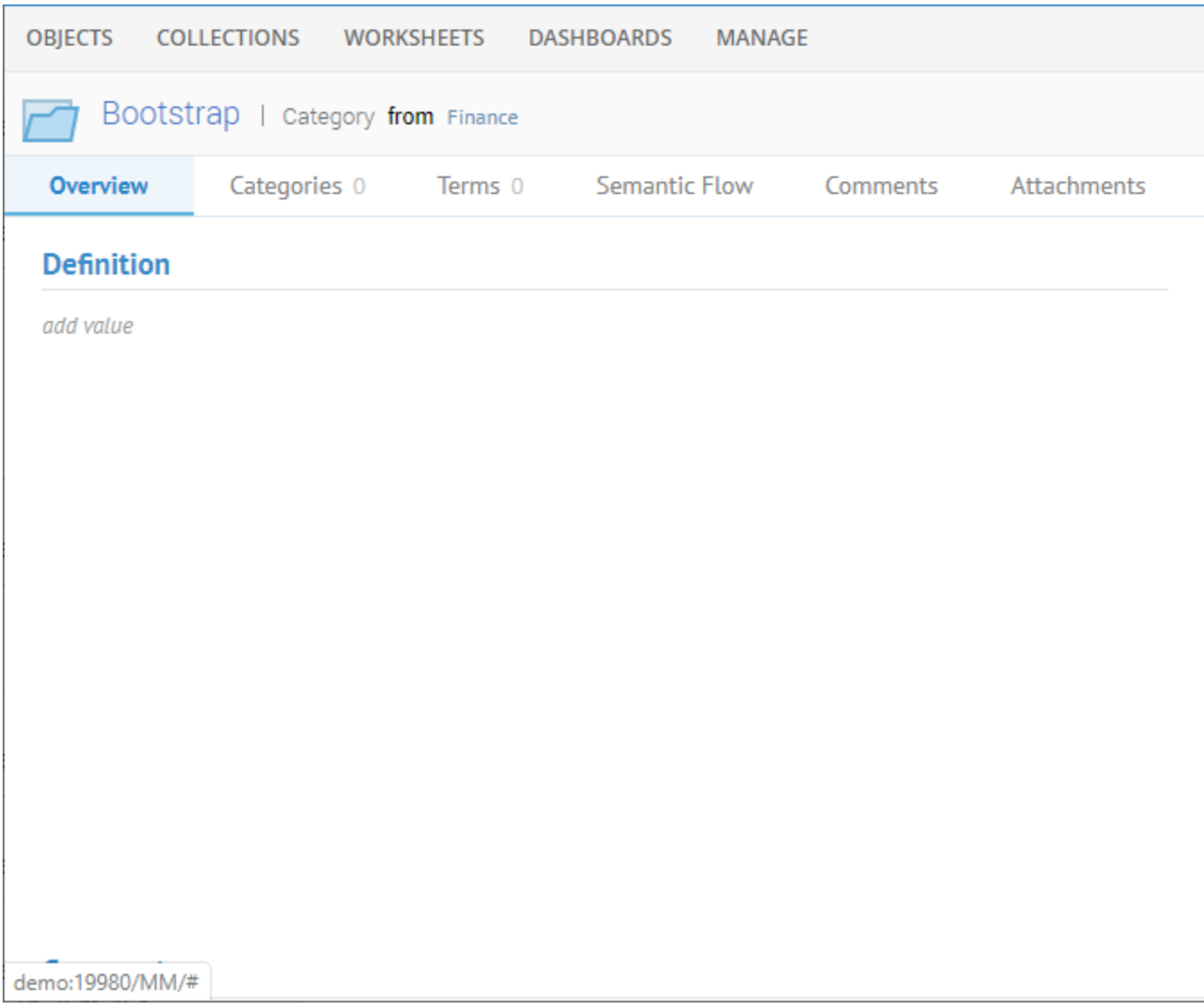
11. You may now review the glossary.

Example

We will use the existing **Finance-AP** model in the **Accounting** multi-model to bootstrap from.

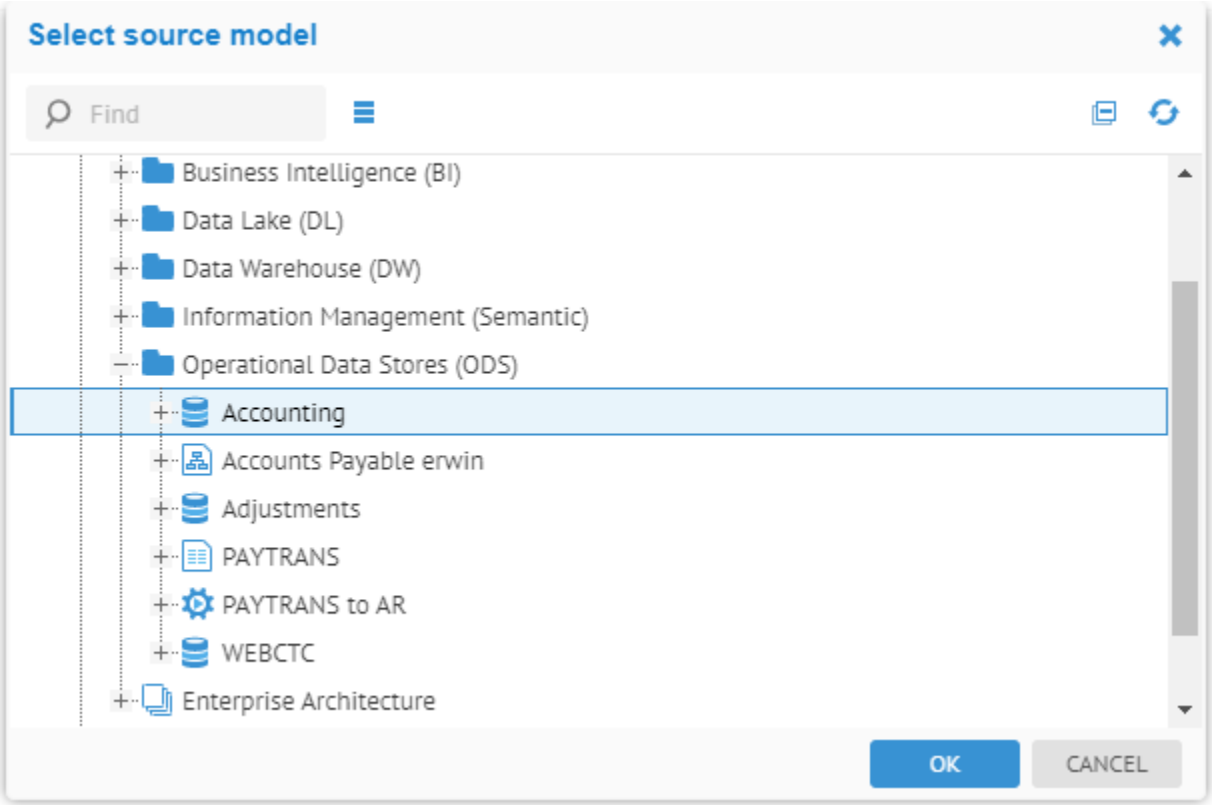
Sign in as **Administrator**. Go to the **Finance** glossary and or create a new category named **Bootstrap**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



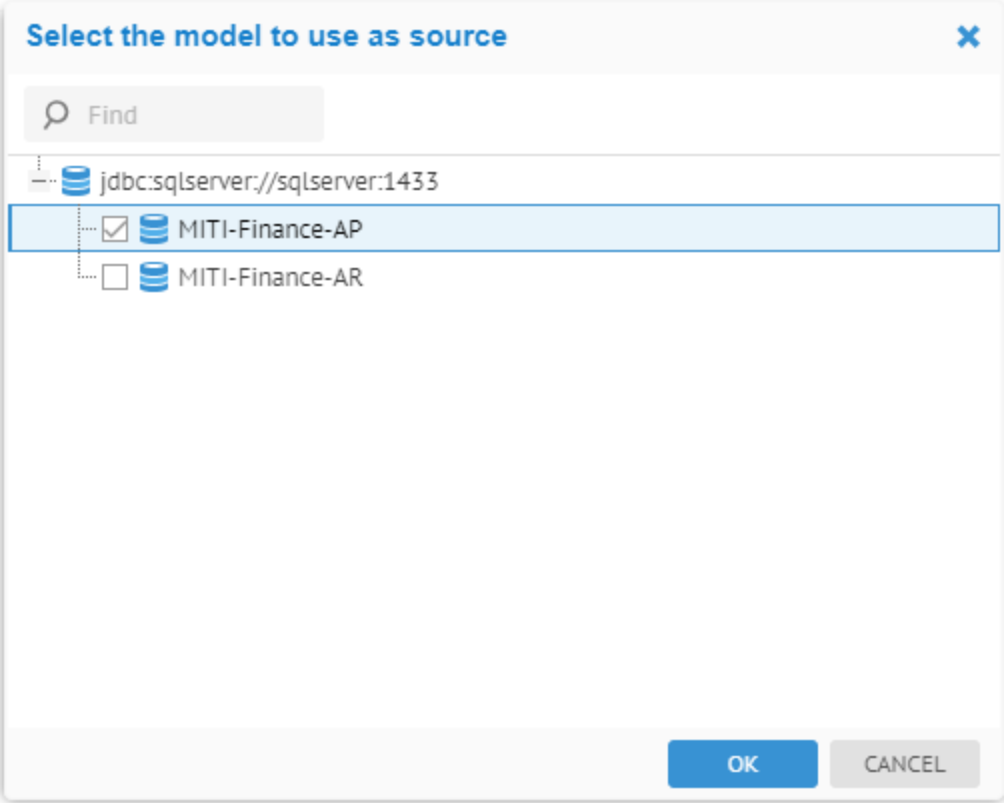
Go to **More Actions > Bootstrap** from model and select **Accounting** multi-model.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

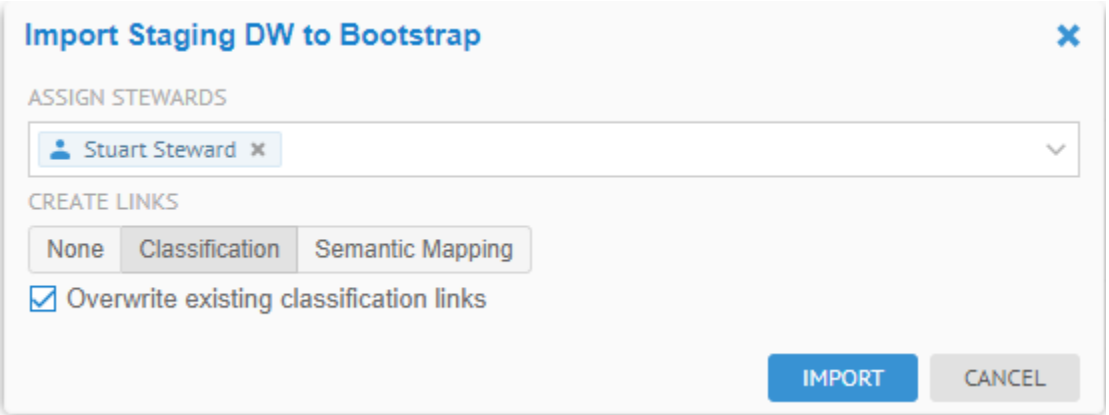


Then click the checkbox for the **Finance-AP** model.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



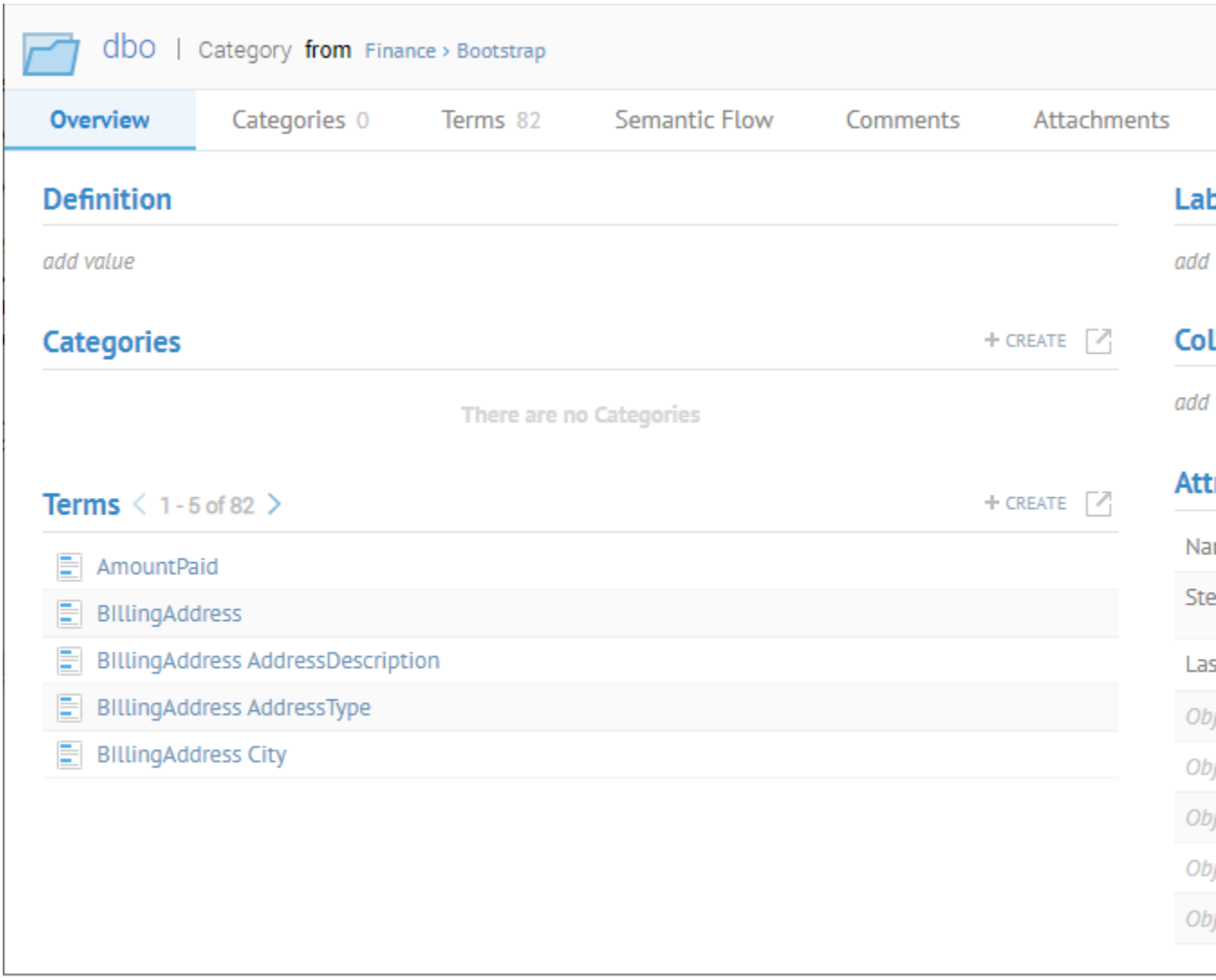
Specify **Steward Steward** as the **Steward**. Click **Classification** and check the Overwrite existing classification links checkbox.



Click **IMPORT**.

When the process is done, naviage to the dbo category and see all the terms from tables and columns in the model.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Delete a Business Glossary

Steps

1. Sign in as a user with at least the **Manage** security role on the Configuration and the repository folder you are in.
2. Go to **MANAGE > Configuration** in the banner.
3. Right-click the glossary to delete under Manage Configuration and select **Delete**.
4. Click YES.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

View Term Management Dashboard

Workflow based search criteria, or dashboards, are available as part of the search capability. They are only available (and only meaningful) if you have specified a workflow process for the Business Glossary.

Steps

1. Sign in as a user which had editor permissions to the Business Glossary you wish to document and has access to the Development configuration which contains the **Development** version of the Business Glossary.
2. Click **Objects > My Workflow Tasks**.
3. From here you have a list of terms which are in various workflow statuses which you may sort and apply workflow actions to.

Depending upon the workflow roles you are assigned, only those terms that match your workflow role for that category will be displayed.

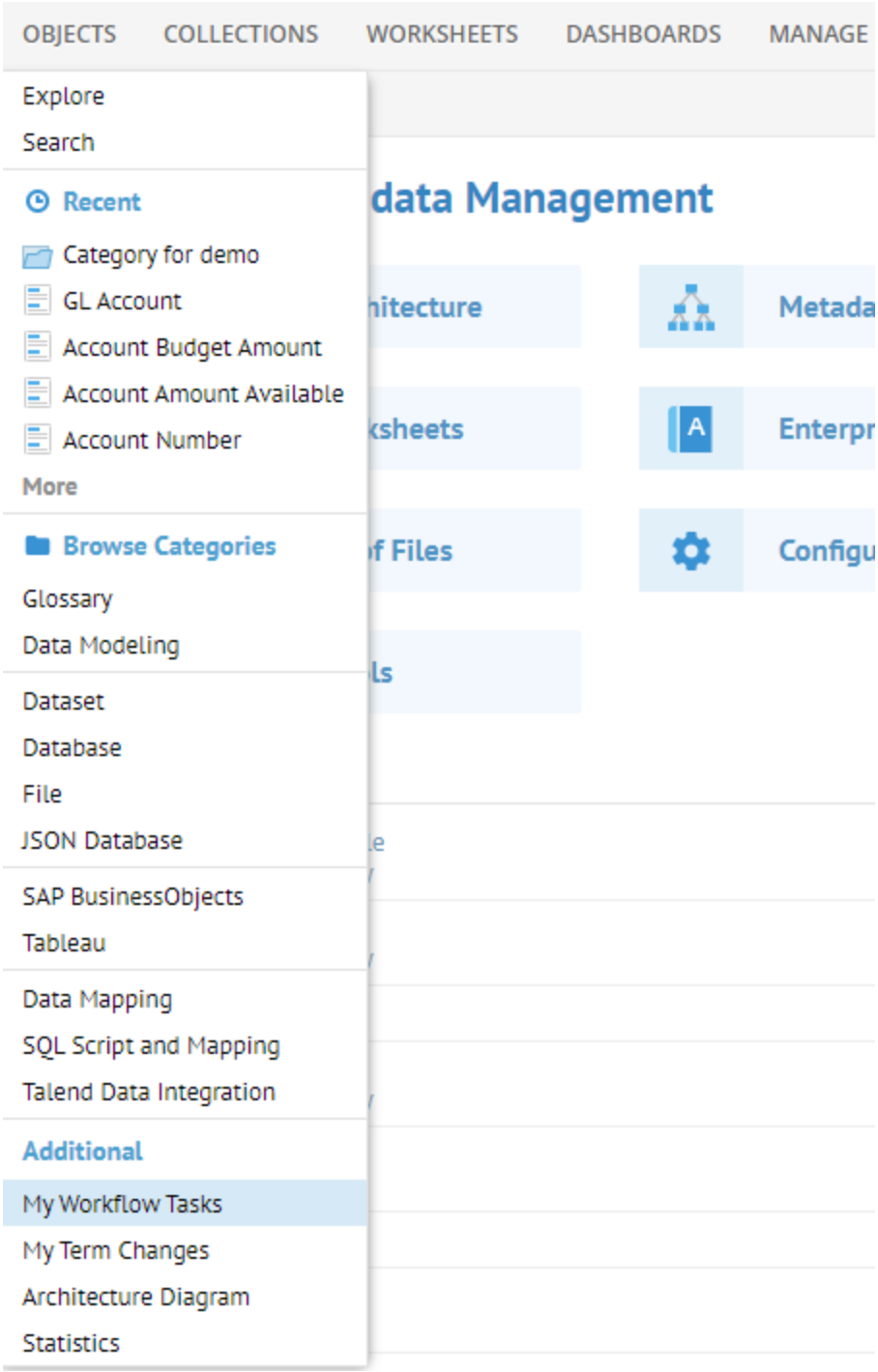
Example

Sign in as a user with the **Security Role** assignment of **Reviewer** (**Robin** in the tutorial with workflow).

Be sure you are in the Development configuration where you may use the workflow.

Go to **Objects > My Workflow Tasks**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

My Workflow Tasks

Glossary: all More recent than: two weeks

Term Name	Path	Status	State
Status: UnderReview			
Account	Enterprise › Enterprise Conceptual ...	UnderReview	Publish

Now, sign in as a user with the **Security Role** assignment of **Editor** (**Ed** in the tutorial with workflow).

Go to **Objects > My Workflow Tasks**.

My Workflow Tasks

Glossary: all More recent than: two weeks

Term Name	Path	Status	State
Status: Draft			
Account Description	Enterprise › Enterprise Conceptual ...	Draft	Publish
Account Name	Enterprise › Enterprise Conceptual ...	Draft	Publish
Address	Enterprise › Enterprise Conceptual ...	Draft	Publish
Address String	Enterprise › Enterprise Conceptual ...	Draft	Publish
Amount Budgeted	Enterprise › Enterprise Conceptual ...	Draft	Publish
Amount Encumbered	Enterprise › Enterprise Conceptual ...	Draft	Publish
Amount Expended	Enterprise › Enterprise Conceptual ...	Draft	Publish
Amount Funded	Enterprise › Enterprise Conceptual ...	Draft	Publish
Account Identifier	Enterprise › Enterprise Conceptual ...	Draft	Publish

You may select multiple rows and apply common workflow tasks.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Workflow Actions in Grid Mode

When analyzing metadata in grid mode you may include a special column **Workflow Actions** to display the possible workflow step-based actions available to you with the workflow role assignments you have.

Steps

1. View the terms you wish to in grid mode and select Columns.

2. Select the **Workflow Actions** column.

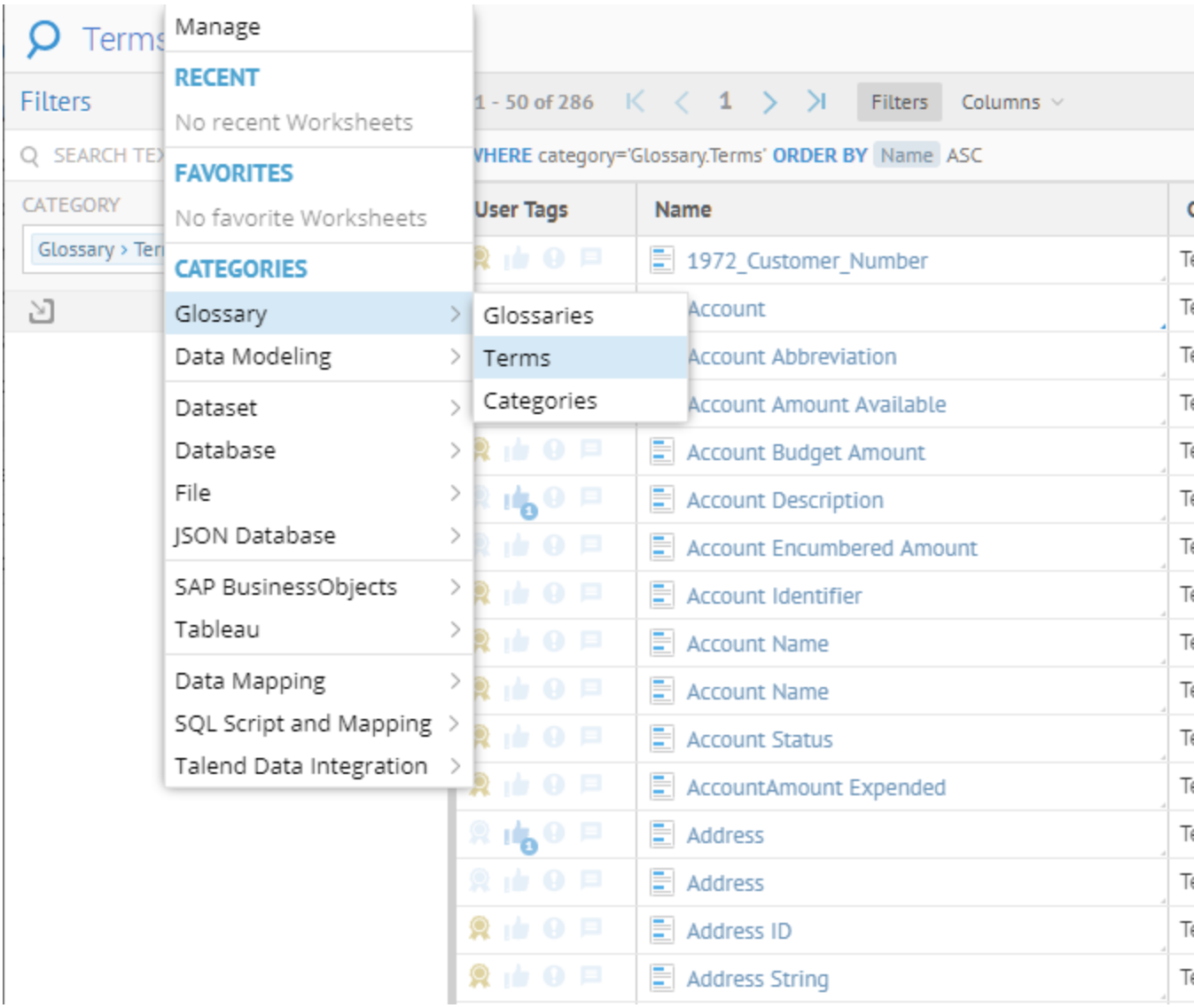
> ***Workflow Actions*** *will only be an option if there are terms which are part of a workflow enabled glossary in the result .*

Example

Sign in as the user **Ed**.

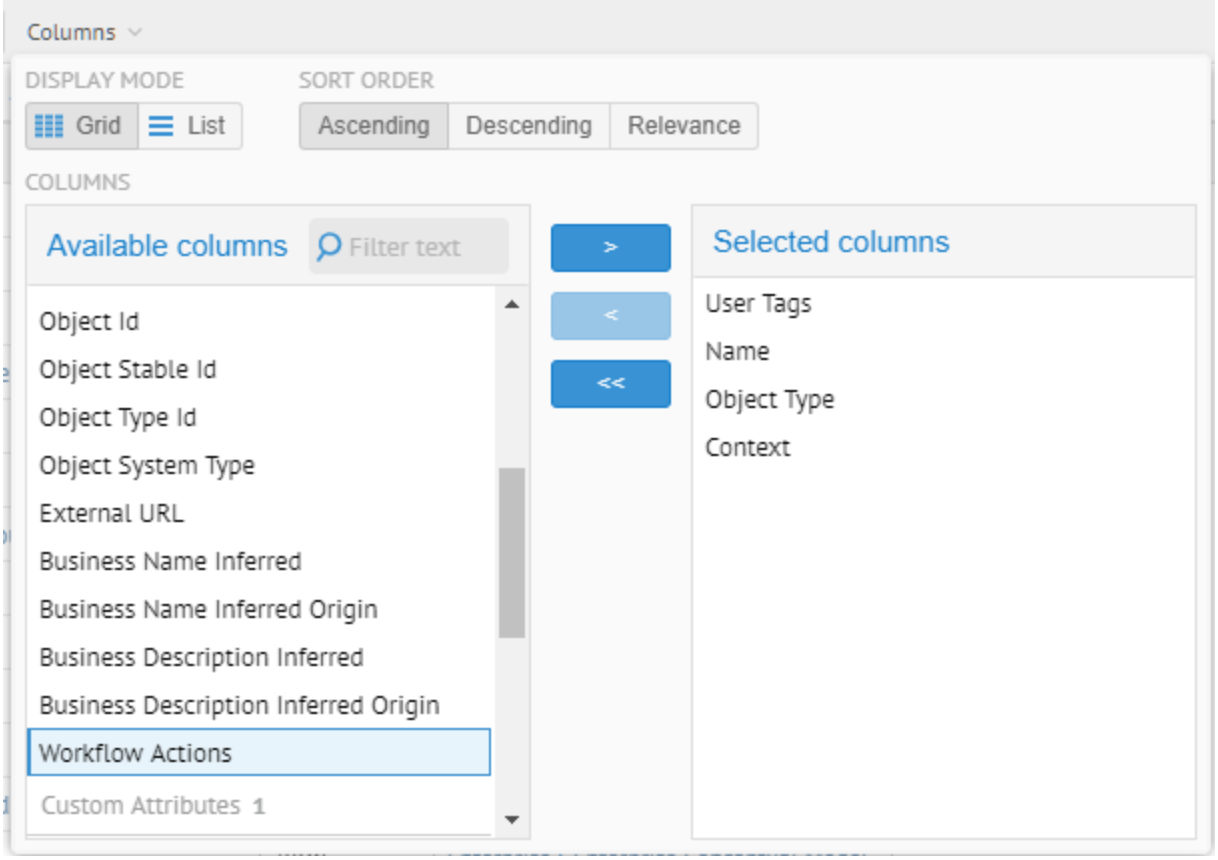
Go to **WORKSHEETS > Glossary > Terms**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



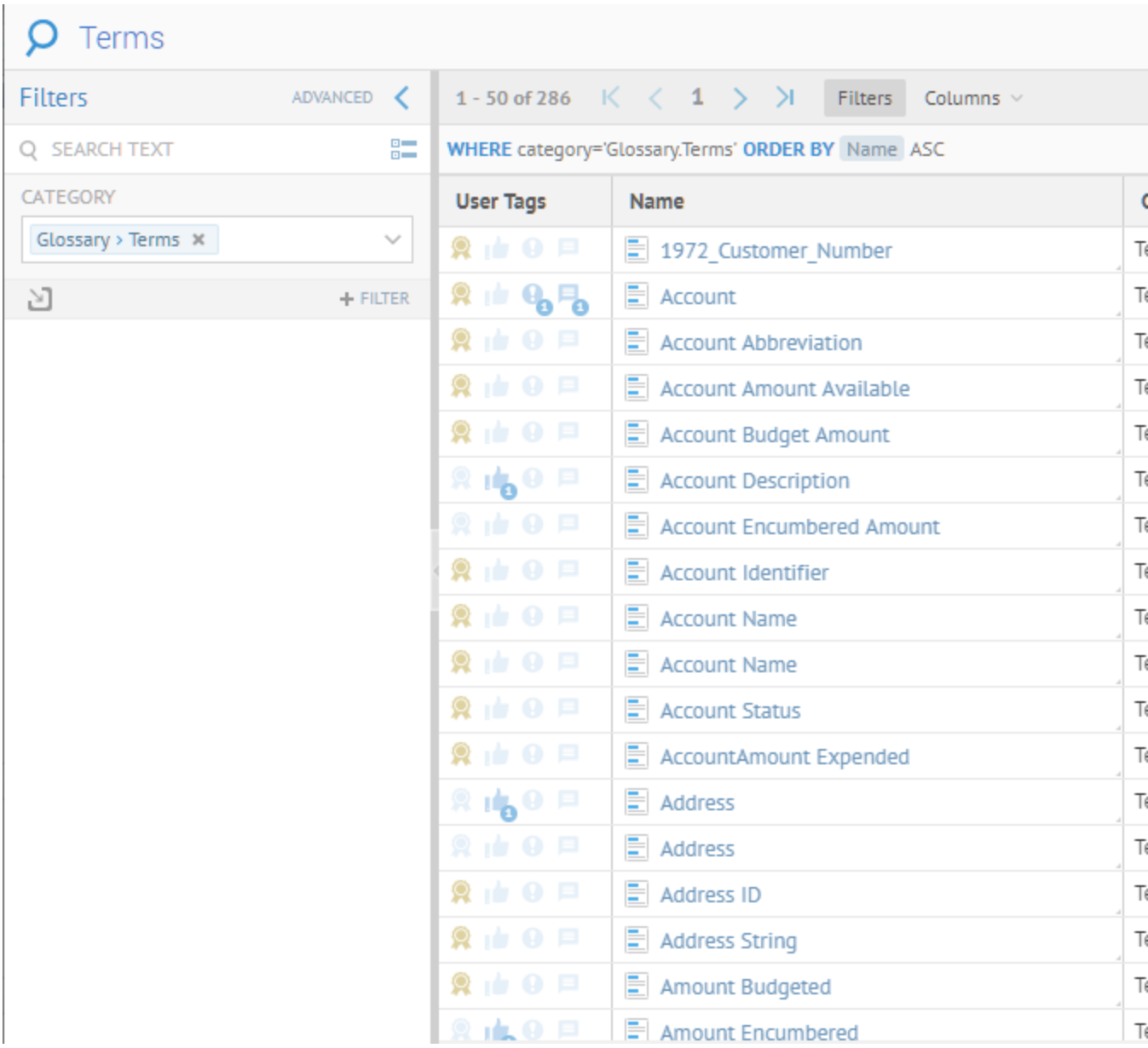
Click **Columns v** and select the **Workflow Actions** column.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click the right pointing caret to include this column in the display and you have actions appropriate to the user **Ed**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



View Term Changes

If one is the Steward of terms in a glossary, one may see the recent changes.

Steps

1. Sign in as a user which has the Steward role to terms in a Business Glossary.

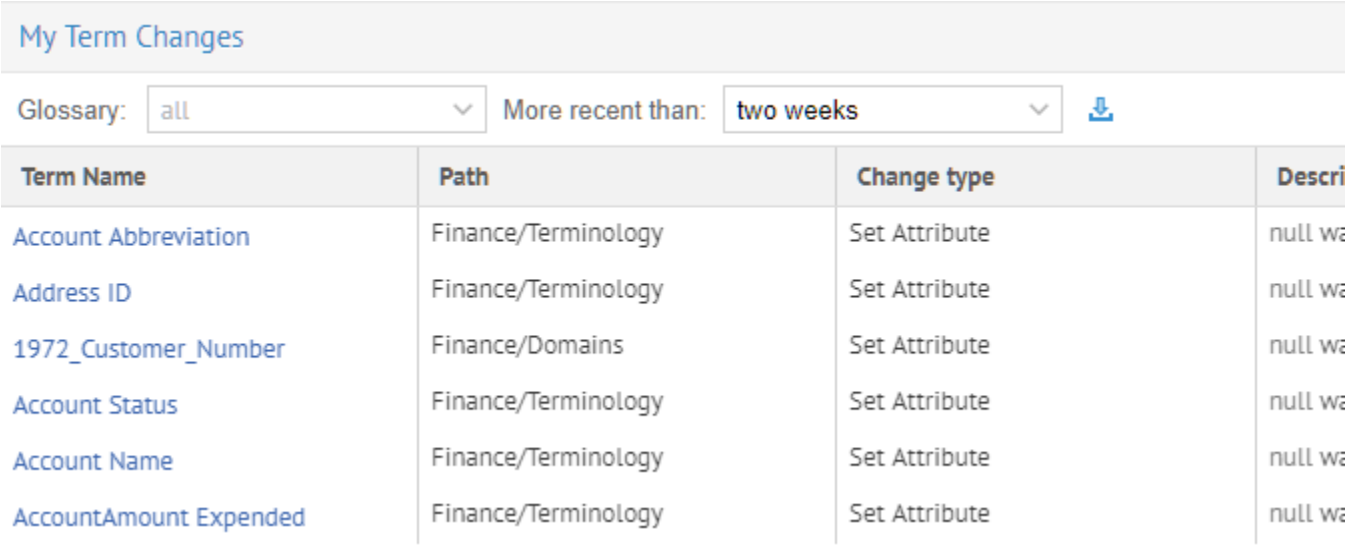
2. Click **Objects > My Term Updates**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Example

Sign in as a user which has the Steward role to terms in a Business Glossary.

Go to **Objects > My Term Changes**.



You may also configure email notification of change reports which you may schedule.

Assign Workflow Roles

A user with the Administrator security role can enable the workflow and assign the following workflow roles to Categories:

- Editor
- Reviewer
- Approver
- Publisher

A workflow role can be assigned to users and applies to all terms in the category. A Category inherits all user-to-role assignments from the parent category and can have additional ones.

The workflow process applies to terms, but not categories. All changes to Categories made in the Manager UI are immediately visible (published) in the Explorer UI. When the workflow is enabled you cannot delete a category that has published terms.

You can enable the workflow when you create the Business Glossary or after. You cannot disable the workflow after it was enabled.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

1. Sign in as a user which had editor permissions to the Business Glossary you wish to document and has access to the Development configuration which contains the Development version of the Business Glossary.
2. Navigate to the business glossary. It will be a part of the Business Glossary category.
3. Navigate to any category you wish to work with.
4. Click on the More Actions ( ) icon and select Assign Workflow Roles.

Workflow Action	Workflow Role			
	Reviewer	Editor	Approver	Publisher
Create, edit or remove an asset		X	X	
Create, edit or remove attributes and relations	X	X		
Create, edit or remove comments	X	X	X	
Create, edit or remove comments/attachments		X		
Assign roles to users and groups			X	
Start/stop workflows and reassign tasks		X	X	
Publish an asset				X

Editor Workflow Role

The Editor is responsible for creating, revising and shepherding terms through the approval process. The Editor can import terms into the Business Glossary from files or create them manually. These terms start in the Draft status. The workflow can allow any Business Glossary user to propose a term. A proposed term starts in the Candidate status. The Editor of the category where the term is proposed can accept the term by promoting it to Draft or deleting it. The user who created the term can edit and delete it as long as it is Candidate.

When the approval activity is disabled the Editor is solely responsible for the terms' workflow. In this case, the Editor takes on the Publisher's responsibilities and can publish terms when the Editor deems ready.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Reviewer Workflow Role

The Reviewer is a subject matter expert (SME) responsible for assessing and commenting on assets under development. The Reviewer can list assets assigned to him/her for the review and comment, endorse or dismiss them individually. Each of the assets offers the Reviewer the Comment, Recommend for Approval and Request Change buttons. Pressing the buttons allows the user to explain the decision with a comment.

The Request Change action sends the asset back to Draft. The Editor is responsible for implementing requested changes or providing clarifications and re-submitting the asset for review again. The review is an iterative activity.

Approver Workflow Role

The Approver is an accountable decision maker who is responsible for rejecting or approving new assets of changes to published assets. The Approve action advances the asset to the Approved status. The Reject action returns the asset to the Draft status.

The approval activity is a part of the workflow process by default. The Administrator can disable it by setting the “Allow approval of terms” to No.

Publisher Workflow Role

The Publisher is an accountable decision maker who is responsible for publishing assets. MIMM provides a single configuraton version view of the metadata. It is is designed for reviewing the repository content by business users in the **Published** configuration version with the **Published** version of the workflow glossaries. You can switch to the **Development** version of a workflow glossary (which is in the **Development** version of the configuration) to create new and edit existing Business Glossary objects when under workflow. If you do not want your business users to see unfinished business glossary changes in the **Published** configuraton version you can enable the workflow. The workflow includes **Publishing** as an action.

When the workflow is enabled you can make multiple changes to different business glossary objects and publish all changes at once or groups of changes at a time. When the workflow is not enabled all changes made are immediately visible in the Explorer UI. You can change an object by editing its attributes (e.g. description) and adding/removing its relationships (e.g. contains). When the workflow is enabled UI shows all unpublished changes when in the **Development** version specially (e.g. yellowish background color). It allows you to view differences between **Published** and **Development** versions of attributes.

When the workflow is enabled terms show their publishing status in **Development** configuration. The application sets the attribute’s value automatically. A new term is unpublished when the approval activity is enabled the **Publisher** can only publish Approved

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

terms. The **Administrator** can configure the workflow to publish terms automatically when they are approved.

Assign a Steward

Stewards are users or groups of users who are assigned as point of contact to answer questions for specific terms or entire categories, as such they are the users or a member of a group who may certify or un-certify terms and data elements. In addition, they may be notified when changes are made to terms as part of the workflow.

Otherwise, stewardship is treated as just another property of a term or category and thus one should refer to the instructions to add, review and edit terminology.

Note, only users who either have been identified as possible stewards or are members of a group of user identified as possible stewards can be selected from the pull-down list. Please refer to the User and Group Management section in the Metadata Manager UI help for more details.

In addition, to set up notification, please refer to the Scheduling and Notification sections Metadata Manager UI help.

Set the Status of a Term

You may not set the status of a term by editing it. Instead, you will use the workflow transition buttons presented to you based upon:

- The workflow processes enabled for the specific Business Glossary
- The status of the term you are editing.

Note: If there is no workflow process defined for the Business Glossary then the term will always be in Published status and there is no need to set it.

List Terms by Steward Assignment

You may set the steward of multiple terms from either a list a category contents or as the result of a search. After searching or browsing to a list of terms, you may either:

- Click on any column headers and click on the icon to include Steward as a column to display, and then sort on that column
- You may also expand ( ) the Filters panel and specify Steward as a criteria or right-click on an example of the Steward you wish to filter on and use the quick filter.

Produce an Audit Log

The Audit Log tab is available on a term's details page.

Export a Business Glossary

One may export one of two different types of file:

- A CSV format file which contains all the Business Glossary object (terms and categories),
- A CSV format file which contains relationships between those terms in the object file.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

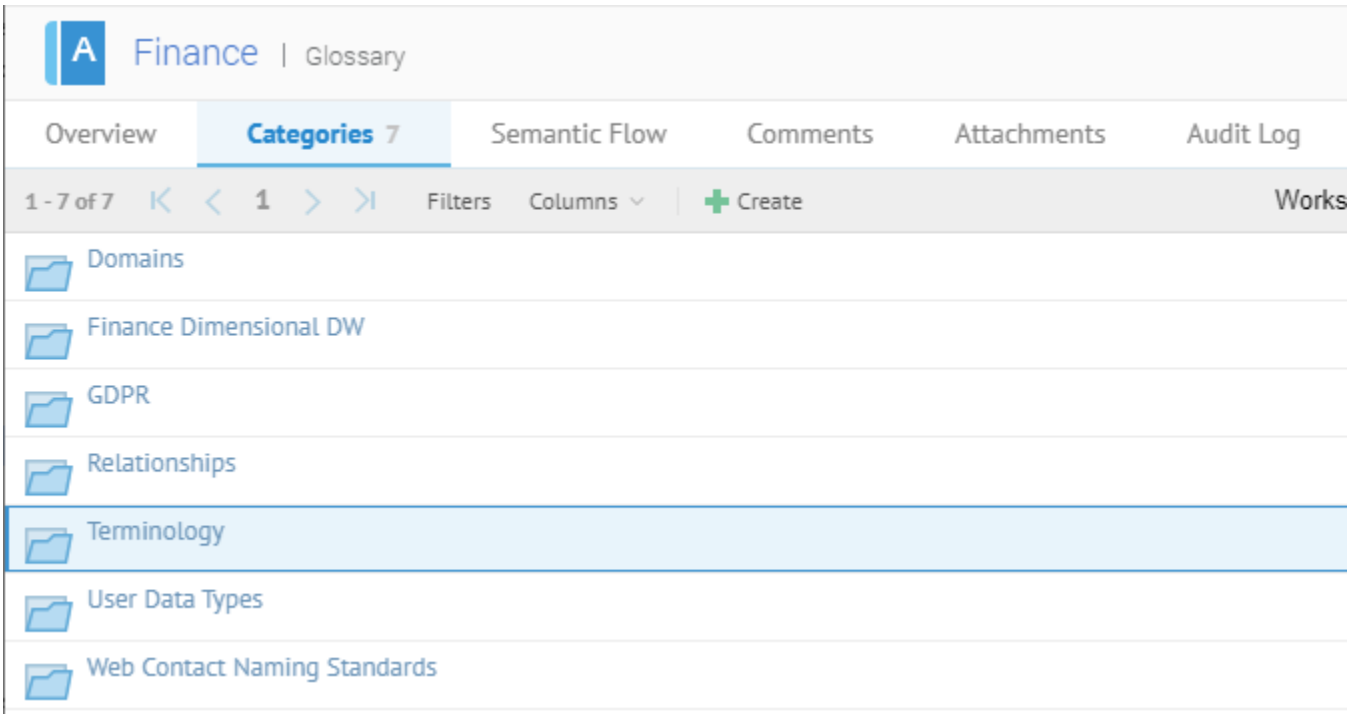
Steps

1. Go to **OBJECTS** > **Glossaries** > and pick the business glossary to export from.
2. Navigate to the proper subset (category or term) to export, or stay at the root.
3. Click **More actions** (⋮) and select **Export Glossary Objects**.
4. Specify the format and click **Download**.

The CSV format file will be downloaded locally.

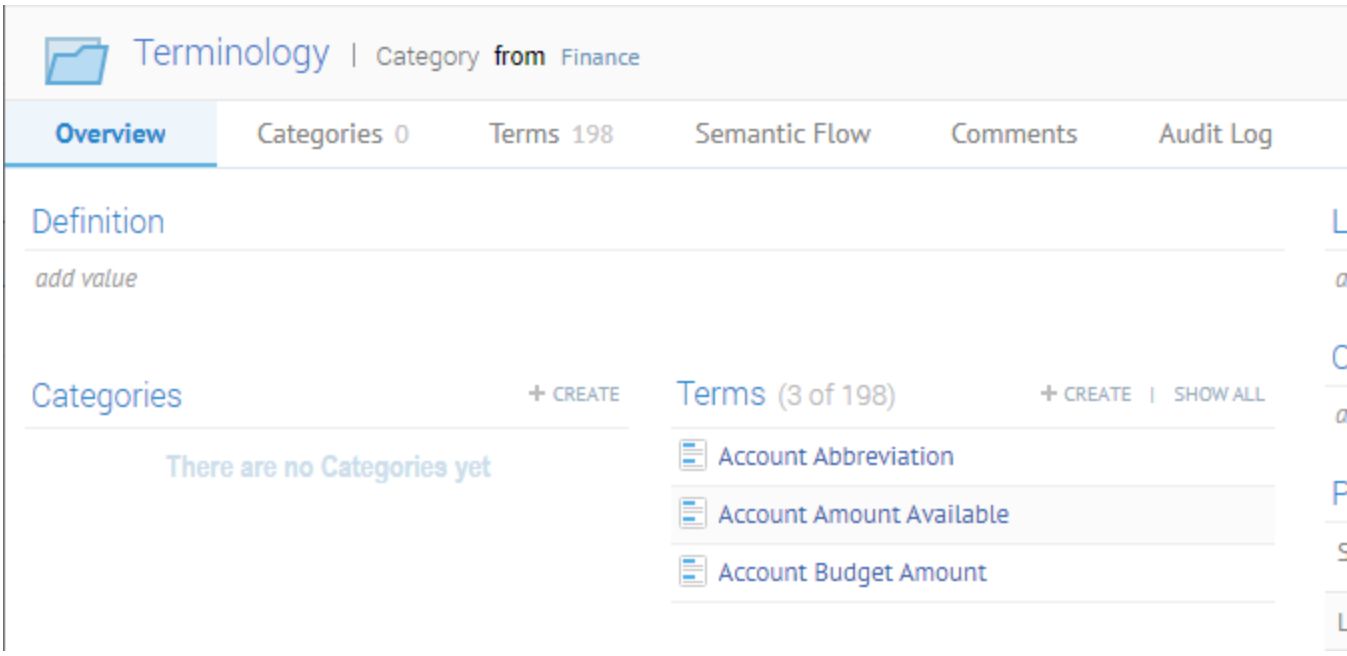
Examples

Go to **OBJECTS** > **Glossaries** > **Finance**.

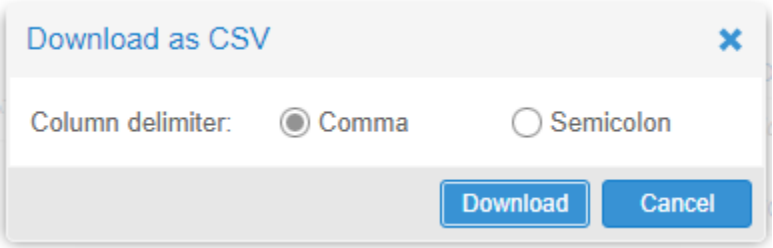


Navigate to the **Terminology** category.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click on the More icon and select **Export Glossary Objects**.



The CSV format file is downloaded locally.

Import a Business Glossary

One may import from one of two different types of file:

- A CSV format file which contains all the Business Glossary object (terms and categories),
- A CSV format file which contains relationships between those terms in the object file.

The object files should be imported before relationships files so that the objects exist for relationship definitions.

One can bootstrap a Business Glossary, or import from existing Business Glossary type systems, using a pre-defined CSV file format. Go to Browse > Glossaries > and pick the Business Glossary to import to.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Steps

1. Go to **OBJECTS** > **Glossaries** > and pick the Business Glossary to import to.
2. Click **More actions** (⋮) and select **Import Glossary Objects/Relationships**.
3. Browse to the file, specify the format and click **IMPORT**.

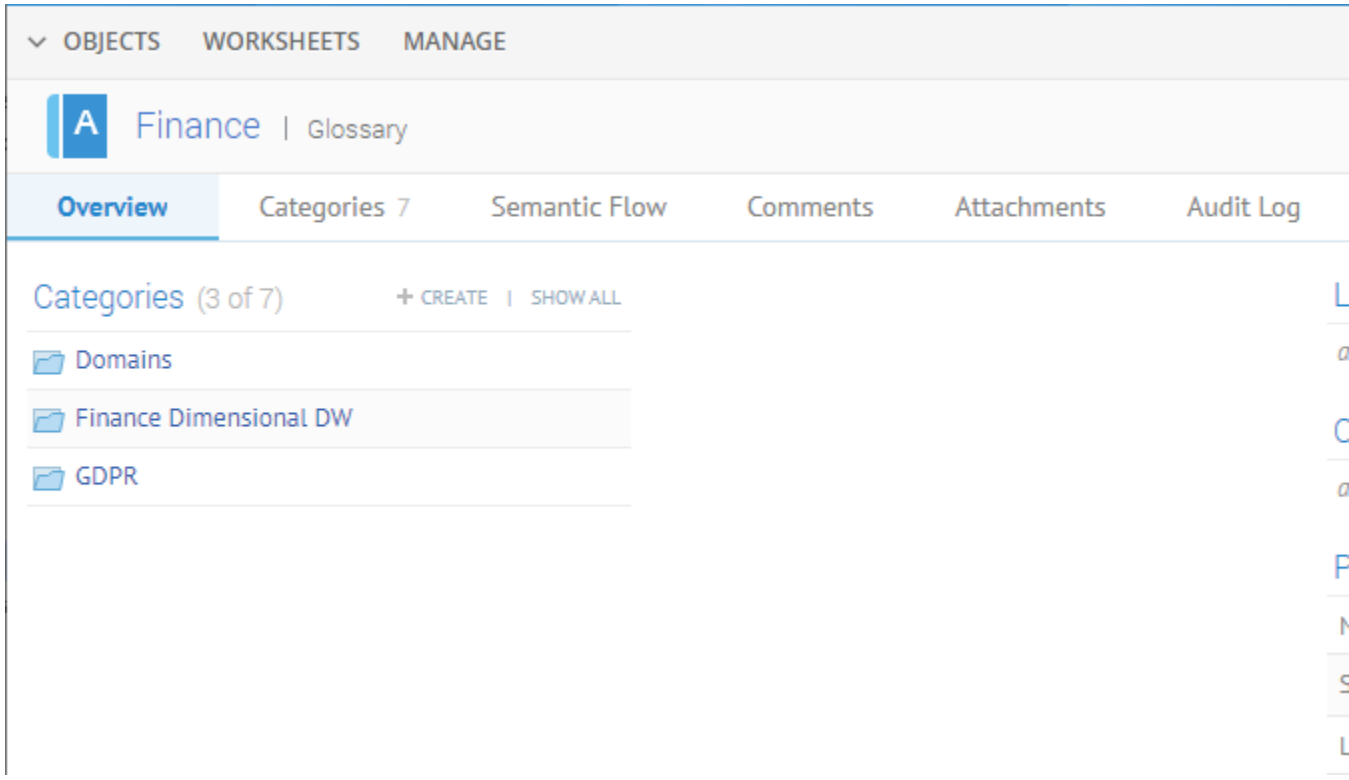
The CSV format file will be uploaded from a local file.

To see the format for this file, simply Export a subset of an existing Business Glossary to Excel.

Example

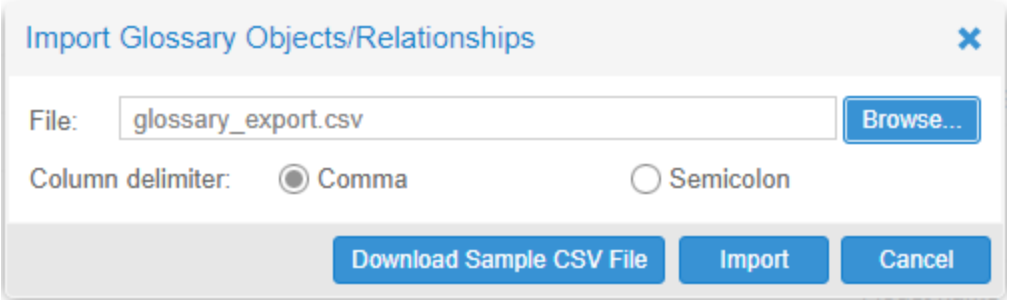
Go to **OBJECTS** > **Glossaries** > **Finance.**

Click **More actions** (⋮) and select **Import Glossary Objects/Relationships**.



Browse to the file, specify the format and click **IMPORT**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Using the Glossary Export/ImportCSV format

It is not only possible to update and add new terms and categories, but by using the _Id_ column, one may also rename, move and delete terms and categories which already existing in the Business Glossary. Here are the guidelines for doing so:

- Adding – To add a term or category:
  - Either the entire _Id_ column must not exist in the CSV file or the _Id_ field is left empty for that line.
  - The Name value must be unique within the _Parent Path_.
  - The _Type_ is optional. However, if empty the object created will be a Term.
- Updating – To update an existing term or category:
  - One must provide either the _Id_ or one must provide the _Parent Path_ along with the Name
  - The _Type_ is optional. However, if empty the object will be assumed to be whatever it already is and _Type_ cannot be changed for an existing object.
  - All other fields are optional. Therefore empty fields do not mean clearing the property value but simply means not to change it.
- Renaming
  - One must provide the _Id_
  - The Name field specified then becomes the new Name
  - Other property updates can be made at the same time.
- Moving
  - One must provide the _Id_
  - The _Parent Path_ field specified then becomes the new _Parent Path_ (the object is moved)
  - Other property updates can be made at the same time
- Deleting
  - One must provide the _Id_ and no other fields

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

- _Type_, _Parent Patch_, Name and all other fields must be empty (except _Id_), otherwise it is not a proper delete request.

Implicit relationships

When consuming term relationships in the CSV file, several types of relationships are alway bidirectional link pairs and the import functionality will build the other link relationship implicitly. These include:

- MoreGeneral – MoreSpecific
- Contains – ContainedBy
- Represents – RepresentedBy
- Reference – ReferencedBy
- Synonym
- PreferedSynonym - Synonym

Data Cataloging

Cataloging your data stores, reports, etc., is an import activity to ensure that potential users of the data can understand what is available, what it means, how it may (even should) be used, and what to expect as a result. MIMM offers a number of features to support data cataloging and provide easy access to that information.

Documentation Type	Description	Characteristics	Usage / Best Practices
Business Name and Description	User understandable name	**Business Name** and **Description** can be defined locally on an object by simply entering a value. In that case, this local name presented as the **Business Name** and **Description** on the details page. Alternatively, if the **Business Name** or the **Description** are not defined locally (the locally defined field is empty), then the **Business Name** and/or **Description** may be derived from the results of the semantic definition lookup, which may be seen in the Semantic	**Business Name** and **Description** are the primary media to carry cataloging information. In particular: ○ Classification - You may define the **Business Name** and **Description** for a business glossary in one place and it will be reflected in any data element that is classified by that term ○ Semantic Mapping - You may define the **Business Name** and **Description** for any data

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

		Flow tab on the details page.	element in one place and it will be reflected in every other data element that is semantically mapped to from that first data element ○ You may review classification and mapping results on the Semantic Flow tab on the details page ○ You may override a name or definition locally by entering the **Business Name** and **Description** locally on the details page or by exporting to .csv fomat, editing and re-importing that file ○ Propagation of **Business Name** and **Description** – Once you have a Business Name and Definition (through classification, semantic mapping or local editing) in one place and it will be reflected in every other element that is semantically related for a definition

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

			○ You may analyze and, report on the **Inferred Business Name** and **Description** via worksheet columns of that name and update in bulk the locally edited values.
Semantic Type	Type associations that may be made automatically on harvesting metadata	Semantic types are based upon a pool, defined repository-wide, e.g., **Social Security Number** or **Gender**. This pool includes a unique name for the type and either a list of valid values or a syntactical rule set used to determine semantic types for metadata elements when sampling the data during harvesting.	**Semantic Type** is the primary tool for automatically typing and hiding large numbers ofdata elements. In particular: ○ Semantic Type Discovery – You may manually assign **Semantic Types** to a metadata element from the element's details page or when browsing in grid mode, identifying those elements to be a certain type, ○ Semantic Type Analysis – With these **Semantic Type** assignments, one may categorize by semantic type and thus identify, sort, operate on different metadata elements all of that same type. ○ Auto-tagging In addition, as part of the

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

			harvesting and data profiling process, MIMM will suggest semantic type assignments that may be confirmed and made permanent. ○ Business Name and Description Inference –You may associate a Term with a Semantic Type and thus the **Business Name** and **Description** may be inferred from all thos data elements which are assigned that **Semantic Type**, Just as with classification and semantic mapping. ○ You may analyze and, report on the **Semantic Type** assignments via worksheet columns of that name and update in bulk the locally edited values,
Other Properties	Other properties specific to the type of metadata element	The properties are unique to the particular category of metadata, e.g., fields vs. columns vs. tables vs. entities.	**Object specific properties** is an uncommon but sometime important tool for tagging/documenting and analysis. In particular: ○ Editing – One may edit these

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

			properties on the element's details page or when browsing in grid mode. ○ Analysis – You may analyze and, report on the **Semantic Type** assignments via worksheet columns of that name and update in bulk the locally edited values.
Custom Attributes	Any number of custom defined attributes may be associated	These **Custom Attributes** may be defined to be possible associations on a type of data element. Once done, you may use these for tagging/documenting and analysis.	**Custom Attributes** is a very common tool for tagging / documenting data elements and in analysis and tracking. In particular: ○ Editing – One may edit these properties on the element's details page or when browsing in grid mode or by exporting to .csv fomat, editing and re-importing that file. ○ Analysis – You may analyze and, report on the **Custom Attributes** assignments via worksheet columns of that name and update in bulk the locally edited values.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

			○ Completeness – You may analyze as above either by either by value (search or matching) or by *existing* or *lack of* the **Custom Attribute** assignment. ○ Well Managed Types – There is a very robust set of **Custom Attribute Types** which may be used to provide controlled documentation (e.g., enumerations) and very colorful documentation (Wiki-like text)
Comments	Discussion and other general comments provided by all users	**Comments** are free-form text entries that are associated with a given data element and also identified by author and time stamp. They may be used for general annotations, discussions and notifications. Please see Curation for more precise and specific types of Comments.	**Comment** is a very common tool for annotating / documenting data elements. However, as it is entirely free form and more involved than a simple Label, it is general less used in analysis and tracking. In particular: ○ Editing – One may edit these **Comments** on the element's details page or when browsing in grid mode. ○ Analysis – You may analyze and report on the text (search) inside **Comments** worksheet filters and create

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

			additional ones in bulk. ○ Anyone May Comment – There are no permission restrictions on **Comments**, and thus these discussions are open. ○ Completeness – You may analyze by *existance* or *lack of* any **Comments** assignment. ○ DIscussion – As any number of **Comments** may be assigned and author and time-stamp information is captured, they are ideal for on-line discussions.
Curation	**Certification, Endorsements and Warnings**	Just as with **Comments, Curation (Certifications, Endorsements** and **Warnings)** are free-form text entries that are associated with a given data element and also identified by author and time stamp. They may be used for general annotations and notifications.	**Curation** is a very common tool for annotating / documenting data elements. It is entirely free form, but is types into the three types (Certification, Endorsements and Warnings). In particular: ○ Editing – One may edit these **Curations** on the element's details page or when browsing in grid mode. ○ Anyone May Comment – There are no permission restrictions on comments, and

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

			thus these discussions are open. ○ Certificaton Rules – One must have permission to Certify a data element and only there can only be one **Certification**. It is free-form text, though. ○ Analysis – You may analyze and, report on the text (search) inside **Curation** (of any particular type) worksheet filters and create additional ones in bulk. ○ Completeness – You may analyze by *existance* or *lack of* any **Curation** (of any particular type) assignment. ○ DIscussion – As any number of **Endoresements** and **Warnings** may be assigned and author and time-stamp information is captured, they are sometimes use to augment on-line discussions.
Labels	Meta tags which may be	**Labels** are very simple, quick, free-	**Labels** is a very common tool for annotating / documenting data

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

	associated with data elements	form meta-tags that anyone may place on a data element. There is a single namespace pool for **Labels** that is MIMM -wide, and thus shared across the entire repository environment.	elements. However, as it is entirely free form and more involved than a simple Label, it is general less used in analysis and tracking. In particular: ○ Assignment – One may assign these **Labels** on the element's details page or when browsing in grid mode. ○ Analysis – You may analyze and report on the **Labels** as a whole (not text search) inside worksheet filters and create additional ones in bulk. ○ Anyone May Label – There are no permission restrictions on **Labels**, and thus these discussions are open. ○ Completeness – You may analyze by *existance* or *lack of* any **Label** assignment. ○ Tagging – As any number of **Labels** may be assigned and there is little management overhead, they are a quick and light-weight tagging mechanism, though they do

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

			not have the different managed values which **Custom Attributes** may have.
Collections	Groups of elements of any type wich my be collected together	**Collections** are simple collections, like a shopping cart, of elements of any type. Anyone may create a **Collection** and keep it private or you may share these with others.	**Collections** is mostly a simple way to corral a set of elements of any kind. Commonly these will include to-do list elements, assignments (shared with others), collections for later analysis or completeness studies, etc. In particular: ○ Assignment – One may assign any number of elements to one or more **Collections** on the element's details page or when browsing in grid mode. ○ Analysis – You may analyze and report on the **Collections** as a whole (not text search) inside worksheet filters and create additional ones in bulk. ○ Anyone May Collect – There are no permission restrictions on **Labels**, and thus these discussions are open. ○ Completeness – You define a worksheet around a

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

			Collection to determine what has been completed in the set of elements. ○ Tagging – Just as with Lables, one may use a Collection as a tagging mechanism.

Data Documentation

Nearly any metadata element in MIMM may be documented.

Technical objects do not have Business descriptions by default. When an object has an Inferred description the application shows it in the Business description field using the "greyed-out text". You can copy it to the Business description by selecting the text and saving it (with or without edit), exactly what the customer did.

Reuse Business Glossary Terminology

In this scenario you will reuse the Name and Description of a term in a Business Glossary

Steps

From the details page

1. Navigate to the details page for the metadata element you wish to document. Then click the **Overview** tab.
2. Click on the Business Glossary icon and select Classify with existing Term.

MIMM *automatically searches with the physical name of the metadata element.*

You may wish to remove that search filter if you wish to find a different term or one that is spelled differently.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

3. If it did not find the term you are looking for, remove the search filter. Then select the Business Glossary you wish to search for the term.
4. Search or navigate to the term you wish to use to classify this metadata element and select the term.
5. Click OK.

*The **Business Name** (next to the physical name) and **Business Description** now inherit from the term selected.*

Also, you may still edit the name and description.

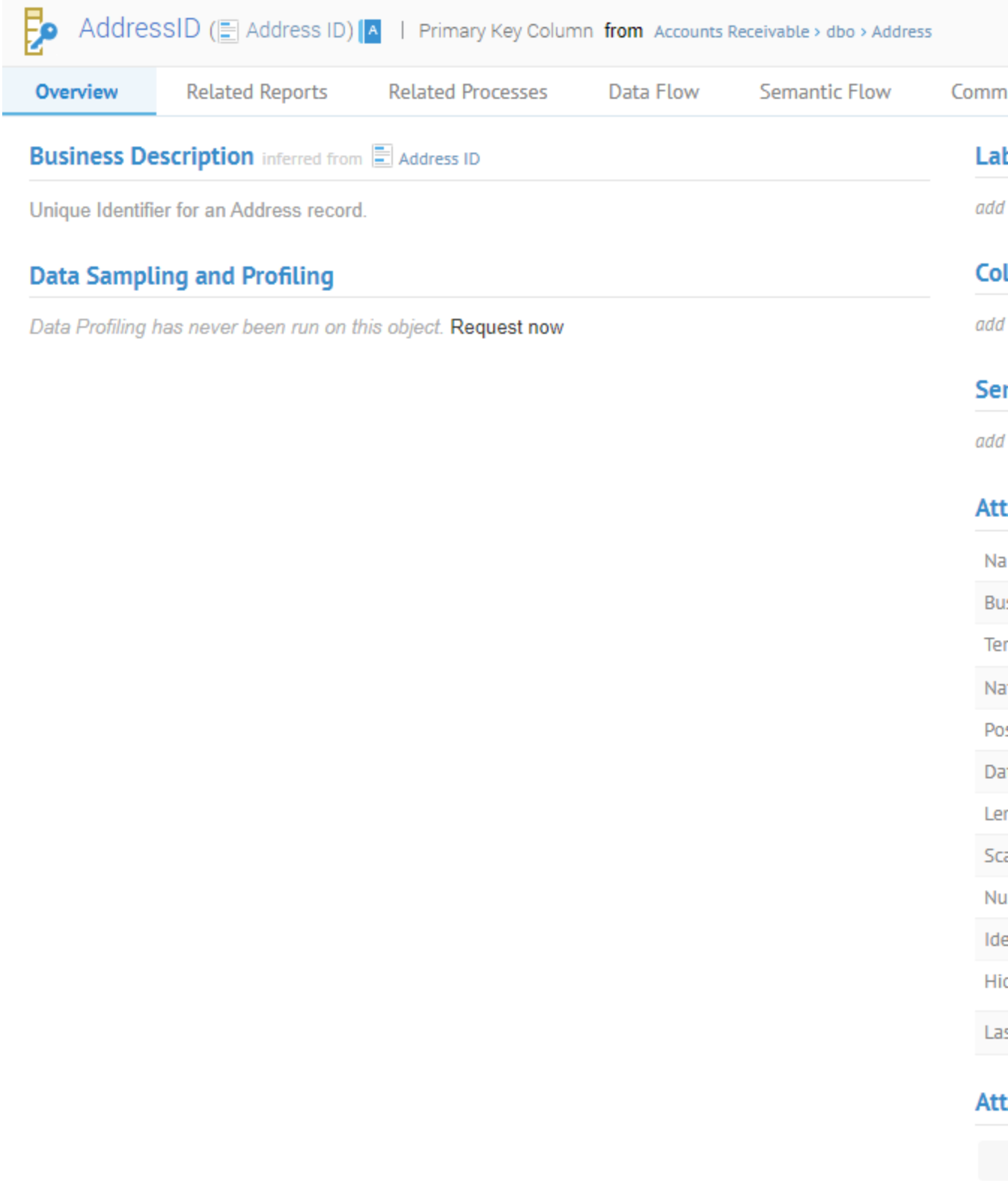
From the Semantic Flow tab

6. Navigate to the details page for the metadata element you wish to document. Then click the **Overview** tab.
7. Click the Semantic Flow tab.
8. Click the Classify button.

Example

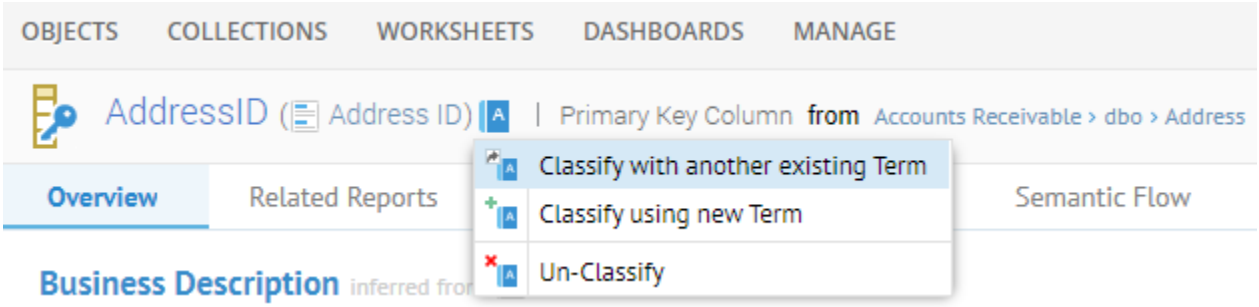
Navigate to the details page for the column **AddressID** in the **Address** table of the **Accounts Receivable** model.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



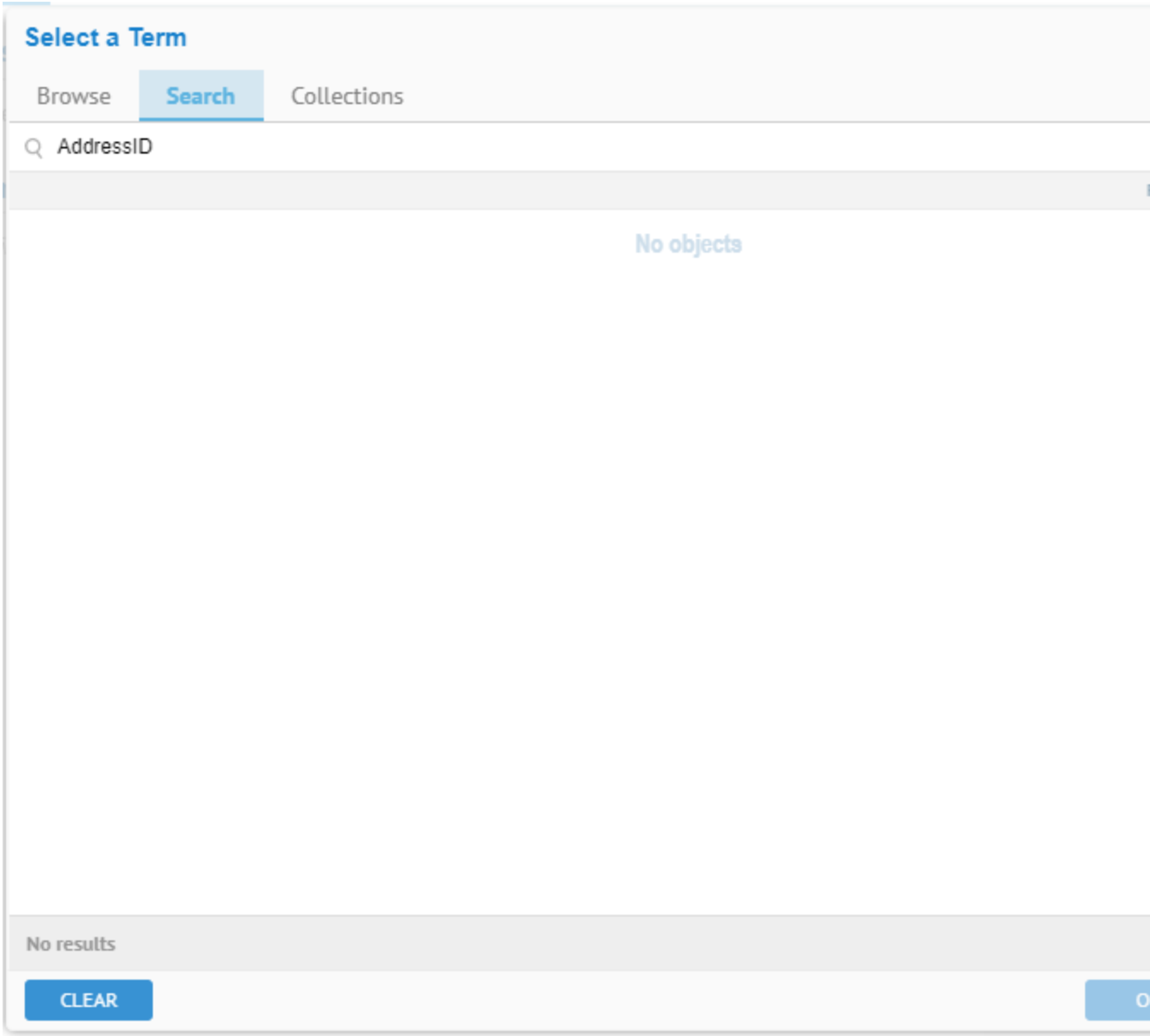
Click the Business Glossary icon and select **Classify with another existing Term**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



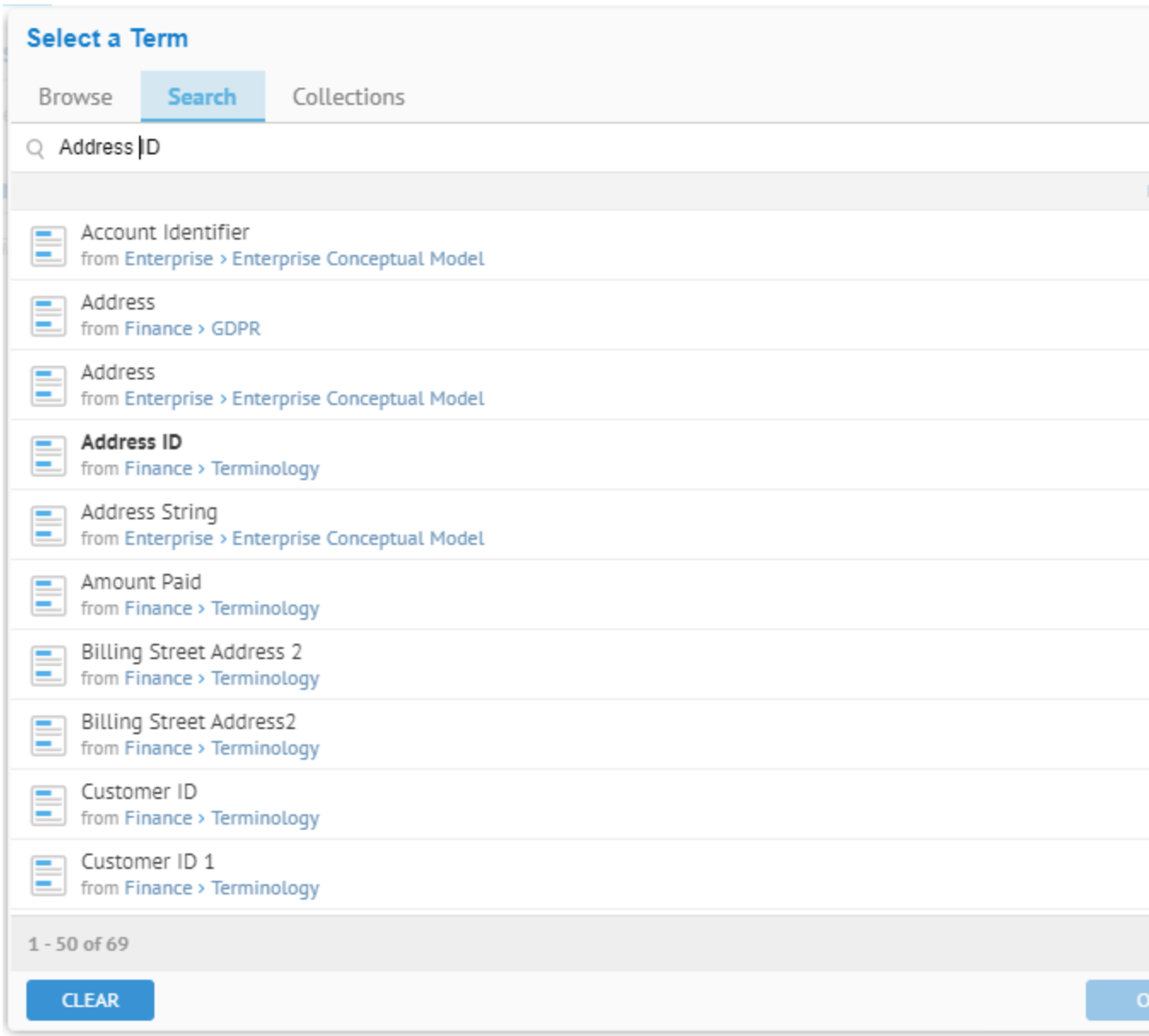
MIMM *automatically searched for AddressID but found no results so you should remove that search filter before looking for you term.*

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



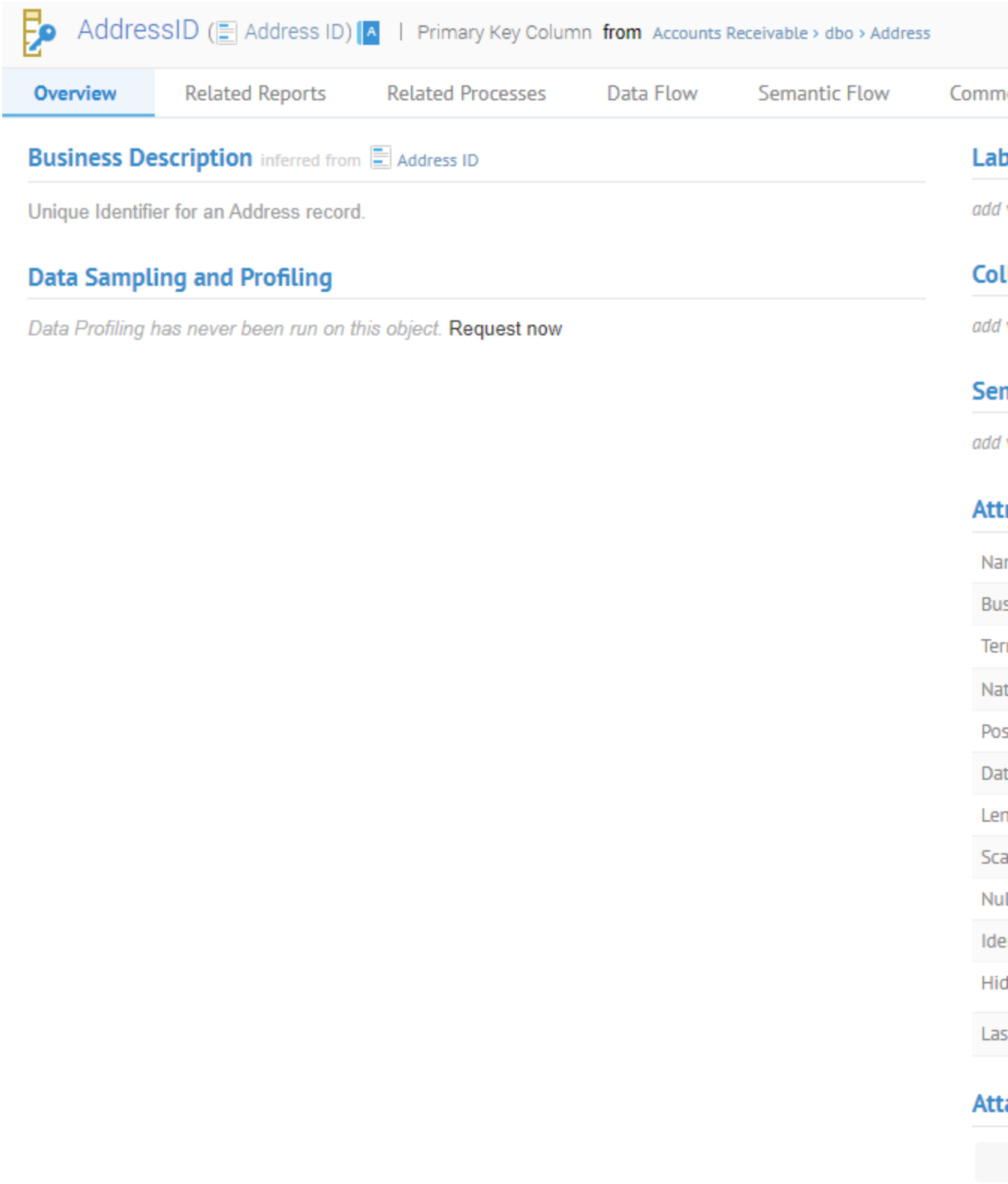
Put a space in the “AddressID” (i.e., make it “Address ID”) search text, so that it matches the logical name that would be in the glossary.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Select the term **Address ID** and click **OK**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



The **Name** and **Business Description** are now inherited from the term.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

*You may remove this inheritance and the classification by again clicking the business glossary icon and selecting **Un-Classify**.*

Stewardship

In a glossary you may assign the role of Steward to any group or user for any term or entire categories of terms. Stewards are users or groups of users who are assigned as point of contact to answer questions for specific objects, as such they are the users or a member of a group who may certify or un-certify terms and data elements. In addition, they may be notified when changes are made to terms as part of the workflow.

Stewardship also applies to harvested models and physical data models. While you may view the stewardship of a model's contents as a column in a worksheet for data elements like tables and columns, the **Steward** property is not actually a property of a table or a column or any object inside a model content. Instead, it is a property on the content as a whole (the entire db import, e.g.). Thus, the **Steward** property on these types of objects is only editable at the model content level on the details page.

The UI includes steward as a column in the grid view because it is an important use case to be able to filter by steward on all the tables in the configuration.

However, you may still take advantage of stewardship assignment at the data element (table or column) level by reusing the stewardship assignments in the glossary and classify the data elements with glossary terms. In this way, the data element inherits the stewardship from the term it is classified by.

Explicitly Define the Business Name and Description

In this scenario you will enter an explicit locally defined **Business Name** and **Description**, overriding the reused **Business Name** and **Description** from a term in a business glossary.

Steps

1. Navigate to the details page for the metadata element you wish to document. Then click the **Overview** tab.
2. In the **Properties**, click on the **Business Name** text and edit.
3. Click on the **Business Description** text and edit.

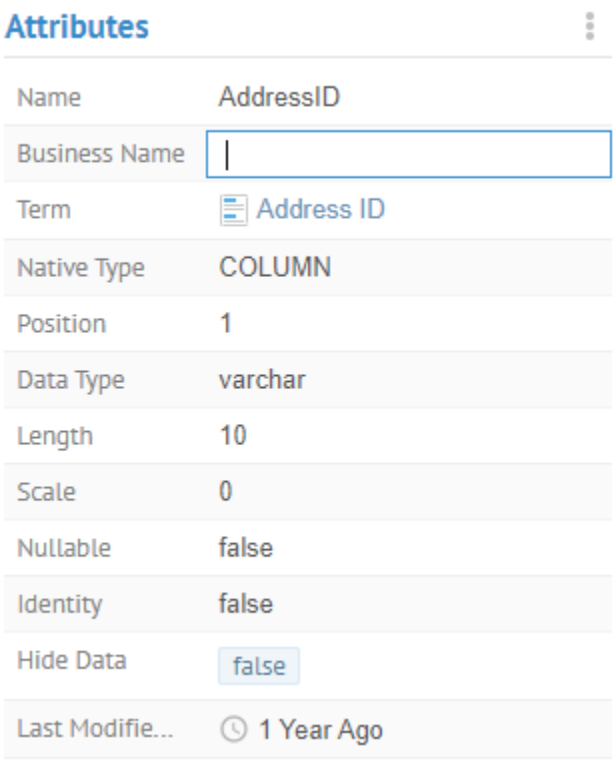
Even when you have an inherited **Business Name** and/or **Description**, you may edit them manually.

*For the **Business Name** but you do so in the **Properties** section of the details page. The name in the upper left is the Name of the term and clicking there will open the details page for that term.*

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Example

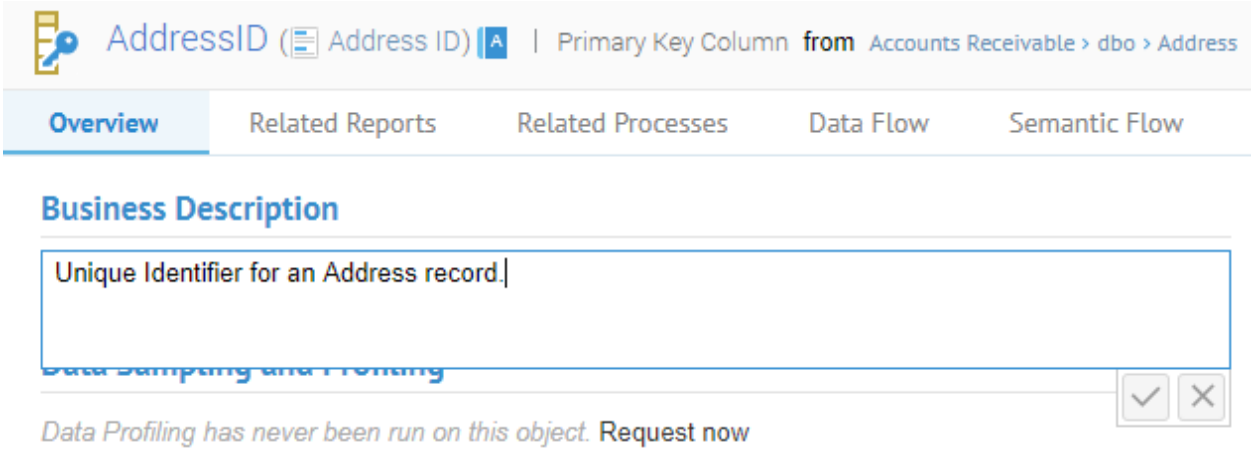
Using the example above, go ahead and edit the **Business Name**.



*Next to the **Business Description** you see **from Address ID**. This text indicates that the value in the **Business Description** is inherited from that term.*

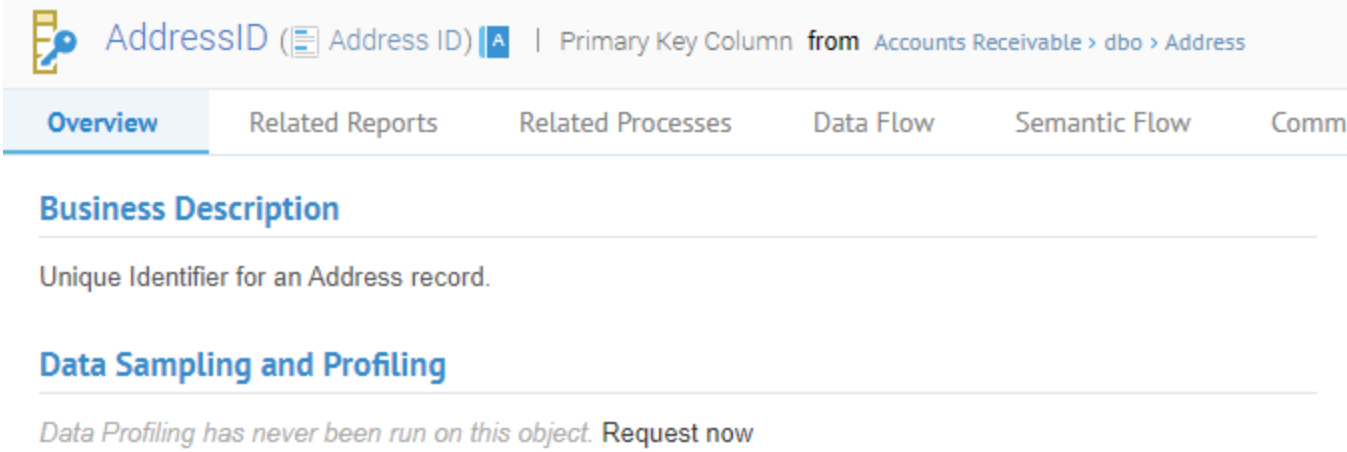
*You may edit the **Business Description** in place. In this case, the term **Description** is replaced by a local **Business Description**.*

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



And click the checkmark.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



And the **Business Description** is updated.

*You no longer see **from Address ID** next to the **Business Description**. This indicates that the value in the **Business Description** is no longer inherited from that term*

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Explorer Further

You may also enter edit the **Business Name** and **Description**, as well as custom attributes by exporting to CSV format and re-importing.

Export Documentation to CSV format (Bulk Update)

You may also enter edit the **Business Name** and **Description**, as well as custom attributes by exporting to CSV format. Thenn you may re-import.

This feature is only available for database models.

Steps

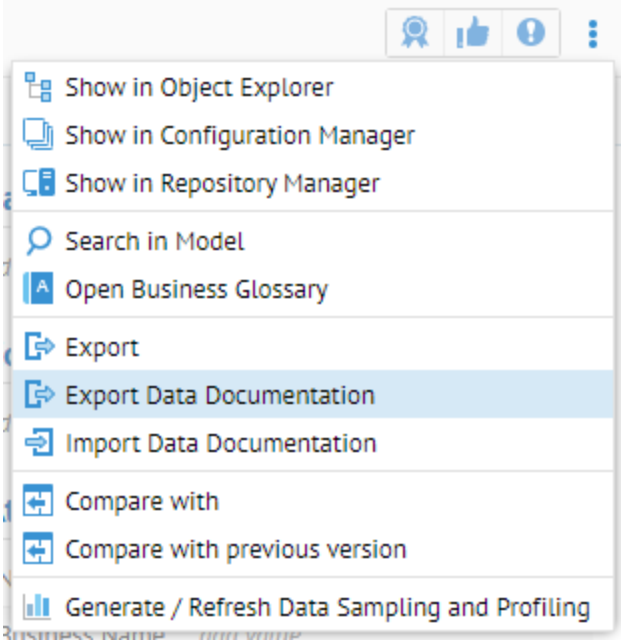
1. Navigate to the details page for the database model for which you want to document the schemas, tables and columns.
2. Click **More actions** (⋮) and select **Export Database Documentation**.
3. Specify the format and click **Download**.

The CSV format file will be downloaded locally.

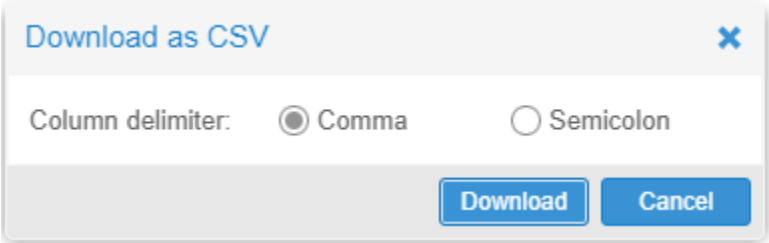
Example

Search for the **Staging DW** database model and go to its details page. Then click **More actions** (⋮) and select **Export Data Documentation**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Specify the format and click **Download**.



Open the resulting .csv file with the the **Business Name** and **Description**, as well as custom attributes in an editor.

Import Documentation from CSV format (Bulk Update)

You may export a .csv format file for editing the **Business Name** and **Description**, as well as custom attributes by exporting to CSV format. Here is how you re-import that file.

This feature is only available for database models.

Steps

1. Navigate to the details page for the database model for which you want to document the schemas, tables and columns.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

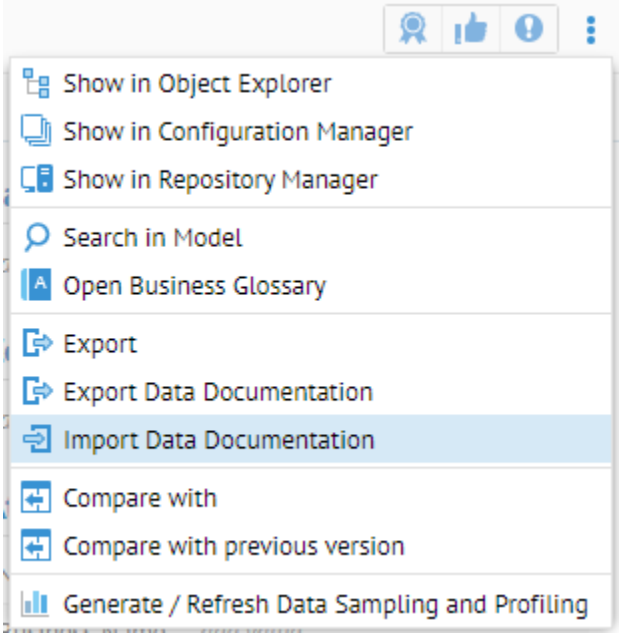
2. Click **More actions** ( ) and select **Import Database Documentation**.

3. Browse to the file, specify the format and click **IMPORT**.

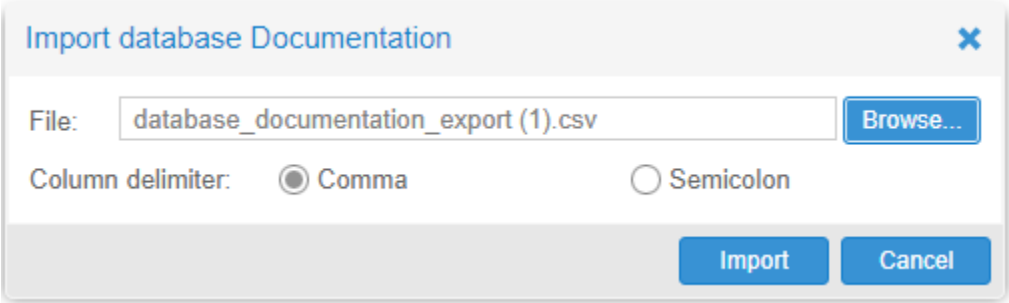
The CSV format file will be uploaded from a local file.

Example

Search for the **Staging DW** database model and go to its details page. Then click **More actions** ( ) and select **Import Data Documentation**.

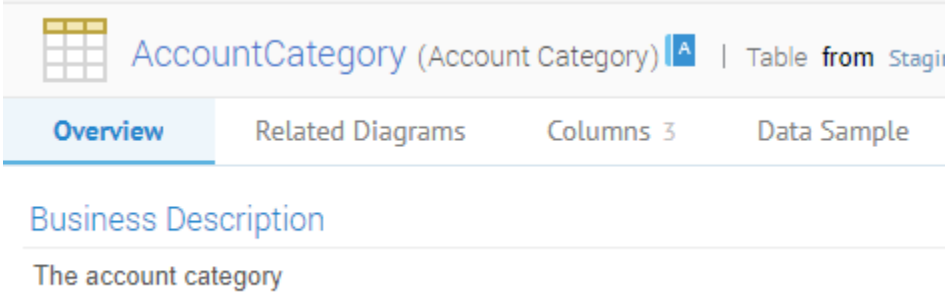


Browse to the file, specify the format and click **IMPORT**.



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Navigate to the **Account Category** table in the model and note the **Business Name** and **Description** and other edits are present.



Semantic Flow Tab and Inferred Business Name and Description

Inferred semantic relationships and definitions

In this scenario you will work with inferred semantic relationships for the Business Name and Description.

Steps

From the details page

1. Navigate to the details page for the metadata element you wish to document. Then click the **Overview** tab.
2. Click the **Semantic Flow** tab.
3. Click Definition in the Type pull-down in the upper right.
4. If the metadata element you are on is not yet classified, you may click the Classify button to classify with a term
5. If there is a semantic mapping defined from another model to the model that this metadata element you are is in, then you may click the Map button to create a semantic link from a metadata element in that other model and this one.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

6. Click the List tab on the left. You may see a number of items in the list. You may do the following here
7. Click Classify to directly classify the metadata element with a term
8. Click Map (if there is a semantic mapping defined to this model) to semantically map the metadata element
9. Click an item in the list and you may:
    - **Classify**/**Un-Classify**
    - **Map**/**Un-Map**
    - Standard icons for lineage, etc.

The items in the list are all the:

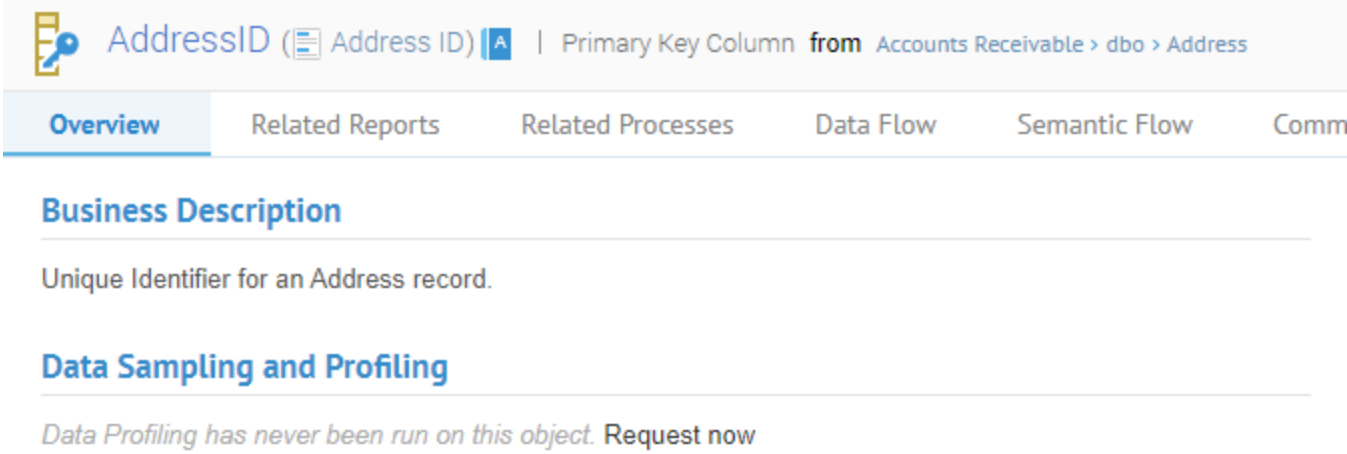
- ***Classifications*** *(terminology)*
- ***(semantically) Mapped*** *either term from other business glossaries or logical metadata element from logical or conceptual model*
- ***Inferred*** *semantic definitions which are Example*

These items are used to infer the ***Business Description****. The order of priority is* ***Classified*** *then* ***Mapped*** *then* ***Inferred****.*

Example

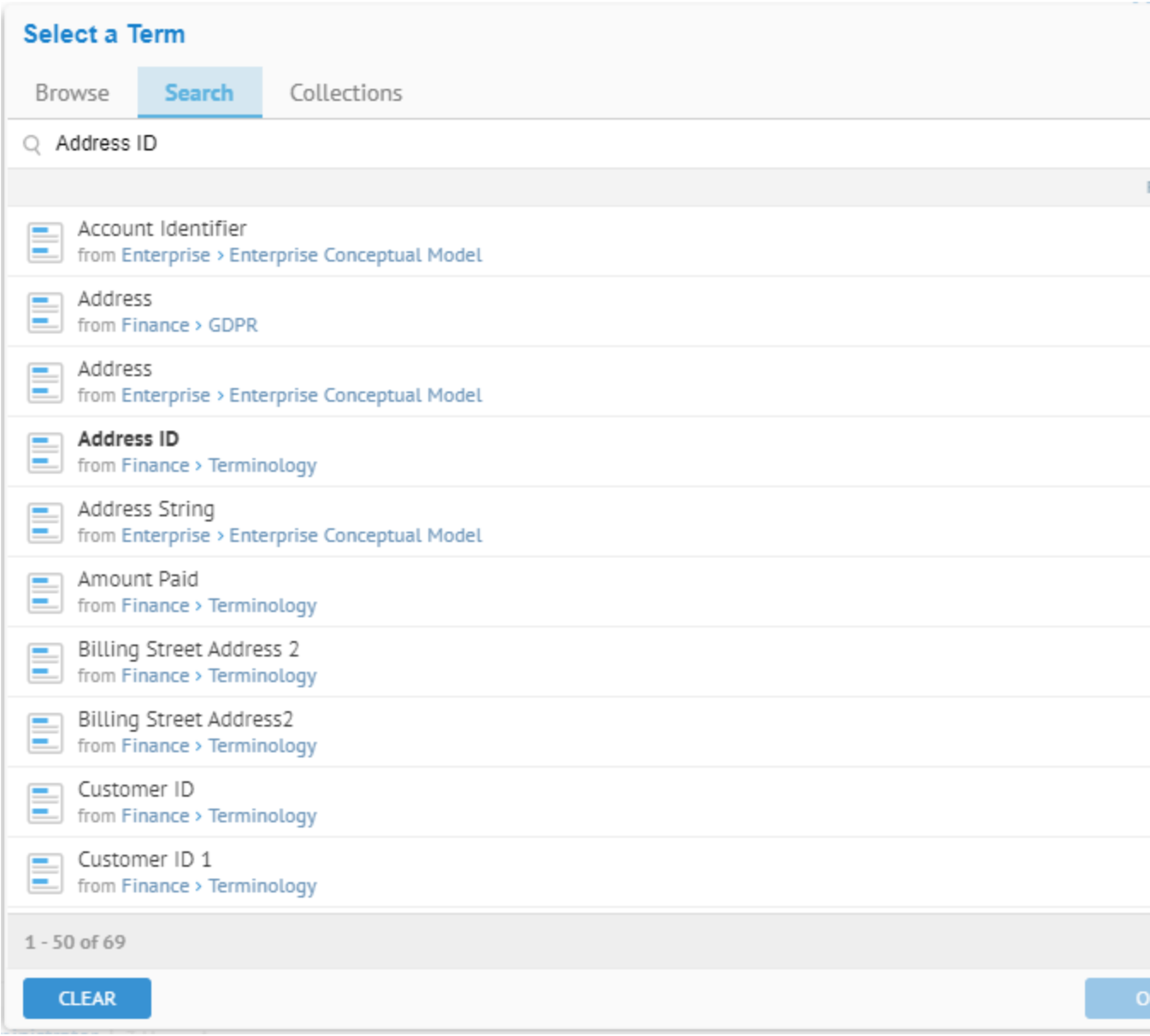
Navigate to the details page for the column **AddressID** in the **Address** table of the **Accounts Receivable** model.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click the Business Glossary icon and select **Classify with another existing Term**.

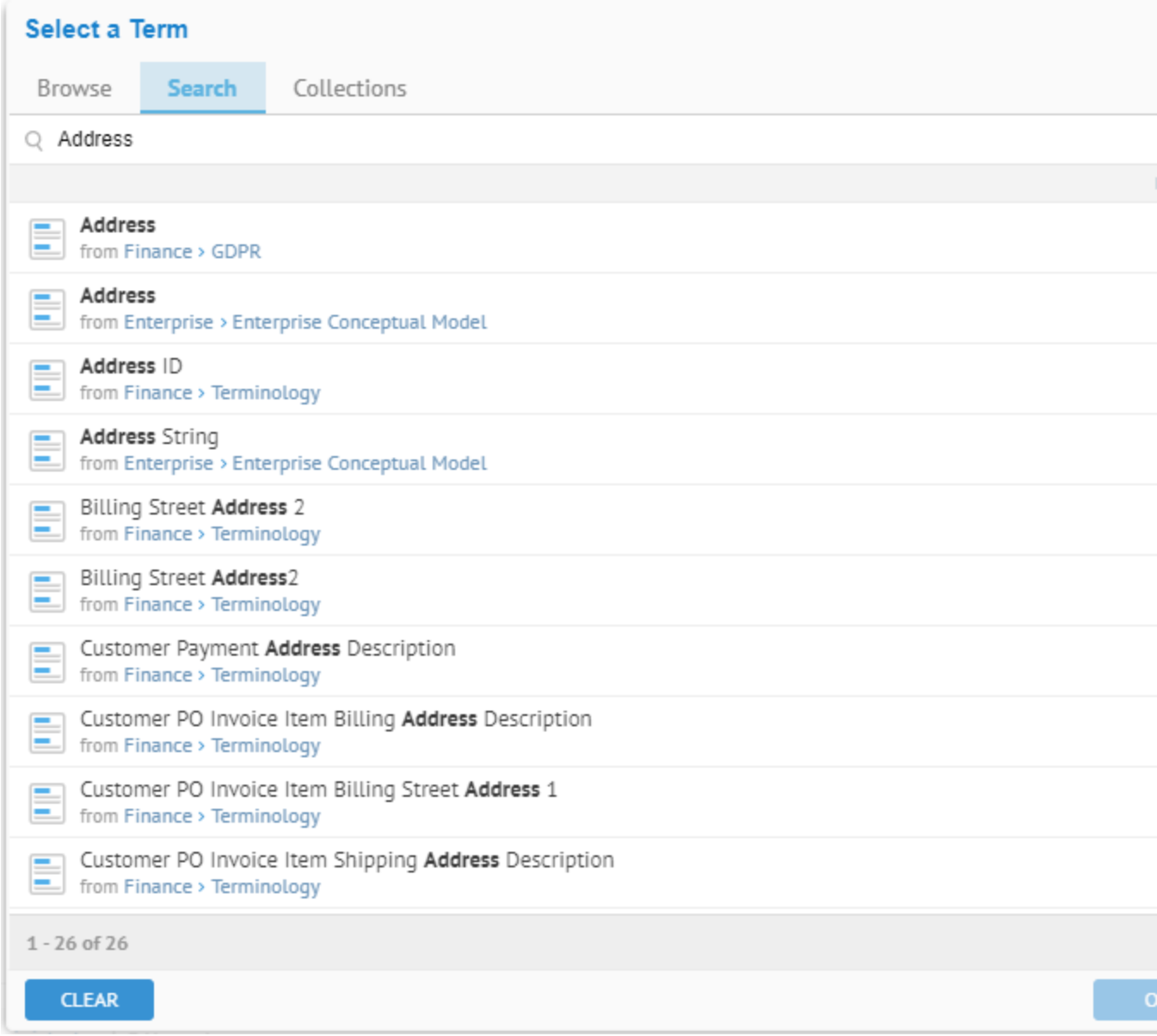
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



MIMM *automatically searched for AddressID but found no results so you should remove that search filter before looking for you term.*

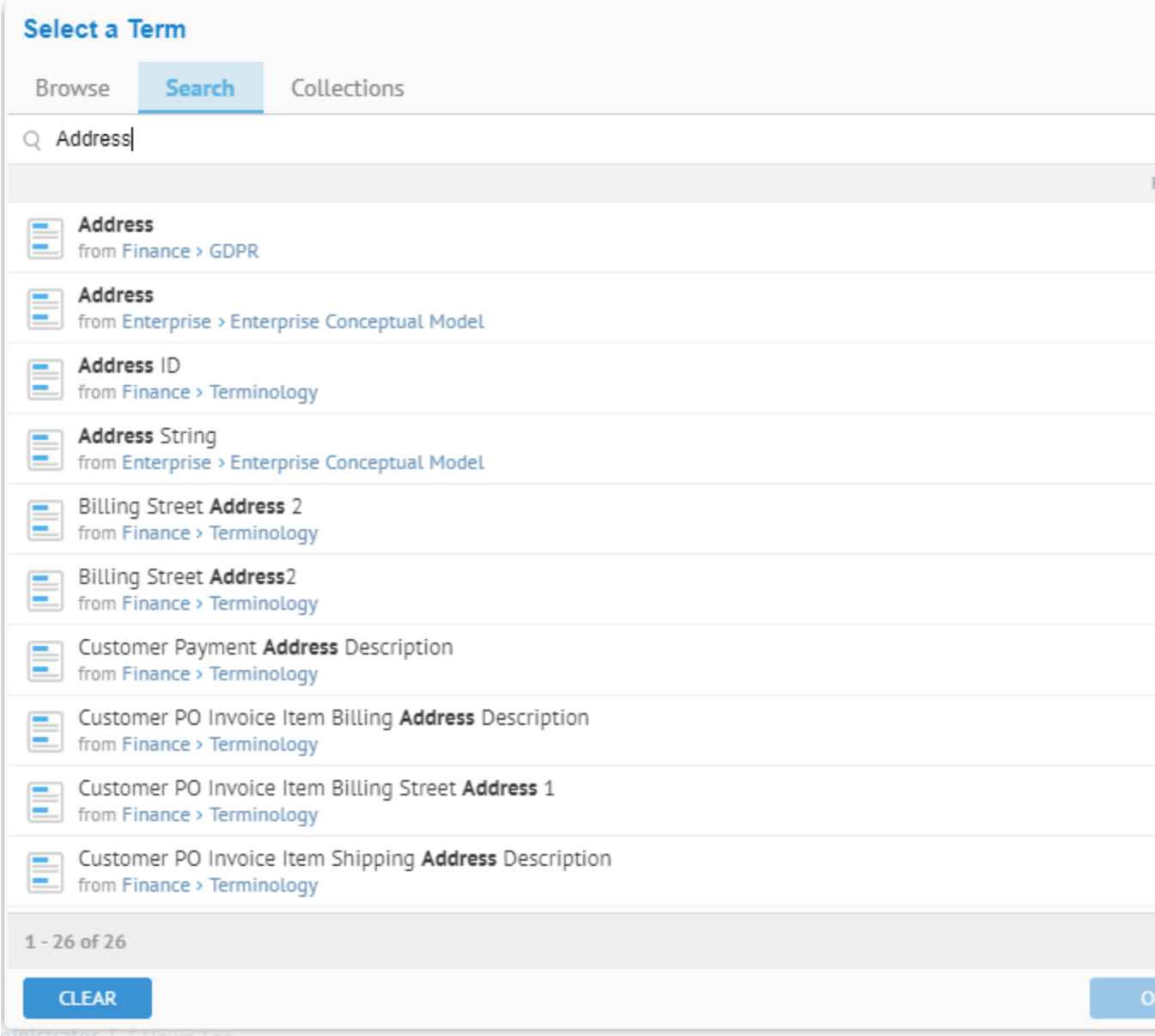
Remove the current search filter and search for “Address”.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Select the term Address ID and click OK.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



The **Name** and **Business Description** are now inherited from the term.

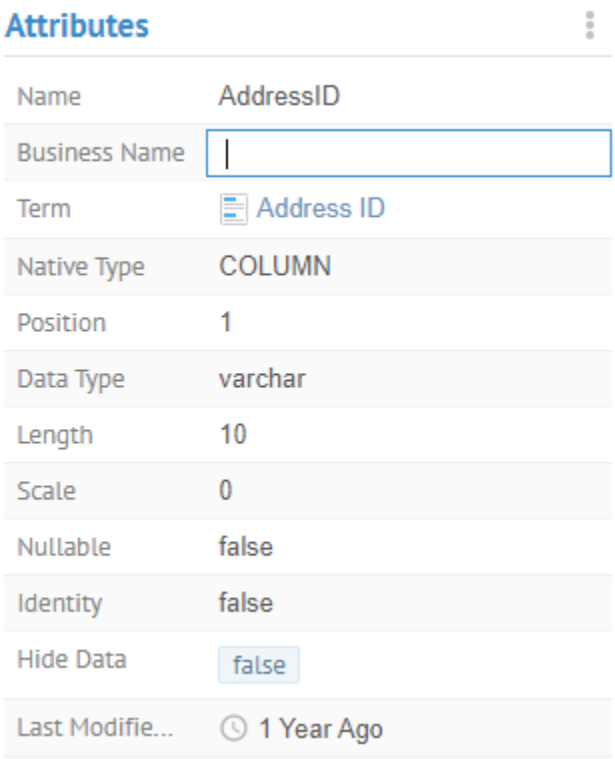
*You may remove this inheritance and the classification by again clicking the Business Glossary icon and selecting **Un-Classify**.*

Even with this inheritance, you may edit the **Business Name** and **Description** later.

*You may update the **Business Name** manually, but you do so in the **Properties** section of the details page. The name in the upper left is the Name of the term and clicking there will open the details page for that term.*

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Go ahead and edit the Business Name.

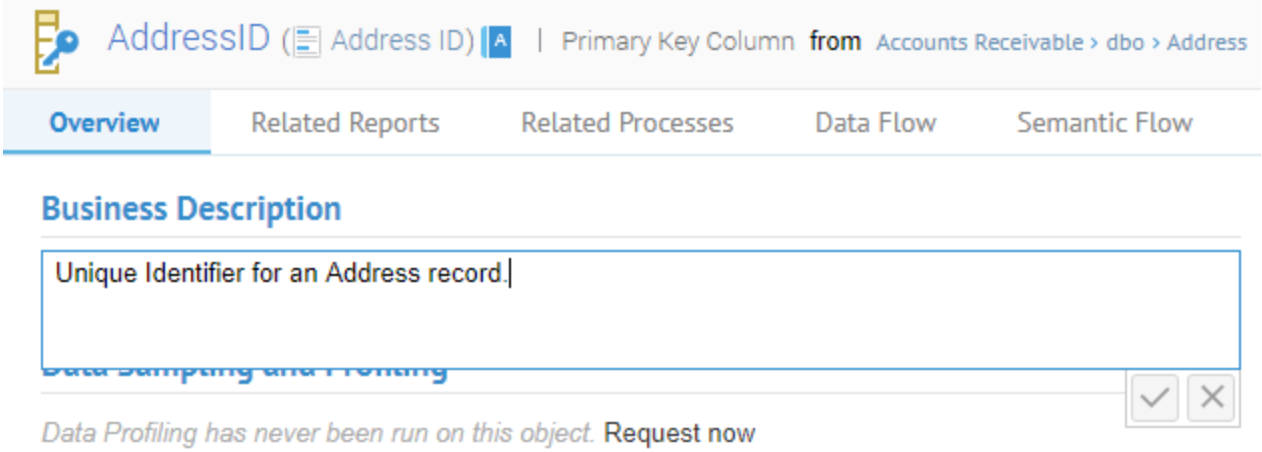


*Note, next to the **Business Description** you see **from Address ID**. This text indicates that the value in the **Business Description** is inherited from that term*

*You may edit the **Business Description** in place. In this case, the term **Description** is replaced by a local **Business Description**.*

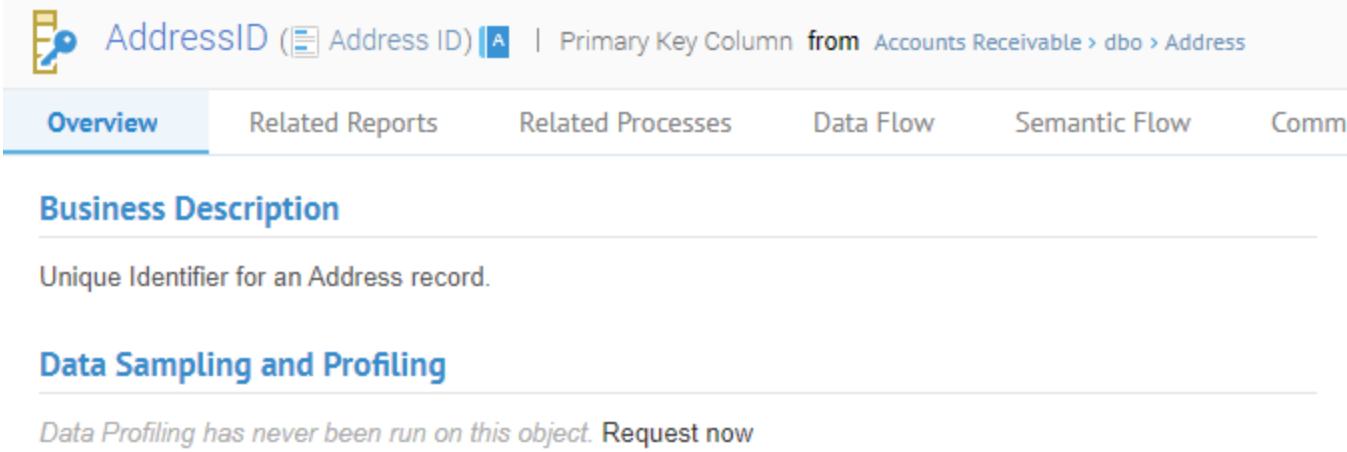
Go ahead and edit the **Business Description**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



And press the checkmark.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



And the **Business Description** is updated.

*You no longer see **from Address ID** next to the **Business Description**. This indicates that the value in the **Business Description** is no longer inherited from that term*

Inferred Name and Description Worksheet

As an effective tool to:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

- Identify documented data elements
- Identify those data elements which still require documentation

You may define a worksheet which shows both the locally defined and inferred **Business Name** and **Description** for data element, e.g., the **Fields** of a data lake.

Steps

1. Create a new worksheet.

2. Filter to the Contents and Categories you wish to analyze.

3. Add the following columns:

   - Business Name
   - Business Name Inferred
   - Business Name Inferred Origin
   - Business Description
   - Business Description Inferred
   - Business Description Inferred Origin

Example

Ensure proper permissions

1. Sign in as a user with at least the **Manage** security role on the Configuration you are in.

Create the content

2. Go to the **MANAGE > Configuration** in the banner.

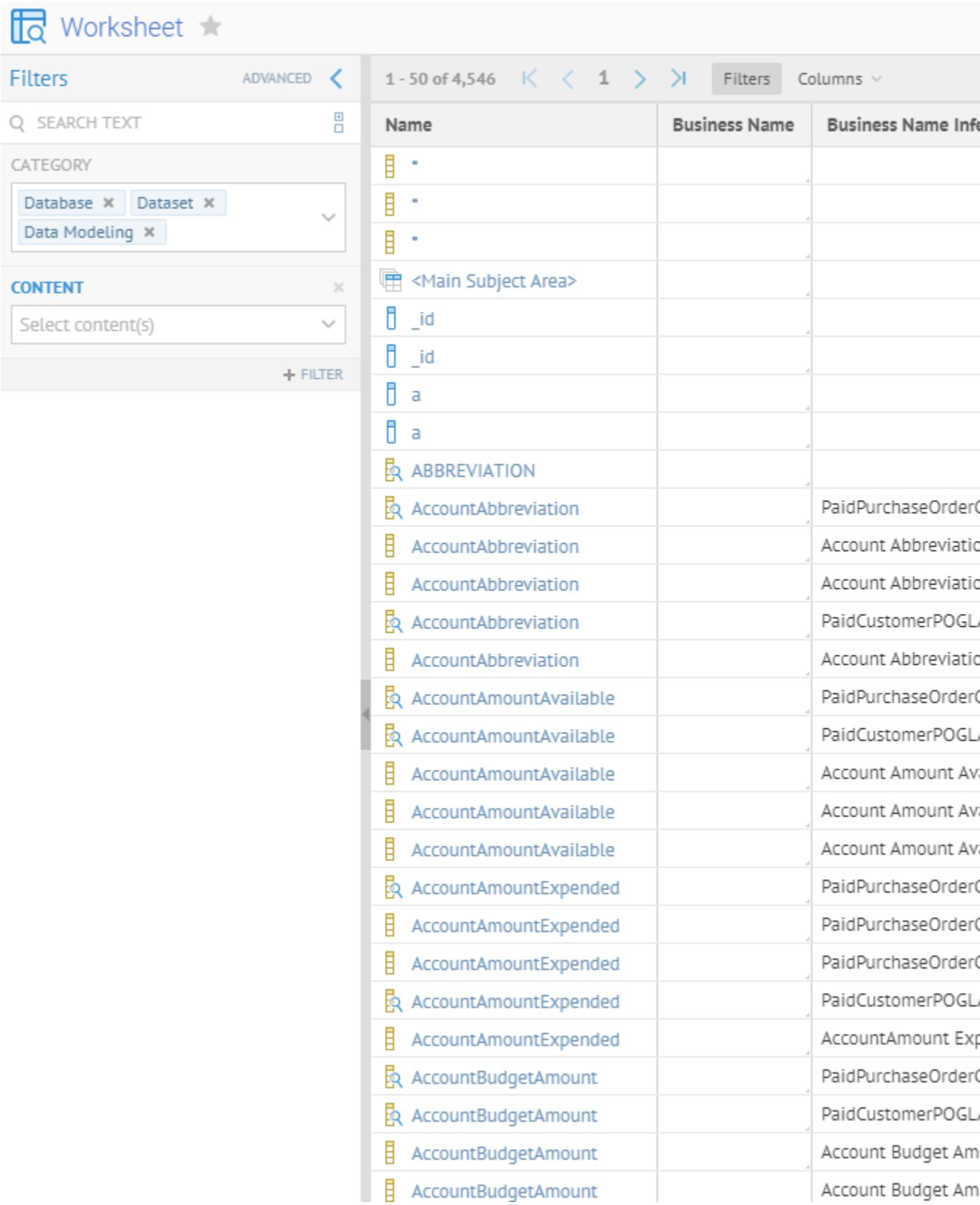
3. Click the plus sign under Configuration Manager and select **Glossary**.

4. Enter a Name and Description for the model and click OK.

5. Click **Columns** to add the following columns from the worksheet:

   - Business Name
   - Business Name Inferred
   - Business Name Inferred Origin
   - Business Description
   - Business Description Inferred
   - Business Description Inferred Origin

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Social Curation

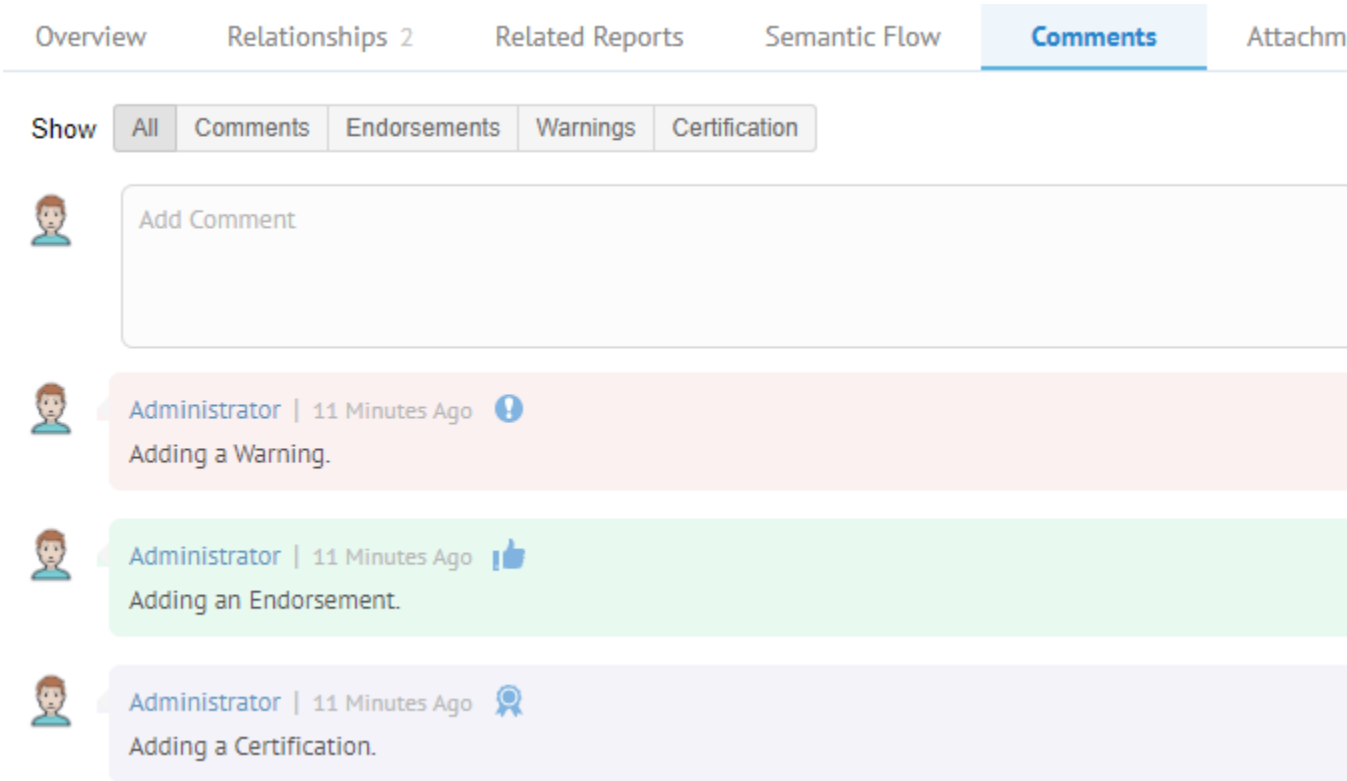
You may certify, Endorse or provide warnings on metadata elements and relationships among them. For metadata elements you may do so on that element's details page.

Steps

1. Navigate to the details page for the metadata element you wish to curate. You may do so from any tab.
2. Click on **Certify**, **Endorse** or **Warn**.

Any user may Comment, Endorse or Warn. Users with the Manager security role may edit or removes those of other users. Only the steward and Administrators may certify.

Example



Certify

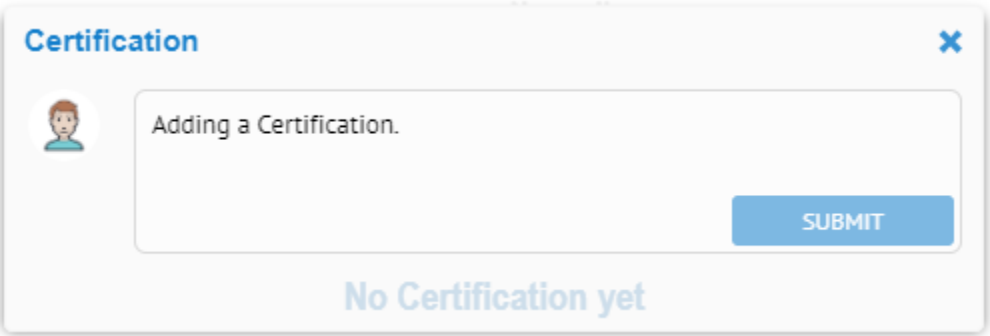
Click **Certify**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

*Any user may **Endorse** or **Warn**, unless your group assignment Properties restricts the **Can Label Property***

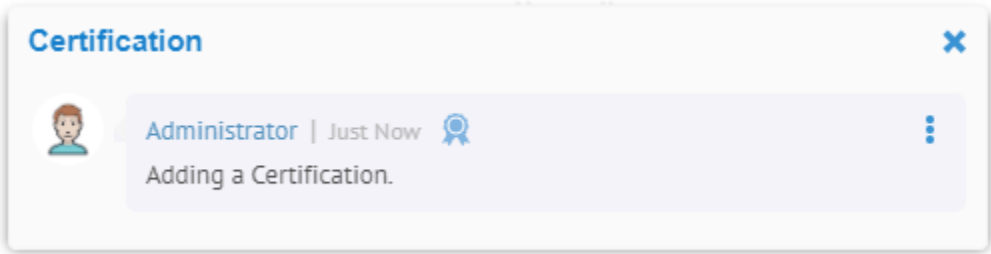
*You must have the Steward assignment on the model containing this metadata element to **Certify**.*

You then may document the certification action.



Click Submit, and close the dialog.

The metadata element is certified.



Only one certification is allowed per object. However, one may amend the certification comment and of course remove the certification with proper permissions.

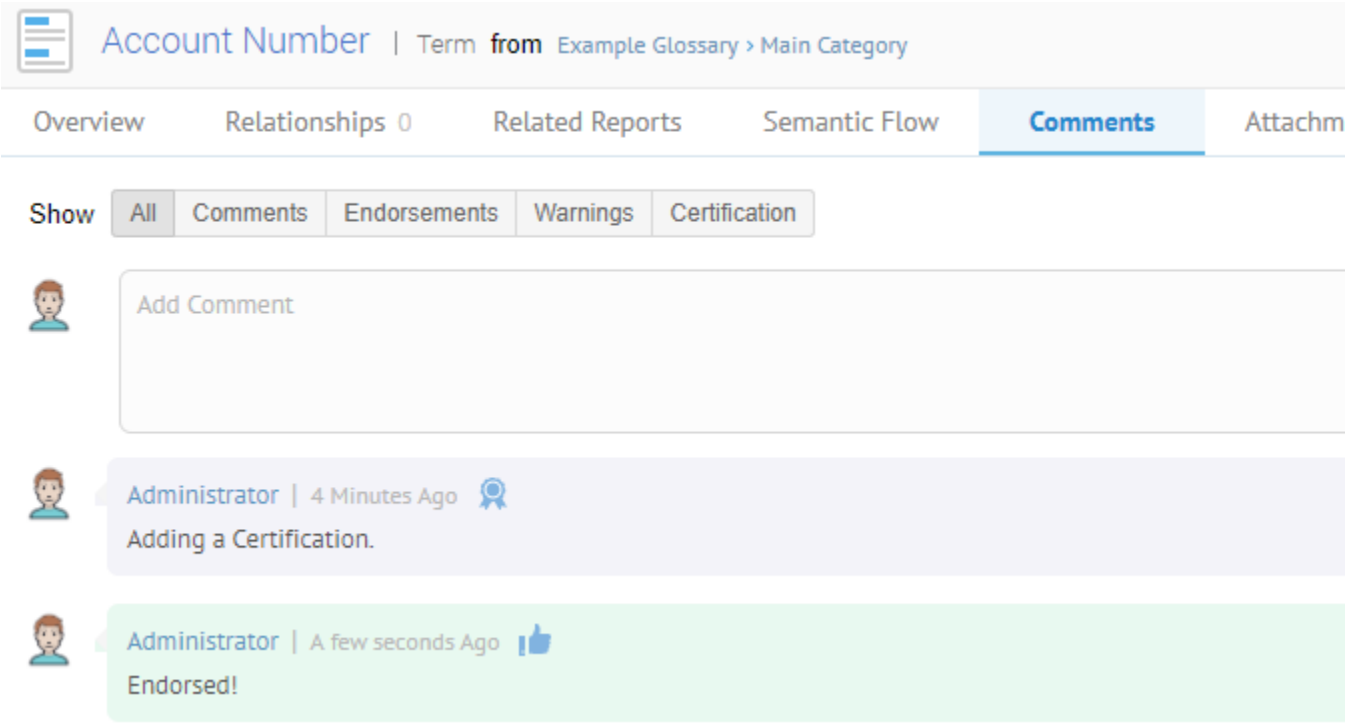
Endorse

Click **Endorse**.

*Anyone may **Endorse**.*

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

You then may document the certification action.



Note the 1 next to the Endorse icon. This tallies the number of endorsements.

Explore Further

Relationships among tables

One may also curate relationships by navigating to the details page for one of the tables (classifier level object, such as tables, flat files, entities, views, etc.) involved in the relationship. More details here.

Semantic Type Discovery

MIMM has a concept of semantic types. These types may be applied like tags to column level (e.g., columns in a database or fields in a file) objects and tag that object to be a type of object, e.g., **Social Security Number** or **Gender**. In this way, one may categorize by semantic type and thus identify, sort, operate on different metadata elements all of that same type.

You may manually assign semantic types to a metadata element from the element's details page or when browsing in grid mode. In addition, as part of the harvesting and data profiling process, MIMM will suggest semantic type assignments that may be confirmed and made permanent.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Steps

1. Ensure that you have specified the appropriate data sampling and profiling options before harvesting.
2. Navigate to the details page for the metadata element you wish to work with.

> *You may also review and editing semantic type assignments in grid mode. However, they cannot be assigned in bulk.*

3. MIMM will have proposed semantic types.
4. To confirm a type proposal, click the check.
5. To reject a type proposal, click the X.

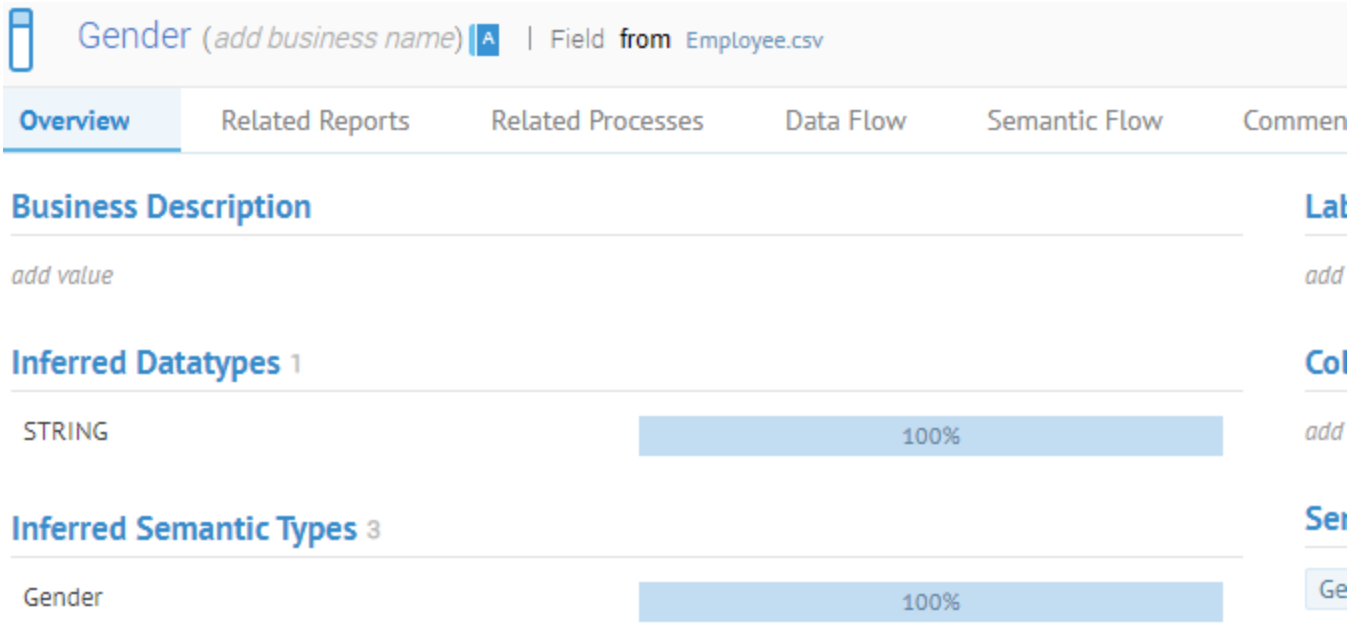
> *Reject a semantic type proposal is permanent, and in future harvests it will not be suggested again. You may, however, assign it manually in the future.*

6. To specify a semantic type that is not currently assigned, click in the box and start typing. A pull-down list with options of valid semantic types will be provided to pick from.

Example

Navigate to the details page of the **Gender** field in the **Employee.csv** file.

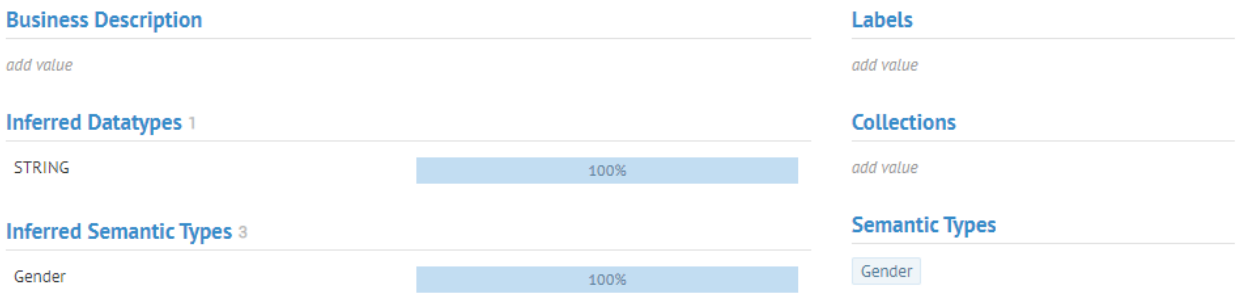
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



There are two suggested Semantic Types. Confirm the Gender type by clicking the check mark next to that type. Then reject the Civility type by clicking the X next to it.

> *You will receive a warning that this action is permanent.*
>
> *Are you sure you want to reject Civility Semantic Type?*
>
> *It will not be proposed again for this object if you reject it but you will still be able to manually add it.*

And the result is a single confirmed type.



Explore Further

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Valid semantic types

The available set of semantic types is strictly controlled, thus you may not simply type a new one in when assigning them to a metadata element. A semantic type definition is more than just a name. In includes rules to match against (textual pattern matching rules or a list of valid values).

The current set of valid semantic types may be reviewed, edited and removed using the manage semantic types feature.

Hiding profiling and sample data by semantic type

You may ensure that that sample and profile data are hidden from the casual user by setting a Hide flag on that metadata element.

In addition to manually setting this value, you may also define a semantic type to hide the data sampled and profiled on subsequent harvests. Thus, e.g., you could define the semantic type US Social Security Number to be hidden for all metadata elements of that semantic type. Then, as the data is profiled in subsequent harvests, and MIMM determines that an element is of that semantic type, its flag will be set to hidden. Go to manage semantic types to manage this feature.

Auto-tagging

MIMM has a concept of semantic types. These types may be applied like tags to column level (e.g., columns in a database or fields in a file) objects and tag that object to be a type of object, e.g., **Social Security Number** or **Gender**. In this way, one may categorize by semantic type and thus identify, sort, operate on different metadata elements all of that same type.

You may associate a semantic type with a term in a glossary. When you do so as part of the definition of that semantic type, then semantic definition lookup (Name and Description) will provide the information for that term. In addition, when reporting on Semantic Usage from that term, you will obtain all these objects assigned that semantic type.

Steps

1. Add and edit a semantic type as needed.

2. Browse for a glossary term to associate with the semantic type.

3. Navigate to the details page for the metadata element you wish to work with.

> *You may also review and editing semantic type assignments in grid mode. However, they cannot be assigned in bulk.*

4. MIMM will have proposed semantic types.

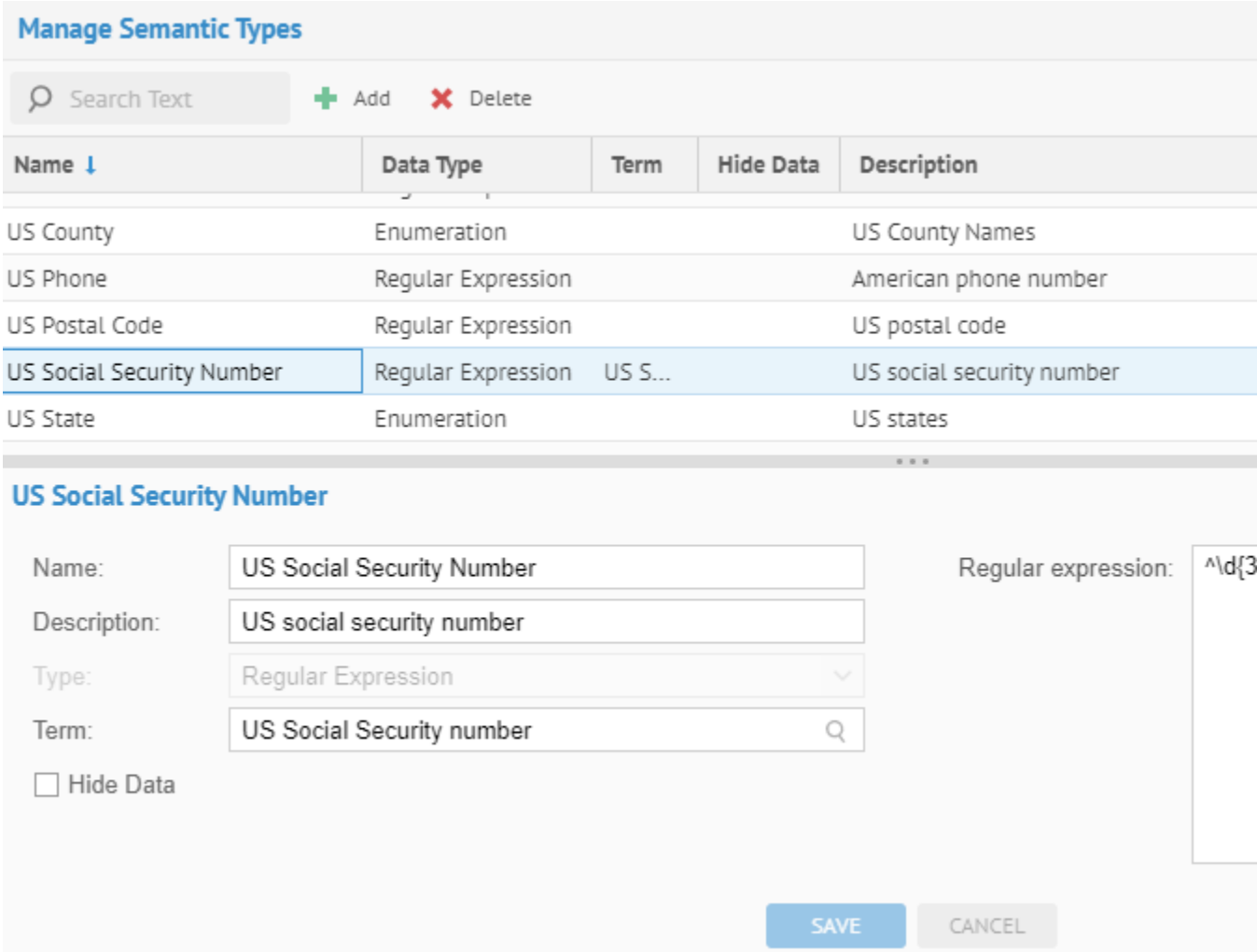
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

5. Either accept the already assigned semantic type or specify the semantic type.
6. Go to the **Lineage Flow** tab. Click on **Definition** and note the term associated with the semantic type is now presented..
7. Click on the term. Go to the **Lineage Flow** tab. Click on Usage and note the metadata object (and others assigned to the same semantic type) are now presented.

Example

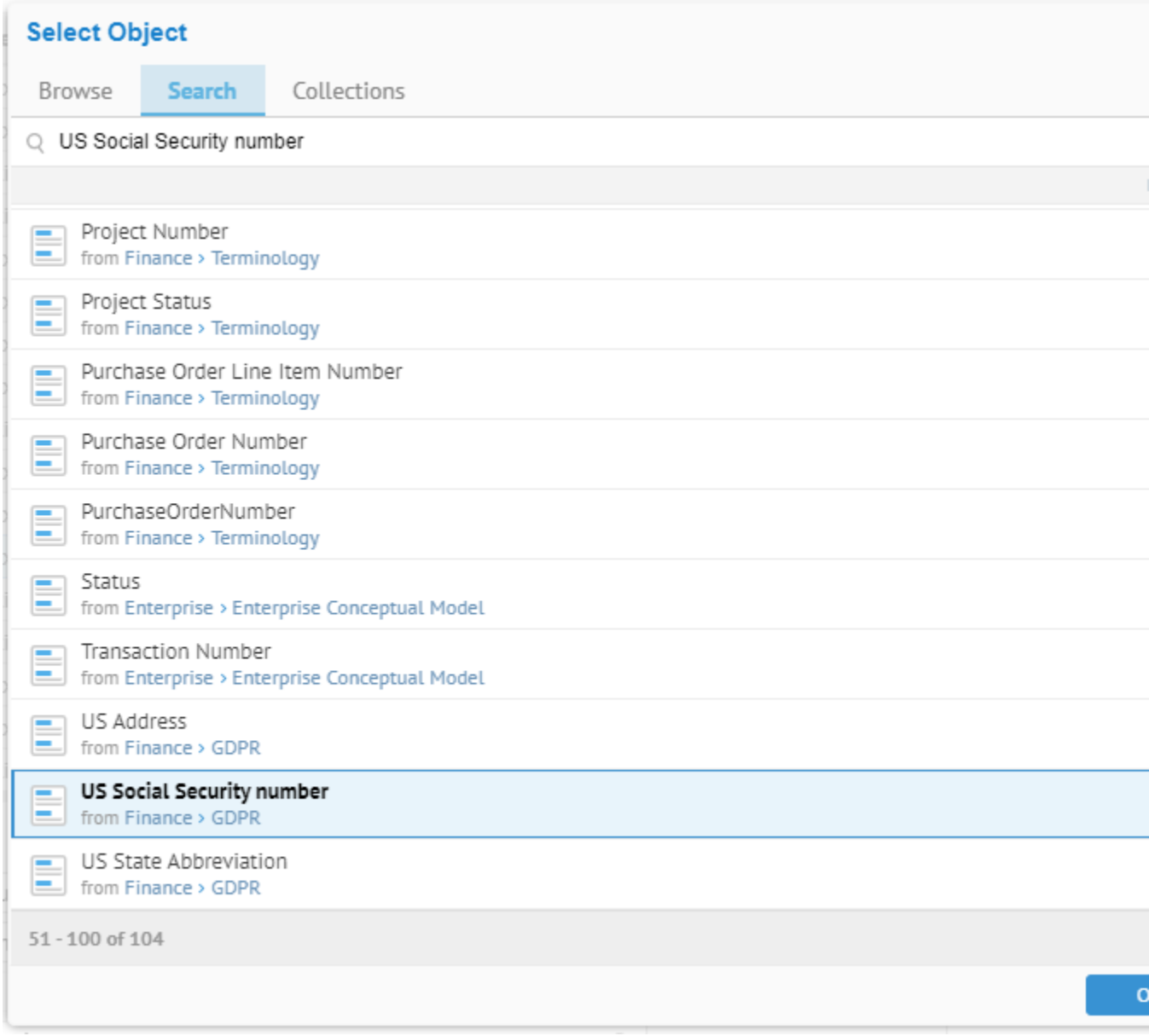
Go to the **MANAGE** > **Semantic Types** in the banner.

Click the line with the **US Social Security Number** semantic type.



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

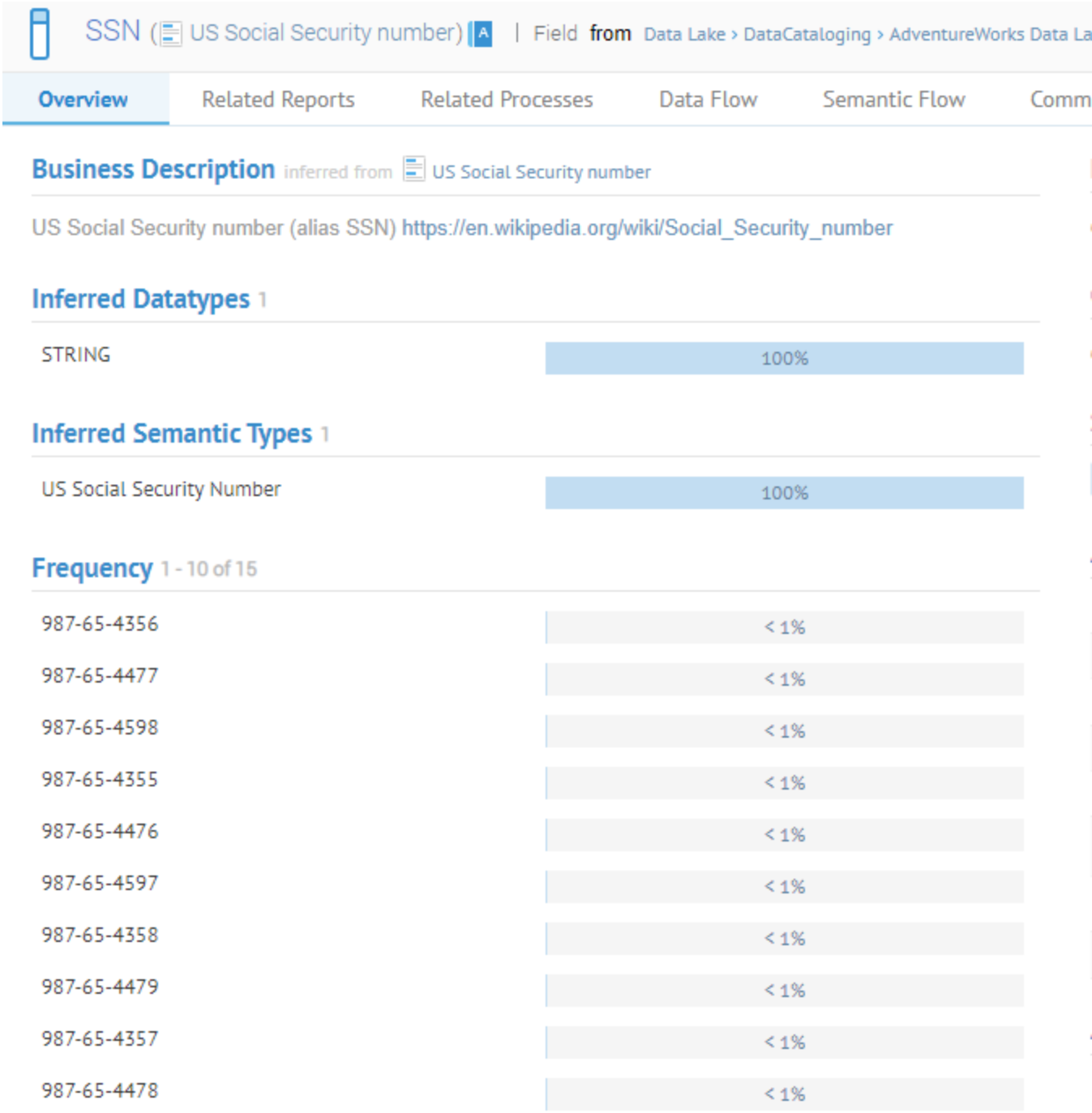
Click the browse icon ( ) next to **Term**. Select the term **US Social Security Number** in the Object Explorer dialog.



Click OK.

Navigate to the details page of the **SSN** field in the **Employee.csv** file.

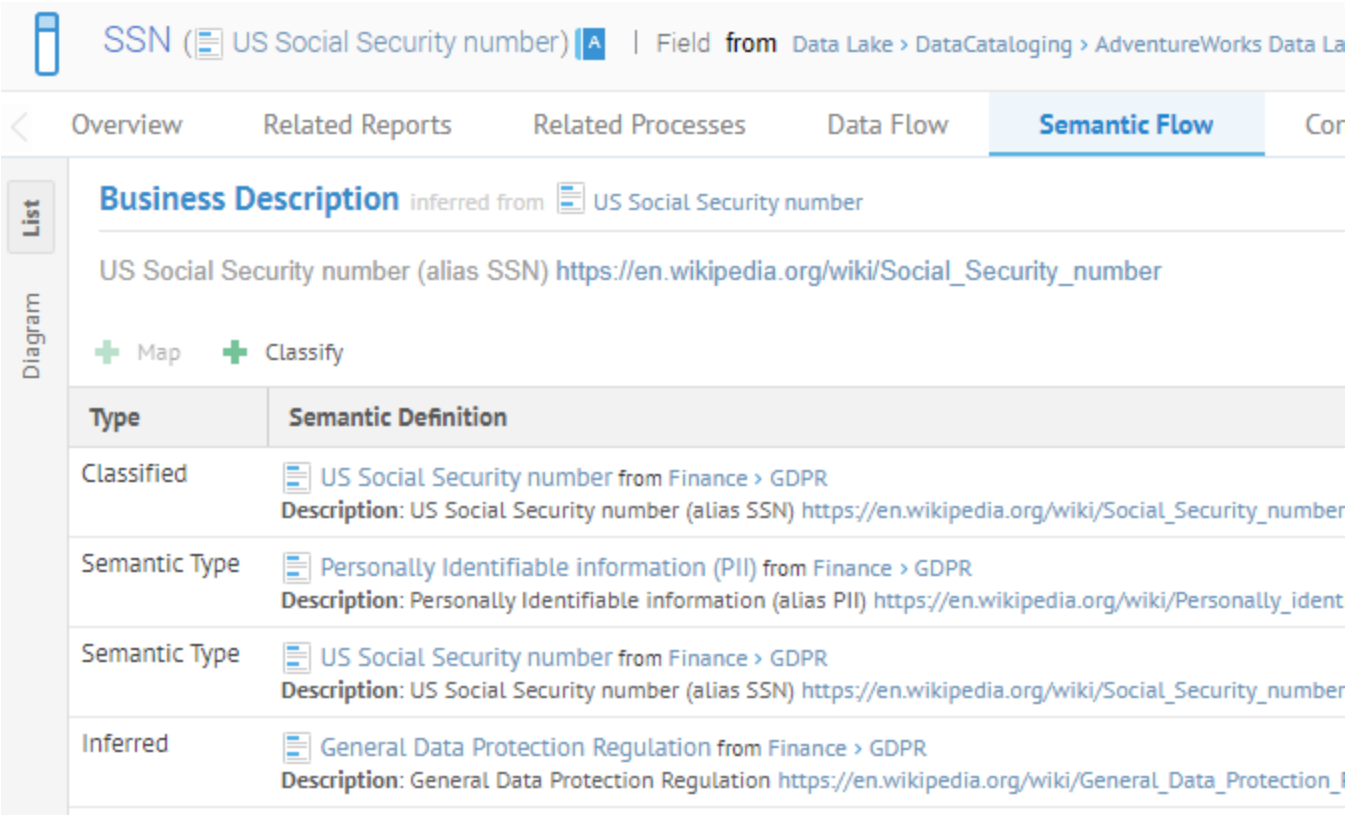
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



*The **SSN** field is assigned the **US Social Security Number** semantic type. Thus, the **Business Name** and **Description** are populated with the information of the SSN term.*

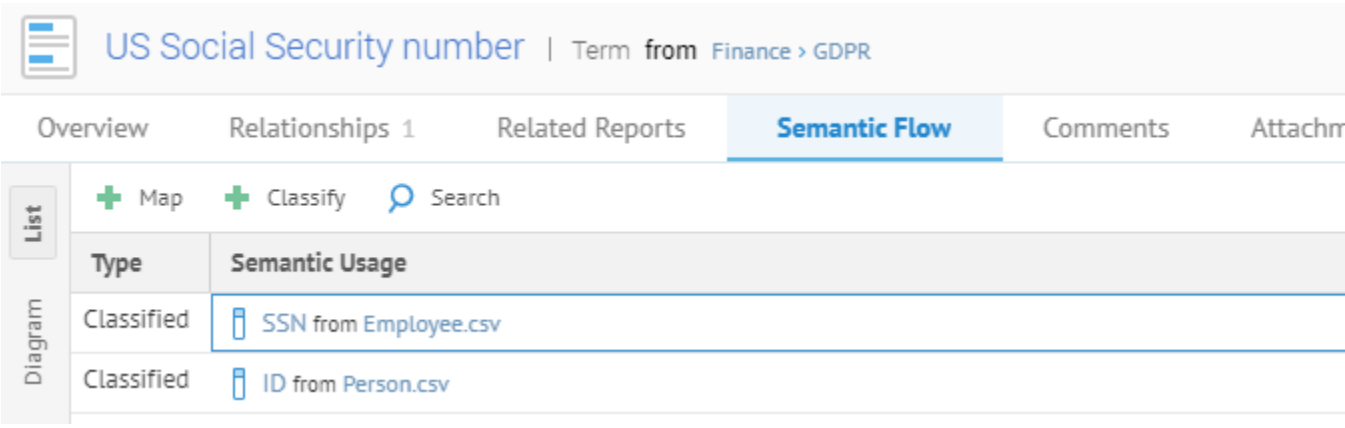
Go to the **Semantic Flow** tab. Click **Definition** in the upper right.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

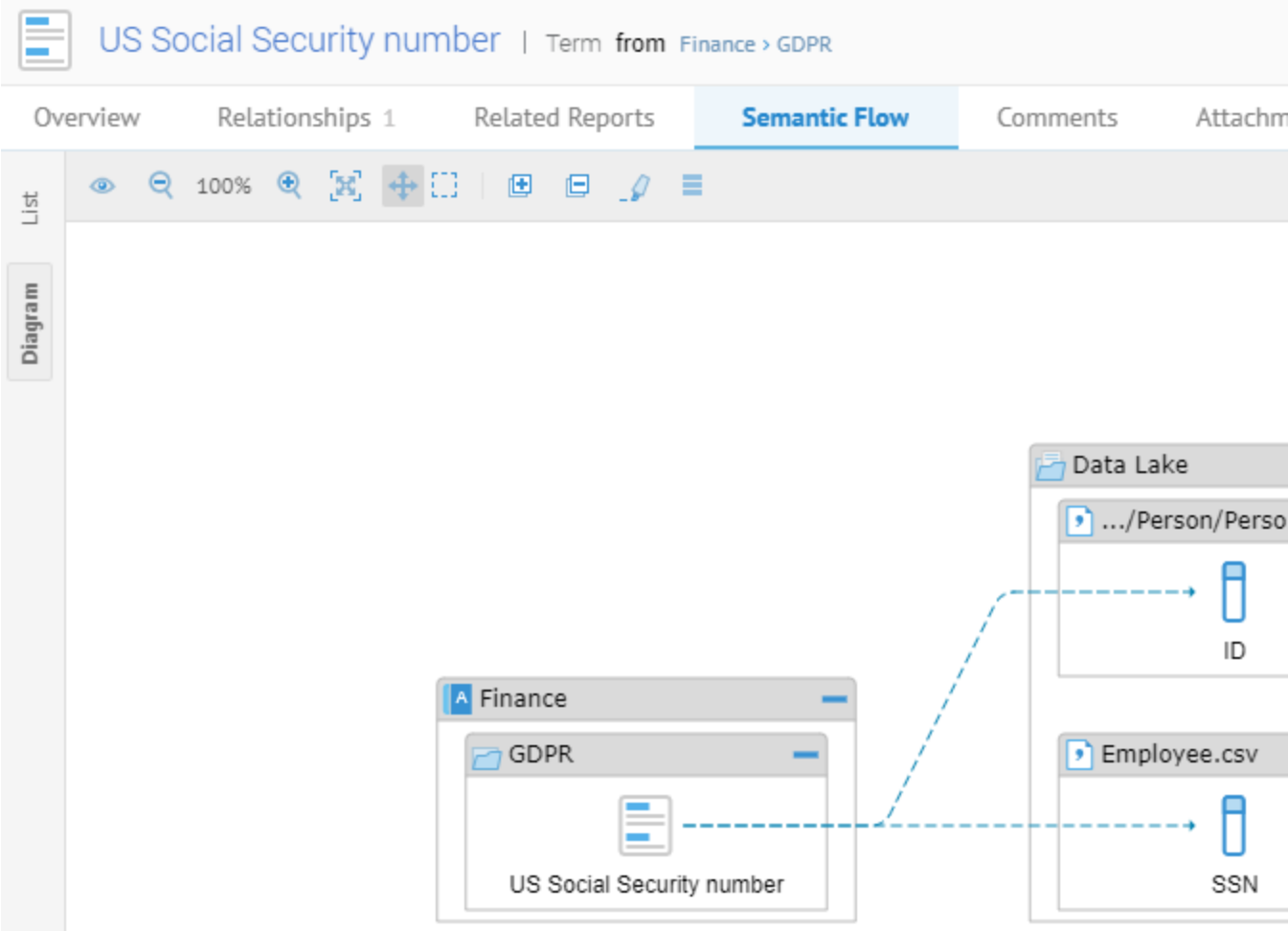


*The **US Social Security Number** term is provided as one of the definitions.*

Click on the term **US Social Security Number**. Go to the **Semantic Flow** tab. Click **Usage** in the upper right.



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



*The **SSN** field is shown as one metadata object (along with others) that use the definition and name of this term.*

Relationship Discovery and Curation

One may also curate relationships by navigating to the details page for one of the tables (classifier level object, such as tables, flat files, entities, views, etc.) involved in the relationship. More details here.

Active Data Cataloging

MIMM may be used as an active data catalog, providing:

Active Data Catalog Feature	Description	Access Method
Publishing platform	All features identified in this user guide	Web based HTML
Programmatic (API) based access to all	Ability for other software and systems to: • Lookup definitions	MIMM RESTful API (See separate user guide)

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

cataloged metadata	• Search for metadata elements including terminology • Report on cataloged metadata • Retrieve lineage	
Export Business Glossary	Export terminology and inter-relationships within a business glossary	• UI and invoked from RESTful API • CSV format export
Export results of search and browse	Export the results of a search or browse	• UI and invoked from RESTful API • CSV format export
Export semantic mapping	Export semantic links in a given semantic mapping	• UI and invoked from RESTful API • CSV format export
Export data mapping	Export data mapping, including source and target definitions, mapping specs, joins, lookups, filters, documentation of all elements and mappings, etc.	• UI and invoked from RESTful API • Microsoft Excel metadata format • Data integration tool native format
Export to metadata target tool	From data store models, subject areas in PDMs, etc., can export the documentation, relationships, etc. to other business intelligence, data modeling, data virtualization, etc. tools	• UI and invoked from RESTful AP • Target tool native format

Semantic Mapping and Linking

Semantic mapping and linking involves creating links between metadata elements. In general, such semantic links describe a relationship between something that is:

- more general to something more specific, e.g., from a term "Quarterly Profit" to a field on a report named "Regional Quarterly Profit"
- from design to implementation, e.g., from an entity in a logical model to a table in a database that implements that logical model
- from a term in the business glossary to a field in the data lake.

In this way, you may trace linage both

- **Semantic Usage**: From the more general or design to the more specific or implemented (down)
- **Semantic Definition**: From an implementation or specific metadata element to its design or defining term (up).

MIMM allows for two types of semantic linking:

Semantic Link Type	Description	Implementation

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Classification	Links from a term to another metadata element, often a column or table in a database or field in a file in the data lake or on a report	Internally managed (imbedded) links
Mapping	General purpose semantic links used for all three use cases: • More general to more specific • Design to implementation • Defining term to defined element. While this activity should be associate with classification, if the defining object is not in a Glossary but in some other type of content, then one should use a semantic mapping.	Explicitly defined **Semantic Mapping** contents

Classification is the preferred method and is system managed so that:

- It is the primary method
- It takes precedence over semantic mapping for lineage (definition lookup and usage)
- Classification works only with business glossaries at the more abstract end of the link
- System managed means that you do not need to create mapping contents between the business glossary and the target model and you do not need to manage the semantic lineage lines in the architecture diagram

Semantic mappings is more user managed and secondary in preference:

- It is the secondary method
- Classification takes precedence over semantic mapping for lineage (definition lookup and usage)
- Semantic mappings may be defined between any two contents (glossary and/or model/PDM)
- You must explicitly create and manage a conent for each mapping content between two models/glossaries. Note, once created you may populate it (map) individual data elements as much as you want within the scope of those two models
- As there is content in the repository:

  - It may be managed using the semantic mapper
  - It may be exported and re-import using the CSV format
  - It can be "embedded" so as to be migrated from semantic mapping to classification if from a glossary.

This section deals with the second type: Semantic Mapping based links.

Create a Semantic Mapping

Steps

1. Sign in as a user with at least the **Manage** security role on the configuration you are in.

2. Go to the **MANAGE > Configuration** in the banner.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

3. Click the plus sign under Manage Contents and select **Semantic Mapping**.
4. Enter a **Name** and **Description**
5. Pick a Source Content which is the more general, more abstract, defining or design model in the mapping
6. Pick a Target Content which is the more specific, less abstract, defined or implementation model in the mapping
7. Click OK to create the semantic mapping.

The semantic mapping is treated just like another content of the repository.

Within the UI you may view the mapping, but you edit the mapping from the details pages of the particular elements in the source or target model.

View a Semantic Mapping

Steps

1. Sign in as a user with at least the **view** security role on the semantic mapping you are interested in
2. Go to the **MANAGE > Configuration** in the banner.
3. Select the semantic mapping you wish to view.
4. Click Open.
5. Go to the Report tab.

Example

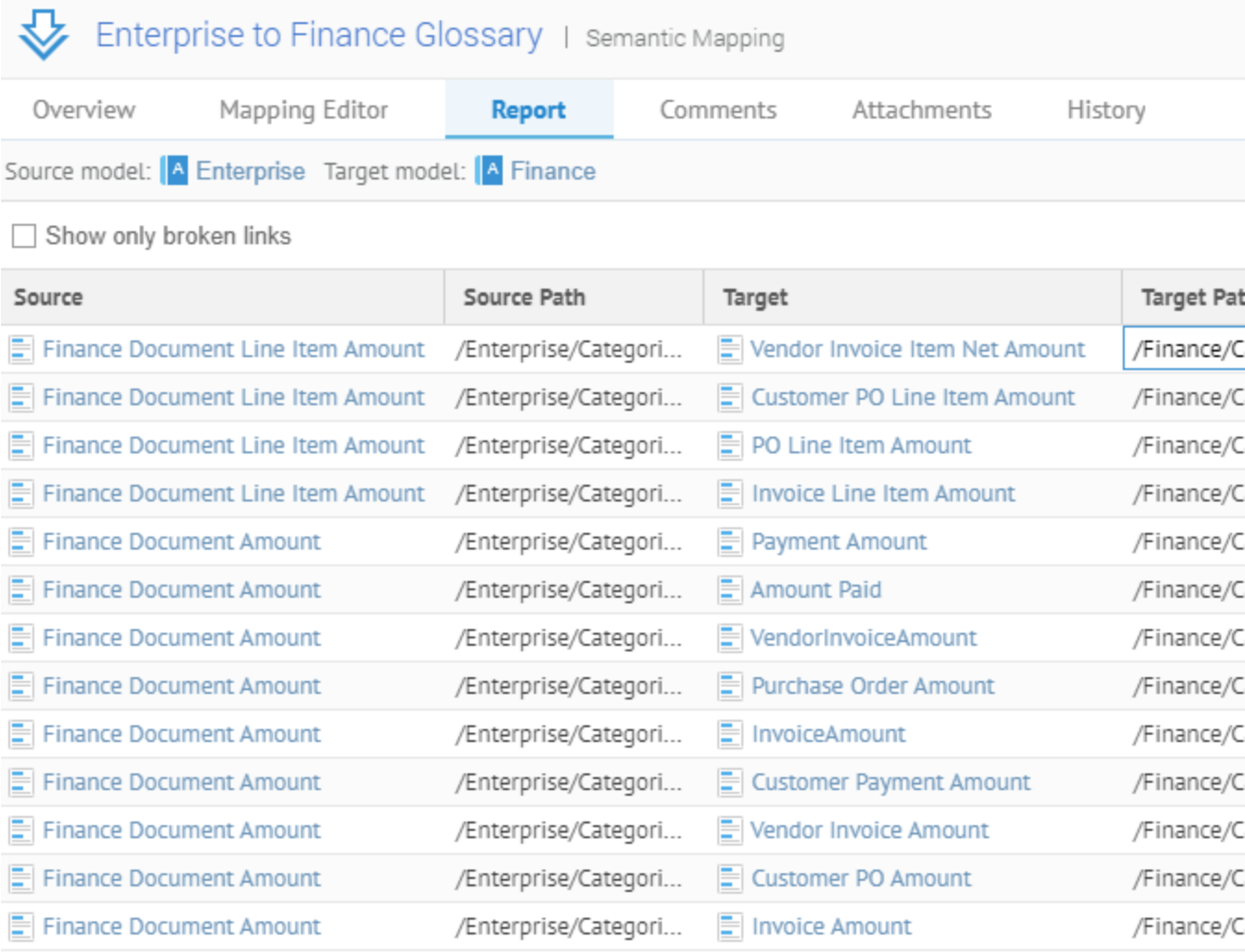
Sign in as **Administrator** and to the **MANAGE > Configuration** in the banner.

Select the **Enterprise to Finance Glossary** semantic mapping.

Click Open.

Go to the **Report** tab.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



*For diagnostic purposes you may click the **Show only broken links**.*

Linking a Metadata Element

Within the UI you may map a particular metadata element from the Semantic Flow tab on its details page. This action may be completed from the details page of either the source element (usage) or the target element (definition).

Steps

1. Sign in as a user with at least the **editor** security role on the semantic mapping you are interested in. If you must create a new semantic mapping you must have the **manager** security role on the configuration you are in.
2. Navigate to the details page for the metadata element you wish to define a link.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

It is a strategic decision as to which end of the semantic mapping to start from. If your intention is to identify a group of database columns that should be defined, you generally will start from those elements' details pages. However, if your task is to work with a set of objects in a logical model and link them to their proper columns in a database, then one would start from the details pages of the source (logical) objects.

3. Click the **Semantic Flow** tab.

Again, depending upon the strategic decision above, you must specify the semantic direction you wish to create links in

4. Click either Definition or Usage in the Type pull-down in the upper right.

You will see the Map button ONLY if you have already defined a semantic mapping which either has a source (when of type Usage) or destination (when of type Definition) content that contains this metadata element you are on the details page of.

5. Click the Map button to create a semantic link from a metadata element in that other model and this one.

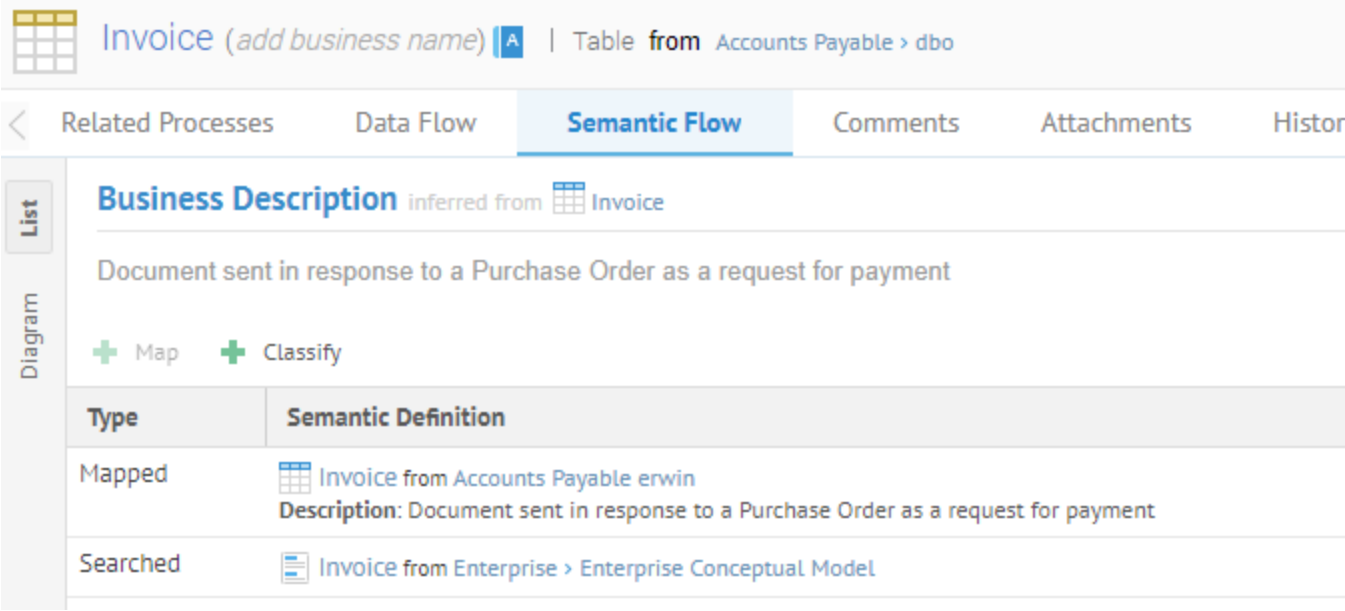
Example

Defining an element with a semantic mapping

We are going to provide definitions for the columns in the **Accounts Payable** model. So, navigate the details page for the **Invoice** table in the **Accounts Payable** model (database), and then to the **InvoiceAmount** column.

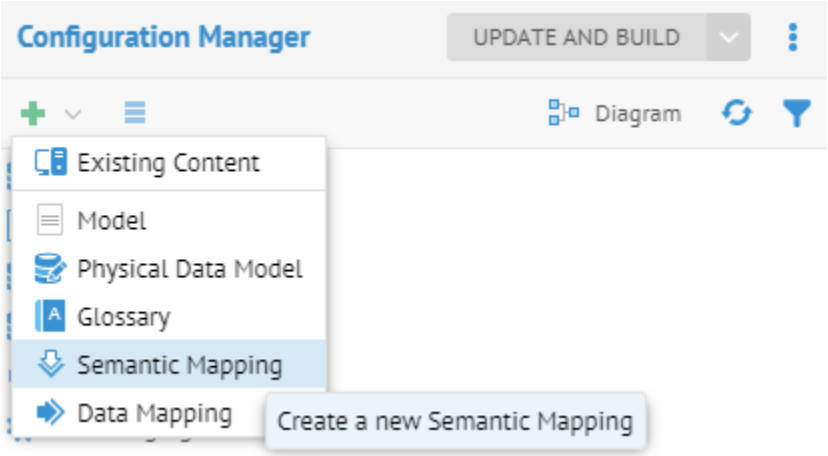
Click the **Semantic Flow** tab, click the **List** tab and be sure to choose **Definition** in the **Type** pull-down in the upper right.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

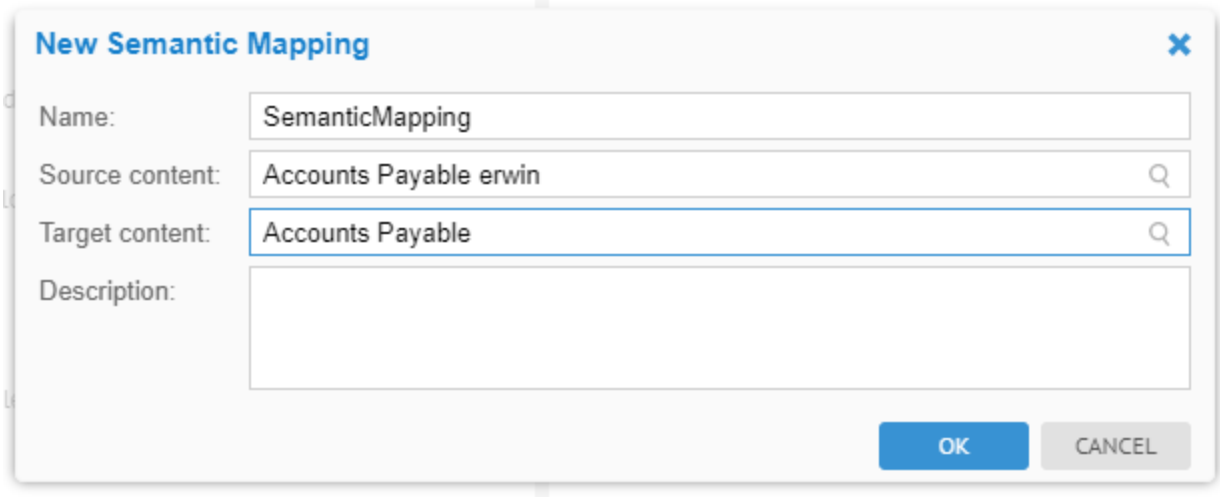


The Map button is disabled. This is because there is no semantic mapping defined between another model and this one.

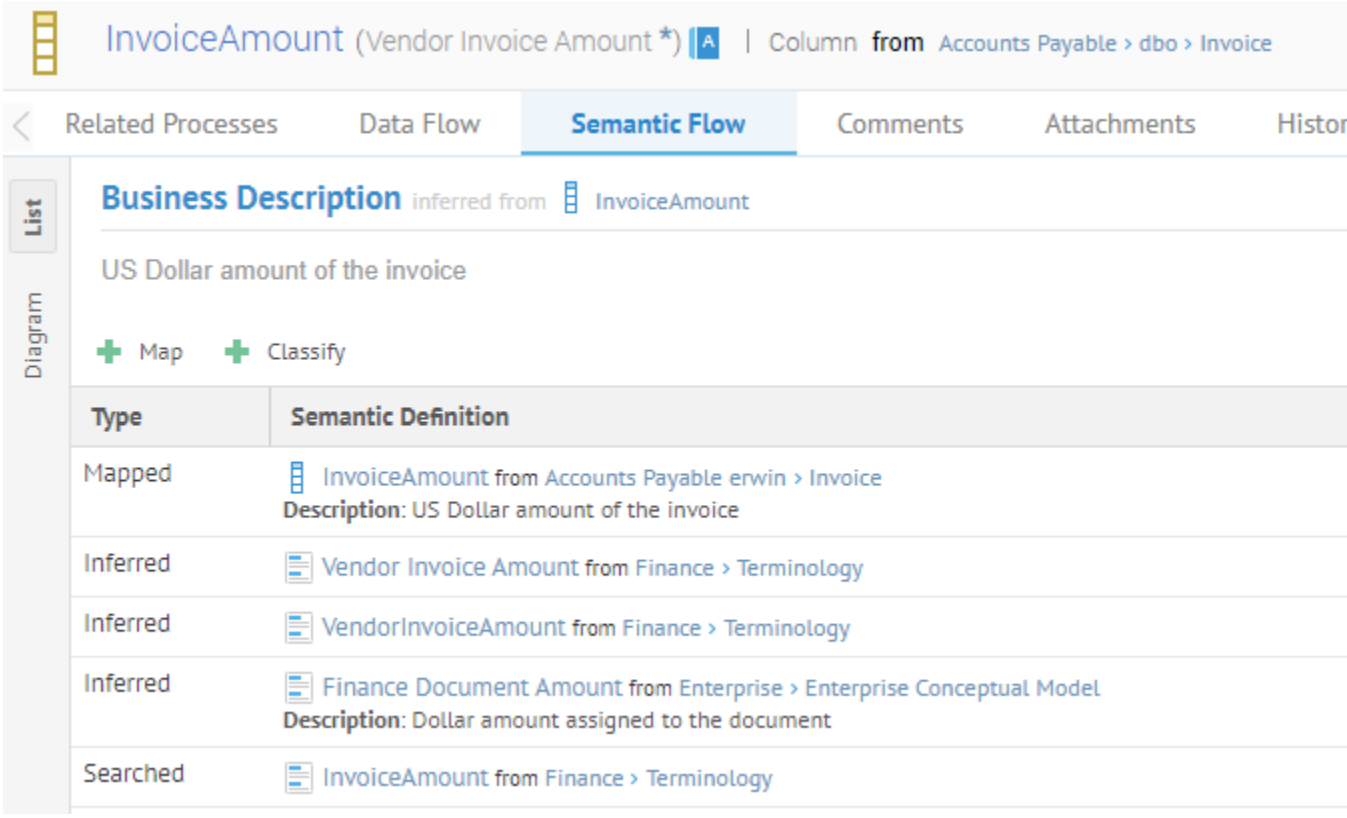
Create a mapping between the **Accounts Payable erwin** model (source logical model) and the **Accounts Payable** database harvested model (target database) in **MANAGE > Configuration** .



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Then, refresh your browser and returning to the **Invoice Amount** details page and the **Semantic Flow** tab, we see the **Map** button.



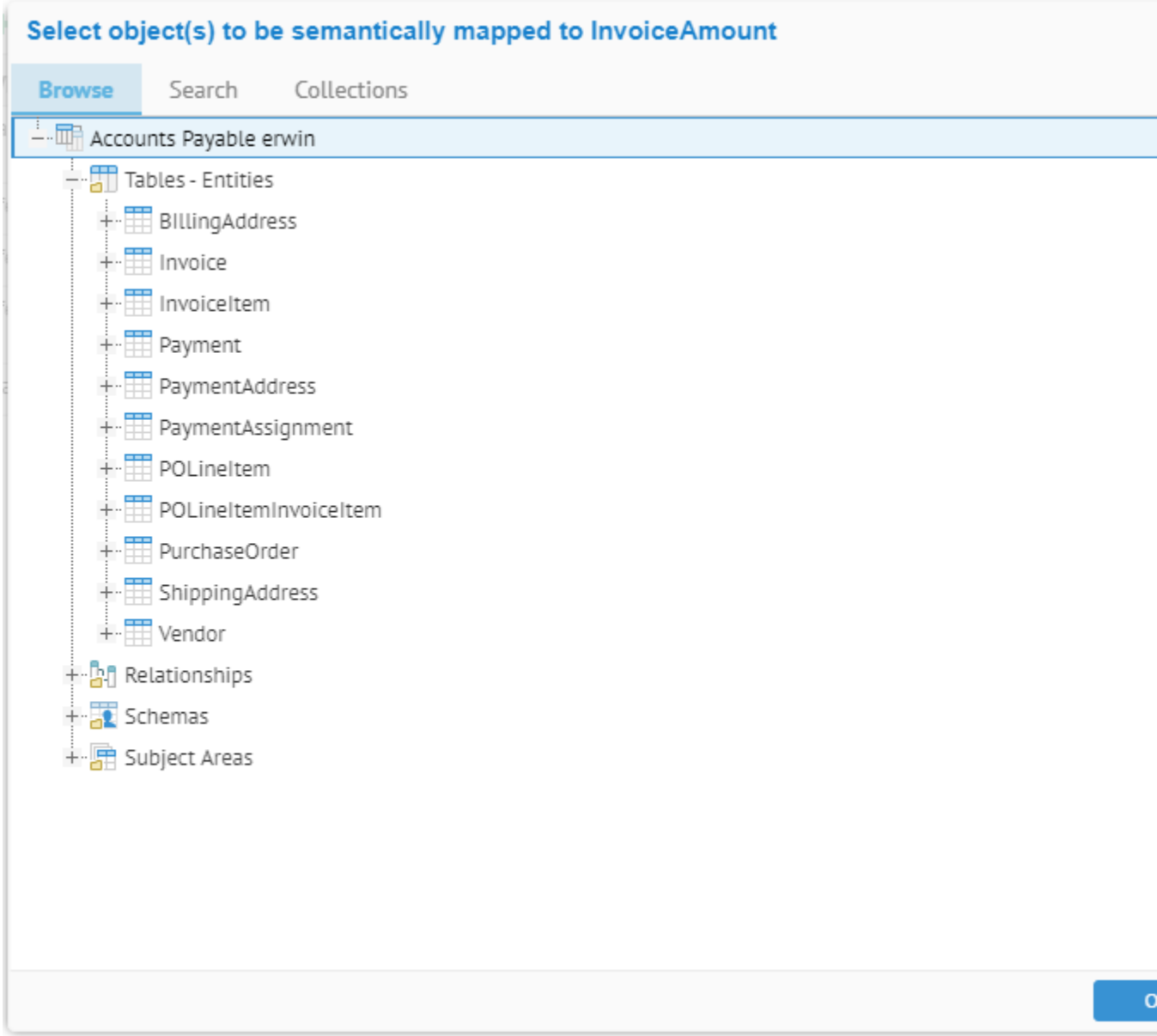
There are already several inferred and searched semantic definitions found (based upon semantic and data flow traces). For more details, see semantic definition lookup and examples.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Using those links you may pick one of those definitions by classifying. Our goal here, however, is to use the erwin based model for definitions. As you can see, this is a somewhat unusual, and counter-intuitive approach, and you would only use mappings instead of classification (imbedded links) in special circumstances.

Also, the Business Name is derived from one of these links but the Business Description is not.

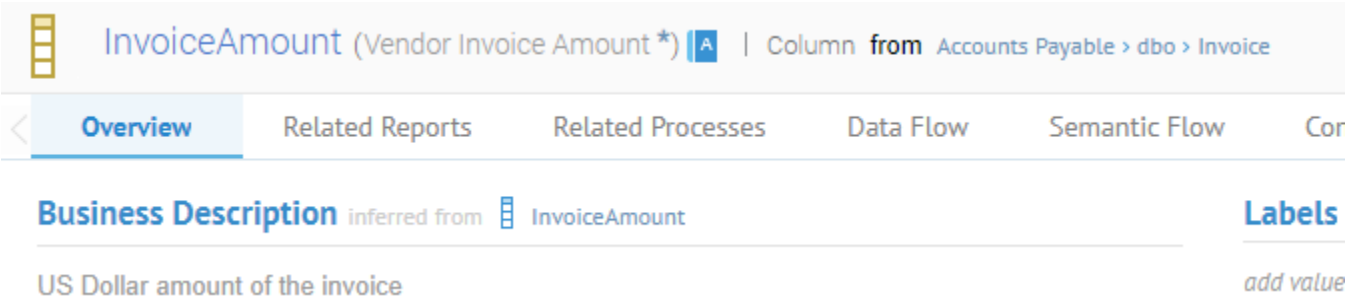
Click **Map**



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

*The list shows all the tables that are currently a part of the only model that has a mapping to this one is the one you just created (**Accounts Payable erwin to DB**).*

Double-click **Invoice** and then select **InvoiceAmount** from the list. Click OK.



Note the Business Description and Business Name are now derived from this new mapping.

Edit a Semantic Mapping

Steps

1. Sign in as a user with at least the **Editor** security role on the semantic mapping you are interested in
2. Go to the **MANAGE > Configuration** in the banner.
3. Select the semantic mapping you wish to view.
4. Click Open.
5. Go to the **Mapping Editor** tab.
6. You may drag and drop from the left (source) to the right (target) to create a map from the source to the target objects.
7. You may drag and drop from the right (target) back to the left (source) to create a new term on the left (if a glossary) and map from the source to the target objects.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

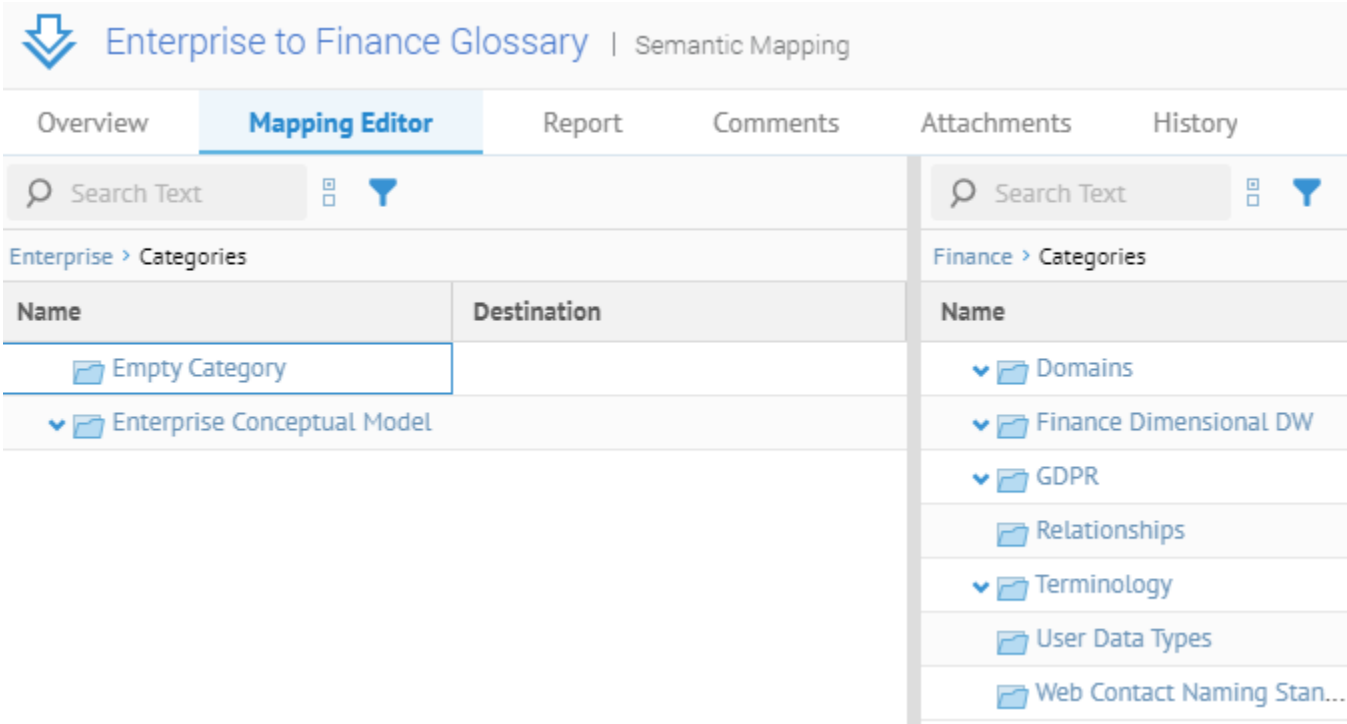
Example

Sign in as **Administrator** and to the **MANAGE > Configuration** in the banner.

Select the **Enterprise to Finance Glossary** semantic mapping.

Click Open.

Go to the **Mapping Editor** tab.



Auto-detect Child Semantic Links

When a more abstract or higher design level model has a close match to an implementation of that model. E.g., a data model with a physical layer that matches a database that was imported separately.

In this datamodel to database case, it is often best just to semantically stitch the two together. However, in many cases you will need to connect to several similar physical databases from the same data model. Stitching will not (and should not) allow this. So, instead, we will use semantic mappings and the auto-detect child semantic links feature.

The semantic mapping tool can automatically "detect child semantic links by name" at any level from the database schema, to tables and columns based on physical name matching. However, this is NOT the equivalent of the bulk mapping in data mapping, because in semantic mapping this detection mechanism is used to generate schema, table and column level links at the time

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

you are editing the mapping. If a new table or column is created, the semantic mapping must be edited again and the "detect child semantic links by name" must be performed in the UI.

Steps

1. Sign in as a user with at least the **Editor** security role on the semantic mapping you are interested in.
2. Go to the **MANAGE > Configuration** in the banner.
3. Select the semantic mapping you wish to view, or create a new mapping from the data model to the database.

Either

4. Click Open.
5. Go to the **Mapping Editor** tab.
6. Naviage to a schema on the source and the target sides of the mapping.
7. Drag from the source to the target.
8. Click **YES**. to detect child links.
9. Specify matching options.
10. Click **OK**.

OR

11. Navigate to target schema details page.
12. Go to the **Semantic Mapping** tab.
13. Click the plus sign to **Map**.
14. Naviage to the source schema in the navigation dialog.
15. Click the **Detect child links** checkbox. In the lower right of the dialog.
16. Click **OK**.
17. Specify matching options.
18. Click **OK**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Example

From the Mapping Editor

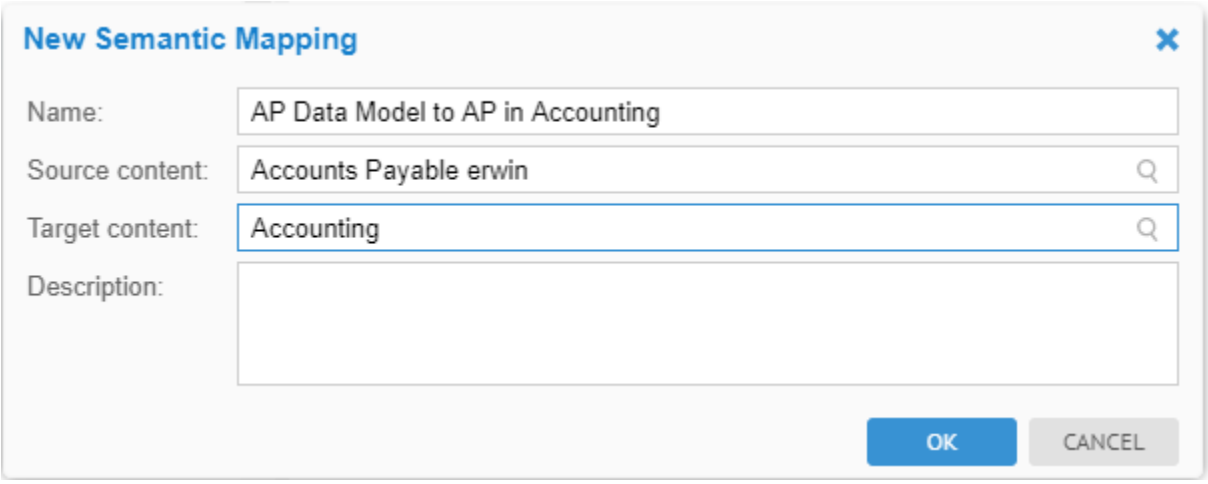
Sign in as **Administrator** and to the **MANAGE > Configuration** in the banner.

Click the plus sign under Manage Contents and select **Semantic Mapping**.

Enter a **Name** and **Description**

Pick the Accounts Payable erwin model as the **Source content** which is the more general, more abstract, defining or design model in the mapping

Pick the Accounting model (from a JDBC connection directly to the database) as the **Target content** which is the more specific, less abstract, defined or implementation model in the mapping



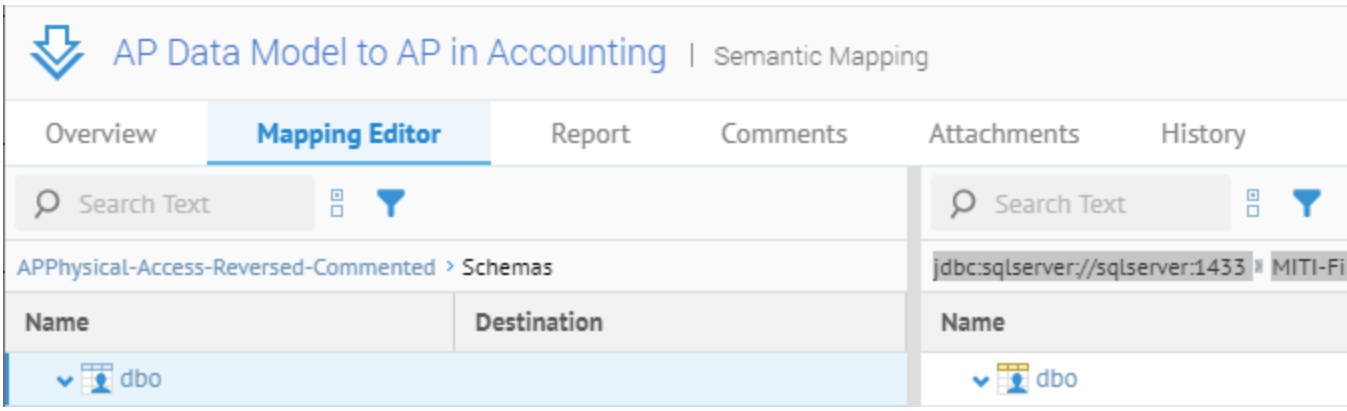
Click **OK** to create the semantic mapping.

Click **Open**.

Go to the **Mapping Editor** tab.

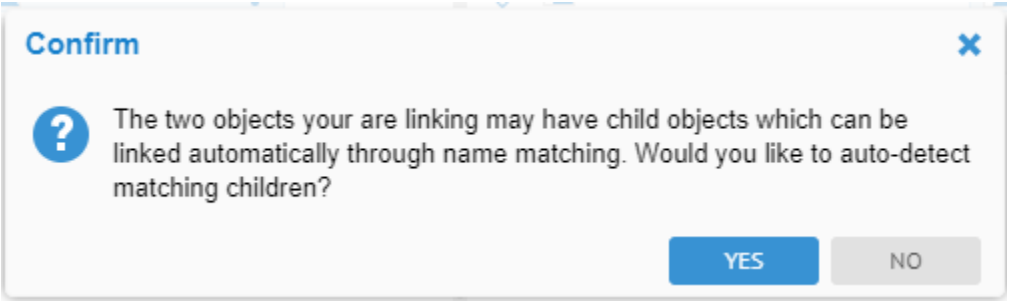
Navigate to the the **APPhysical-Access-Reversed-Commented > Schemas** level in the source side and The **jdbc:sqlserver://sqlserver:1433 > MITI-Finance-AP > Schemas** level on the target side (aligning them for the matching to work).

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

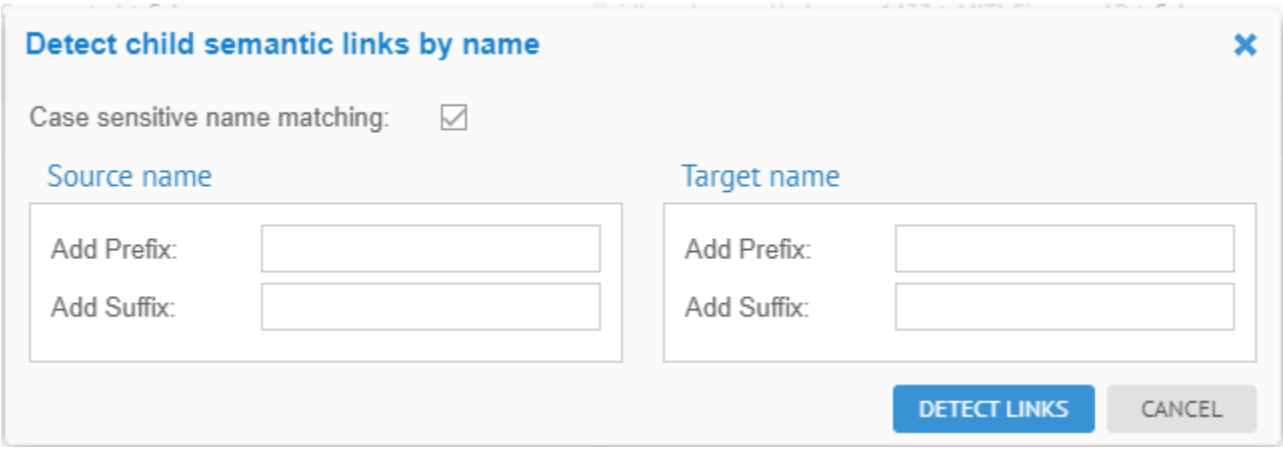


*There are two schema in the target, thus you must navigate to the one you wish to match. The other (**MITI-Finance-AP**) is the accounts receivable database, and does not match completely with the data model (source).*

Drag the dbo schema from the left onto the one on the right.



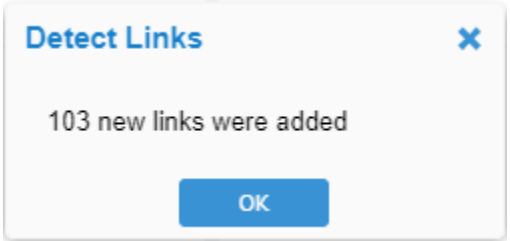
Click **YES**.



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

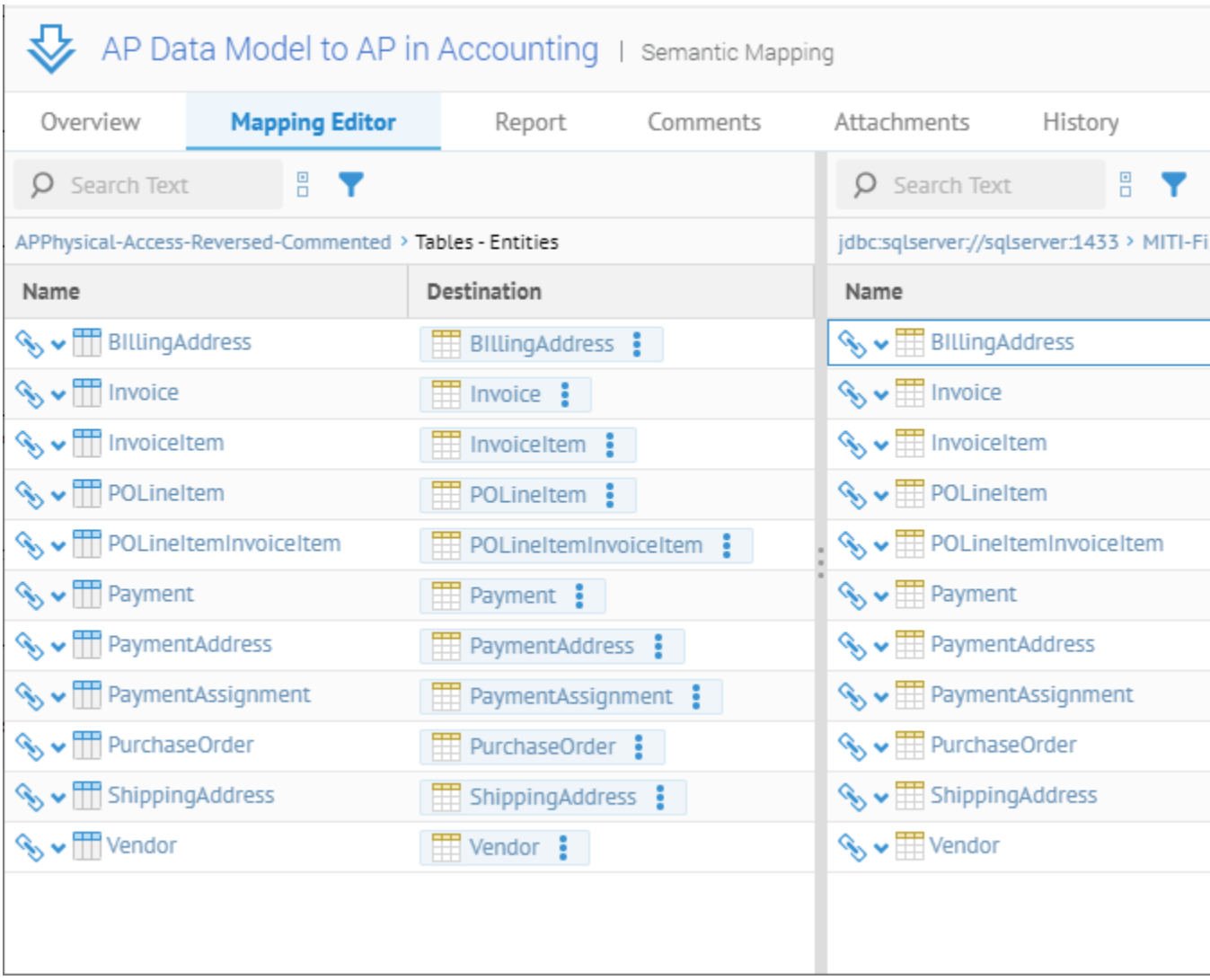
Just as with the matching in the data mapping, you may specify case sensitivity to the match (enforced by default) and any prefixes or suffixes you would like to ignore when matching.

Click **DETECT LINKS**

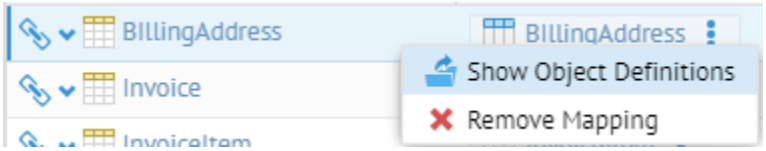


Click OK to see the mappings.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

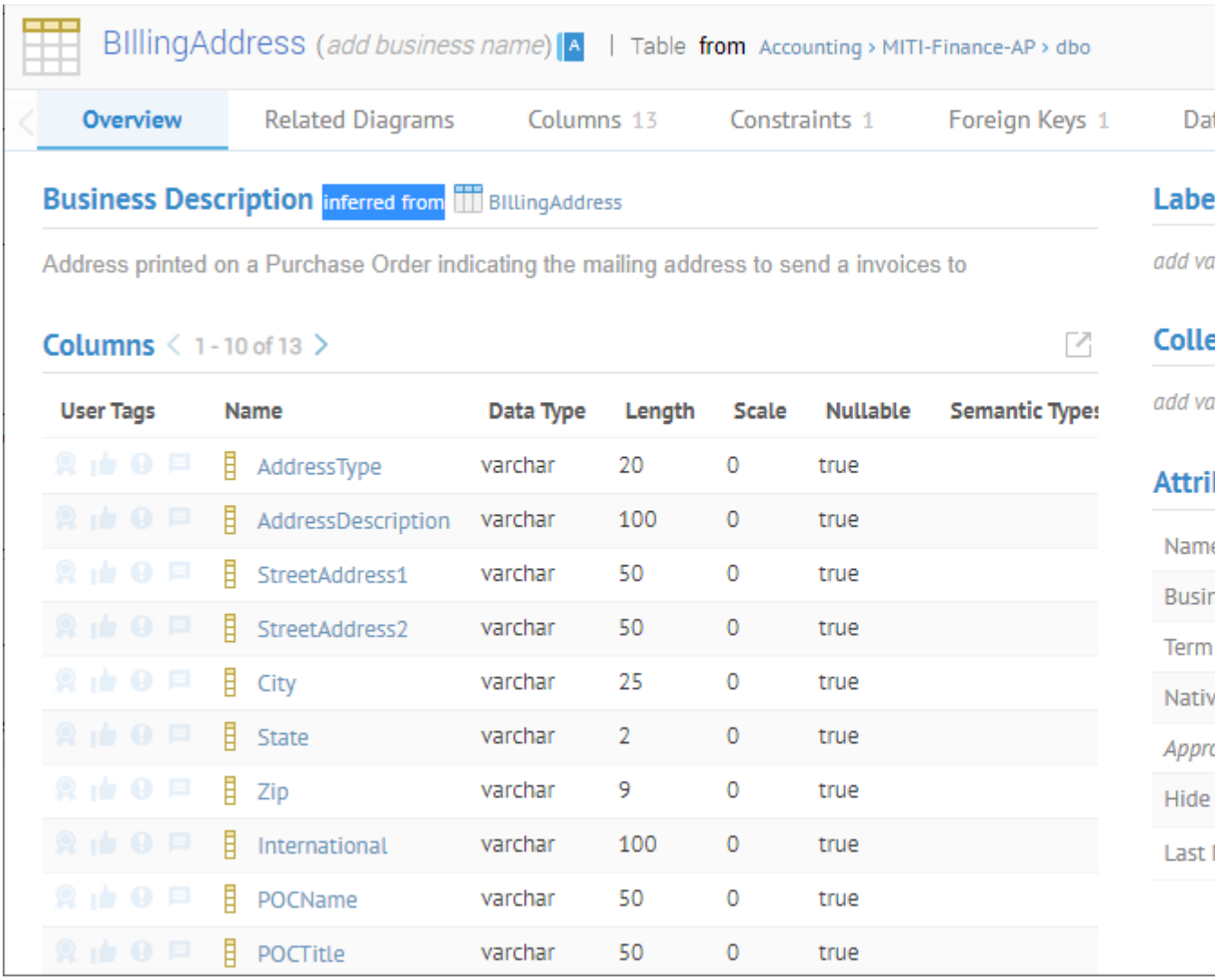


Right-click the Billing Address table on the target (database) side and select **Show Object Definitions**:



*The **Business Name** and **Description** are now inferred from the data model **Logical Name** and **Description**.*

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



From the Semantic Mapping tab

Sign in as **Administrator** and to the **MANAGE > Configuration** in the banner.

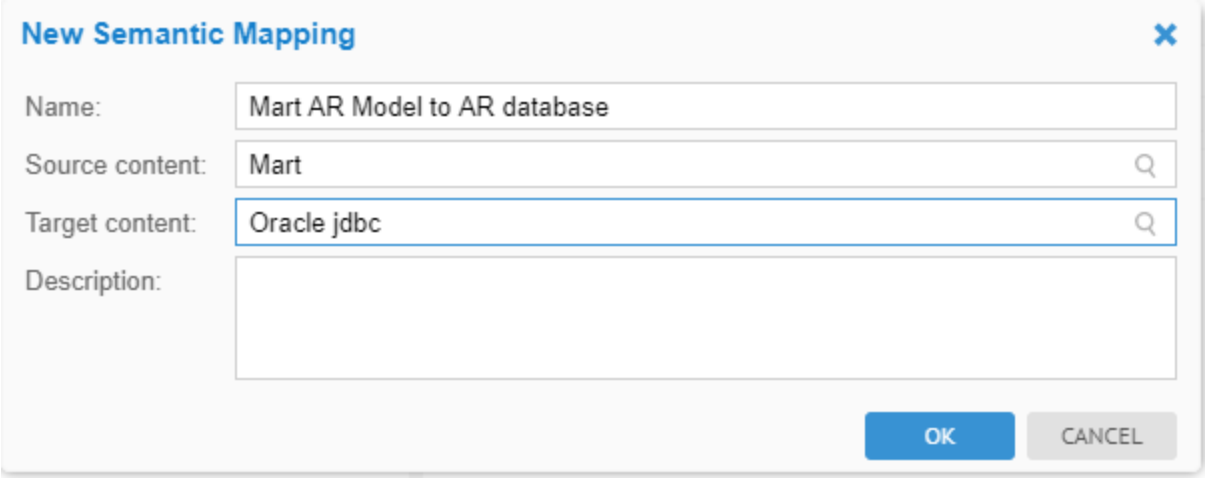
Click the plus sign under Manage Contents and select **Semantic Mapping**.

Enter a **Name** and **Description**

Pick the (erwin) **Mart** model as the **Source content** which is the more general, more abstract, defining or design model in the mapping

Pick the **Oracle JDBC** model (from a JDBC connection directly to the database) as the **Target content** which is the more specific, less abstract, defined or implementation model in the mapping

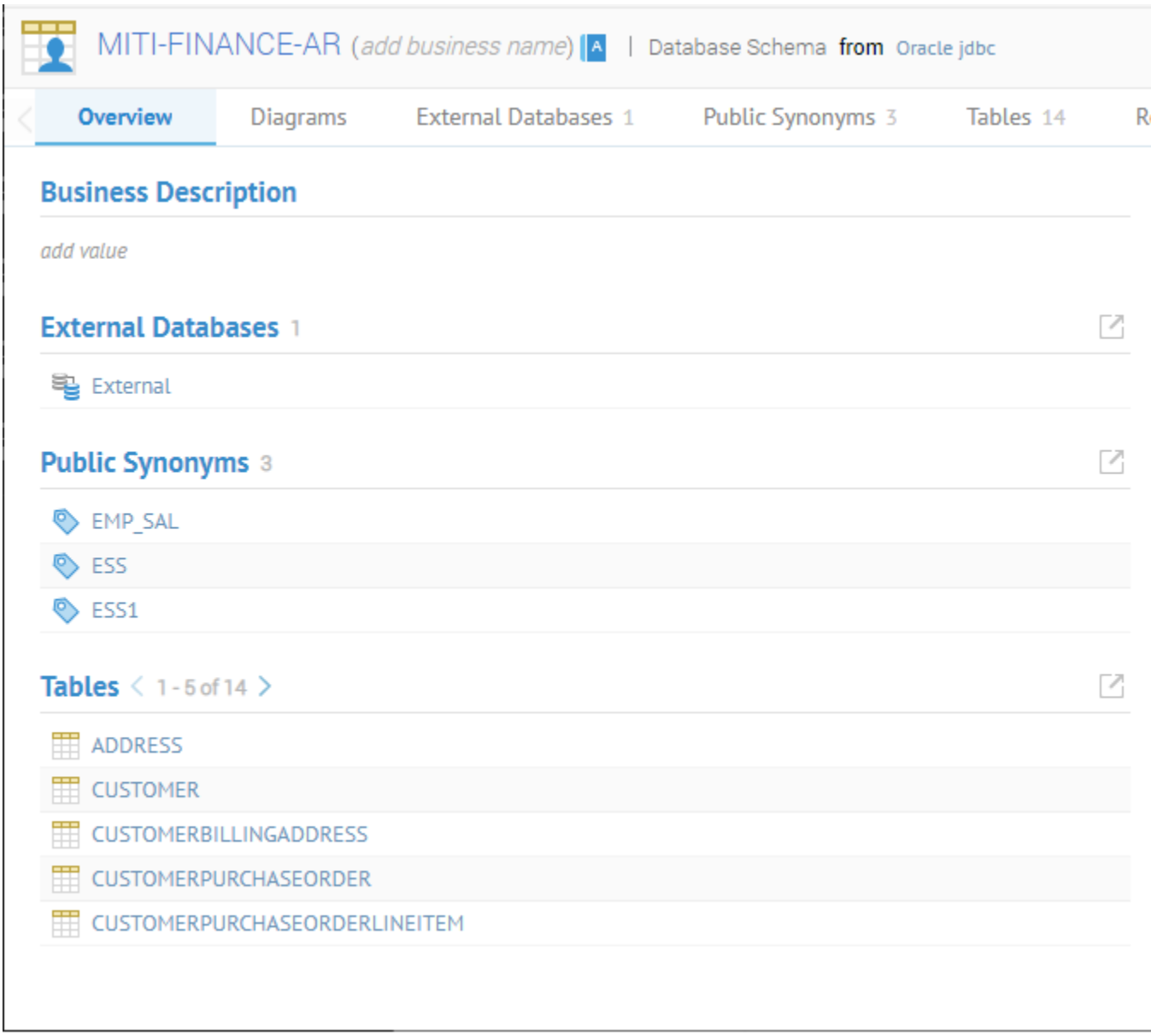
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click **OK** to create the semantic mapping.

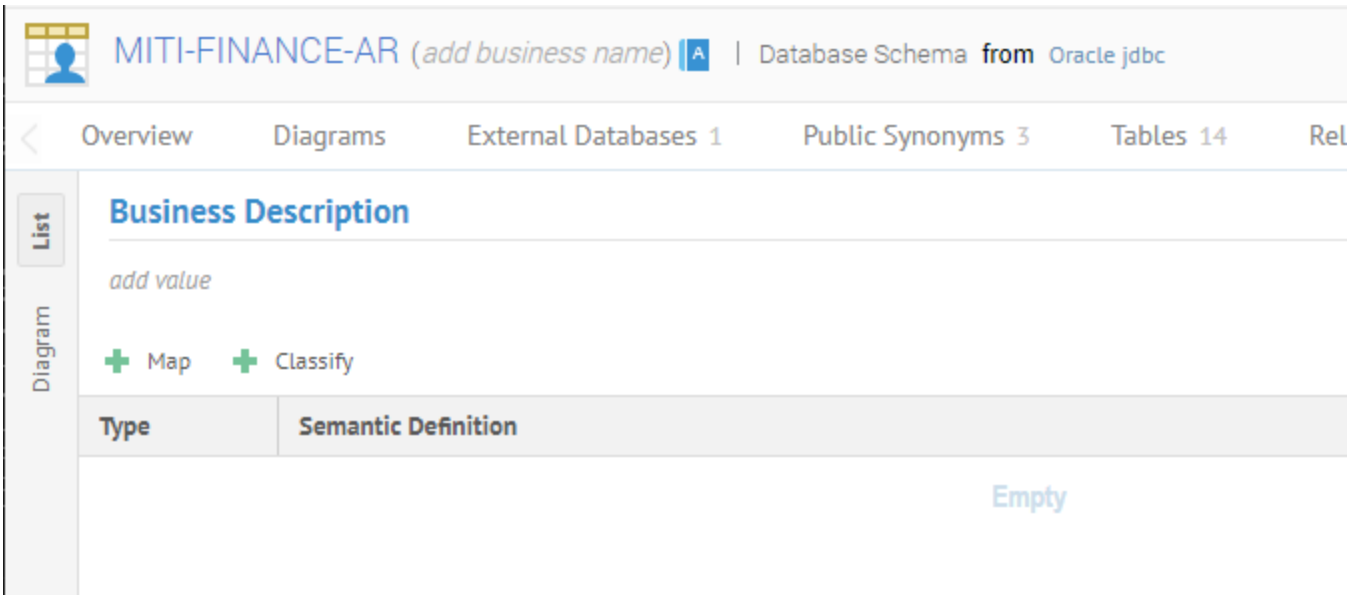
Navigate to **Oracle JDBC.MITI-FINANCE-DB** (target schema) details page.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



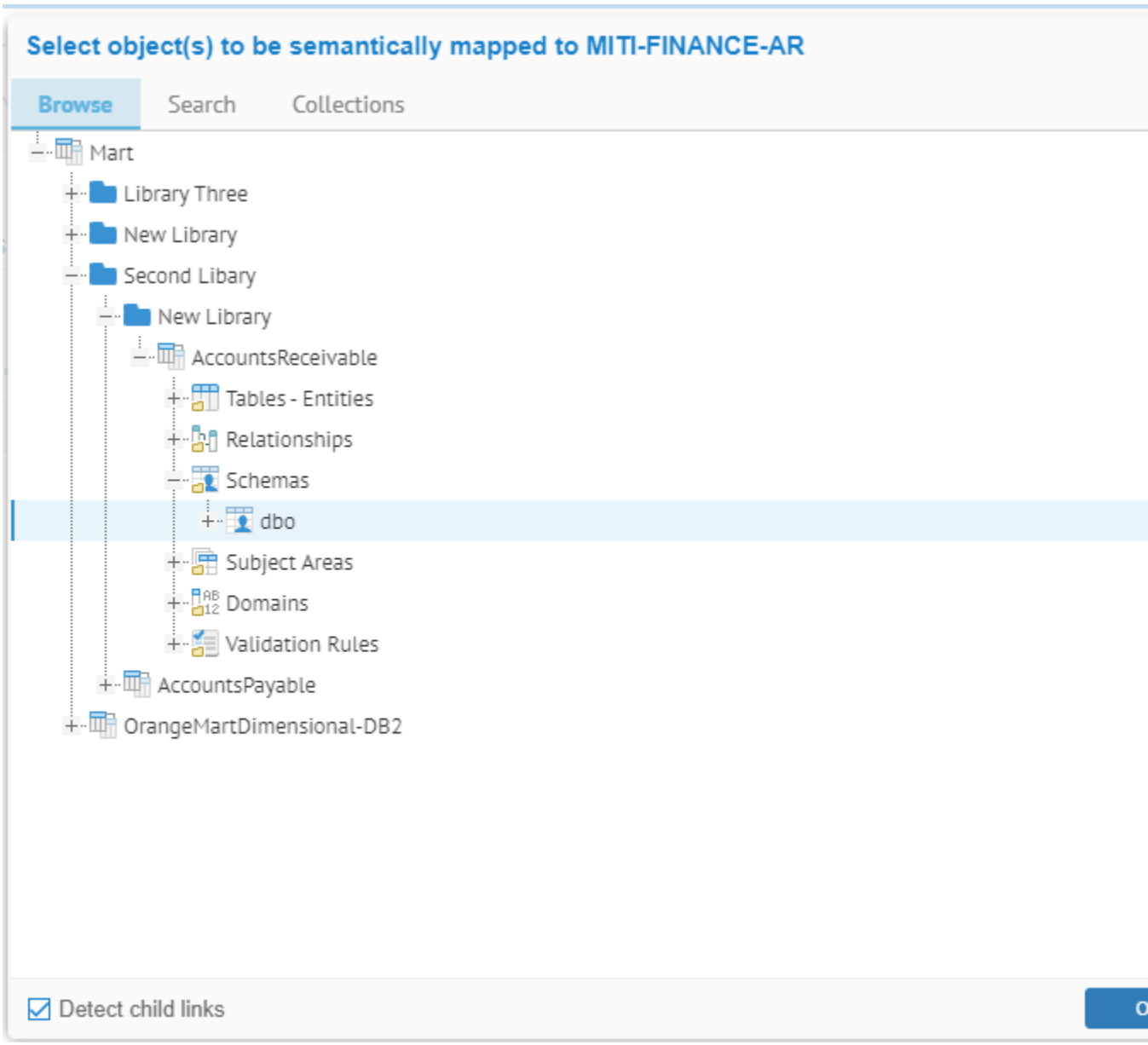
Go to the **Semantic Mapping** tab.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click the plus sign to **Map** and naviage to the **dbo** schema in the **AccountsReceivable** model (source schema) in the navigation dialog.

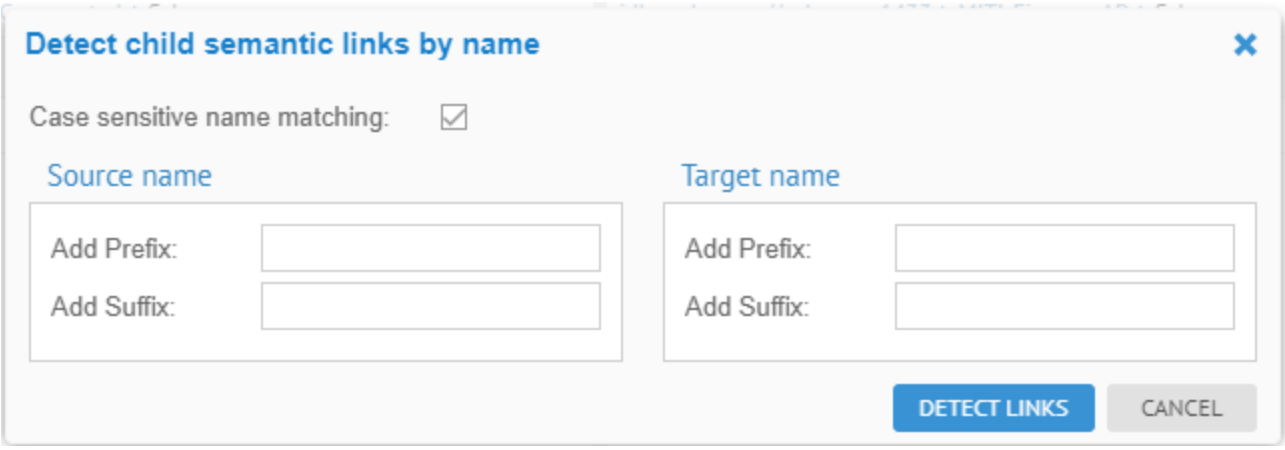
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Be sure to check the **Detect child links** checkbox.

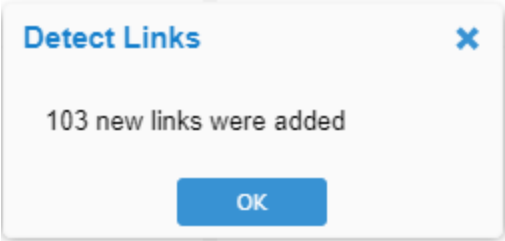
Click **OK**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Just as with the matching in the data mapping, you may specify case sensitivity to the match (enforced by default) and any prefixes or suffixes you would like to ignore when matching.

Click **DETECT LINKS**



Recursively Remove Child Semantic Links

Just as the semantic mapping tool can automatically "detect child semantic links by name" at any level from the database schema, to tables and columns based on physical name matching, there is also the ability to recursively remove all child semantic links based upon linked a schema or table.

All such child links (tables within a schema and columns within the tables) will be deleted, regardless of how they are created.

Steps

1. Sign in as a user with at least the **Editor** security role on the semantic mapping you are interested in.
2. Go to the **MANAGE > Configuration** in the banner.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

3. Select the semantic mapping you wish to edit and click Open.
4. Go to the **Mapping Editor** tab.
5. Naviage to the target side of the mapping.
6. Right-click and select **Recursively remove mappings**.
7. Click **YES**.

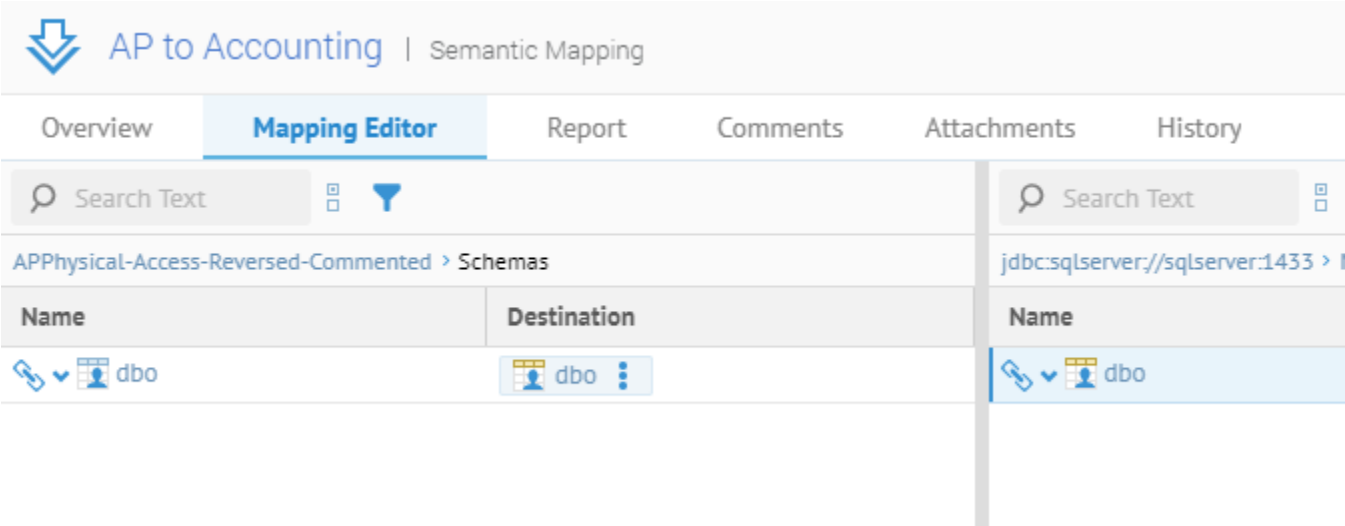
Example

Sign in as **Administrator** and to the **MANAGE > Configuration** in the banner.

Select the AP to Accounts semantic mapping and click OPEN.

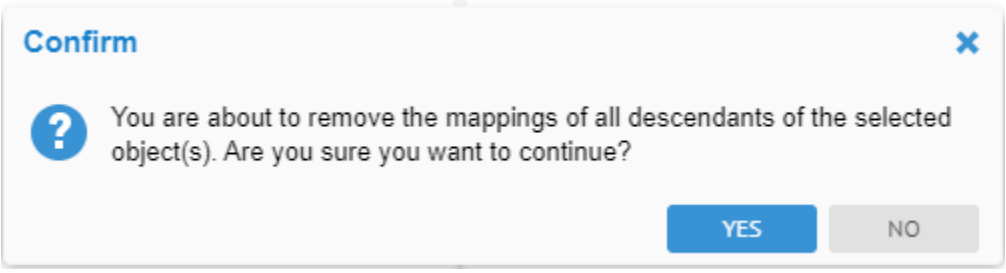
Go to the **Mapping Editor** tab.

Navigate to the the **APPhysical-Access-Reversed-Commented > Schemas** level in the source side and The **jdbc:sqlserver://sqlserver:1433 > MITI-Finance-AP > Schemas** level on the target side.



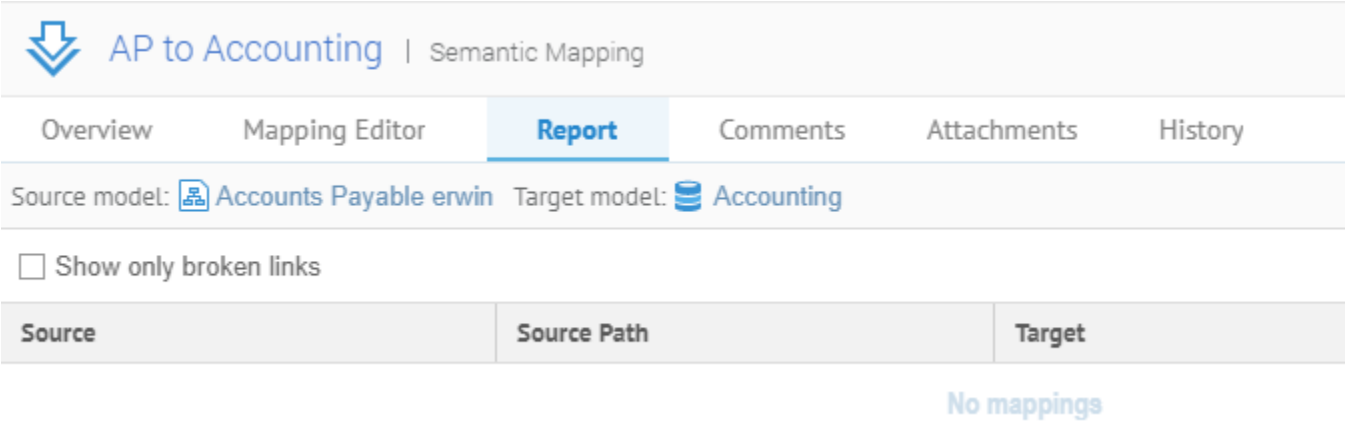
Right-click and select **Recursively remove mappings**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click **YES**.

Go to the Report tab and note the mappings are removed all the way down to the column level.



Importing a Semantic Mapping

You may import a semantic mapping from CSV file in a specific format defined for MIMM .

Steps

1. Be sure you already have created a semantic mapping.
2. Sign in as a user with at least the **editor** security role on the semantic mapping.
3. Navigate to the details page ofthe semantic mapping of interest.
4. Click on the **More actions** Icon in the upper right and select “Import from CSV file”.
5. Browse for the actual file to import from.
6. Click **IMPORT**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

To see the format for this file, simply Export a subset of an existing semantic mapping.

Exporting a Semantic Mapping

You may import a semantic mapping from CSV file in a specific format defined for MIMM .

Steps

1. Be sure you already have created a semantic mapping.
2. Sign in as a user with at least the **editor** security role on the semantic mapping.
3. Navigate to the details page ofthe semantic mapping of interest.
4. Click on the **More actions** Icon in the upper right and select "Export to CSV file".
5. Enter the file path name to export to.
6. Click Export.

Data Mappings

Some data flow processes are not harvestable using the bridges provided as a part of the MIMB|variable=MIMB tool suite. Of course, if these processed are not modeled in MIMM , it will leave gaps in the lineage and impact analysis answers and provide an incomplete picture of the physical architecture of your systems.

In order to address these gaps and produce proper lineage and impact results, MIMM has a data mapping editing and management toolset. Data mappings] are essentially simply high-level logical (or notional) definitions of the way data "flows" from some number of source models into elements of a target model. These mappings are specified using a simple web based drag and drop type mapping specification editor and are defined using descriptive text and one may also define pseudo operations using an operation editor.

The data mapping forms a content within MIMM which defines mappings between source and target data stores. The data stores themselves are modeled separately as model contents within MIMM but external to the data mapping.

A data mapping content may contain many (any number of) mappings.

There are two types of mappings which a data mapping might contain:

- Query mapping - is most flexible and you define a column by column mapping definition for all the columns in the target table. They may include joins, filters, transformations, etc. Each query mapping is defined for one target classifier.
- Bulk mapping – is useful when modeling data replication technologies. Each bulk mapping is defined for one target schema and one source schema.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

When defining a query mapping, the target classifier my come from any data store model defined in the configuration. Sources too may come from any data store model(s), and as you may have many source classifiers, they could come from multiple source contents in the same mapping.

In addition to defining mapping specifications, the data mapping allows you to define all the physical data integration constructs, including joins, filters, transformation operations, etc., which may even be forward engineered into data integration tools.

Finally, the data mapper is round-trip compatible with the Excel metadata format that is defined and provided as part of the delivery of MIMM . In this way, you may export to this format for reporting purposed, or edit and re-import to a mapping.

Create a Data Mapping

A data mapping content may contain many (any number of) mappings. You may also create a hierarchy of folders that each may contain any number of mappings.

Steps

Ensure proper permissions

1. Sign in as a user with at least the **Manage** security role on the Configuration you are in.

Create the content

2. Go to the **MANAGE > Configuration** in the banner.
3. Click the plus sign under Manage Configuration and select **Data Mapping**.
4. Enter a Name and Description for the content and click OK.
5. Click Open.

Edit the folder structure

6. You may then click on the **Mappings** tab to create a new mapping directly at the root of the content or you may click on the **Folders** tab and create a folder structure.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

7. Click the plus sign to add either folders or mappings depending upon which tab you are one. Ultimately, you must click the plus sign on the **Mappings** tab for the details page of the content or one of its folders to create a mapping.
8. Select Query mapping or Bulk mapping.
9. If a query mapping, you must select the tables you will map to at this time.
10. If a bulk mapping, you specify the target and source schemas later.

Edit a Query Mapping

When defining a query mapping, the target classifier my come from any data store model defined in the configuration. Sources too may come from any data store model(s), and as you may have many source classifiers, they could come from multiple source contents in the same mapping.

In addition to defining mapping specifications, the data mapping allows you to define all the physical data integration constructs, including joins, filters, transformation operations, etc., which may even be forward engineered into data integration tools.

Steps

Ensure proper permissions

1. Sign in as a user with at least the **Editor** security role on the Data Mapping you are going to edit.

Navigate to the mapping to edit

2. Navigate to the details page for the data mapping content and navigate to the folder if necessary.
3. Click the **Mappings** tab.
4. Create the query mapping if necessary.
5. Specify the target table(s), mapping **Name** and **Description**.
6. Click to open the query mapping.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Assign the source(s)

7. Click Select a source table.
8. Specify filters to narrow down the choices and select a table from the list.
9. Specify as many source tables as needed.

Map

10. Click the Detect Links magic wand to automatically match tables and columns.
11. Click the Joins tab to edit joins.
12. Click the Detect Joins magic want to automatically define joins for the source tables.
13. Click the Filters tab to edit filters.
14. Drag a specific source column to target column to map all the columns.
15. Edit the Operation for a target column, including using the functions editor.
16. Drag another source column into an already mapped target column to include the new column in the existing mapping and operation.

Adina columns will be appended with a plus sign ("+") in the operation. Thus, invalid operations could result which must be corrected.

17. Click Save.

Example

Create a new data mapping content

Go to the **MANAGE > Configuration** in the banner. Click the plus sign under Manage Contents and select **Data Mapping**. Enter a **Name** and **Description** for the content and click OK.

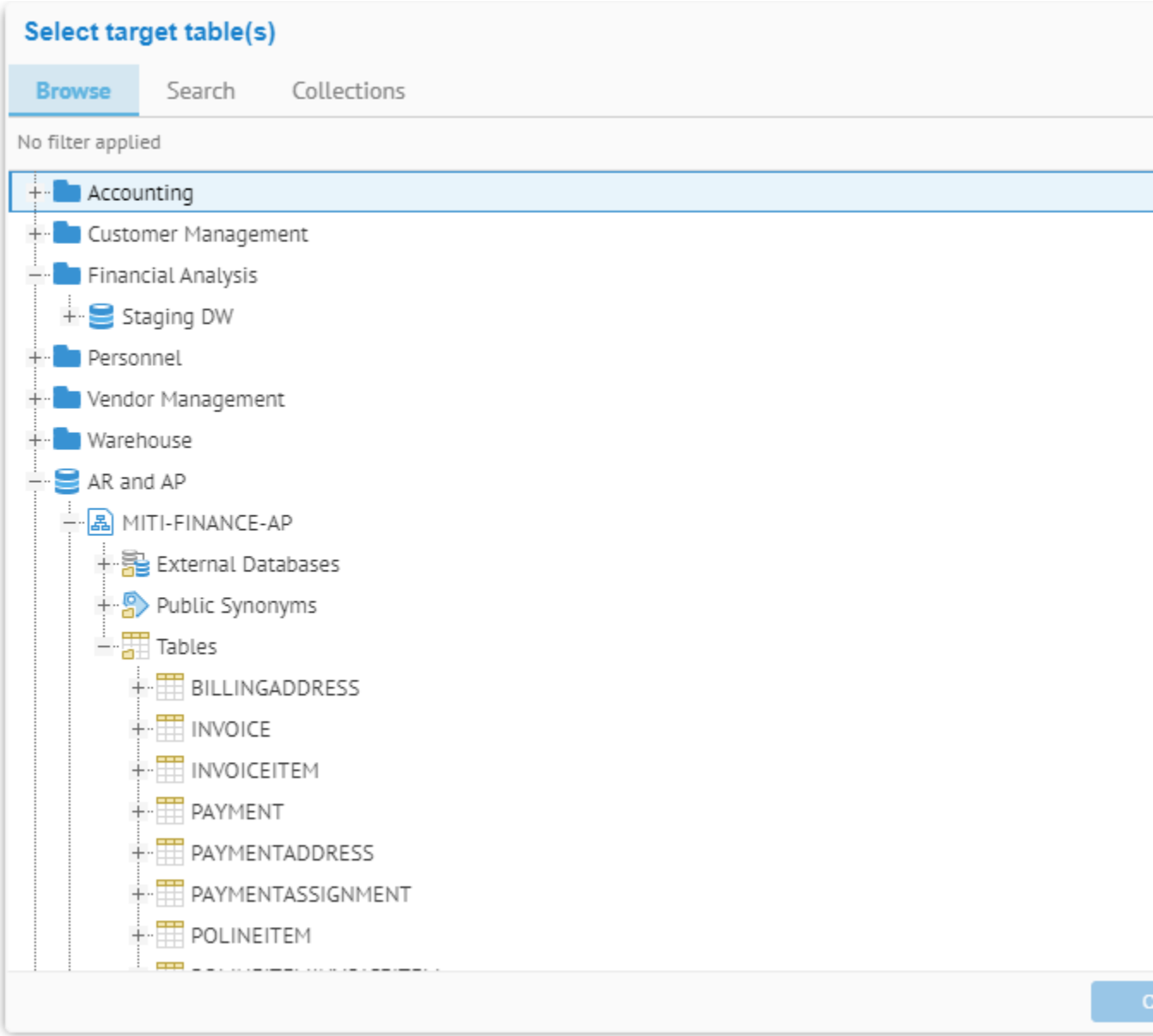
Create a query mapping

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Click OPEN . Click the **Mappings** tab. Click the plus sign . Specify a Query mapping.

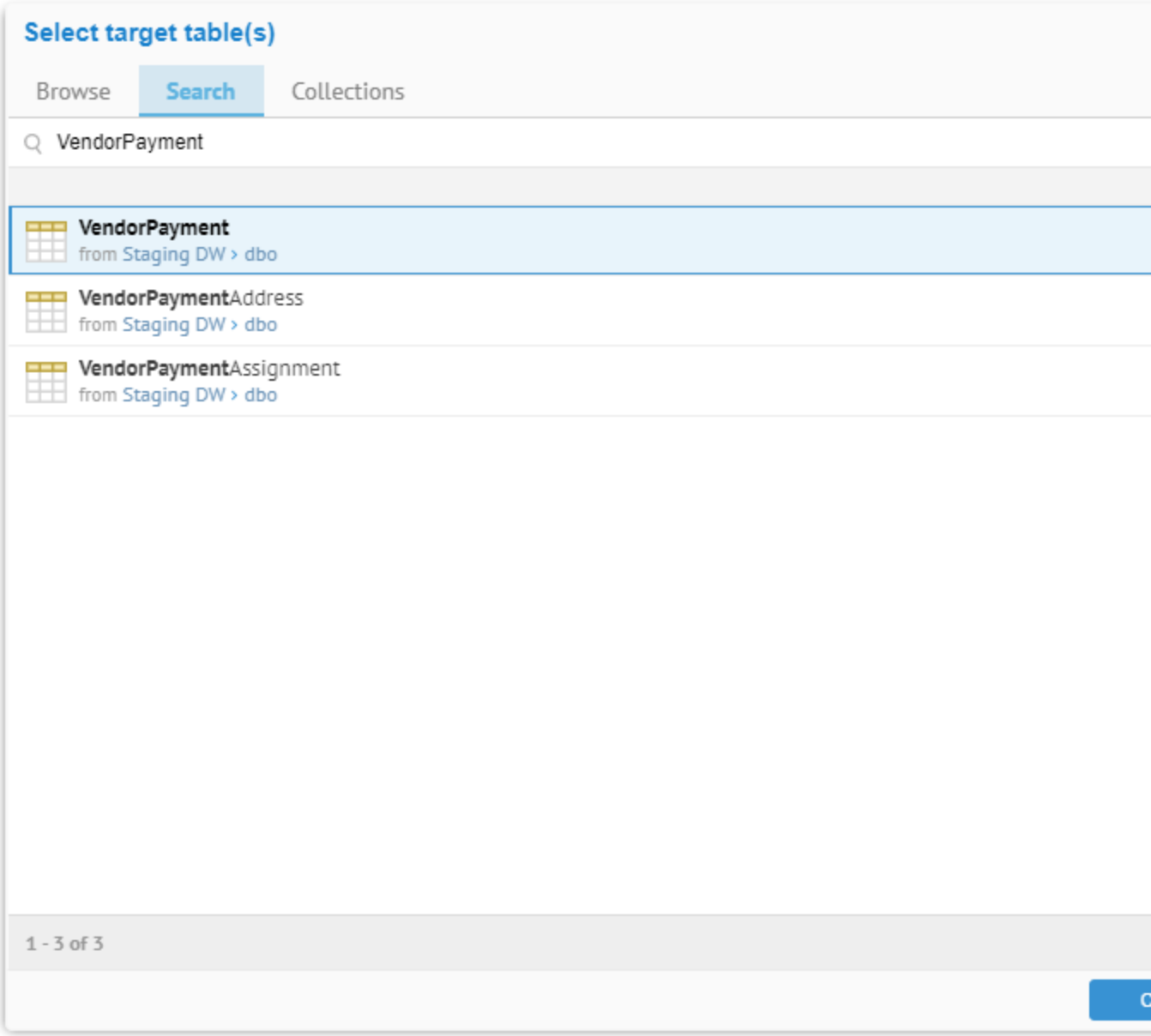
You must specify the target tables up front as that is the scope of the mapping

Note, you now have an explorer type panel.



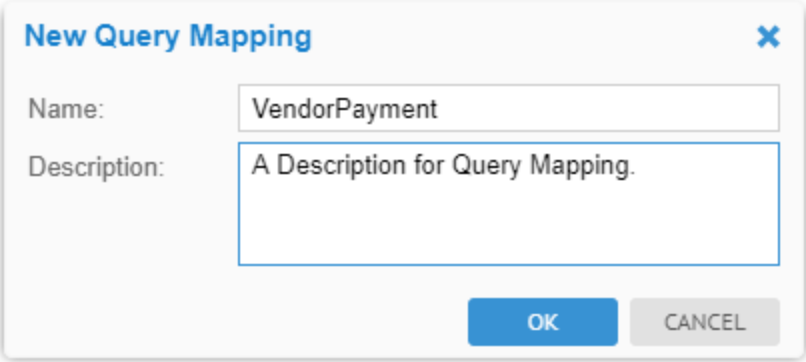
Since we know the name of the table we want (it is Staging DB.dbo.VendorPayment), simply go to the **Search** tab and enter the table name.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



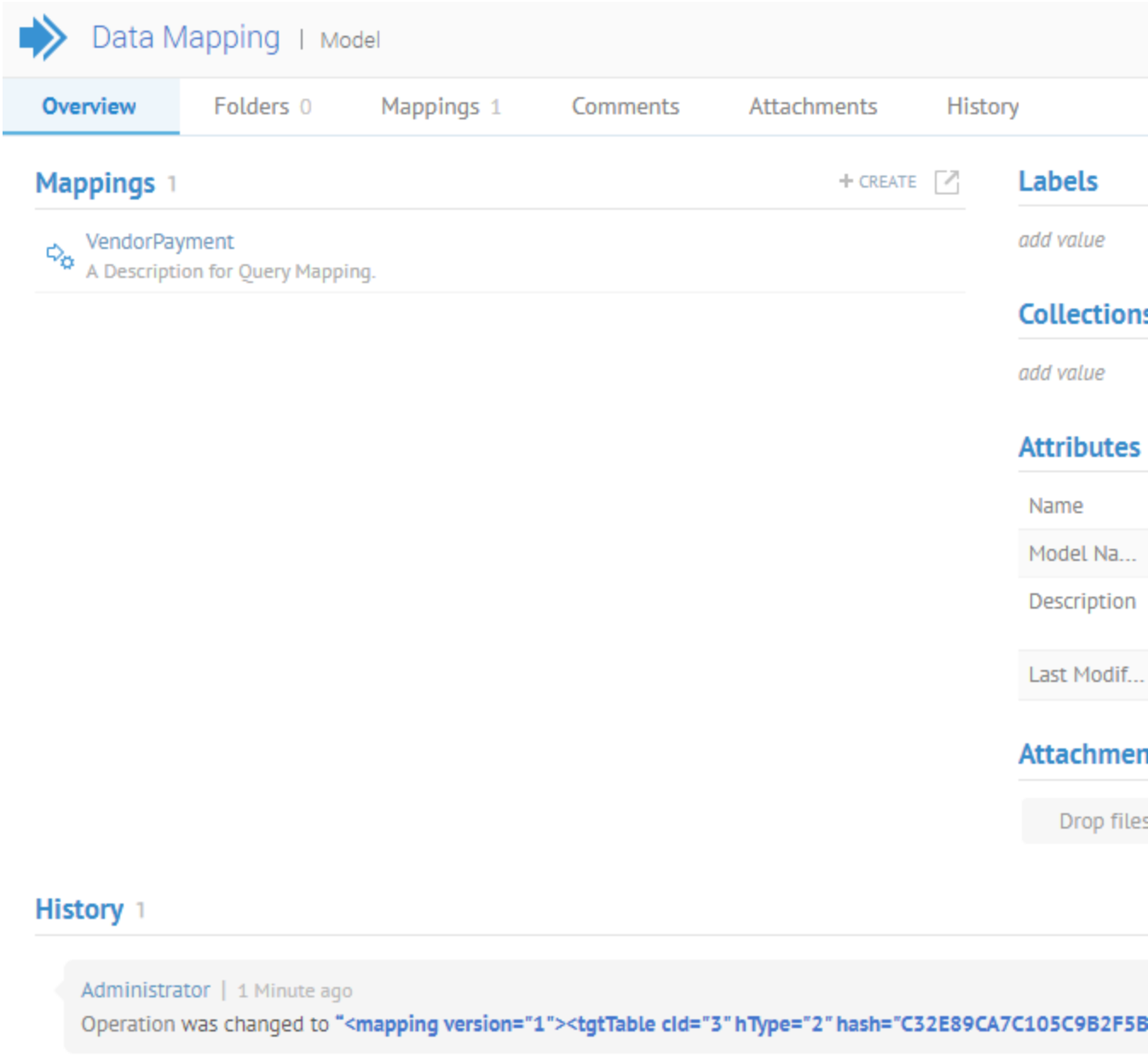
Enter the **Name** and **Description**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



And the result is a mapping **Overview** tab.

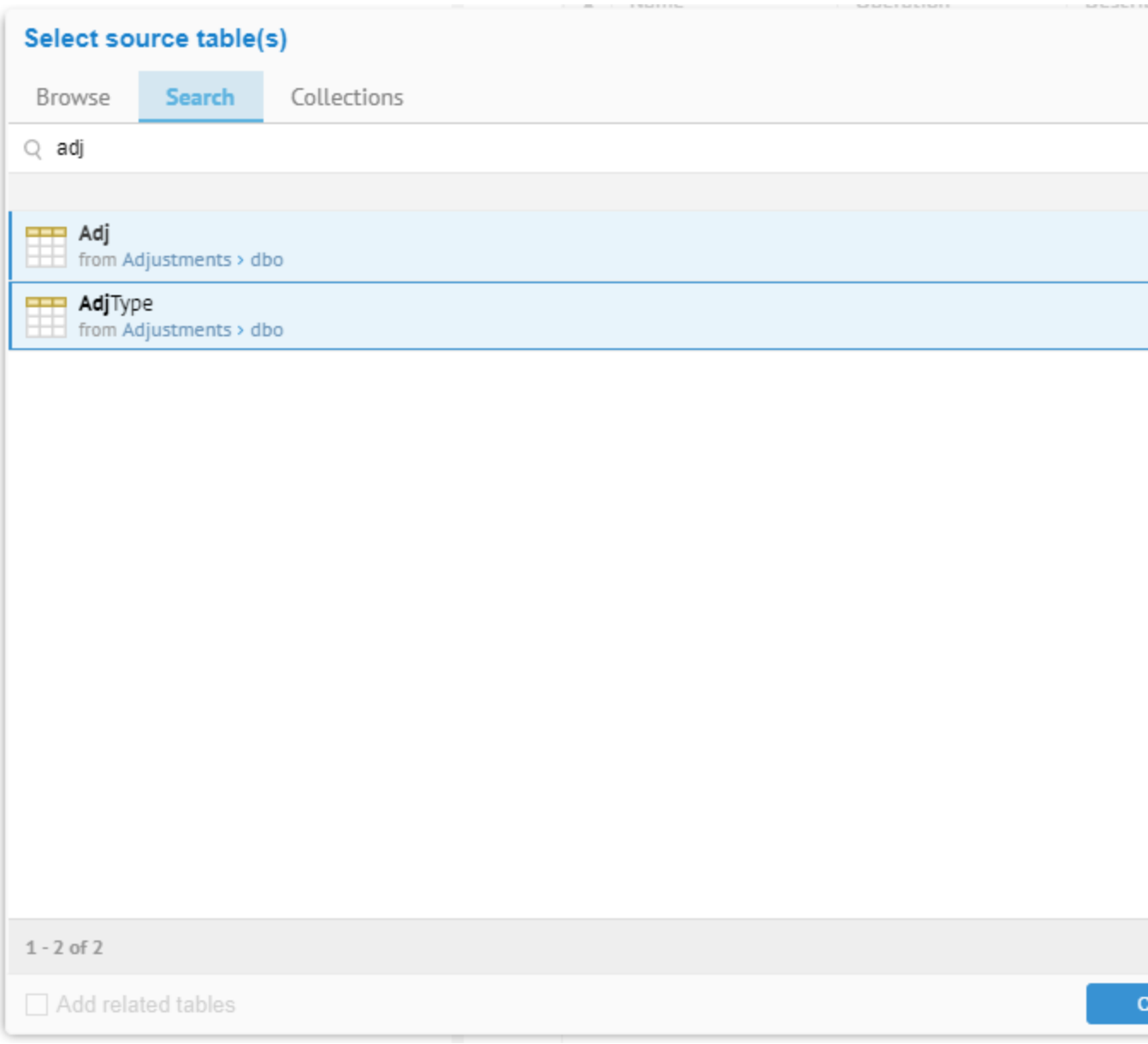
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Add sources

Click the mapping to open it. Click **Add Source**. In the **Search** tab, enter “Adj” and pick the **Adj** and **AdjType** tables.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

VendorPayment | Query Mapping from Data Mapping

Overview | * Mapping Editor | Semantic Flow | Comments | Attachments | History

Sources + | Filter | Links (0) | Target | Columns 0 / 8 | Joins | Filter

Adj (6)

- AdjNum AB
- TransDT
- TransAmt 12
- AdjTxt ?
- TransSetNm AB
- AdjTyp AB

AdjType (3)

- AdjTyp AB
- AdjTypNm AB
- AdjTypTxt ?

Drag columns from left to right to create links

VendorPayment

Name		Operation
VendorPaymentID	AB	enter expre
CheckNumber	AB	enter expre
PaymentAmount	12	enter expre
PaymentType	AB	enter expre
Description	AB	enter expre
Status	AB	enter expre
VendorInvoiceNumber	AB	enter expre
VendorID	AB	enter expre

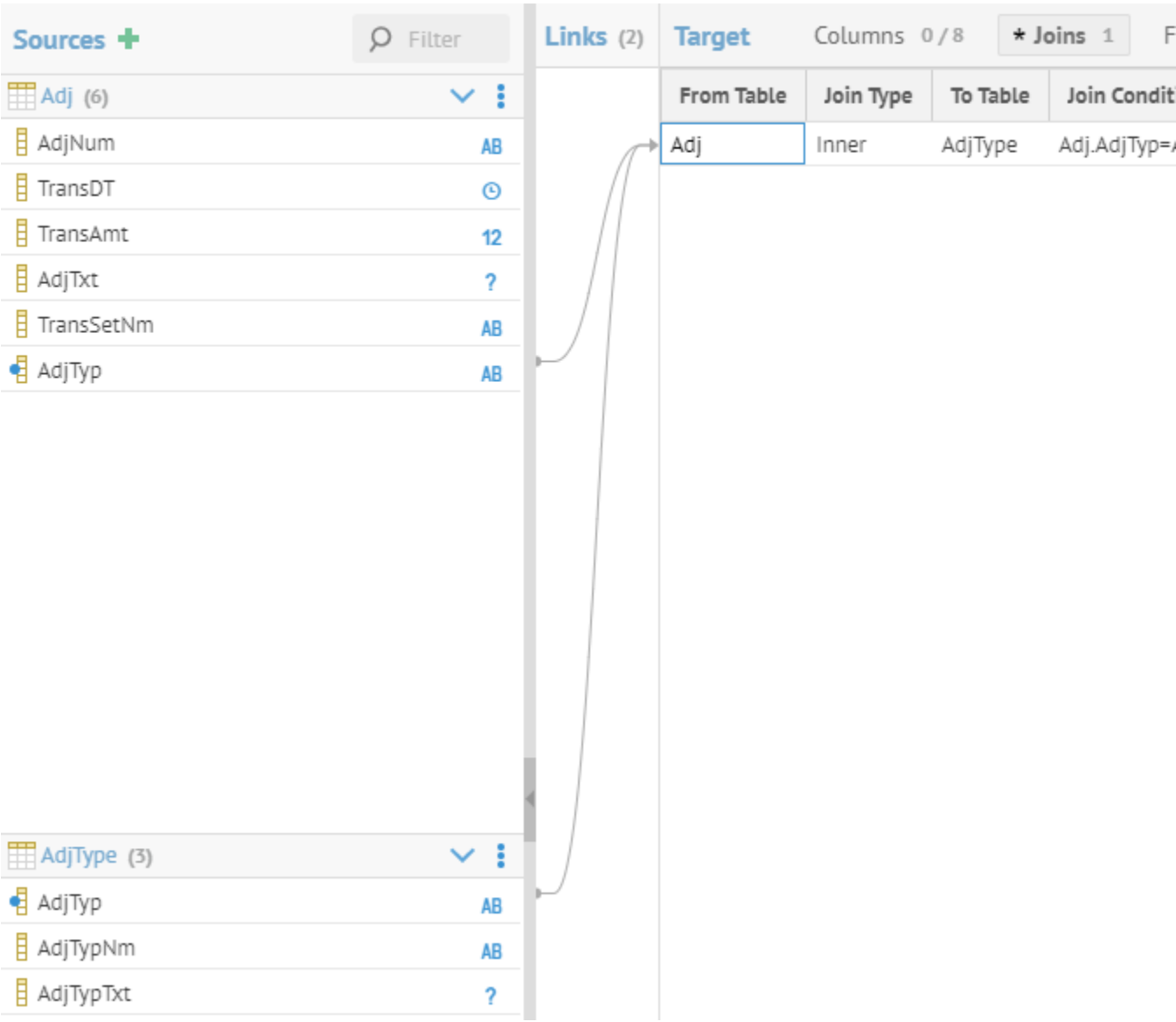
Select a column to edit its mapping expression

1

Copyright

Define Joins

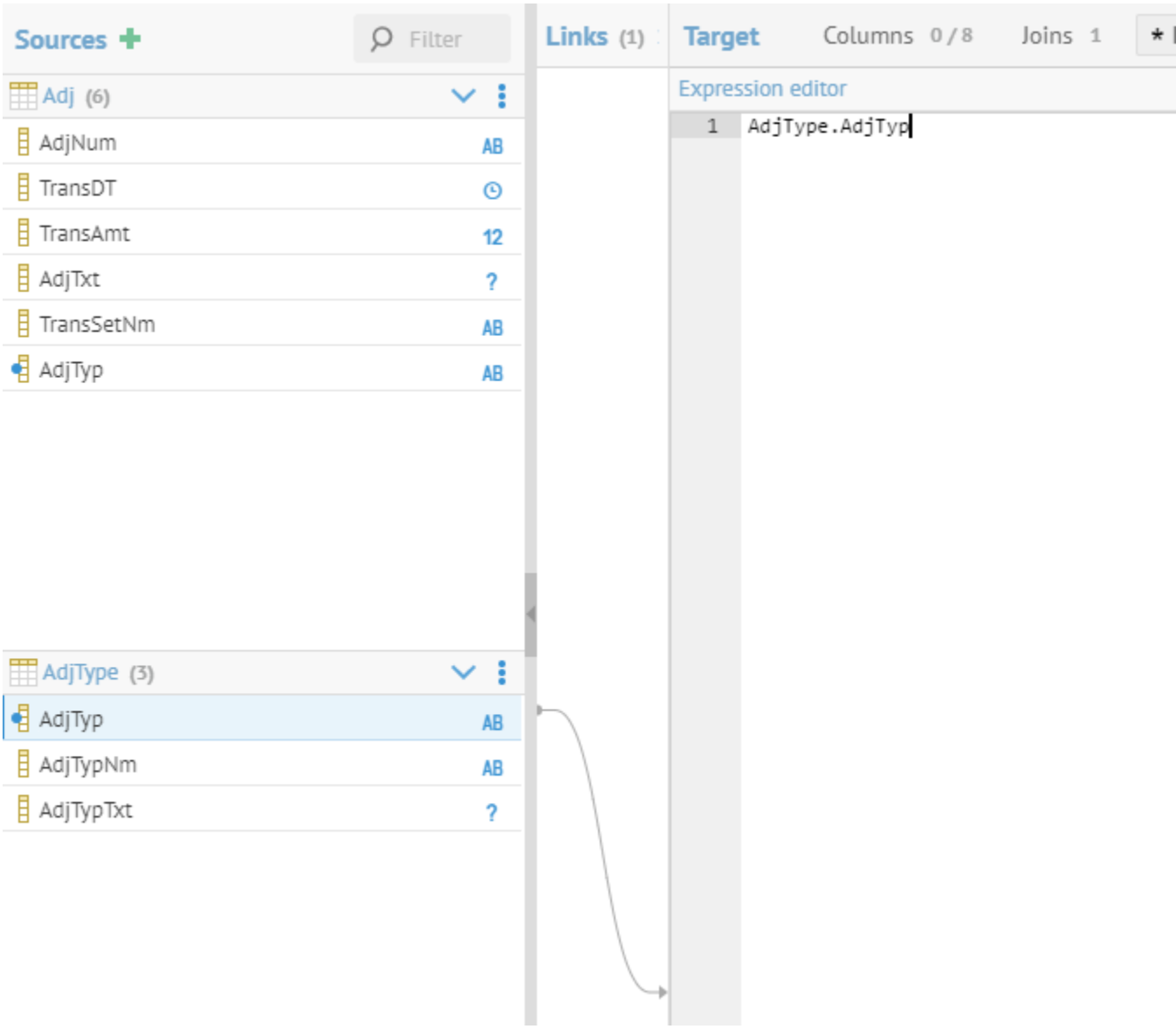
Click the **Joins** tab. Click the Detect Joins magic wand . Click OK to accept the suggestion.



Define filters

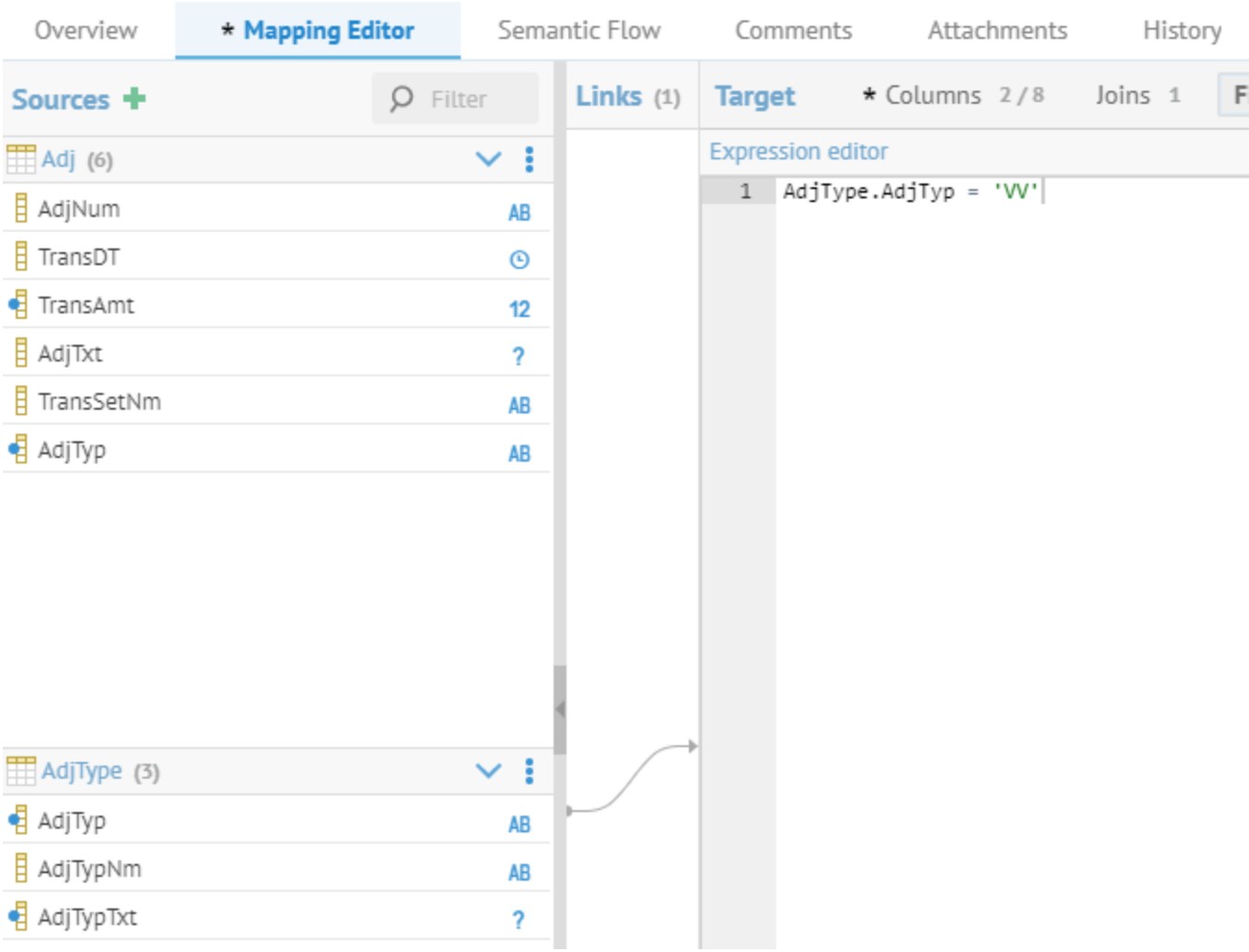
Click the **Filters** tab. Drag **AdjTyp** to the expression.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Type “= 'VV'” in the expression.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



MIMM *validates the expression as you type, thus, the line disappears until you have a valid expression (finish the last single quote mark).*

Define mappings

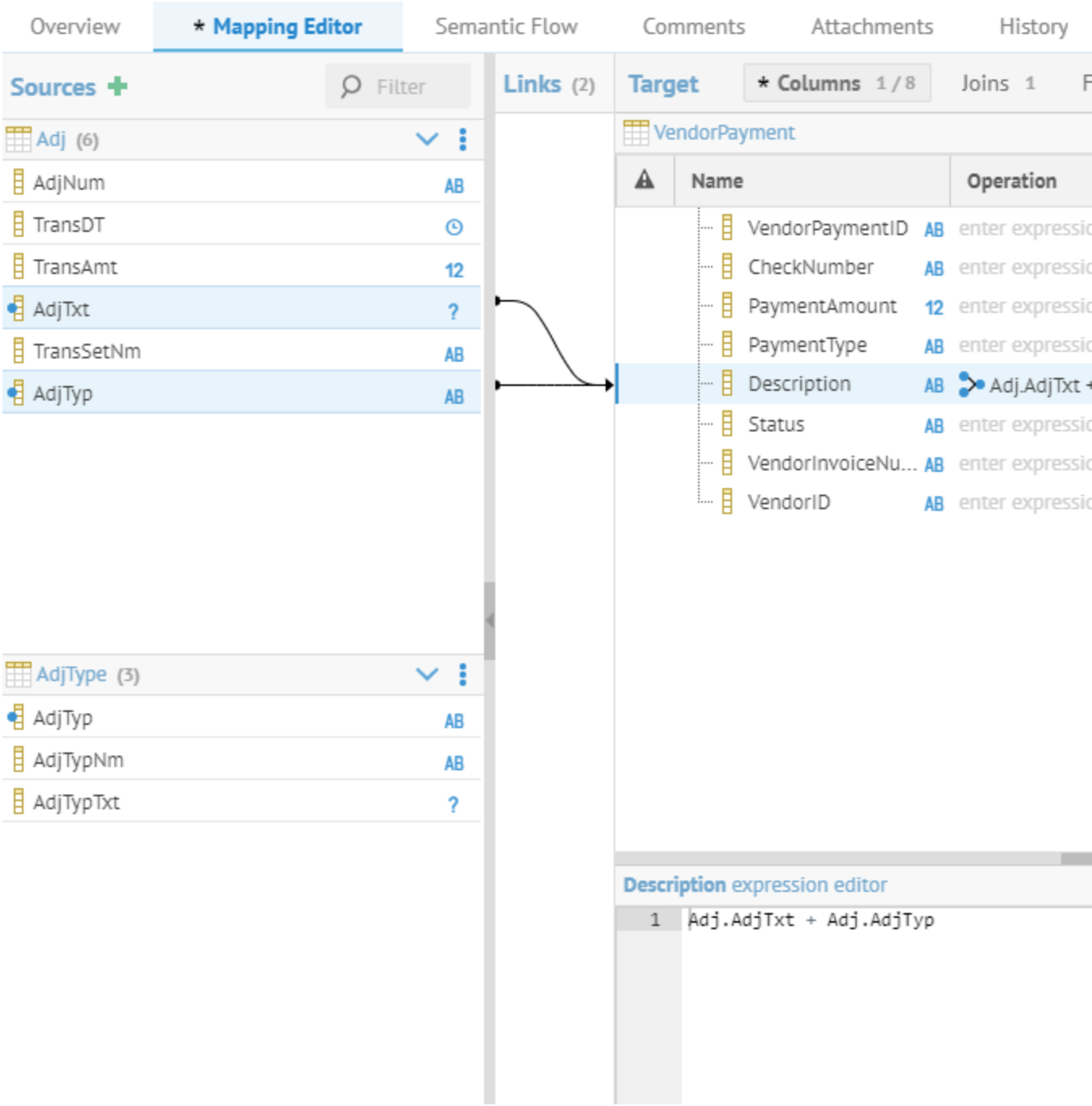
Click the **Columns** tab.

Drag the **Adj**.**TransAmt** column to the **PaymentAmount** column.

Select both the **Adj**.**AdjTyp** and **Adj**.**AdjTxt** columns and drag them to the **Description** column. Click on the expression and expand the Functions panel at the bottom right.

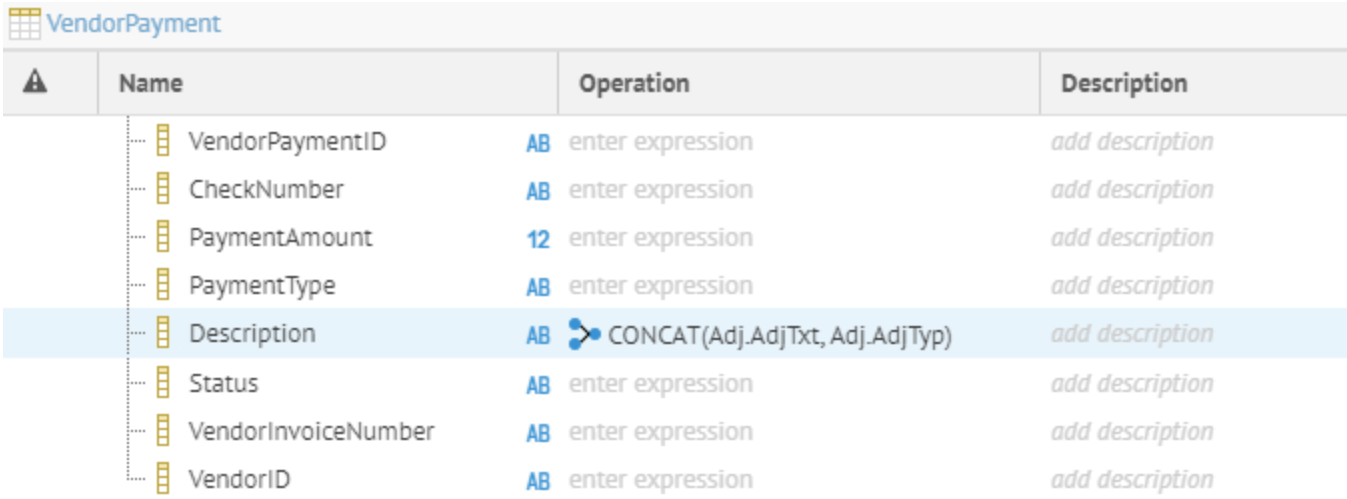
*You may also click the **Adj**.**AdjTyp** column and drag it first, then click the **Adj**.**AdjTxt** column and drag it into the same target and you would obtain the same result.*

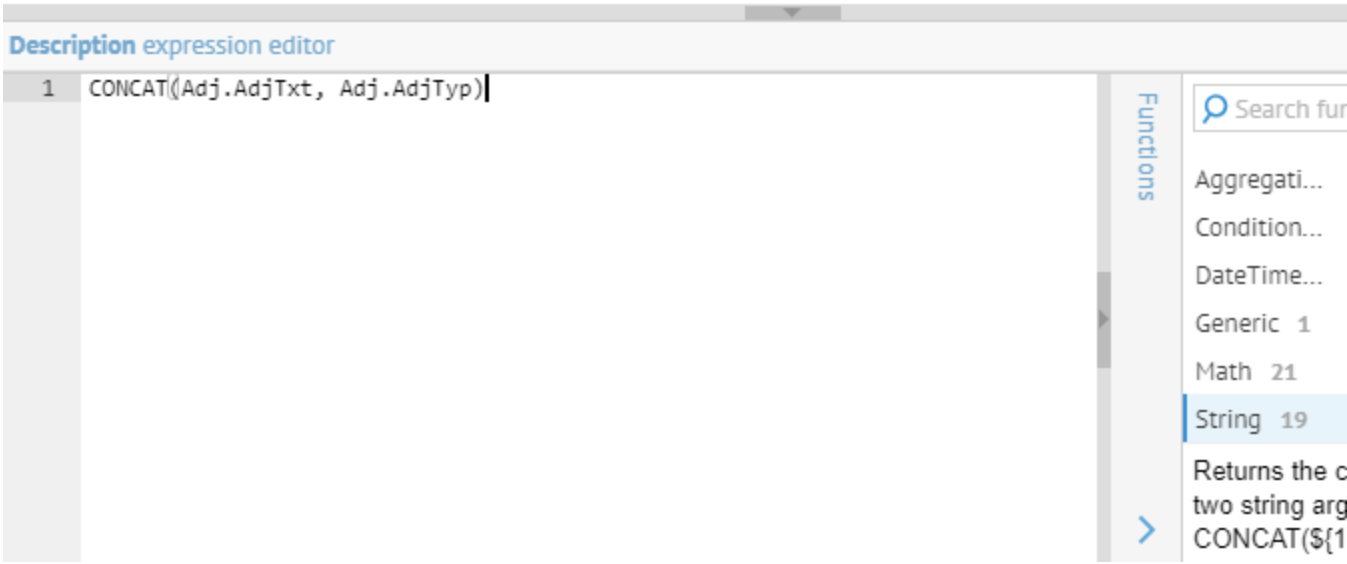
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Select String (functions) and then double-click on CONCAT. Edit the expression to be "CONCAT(Adj.AdjTxt, Adj.AdjTyp)".

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

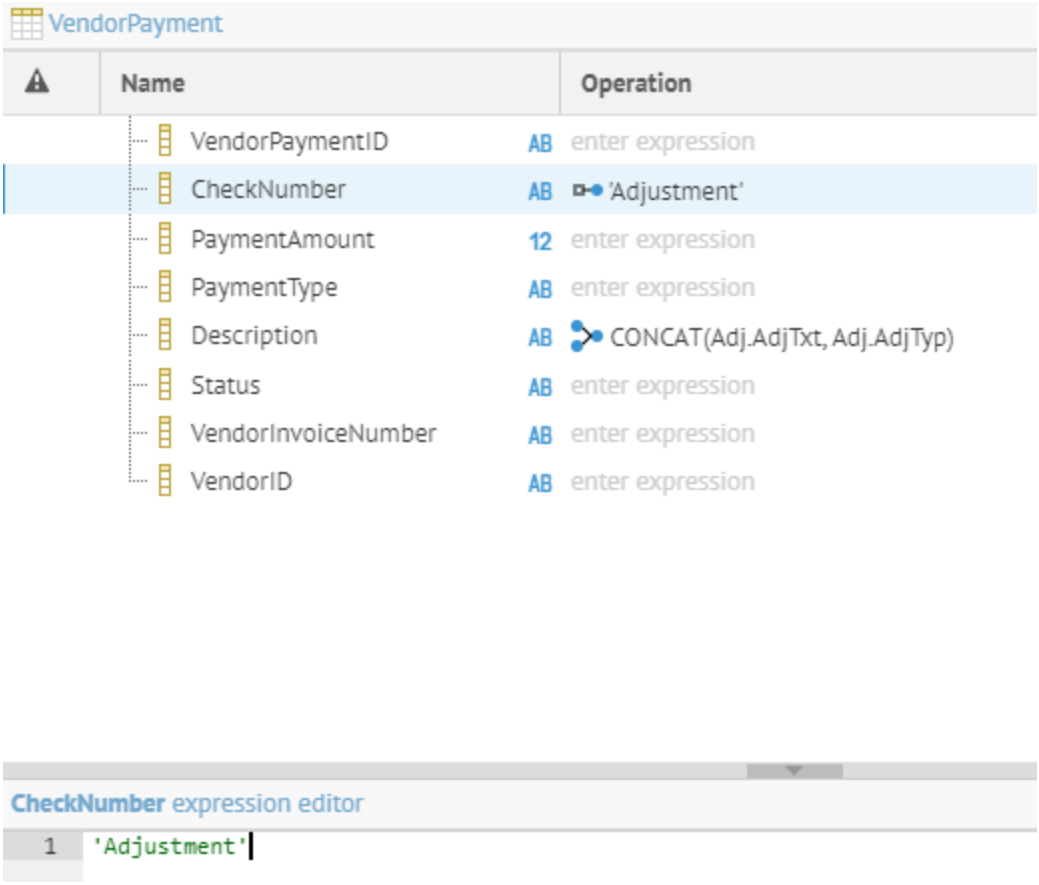




Again, the mapping lines disappear while the expression is invalid and only reappear when the expression is complete and valid.

Click on the Operation next to CheckNumber. Enter "'Adjustment'" in the expression text below.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Fixed value "mappings" are allowed too.

Click Save.

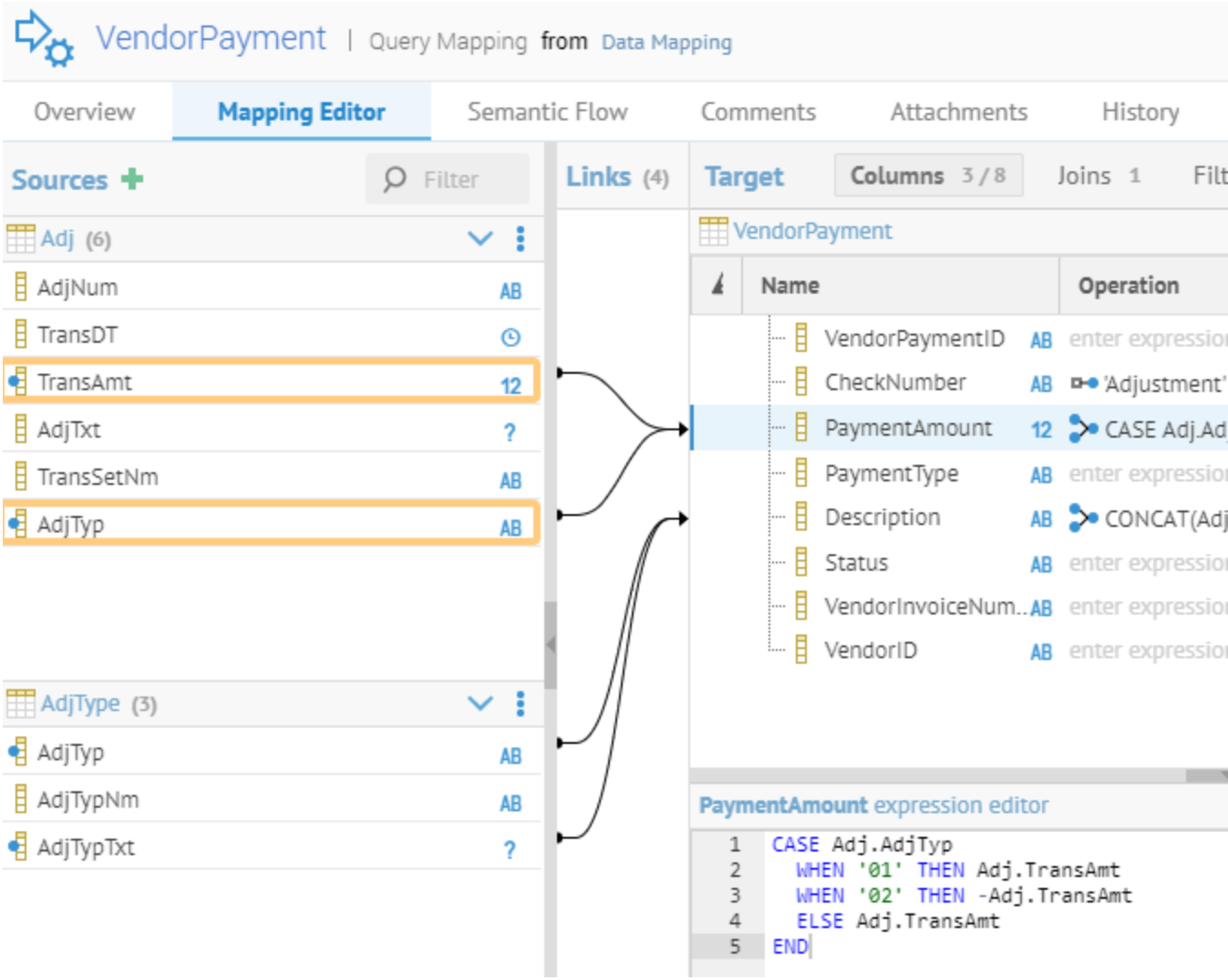
Complex Expressions

You may also simply type in complex expressions, such as **CASE**.

Enter the following for the **PaymentAmount** Operation:

```
CASE Adj.AdjTyp
  WHEN '01' THEN Adj.TransAmt
  WHEN '02' THEN -Adj.TransAmt
  ELSE Adj.TransAmt
END
```

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Other Functions

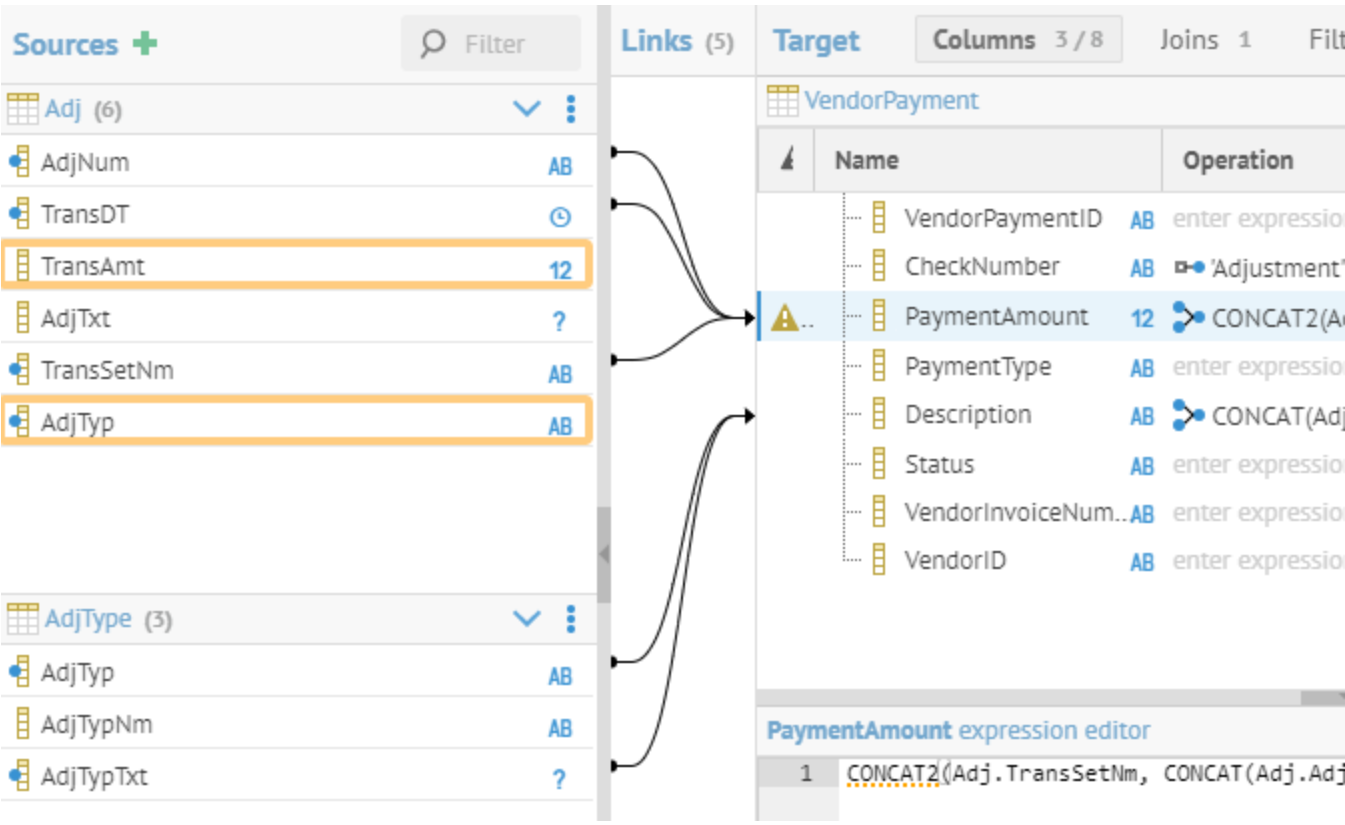
You may also enter other functions, even if they are not in the pick list.

Select **Preferences > Unknown functions**.

Enter the following for the **PaymentAmount Operation**

```
CONCAT2(Adj.TransSetNm, CONCAT(Adj.AdjNum, Adj.TransDT))
```

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



There is a warning about the unknown function, but SAVE is still enabled, and lineage is still produced.

Edit a Bulk Mapping

A bulk mapping is useful when modeling data replication technologies. Each bulk mapping is defined for one target schema and one source schema.

It is important to understand that a bulk mapping is dynamically re-calculated every time you re-build the configuration. This means that while the source and target data store columns may change every time you harvest them, you do not need to rebuild these bulk mappings. The magic wand gives you the illusion that the name mapping is performed in the data mapping tool but that is only for illustration of this bulk mapping at that point in time. The column mapping is not hard coded in that bulk mapping. Instead only a bulk mapping between tables is recorded and the column mappings are re-evaluated at every configuration build.

Steps

Ensure proper permissions

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

1. Sign in as a user with at least the **Editor** security role on the Data Mapping you are going to edit.

Navigate to the mapping to edit

2. Navigate to the details page for the data mapping content and navigate to the folder if necessary.
3. Create the bulk mapping if necessary.
4. Click the **Mappings** tab.
5. Click to open the bulk mapping.

Assign target and source

6. Click Select a target schema.
7. Specify filters to narrow down the choices and select a schema from the list.
8. Click Select a source schema.
9. Specify filters to narrow down the choices and select a schema from the list.

Map

10. Click the Detect Links magic wand to automatically match tables and columns.
11. Drag a specific source table to target table to map all the columns.
12. Click Save.

Example

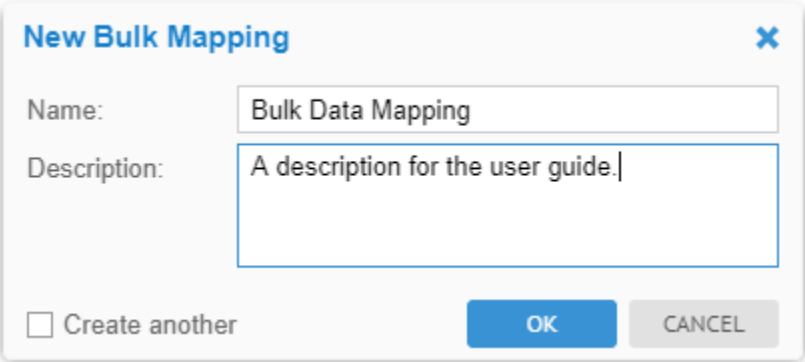
Create a new data mapping content

Go to the **MANAGE > Configuration** in the banner. Click the plus sign under Manage Contents and select **Data Mapping**. Enter a **Name** and **Description** for the content and click OK.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Create a bulk mapping

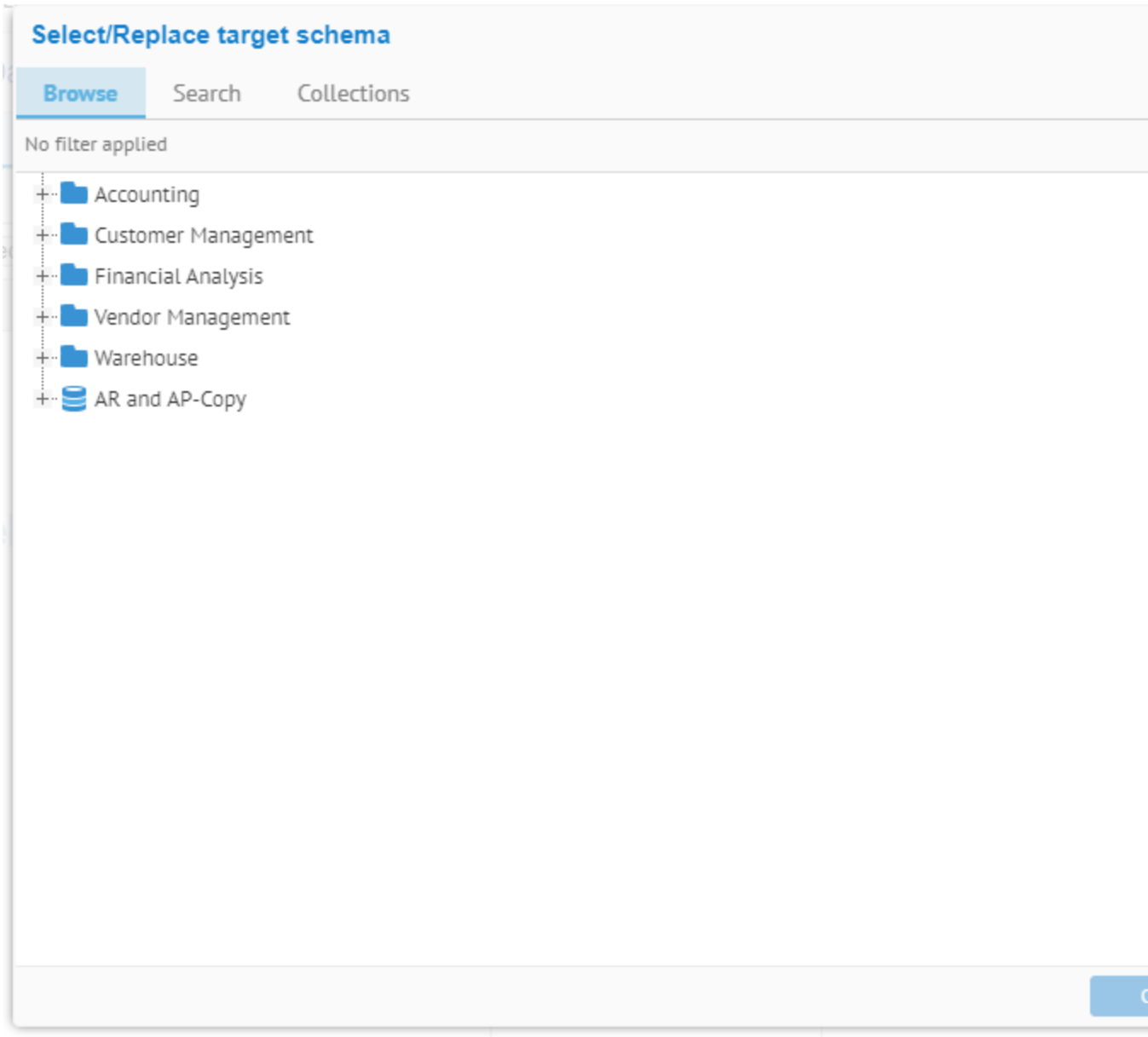
Click Open. Click the **Mappings** tab. Click the plus sign . Select **Bulk Mapping**. Enter the **Name** and **Description**.



Click the mapping to open. Click Select in the **Target** panel.

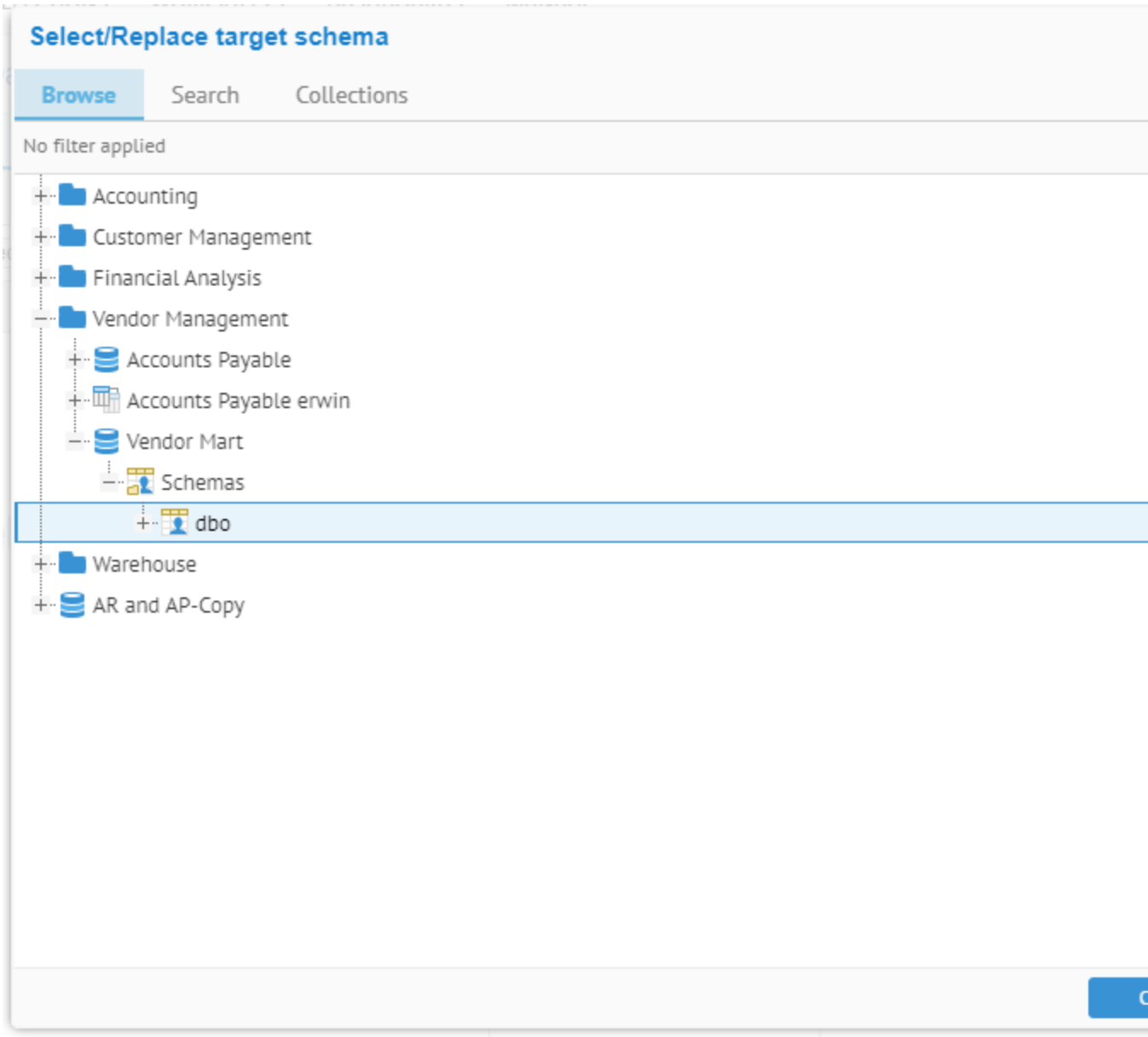
Note, you now have an explorer type panel.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Expand to the **dbo** schema in the **Vendor Mart** model. Select the **dbo** schema (the only one now there with the filter).

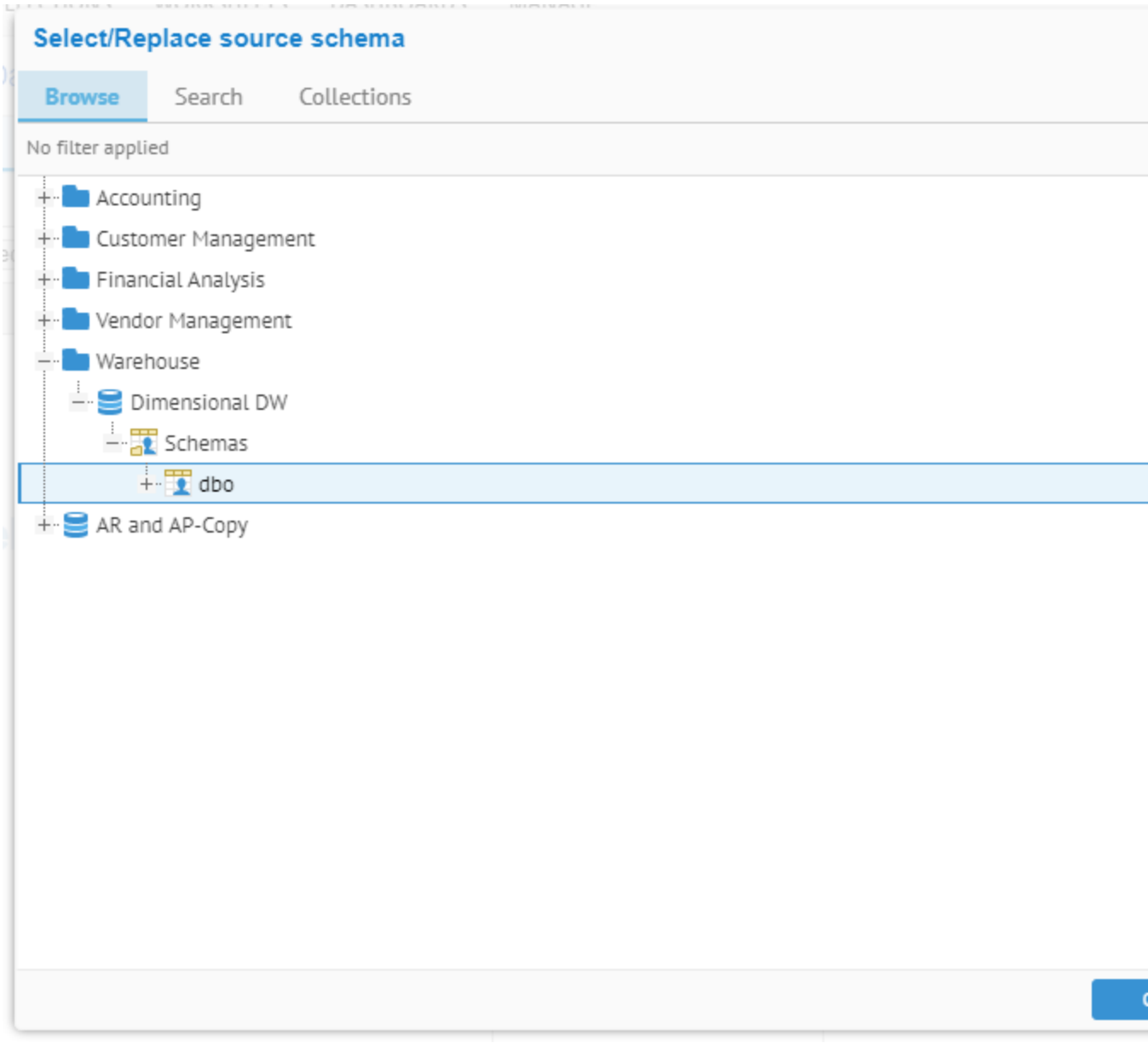
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Select **dbo**.

Do the same for the **Source** panel, selecting the **dbo** schema in the **Dimensional DW** model.

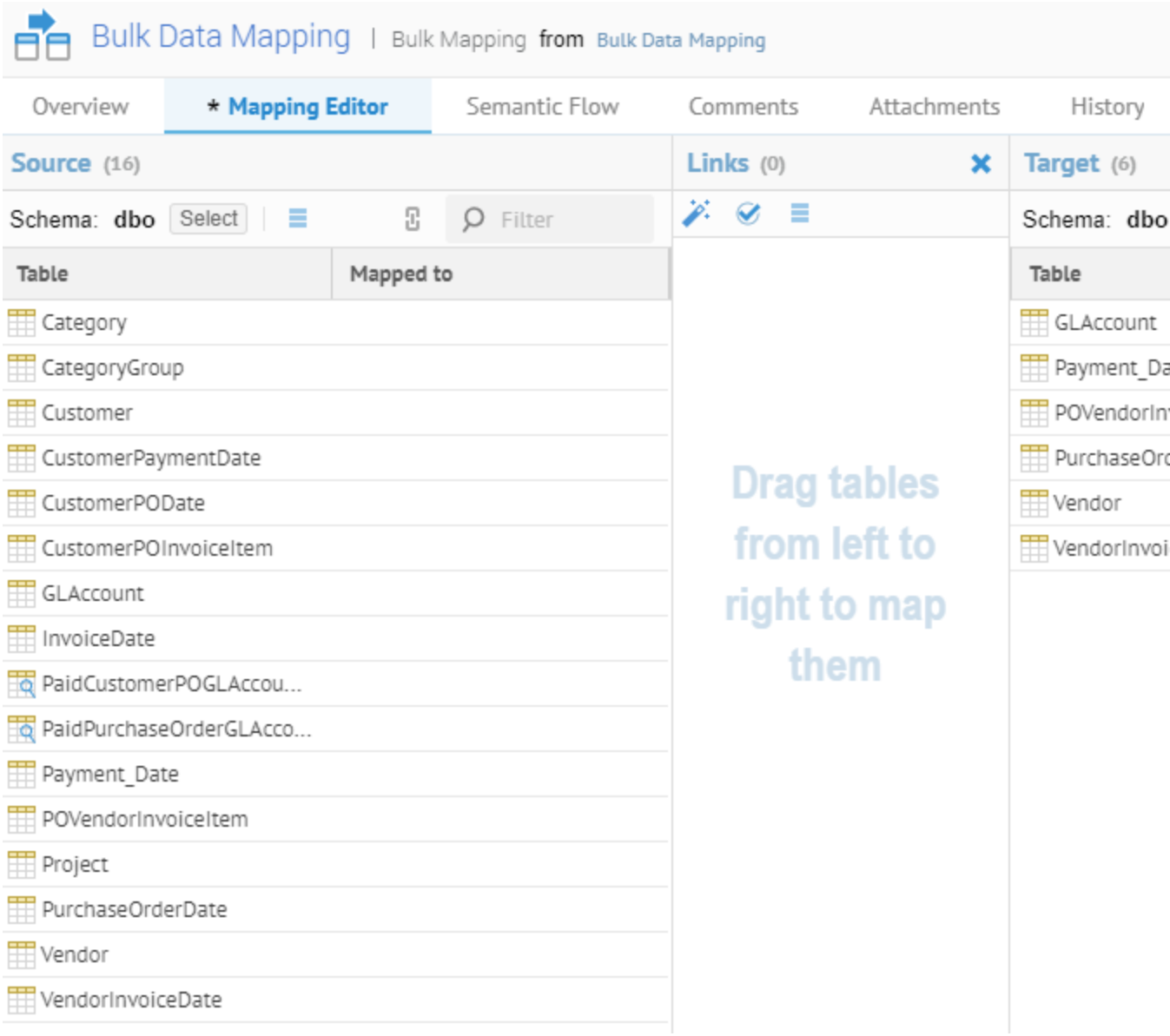
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click OK.

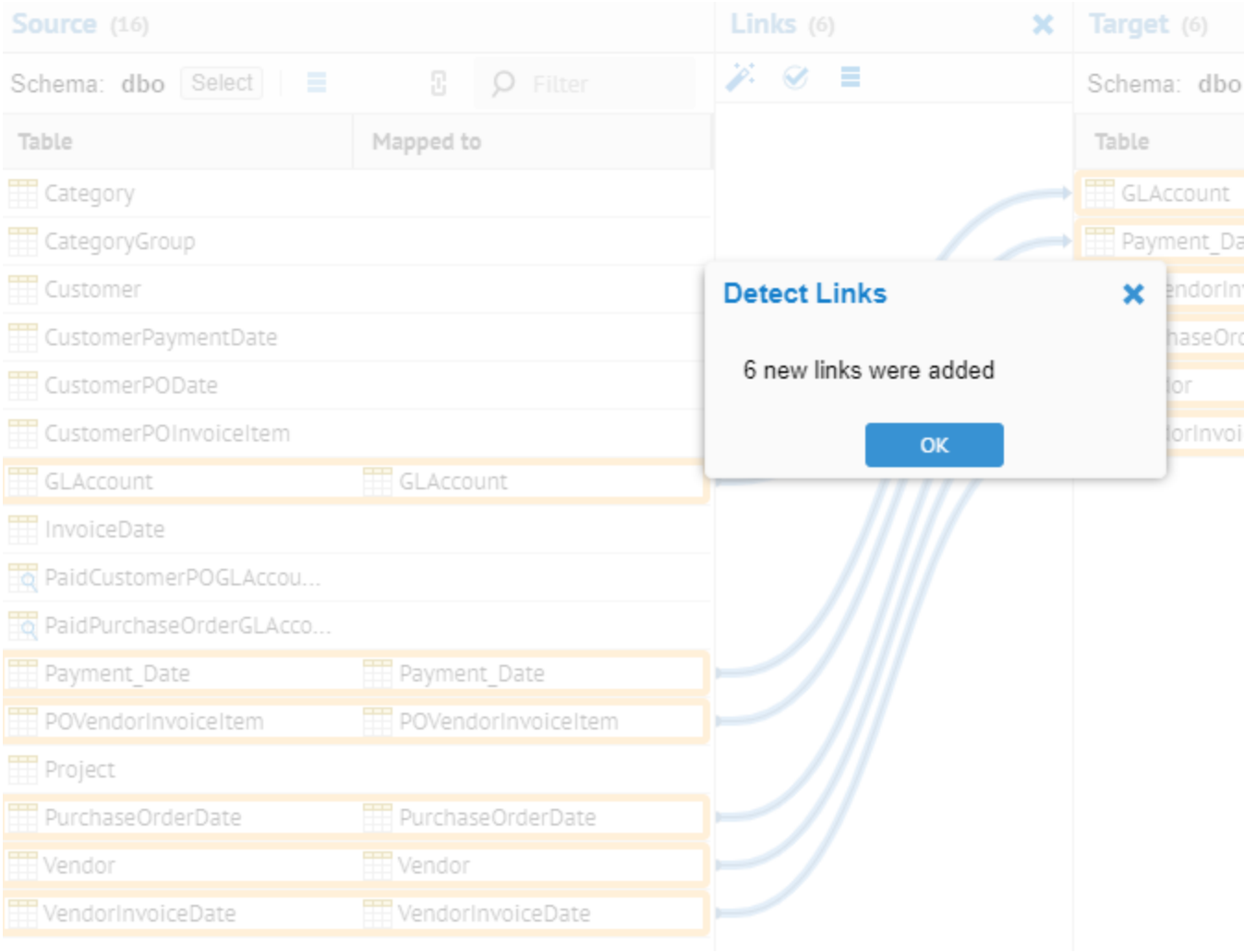
All the target tables in the dbo schema are listed on the target side.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click the Detect Links ( ) to automatically match tables and columns.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click Save.

Replace a Mapping

Data mappings are models of the underlying data flow in your architecture. As such, they are not rigidly connected to source or target models and they contain their own connection information internally. Thus, you may *connect* a mapping a different (but likely identical or nearly identical) model.

Steps

1. Sign in as a user with at least the **Editor** security role on the Data Mapping you are going to edit.

2. Navigate to the details page for the data mapping content.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

3. Click the **Mapping Editor** tab.

Replace with a new source

4. Go to the source (on the left) you wish to replace and click **Actions** > **Remove source**.
5. Click Yes.
6. Click to **Add Source**.
7. Pick an identical (at the column level) dataset (table, file, etc.).

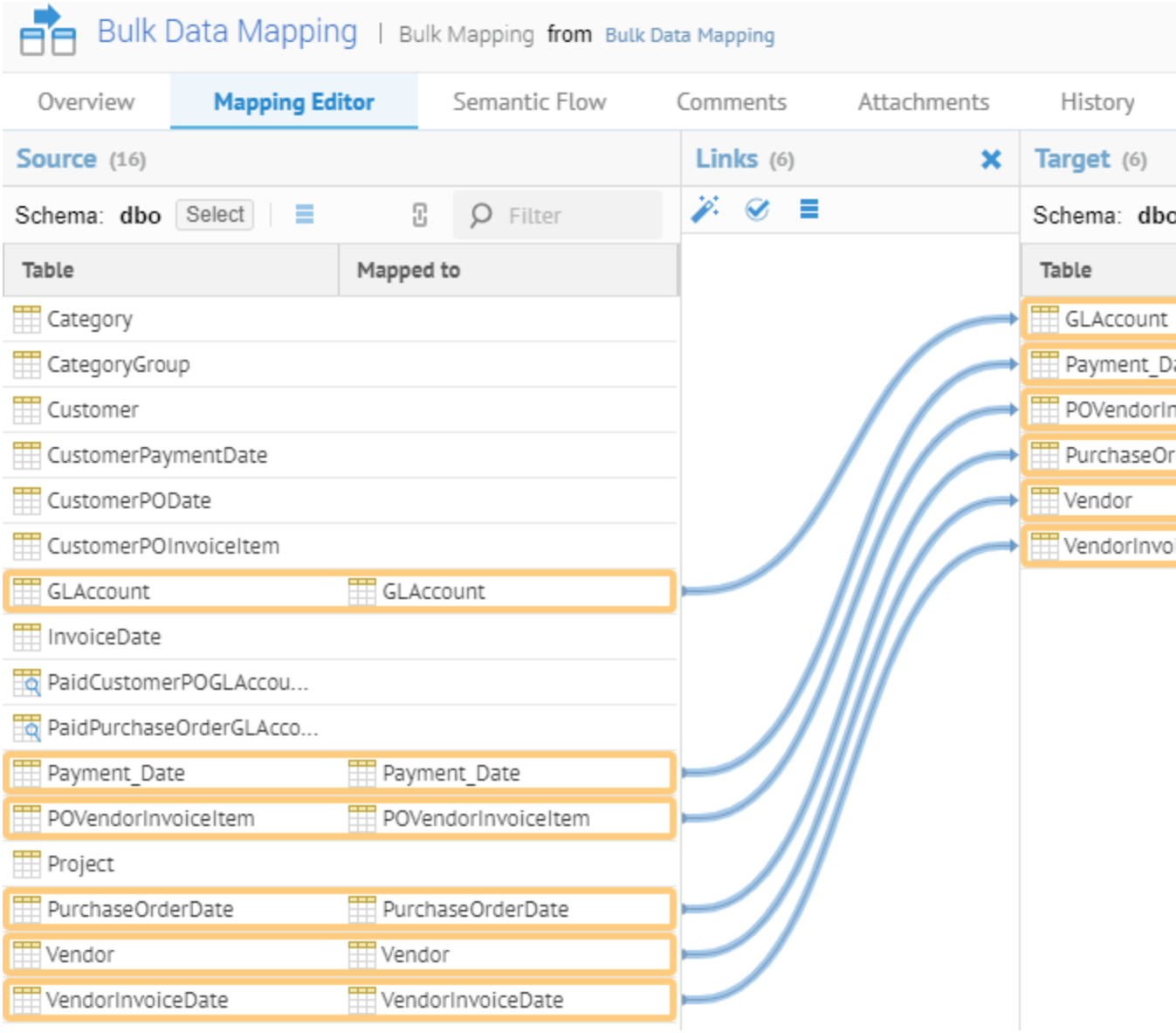
Replace with a new target

1. Go to the target (on the right) you will replace and click **Actions** > **Replace target**.
2. Pick an identical (at the column level) dataset (table, file, etc.).

Example

Navigate to the details page for the data mapping content. Go to the **Mapping Editor** tab.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



The mapping is fully defined and saved.

Migrate to a new source

Go to the source (on the left) you wish to replace and click **Actions** > **Remove source**. Click Yes to confirm.

<dialog>

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Now, the source is no longer in the Mapping Editor tab.

<after removal>

However, the mappings and source connection definitions are still there and that is what we will reconnect to a new source.

Click to **Add Source**, and pick an identical (at the column level) dataset (table, file, etc.).

The mappings are now connected to the new source.

<result>

Replace with a new target

Navigate to the details page for the data mapping content. Go to the **Mapping Editor** tab.

<current mapping>

The mapping is fully defined and saved.

Go to the target (on the right) and click **Actions** > **Replace target**.

<dialog>

Pick an identical (at the column level) dataset (table, file, etc.).

The mappings are now connected to the new source.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

<result>

Export a Data Mapping to Excel

The data mapper is compatible with the Excel metadata format that is defined and provided as part of the delivery of MIMM . In this way, you may export to this format for reporting purposed, or edit and re-import as an ETL model using the Excel Metadata Format file import bridge.

Only query mappings are supported by the Excel format.

Steps

1. Sign in as a user with at least the **Viewer** security role on the Data Mapping you are going to edit.
2. Navigate to the details page for the data mapping content.
3. Select **Metadata Excel Format** from the **Export to** pull-down.
4. Click Export.

Import a Data Mapping from Excel

The data mapper is compatible with the Excel metadata format that is defined and provided as part of the delivery of MIMM . In this way, you may import an existing spreadsheet in this format into a data mapping. Note, this process may fail due to differences in the definition of the source and/or target data stores in the spreadsheet vs. the versions of those models in MIMM and associated with the specific mappings.

Best practice, though, is to import the spreadsheet as an ETL model using the Excel Metadata Format file import bridge.

Only query mappings are supported by the Excel format.

Steps

1. Sign in as a user with at least the **Editor** security role on the Data Mapping you are going to edit.

Navigate to the mapping to edit

2. Navigate to the details page for the data mapping content. Create a new empty content if necessary.

Forward Engineering a Data Mapping

The data mapping allows you to define all the physical data integration constructs, including joins, filters, transformation operations, etc., which may even be forward engineered into data integration tools.

Only query mappings are supported by the export.

Steps

1. Sign in as a user with at least the **Viewer** security role on the Data Mapping you are going to edit.
2. Navigate to the details page for the data mapping content.
3. Select the 3rd party tool format from the **Export to** pull-down.
4. Click Export.

Bulk mapping application

Some DI tools specify data movement logic at the table (or even schema) level. A database replication tool can ask to load a table from a file without specifying columns involved. MIMM customers would like to trace lineage through these bulk metadata at the column level.

The MIMM metamodel and Database/DI bridges support classifier-level-only mappings. The data mapper supports authoring of these type of mappings and resolves these “not completely defined” MIMB and Mapper mappings during the configuration assembly (verification) process.

Use cases

Database replication tools

Database replication tools, like Oracle GoldenGate and HVR allows you to synchronize database at catalog, schema, table and column level. They support inclusion and exclusion rules, like “all but these tables in this schema”. The rules can use wildcards and regular expressions. They can use conditions, like “where a>1”.

Database file import/export, like Oracle bulk loader

To use a database bulk loader, you need a control file, which specifies how data should be loaded into the database; and a data file, which specifies what data should be loaded.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Apache Sqoop

Apache Sqoop efficiently transfers bulk data between Apache Hadoop (HDFS/Hive) and structured datastores such as relational databases. Sqoop can also be used to extract data from Hadoop and export it into external structured datastores.

MM Mapping Specification

When users cannot import bulk mapping metadata they would like to specify it manually in MIMM .

Detect link algorithm

One may specify prefix and suffix for a bulk mapping. These are not filters but rather matching helpers. For example, if all target tables have names of source tables but start with stage_ you should specify the target table “stage_” prefix in the dialog.

Data Modeling

Data modeling tools have been conceived as database design tools to be use by data architects and database administrator to design logical and physical data models generating DDL. Although many of these data modeling tools are rather used to document (create a data model) of existing databases. MIMM offers a different approach than traditional data modeling tool:

- The Business Glossary driven methodology allows for immediate reuse and creation of Terms and naming standards on the fly, fast tracking the data store documentation process
- The Web enabled tool offers better access than desktop tools
- The Data Modeling / Diagramming capabilities of the MIMM are similar to conventional data modeling tools
- Full integration (import/export) to most popular data modeling tool.

In addition, MIMM has a Business Glossary application that allows one to manage terminology and domain definitions across the enterprise. One can reuse these definitions not only among different enterprise applications but between versions of the same application. A glossary may be used to collect and apply naming standards based upon the name assignments made when editing a model. In addition, the MIMM allows one to link tables and columns to terms and glossary domains and business rules.

All the above may be accomplished with harvested models. However, there are limitations as harvested models must maintain consistency with the underlying source (database, DDL, file structure, etc.). MIMM also provides a completely flexible solution, the physical data model (PDM). A PDM

- Does not need to be completely consistent with an underlying data source
- May be extended by adding
    - Schemas
    - Tables
    - Columns
    - Subject areas

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

- Diagrams within subject areas

- May be periodically synchronized with an underlying data source using automatic and/or manually applied compare/merge
- May bootstrap a PDM from and existing data modeling tool model
- May reconcile with an existing data modeling tool model using compare/merge
- May export a PDM to another data modeling tool.

When modeling with a PDM, one may then:

- Model schema, tables and columns and physical properties of each
- Add business names and descriptions to objects, like tables and columns
- Organize and view objects graphically using diagrams and subject areas
- Create and annotate diagrams.
- Model relationships including

  - Cardinality
  - Join conditions
  - Verb phrases
  - to better understand interrelated objects

In addition, these data stores change over time. MIMM protects an investment in documenting data stores by supporting the synchronization of existing Physical Data Models to new data store versions automatically.

Data Modeling with Ordinary Models

Edit a Model

You may edit the components of a model on the details page for that model or as the result of search or browse activity in grid mode.

Edit a Model in the Details Page

This method works well when editing a single metadata element in a model or proceeding through a models structure (schema, table, column) to edit a model completely.

Steps

1. Sign in as a user at least the **editor** security role on the model containing the metadata element you wish to edit.

2. Navigate to the details page for the metadata element.

3. Click the **Overview** tab.

All primary properties are available for editing here.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

In particular, the Business Description and Business name are also derived from semantic definition lookup. Thus, special care must be taken with these fields.

4. Select Preferences > Add custom attributes to extend the properties associated with this metadata element.

*Custom attributes are taken from a pool defined in the **MANAGE** > **Custom Attributes** function.*

5. Click the Related Diagrams tab to create new and edit existing diagrams using.
6. On the details page of a classifier (e.g., table, view) level metadata element you may click the Relationships tab to add (with inference and detection), edit and curate relationships with other classifiers.

These relationships may then be

- *included in the model diagrams*
- *used as part of joins and filters in data mappings.*

7. Click the Semantic Flow tab to add, edit, delete semantic links (classifications and mappings)

Edit a Model in Grid Mode

This method works well when editing multiple metadata elements in several different models that are collected together as the result of a search, browse filter or list.

Steps

1. Sign in as a user at least the **editor** security role on the models containing the metadata elements you wish to edit.
2. Search, specify a browse filter or open a list.
3. Click the Grid Mode icon.

*All the primary properties are available for editing here. They are columns in a spreadsheet like presentation. In particular, the **Business Description** and **Business Name** are also derived from semantic definition lookup. Thus, special care must be taken with these fields. In fact, the columns for these two properties in the grid mode are the actual manually entered values that you see on the details page under **Properties**. They are **not** always the values presented next to the **Physical Name** and just underneath it.*

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Edit a cell

4. Double-click on a cell in the grid (or right-click and select **Edit**) to edit it.

Those that are editable have a small triangle in the lower right corner.

Edit like a spreadsheet

5. Use the tab, enter and arrow keys to proceed through the editable cells of the grid.
6. Right-click any cell for the context menu options.

Multi-edit

7. Select more than one row (Shift-click, Ctrl-click, etc.) to apply action to all of the selected rows or to update common and editable properties shared by all the rows selected.

Only those actions available to ALL of the selected rows and permitted according to your permissions will be presented.

Sort and add/remove columns

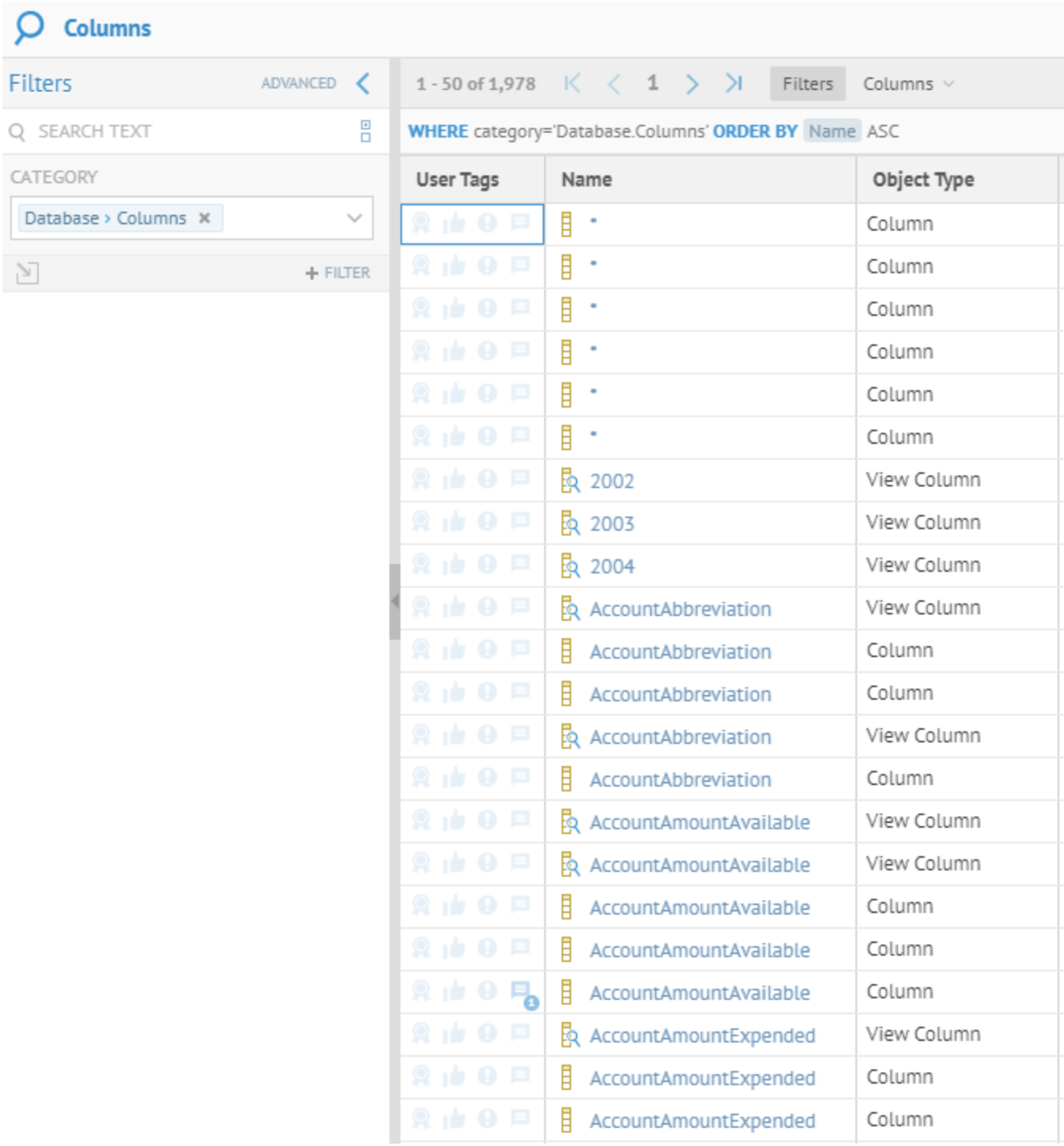
8. Click on any column header to sort (toggles between ascending and descending).
9. Click on the down pointing caret to add or remove the columns displayed in the grid.

All possible properties for the metadata element types you are browsing are presented as well as all custom attributes defined for this type.

Example

Select **WORKSHEETS** > **Database** > **Columns** in the banner and click the grid mode icon, under **Columns**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Add a Model Diagram

Steps

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

1. Sign in as a user at least the **editor** security role on the model containing the metadata element you wish to edit.
2. Navigate to the details page for the model as a whole.
3. Click the **Related Diagrams** tab.
4. Click the plus sign to add a diagram.
5. From here you may edit the model diagram.

Edit a Model Diagram

Steps

1. Sign in as a user at least the **editor** security role on the model containing the metadata element you wish to edit.
2. Navigate to the details page for the model as a whole.
3. Click the **Diagrams** tab.
4. Click to Open the diagram.
5. From here you may use all the options to visualize a diagram.
6. Click **Start Editing** to edit the diagram.

The panel on the left provides a pool of all classifier level objects in the model which may be included in the diagram.

7. Drag and drop tables, etc., from the pool into the diagram to include that object in the diagram.
8. Multi-select (Shift-click and Ctrl-click) in the pool and drag and drop the selection into the diagram to include that object in the diagram.

As you include objects from the pool, you will notice that relationships among the current set of classifiers in the diagram are also included. By default, only user-defined (either created or certified inferred) relationships are included automatically.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

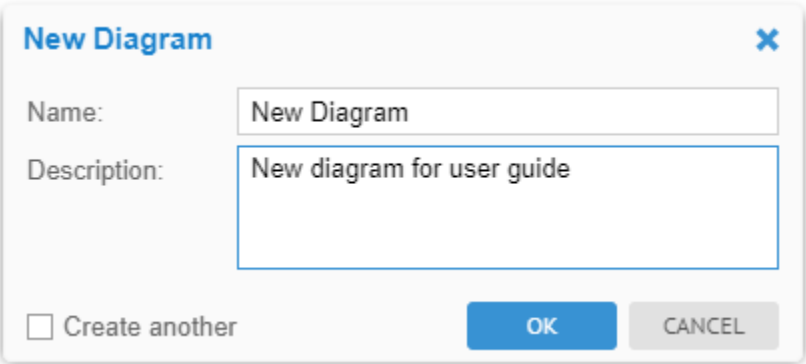
These relationships are simply join conditions, not true logical relationships and in entity-relationship modeling. Thus, all you specify for them is a join condition and a description.

9. To include additional relationships inferred between the currently included classifiers, right-click on a classifier and select **Import Relationships…**, select the rows to include and click OK.
10. Click Add Annotation to add any annotation with text to the diagram.
11. Click Add Relationship (Join) to add a new relationship to the diagram. Do so, by dragging from one classifier to another.
12. Double-click on any relationship defined in this way to edit the **Description**.
13. To edit the join condition of a relationship:
    - Right-click on one of the classifiers of a relationships
    - Select **Open**
    - Click on the **Relationships** tab
    - Right-click on the row representing the relationship and select **Edit operation**.
    - Drag and drop the columns that are part of the operation to define it.

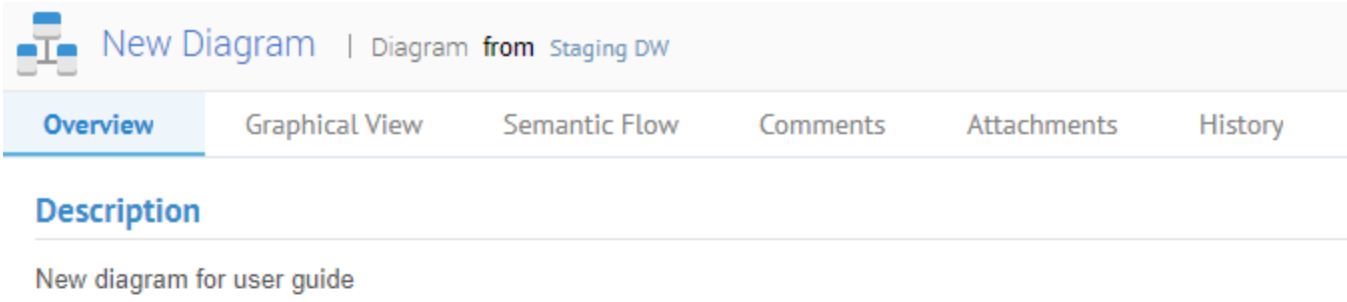
Example

Navigate to the details page for the **Staging DW** database model and click the Diagrams tab.

Click the plus sign to create a new diagram.

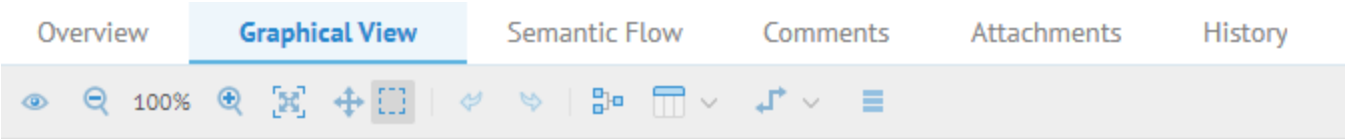


Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click the **New Diagram**. Then click **Start Editing**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

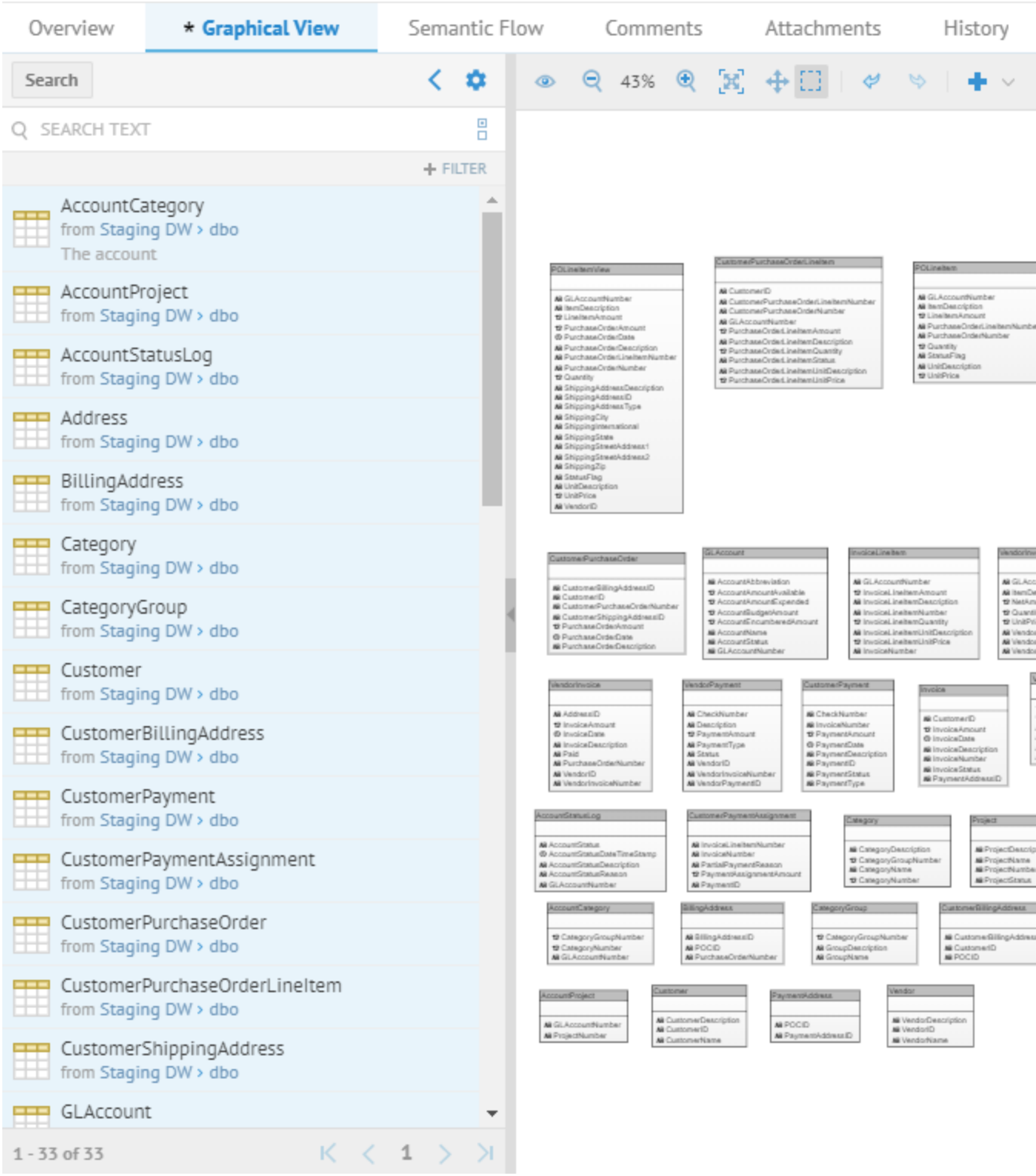


The possible tables to include are on the left.

If you move away from this page or click Stop editing and do not save, all changes will be lost.

Type Ctrl-A to select all the tables and drag the tables into the diagram

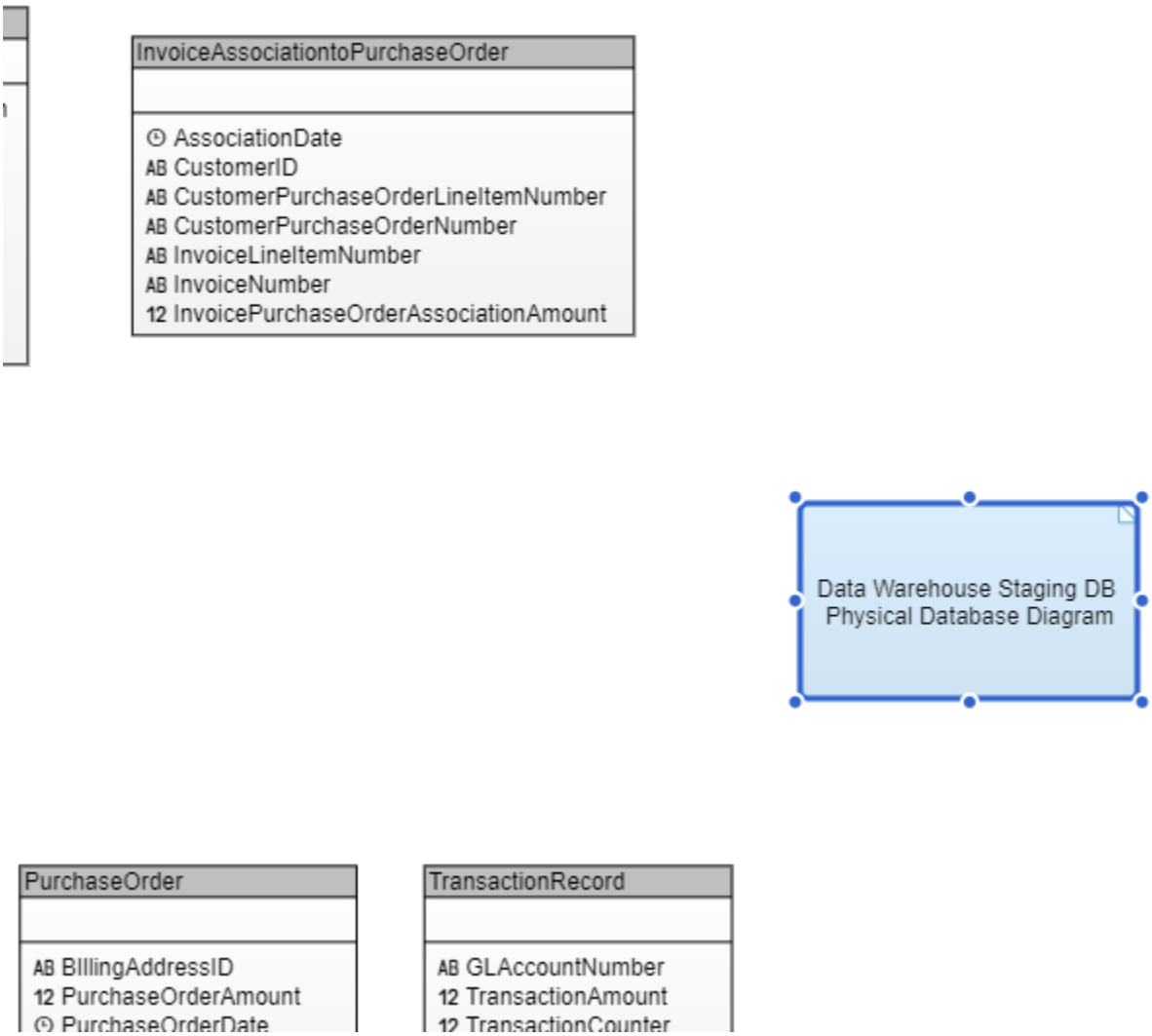
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Relationships are also included that are either PK-FK or user-defined for these tables.

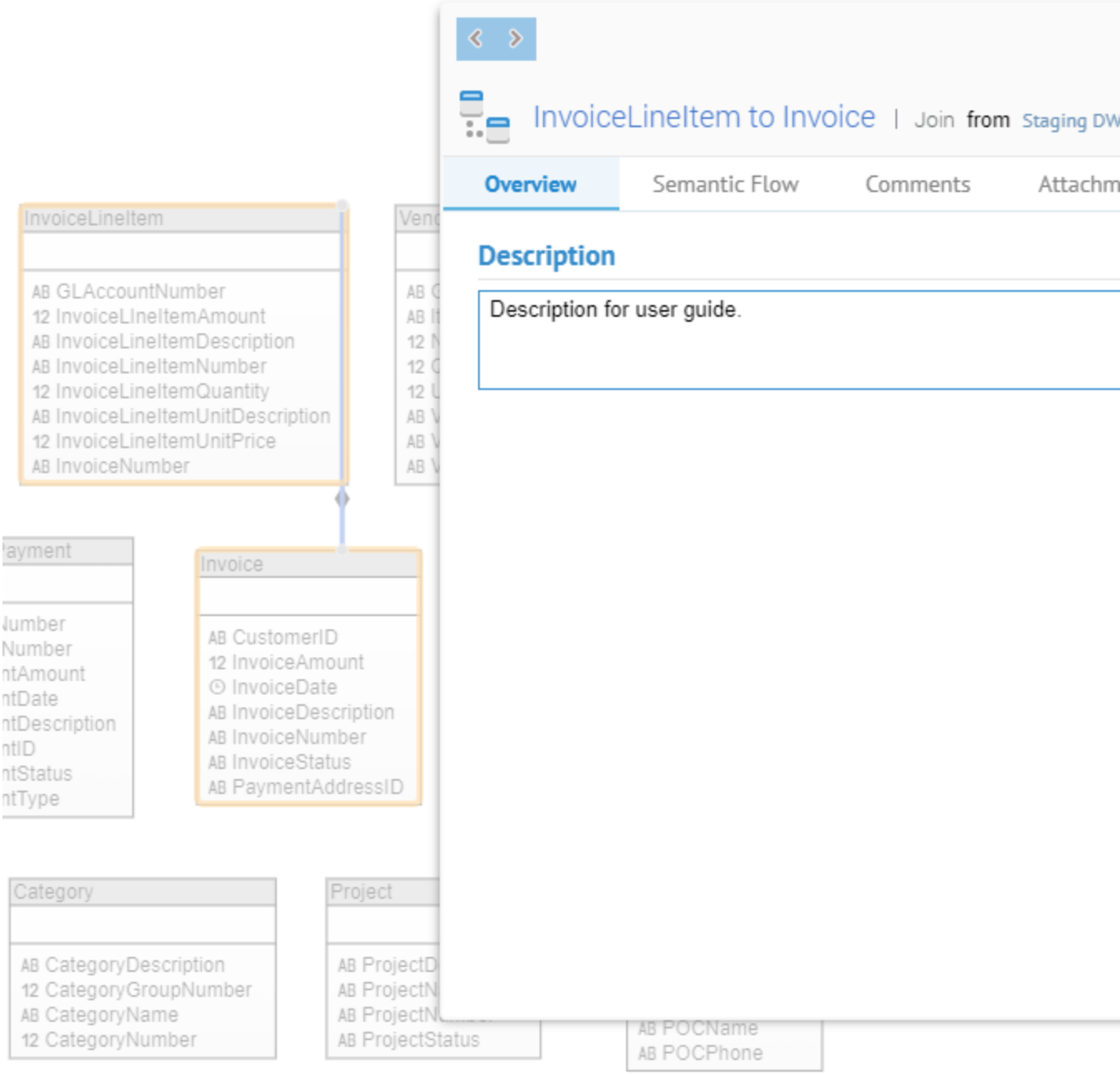
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Drag the edge of the panel with the pool of tables on the left to hide most of it and get more room to work. Then, click **Add > New shape** and create a title annotation for this diagram.



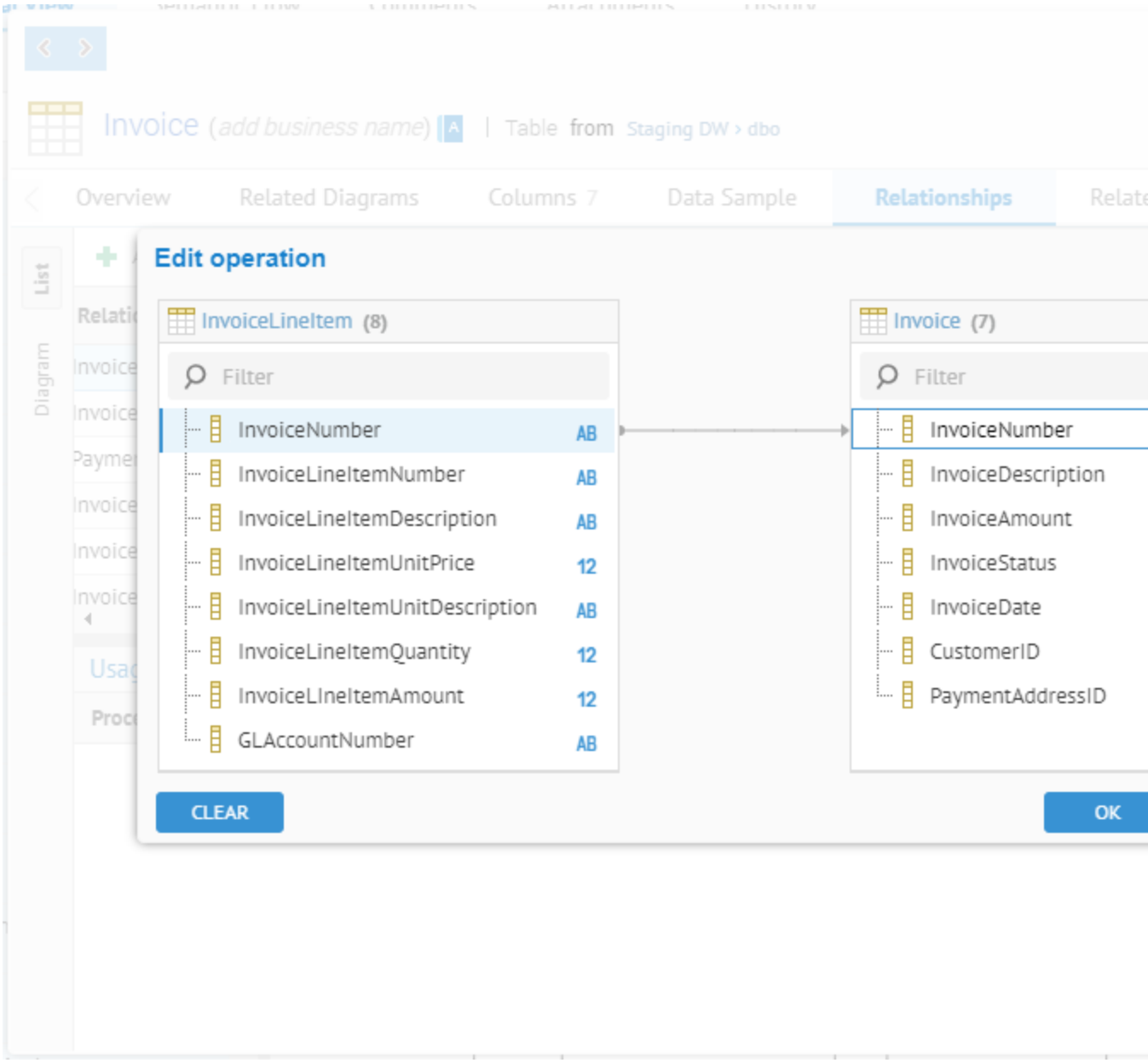
Click **Add** > **New** relationship and then drag from the **InvoiceLineItem** table to the **Invoice** table. Double-click on the resulting relationship line and provide a **Description**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



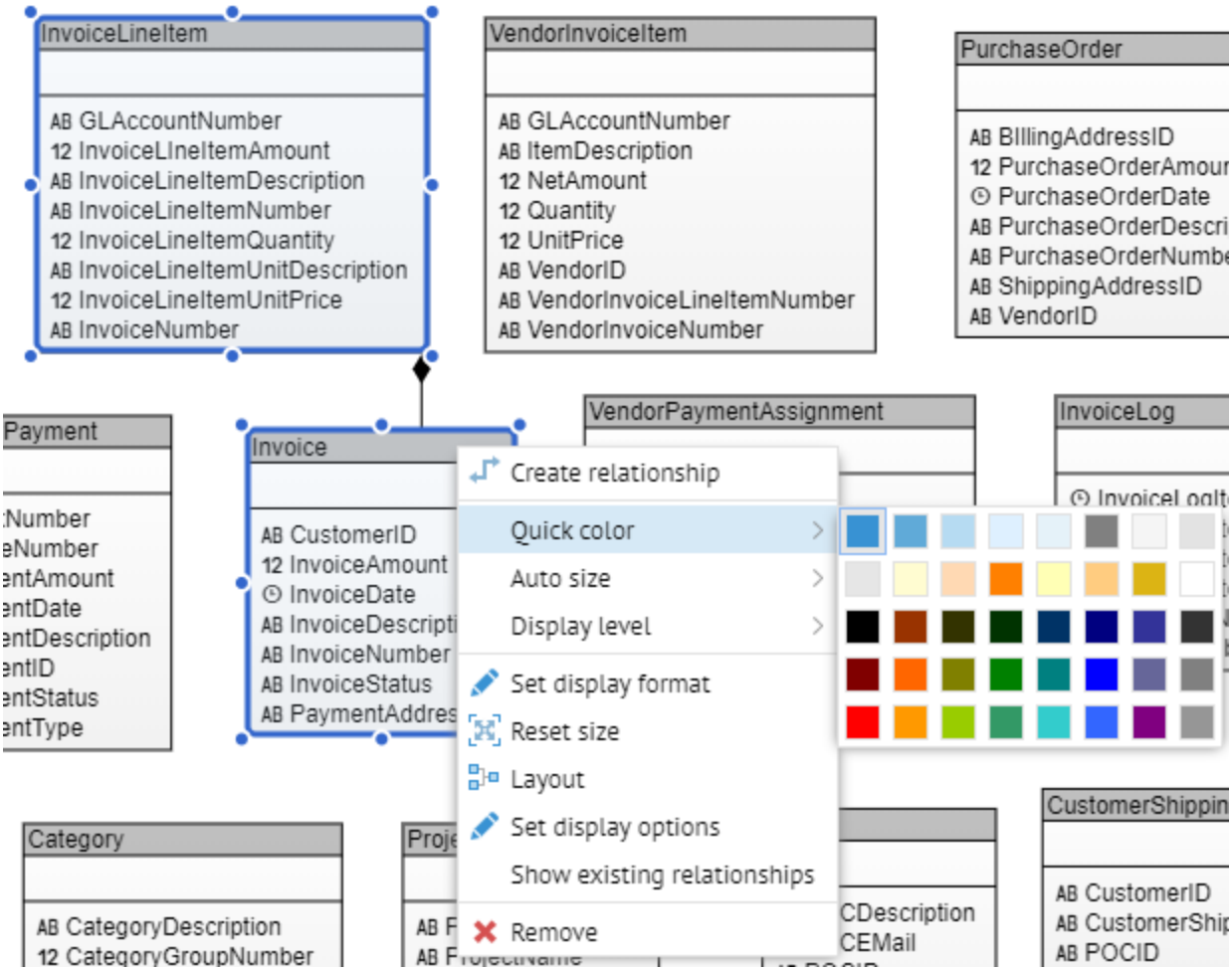
Right-click on the **Invoice** table, select Open. Then, go to the **Relationships** tab and edit the relationship you just created to give it an operation.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



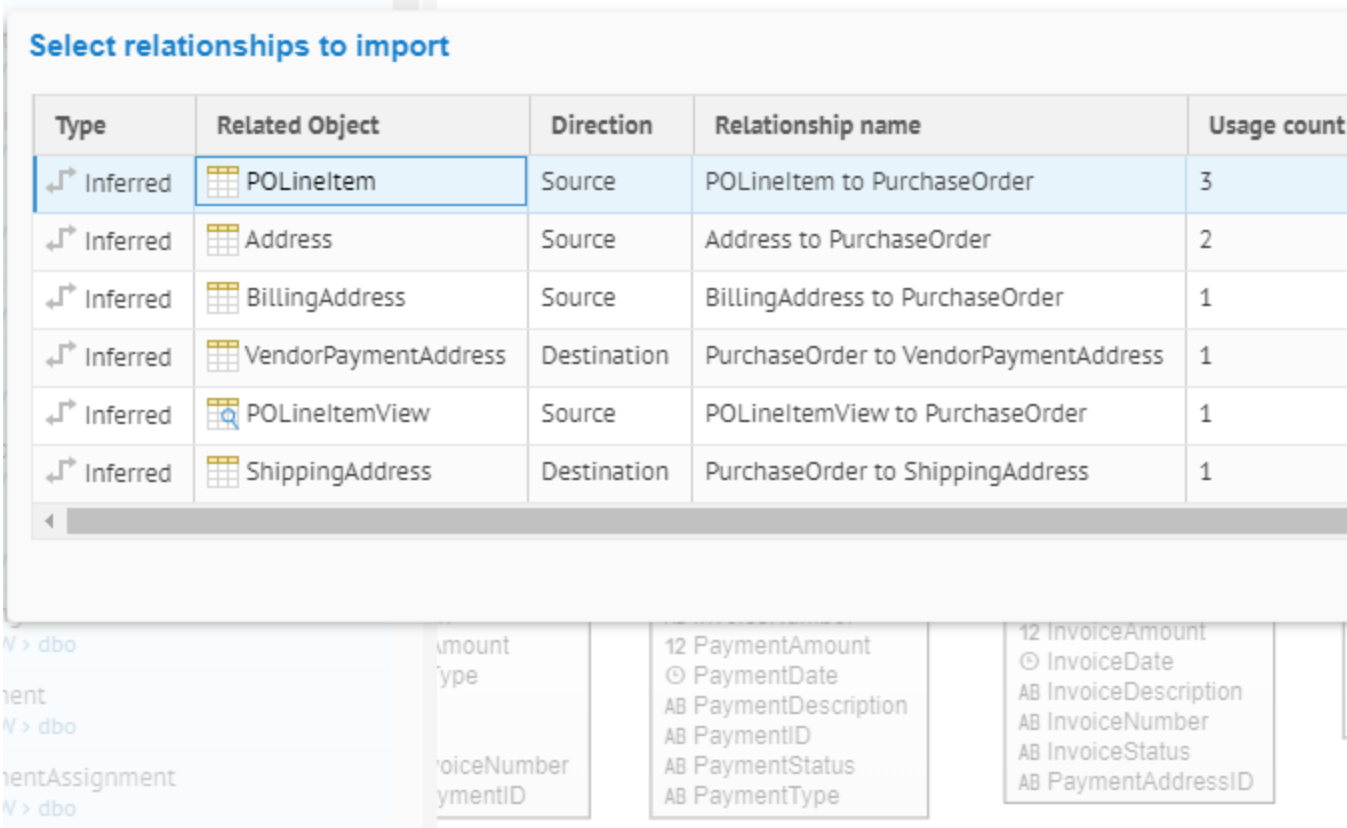
Commit that change, close the **Invoice** table dialog. Select the two tables you just related (with Ctrl-click or with the lasso tool), right-click on one and select **Quick Color**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



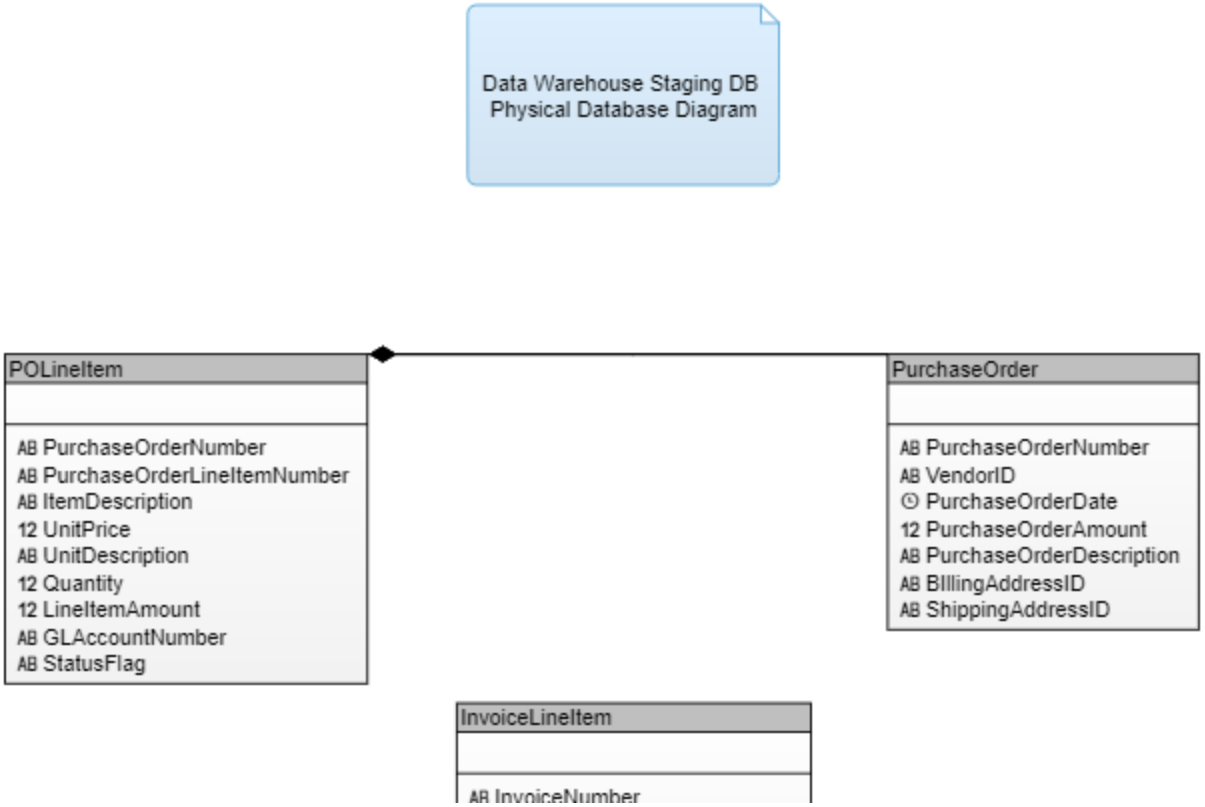
Now, right-click on the Purchase Order table and select Import Relationships. Then, pick the first relationship (with POLineItem) and click OK.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



And we have a new relationship.

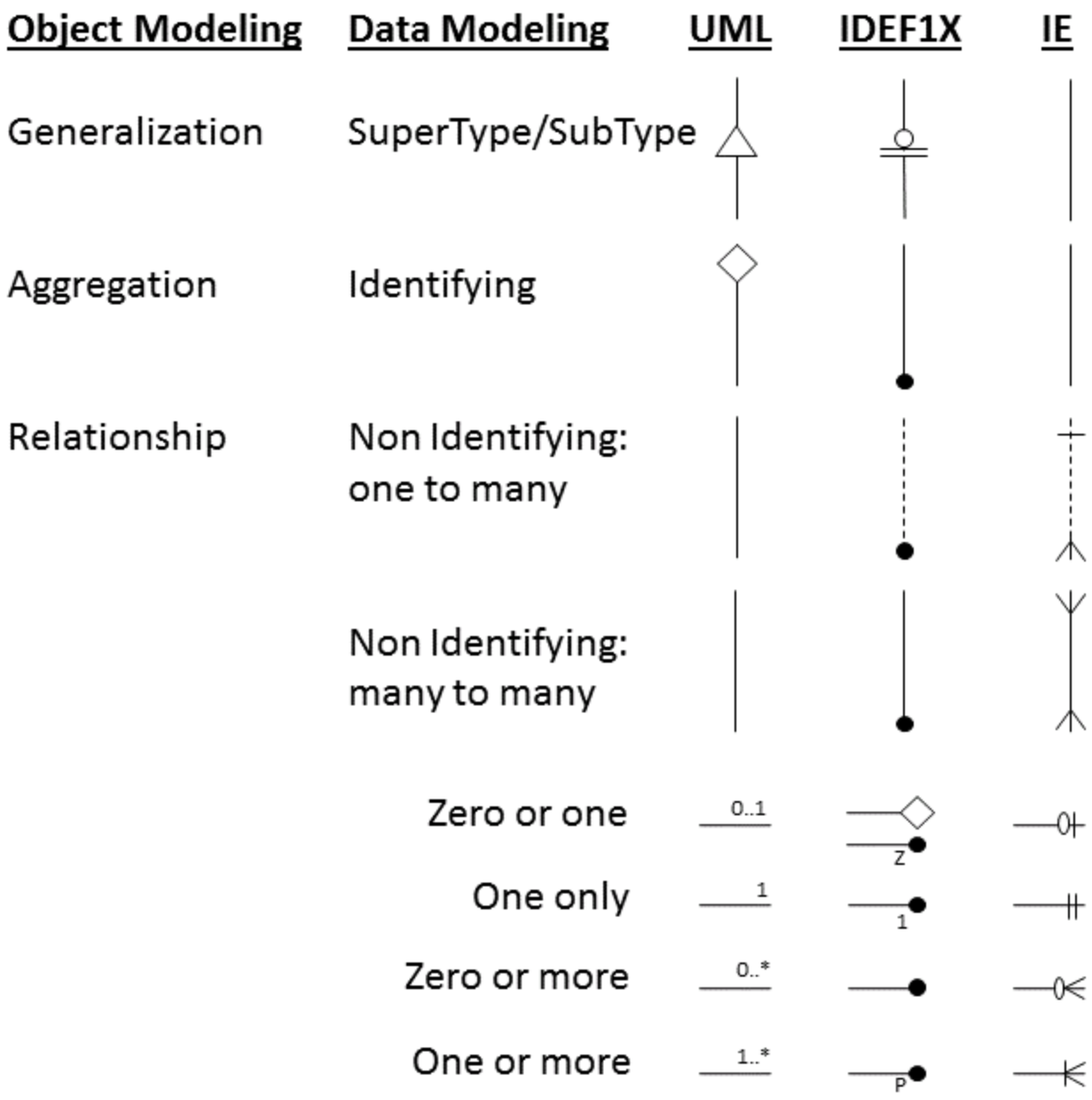
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Explore Further

Interpreting the graphical diagram

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Naming Standard for a Model

Abbreviation/Naming standard can help one to derive business names from physical ones in a consistent manner. For example, a physical name empl_first_name can be interpreted as a business name Employee First Name by tokenizing the physical name over the "_" separator, assuming "empl" is an abbreviation of "employee" and capitalizing the first letters of each word. This process is automated by MIMM based upon any defined naming standard.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

A naming standard is a list of abbreviations and words they represent, defined as terms in a glossary. MIMM allows one to define a naming standard once and reuse it for documenting different models and their new versions.

MIMM can generate an initial naming standard from a physical model. It is a list of all unique abbreviation tokens produced from table and column physical names. The application tokenizes names by separating characters (e.g. "_") and capitalized letters (e.g. EmployeeName). The application cleanses the list from obvious noise (e.g. numbers).

To associate a glossary with a model for naming standard purposes, you may do so at model creation time or when editing the Options of the Model.

Associate a Naming Standard with a Model

Associating a naming standard with a model is performed at model creation time or later under the model **Naming Standards** tab.

Steps

Ensure proper permissions

1. Sign in as a user with at least the **Manage** security role on the model you are defining naming standards for.

Create the content

2. Go to the **MANAGE > Configuration** in the banner.
3. Click the **Naming Standards** tab.
4. Check the **Enable Naming Standards** checkbox then select your options, including
    - Pick a glossary to contain the naming standards lookup values. You may need to open that glossary separately and create a new category.

> *Using a glossary category means that terms are created under the specified category that is the business names for the objects to which the naming standard applies. The physical name that is equivalent for each term is placed in the **Abbreviation** property for that term.*

    - Specify the options you wish to use.
5. Click Save.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

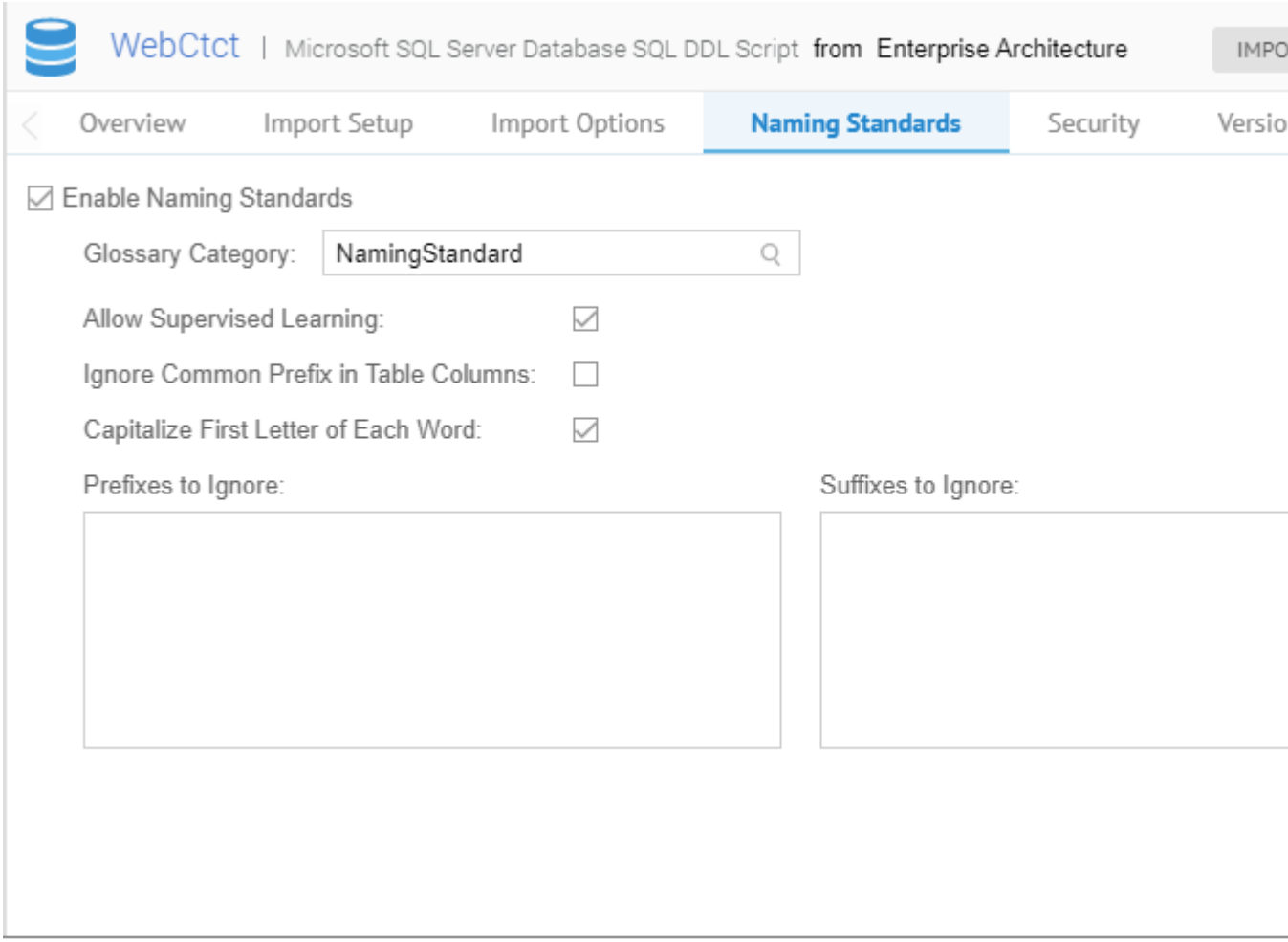
Example

Sign in as **Administrator**. Go to the **MANAGE > Configuration** in the banner.

Select the **WEBCTC** model.

Click the **Naming Standards** tab.

Note, the the **Enable Naming Standards** checkbox is checked as well as selected options.



Explore Further

Naming Standard Supervised Learning

When supervised learning is specified in the Naming Standards tab for the documentable model, every time you edit the (logical) Name property for columns and tables, the associated naming standard Business Glossary category terms will be updated to reflect the new naming. E.g., if

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

and column has the Physical Name ACT, and then one edits the (logical) Name to be Action, a term Action will be created with and Abbreviation ACT.

One may apply the naming standard on demand as needed.

Apply a Naming Standard

Ensure that naming standards are defined for the model.

Steps

For the entire model (schema, table, etc.)

1. Sign in as a user at least the **editor** security role on the model containing the metadata element you wish to edit.
2. Navigate to the details page for the model as a whole.
3. Go to **More Actions** > **Apply naming standards to the entire model**.

To do so, when editing a metadata element, use the apply naming standard icon .

Data modeling with Physical Data Models (PDM)

Create a Physical Data Model

Steps

Ensure proper permissions

1. Sign in as a user with at least the **Manage** security role on the Configuration you are in.

Create the content

2. Go to the **MANAGE > Configuration** in the banner.
3. Click the plus sign under Manage Contents and select **Physical Data Model**.
4. Enter a Name and Description for the model and select an **Import Bridge** and click OK.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

*You may always harvest using a remote harvesting server by specifying it here under **Import Server**.*

A Physical Data Model does not depend upon an underlying data store. However, a bridge choice is required in order to understand the type of metadata and presentation profile that will be used for this PDM. I.e., you are specifying what kind of data store you are modeling, even abstractly.

Overview tab

5. Specify a glossary to use for classification of terms in PDM.

While a model may be classified by any glossary a PDM is tied to a specific glossary.

Configure the import specifications

6. Click the **Import Setup** tab.
7. Here there will be a set of parameters which are unique to each import bridge. For each **Parameter**, click in the **Value** column and enter the appropriate value.
8. Be sure to click Save.

*Expand the **Help** panel to the right of the parameters.* MIMM *provides detailed help for the bridge as a whole and for each parameter selected. It is **imperative** that you read these "tool tips" when using a new bridge or diagnosing an issue with the import.*

9. Click the **Import Options** tab.
10. Click all checkboxes that apply to send email notification on import.
11. Click **Save**.
12. Specify Create Copy on Database Sync to ensure that a new version of the PDM is created each type you sync with the underlying data store.

Special version management options will be presented in the multi-version editions of MIMM *. Please see version management for details.*

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Import (a Version) of the model

13. Click Import to sync with the underlying data source, or simply Open to view and edit the PDM.

Edit a Physical Data Model

Edit a Physical Data Model in the Details Page

This method works well when editing a single metadata element in a model or proceeding through a models structure (schema, table, and column) to edit a model completely. Editing of a model is under concurrency control in that only one user at a time may edit a given model diagram.

Steps

1. Sign in as a user at least the **editor** security role on the model containing the metadata element you wish to edit.
2. Navigate to the details page for the metadata element.
3. Click the **Overview** tab.

> *All primary properties are available for editing here.*
>
> *In particular, the Business Description and Business name may be reused from a term that you use to classify this metadata element in the PDM, as long as associated the PDM with a glossary when creating it.*

4. Select Preferences > Add custom attributes to extend the properties associated with this metadata element.

> *Custom attributes are taken from a pool defined in the **MANAGE** > **Custom Attributes** function.*

5. From the PDM details page, click the Schemas tab on the model details page, the Tables tab on a schema details page, or the Columns tab on the table details page in order to add either schemas, tables or columns to the model.

> *Only PDMs allow you to extend the model with additional schemas, tables and columns.*

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

6. From the PDM details page, click the **Subject Areas** tab to create new and edit existing subject areas.

As a PDM is a design model that may be synchronized with the underlying data source, it has a logical structure as well as physical. I.e., subject areas, diagrams, relationships, domains, etc., along with the schema, table, and column physical structure.

1. From a subject area details page, click the **Diagrams** tab to create new and edit existing diagrams.
2. From a subject area details page, click the **Domains** tab to create new and edit existing domains. Domains provide additional reusable objects, just like terms, to extend the model with..
3. On the details page of a classifier (e.g., table, view) level metadata element you may click the **Relationships** tab to add.

Unlike models, PDMs have a logical component and relationships are part of that. These relationships cannot be inferred but are authored in the diagram. They may be used as part of joins and filters in data mappings.

4. Click the Semantic Flow tab to add, edit, delete semantic links (mappings).

*As PDMs are already tied to a particular glossary, you cannot classify metadata elements in the **Semantic Flow** tab, but instead reuse terminology as above and in the diagram.*

Edit a Physical Data Model in Grid Mode

This method works well when editing multiple metadata elements in several different models that are collected together as the result of a search, browse filter or list. It works the same with PDMs as for editing a model in grid mode.

Edit a Physical Data Model Diagram

This works the same with PDMs as for editing a model in grid mode. However, as you are able to add new table and columns and also can extend a model directly from the glossary that is assigned to the model, there are a few additional features.

In addition, as relationships are defined in the model, not inferred from existing joins, conditions, etc., those features are not available for PDMs.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Steps

1. Sign in as a user at least the **editor** security role on the model containing the metadata element you wish to edit.
2. Navigate to the details page for the model as a whole.
3. Click the **Subject Areas** tab.
4. Select a subject area.
5. Click to **Diagrams**.
6. From here you may use all the options to visualize a diagram and all the options in edit a model diagram, except for including inferred or detected relationships.
7. Click **Start Editing** to edit the diagram.

The panel on the left provides a pool of all classifier level objects in the model which may be included in the diagram.

There may be several pools, as shown by tabs in that panel. In particular, you may drag and drop terminology in the associated glossary as tables or columns in the diagram. You may do the same for domains you have defined in the subject area.

*When you click **Start Editing**, you have locked the model diagram and it cannot be edited by other users/sessions until you click **Stop Editing**.*

8. Drag and drop tables, views, domains or terms, from the pool into the diagram to include that object in the diagram.
9. Multi-select (Shift-click and Ctrl-click) in the pool and drag and drop the selection into the diagram to include that object in the diagram.

As you include objects from the pool, you will notice that relationships among the current set of classifiers in the diagram are also included. All relationships defined in the subject are included automatically.

These relationships are more than simple join conditions, they are true logical relationships as in entity-relationship modeling.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

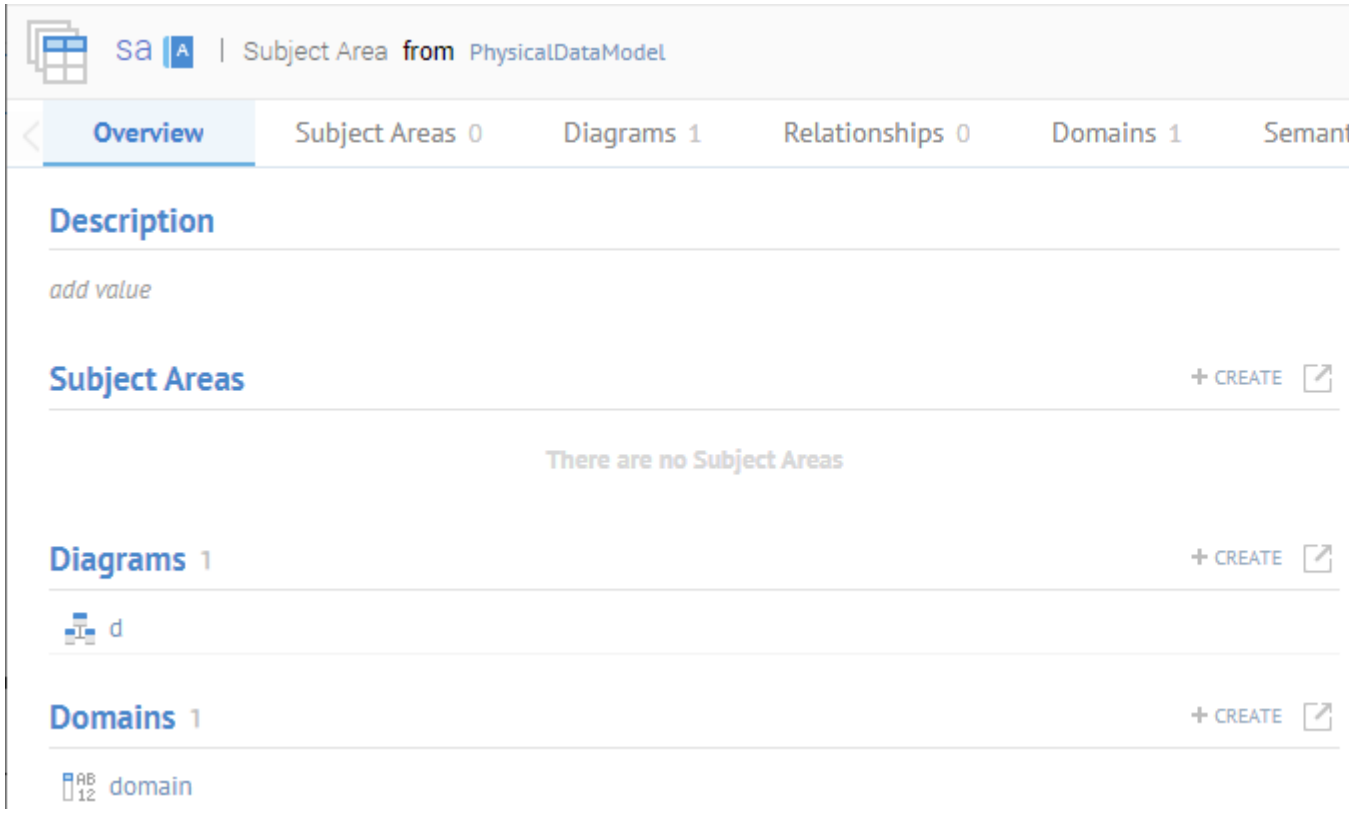
10. To edit the join condition of a relationship:

    - Double-click on one of the relationships
    - Select **Open**
    - Edit accordingly.

Example

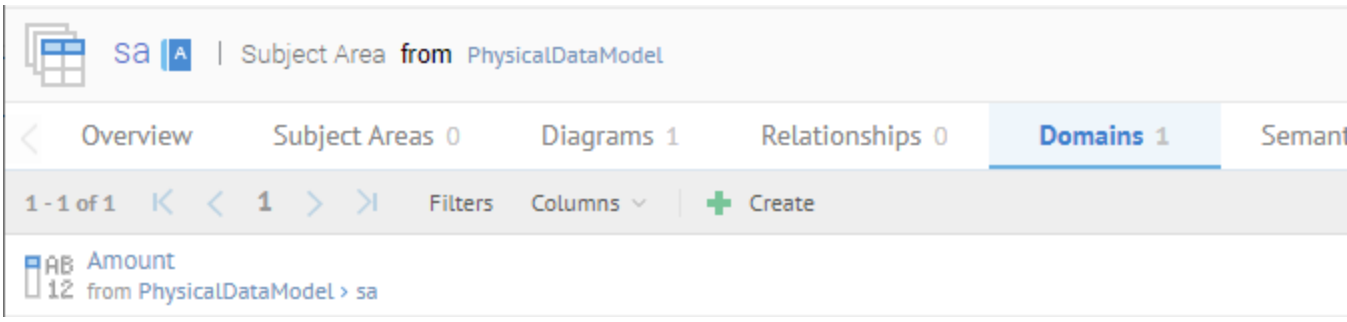
Navigate to the details page for the **Staging DW** database model and click the **Subject Areas** tab.

Click the plus sign to create a new subject area named “sa”.

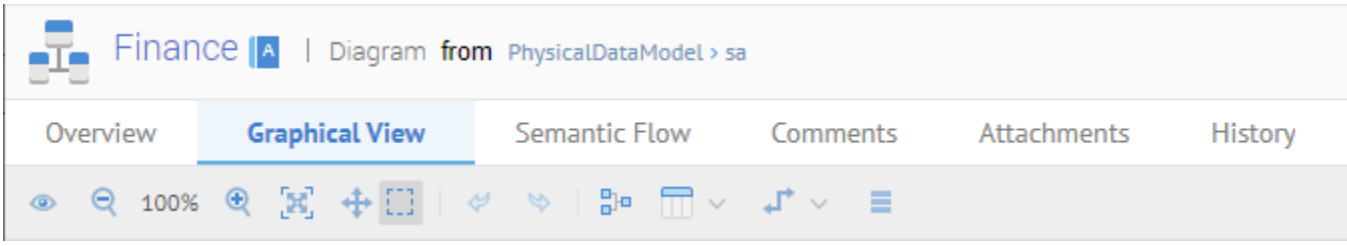


Click the **Domains** tab. Click the plus sign to create a new domain “Amount”.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



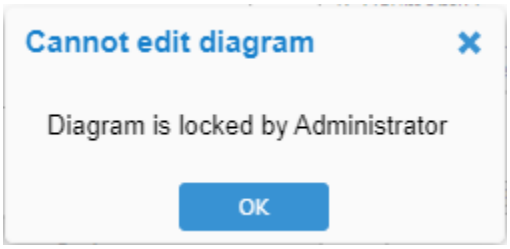
Click the **Diagrams** tab. Click the plus sign to create a new diagram "Finance".



Then click **Start Editing**.

The possible tables to include are on the left. More pools are available, in this case we see ***Domains*** *and* ***Terms****.*

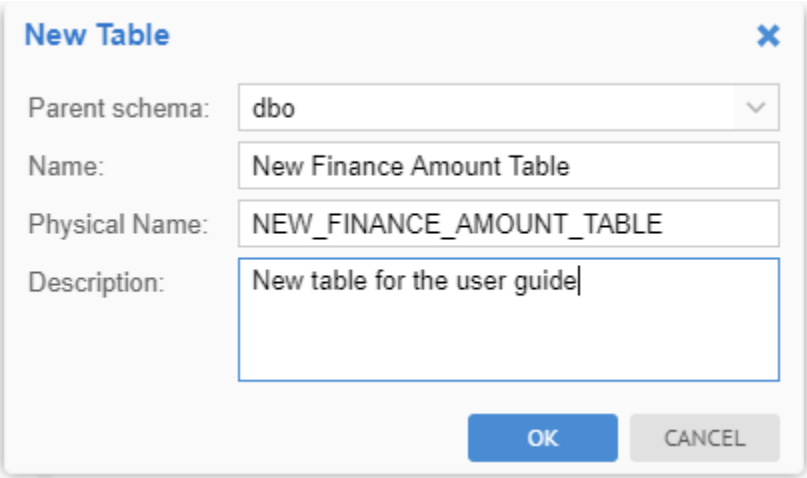
When you click ***Start Editing****, you have locked the model diagram and it cannot be edited by other users/sessions until you click* ***Stop Editing****. If the diagram is already being edited by another user, the following dialog is presented and you must wait until the other user/session is finished and has cliced* ***Stop Editing****:*

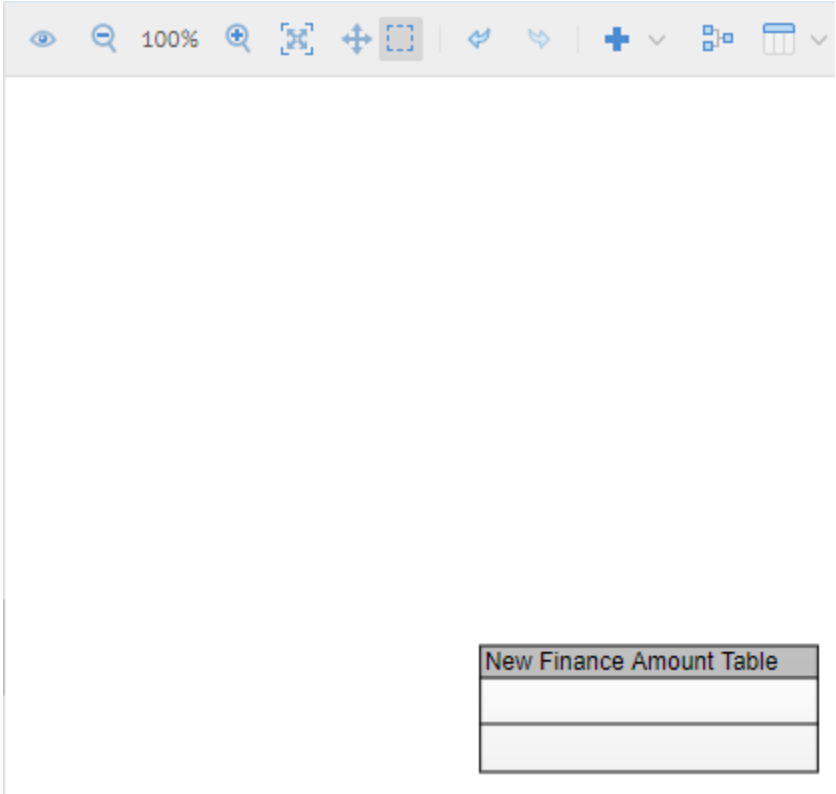


Click Add > New table. Define it as below:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

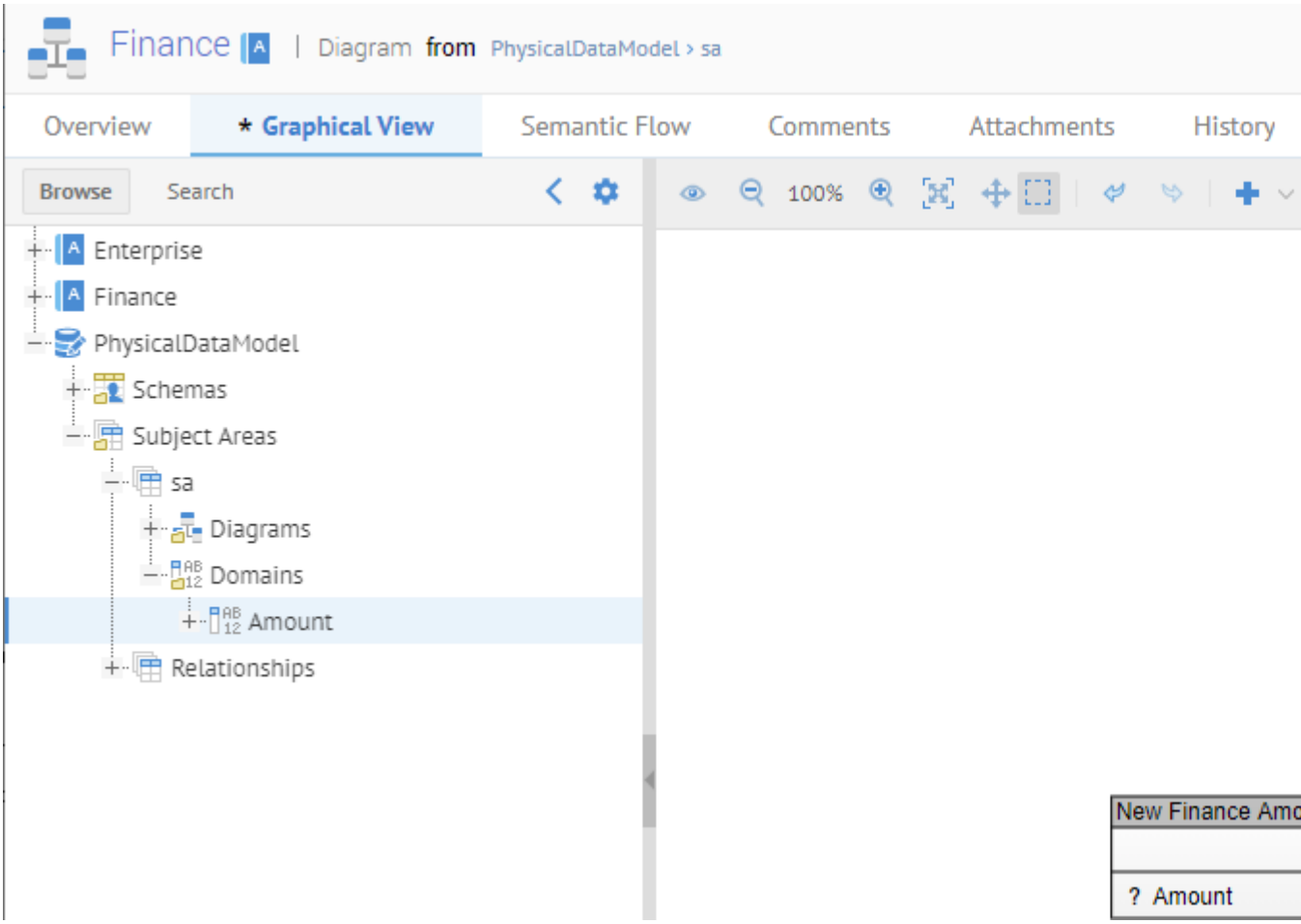
<dialog showing “dbo” for Parent schema, “New Finance Amount Table” for Name, NEW_FINANCE_AMOUNT_TABLE” for Physical Name and “New table for the user guide.” For Description>





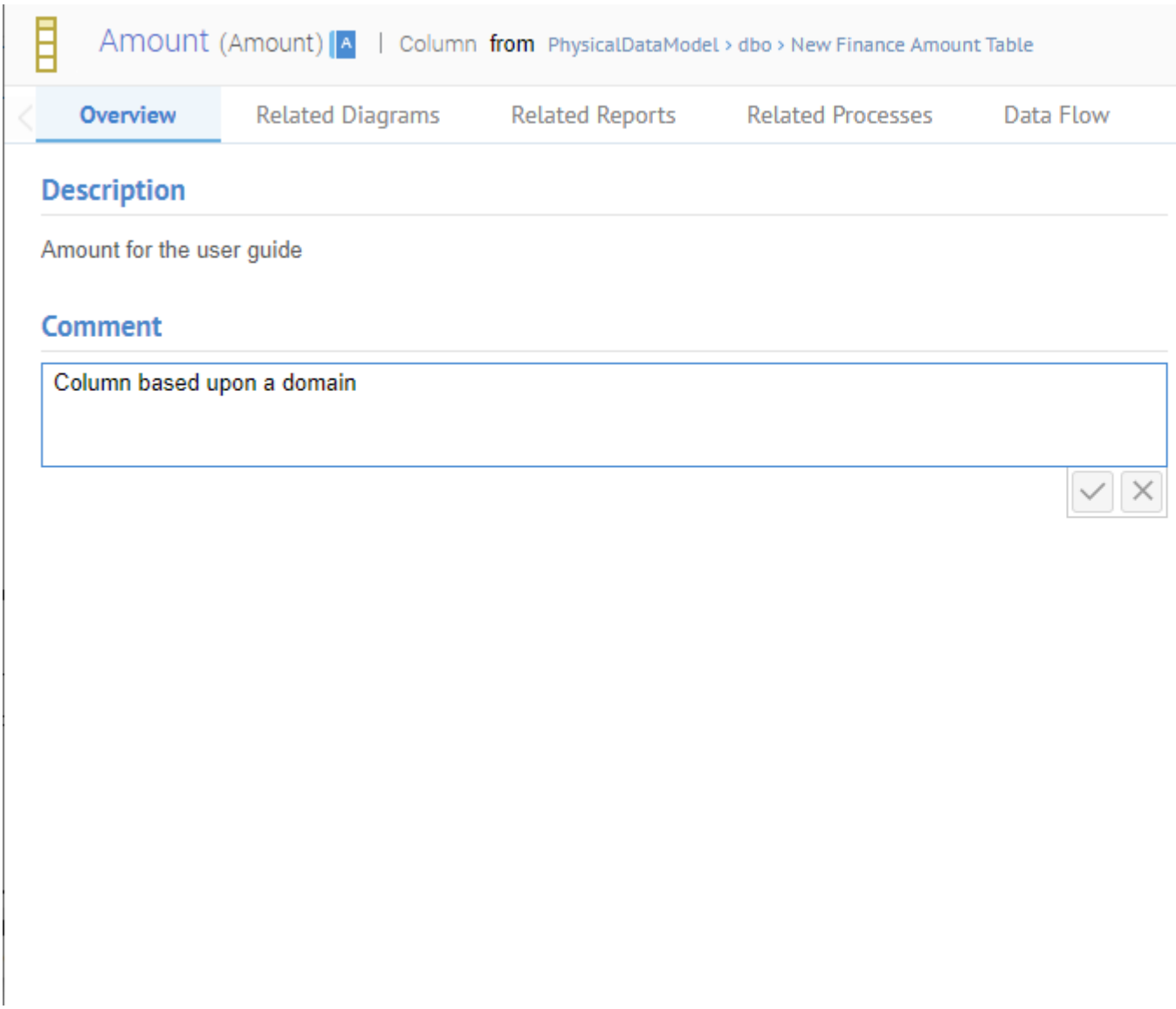
Click the **Browse** in the tree on the left. Drag the domain **Amount** to be a column **in New Finance Amount Table**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

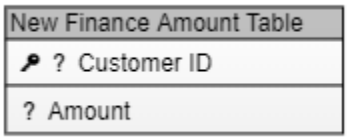


Double-click the new column **Amount** and edit:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

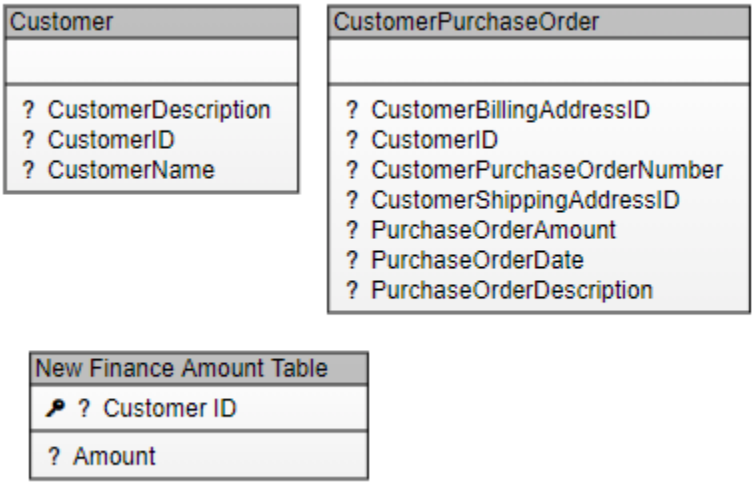


Go back in the browser. Click **Search** in the panel on the left and enter "Customer". Drag the term **Customer ID** as a key column in the table.

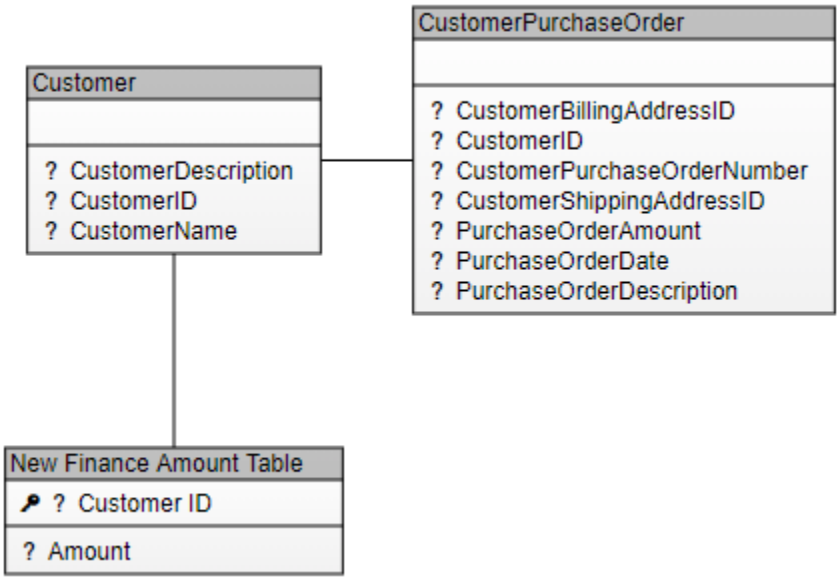


Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Click the **Browse** in the panel on the left. Drag the tables **Customer** and **Customer Purchase Order** from the physical data model into the diagram.



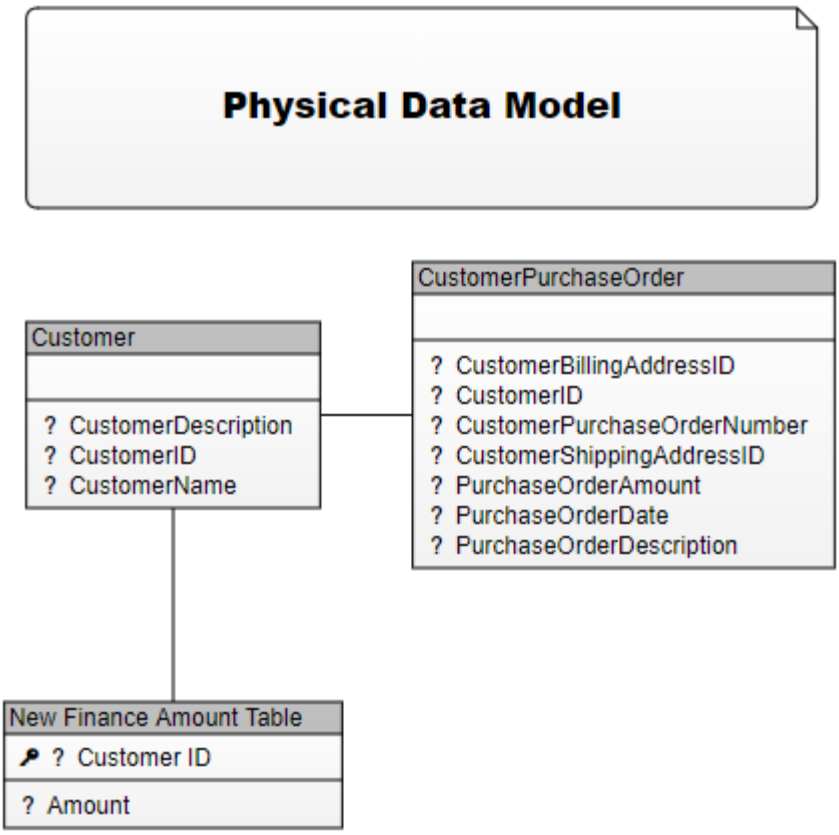
Drag from **Customer** to **New Finance Amount Table**. Then click **Add > New relationship**, and drag from **Customer** to **Customer Purchase Order**. Click **Auto Layout**.



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Relationships are also included that are PK-FK in the underlying data source.

Drag the edge of the panel with the pool of tables on the left to hide most of it and get more room to work. Then, click **Add > New shape** and create a title annotation for this diagram.



Naming Standard for a Physical Data Model

Works the same way as for Naming standard for a model.

Exporting a Physical Data Model

Steps

1. Sign in as a user at least the **manger** security role on the physical data model.
2. Go to **MANAGE > Configuration** .
3. Right-click on the PDM in the list.
4. Select **Export**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

5. Specify the target tool format in the **Export** to pull-down.

6. Specify any required bridge parameters.

7. Click Export.

Active Data Governance

Explore Further

Data models, including PDMS, may be export to various 3rd party tool formats

Exporting PDMs to 3rd party reporting tools

Exporting data mappings to 3rd party data integration tools

Version and Configuration Management

Manage the Repository

The MANAGE > Repository tree allows you to work with the entire repository structure in a tree presentation. Unlike MANAGE > Configuration, the scope is not limited to the current configuration. Instead, you may work with folders and contents (models, configurations, mappings, glossaries, etc.) and their versions.

Steps

1. Sign in as a user with at least the some administrative type of security role

2. Go to **MANAGE > Repository.**

3. From here:

   - One may expand folders to see their contents.
   - One may explan a content to see it versions.
   - Clicking on an object in the tree opens its details page.
   - Right-clicking on an object in the tree presents a context menu of actions which may be performed on the particular type of object or version.

Manage Model Versions

In some cases, one may wish to use the Repository to maintain a version history for each harvest or import of a model. These versions are individual objects within the Repository and represent the object's contents at a specific point in time.

The Administrator may manage any number of versions. By default, however, the UI only shows one version of a model. The technical user may use the MANAGE > Repository function to view

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

a multi-version user interface (Tree) mode at any time. Also, a particular version may be designated to be the default version. It is the default version of a model which is used when the metadata manager UI is in single-version mode.

In addition, when including a model in a configuration, one is actually including a specific version of that model in the configuration. This means that one may control which versions of which models are to be Published at any point in time. E.g., one may place the approved version of a model in a Published configuration while data modelers continue to edit and Upload newer version as work in progress (unpublished).

Otherwise, users are restricted to a single configuration at a time, and thus in those cases the UI only shows one version of a model.

Add a New Version to a Model

Adding a new version of a model simply involves harvesting or importing the model again.

Review import log

Steps

1. Sign in as a user with at least the **Manage** security role on the model.
2. Either
   - Go to **MANAGE > Configuration** in the banner. Select the content. Click on the **Versions** tab.
   - Go to **MANAGE > Repositor**y. Expand the tree to see the content and expand the content to see its versions.
3. As a model may be imported several times, select the log for the specific date and time of the import in question and click on **View Log**.

Publish a Version of a Content

When including a model in a configuration, one is actually including a specific version of that model in the configuration. This means that one may control which versions of which models are to be Published at any point in time. E.g., one may place the approved version of a model in a Published configuration while data modelers continue to edit and Upload newer version as work in progress (unpublished).

To publish then means to add the version of the content to the Published version of a configuration.

Steps

1. Sign in as a user with at least the **Edit** security role on the configuration.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

2. Go to **MANAGE > Repository.**

3. Right-click the **Published** version of the configuration and select **Switch to this configuraton**.

Be sure the Repository Panel is filtered to enable showing of versions.

4. Click the plus sign and select **Existing content** for the contents you wish to **Publish**.

5. You may now view the content by default when signed in to that configuraton.

Make a Version of a Content the Default

The default version of a content is the version that is used when an action is taken against the content as a whole. For example, if one opens a content but not a specific version, then the default version is opened.

Steps

1. Sign in as a user with at least the **Manage** security role on the model.

2. Go to **MANAGE > Repository.**

Be sure the Repository Panel is filtered to enable showing of versions.

3. Right-click on the version of the content in the **Repository Panel** and select **Set to default**.

The previous default version will no longer be default.

Delete Unused Versions

As new versions of models and physical data models are harvested, they begin to collect. Most of these "historical" versions are of no value to keep around. Also, they consume resources, such as disk space, index size, performance of search, etc.

MIMM provides a tool to manage and eliminate these older versions. There is a script operation named **Delete unused versions**. When run, if a version of a model is not in any current configuration version, and it is more than one hour old, it will be deleted.

No model that has been imported in the last hour will be deleted by Delete unused versions as it may yet be included in a configuraton in the near future as part of the harvesting and scheduled update process.

Thus *used* refers to containership in a configuration ONLY. No other relationships will prevent the purging of a model version which is not a member of a configuration version.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Steps

Manual Delete

1. Go to **MANAGE > Repository.**
2. Right-click on the **Repository** as a whole, a folder or a model and select **More…** >

   Operations > **Delete unused versions**.

Be sure to Show versions if necessary.

Scheduled Delete

In order to manage the version overload in an automated fashion, you may schedule the task.

1. Go to **MANAGE > Schedules.**
2. Provide the required information as for any scheduled task.
3. Specify the **Delete unused versions** action.

You may use the View Links option on a version of a model to determine if it is a member of a configuration.

Example

Import on the Staging DW model**.**

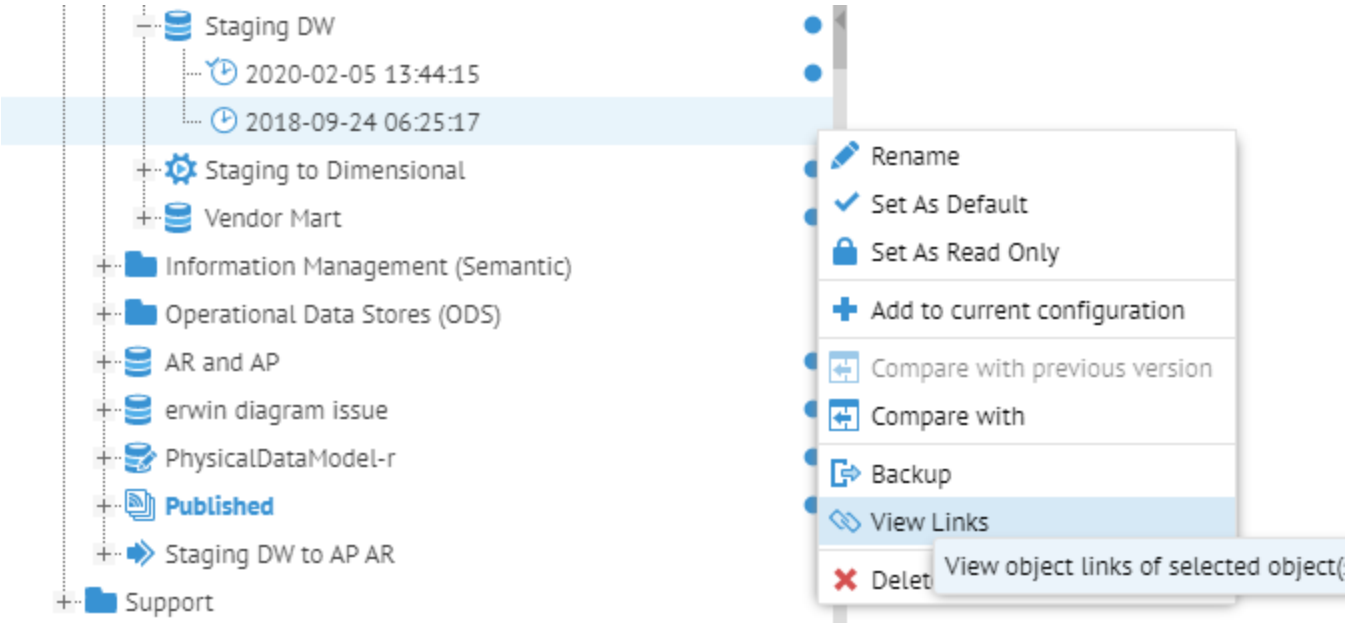
After the import has finished note that there are two versions of the **Staging DW**.

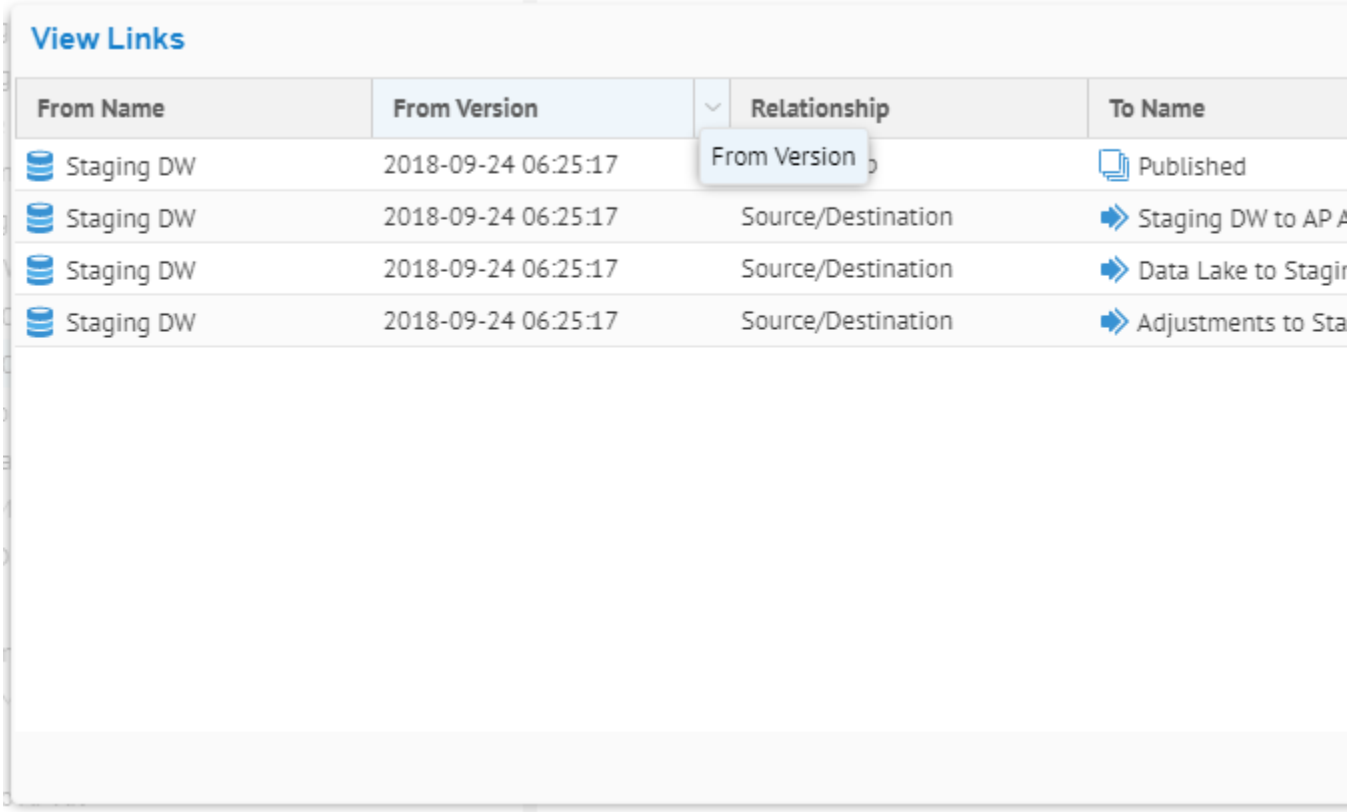
Go to **MANAGE > Repository.**

Be sure the Repository Panel is filtered to enable showing of versions.

Right-click on the second version of the **Staging DW** model and select **View Links** and note that it is not a member of any configuration version and is thus a candidate to be purged.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

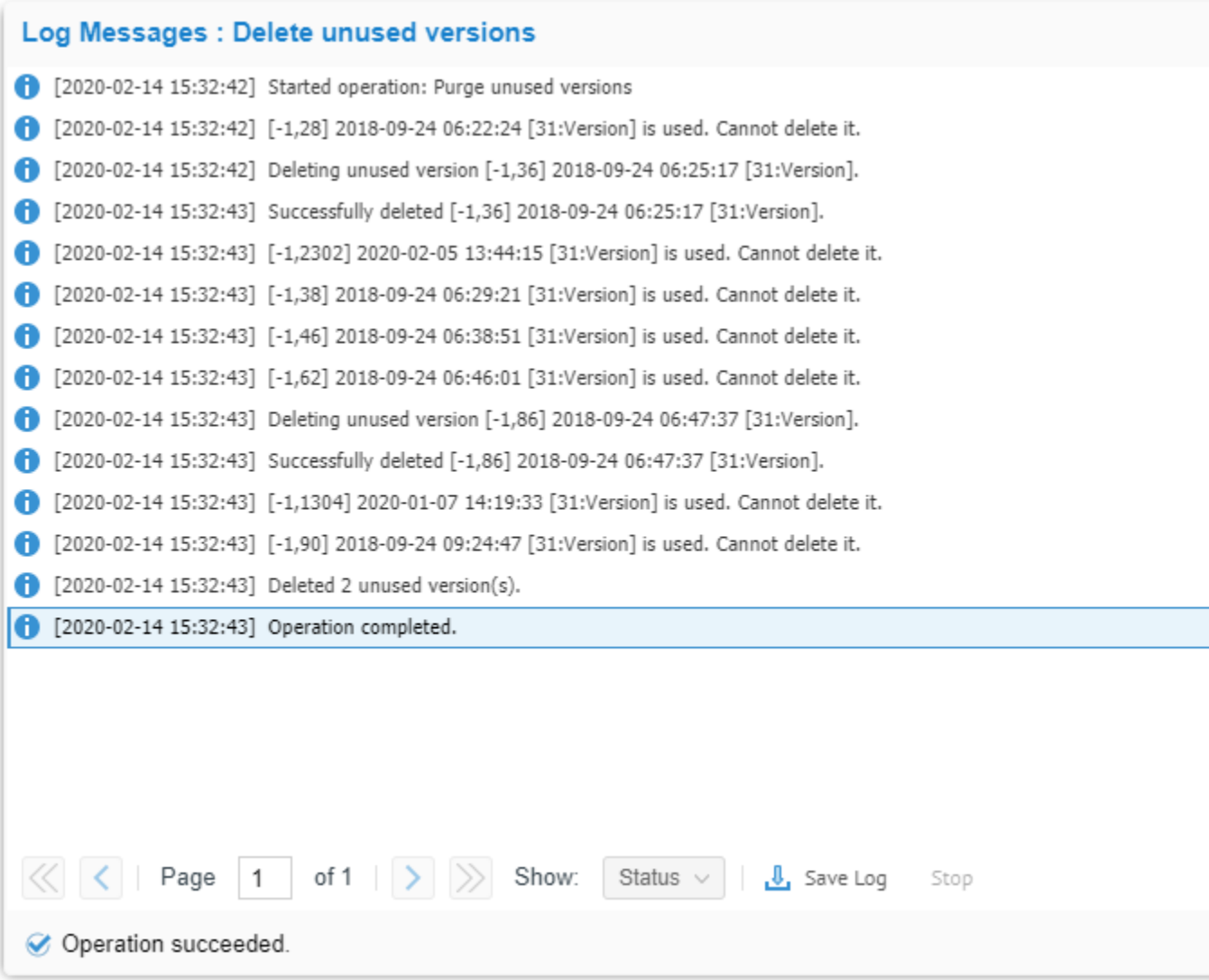




Wait more than one hour.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Right-click on the **Data Warehouse** folder and select **More…** > **Operations** > **Delete unused versions**. Click **Run Operation**.



Note, the log reports one model version deleted and the version is no longer in the **Repository** panel.

Retain Maximum Versions

Manage Configurations

The configuration is an extremely important concept. It is the scope for many operations, including lineage analysis, search, version management, etc. In this way, what would otherwise be an overload of information (everything in the repository) is instead well managed according to the configuration of metadata one is interested in analyzing or working with. The name

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

configuration comes from the concept of "Version & Configuration Management" where a configuration is a collocation of particular version of models.

A valid configuration consists of a collection of model versions, mapping versions, glossaries and stitchings. The model versions relate to data stores and data processes that have been harvested into MIMM .

A configuration may be understood as any of the following:

- Repository workspace - a collection of repository objects to be analyzed together (search, browse, reports, etc.) as a technical scope, or business area under the same access permission scope.
- Enterprise architecture - a collection of data store models (ODS, data staging areas, data warehouses, data marts, etc.) and data process models (ETL/DI, and BI) connected together through data flow stitching.
- Design workflow - a collection of conceptual, logical and physical models connected (semantically stitched) together through semantic mappings modeling the design process.

A configuration may have one or more configuration versions. configuration versions may be understood each as a different collection of versions of repository objects. In this way, one can define several configuration versions, each containing various versions of the repository objects. As a result, one may perform

- Historical analysis using configuration versions containing older versions of models which were deployed at some time in the past
- What-if analysis using configuration versions containing the versions of models which may be deployed in the future.

One may also *publish* a configuration version, or make it available to users of the **Published** version. In this way, a configuration may be used by an administrator of MIMM to ensure the completeness and correctness of what is visible to business users and how all users search and analyze within the full complexity of MIMM .

MIMM accomplishes this management within the UI by way of the configuration Manager. This tool provides a drag and drop based visual interface for constructing configurations of repository objects. One may:

- Define any number of configurations
- Publish a configuration to a different set of users (by group)
- Publish none, some, or all configurations.

In this way, one has infinitely fine control of who sees what and when they may see it.

Create a New Configuration

Steps

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

1. Sign in as a user with at least the **Manage** security role on the folder where the configuration will go.
2. Go to **MANAGE > Repository.**

Be sure the Repository Panel is filtered to enable showing of versions.

3. Right click on a folder In the **Repository Panel** where you want the configuration to be located, and select **New** > **Configuration**.

Build a Configuration

Once you have a configuration that is complete, with connection definitions resolved, you may Build the configuration. This action allows users to perform lineage and impact analysis with the configuraton, as well as semantic definition and usage reporting. It is required before any of that analysis may be made accurately in that configuration versions.

Configuration Update/Build means:

- Update the configuration with default versions (or latest if there is no default) of each model of that configuration
- Build that version of that Configuration. Note, it does not create a new version.

Steps

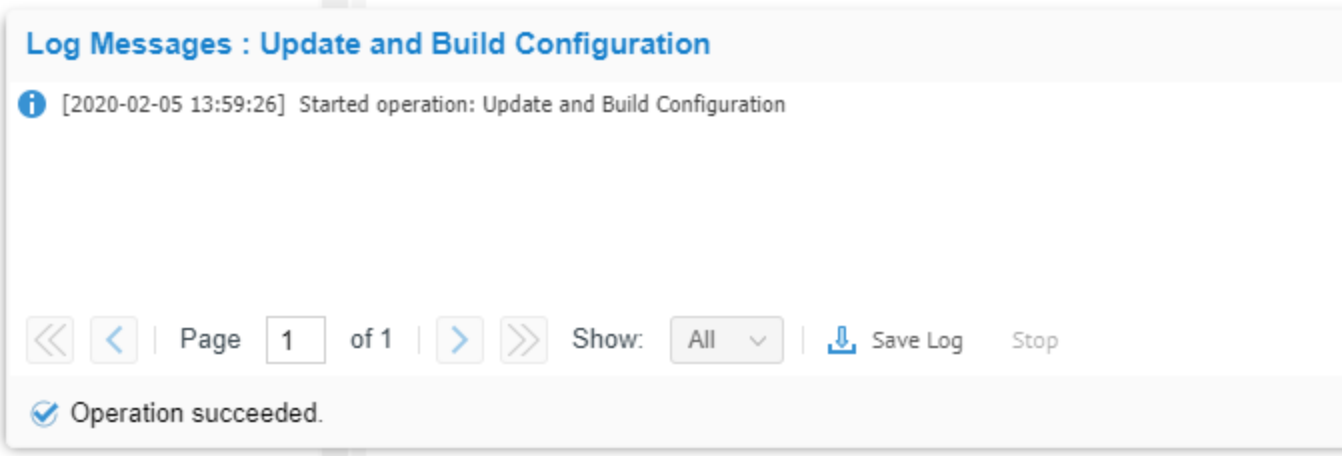
1. Sign in as a user with at least the **Manage** security role on the Configuration you are in.
2. Go to the **MANAGE > Configuration** in the banner.
3. Click the **Update and Build** button.

Example

Sign in as a user with at least the **Manage** security role on the configuration.

Go to **MANAGE > Configuration** and click the **Update and Build** button.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Assign a Group to a Configuration

Groups may be assigned to a particular configuration. In this way, any users who are associated with that group are presented with only that configuration and its published version, by default. They may choose other configurations and versions if they have permissions to those or are a member of a groups that is not assigned to a configuration..

Publish a Configuration

A configuration may have one or more configuration versions. configuration versions may be understood each as a different collection of versions of repository objects. In this way, one can define several configuration versions, each containing various versions of the repository objects. As a result, one may perform

- Historical analysis using configuration versions containing older versions of models which were deployed at some time in the past
- What-if analysis using configuration versions containing the versions of models which may be deployed in the future.

One may *publish* a configuration version, or make it the default in the UI. In this way, a configuration may be used by an administrator of MIMM to ensure the completeness and correctness of what is visible to business users and how all users search and analyze within the full complexity of MIMM .

Steps

1. Sign in as a user with at least the **Manage** security role on the folder where the configuration will go.
2. Go to **MANAGE > Repository.**

Be sure the Repository Panel is filtered to enable showing of versions.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

3. Expand the configuration to show versions.

Be sure the Repository Panel is filtered to show the content versions.

4. Right click on the configuration version in the **Repository Panel** and select **Publish**.

Publish a Content to Any Configuration

See publish a version.

Manage Configuration Structure

The contents contained within a configurations may be organized into configuration folders.

Steps

1. Sign in as a user with at least the **Edit** security role on the configuration.

2. Go to **MANAGE > Repository.**

Be sure the Repository Panel is filtered to enable showing of versions.

3. Click the configuration version you wish to define or update the structure for.

4. Use the **Add** action of the configuration editor to add a folder and the **Delete** action to remove one.

5. Drag and drop contents into folders, or the root, to reorganize them.

Automatic Configuraton Update

The configuration automatic update/build is always active with MIMM standard editions (without support for any version and configuration management). In this case, any model import (manual or scheduled operation) automatically updates and rebuilds the (only) configuration with the newly imported metadata.

However, with MIMM advanced editions (with support version and configuration management) there is much more flexibility driven by two options:

- MANAGE > Configuration > Import Options you may use the Set new versions as default checkbox(The user must still perform a Update/Build on the configuration version)
- In user preferences you may use the Update the configuration automatically when importing new version of a model checkbox. This options is checked by default. It only applies to the specified user and is a UI option for manual imports. But, if checked, after a manual import then MIMM performs an Update/Build the current configuration version. If the model is not in the current configuration version, it will be added.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

There are two ways a model can be imported:

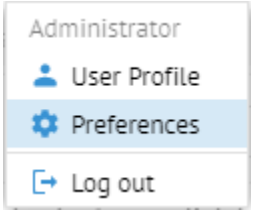
- *Manually on Manage > Configuration (or Repository) > Model > Import > update/build the current configuration if set on user preference*
- *Automatically on Manage > Schedules > Operation or REST API to import a model > never update/build any configuration*

Steps

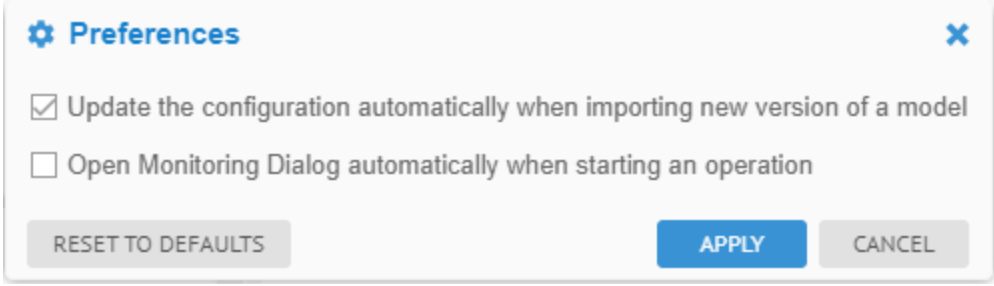
1. Sign in as a user with at least the **Manage** security role on the configuration.
2. Go to your avatar and **Preferences** in the upper right.
3. Check the **Update the configuration automatically when importing new version of a model checkbox**.

Example

Sign in as a **Administrator**. Go to your avatar and **Preferences** in the upper right.



Check the **Update the configuration automatically when importing new version of a model checkbox**.



Click **APPLY**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

You may also uncheck to turn off automatic update.

The configuration automatic update/build is always active with MIMM standard editions (without support for any version and configuration management). In this case, any model import (manual or scheduled operation) automatically updates and rebuilds the (only) configuration with the newly imported metadata. It only applies to the specified user and is a UI option for manual imports. But, if checked, after a manual import then MIMM performs an Update/Build the current configuration version.

Scheduling the Update and Build of a Configuration

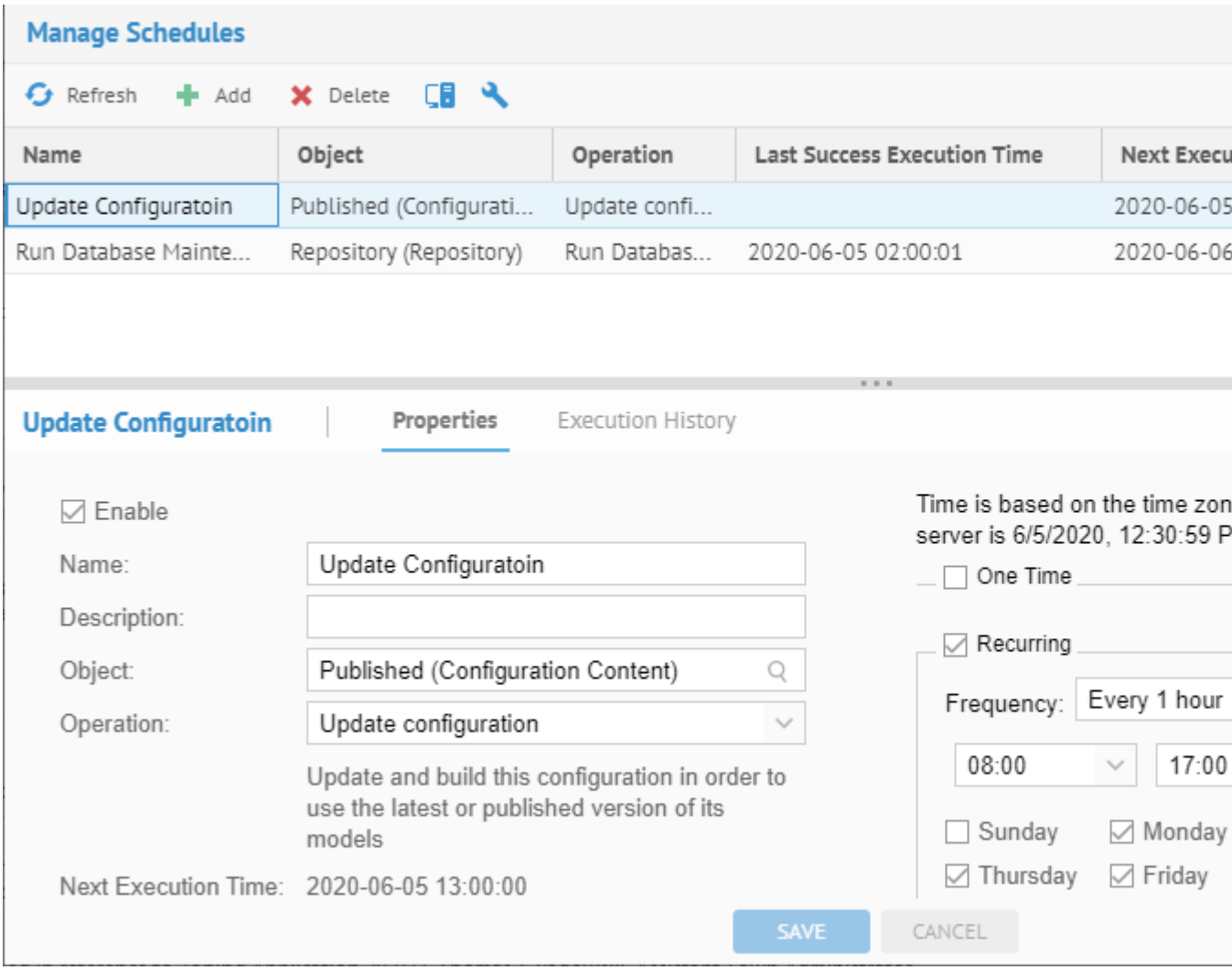
The automatic update is convenient for simple repositories and configurations, where a single configuration contains everything and you simply wish to publish the current version of everything. However, in more complex environments, with multiple configuraton, multiple versions of configurations, very large models and large numbers of models, mappings, etc., the automatic update associated with the manual import process options is not appropriate. Instead, one should use the scheduling features of MIMM to ensure that model harvesting and configuraton updates and building is scheduled to work in concert and only during low activity hours and days of the week.

Steps

1. Sign in as a user with at least the **Adminstrator** security role.
2. Go to **MANAGE** > **Schedules**.
3. Click **Add**.
4. Select the subset of the repository (folder or only one configuration) to schedule.
5. Select **Update Configuration** in the **Operation** pull-down.
6. Specify the schedule.
7. Click **Create**.

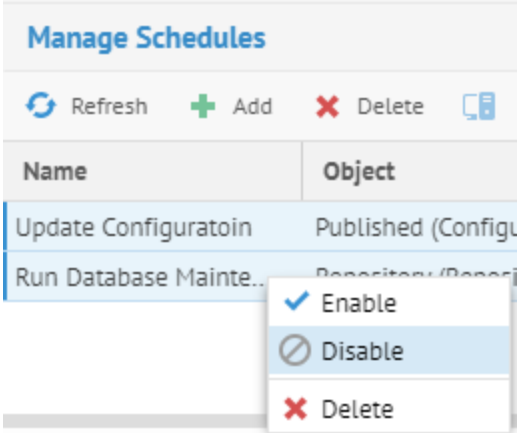
Example

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



You may enable or disable a schedule without deleting it by either clicking on the schedule and then the Enable checkbox or by selecting the schedules you wish to set in the list and right-clicking.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Configuration History

The history tab presents the audit log for that configuraton. You may download it to CSV, as well.

Steps

1. Sign in as a user with at least the **Manage** security role on the configuration.
2. Go to **MANAGE > Repository.**
3. Select the configuration you wish to show history for.
4. Go to the **History** tab.

You may download it to CSV using the Download icon.

Example

Sign in as Administrator and go to **MANAGE > Repository.**

Select the **Enterprise Architecture** configuration and go to the **History** tab.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

	A	B	C	D
1	Time	User Name	Object Name	Object path
2	Oct 21, 2019, 2:00:58 PM	Administrator	Enterprise Architecture	/Repository/Enterprise Architecture
3	Oct 21, 2019, 2:00:58 PM	Administrator	Enterprise Architecture	/Repository/Enterprise Architecture
4	Nov 22, 2019, 4:31:37 AM	Administrator	Enterprise Architecture	/Repository/Enterprise Architecture
5	Feb 6, 2020, 8:00:03 AM	System	Enterprise Architecture	/Repository/Enterprise Architecture
6	Feb 7, 2020, 8:00:01 AM	System	Enterprise Architecture	/Repository/Enterprise Architecture
7	Feb 7, 2020, 2:00:00 PM	System	Enterprise Architecture	/Repository/Enterprise Architecture
8	Feb 10, 2020, 8:00:00 AM	System	Enterprise Architecture	/Repository/Enterprise Architecture
9	Feb 10, 2020, 2:00:00 PM	System	Enterprise Architecture	/Repository/Enterprise Architecture
10	Feb 11, 2020, 8:00:01 AM	System	Enterprise Architecture	/Repository/Enterprise Architecture
11	Feb 11, 2020, 2:00:01 PM	System	Enterprise Architecture	/Repository/Enterprise Architecture
12	Feb 12, 2020, 8:00:00 AM	System	Enterprise Architecture	/Repository/Enterprise Architecture
13	Feb 12, 2020, 2:00:00 PM	System	Enterprise Architecture	/Repository/Enterprise Architecture
14	Feb 13, 2020, 2:00:01 PM	System	Enterprise Architecture	/Repository/Enterprise Architecture
15	Feb 14, 2020, 8:00:00 AM	System	Enterprise Architecture	/Repository/Enterprise Architecture
16	Feb 14, 2020, 2:00:00 PM	System	Enterprise Architecture	/Repository/Enterprise Architecture
17	Feb 17, 2020, 8:00:04 AM	System	Enterprise Architecture	/Repository/Enterprise Architecture
18	Feb 17, 2020, 11:42:36 AM	Administrator	Enterprise Architecture	/Repository/Enterprise Architecture
19	Feb 17, 2020, 2:00:00 PM	System	Enterprise Architecture	/Repository/Enterprise Architecture
20	Feb 18, 2020, 8:00:01 AM	System	Enterprise Architecture	/Repository/Enterprise Architecture
21	Feb 18, 2020, 2:00:00 PM	System	Enterprise Architecture	/Repository/Enterprise Architecture
22	Feb 19, 2020, 8:00:02 AM	System	Enterprise Architecture	/Repository/Enterprise Architecture
23	Feb 19, 2020, 2:00:00 PM	System	Enterprise Architecture	/Repository/Enterprise Architecture

Manage Configuration Versions

In some cases, one may wish to maintain a version history for a configuration. E.g., one may wish to maintain historical configurations of content versions for historical analysis. In addition, one may wish to perform what-if analysis by placing the latest, but not approved, version of the contents in a new (and unpublished) version of that configuration.

As with contents, these Configuration versions are individual objects within the Repository and represent the configuration of the contents at a specific point in time.

The Administrator may manage any number of Configuration versions.

Additionally, when one sets a version of a configuration to Published status, it is then presented by default in the UI. I.e., one is actually designating a specific version of that configuration as the Published version. This means that one may Publish a precise collection of content versions.

In all cases, the metadata explorer UI only shows the Published version of a configuration, which is simply seen as the configuration.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Manually Update All Versions in a Configuration

Just as you may define configurations for automatic update of new content versions which are contained in that configuraton, you may use the **Update and build** option to do so manually. In this way, for each contained content, the latest version is included in the configuraton. Then the configuraton is Built as part of the process.

Steps

1. Sign in as a user with at least the **Manage** security role on the configuration.
2. Go to **MANAGE > Repository.**
3. Click the configuration version you wish to update and select **Switch to this configuration.**
4. Select the **Update and build** option in the **More Actions** menu at the upper right.

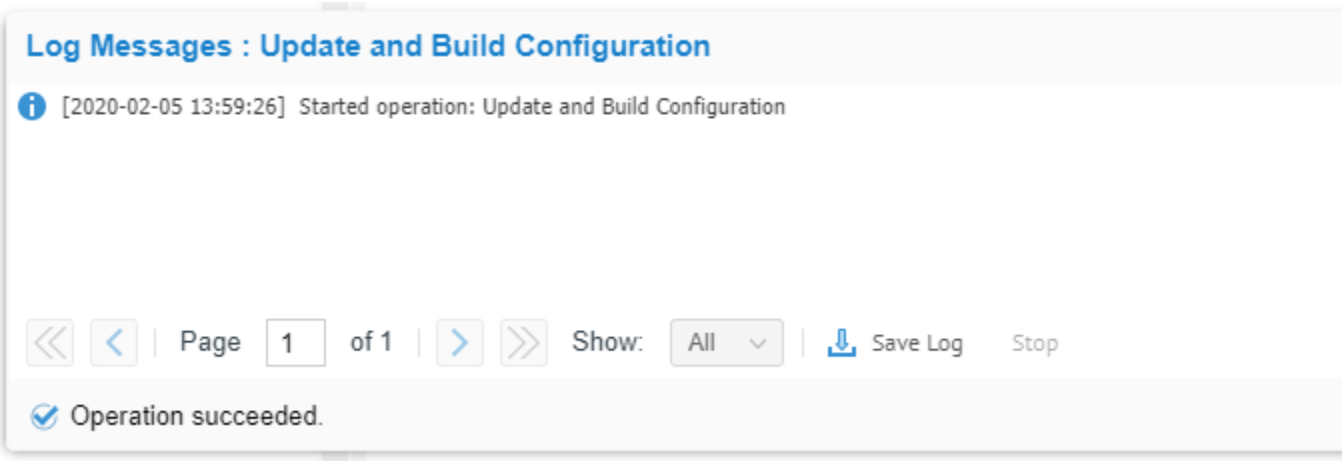
Example

Sign in as a user with at least the **Manage** security role on the configuration.

Go to **MANAGE > Repository** Repository Panel.

Click the configuration version you wish to update and select **Switch to this configuration**.

Click the **Update and Build** button.



Application Integration

Business Intelligence Tool Integration

MIMM captures the metadata from numerous business intelligence and reporting (BI) tools and environments. One may then curate and govern this metadata with MIMM . In this way, MIMM

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

often becomes a central BI Catalog for end-users who are interested in understanding what is available in the BI systems available, regardless of vendor or server. Direct integration between the BI environments and MIMM is then critical to the success of such a metadata catalog.

In particular, two major capabilities are explored:

- How to invoke the third-part BI tools directly from within MIMM for reports harvested. This ability is detailed in managing metadata content.
- How to _call back_ to MIMM from those third-part BI tools for seamless use of the cataloging capabilities while user are looking at reports in the BI environment.

Call from Third Party BI tool back to MIMM

Implementing the call back

Obviously, the manner in which each of these third party tools is able to invoke a call to another product, like MIMM , will vary greatly from tool to tool. In general, though, any of these tools may include a URL which either allows one to open a web page for that URL that includes specifics about the location (report being viewed) within the BI environment, or embed such a web page result within the reporting environment. Thus, the most common method for calling back to MIMM is to use the generic business glossary report URL

Generic Business Glossary Report

One URL based result is the generic business glossary report. Business intelligence sources which are imported in MIMM include the metadata about reports presented by the BI system. The reports then may have a hierarchical organization of “sub” reports and individual data elements.

The business glossary report is a simple report of all elements and sub reports contained in a report and then all terms linked to those elements and sub reports and any terms linked to the report as a whole. It is designed to be invoked from a URL which can be called from within the BI solution itself, thus allowing one to customize the reports themselves to provide the terms and definitions associated with the report.

The URL signature is as follows:

```
http://localhost/MM/BusinessGlossaryReport
```

You may append any of the following to any UI URL:

URL Option text	Value
&env	Environment as defined in MIRMetadataExplorer.xml
&report	A unique report id or name

The call back to MIMM requires a license (Consumer type). Thus, you must authenticate to receive the report.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Example

In the demo/tutorial example with Tableau, one can obtain the &report option value by going to the details page of the workbook and opening the **Parameters** panel and then looking at the **URL** parameter. Thus, the URL would be:

```
http://localhost/MM/BusinessGlossaryReport?env=Env1&report=Finance1
```

Note, if you embed this link in Tableau, you should use the following URL which takes advantage of the workbook name substitution parameter:

```
http://localhost/MM/BusinessGlossaryReport?env=Env1&report=<Workbook Name>
```

Where this has been added to **MetadataExplorer.xml** in order to define where **Env1** points to:

```
<Environment name="Env1" configPath=" /Enterprise Architecture/Published" contentPath=" /Enterprise Architecture/Business Intelligence (BI)/Tableau">

<URLParameter>noHeader=true</URLParameter>

<URLParameter>noTitle=true</URLParameter>

<URLParameter>noHyperlink=true</URLParameter>

<URLParameter>noContext=true</URLParameter>

<URLParameter>noIcon=true</URLParameter>

<URLParameter>noGrouping=true</URLParameter>

</Environment>
```

Here are all the possible options

URL Option text	Value
noHeader=(true|false)	Hides the header of the report
noTitle=(true|false)	Hides the title of the report
noGridHeader=(true|false)	Hides the grid header
noHyperlink =(true|false)	Makes hyperlinks non clickable
noContext =(true|false)	Hides the context information
noIcon =(true|false)	Hides all icons
showDefinitionsOnly =(true|false)	Only show the list of distinct terms documenting the report
modelDefinitionsOnly =(true|false)	- Only show the definitions of the model itself (not the report item ones)

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

UI Customization

Located in the conf\template\resources folder within the installation on the application server machine, the MetadataExplorer.xml file contains complete XML providing definition of the behavior of the Metadata Explorer UI. This is where we will include the new Environment for calls via URL.

To cause MIMM to leverage any changes to this file (so that the UI is controlled by your updates) you must copy the file from conf\template\resources\ to conf\resources\. Only when the file is in this new location will it be picked up and parsed on startup of the MIMM application server.

The customization of this file is covered in detail in the Metadata Management Tutorial - User Interface Customization Using MIMM

Open an Object in MIMM from a Third Party Tool

Implementing the call back

Obviously, the manner in which each of these third party tools is able to invoke a call to another product, like MIMM , will vary greatly from tool to tool. In general, though, any of these tools may include a URL which either allows one to open a web page for that URL that includes specifics about the location (report being viewed) within the BI environment, or embed such a web page result within the reporting environment. .

Open Object URL

MIMM provides a generic "open object" servlet. This servlet requires the user to specify the tool (e.g. erwin Data Modeler) and tool-specific parameters that identify the object (e.g. modelName or modelLocator, and objectId). The servlet resolves the tool-specific model/object identification parameters into MM-specific ones (backend) and uses them to redirects the browser to the appropriate MIMM UI.

The Open Object servlet takes the following parameters (http://localhost:19980/MM/OpenObject?param1=value1&param2=value2):

Parameter	Description	Example (s)
tool	(Mandatory) Name of the tool	○ BO ○ Cognos ○ erwin ○ Etc.
configurationId	*(Optional)* Configuration content ID. Can be missing in the single configuration environment	1_12

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

	where it is computed automatically with hardcoded default Id	
UI	(Optional) User Interface to invoke	○ Explorer (default) ○ Manager
view	(Optional) Tab name of the object page	○ Overview (default) ○ Data Flow ○ Related Reports ○ Etc.
erwin Data Modeler Specific Parameters		
modelName	(Optional) Specific model identification parameters, like GUID, Path in repository, etc.	mart%3A%2F%2FMart%2FTutorial%2FAccountsReceivable
modelLocator	(Optional) Mart model locator in URL form, in case of a multimodel (mart)	mart://Mart/Folder/ModelName
objectID	(Mandatory) Specific object identification parameters, like GUID, Path in model, etc.	%7B485BCD34-0000-0000-0000-000000000030%7D%2B00000000

The values must be encoded, escaped to make sure the URL is valid ([https://en.wikipedia.org/wiki/Percent-encoding])

For example, replace space with %20 , back-slash (\) with %7B , curly braces ({) with %7D , plus sign (+) with %2B, semi-colon (☺ with %3A and slash (/) with %2F

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Report Preview Snapshots

When viewing a report imported from some metadata sources, it is possible to show a thumbnail type preview of the report.

Steps

5. Be sure to specify the "-t" option in the **Miscellaneous** bridge parameter when importing the model.

*The thumbnails will appear on the details page of the report and also in any worksheet as long as you add the **Thumbnnails** column.*

REST API Access

The information contained within MIMM is accessible via a REST API.

The REST API SDK documentation is available within the UI by going to the Help menu (top right corner) under Help on REST API, or go directly to: http://localhost:<port>/MM/REST-API/.

For illustration purpose, a glossary definition search demo is also available at http://localhost:<port>/MMGlossaryClient/. This demo assumes a server URL located at "http://localhost:<port>", and a glossary in a configuration called "Published". REST API application developers are familiar with the above documentation, and can find the demo source code in Chrome > top right menu > More tools > Developer tools.

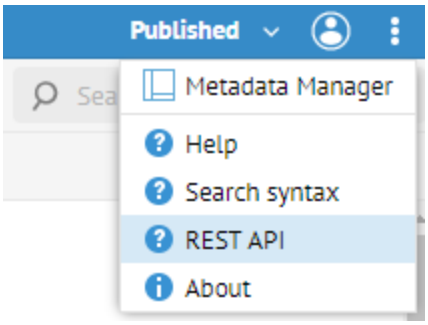
Steps

1. Go to the **More Actions** menu in the top right of the page.
2. Select REST API.
3. Sign in as a user with at least the Access REST API security preference on the configuration.

Example

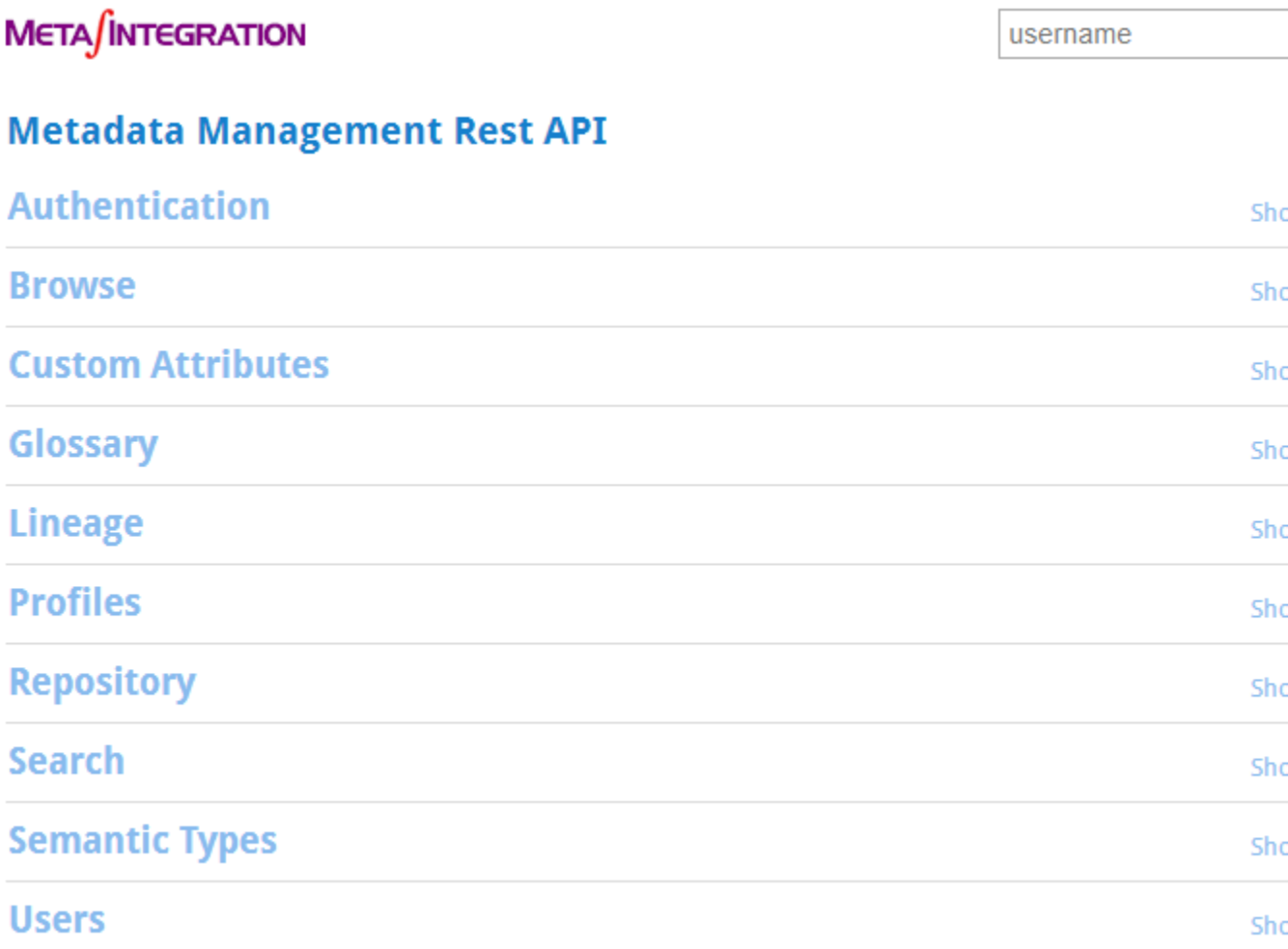
Go to the **More Actions** menu in the top right of the page and Select REST API.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Login as **Administrator**.

Click on **General Info** link to see details as to how to use the REST API.



Click **Glossary** > **/search/glossary**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

GET /search/glossary — Search for glossary terms

Response Class (Status 200)

The result value of the response contains a list of glossary terms of type GlossaryTerm.

Model | Model Schema

```
{
  "result": "",
  "error": {
    "errorCode": "REQUIRED_PARAMETER_NOT_SPECIFIED",
    "message": "A valid JSON UserGroup object is not provided."
  }
}
```

Response Content Type application/json

Parameters

Parameter	Value	Description	Parameter Type	Data Type
configurationContentPath	Published	The repository path or the object identifier of a configuration content or configuration version, for example, "Configuration/Published", or "-1_456".	query	string
limit	1000	Number of results to return.	query	integer
nameOnly	true (default)	if true only search name otherwise search definition also.	query	boolean
searchText	(required)	**The search query text in MIMM search language, e.g. "+invoice+amount". Must be specified.**	query	string

Response Messages

HTTP Status Code	Reason	Response Model	Headers
400	Bad request	Model | Model Schema `{ "result": "", "error": { "errorCode": "REQUIRED_PARAMETER_NOT_SPECIFIED", "message": "A valid JSON UserGroup object is not provided." } }`	
401	Authentication error	Model | Model Schema `{ "result": "", "error": { "errorCode": "REQUIRED_PARAMETER_NOT_SPECIFIED", "message": "A valid JSON UserGroup object is not provided." } }`	
500	Server error	Model | Model Schema `{ "result": "", "error": { "errorCode": "REQUIRED_PARAMETER_NOT_SPECIFIED", "message": "A valid JSON UserGroup object is not provided." } }`	

Try it out!

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Enter “invoice” in the **searchText** box.

GET /search/glossary — Search for glossary terms

Response Class (Status 200)

The result value of the response contains a list of glossary terms of type GlossaryTerm.

Model | Model Schema

```
{
  "result": "",
  "error": {
    "errorCode": "REQUIRED_PARAMETER_NOT_SPECIFIED",
    "message": "A valid JSON UserGroup object is not provided."
  }
}
```

Response Content Type application/json

Parameters

Parameter	Value	Description	Parameter Type	Data Type
configurationContentPath	Published	The repository path or the object identifier of a configuration content or configuration version, for example, "Configuration/Published", or "-1_456".	query	string
limit	1000	Number of results to return.	query	integer
nameOnly	true (default)	if true only search name otherwise search definition also.	query	boolean
searchText	invoice	**The search query text in MIMM search language, e.g. "+invoice+amount". Must be specified.**	query	string

Response Messages

HTTP Status Code	Reason	Response Model	Headers

Click **Try It Out**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Try it out! Hide Response

Curl

```
curl -X GET --header 'Accept: application/json' 'http://demo:19980/MM/rest/v1/sear
```

Request URL

```
http://demo:19980/MM/rest/v1/search/glossary?configurationContentPath=Published&li
```

Response Body


```
{
  "result": null,
  "error": {
    "errorCode": "AUTHENTICATION_ERROR",
    "message": "A valid token must be supplied. Call the login API first to obtai
    "details": ""
  }
}
```


Response Code

```
401
```

Response Headers


```
{
  "cache-control": "private",
  "connection": "keep-alive",
  "content-length": "163",
  "content-security-policy": "default-src 'self'; child-src 'self' *; img-src 'sel
  "content-type": "application/json",
  "date": "Sat, 14 Dec 2019 00:32:05 GMT",
  "expires": "Thu, 01 Jan 1970 00:00:00 GMT",
  "keep-alive": "timeout=60",
  "x-content-type-options": "nosniff",
  "x-xss-protection": "1; mode=block"
}
```


Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Putting it All Together

Personally Identifiable Information (PII)

With the advent of requirement for data security on any data elements which qualify as personally identifiable information (PII), it is common to want to identify, catalog, manage and report on the PII metadata within the data cataloging and governance system, such as MIMM . In fact, MIMM has a wealth of features designed to support this requirement in a number of ways. In particular, this scenario will walk you through the use of:

- Semantic type definition, profiling and auto-tagging
- The glossary for PII element terminology, standardization/normalization, and ontology or semantic architecture
- Semantic usage and definition reporting

For the purposes of addressing PII requirements.

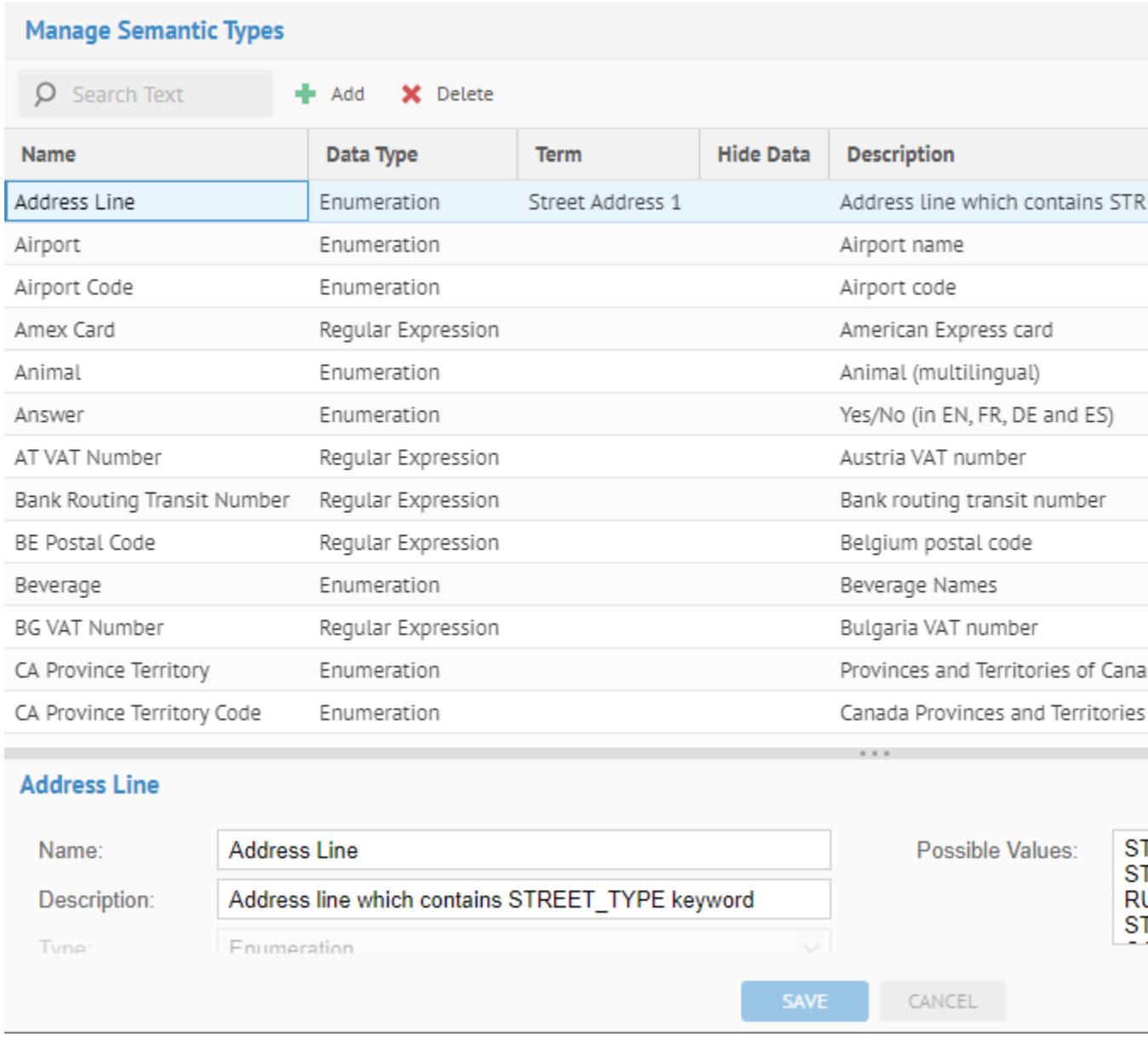
PII Semantic Types

MIMM is delivered with a fairly robust set of semantic types already defined. Many of these may be considered PII. First thing we will do is identify which ones should be considered PII.

Create a Compound PII Semantic Type

Go to **MANAGE** > **Semantic Types**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Looking at the list we have at least five different types which could be PII:

- Address Line
- Gender
- Last Name
- US Postal Code
- US Social Security Number

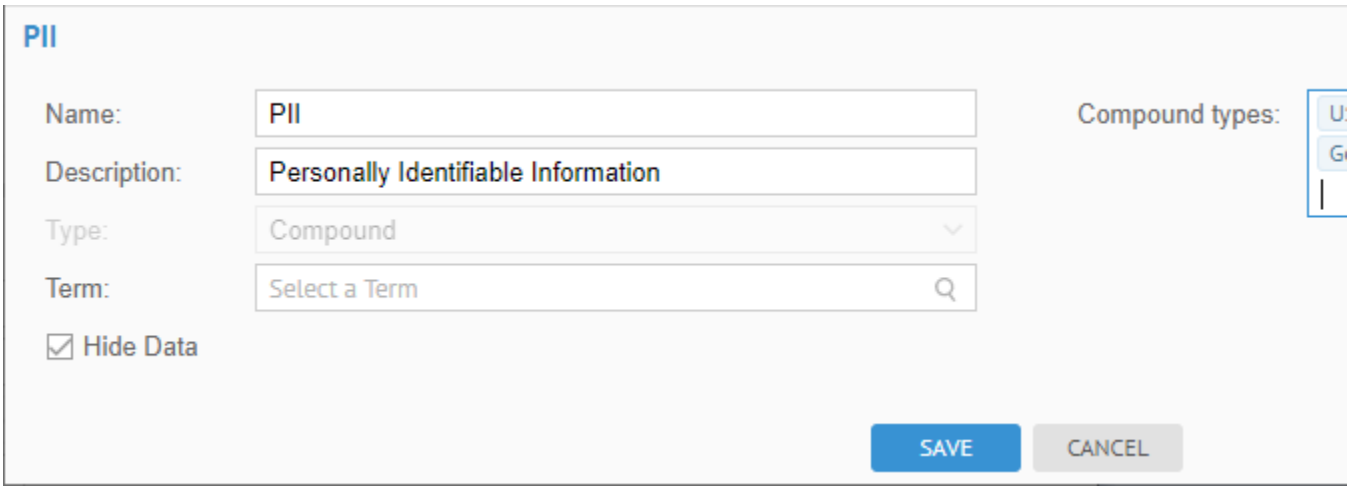
There may be others, but we will start with these for this exercise.

One of the powerful features of semantic types is the ability to enable auto-tagging of elements and auto hiding at the same time. In order to take advantage of these features, we will create a

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

new **PII** semantic type which is a compound type of the above PII related semantic types we listed.

Click **Add** and enter the following:



*The semantic type is a **Compound** semantic type consisting of the five types in the earlier list.*

*The **Hide Data** checkbox is checked. This way, when a data element is tagged with the **PII** semantic type, its data will also be hidden from casual users who do not have the **Data Administrator** security role.*

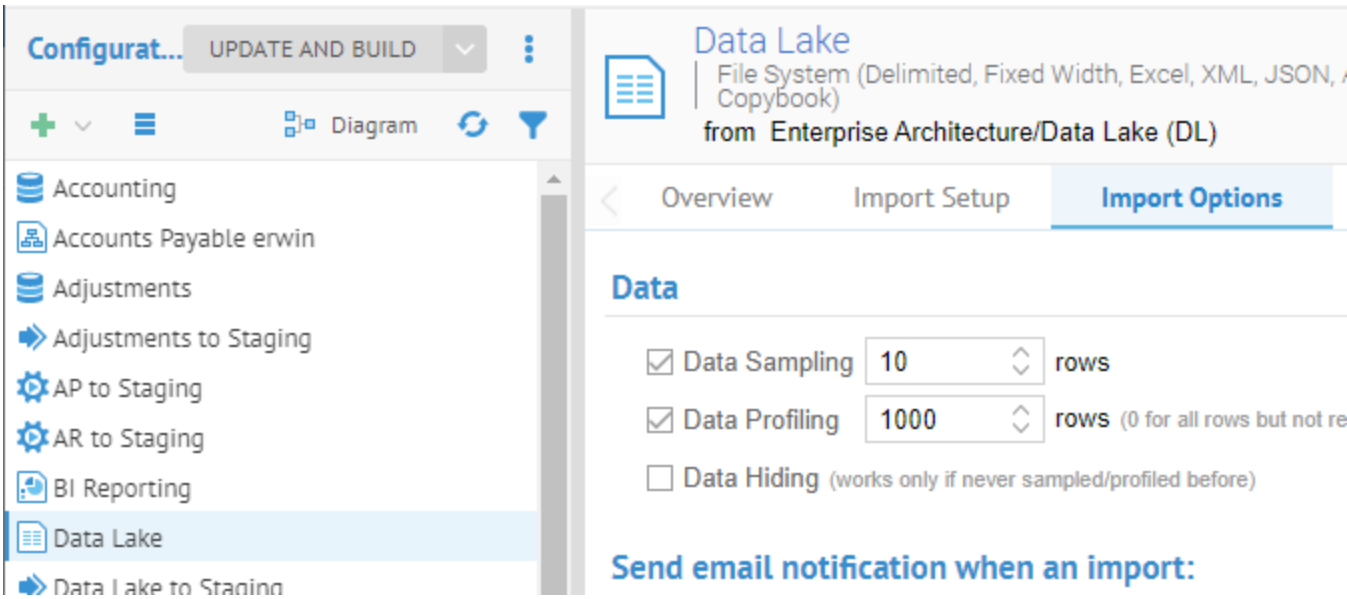
Click **Save**.

Click **Publish** to publish the semantic types so that they are defined in the next model harvest.

Harvest with the Semantic Type

Go to **MANAGE** > **Configuration**, select the **Data Lake** model and go to the **Import Options** tab. Note, this model is defined fro **Data Profiling** and **Sampling**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click **Import** and be sure to check **Full source import instead of incremental** to ensure that the cached copy is not simply reused.

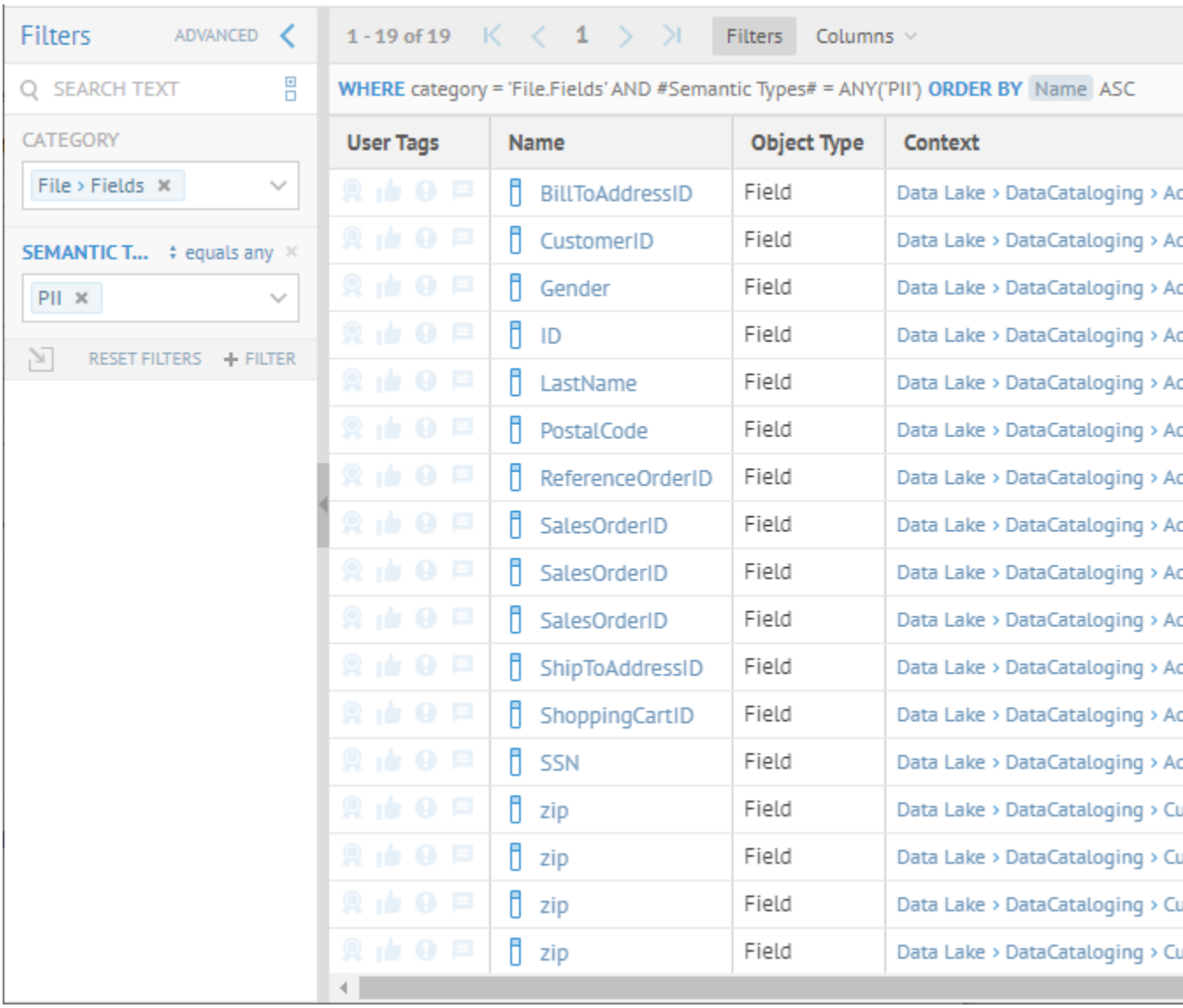
Once the import has completed and the data profiled and samples (check the **Logs** tab), We will see what was profiling and auto tagged (and thus auto hidden).

Analyze the Auto Tagging and Hiding Results

Go to WORKSHEETS > File > Fields.

Add the **Semantic Type** column to the Grid view and Filter on **Semantic Type = PII**:

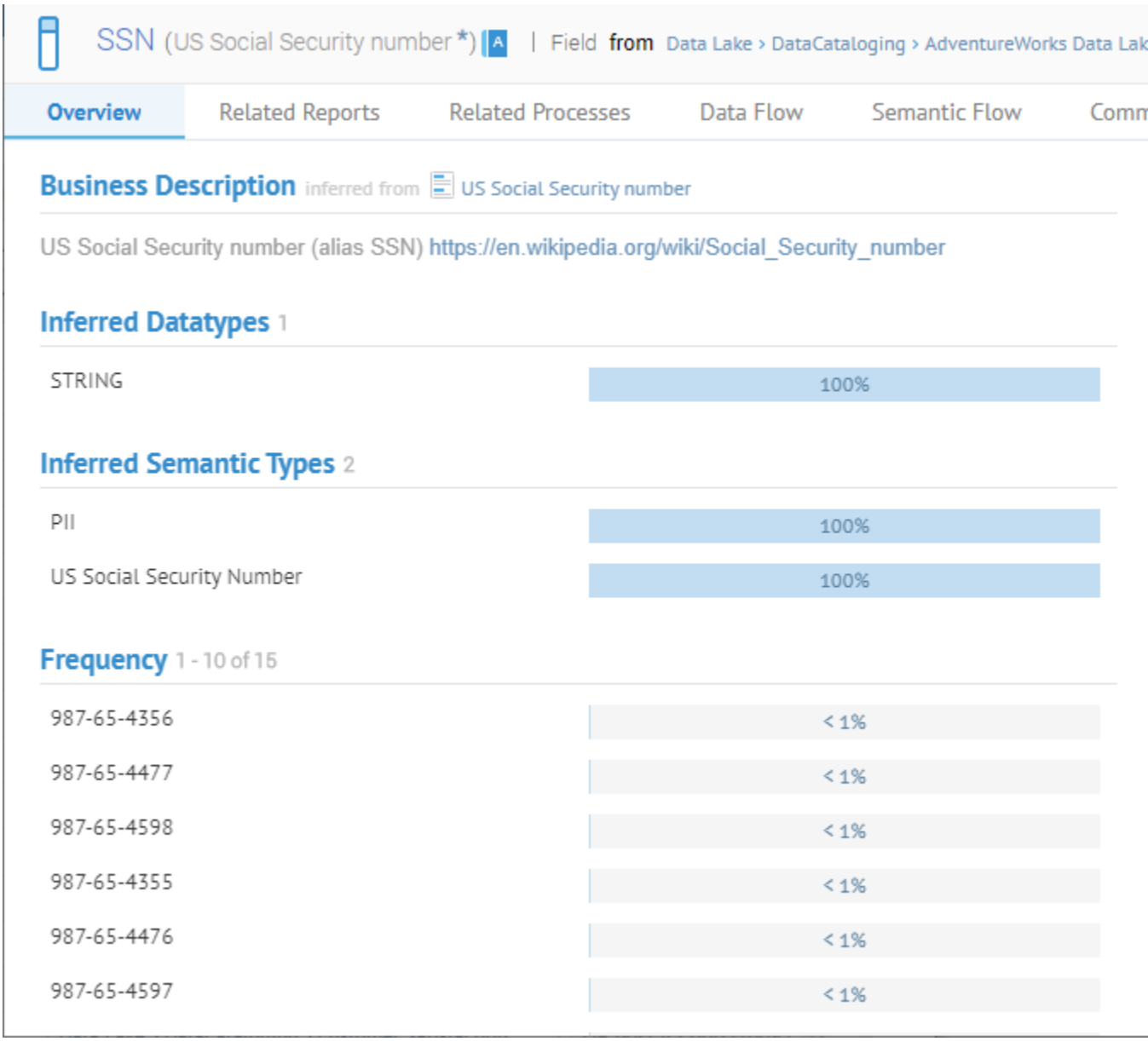
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Here is a list of all the auto tagged PII fields.

Go to the details page for (click) **SSN**.

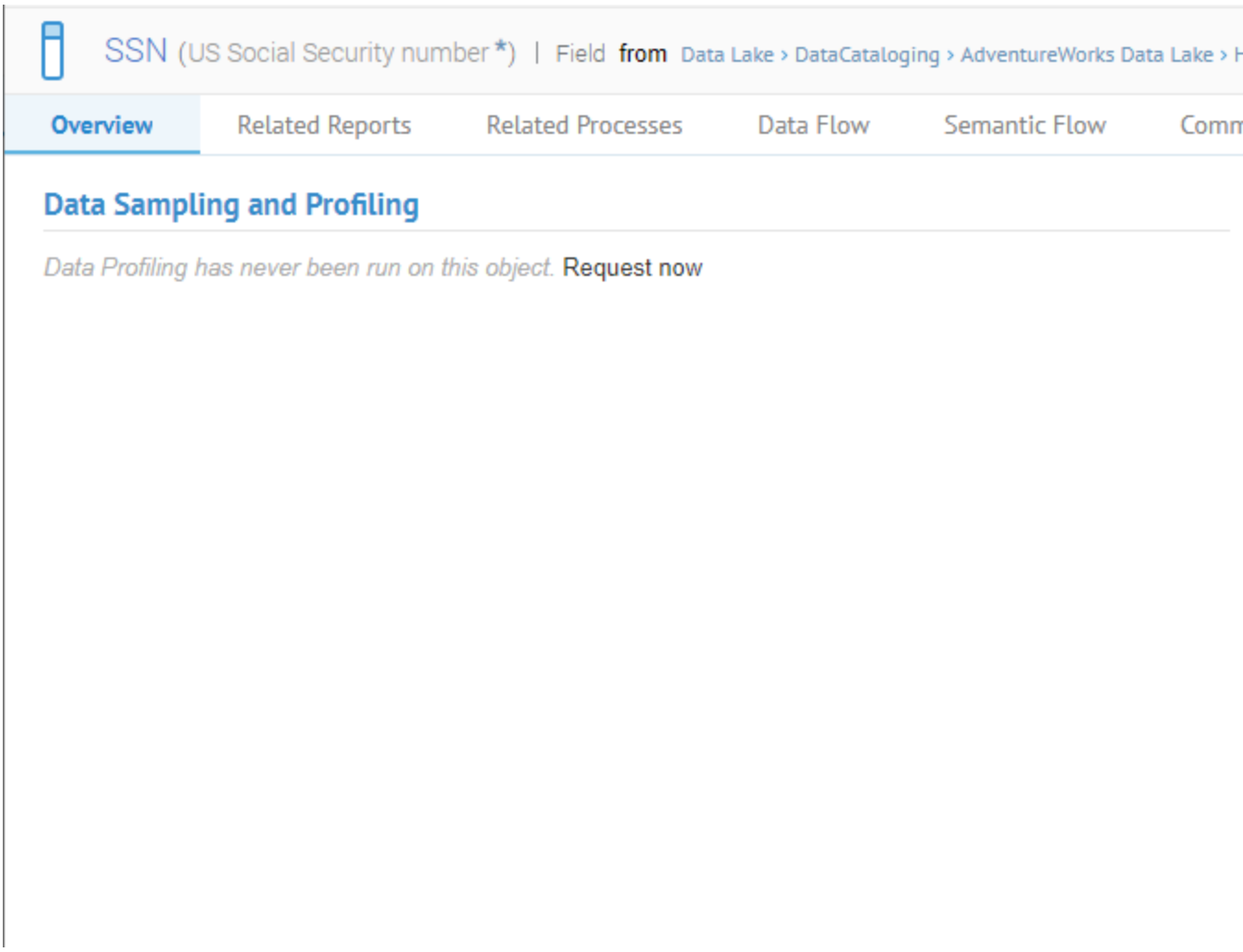
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



*This field was tagged as both **US Social Security Number** and **PII**, as **PII** is a compound of several types including the other.*

If we sign in as a casual user (e.g., **Bob**), we cannot see the profiling information:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Demonstrating the auto hiding feature.

Semantic Types in the Glossary

Defining a compound semantic type like **PII** composed of different subtypes is very important to support auto tagging and auto hiding. In addition, it can be important to build up an ontology in one or more business glossaries with terminology that reflects (and is linked to) the significant PII semantic types. In this way, you will be able to use the semantic usage and definition reporting on terminology and data elements already auto tagged as well as those you manually tag, classify or semantically map.

Define PII Terminology

Here we will create the specific terms in the glossary from which we will build an ontology.

Create a new category in the **Finance** glossary named **GDPR** and create a **General Data Protection Regulation** term:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

General Data Protection Regulation | Term from Finance › GDPR

Overview | Relationships 1 | Related Reports | Semantic Flow | Comments | Attachm

Definition

General Data Protection Regulation
https://en.wikipedia.org/wiki/General_Data_Protection_Regulation

Documentation

The **General Data Protection Regulation** ("GDPR") is a regulation in EU law on data protection and privacy for all individuals within the European Union (EU) and the European Economic Area (EEA). It also addresses the export of personal data outside the EU and EEA areas. The GDPR aims primarily to give control to citizens and residents over their personal data and to simplify the regulatory environment for international business by unifying the regulation within the EU.

Regulation (EU) 2016/679

European Union regulation	
Title	Regulation on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (Data Protection Directive)
Made by	European Parliament and Council of the European Union
History	
Date made	14 April 2016
Implementation date	25 May 2018
Preparative texts	
Commissionproposal	COM/2012/010 final ◆ 2012/0010 (COD)
Other legislation	
Replaces	Data Protection Directive
Current legislation	

^ LESS

And create a **Personally Identifiable Information (PII)** term:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Personally Identifiable information (PII) | Term from Finance › GDPR

Overview | Relationships 6 | Related Reports | Semantic Flow | Comments | Attachm

Definition

Personally Identifiable information (alias PII)
https://en.wikipedia.org/wiki/Personally_identifiable_information

Documentation

Personal information, described in United States legal fields as either **personally identifiable information** (**PII**), or **sensitive personal information** (**SPI**),[1][2][3] as used in information security and privacy laws, is information that can be used on its own or with other information to identify, contact, or locate a single person, or to identify an individual in context. The abbreviation PII is widely accepted in the U.S. context, but the phrase it abbreviates has four common variants based on *personal / personally*, and *identifiable / identifying*. Not all are equivalent, and for legal purposes the effective definitions vary depending on the jurisdiction and the purposes for which the term is being used. (In other countries with privacy protection laws derived from the OECD privacy principles, the term used is more often "personal information", which may be somewhat broader: in Australia's *Privacy Act* 1988 (Cth) "personal information" also includes information from which the person's identity is "reasonably ascertainable", potentially covering some information not covered by PII.)

European and other data protection regimes, which centre primarily around the General Data Protection Regulations, the term "personal data" is significantly broader, and determines the scope of the regulatory regime.[4]

NIST Special Publication 800-122[5] defines PII as "any information about an individual maintained by an agency, including (1) any information that can be used to distinguish or trace an individual's identity, such as name, social security number, date and place of birth, mother's maiden name, or biometric records; and (2) any other information that is linked or linkable to an individual, such as medical, educational, financial, and employment information." So, for example, a user's IP address is not classed as PII on its own, but is classified as linked PII.[6]

The concept of PII has become prevalent as information technology and the Internet have made it easier to collect PII leading to a profitable market in collecting and reselling PII. PII can also be exploited by criminals to stalk or steal the identity of a person, or to aid in the planning of criminal acts.[7] As a response to these threats, many website privacy policies specifically address the gathering of PII,[*citation needed*] and lawmakers[*who?*] have enacted a series of legislation[*which?*] to limit the distribution and accessibility of PII.[*citation needed*]

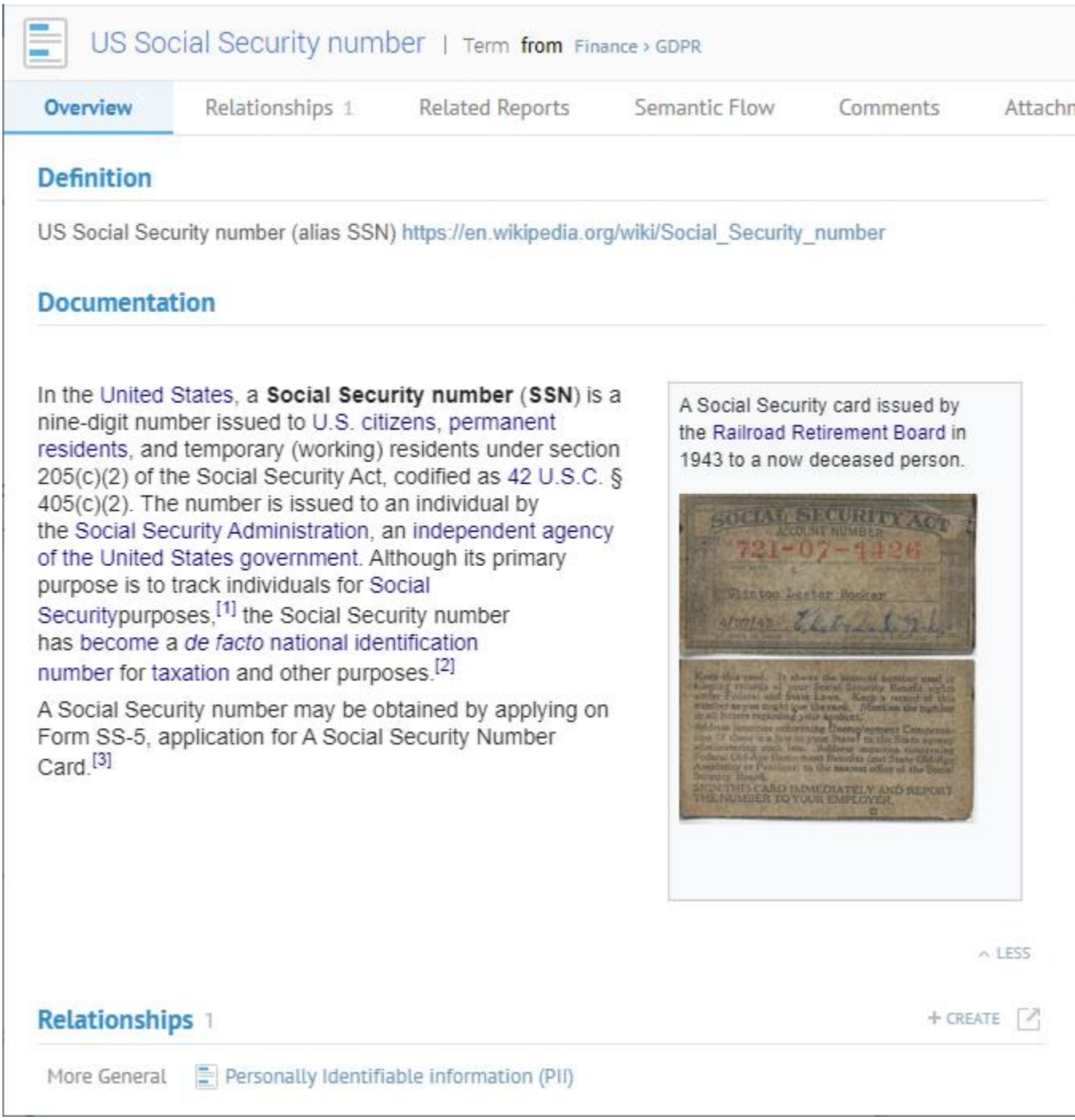
Define PII Ontology

Then create a relationship of **More General** to **More Specific** between **GDPR** and **PII**:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

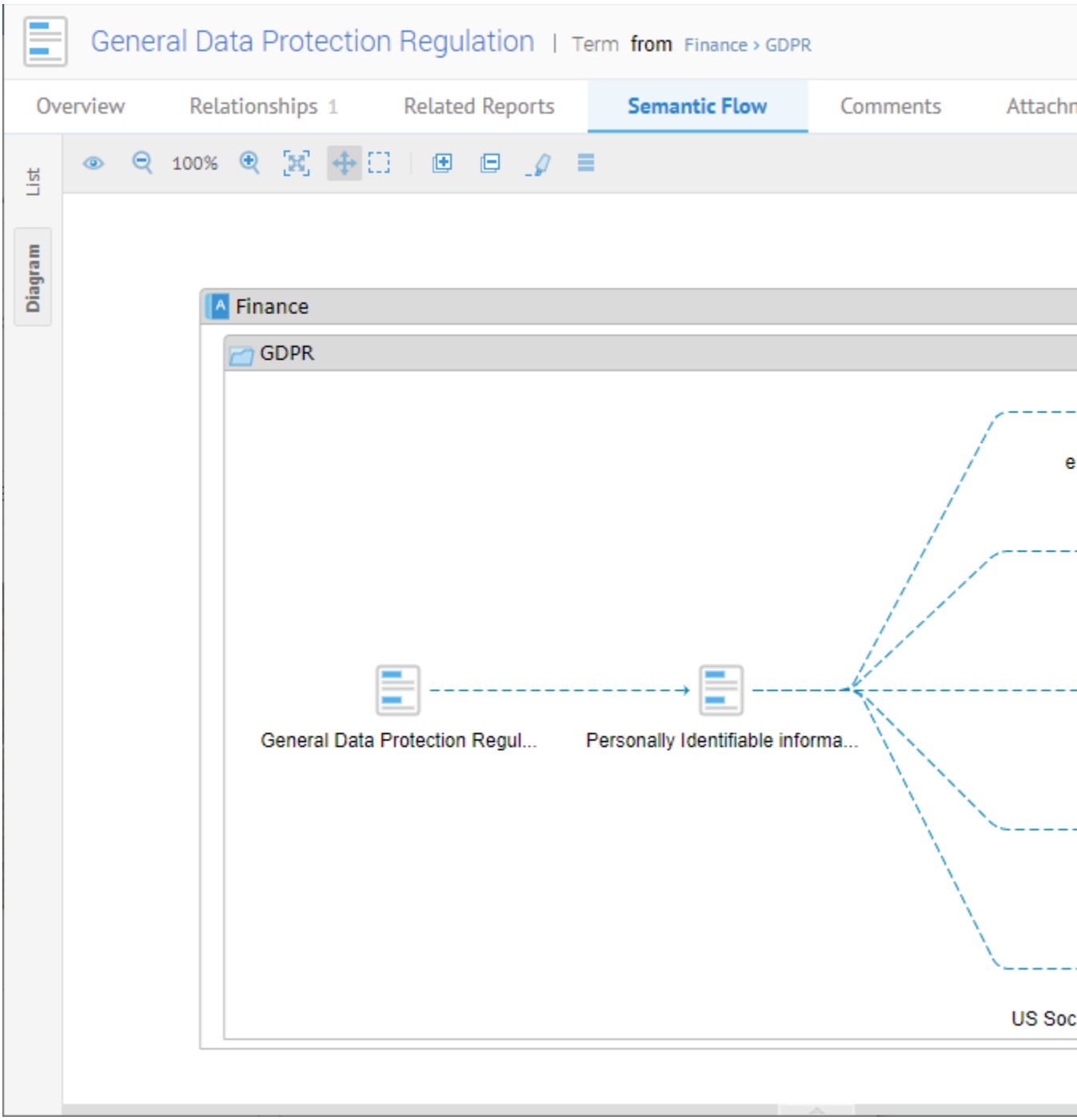
Then, you may create terms for all the other concepts associated with **PII**, such as **eMail Address**, **Address**, **US Social Security Number**, etc.:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Create the relationships of **More General** to **More Specific** between them. In the **Semantic Mapping** tab of the details page for **GDPR** we then have:

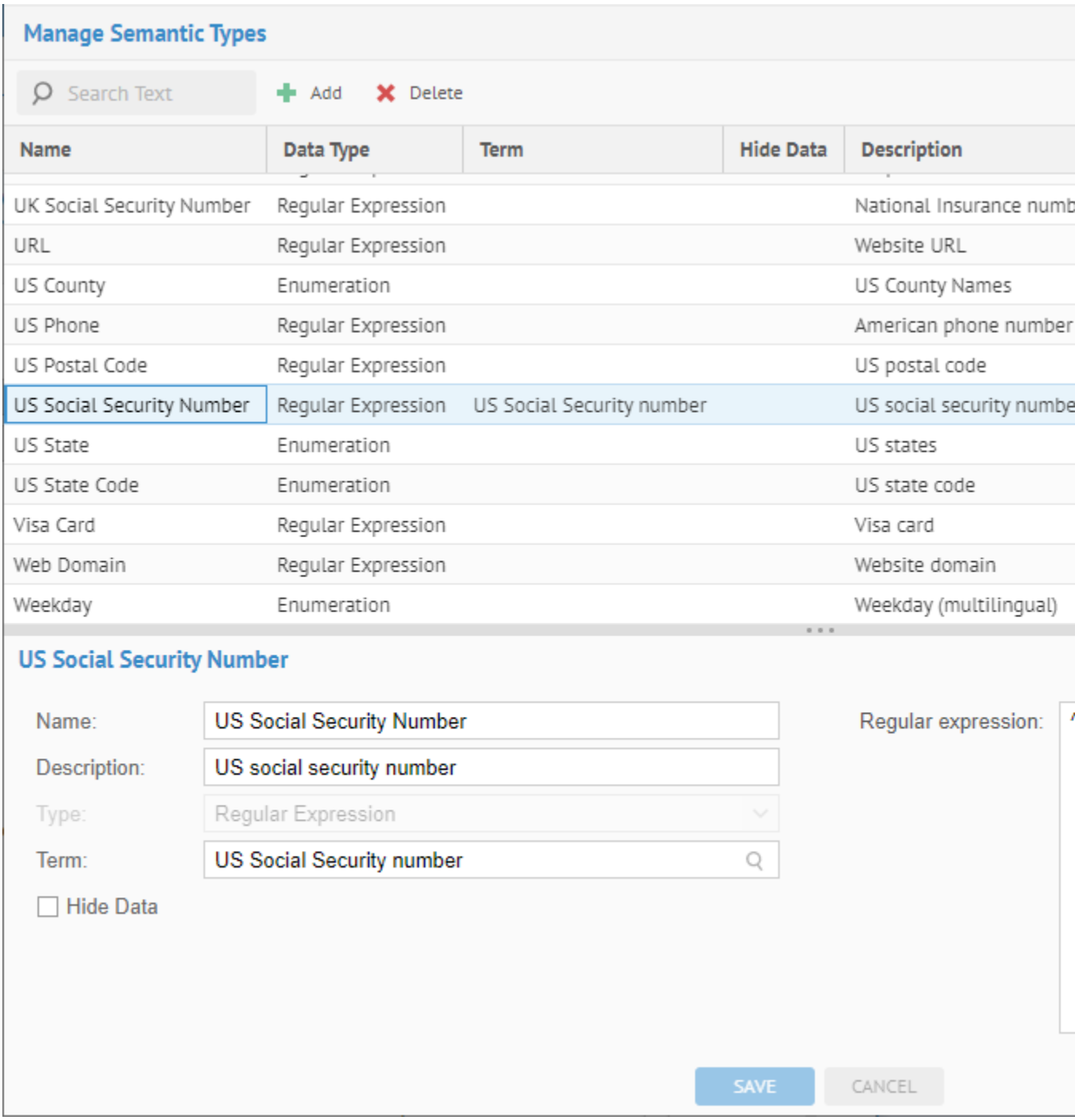
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Link PII Terminology to Semantic Types

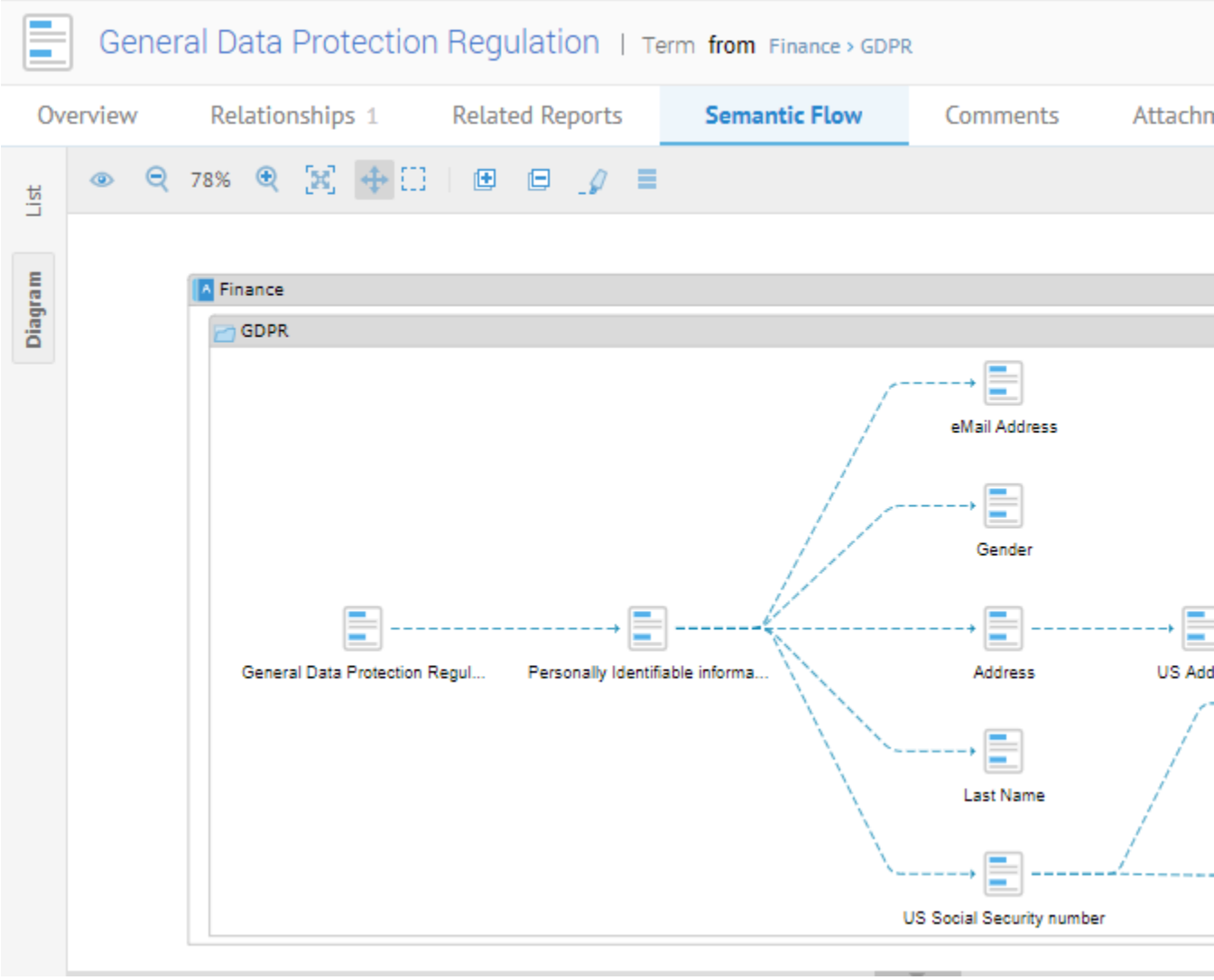
Go to **MANAGE** > **Semantic Types** again and click on **US Social Security Number**. Then, assign the **US Social Security Number** term to this semantic type.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



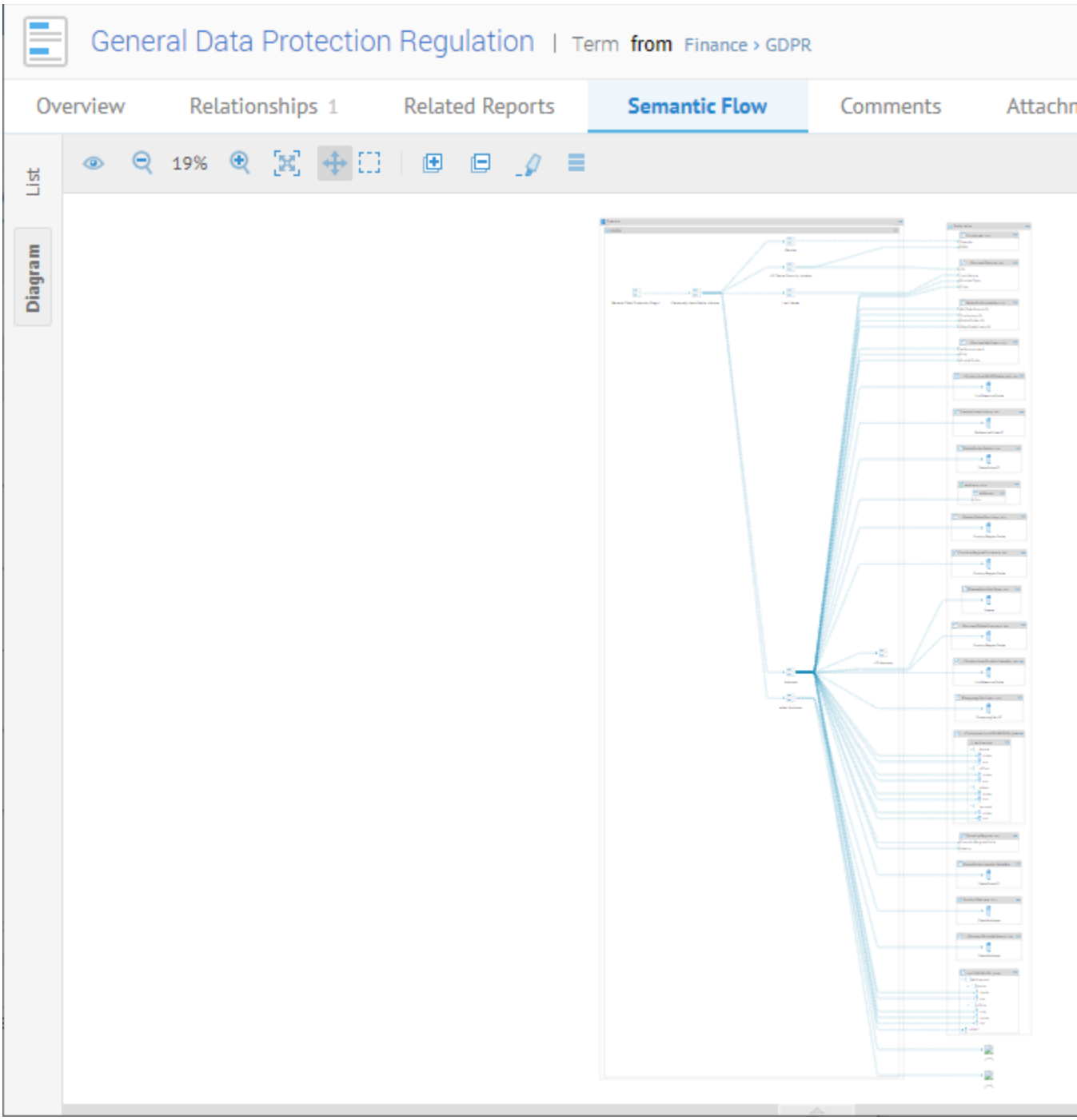
Now, return to In the **Semantic Mapping** tab of the details page for **GDPR** we then have:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Linking all the other terminology to semantic types, we have:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



And suddenly a diagram is less useful.

Click the List tab on the left to get a list of the semantic usage elements:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

General Data Protection Regulation | Term from Finance › GDPR

Overview | Relationships 1 | Related Reports | Semantic Flow | Comments | Attachm

List | Diagram

Map | Classify | Search

Type	Semantic Usage
Classified	Personally Identifiable information (PII) from Finance › GDPR **Description**: Personally Identifiable information (alias PII) https://en.wikipedia.org/wiki/Personally_identifiabl
Inferred	US Social Security number from Finance › GDPR **Description**: US Social Security number (alias SSN) https://en.wikipedia.org/wiki/Social_Security_number
Inferred	Last Name from Finance › GDPR **Description**: Person's sir name
Inferred	Address from Finance › GDPR **Description**: Full address associated with a physical location
Inferred	US Address from Finance › GDPR **Description**: Full address associated with a physical location as specified in the United States
Inferred	Gender from Finance › GDPR **Description**: Self identified gender designation
Inferred	eMail Address from Finance › GDPR **Description**: Address for receiving eMail
Inferred	SalesOrderID from SalesOrderHeaderSalesReason.csv
Inferred	state from cust20180131.json › addresses › home
Inferred	zip from cust20180131.json › addresses › home
Inferred	city from cust20180131.json › addresses › office
Inferred	state from cust20180131.json › addresses › office
Inferred	zip from cust20180131.json › addresses › office
Inferred	eMail from cust20180131.json
Inferred	state from cust20180201.json › addresses › home

And, one may also see **Business Names** and **Definitions** now (based upon the terminology):

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

ID (US Social Security number *) | Field from Data Lake › DataCataloging › AdventureWorks Data Lake ›

Overview | Related Reports | Related Processes | Data Flow | Semantic Flow | Comm

Business Description inferred from US Social Security number

US Social Security number (alias SSN) https://en.wikipedia.org/wiki/Social_Security_number

Inferred Datatypes 1

STRING	100%

Inferred Semantic Types 2

PII	100%
US Social Security Number	100%

Frequency 1 - 10 of 15

987-65-4910	< 1%
987-65-4912	< 1%
987-65-4911	< 1%
987-65-4903	< 1%
987-65-4902	< 1%
987-65-4905	< 1%
987-65-4904	< 1%
987-65-4907	< 1%
987-65-4906	< 1%

And anything that is downstream in terms of pass-through lineage.

Administration and System Management

Manage Users and Authentication

Users are defined within MIMM in order to:

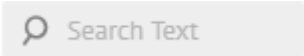
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

- Identfy authorship of objects and originator of an action
- Detmine session counts for licensing or usage of the product
- Assign various security roles, stewardship and workflow roles directly or through group assignment.

Listing All Users

The list of users present in the **Manage Users** page is paginated for larger lists. You may locate a user in the pages of the list by way of the **Search** text field in the upper left of the **Manage Users** page.

Steps

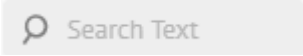
1. Sign in as a user with at least the **User Admin** security role.
2. Go to **MANAGE** > **Users** in the banner.
3. Enter the text to search for in the 

box.

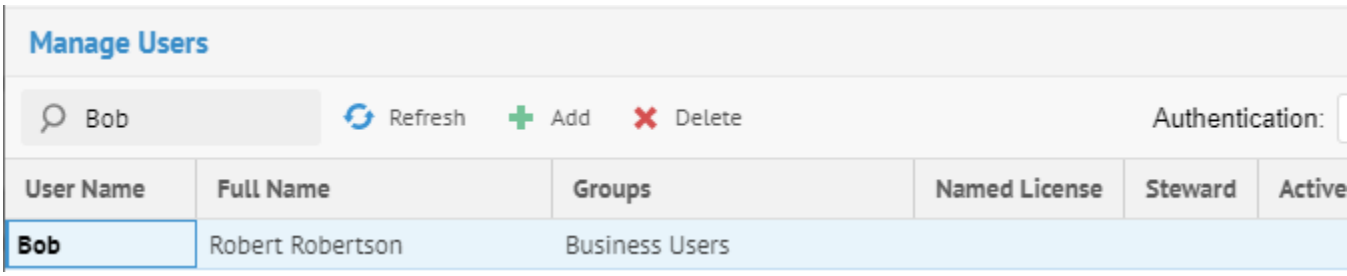
Example

Sign in as an **Administrator**.

Go to **MANAGE** > **Users** in the top banner.

Enter “bob” in the 

box.



Edit User Account Details

Steps

1. Sign in as a user with at least the **User Admin** security role.
2. Go to **MANAGE** > **Users** in the banner.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

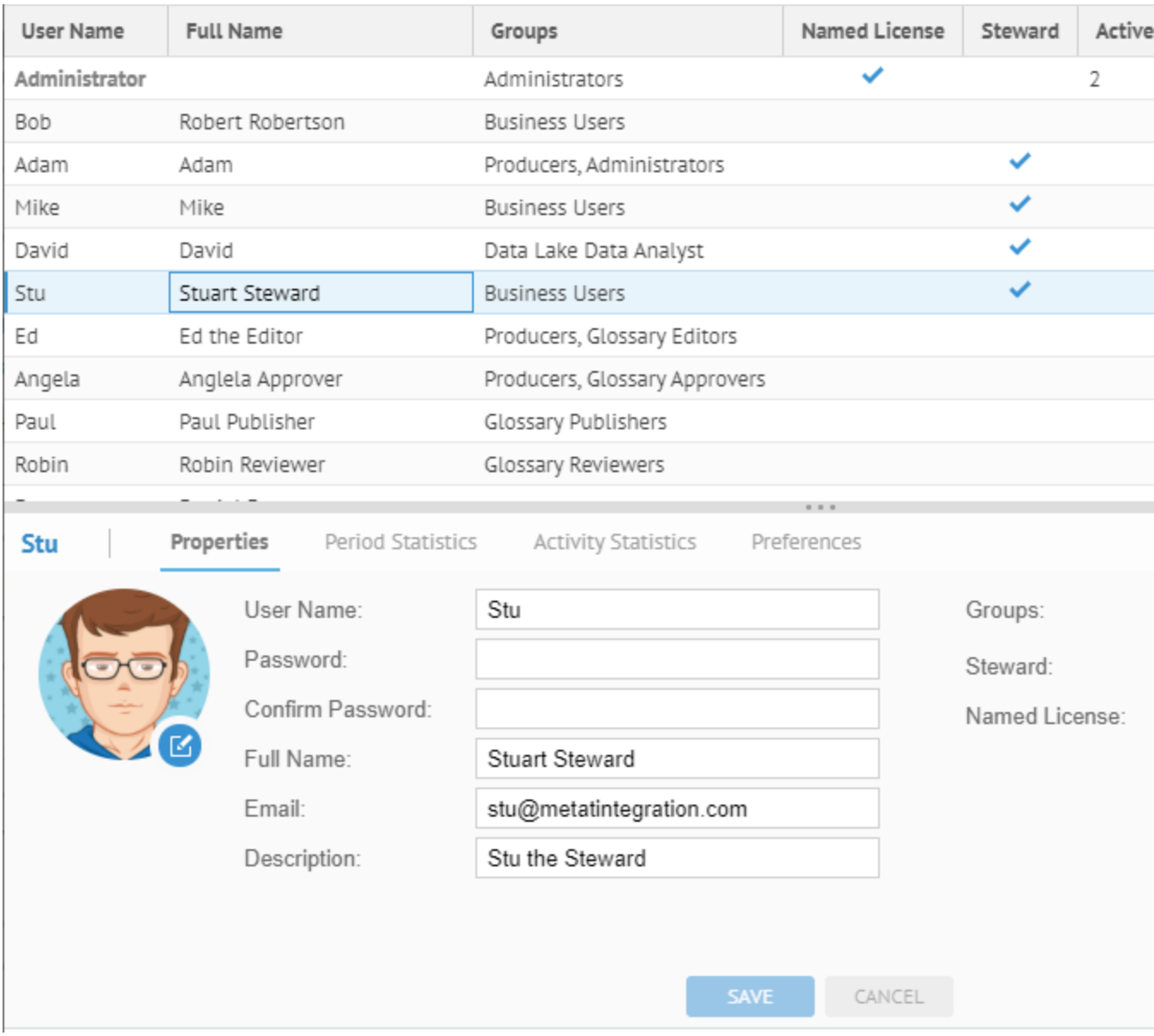
3. Select the user from the list.

Example

Sign in as an **Administrator**.

Go to **MANAGE** > **Users** in the top banner.

Click on the user to delete, **Jim**.



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Review User Statistics

Detailed user session statistics may be downloaded.

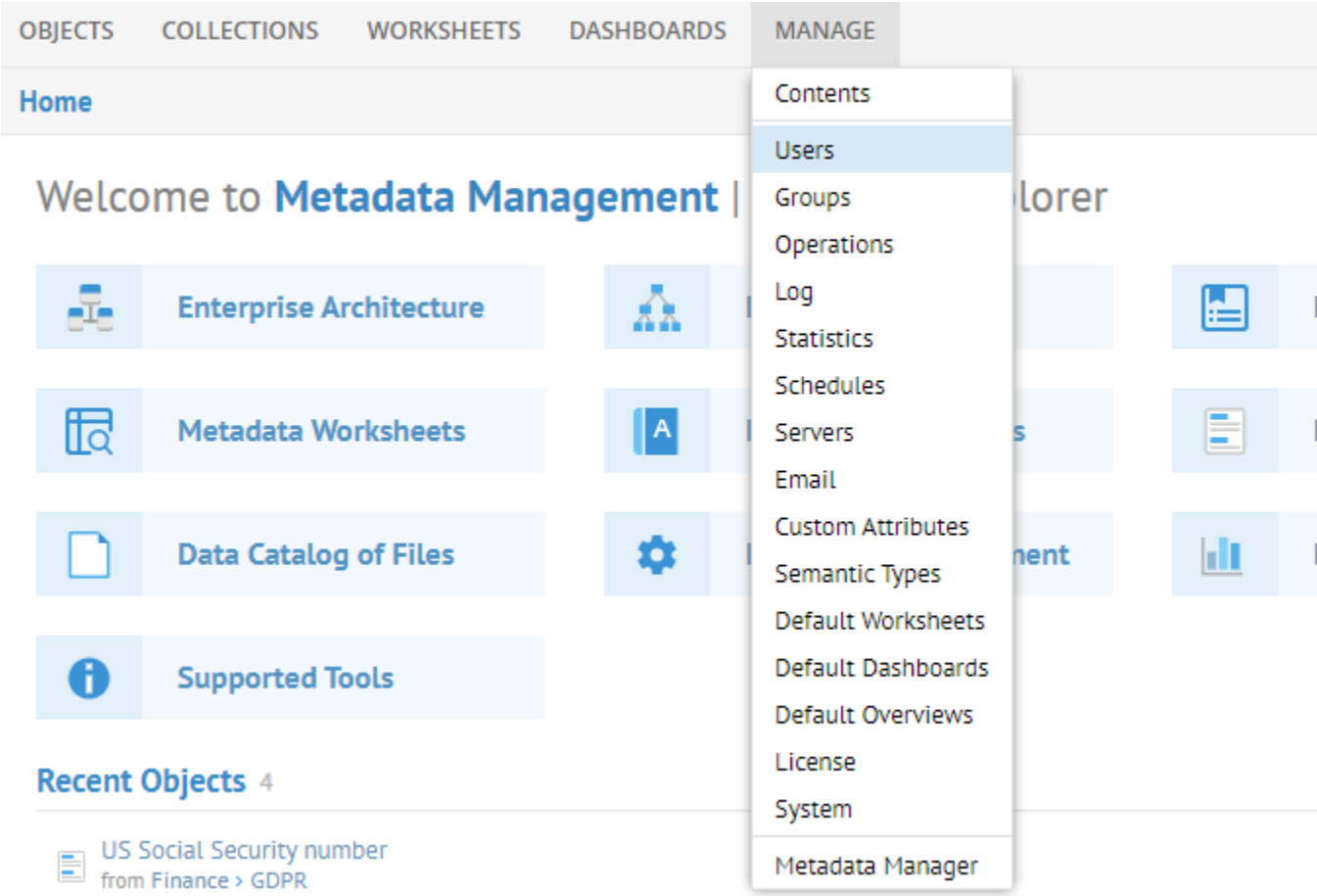
Steps

1. Sign in as a user with at least the **User Admin** security role.
2. Go to **MANAGE** > **Users** in the banner.
3. Select the user from the list.
4. Click the **Period Statistics** tab.
5. Click the **Activity Statistics** tab.

Example

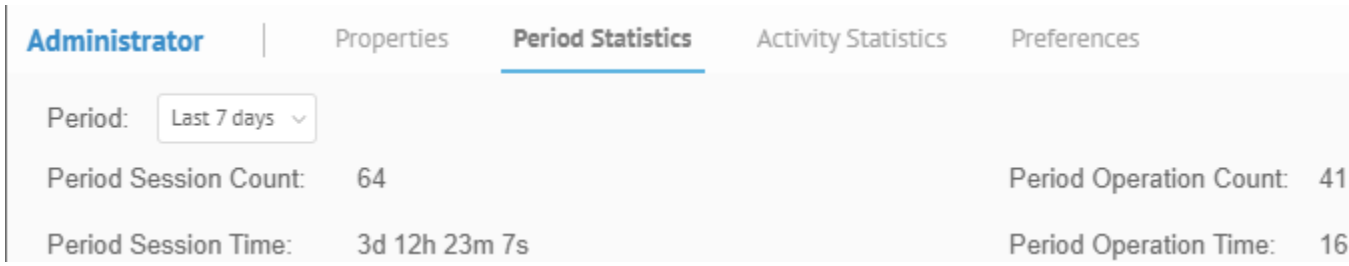
Sign in as an **Administrator**.

Go to **MANAGE** > **Users** in the top banner.

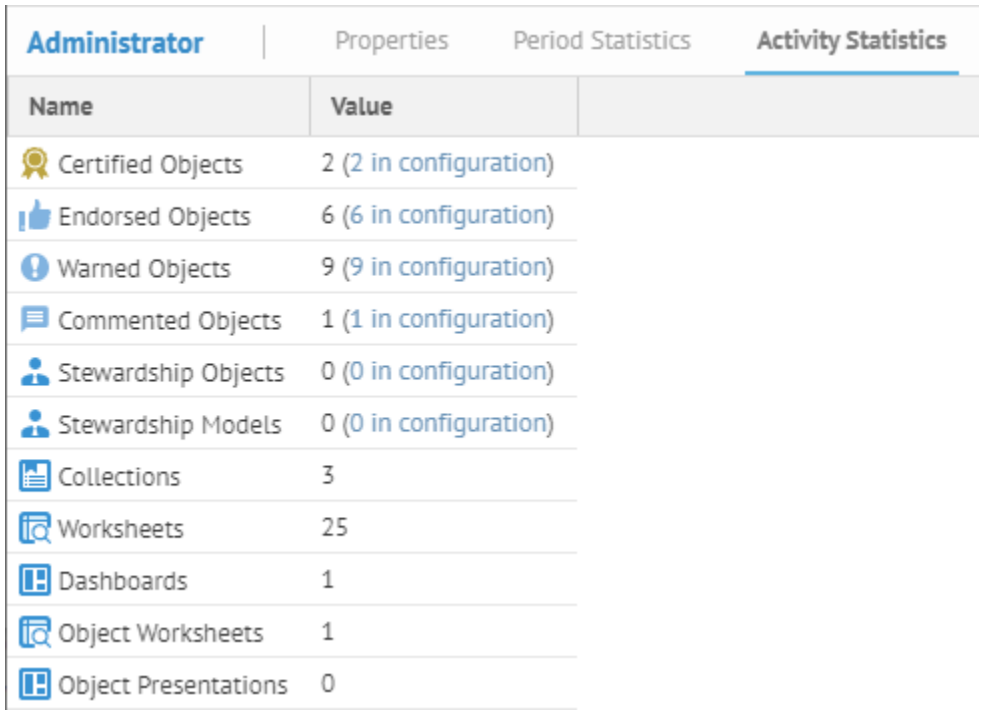


Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Click on the **Administrator** user and click the **Period Statistics** tab.



Click the **Activity Statistics** tab.



Edit User Preferences

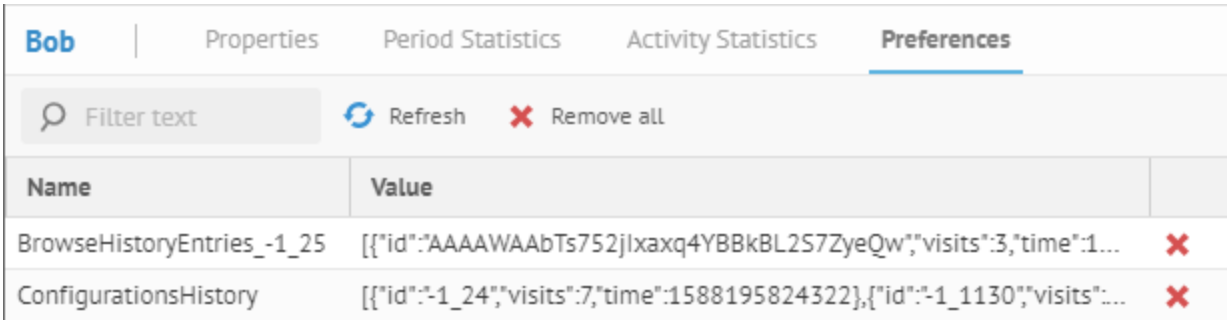
One may clear user preference settings using the Preference tab when managing a user.

Steps

6. Sign in as a user with at least the **User Admin** security role.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

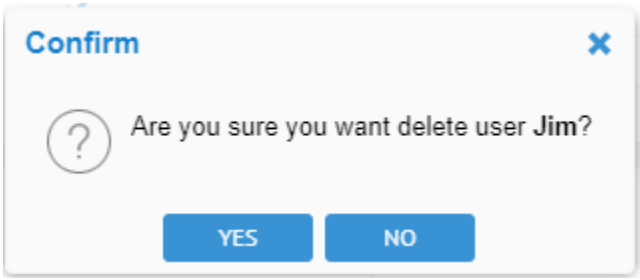
7. Go to **MANAGE** > **Users** in the banner.
8. Click a user.
9. Go to the **Preferences** tab.
10. Use the **X** to clear one of the preferences.
11. Use the **X** at the top of the list to **Remove all** preferences.



Delete a User

You may delete any username from MIMM . However, externally authenticated users will be recreated if that user signs in and is again properly authenticated.

Click the ✖ Delete icon.



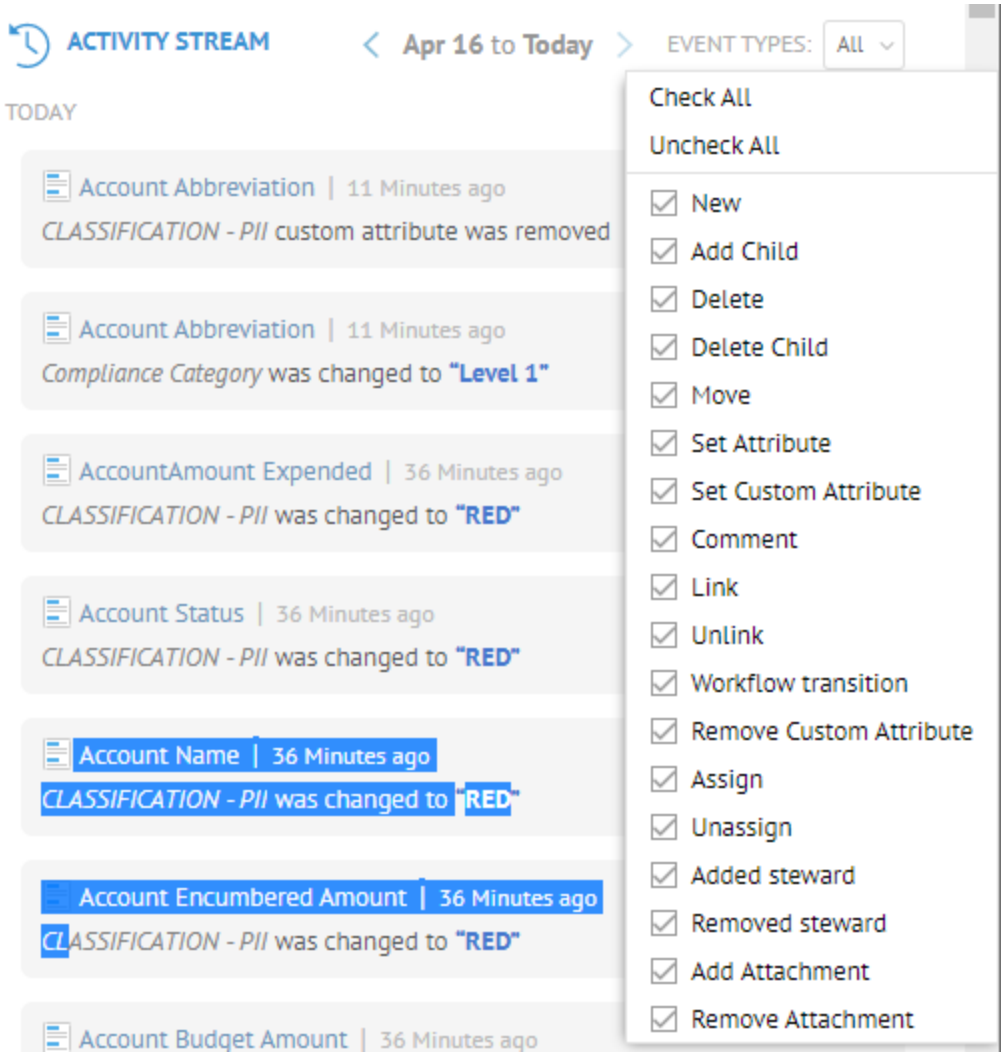
Click **YES** to confirm.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Open User Profile

Steps

1. Sign in as a user with at least the **User Admin** security role.
2. Go to **MANAGE** > **Users** in the banner.
3. Right-click on a user from the list and select **Open User Profile**.
4. From here you may:
   - Click the link to the right of any entry in **STATISTICS** and you will have a worksheet with that query in the current configuration.
   - Click **EVENT TYPES** to choose which events are shown in the **ACTIVITY STREAM**.



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

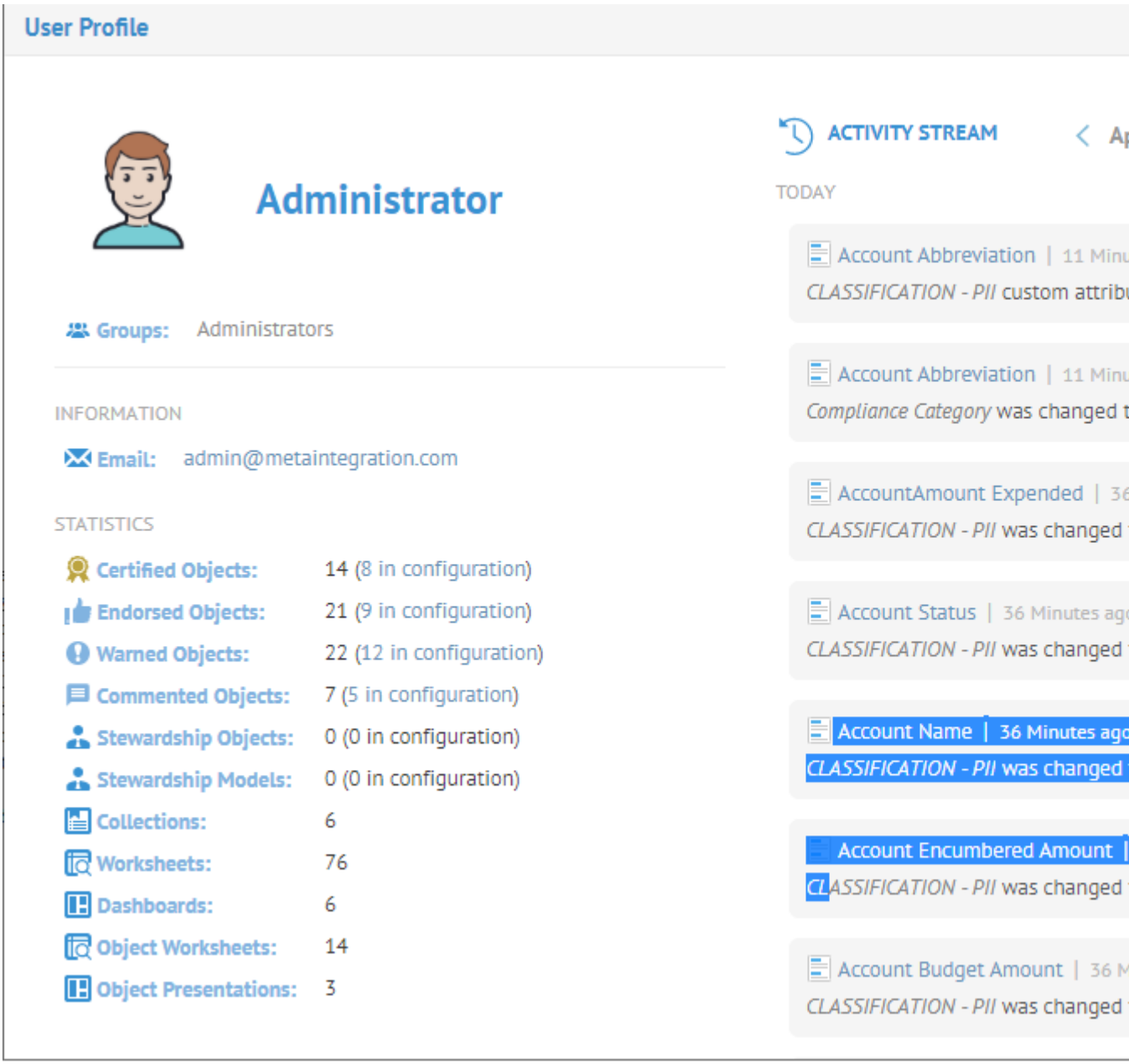
- Click the Email address to send email to that user.

Example

Sign in as an **Administrator**.

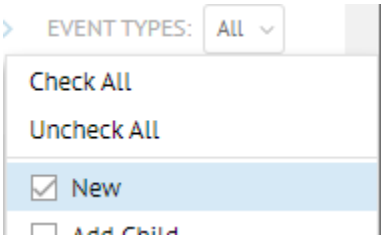
Go to **MANAGE** > **Users** in the top banner.

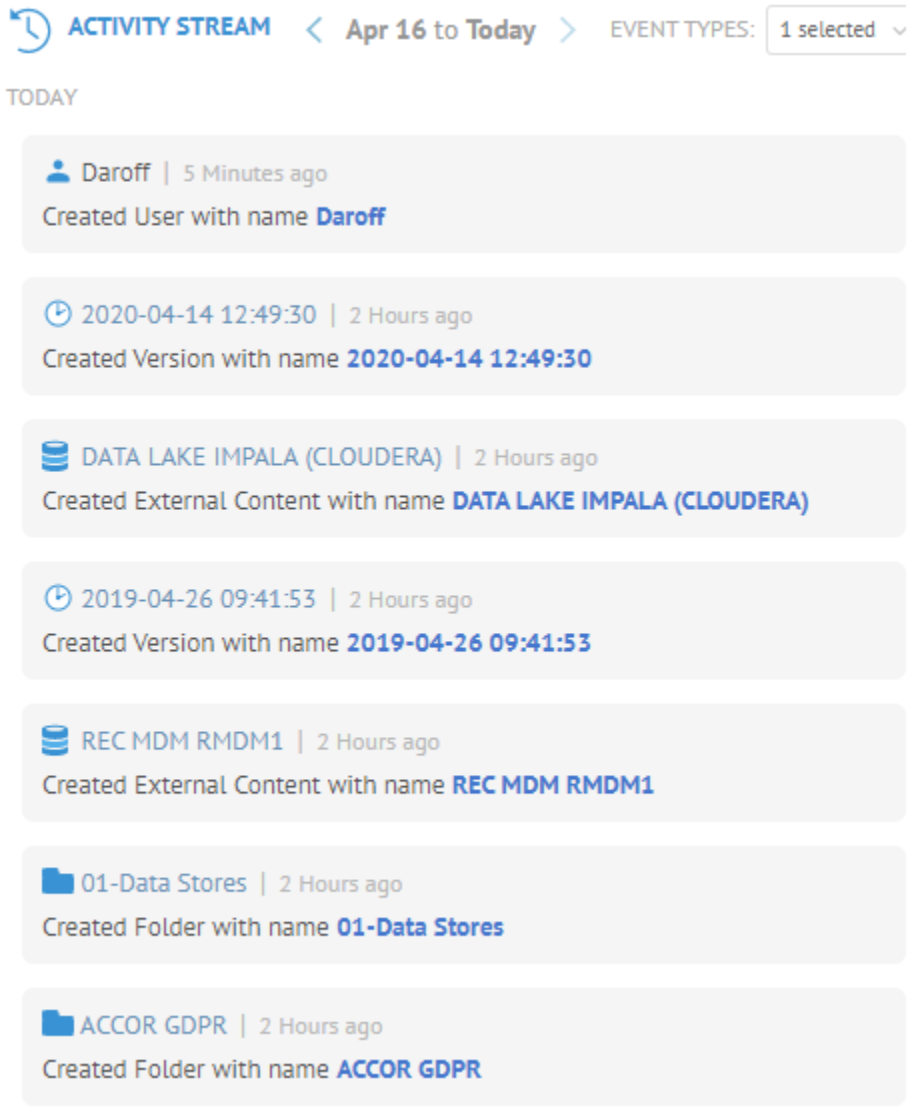
Right-click on the Administrator user and select **Open User Profile**.



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

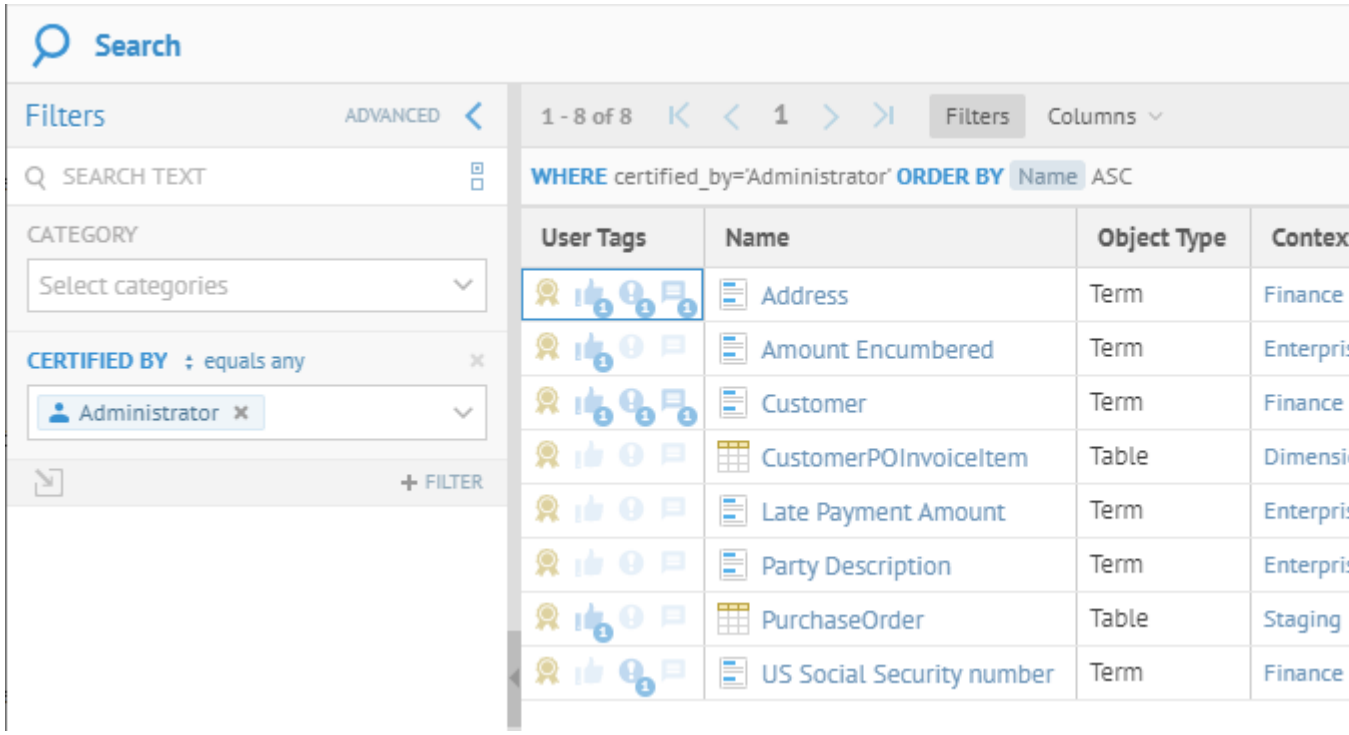
Click **EVENT TYPES** and choose only **New**.





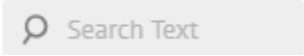
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Click on the link (8 in configuration) to the right of **Certified Objects** in **STATISTICS** and you will have a worksheet with that query in the current configuration.



Set the Login Timeout

Steps

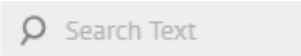
1. Sign in as a user with at least the **User Admin** security role.
2. Go to **MANAGE** > **Users** in the banner.
3. Enter the text to search for in the 

box.

Example

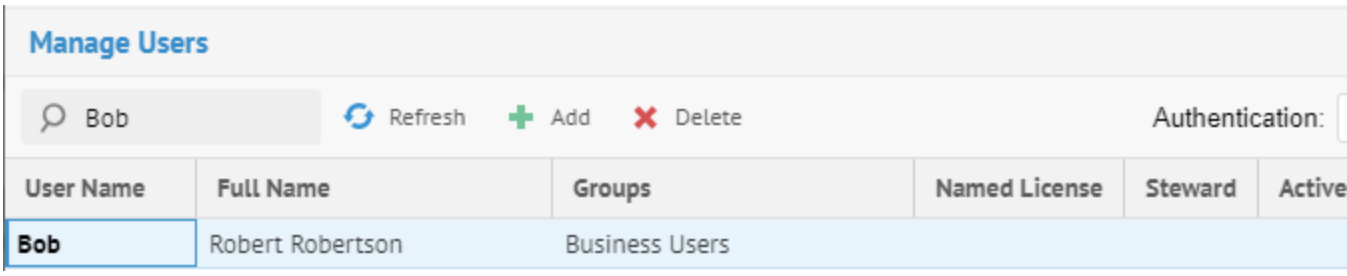
Sign in as an **Administrator**.

Go to **MANAGE** > **Users** in the top banner.

Enter “bob” in the 

box.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Import Users

Download Users and Statistics

A complete report of users may be downloaded.

Steps

1. Sign in as a user with at least the **User Admin** security role.
2. Go to **MANAGE** > **Users** in the banner.
3. Click the **Download** icon.

Manage Native Authentication

In this mode, users may be defined as a user defined locally within MIMM . All create, edit, group assignments and deletion actions on that user may only be made within {MIMM}.

When logging in using native authentication mode, if the user name is associated with a native user the system will authenticate that user with native authentication (based on the local password).

Set Native Authentication

Steps

1. Sign in as a user with at least the **User Admin** security role.
2. Go to **MANAGE** > **Users** in the banner.
3. Select **Native** from the **Authentication** pull-down.

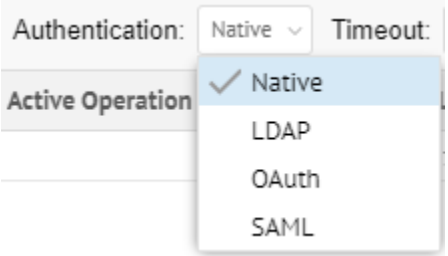
Example

Sign in as **Administrator**.

Go to **Tools** > **Administration** > **Users**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Select **Native** from the **Authentication** pull-down.



Create a New Native User

Native users are manually created/updated by the Administrator. A Native user is required to have a password defined at the creation time. Native Users can coexist with LDAP Users, which may be useful in creating temporarily logins for administrators, support, consultants, etc.

Steps

1. Sign in as a user with at least the **User Admin** security role.
2. Go to **MANAGE** > **Users** in the banner.
3. Click the Add icon.
4. At the bottom of the screen, in the **Properties** tab, provide a **Username**, **Password**, and other identifying information.
5. Check the **Steward** checkbox if you want this user to be in the pick list for possible stewards for special roles and notification for terms and models.
6. Check the **Named License** checkbox if you want to designate this user as a named user for licensing purposes.
7. Assign a group to the user.

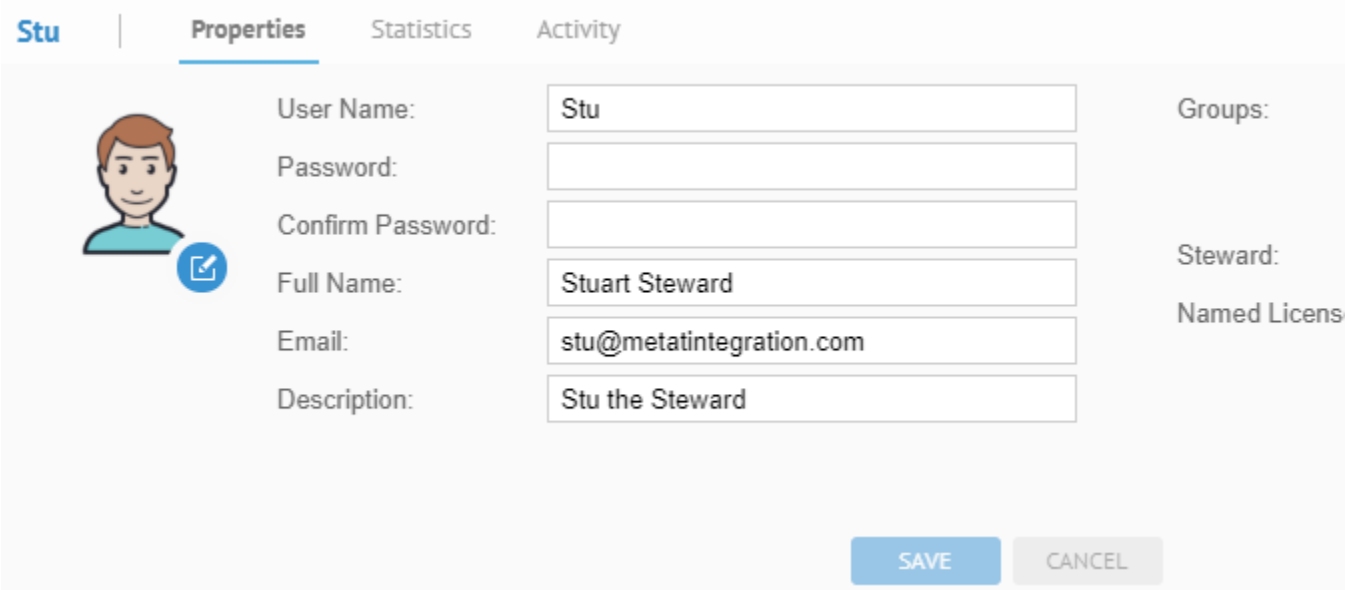
Example

Sign in as an **Administrator**.

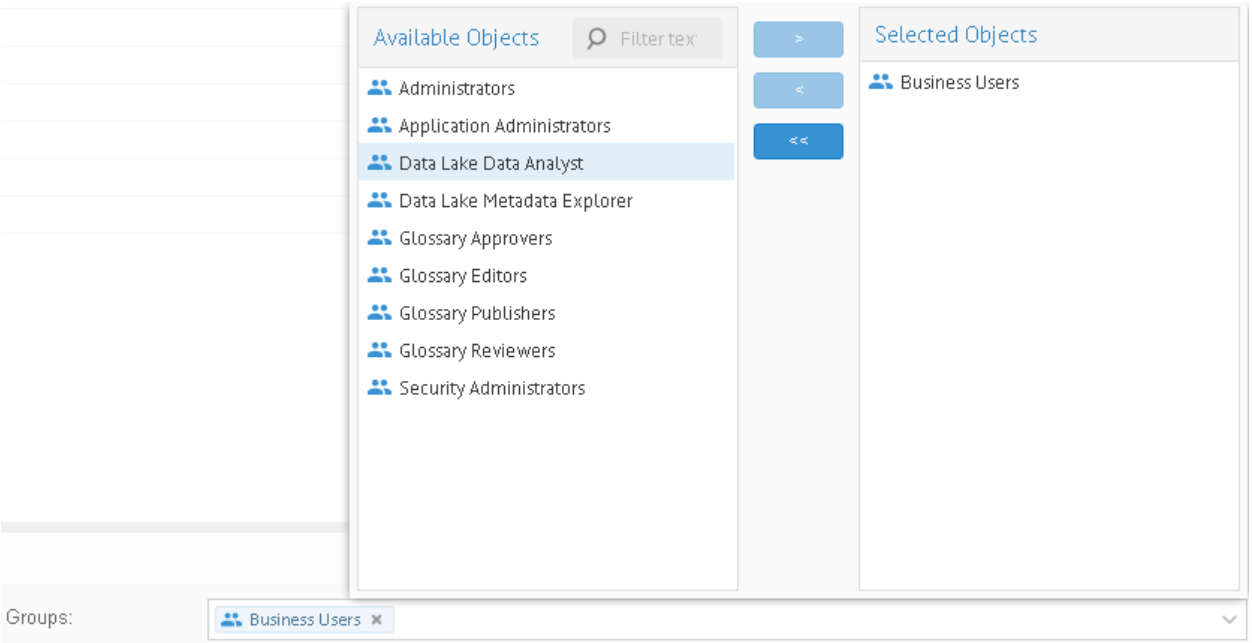
Go to **MANAGE** > **Users** in the top banner.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Click the Add icon. At the bottom of the screen, in the **Properties** tab, provide a **Username**, **Password**, and other identifying information.



Click the **Groups** pull-down and choose the **Business Users** group.



Click **Save**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Manage LDAP Authentication

Set LDAP Authentication

Steps

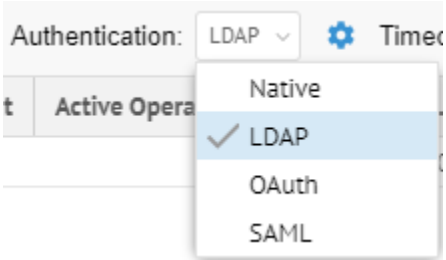
1. Sign in as a user with at least the **User Admin** security role.
2. Go to **MANAGE** > **Users** in the banner.
3. Select **LDAP** from the **Authentication** pull-down.

Example

Sign in as **Administrator**.

Go to **Tools** > **Administration** > **Users**.

Select **LDAP** from the **Authentication** pull-down.



Configure LDAP Authentication

LDAP authentication configuraton is based upon defining the proper connection to the LDAP server.

Steps

1. Sign in as a user with at least the **User Admin** security role.
2. Go to **MANAGE** > **Users** in the banner.
3. Be sure LDAP Authentication is enabled.
4. Click the **Configure Authentication** icon.
5. Specify the **Type** of LDAP to be used. If you select **Custom**, you may specify further in the **Attribute Mappings** tab.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

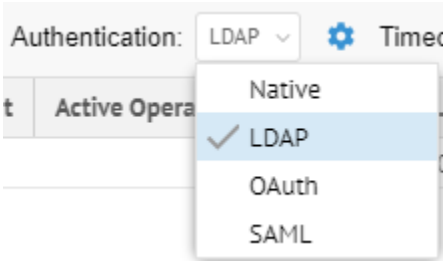
6. Enter the connection parameters available in the **Connection** tab.
7. Enter the mapping information for LDAP attributes attributes in the **Attribute Mappings** tab.
8. Use the **Test** button to validate the settings.
9. Go to the Group Assignment tab to auto-assign groups based upon the LDAP security model.

Example

Sign in as **Administrator**.

Go to **Tools** > **Administration** > **Users**.

Select **LDAP** from the **Authentication** pull-down.



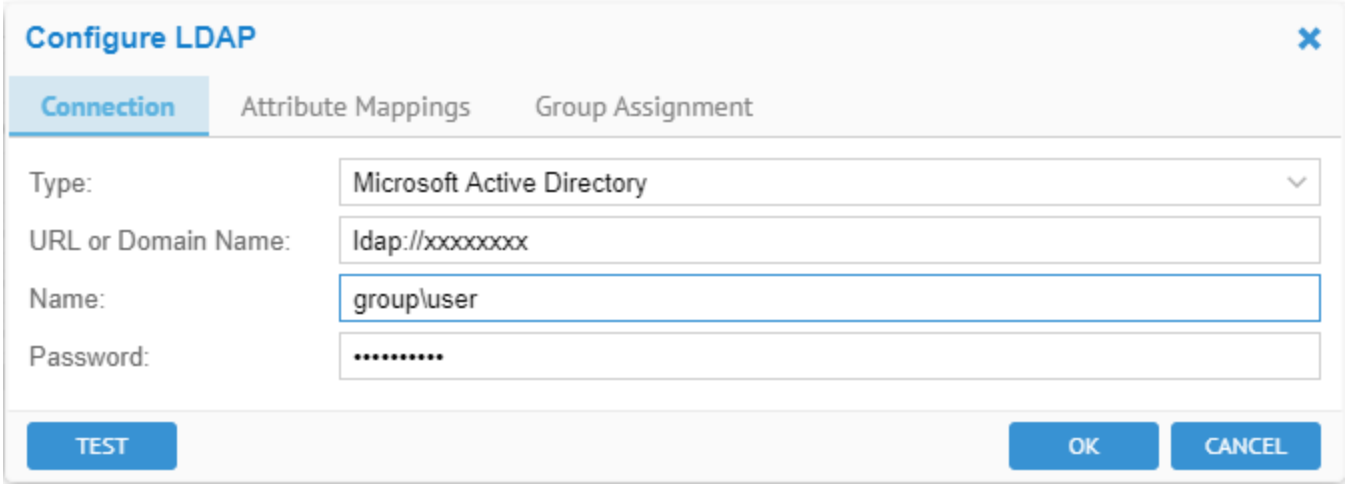
Specify Microsoft Active Directory as the **Type** of LDAP to be used

Enter the connection parameters.

Click the **Test** button to validate the settings.

Go to the Group Assignment tab to auto-assign groups based upon the LDAP security model.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



If you do not click the TEST button, a test connection will be attempted anyway on clicking OK and it must pass successfully before the dialog closes. You may always click CANCEL to cancel the change..

Create a New LDAP User

There is no need to create an LDAP user manually. Instead, an LDAP user is automatically created/updated as a result of a successful LDAP authentication login. Thus, all that is required is that the user/password combination is valid for the LDAP authentication connection definitions and query rules.

The LDAP user attributes (login, full name, e-mail, description, etc.) are automatically mapped to selected LDAP attributes (e.g. sAMAccountName is used by default for login on Microsoft Active Directory). In addition, one may change this mapping using the Advanced LDAP connection button.

Manage OAuth Authentication

Configuration of MIMM to support an external SSO environment requires working with your System Administrator. In this mode, the system default login page is disabled and not presented. It must be replaced by an external authentication login system.

Administrators can always login even in External Authentication Mode using the dedicated administrator rescue login URL: http://localhost:<port>/MM/Auth?nativeLogin, where <port> is the http port that MIMM *responds to.*

Please refer to the readme for more details.

The OAuth specification defines a delegation protocol that is useful for conveying authorization decisions across a network of web-enabled applications and APIs. OAuth is used in a wide variety of applications, including providing mechanisms for user authentication.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

MIMM supports the OAuth 2.0 protocol for external authentication.

Set OAuth Authentication

Steps

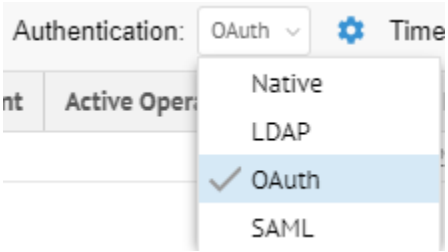
1. Sign in as a user with at least the **User Admin** security role.
2. Go to **MANAGE** > **Users** in the banner.
3. Select **OAuth** from the **Authentication** pull-down.

Example

Sign in as **Administrator**.

Go to **Tools** > **Administration** > **Users**.

Select **OAuth** from the **Authentication** pull-down.



Configure OAuth Authentication

Steps

1. Sign in as a user with at least the **User Admin** security role.
2. Go to **MANAGE** > **Users** in the banner.
3. Select **OAuth** from the **Authentication** pull-down.
4. Click **Configure Authentication**.

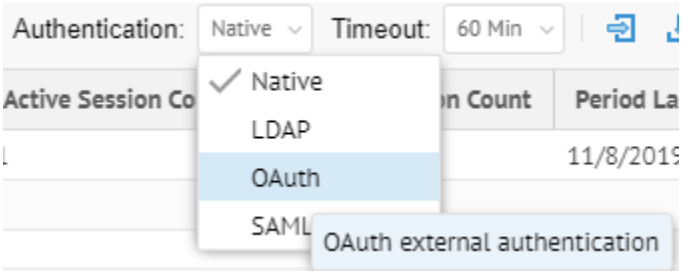
Example

Sign in as an **Administrator**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Go to **MANAGE** > **Users** in the banner.

Select **OAuth** from the **Authentication** pull-down.



Click **Configure Authentication**.

Configure the OAuth Server

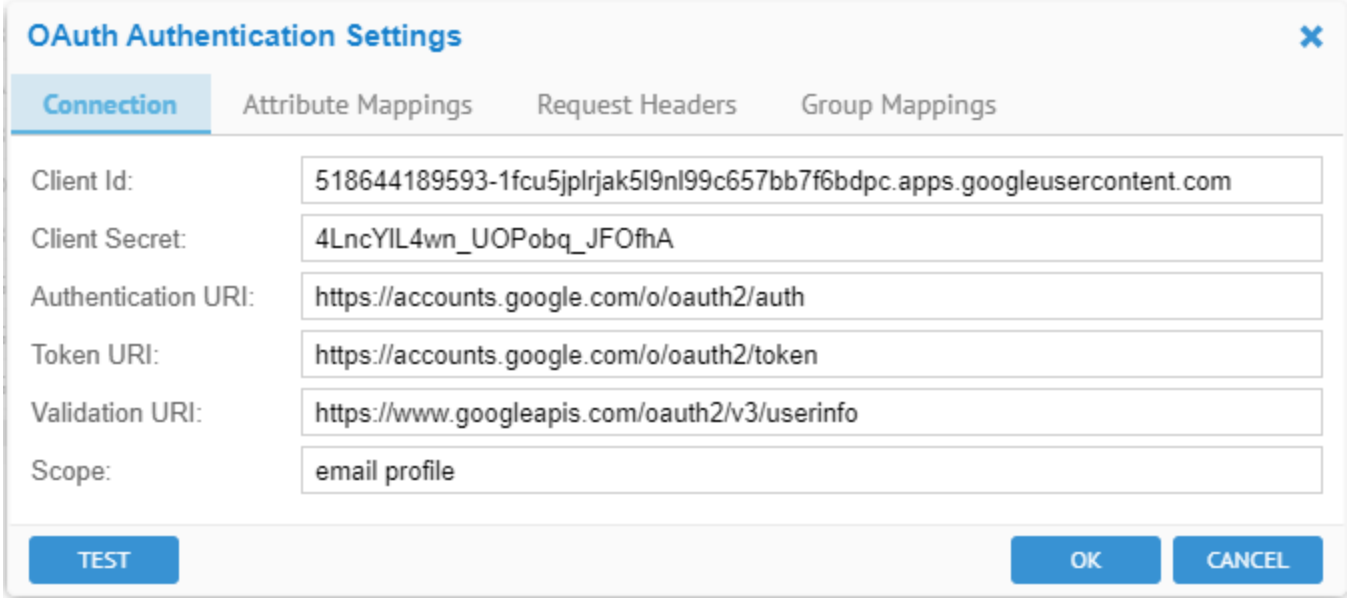
In order to enable an external authentication server using the OAuth 2.0 protocol, the Administrator needs to configure the OAUTH server. The following example shows the Configure OAUTH Server editor parameters using the Google server.

Steps

1. Go to the OAuth Configuration dialog.
2. Go to the **Connection** tab.

Example

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



The user needs to obtain OAuth 2.0 client credentials, such as **Client Id**, **Client Secret** from the external authentication server, such as Google and Facebook.

Besides the **Client Id** and **Client Secret**, the OAUTH Server configuration also requires the external authentication server Authentication URI, token URI and a few other parameters:

- **Authentication URI:** a URI on the external authentication server that handles the user authentication. The result is an authorization code, which the application can exchange for an access token and a refresh token.
- **Token URI**: a URI on the external authentication server that exchanges the authentication code for an access token.
- **Validation URI**: a URI on the external authentication server that validates the access token and provides access to the user's account
- **Scope**: One or more scope values indicating which parts of the user's account an access token permits.

Add an External Authentication User

External authentication users are automatically created/updated by successful external authentication login. They are assigned groups according to the rules provided by the authentication system, or the guest group by default.

One may specify additional group assignments manually (see Assign a group to a user).

User Attribute Mapping

The **User Attribute Mapping** tab specifies a mapping from the external user account attributes to MIMM user attributes (login, full name, email, etc.).

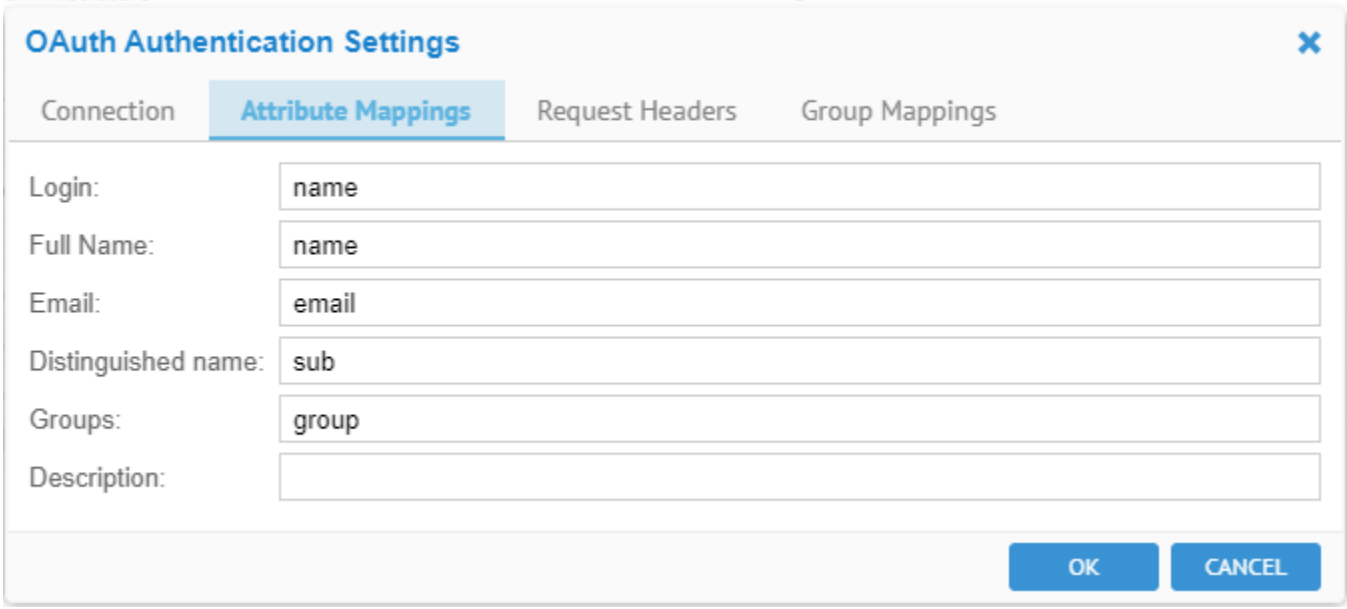
Steps

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

1. Go to the OAuth Configuration dialog.

2. Go to the **Attribute Mappings** tab.

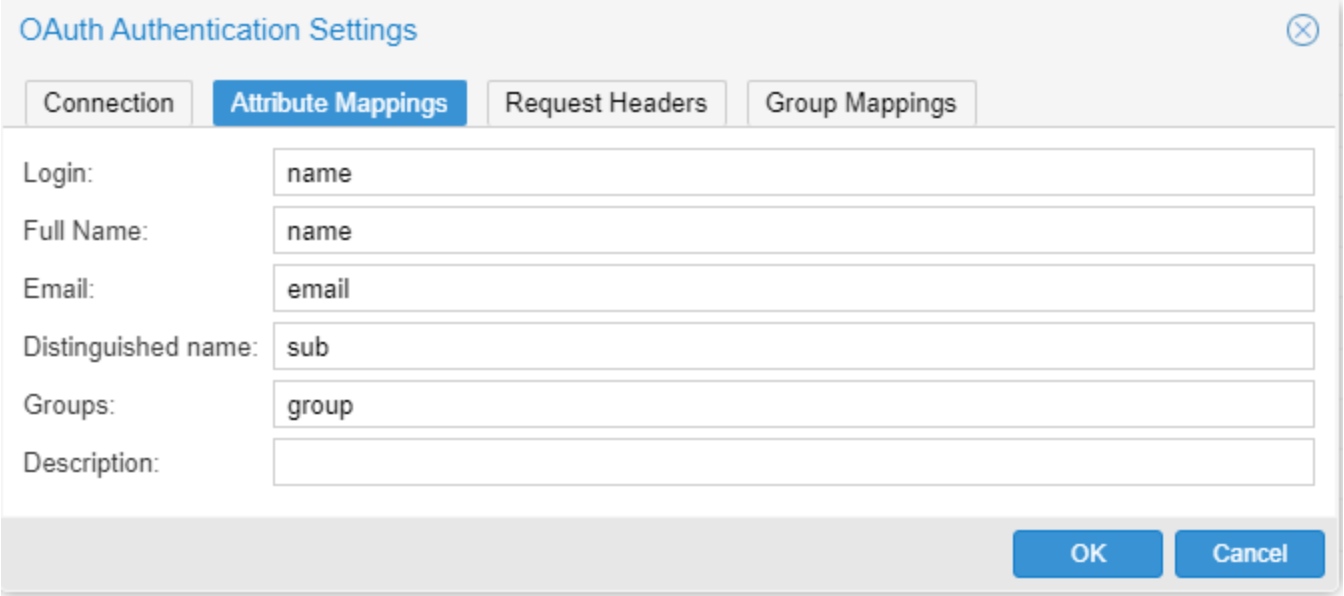
Example



Security Group Assignment

In order to support automatic group assignment, specify in the **Attribute Mapping** tab the corresponding attribute for the security group in MIMM . If the attribute **group** in an OAuth user account information is to be mapped to the security group, the **Attribute Mapping** tab should look like this:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



In this case, if the user account information for user **John** has a field called **group** , MIMM will use the value of the field **group**, e.g. "Business user", as the security group assignment for the user **John**.

The user account information is returned from the OAuth server to MIMM *after the OAuth server validates an access token upon a login request.*

You may also map individual values assigned to the OAuth attribute that maps to the Groups in MIMM .

Please keep in mind, when you populate an OAuth attribute for group assignment, you are now switching from native (manually managed) group assignment to OAuth driven (automatic) group assignment for all OAuth users. Any OAuth user will lose any previous native group assignment at the next login.

Similarly, when deleting the last OAuth attribute for group assignment, you are now switching from OAuth driven (automatic) group assignment, to native (manually managed) group assignment. Any OAuth user will now be only associated to the "Guest" group, until more groups are manually granted to that user.

Steps

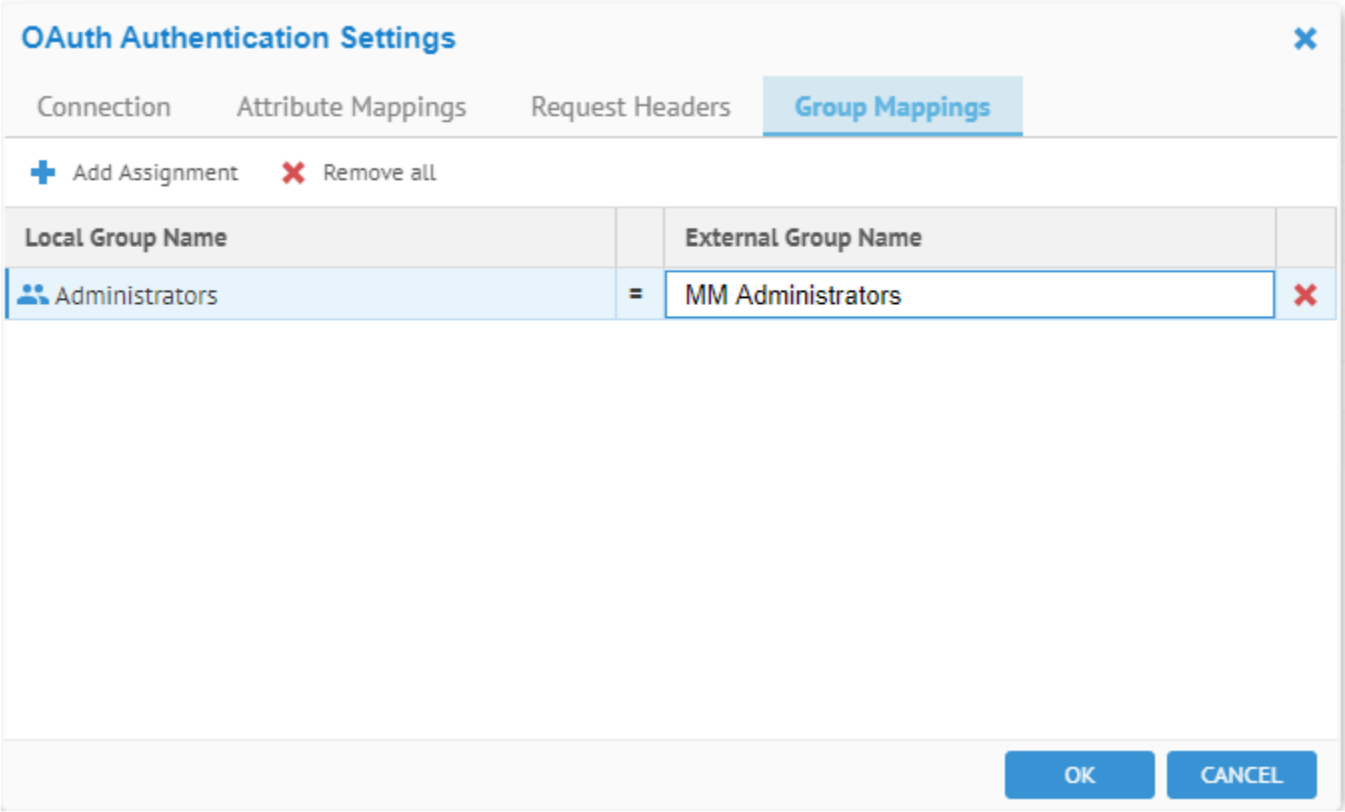
1. Go to the OAuth Configuration dialog.

2. Go to the **Group Mappings** tab.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

3. Click the ✚ Add Assignment action icon.

Example



Request Headers

The **Request Headers** tab specifies extra parameters to be added in the HTTP requests to the external authentication server by MIMM .

Steps

1. Go to the OAuth Configuration dialog.
2. Go to the **Request Headers** tab.
3. Click the ✚ Add Header action icon.

OAuth authentication workflow

1. A Client submits an authentication request via the User Interface of a Resource Server

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

2. The Resource Server presents the Client with an Authorization Grant, and redirects the Client to the Authorization Server
3. The Client requests an Access Token from the Authorization Server using the Authorization Grant Code
4. The Client logs in to the Authorization Server, and if the code is valid, the Client gets an Access Token that can be used to request a protected resource from the Resource Server
5. After receiving a request for a protected resource with an accompanying Access Token, the Resource Server verifies the validity of the token directly with the Authorization Server
6. If the token was valid, the Authorization Server sends information about the Client to the Resource Server

Signing in with Google

In this case the MIMM application server is the Resource Server, the Google Authorization Server is the Authorization Server, and the end user is the Client. The OAuth server configuration parameters should look like those in the screenshots in the Configure the OAuth Server section.

Once you have specified OAuth External Authentication Mode

1. MIMM presents the end user with an Authorization Grant, and redirects the end user to the Google Authorization Server's **Authentication URI** https://accounts.google.com/o/oauth2/auth. The scope values "email profile" indicates that we are not requesting access to the user's Google data, just wanting to know the user's email address and basic profile information.
2. The end user requests an Access Token from the Google Authorization Server's Token URI https://accounts.google.com/o/oauth2/token, using the Authorization Grant Code.
3. The end user logs in to the Google Authorization Server, and if the code is valid, the end user gets an Access Token that can be used to request a protected resource from MIMM .

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

4. After receiving a request for a protected resource with an accompanying Access Token, MIMM verifies the validity of the token and gets the user's name and other profile info directly with the Google Authorization Server by sending a validation request to the Google Authorization Server's Validation/User Info URI https://www.googleapis.com/oauth2/v3/userinfo using the Access token.
5. If the access token is valid, the Google Authorization Server sends information about the end user based on the scope values to MIMM . Below is an example of the data in JSON.


```
{ "sub": "110248495921238986420",
  "name": "Aaron Parecki",
  "given_name": "Aaron",
  "family_name": "Parecki",
  "picture": "https://lh4.googleusercontent.com/-kw-iMgD_j34/AAAAAAAAAAI/AAAAAAAAAAc/P1YY91tzesU/photo.jpg",
  "email": "aaron.parecki@okta.com",
  "email_verified": true,
  "locale": "en",
  "hd": "okta.com"
}
```


Using the given User Attribute Mapping, Google's **name** attribute is mapped to MIMM's **login** and **full name** attributes, Google's **sub** attribute is mapped to **distinguished name** attribute in MIMM , Google's **email** attribute is mapped to **email** attribute in MIMM .

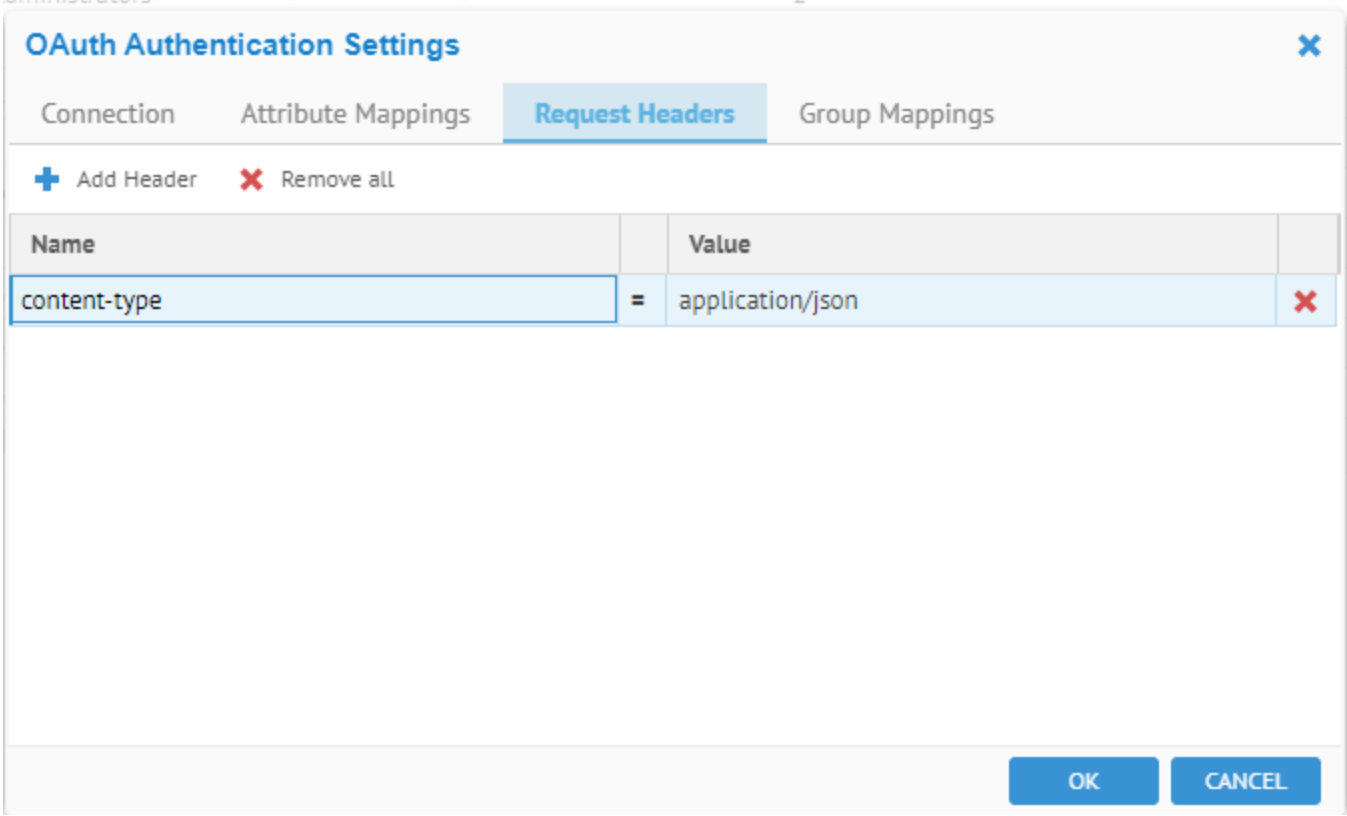
6. MIMM logs the end user into the system and grants the protected resource to the user based on the end user's roles.

Signing in with Microsoft Azure Active Directory Web API

In this case the server at MIMM is the Resource Server, the Azure Active Directory (Azure AD) Web API is the Authorization Server, and the end user is the Client. The OAuth server configuration parameters look like the following:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Client Id:	6731de76-14a6-49ae-97bc-6eba6914391e
Client Secret:	p@ssw0rd
Authentication URI:	https://login.microsoftonline.com/{tenant}/oauth2/authorize
Token URI:	https://login.microsoftonline.com/{tenant}/oauth2/token
Validation URI:	https://graph.microsoft.com/oidc/userinfo
Scope:	email profile



The {tenant} value in the path of the request can be used to control who can sign into the application. The allowed values are tenant identifiers, for example, 8eaef023-2b34-4da1-9baa-8bc8c9d6a490 or contoso.onmicrosoft.com or common for tenant-independent tokens. The OAuth authentication workflow with Azure AD Web API is similar to the workflow with the Google Authorization Server.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Manage SAML2 Authentication

SAML (Security Assertion Mark-up Language) is an umbrella standard that covers federation, identity management and single sign-on (SSO).

MIMM supports the SAML 2.0 protocol for external authentication.

SAML requesters and responders communicate by exchanging messages. The mechanism to transport these messages is called a SAML binding. MIMM supports the following SAML bindings: HTTP redirect and HTTP POST.

Administrators can always login even in External Authentication Mode using the dedicated administrator rescue login URL: http://localhost:<port>/MM/Auth?nativeLogin, where <port> is the http port that MIMM *responds to.*

Please refer to the readme for more details.

Frequenly Asked Questions:

- *The value of NameIDPolicy in SAML request is "urn:oasis:names:tc:SAML:2.0:nameid-format:transient"*
- *The value of Issuer in SAML request is the *host name portion* of the unique id for the SAML identity provider which you specify in the SAML configuration as the Identity Provider*
- *The MIMM assertion consumer service URL is http://<server>:<port>/MM/Auth where server and port are the server and port number where the MIMM service is running.*
- *The Service provider (MIMM 's entity id) is the host name where you are running the TDC server. We use that as the issuers in the SAML requested generated by the TDC server. Configure the app id and Audience restriction on the ADFS side accordingly*.

A sample decoded request:

```
{code:java}

<samlp:AuthnRequest xmlns:samlp="urn:oasis:names:tc:SAML:2.0:protocol"

xmlns:saml="urn:oasis:names:tc:SAML:2.0:assertion"

ID="ONELOGIN_04d4bf69-4348-4148-b4bf-1f0d05a4802c"

Version="2.0" IssueInstant="2020-06-03T17:21:25Z"

Destination="https://dev-388428.oktapreview.com/app/nonedev388428_saml2test_1/exki10h88urLntvTj0h7/sso/saml"

ProtocolBinding="urn:oasis:names:tc:SAML:2.0:bindings:HTTP-POST"
```

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

```
AssertionConsumerServiceURL="http://mitiauth.com:19980/MM/Auth">

<saml:Issuer>mitiauth.com</saml:Issuer>

<samlp:NameIDPolicy Format="urn:oasis:names:tc:SAML:2.0:nameid-format:transient"
AllowCreate="true" />

</samlp:AuthnRequest>{code}
```

Set SAML2 Authentication

Steps

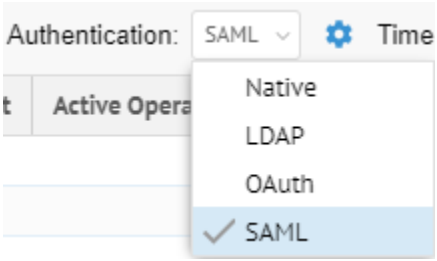
1. Sign in as a user with at least the **User Admin** security role.
2. Go to **MANAGE** > **Users** in the banner.
3. Select **SAML** from the **Authentication** pull-down.

Example

Sign in as **Administrator**.

Go to **Tools** > **Administration** > **Users**.

Select **SAML** from the **Authentication** pull-down.



Configure SAML Authentication

Steps

1. Sign in as a user with at least the **User Admin** security role.
2. Go to **MANAGE** > **Users** in the banner.
3. Select **SAML** from the **Authentication** pull-down.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

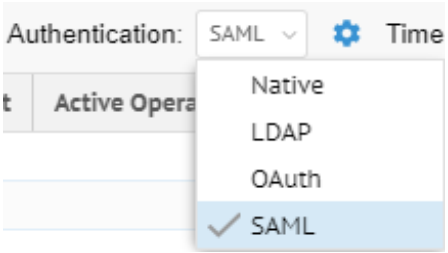
4. Click **Configure Authentication**.

Example

Sign in as an **Administrator**.

Go to **MANAGE** > **Users** in the banner.

Select **SAML** from the **Authentication** pull-down.

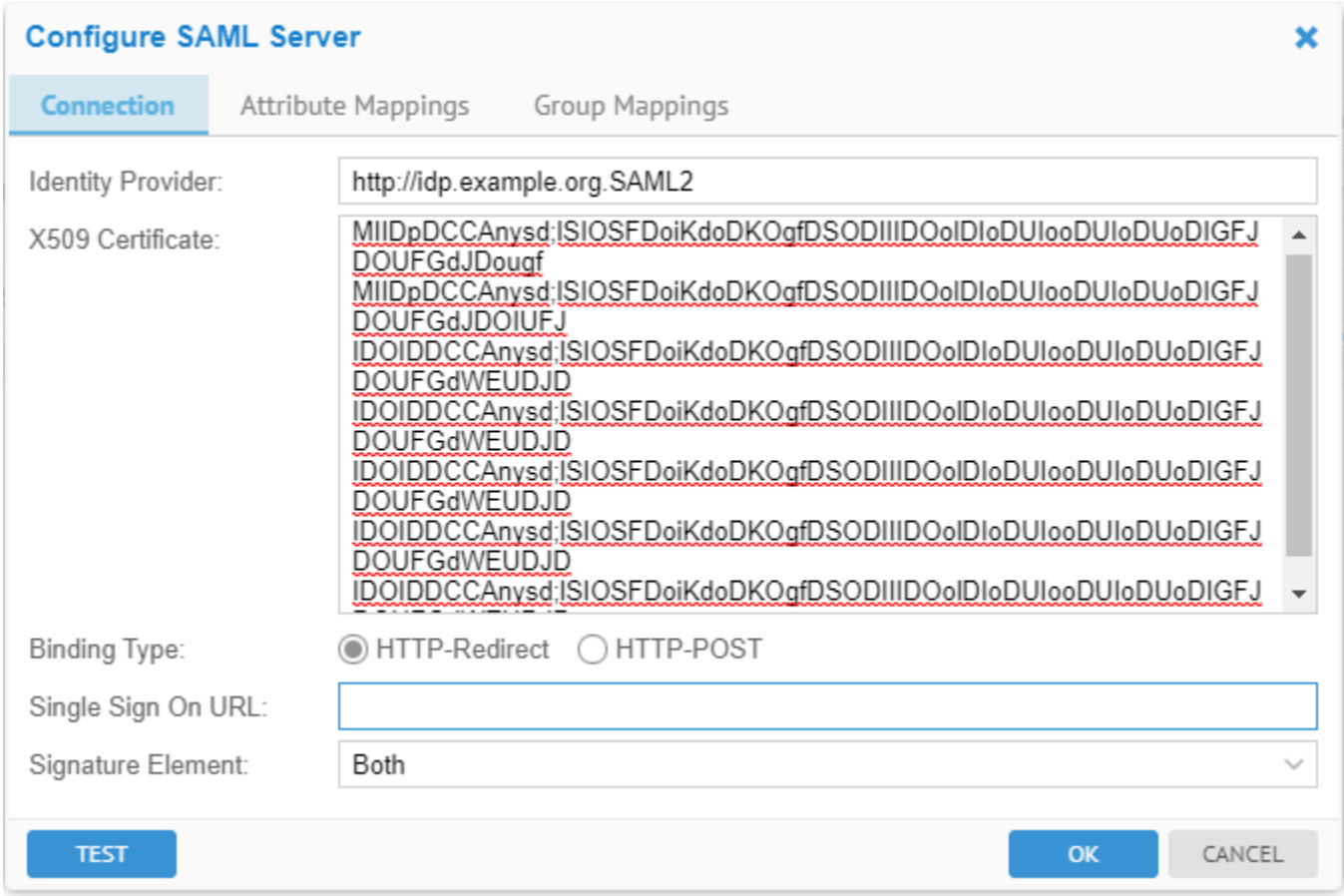


Click **Configure Authentication**.

Configure the SAML server

In order to enable an external authentication server using the SAML2 protocol, the Administrator needs to configure the SAML server. The following example shows the Configure SAML Server editor parameters.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Steps

The user needs to obtain the following information about the **Identity Provider**:

1. **IdP Entity ID**: a globally unique name for the Identity Provider
2. **X509 Certificate**: the public X509 certificate of the Identity Provider which allows MIMM to verify the signatures therefore establish trust in the messages that have been exchanged
3. **SSO HTTP-POST Binding URI**: the HTTP-POST binding URI
4. **SSO HTTP-Redirect Binding URI**: the HTTP-Redirect binding URI.
5. **Signature Element**: Whether the SAML authentication response message and SAML assertion are digitally signed by the Identity Provider or not.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

*The user may configure the **Signature Element** to be one of the following values: **Response**, **Assertion**, **Both** and **Neither**. MIMM will return an error message at the SAML user login time if an element is configured as signed but the element in the SAML response was not signed by the **Identity Provider**.*

*If an element is configured as not signed, MIMM will not validate the signature in that element even if it may have been signed by the **Identity Provider**.*

User Attribute Mapping

Same as the OAuth server User Attribute Mapping.

Configuring SAML with Microsoft Active Directory FS.

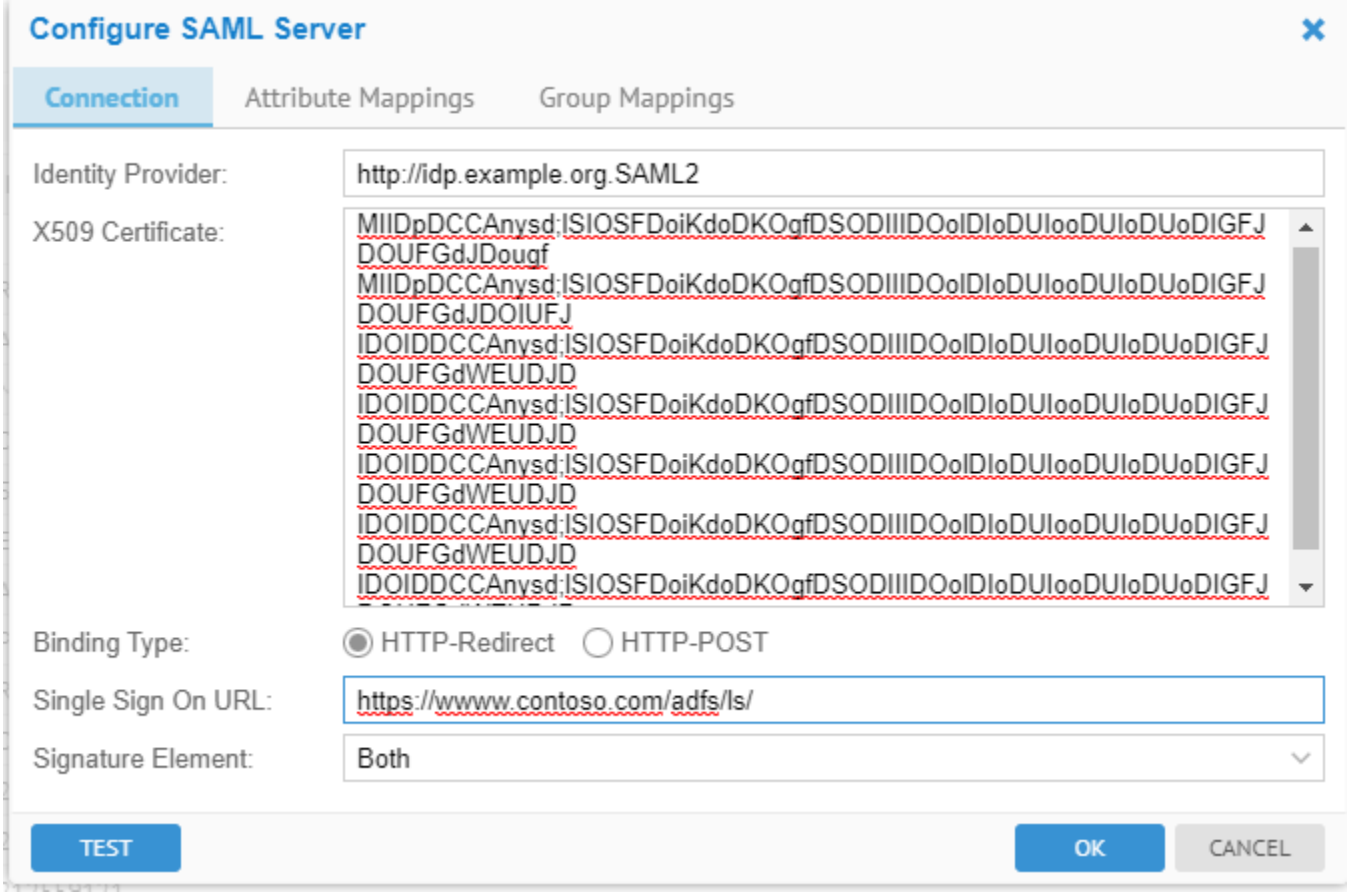
AD FS is a service provided by Microsoft as a standard role for Windows Server that provides a web login using existing Active Directory credentials. Instructions for configuring and installing AD FS can be found at Microsoft AD FS website.

In your AD FS installation, please note the value for the 'SAML 2.0/W-Federation' URL in the AD FS Endpoints section. If you chose the defaults for the installation, this will be '/adfs/ls/'. Use this value for the Single Sign On URL in configuring the MIMM SAML Server.

The Identity Provider should take the value for the 'Identifier' URL in the AD FS Relying Party Trusts section.

The SAML server configuration sample parameters look like the following:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



SAML2 authentication workflow

Steps

1. A Client submits an authentication request via the User Interface of a Service Provider
2. To authenticate the Client, the Resource Server constructs a SAML Authentication Request, signs and optionally encrypts it, and sends it directly to the Identity Provider (IdP).
3. The Service Provider redirects the Client's browser to the IdP for authentication.
4. The IdP verifies the received SAML Authentication Request and if valid, presents a login form for the Client to enter his username and password.
5. Once the Client has successfully logged in, the IdP generates a SAML Assertion (also known as a SAML Token), which includes the Client identity (such as the username entered before), and sends it directly to the Service Provider.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

6. The IdP redirects the Client back to the Service Provider

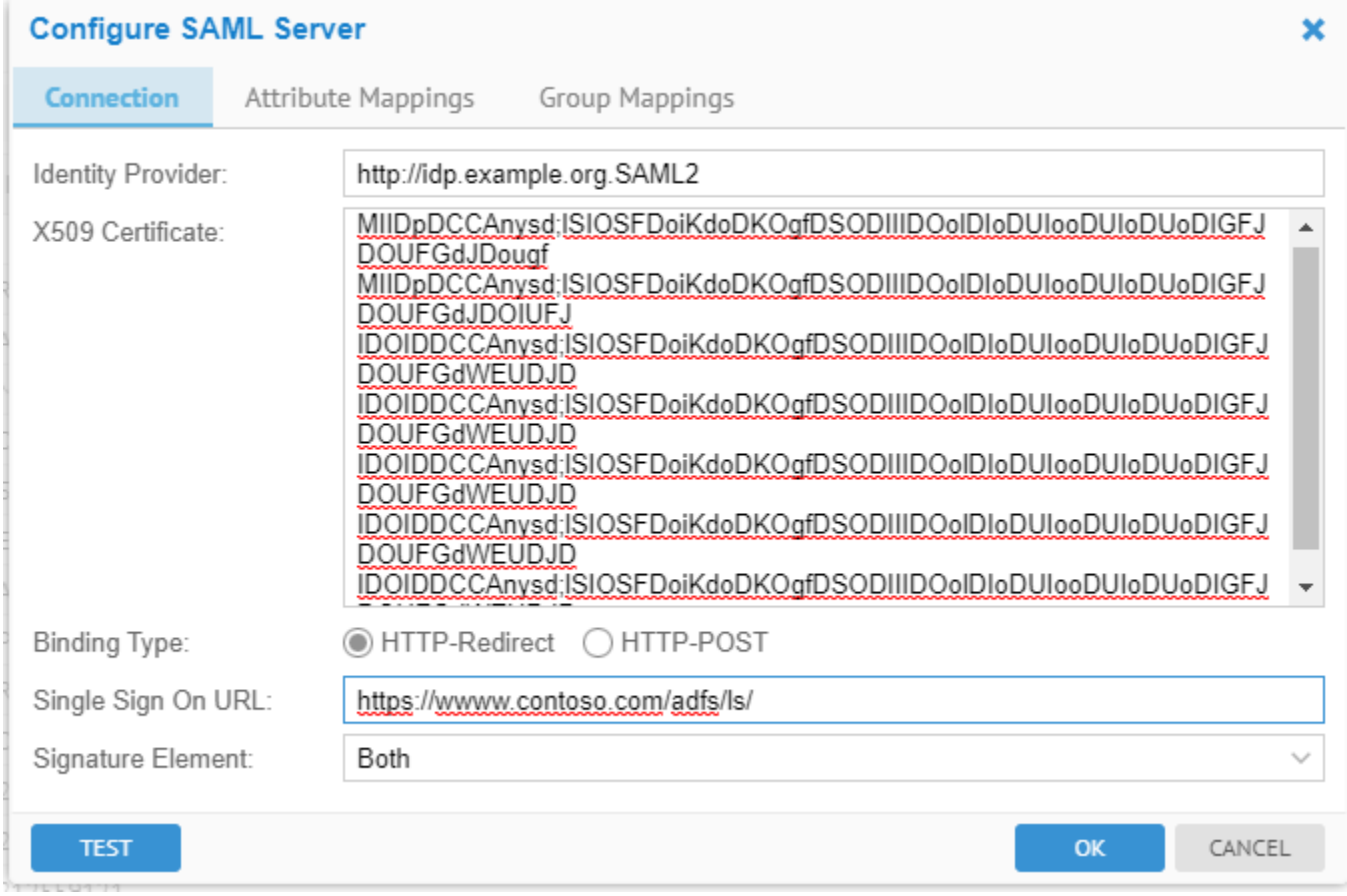
7. The Service Provider verifies the SAML Assertion, extracts the Client identity from it, assigns correct permissions for the Client and then logs him in to the service

MIMM does not have the private key of the Identity Provider. Therefore the SAML Assertion received by the MIMM can be signed but not encrypted. To validate the signature, MIMM only needs the Identity Provider's public key. However to decrypt the SAML Assertion, MIMM would need to have the Identity Provider's private key. Requiring the Assertion to be signed allows MIMM to verify that the assertion contents have not been altered in transit.

Similarly the SAML Authentication Request sent by MIMM is neither signed nor encrypted as MIMM would need to have the Identity Provider's private key to sign or encrypt the request. Since the request usually does not contain much private data there is little need to encrypt the SAML request.

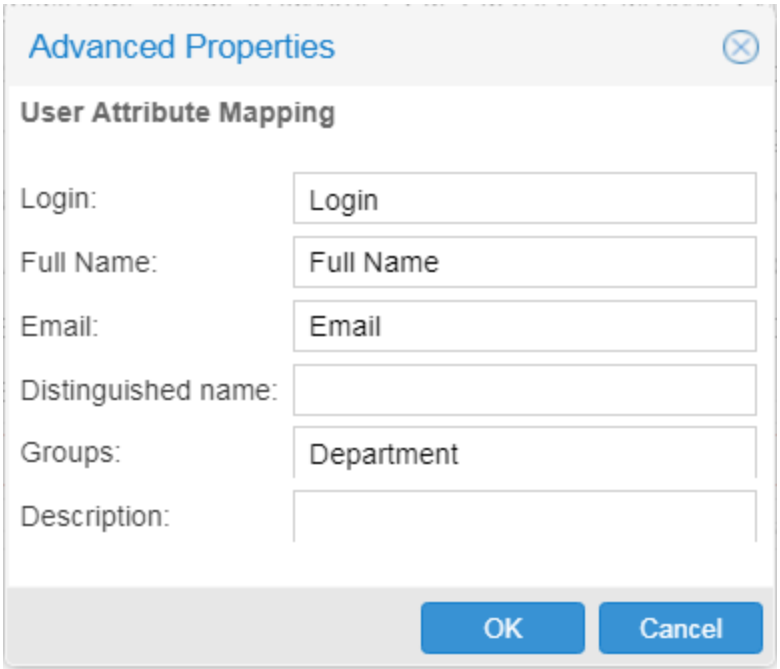
A custom SAML application which Okta Single Sign ON URL is http://mitiauth.com:19980/MM/Auth, is created and configured in Okta. This application can be used as an Identity Provider to demonstrate the SAML authentication workflow. In this case the service at MM.com is the Service Provider, the custom SAML app configured in Okta is the Identity Provider, and the end user is the Client. The SAML server configuration parameters look like the following:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



The User Attribute Mapping looks like below:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Steps

Following is the authentication workflow in MIMM :

1. An end user clicks on the “Login” button on a metadata management service at MIMM .
2. To authenticate the user, MIMM generates a SAML Authentication Request and redirects the user to the Okta Single Sign-On URL endpoint with the request embedded. This endpoint is unique for each application within each Okta tenant. Below is the Okta Single Sign-On login window.
3. Once the user is redirected to Okta they’ll need to enter their Okta credentials, unless they had already authenticated into Okta in a previous session within the same browser. In either case, a successful authentication request will send a POST request to the MIMM Assertion Consumer Service, i.e. the MIMM Authentication Servlet, with an embedded SAML response from Okta. At a minimum, the response will:
    - Indicate that it is indeed from Okta and hasn’t been altered, and contain a digital signature proving such. This signature will be verified by MIMM using a public key from Okta that was previously stored in the SAML Server Configuration.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

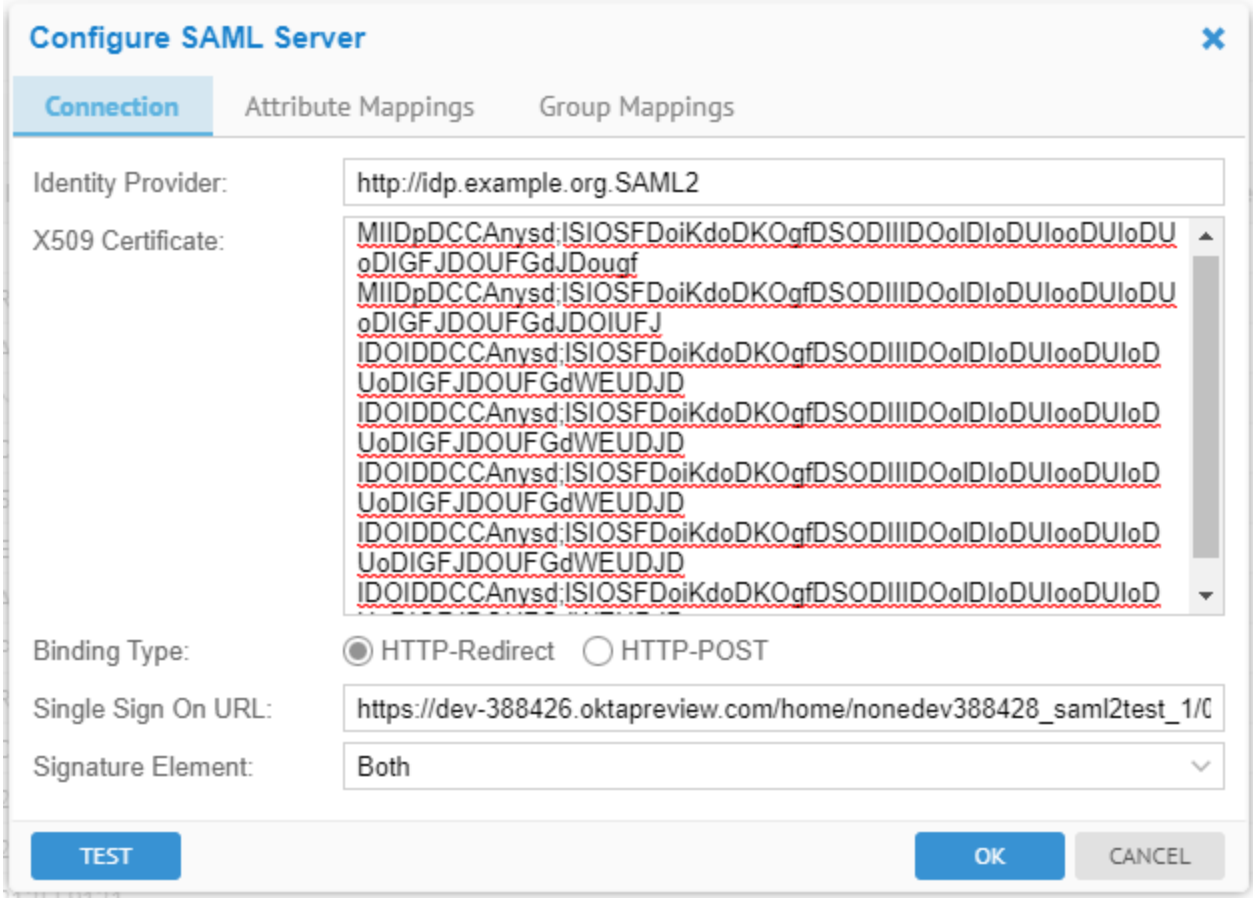
- Indicate that the user has authenticated successfully into Okta
- Indicate who the user is via the NameID, a standard attribute used in SAML assertions. Besides the NameID attribute, the response may also contain other attributes specified in the User Attribute Mapping. MIMM may retrieve the user information from these attributes..

4. After the assertion is successfully parsed and validated by the MIMM Authentication Servlet, the user will then be redirected to the MIMM default relay state, e.g., metadata explorer, which is usually the same page they would wind up if they were to simply log in with a username and password.

Signing in with a custom SAML app configured in Okta

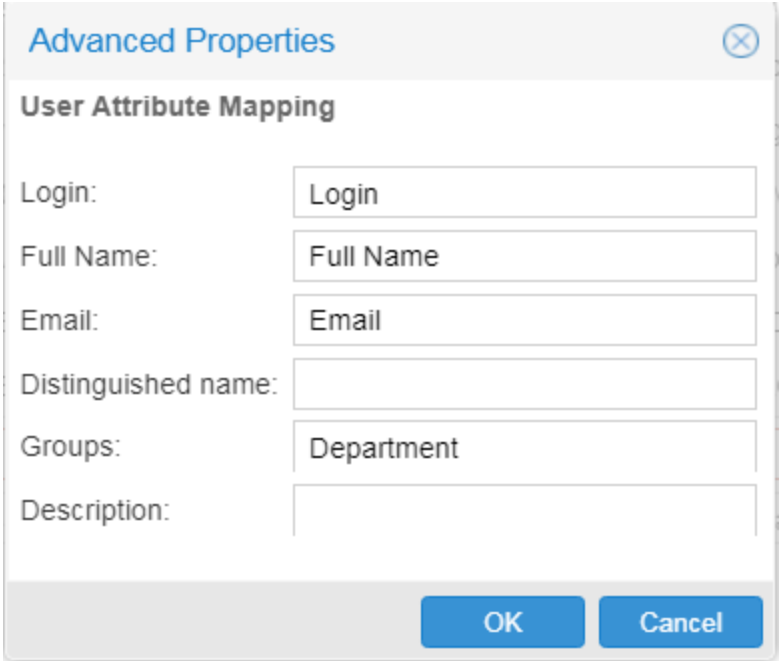
A custom SAML application which Okta Single Sign ON URL is http://mitiauth.com:19980/MM/Auth, is created and configured in Okta. This application can be used as an Identity Provider to demonstrate the SAML authentication workflow. In this case the service at MM.com is the Service Provider, the custom SAML app configured in Okta is the Identity Provider, and the end user is the Client. The SAML server configuration parameters look like the following:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



The User Attribute Mapping looks like below:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Steps

Following is the authentication workflow in MIMM:

1. An end user clicks on the “Login” button on a metadata management service at MM.com.
2. To authenticate the user, MIMM generates a SAML Authentication Request and redirects the user to the Okta Single Sign-On URL endpoint with the request embedded. This endpoint is unique for each application within each Okta tenant. Below is the Okta Single Sign-On login window.
3. Once the user is redirected to Okta they’ll need to enter their Okta credentials, unless they had already authenticated into Okta in a previous session within the same browser. In either case, a successful authentication request will send a POST request to the MIMM’s Assertion Consumer Service, i.e. the MIMM Authentication Servlet, with an embedded SAML response from Okta. At a minimum, the response will:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

- Indicate that it is indeed from Okta and hasn't been altered, and contain a digital signature proving such. This signature will be verified by MIMM using a public key from Okta that was previously stored in the SAML Server Configuration.
- Indicate that the user has authenticated successfully into Okta
- Indicate who the user is via the NameID, a standard attribute used in SAML assertions. Besides the NameID attribute, the response may also contain other attributes specified in the User Attribute Mapping. MIMM may retrieve the user information from these attributes..

4. After the assertion is successfully parsed and validated by the MIMM's Authentication

   Servlet, the user will then be redirected to the MIMM's default relay state, e.g., MM

   Explorer, which is usually the same page they'd wind up if they'd simply logged into the

   MIMM with a username and password.

Manage User Group Assignment

Users may be assigned to one or more groups, as defined in user group administration. Each group assigned controls security roles assigned (Viewer/Editor/Manager/Data Viewer/Data Manager).

Native Group Assignment

Native group assignment applies to all native users. It may also apply to other users, when automatic group assignment is not enabled, and thus when those other users are authenticated they will not have their group assignments reset.

In all these cases, any group assignments may be made as follows.

Steps

1. Sign in as a user with at least the **User Admin** security role.
2. Go to **MANAGE** > **Users** in the banner.
3. Select the user from the list.
4. If you have not already done so create a new user.
5. If you have not already done so create a new group.
6. Click the **Groups** pull-down and choose the selected group to assign to the user.

Example

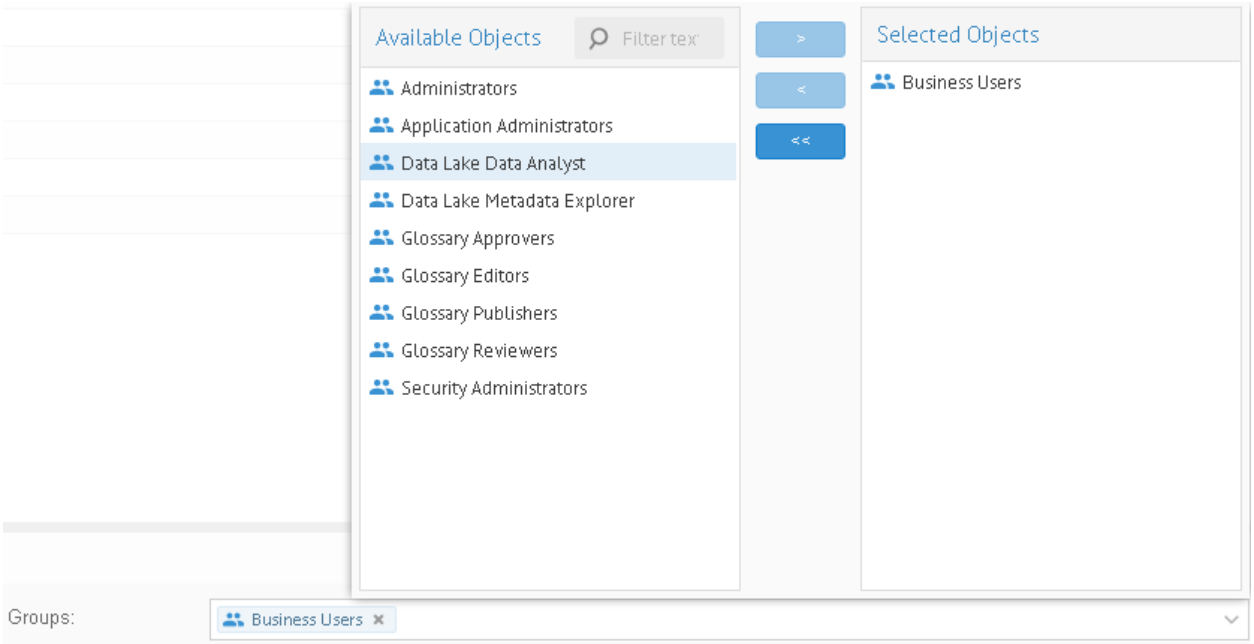
Sign in as an **Administrator**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Go to **MANAGE** > **Users** in the top banner.

Select the user to assign groups to, Jim.

Click the **Groups** pull-down and choose the **Business Users** group.



Click outside the dialog.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Explore Further

Define Administrative Users

Administrative users are those who are assigned the group **Administrator**. To create an administrative user.

Steps

1. Sign in as a user with at least the **User Admin** security role.
2. Go to **MANAGE** > **Users** in the banner.
3. Select the user from the list.
4. If you have not already done so create a new user.
5. Assign the **Administrator** group to the user.

Multiple Group Assignments

One may assign more than one up to any number of groups to a given user. In doing so:

- The user then has the union of all security role assignments provided by those groups
- If any of the groups are assigned to a particular configuration
  - Then whenever the user first signs in, they are presented with a choice of configurations from the union of all configurations the groups assigned have access to.
  - It is possible at this time or subsequent sign-ins to define a default configuration.
  - They may change configurations at any time by clicking on the configuration name in the header and select **Change Configuration**.
- If none of the groups assigned to the user are assigned to a particular configuration
  - Then whenever the user first signs in, they are presented with a choice of configurations from the union of all configurations the groups assigned have access to, which is all.
  - It is possible at this time or subsequent sign-ins to define a default configuration.
  - They may change configurations at any time by clicking on the configuration name in the header and select **Change Configuration**.

Group Assignment Considerations

A common practice, whether using Native/LDAP or External Authentication is to not depend upon these authentication modes to provide proper group assignment. This is because, those systems are managed by other authorities and are generally not maintained in order to group users so that group assignments logically map.

Instead, it is common to simply use the default group assignment, so that by default, any user is given the Guest group when logging the first time or when created. By default, Guest group is

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

assigned to the Published configuration. In this way, one controls the default presentation to new users, and it is based on a controlled default configuration.

Once the user's true groups and responsibilities are identified, further groups are assigned to the user.

Note, the considerations for multiple group assignments.

Automated OAuth Group Assignment

See the details in OAuth Authentication.

Automated SAML Group Assignment

See the details in SAML Authentication.

Automated LDAP Group Assignment

The LDAP configuration window offers a second tab for LDAP driven group assignment. In this case, the groups assignments may be associated to predefined LDAP groups or queries. There are two convenience features helping non LDAP experts retrieve/build the group assignments they need:

- The LDAP group data entry allows one to search for groups defined in your LDAP environment and retrieve the exact LDAP query for such groups. This is very useful when planning to use large predefined groups of business users in group assignment.
- The LDAP search filter data entry allows one to automatically build a proper query to create an LDAP based virtual group of users. This is very useful in creating small Administrator groups or temporarily groups for a project.

In order to create queries defining LDAP driven group assignment.

Steps

1. Sign in as a user with at least the **User Admin** security role.
2. Go to **MANAGE** > **Users** in the banner.
3. Select **LDAP Authentication** from the **Authentication type** pull-down in the header.
4. Click on **Authentication** in the header and select LDAP.
5. Click on the **Group Assignment** tab.
6. Click on the Add icon.
7. Enter the following:
   - Provide a **Name** for the query
   - Define the group you wish to associate with users in the query

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

To assign groups by group name:

8. Click on the **Browse** icon in the **Group** entry
9. Enter a group name in the **LDAP** system or search text
10. Select the **Distinguished Name** for that group

To specify a search filter and include individual users

11. Specify a **Search Root** like: CN=company,CN=Users,DC=company,DC=local
12. Click on the **Browse** icon in the **Search Filter** entry and select users in that filter.

To specify a search filter and exclude individual users, you may

13. Specify a **Search Root**: CN=company,CN=Users,DC=company,DC=local
14. Use the following syntax:

    (&(!(sAMAccountName=username1))(!(sAMAccountName=username)))

15. Click OK.

Please keep in mind, when you create the first LDAP query for group assignment, you are now switching from native (manually managed) group assignment to LDAP driven (automatic) group assignment for all LDAP users. Any LDAP user will lose any previous native group assignment at the next login.

Similarly, when deleting the last LDAP query for group assignment, you are now switching from LDAP driven (automatic) group assignment, to native (manually managed) group assignment. Any LDAP user will now be only associated to the "Guest" group, until more groups are manually granted to that user.

Manage Concurrent Users

The MIMM license may include licensing for both named and floating concurrent users. E.g., if a license provides 10 named and 5 floating users, then up to 10 users may be set as named users and thus can always log in, and the rest of the users are considered floating, where only 5 can sign on concurrently.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Determining the Number of Users Available

Steps

1. Sign in as a user with at least the **Admin** security role.
2. Go to **MANAGE** > **License** in the banner.
3. Assigning Named Users

Steps

1. Sign in as a user with at least the **User Admin** security role.
2. Go to **MANAGE** > **Users** in the banner.
3. Click the user in the list.
4. Select the **Named License** checkbox.
5. Click Save.

Assigning Concurrent (Floating) Users

Steps

1. Sign in as a user with at least the **User Admin** security role.
2. Go to
   - **MANAGE** > **Users** in the banner.
   - Click the user in the list.
3. Uncheck the **Named License** checkbox.
4. Click Save.

> *Remember, all users not explicitly named are considered floating.*

Setting User Inactivity Logout Duration

Steps

1. Sign in as a user with at least the **User Admin** security role.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

- Go to **MANAGE** > **Users** in the banner.
- Click on the number of minutes of inactivity before logout.

User Statistics and Server Audit Log

All user logins, login attempts (rejected) and object creation/update/delete actions are recorded in a Server Audit Log..

Manage Groups

Each user of the system is assigned one or more groups. Each group assigned to a user controls security roles assigned (**Viewer**/**Editor**/**Manager**). Security roles are then associated with the types of permissions one has to an object in MIMM .

The basic configuration of MIMM has three groups defined, which may not be removed:

- **Administrators** – Users assigned this group are given all roles.
- **Security Administrators** – Users assigned this group are given all security roles.
- **Application Administrators** – Users assigned this group are given all application roles.

A user assigned to the **Administrators** and **Security Administrators** group may create any number of groups with different user interface assignments and access security role assignments.

All security role related operations are available to both users and user groups.

There are two types of security roles in MIMM :

- A security role can be assigned to users and groups and applies to repository objects, like folders and contents.
- A workflow role typically applies to a particular content type and its workflow (see Workflow process for details (e.g., Business Glossary workflow).

You may assign group Preferences for granular control of permissions.

Permissions	Administrators (Sys Group)	**Security Administrators (Sys Group)**
Security	x	
Users	x	x
Groups	x	x

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

External Authentication	x	x
Security roles on folders and contents	x	x
Administration	x	
Application administration, e.g., custom attributes	x	
View the folder properties and children	x	
Edit the folder properties, e.g., description	x	
Create, delete and move child folders and content	x	
Create and delete child versions, like import model	x	
Edit the content properties, e.g., description	x	
Edit version properties	x	
Set default version	x	
Publish a version (e.g. configuration)	x	
Archive a version	x	
Content objects metadata		
View	x	
Add/Remove labels	x	
Add/Remove/Edit your comments	x	
Edit	x	
View Audit trail	x	
Edfit / Remove any curation (except for certification)	x	
Certify/Un-certify	x	
Create/Assign System Default Worksheets to Details Pages	x	
Content objects data		
View data profiling/sampling details	x	
Hide profiling/sampling data	x	
Run data profiling/sampling	x	
Glossary Workflow		

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Enable and disable Glossary workflow	x
Assign Glossary workflow security roles	x
Semantic Mapping and Classification	
Semantically Map Data Element	x
Classify Data Element	x
Configuration Management	
Add, remove and replace configuration contents and edit connections	x
REST API	
Make calls to the REST API	x

All security role assignments are additive and inherit down through the folder structure.

Create a New Group

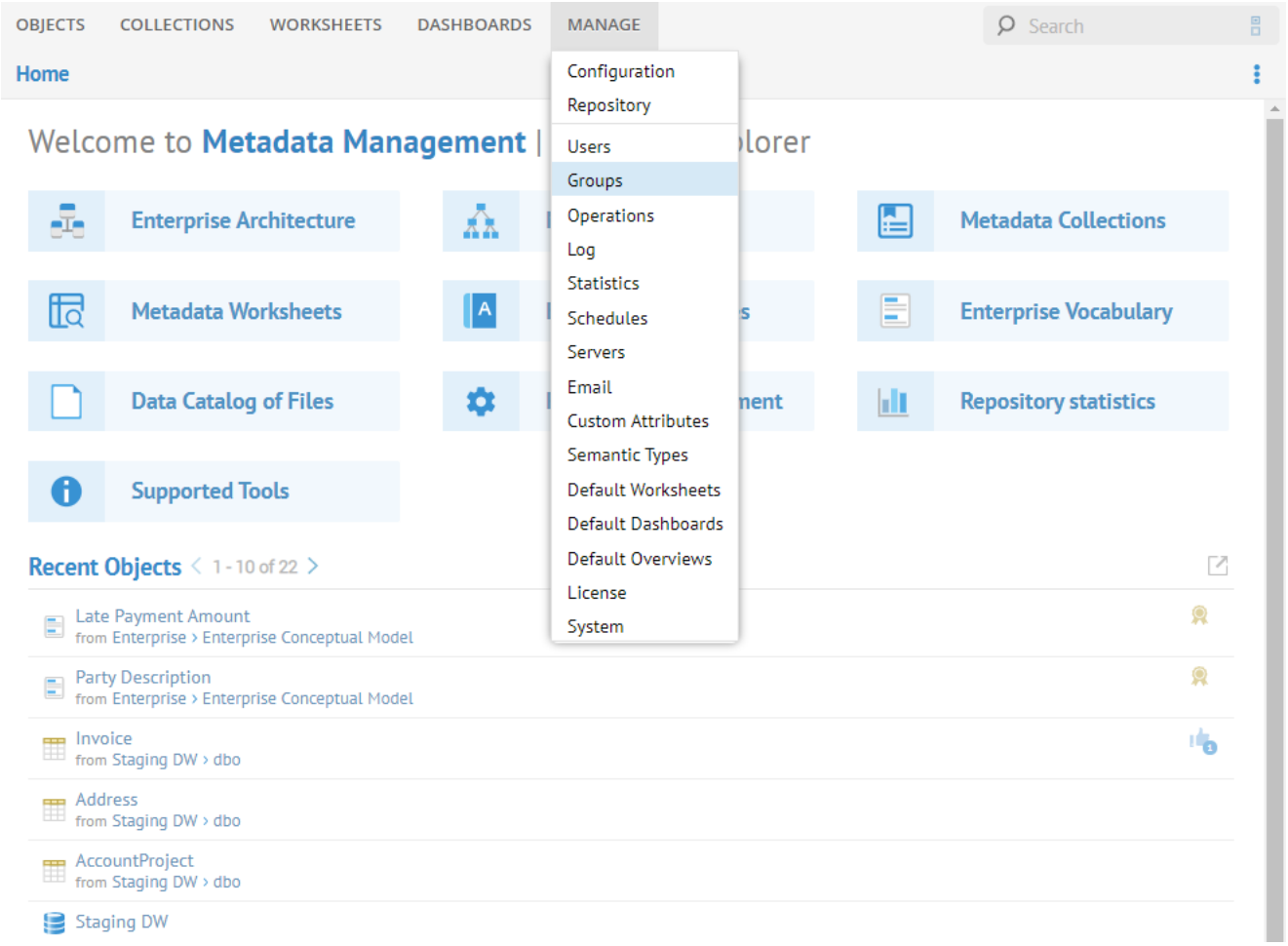
Steps

1. Sign in as a user with at least the **User Admin** security role.
2. Go to **MANAGE** > **Groups** in the banner
3. Click Add sign.
4. Provide Name and Description.
5. Check Steward to include the members of this group in the list of possible stewards.
6. Select a published configuration from the Default Configuration search box.

Example

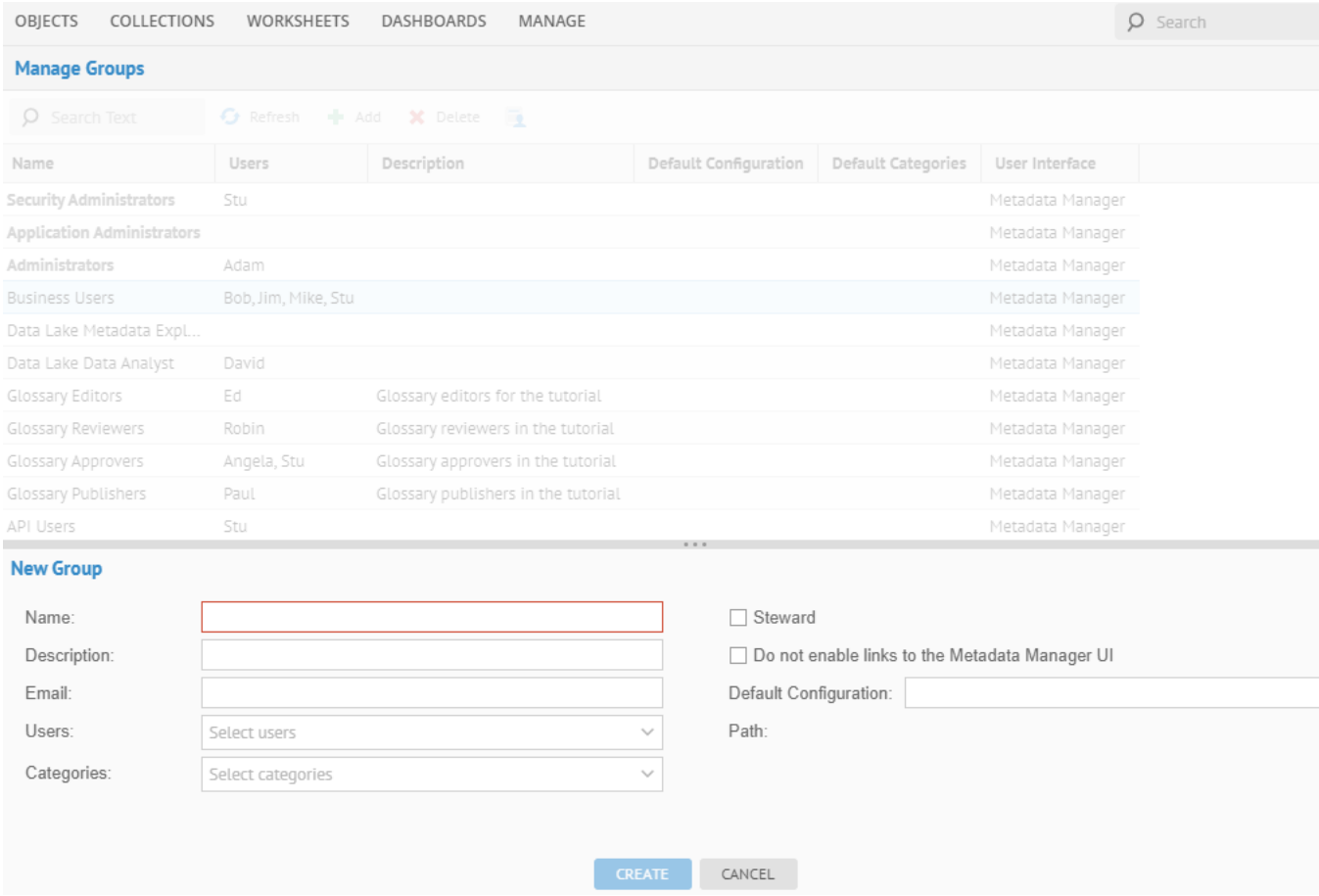
Go to **MANAGE** > **Groups**

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click Add

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Provide **Name** and **Description**.

Check **Steward** to include the members of this group in the list of possible stewards.

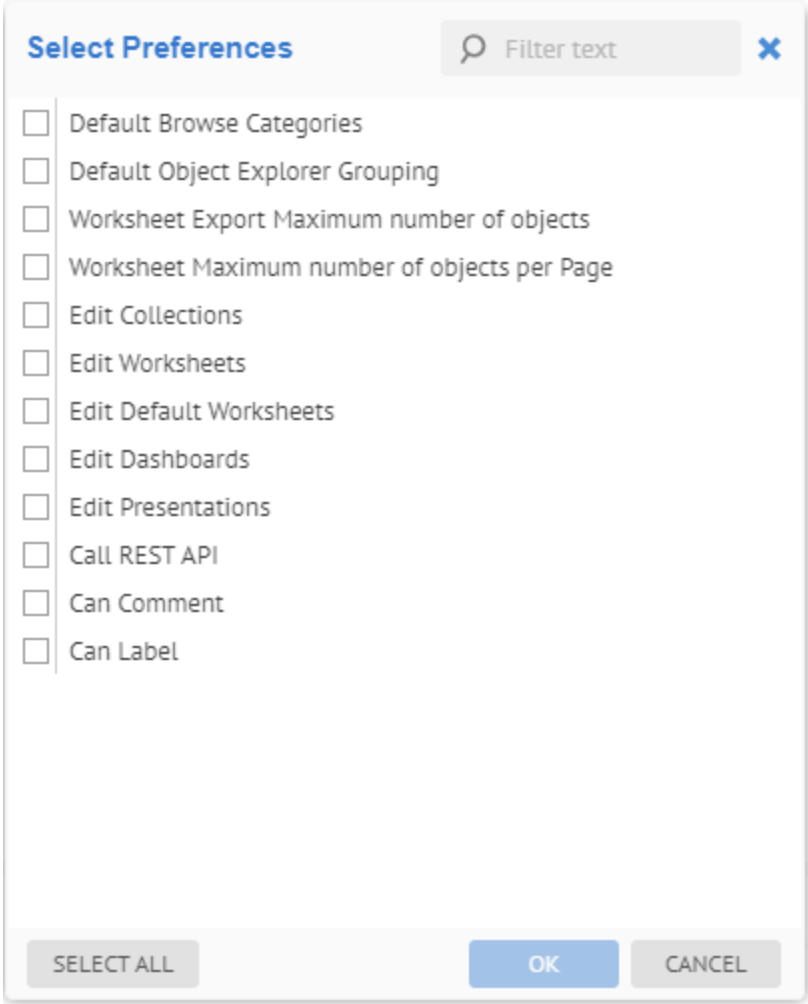
Select a published configuration from the **Default Configuration** search box.

Explore Further

Group Preferences

Any member of the **Security Administrator** group is able to go to the **Preferences** tab when managing a group.where they may assign and edit key/value pairs defining options as to the product will behave for users of that group, e.g.:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Choosing an option like **Edit Collections** and then setting it to **false** will disable that part of the UI for users of that group (Not allowing editing of collections, for example).

Steps

1. Sign in as a user with at least the **Security Administrator** security role.
2. Go to **MANAGE** > **Groups** in the banner
3. Select a group.
4. Click the **Preferences** tab.
5. Click Add sign to add a preference that is not yet assigned.
6. Click the X next to a preference to remove it (unassign it).

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

7. Change the value between **true** and **false** to enable or disable the feature or setting of a preference, or set the numeric value.

Setting the value to "0" generally means unlimited.

The product reads the group preferences settings when starting up and they are cached for the current user until one refreshes the browser. If a user is part of multiple groups, the product takes care of consolidating any contradicting settings.

For example if a user is part of multiple groups with different Worksheet Export Maximum number of objects, the product will pick the largest one.

Many features, e.g., adding labels and commenting may be disabled even though there is no user role assignment that could restrict that.

*General editing of contents, may be enabled or disabled by type. If enabled, you must still have the **Editor** role assigned for the specific content.*

*The **Can Comment** property also applies to endorsements and warnings.*

Assign Security Roles to a Repository Object

Keep in mind that in order to have any security role assignments on a child object in MIMM , one must at least have the Viewer security role to its parent. Thus, in order to create portions of the repository which are entirely inaccessible to a group, you may create a new folder at the root of the Repository Panel in order to assign special Viewer security role assignments privileges there.

Steps

1. Sign in as a user with at least the **User Admin** security role.
2. Go to **MANAGE > Users**.
3. Assign security roles by group (please see table below).

The security roles that you set for a configuration apply to the configuration, not its contents. Thus, when you assign a group or user to the Editor security role on that configuration then they have the ability to, e.g. add a model to the configuration, but do not necessarily have permissions to edit the contained models within the configuration. Instead, each model in the configuration may also have its own security role assignments. Thus, if you wish to be able to

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

edit the contained model properties, you will need to assign the Editor security role to that user or group. This is a very powerful feature that allows one to control who is Editor or Manager for individual models in a configuration, separately from security role assignments to the configuration itself.

While security roles assignments are not inherited through the configuration, security role assignments are inherited through the actual folder structure in MIMM *. Thus, if you assign a group or user to the Editor security role for a parent folder (e.g., "public") then all contained contents and folders are included in those security role assignments.*

Permissions	Manager (Role)	Editor (Role)	Viewe (Role)
Security			
Users			
Groups			
External Authentication			
Security roles on folders and contents			
Administration			
Application administration, e.g., custom attributes			
View the folder properties and children	x		x
Edit the folder properties, e.g., description	x		
Create, delete and move child folders and content	x		
Create and delete child versions, like import model	x		
Edit the content properties, e.g., description	x		
Edit version properties	x		
Set default version	x		
Publish a version (e.g. configuration)	x		
Archive a version	x		
Content objects metadata			
View			x

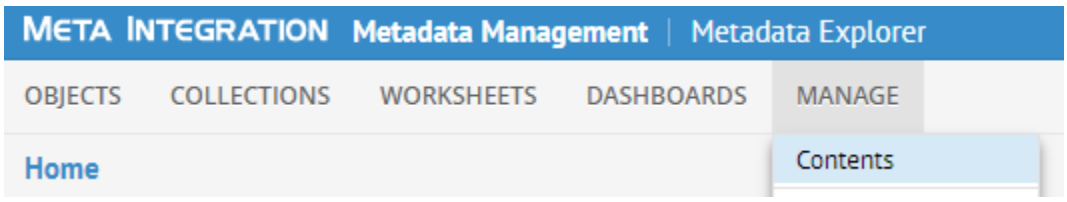
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Add/Remove labels			x
Add/Remove/Edit your comments			x
Edit		x	
View Audit trail			x
Remove any comment	x		
Certify/Un-certify			
Content objects data			
View data profiling/sampling details			
Hide profiling/sampling data			
Run data profiling/sampling			
Glossary Workflow			
Enable and disable Glossary workflow	x		
Assign Glossary workflow security roles	x		
Configuration Management			
Add, remove and replace configuration contents and edit connections	x		

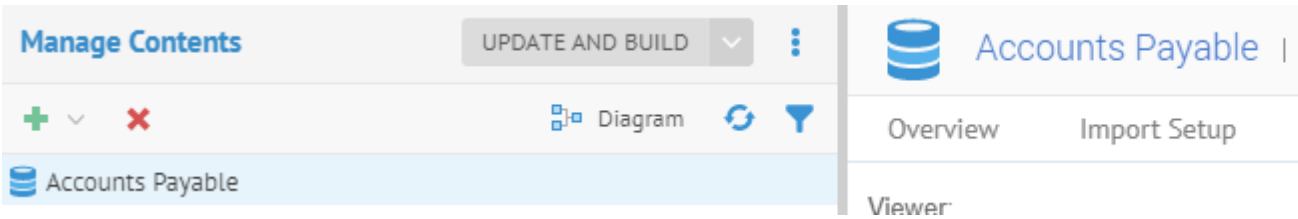
Example

After successfully logging into MIMM with at least an User Administrator security role

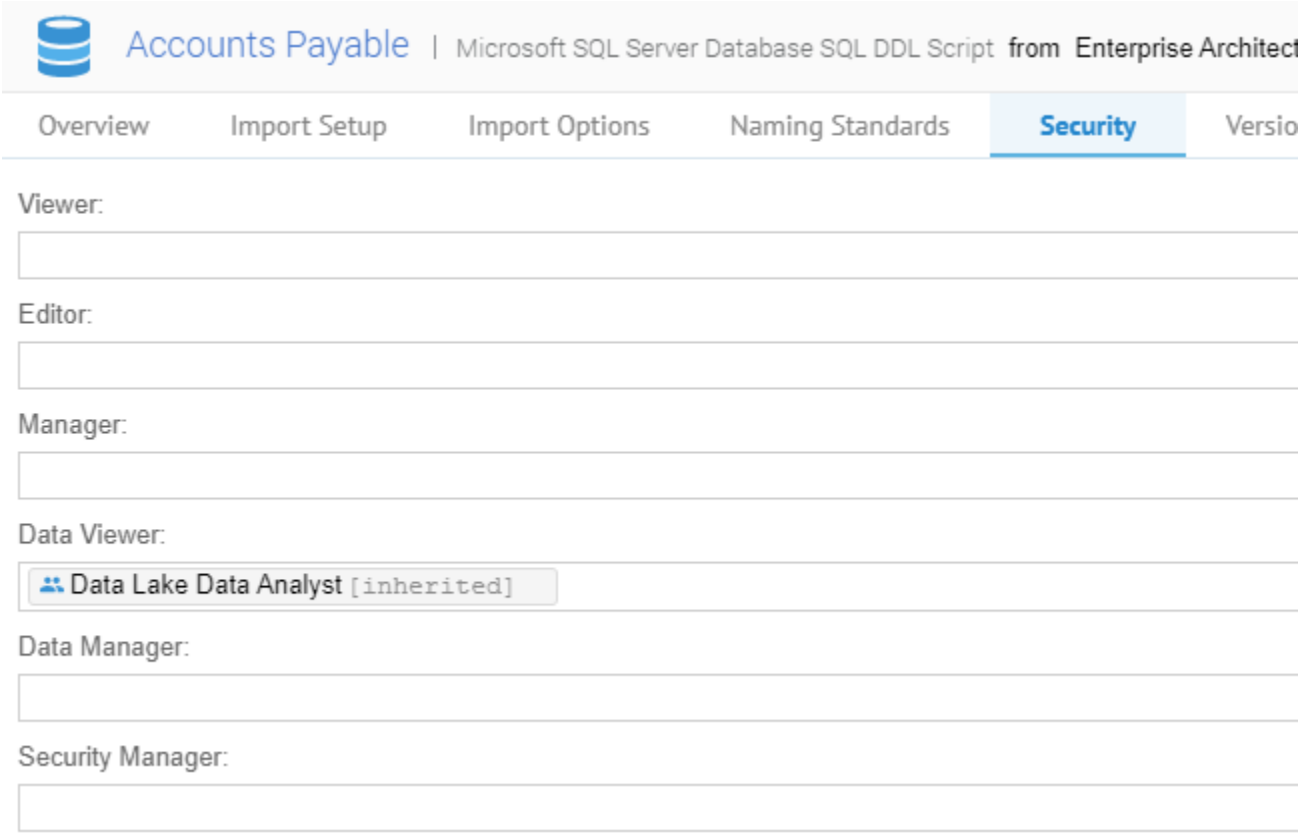
Go to MANAGE > Configuration. Lastly select Security.



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Under the Security window, add the appropriate permission groups.



Special Groups

Membership in specific, pre-defined, groups provides permissions that would otherwise be assigned out via security roles and some which are available only to members of these groups.

Administrators Group

Members of this group have the union of Security Administrators and Application Administrators.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Security Administrator Group

Members of this group have permission to fully manage users, group, external authentication and security roles on folders and contents.

Application Administrator Group

Members of this group have full Manager, Editor, Viewer, Data Viewer and Data Manager permissions to contents in the repository.

Download Group Report

Steps

1. Sign in as a user with at least the **User Admin** security role.
2. Go to **MANAGE** > **Groups** in the banner.
3. Click the **Download** icon.

Examples

Go to **MANAGE** > **Groups**.

Click the **Download** icon.

It is a CSV file, so opened in Excel we see:

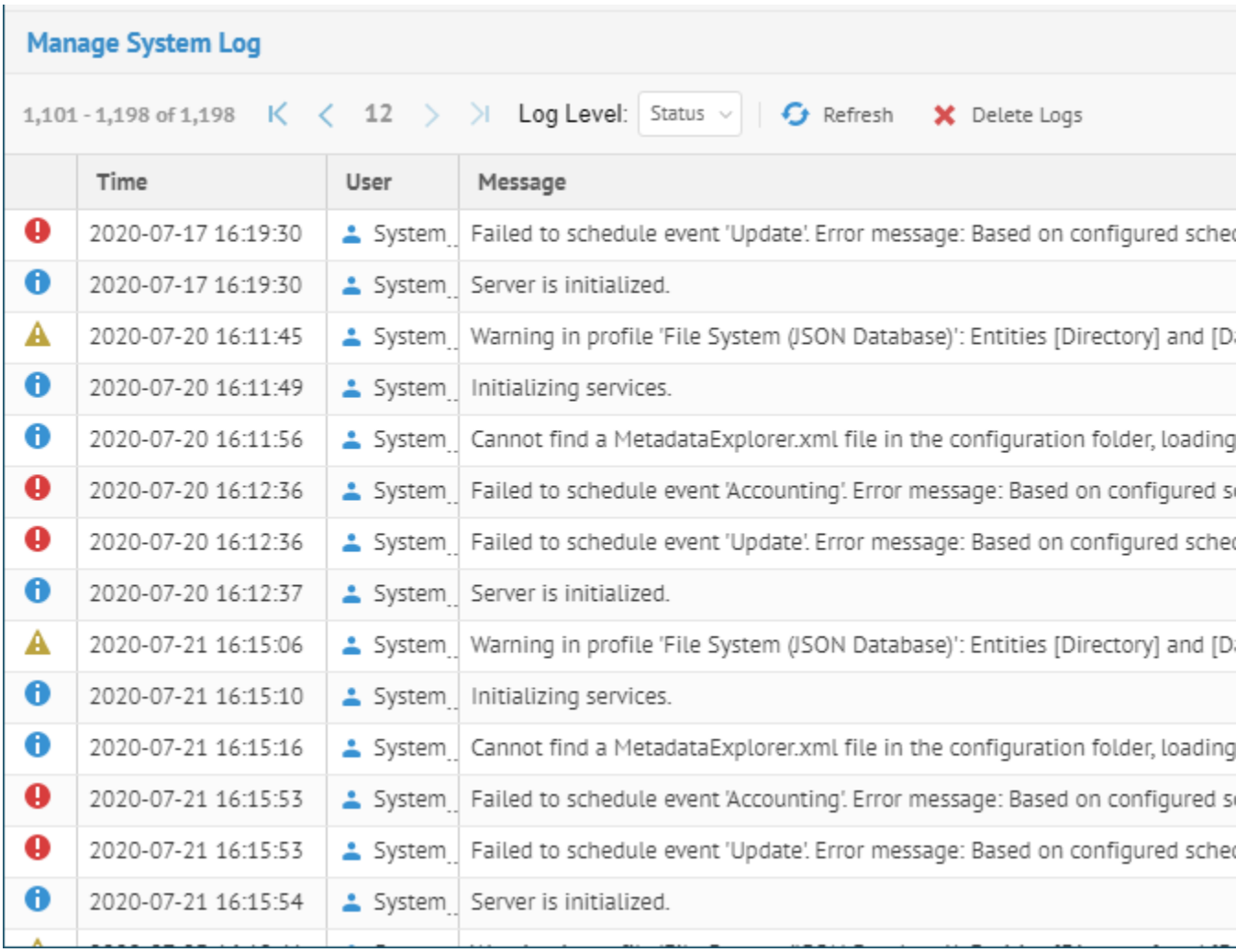
A	B	C	D	E
Group Name	Description	email	User Interface	Default Con
Security Administrators			Metadata Manager	
Application Administrators			Metadata Manager	
Administrators			Metadata Manager	
Business Users			Metadata Manager	

Manage System logs

Steps

1. Sign in as a user with at least the **Admin** security role.
   - Go to **MANAGE** > **System Log** in the banner.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



See Analyze a Log for more details and how to download.

Debug level messages are not shown here, nor is it part of the download here. Instead, when you enable debug logging, those messages are written to the Tomcat server logs on the application server machine. You may find these in the installation directory at

`/data/logs/tomcat/`

Manage Scheduled Tasks

Steps

1. Sign in as a user with at least the **Admin** security role.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

2. Go to **MANAGE** > **Schedules** in the banner.

3. Choose an object from the repository on which you will schedule an action.

You may pick any number of like objects. The selection of operations will change accordingly.

4. From here you may pick any of the following:

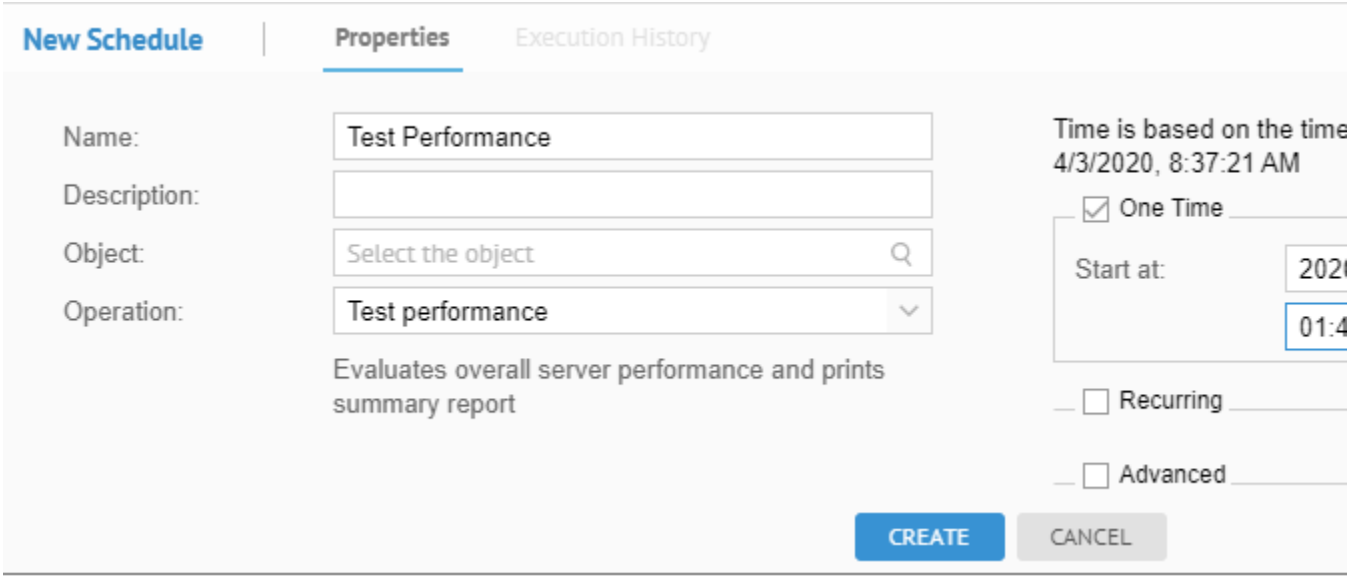
   - **Convert to database**: Convert a physical data model to database model
   - **Delete operation logs**: Permanently deletes completed operations and their logs older than a specified number of days. You cannot delete the original import operation log of versions available in the repository. They are automatically deleted when you delete their versions. Check 'Failed only' to delete logs of failed operations or uncheck to delete logs of all operations (successful and failed).
   - **Delete system log**: Delete the system logs older than 7 days (number of days may be specified).
   - **Delete unused versions**: Permanently deletes model versions not used (linked) in any configurations
   - **Import External Users**: Updates the users from the conf/UserDirectory.csv. Please copy the template file from Templates directory and populate the CSV. Merges existing users, removes users not part of the file and creates new users
   - **Import LDAP Users**: Updates the ldap users based on the LDAP queries configured in MM. Merges existing users, removes users not part of the file and creates new users
   - **Import new model(s)**: Import new versions of external model contents
   - **Import new model(s) from folder**: Import new versions of external model contents of all file based models recursively located within a folder
   - **Restore a backup under the selected object**: Send email notifications to glossary stewards
   - **Run Database Maintenance**: Run Database Maintenance
   - **Send glossary workflow notifications**: Send email notifications to glossary workflow roles
   - **Sync physical data model(s) with database**: Synchronize the physical data model(s) with the database
   - **Test performance**: Evaluates overall server performance and prints summary report
   - **Update configuration**: Update and build this configuration in order to use the latest or published version of its models
   - **Update configurations**: Update and build all configurations set to 'auto update' in order to use the latest or published version of their models
   - **Upgrade physical data model**: Upgrade physical data model.

Explorer Further

Repository Wide Operations

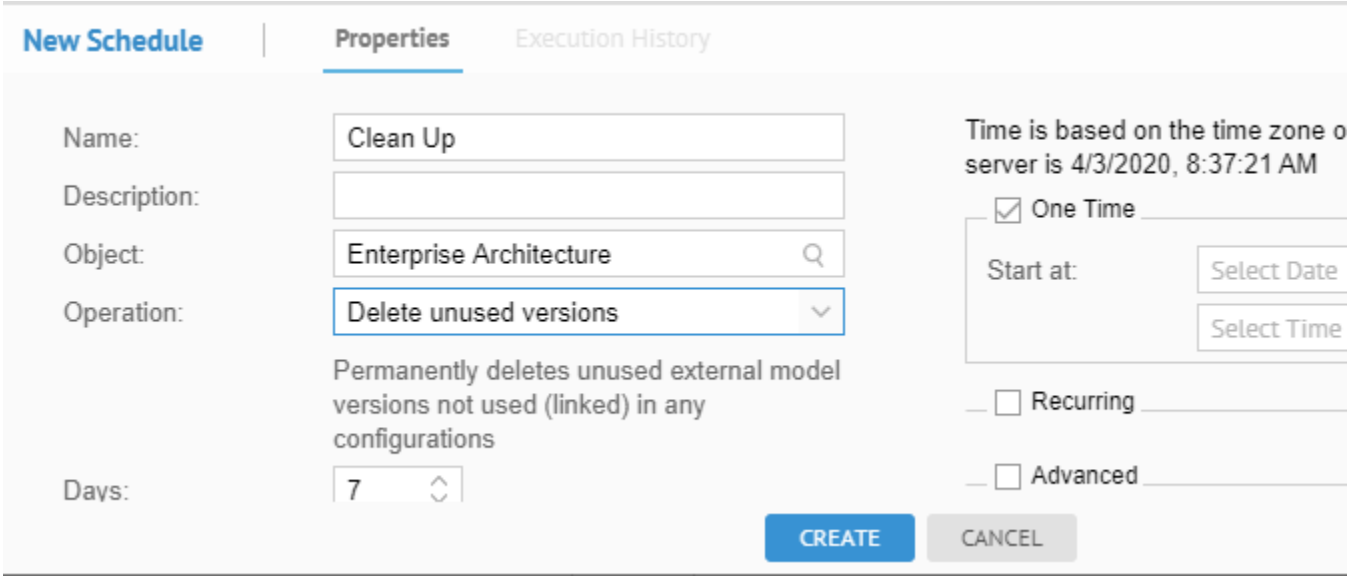
Many operations simply apply to the entire repository, e.g., **Test Performance**. You may simply select the **Repository** as a whole for these operations to be available or leave it blank and the **Object** field will be filled with **Repository**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Additional Operation Parameters

Some operations have additional parameters which may be set, e.g., Delete Unused Versions, which has a Days parameter indicating the number of days in history to NOT delete.



*In this case, only those versions of object in the **Enterprise Architecture** folder which are more than seve days old will be considered for deletion.*

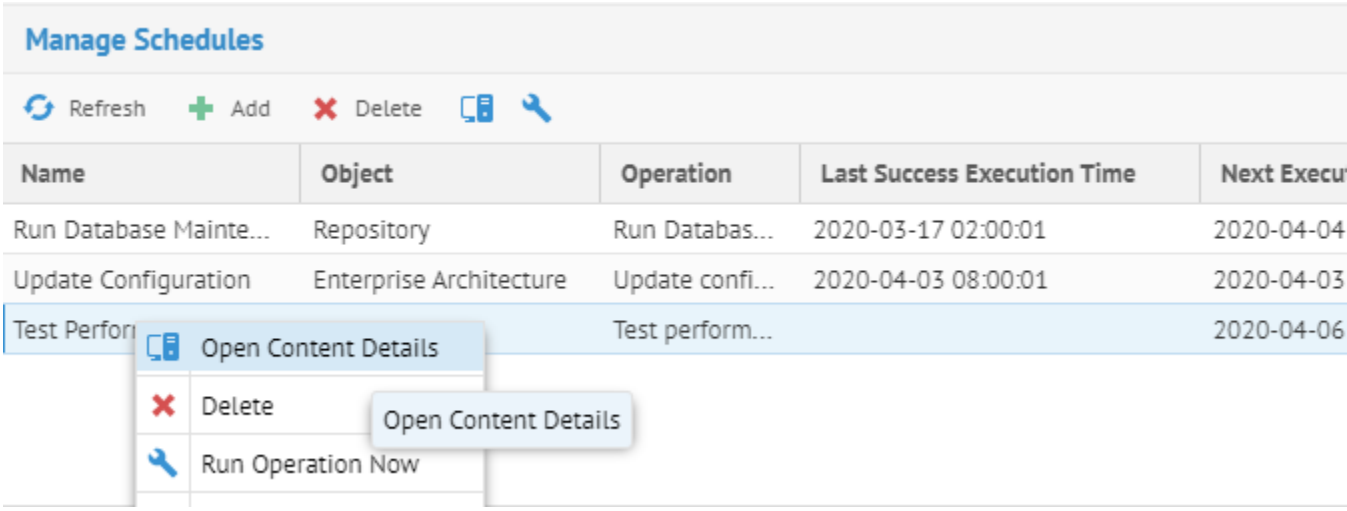
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Scheduled Task Content Details

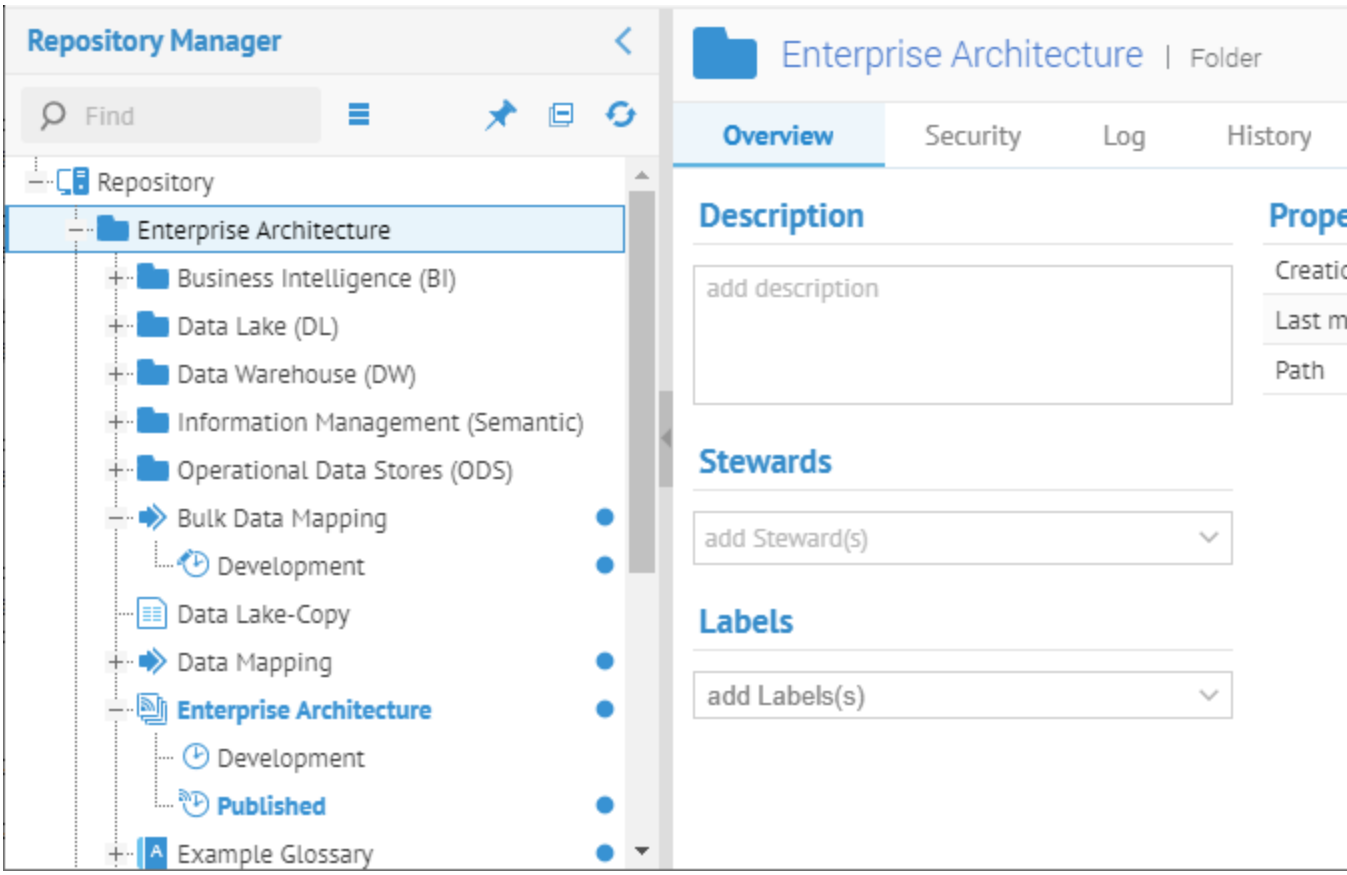
You may right-click on a schedule and see the details of the object being operated on.

Example

Right-click the Clean Up schedule and select Open Content Details.



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Execution History

One may see the history of execution with this tab.

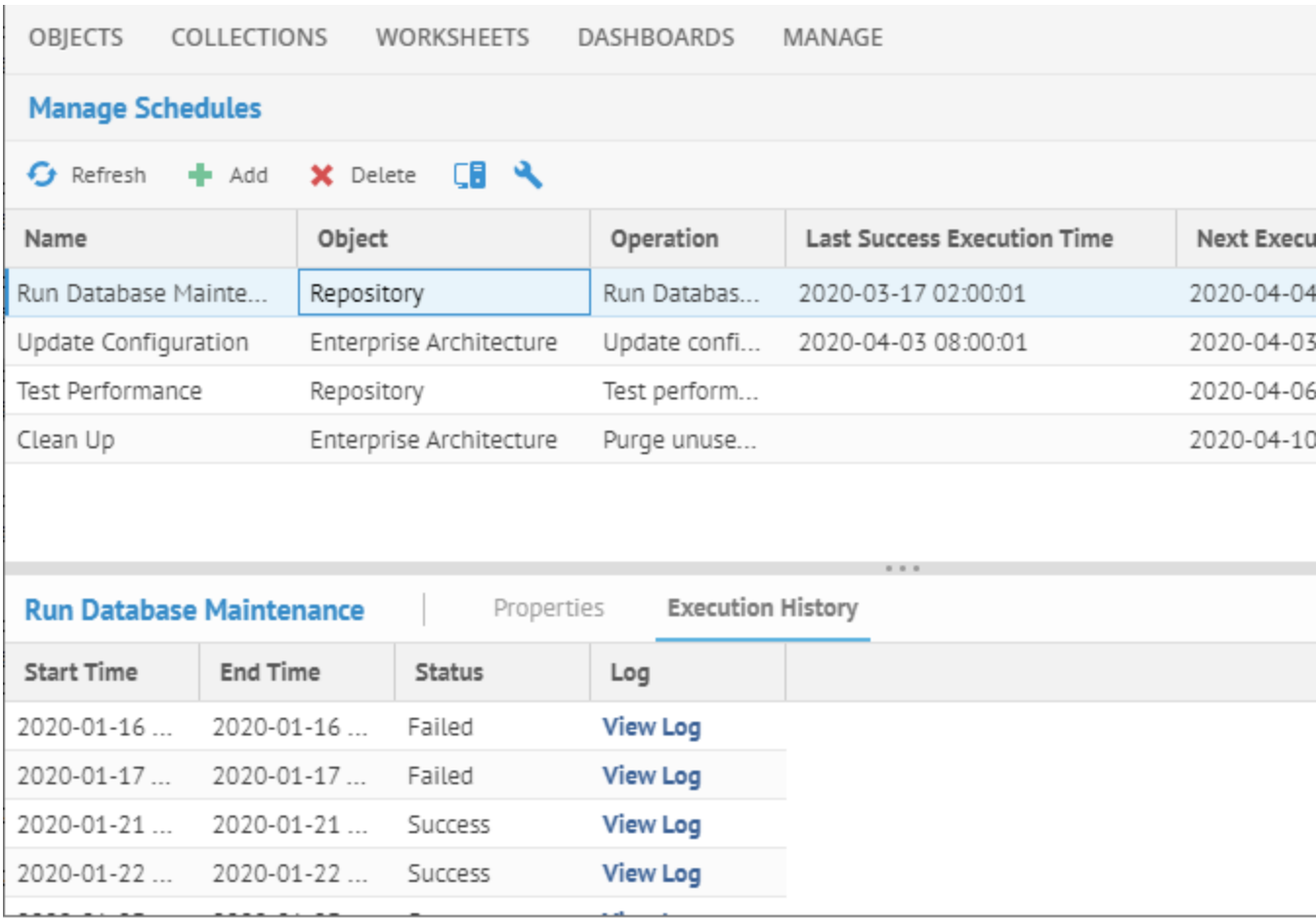
Steps

1. Click the schedule you want to check.

2. Go to the Execution History tab.

Example

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Manage Operations

Many of the tasks which take significant resources are spawned off as operations, which may be managed in this feature.

Steps

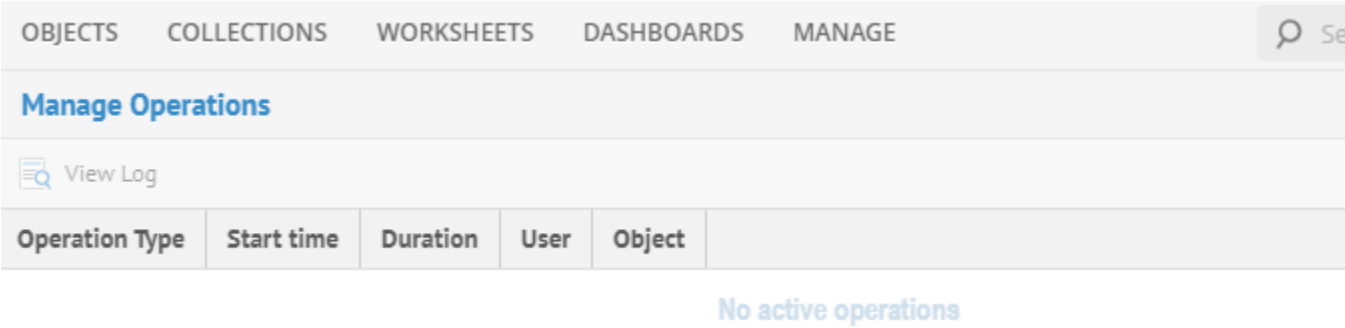
1. Sign in as a user who is a member of the **Administrator** group.
2. Go to **MANAGE > Operations** in the banner.
3. From here you may:
   - View and download the log of an operation
   - Stop the operation

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

4. An operation icon (), will appear when there is an on-going operation and also show a number of operations currently running. If there is an error during the operation, an exclamation mark () will appear instead of a number. Once an operation successfully completes, a check mark will appear ().

Example

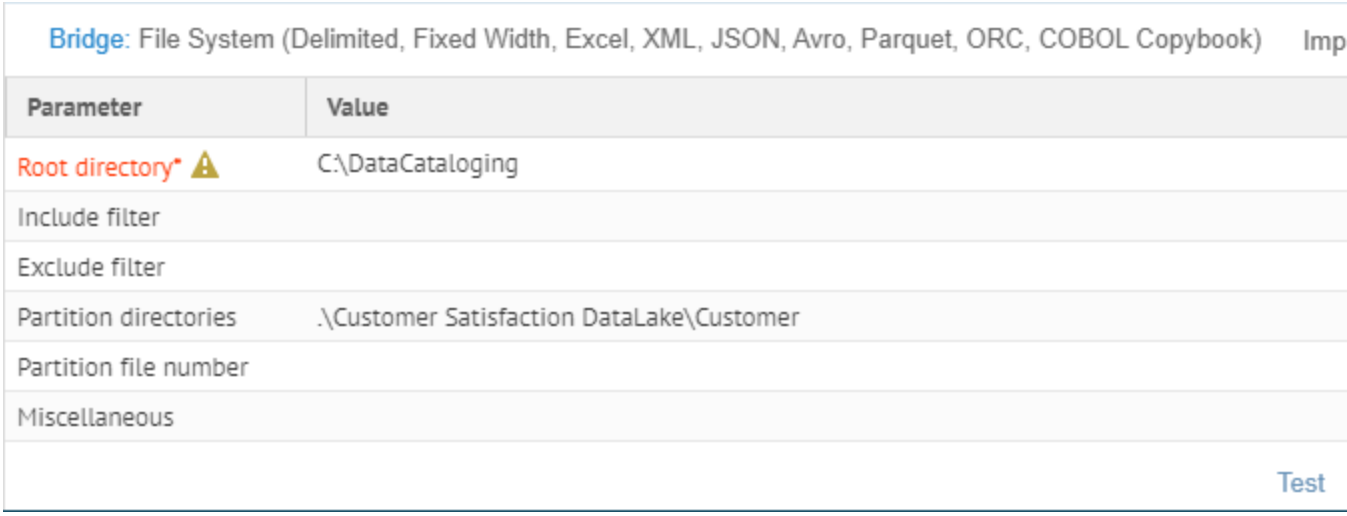
Sign in as **Administrator**, and go to **MANAGE > Operations**.



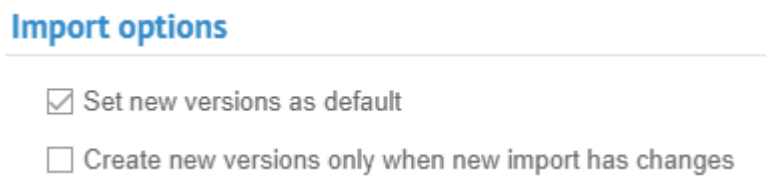
Note, no processes are running. So, in order to catch one while it is running, do the following:

- Go to **MANAGE > Configuration**
- Select the Data Lake model

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

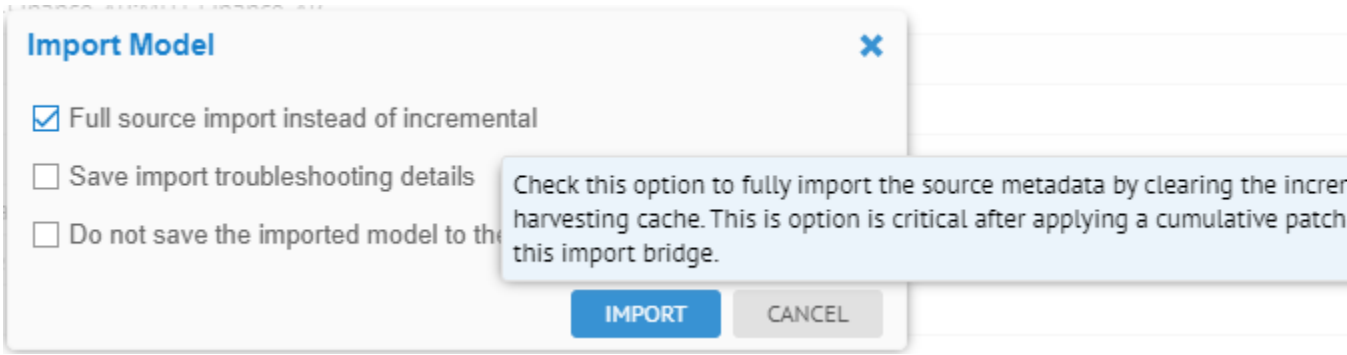


- Go to the **Import Options** tab and uncheck the **Create new versions only when new import has changes** checkbox and click **Save**.



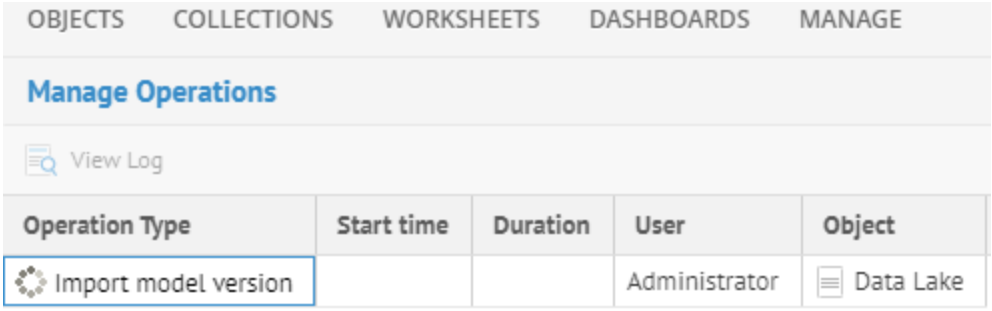
- Click **IMPORT.**

5. Check the **Full source import instead of incremental** checkbox and click **IMPORT** if you wish to clear any cached metadata and thus force a complete re-harvest.



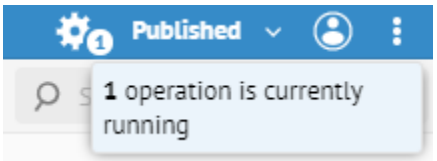
- Click **IMPORT** and immediately go to **MANAGE > Operations**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

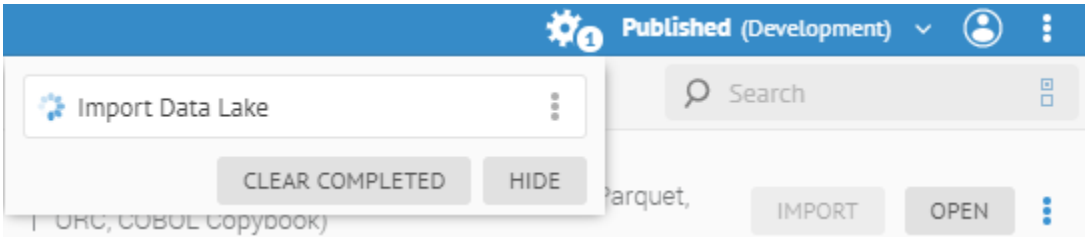


The operation is then in the list.

- Once an Operation commences, a gear icon ( ) will appear with a number of currently running operations. You may hover over the gear, to observe what is currently running.

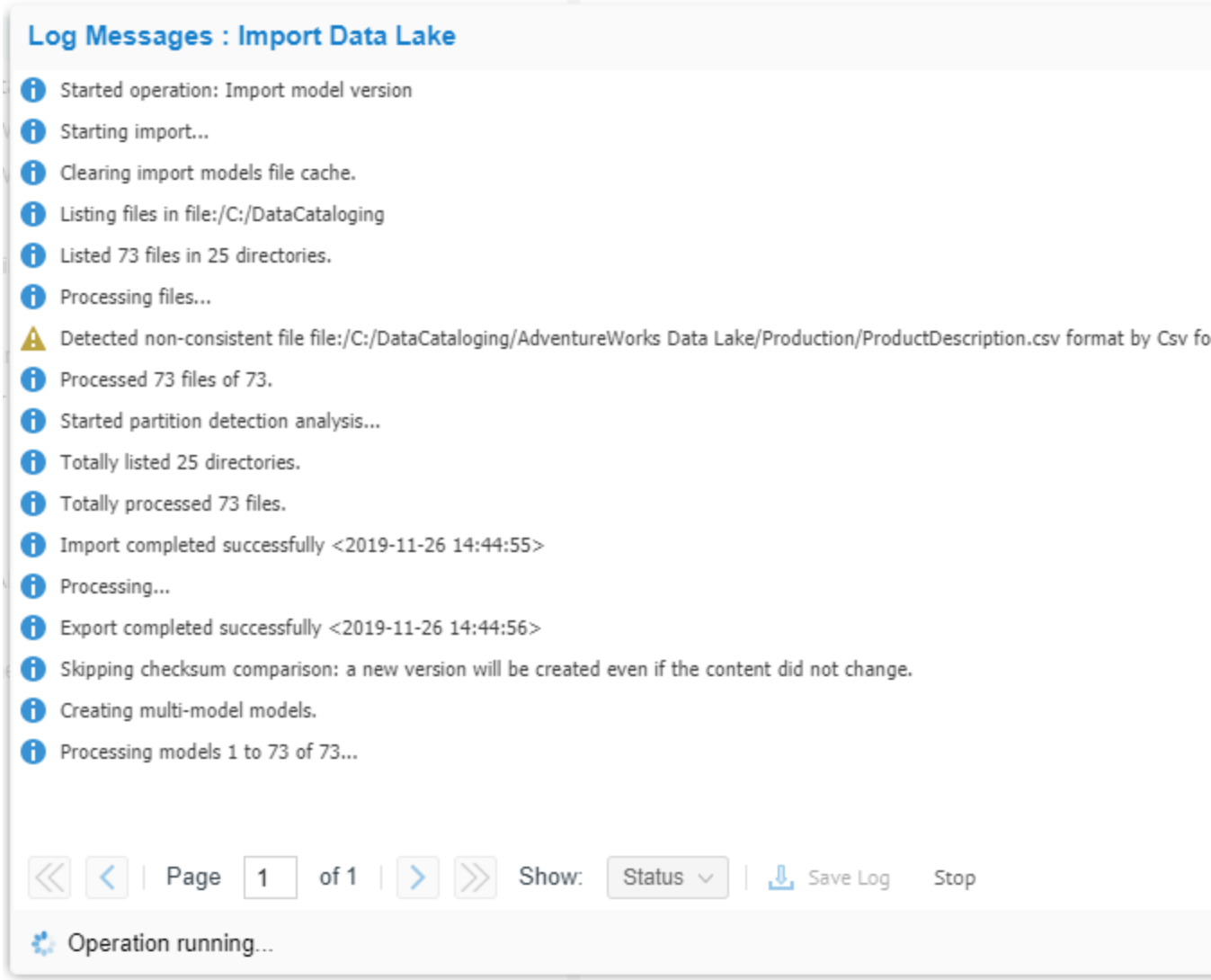


- You may also click on the gear, and receive more information on the currently running operation.



Click View Log to open the log viewer.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



You may download ( ) the log and stop the process in the log viewer.

Manage (Harvesting) Servers

In order to harvest metadata (model import) from a tool (e.g. database, DI/ETL, BI tool, etc.), the local MIMM (Default) Server may not be able to support that tool and therefore require a remote harvesting server (agent) in the following cases:

- a bridge running on Microsoft Windows only (such as COM based tools like SAP BusinessObjects, MicroStrategy), while the MIMM Server is running on Linux (on Prem or on Cloud)
- a bridge requiring the tool (often the client) to be installed in order to access its SDK. (such as Oracle DI or Talend DI), while the MIMM server is running on the cloud (with no local file system access)

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

- a bridge requiring access to local files / drivers (such as Database JDBC bridges), while the MIMM server is running on the cloud (with no local file system access)
- a bridge connected to a tool running on a different network (such as a MIMM server on cloud harvesting from sources on prem).

Go to supported tools for more details on the above requirements:

http://www.metaintegration.com/Products/MIMB/SupportedTools.html

Installing a remote bridge server is equivalent to installing MIMM on an application server, except that one specifies **Metadata Harvesting Server Only** in the **Application Server** tab in the setup.bat utility and no license is required and thus it will not have an available web based UI. Please refer to the installation instructions for more details and special instructions for MIMM installations in the cloud.

Once such a remote harvesting server is installed and working, one must add it to the list of servers in MIMM .

To add a remote harvesting server to MIMM .

Steps

1. Sign in as a user with at least the **Admin** security role.
   - Go to **MANAGE** > **Servers** in the banner..
2. Specify
   - The **Name** to refer to this remote server by
   - The **Type** of remote harvesting server to create
     i. **Local Network** – Remote harvesting server that is within the same domain as the MIMM server. In such case, the MIMM Server is requestion operations to do (in real time when needed) to its registered MIMB Agent. E.g., where the MIMM Server is on Linux and needs to import metadata from a MIMB Agent on Windows (for Windows only bridges like Erwin DM, or SAP BusinessObjects).
     ii. **Over the Web (Cloud)** – Remote harvesting server that is local to the organization but the MIMM server is Cloud-based. In such case, the MIMB

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Agent is requesting operation to do on regulare basis (every 40s) from its registered MIMM Server. E.g., where the MIMM Server is on the cloud and needs to import metadata from another Server on prem.

Most operations requested by the MIMM *server to the MIMB agents are model imports (i.e. metadata harvesting), however a particular operation is to patch the MIMB agent with a MIMB OEM cumulative patch, see…..*

- The **URL** for this remote server (generally one only need update the machine name inside the URL signature suggested):
  i. For **Local Network** remote harvesting servers it is of the form

     http://<hostname>:<port>/MIMBWebServices

     where <**hostname**> and <**port**> is the hostname or IP address and port that the remote harvesting server runs on.

  ii. For **Over the Web (Cloud)** remote harvesting servers it is of the form

     listener://<agentname>

     where <**agentname**> is **the M_AGENT_NAME** assigned to the remote harvesting server as defined in the configuration files. Details about web based configuration is below in the Cloud-based Application Server and Shared Secret section.

Please refer to the installation instructions for more details and special instructions for MIMM *installations in the cloud.*

3. A **Description**
4. One may also specify:
   - **Compress Data** – to use data compression for the communication between the servers
   - **Set as Default** – To make this remote harvesting server the default when creating models.

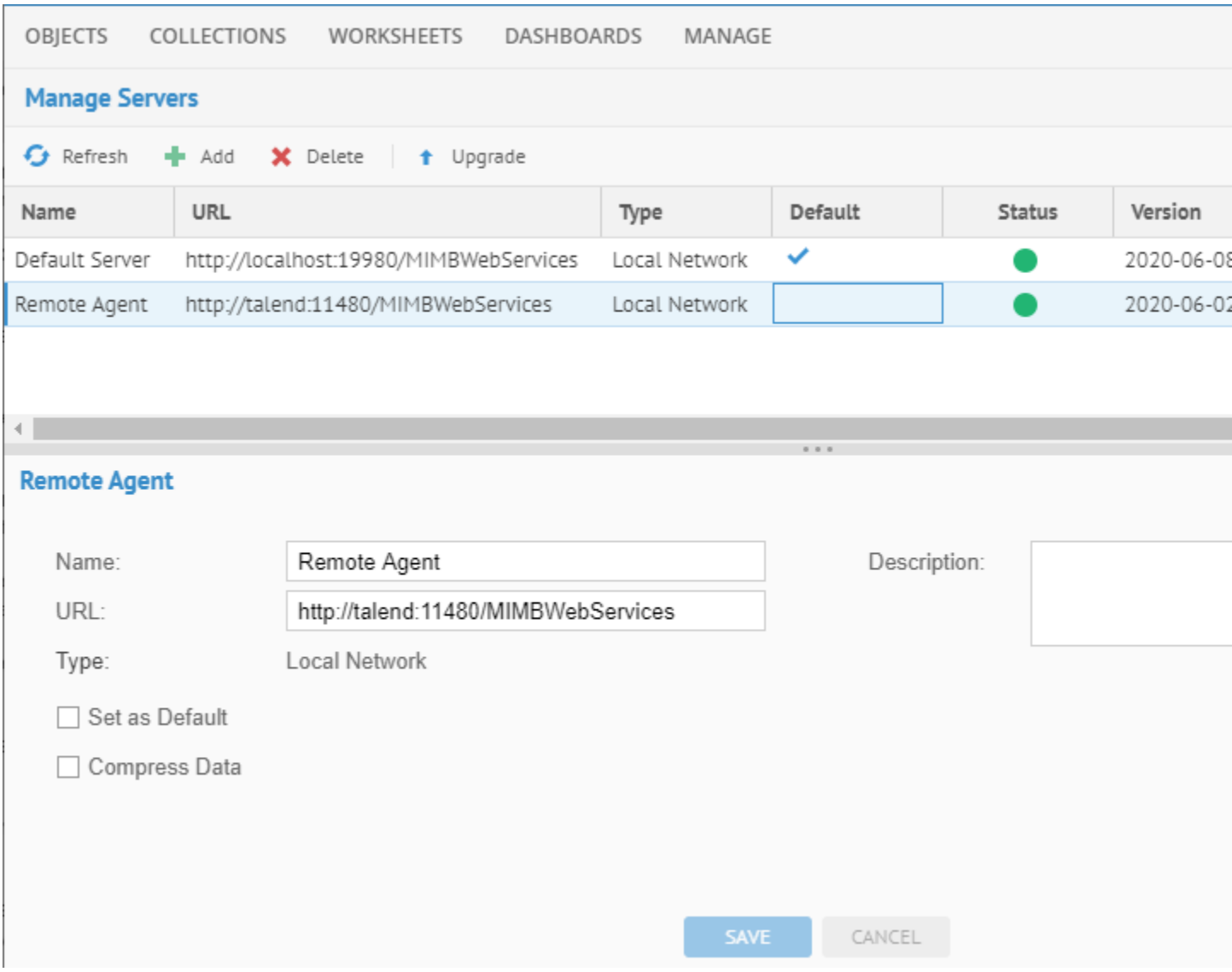
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

5. Click Save.

> *When harvesting using a remote bridge server, one would perform the same steps as for any other harvesting activity with the exception selecting a (remote)* ***Server*** *name in the pull-down.*

Examples

Sign in as **Administrator** and go to **MANAGE > Servers**.



> *You may determine the MIMB-OEM patch level in the* ***Version*** *column for each remote harvesting agent and the local (Default) server.*

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

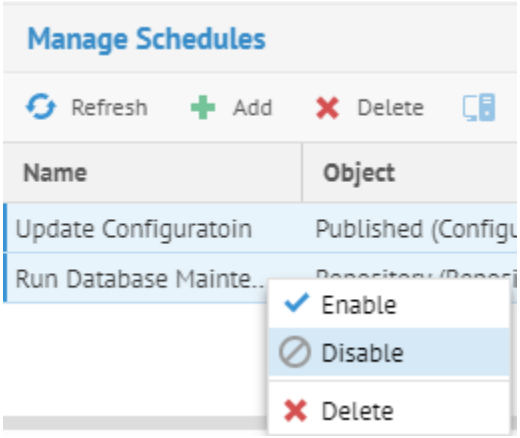
Explore Further

Upgrade

The **Upgrade** operation allows you to apply a software patch to the server from the UI. Each patch is in the ZIP format and is a collection of files and directories organized in the same manner as the home directory of the application server.

The most critical patches are officially delivered as *cumulative* patches.

> *You should inspect the currently running Operations and either let them finish or STOP them before the upgrade.*
>
> *You may disable all schedules without deleting them by selecting the schedules you wish to set in the list and right-clicking.*



MIMB OEM Cumulative Patch Upgrade

Contains patches for all import/export bridges, in the format:

```
MIMB-OEM-CumulativePatch-1010-20200422.zip
```

These cumulative patches include updated import/export bridge components which will be automatically deployed in the local MM server, as well as in any connected remote harvesting servers.

Steps

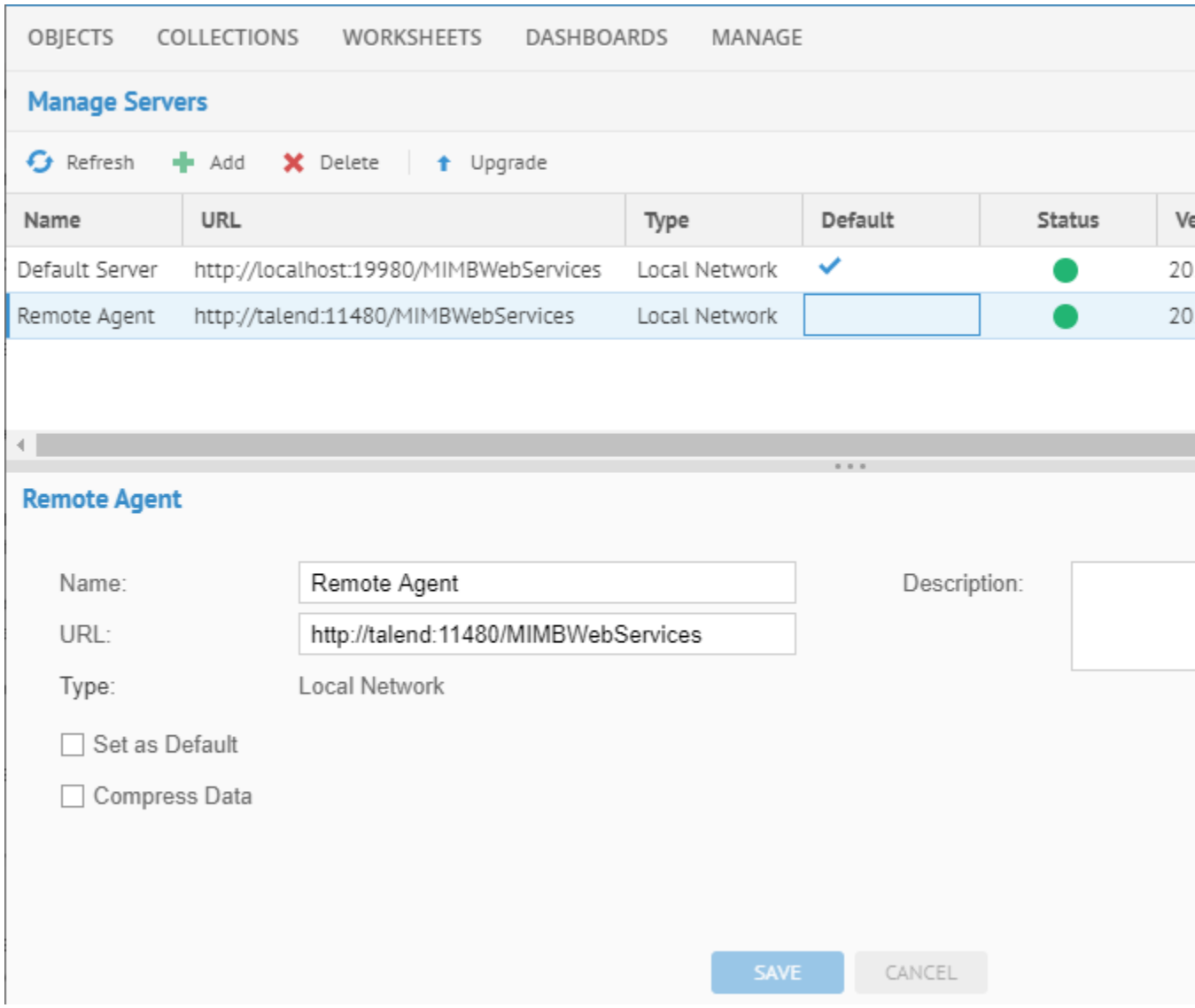
1. Sign in as a user with at least the **Admininstrator** security role.
2. Go to **MANAGE** > **Servers** in the banner.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

3. Confirm that all the remote harvesting agents are properly connected.
4. Click on **Upgrade**.
5. **Browse** for the patch package.
6. Click **UPGRADE**.

Examples

Sign in as **Administrator** and go to **MANAGE > Servers**.



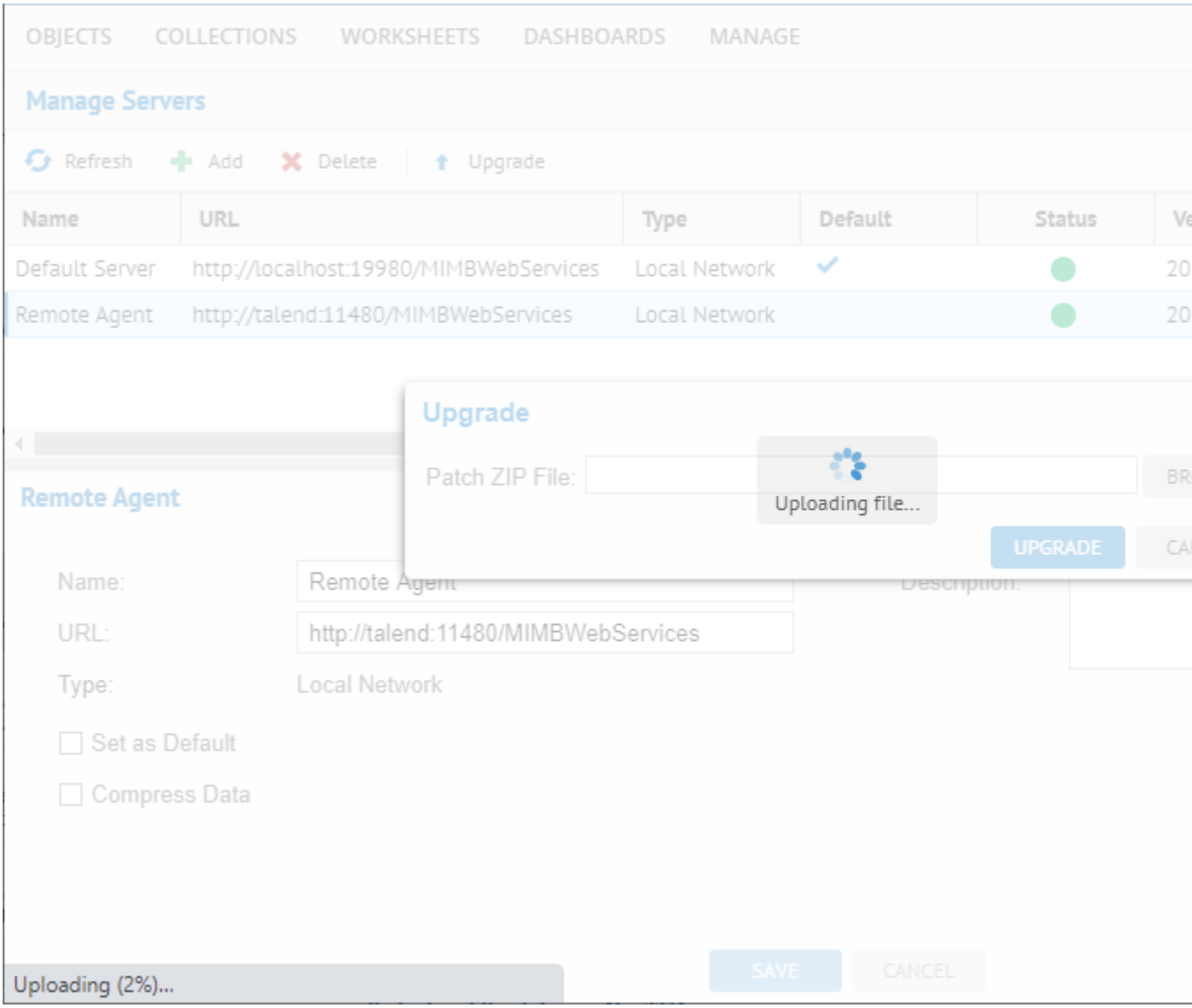
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Confirm that all the remote agents are properly configured.

Click on **Upgrade**.

Browse for the patch package.

Click **UPGRADE**.



*The **Version** date is now updated.*

The date displayed for each server is the date defined in the last line of the MIMB-OEM-ReadMe.txt in each server which corresponds to the latest MIMB OEM cumulative patch applied.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Remote harvesting agents (servers) of type "Over the web" will experience a delay in displaying the Version date after a patch update as the remote harvesting agents only update the MIMM server for new operations (like the patch) every 40secs.

MIMB Third Party Patch

Many MIMB bridges require third-party software to be downloaded (via the Internet) from the Maeven service. If the harvesting servers do not have access to Maeven (via the Internet) then you may install MIMM on a machine that has internet access (such as your laptop), you do NOT need a license to run

- On Windows

```
bin\mimb.bat -d
```

- On Linux

```
bin/mimb.sh -d
```

This function will download all the latest third-party drivers required by any bridge into:

```
data/download/MIMB
```

and will produce a patch file in the MIMM home directory:

```
MIMB-ThirdParty-Patch-1010-20200608.zip
```

Finally you can use the Upgrade button to upload it to all connected agents automatically (as you would do for an MIMB OEM cumulative patch).

Cloud-based Application Server and Shared Secret

When placing the MIMM Application Server on the cloud, you will generally need to place remote harvesting servers on premises in order to harvest metadata locally that are not accessible from the cloud. Obviously, an organization would not want servers outside the organizations' on premises network to be able to invoke a harvesting server on premises. Thus, in the **Over the Web (Cloud)** mode, the harvesting is invoked according to a schedule on the harvesting server (not by the cloud-based Application Server) and the result is *pushed* up to the cloud.

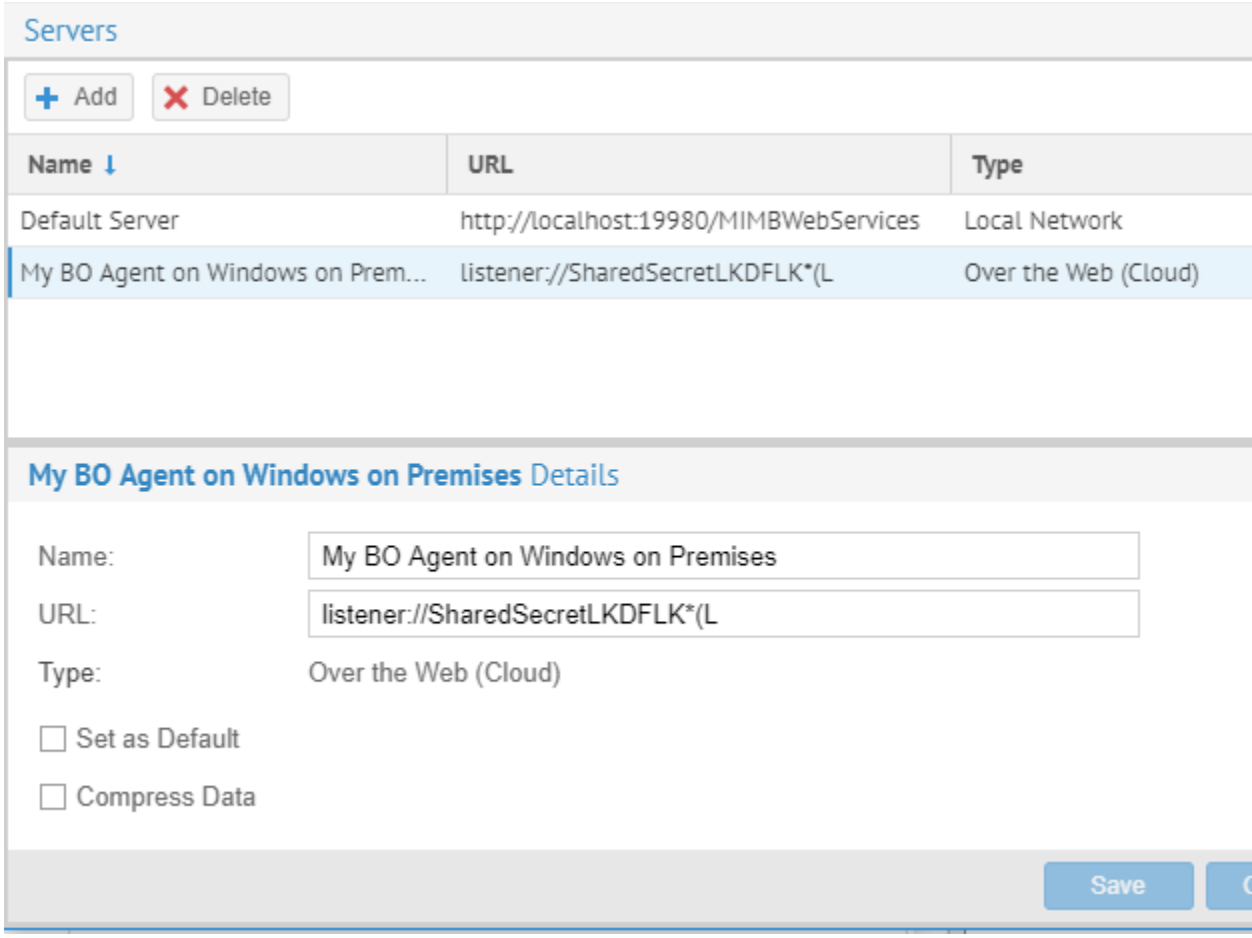
Now, to ensure that no one may launch an attack on the Application Server in the cloud and pushing invalid metadata requests, both the application server and the on premises harvesting server use a shared secret between the cloud-based application server and the on premises harvesting server. In this scenario, both the URL in the UI and Server M_AGENT_NAME= in the agent.properties file of the on premises harvesting server must match before such a push of metadata is recognized or allowed.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Please refer to the installation instructions for more details and special instructions for the setup of the on premises harvesting server.

Example

1. Specify the **Type** of on premises harvesting server to be **Over the Web (Cloud)**.
2. Enter a meaningful name in the Name field. Note, this name is what will appear when one is selecting the server to harvest from.
3. Update the URL with the shared secret, in this case "SharedSecretLKDFLK*(L".



4. Refer to the ReadMe installation instructions and update the agent.properties file of the on premises harvesting server with the same shared secret:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

M_AGENT_NAME= SharedSecretLKDFLK*(L

Manage Custom Attributes

One may customize the Repository to include custom attributes (like user defined properties) which will then be associated with any specific object type (e.g., folder, model, entity, column, or configuration, etc.).

Add a New Custom Attribute

Steps

1. Sign in as a user with at least the **Admin** security role.
   - Go to **MANAGE > Custom Attributes** in the banner.
2. Click the **Add** plus sign.
3. Specify the **Name** and **Description** for the attribute.
4. Associate the new attribute with one or more metadata object type **Scope**.

These associations define the type of object (say table or column or term) to which this custom attribute may be assigned. There are no restrictions to selecting multiple Types.

One may click Advanced to see a more complete list of Types.

5. Select the data **Type** of the custom attribute.
6. If you picked **Enumeration** as the **Type**, then enter **Possible Values**.
7. Enter a **Default Value**.
8. Specify any number of users or groups allowing only those users or group members to have

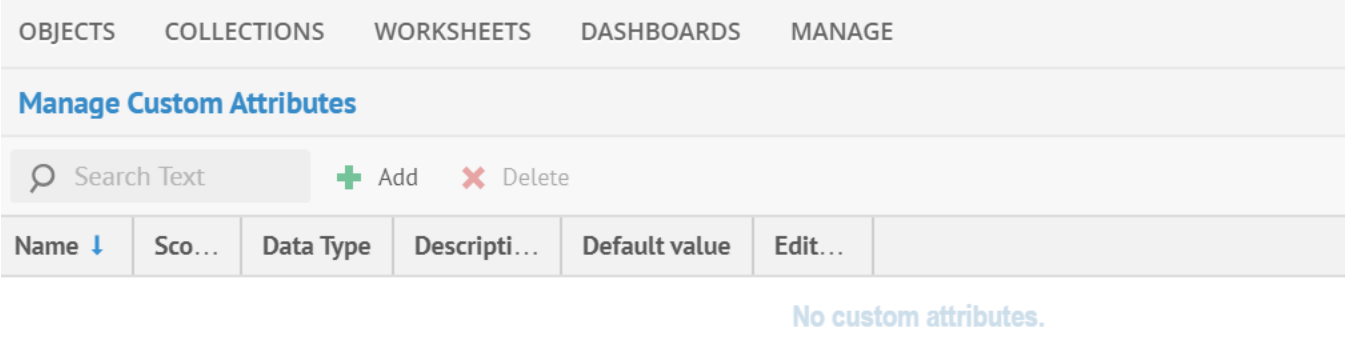
   Edit Permission to this custom attribute.

That user or group of users must also have the Editor security role assigned to the content containing a particular metadata object with the customer attribute.

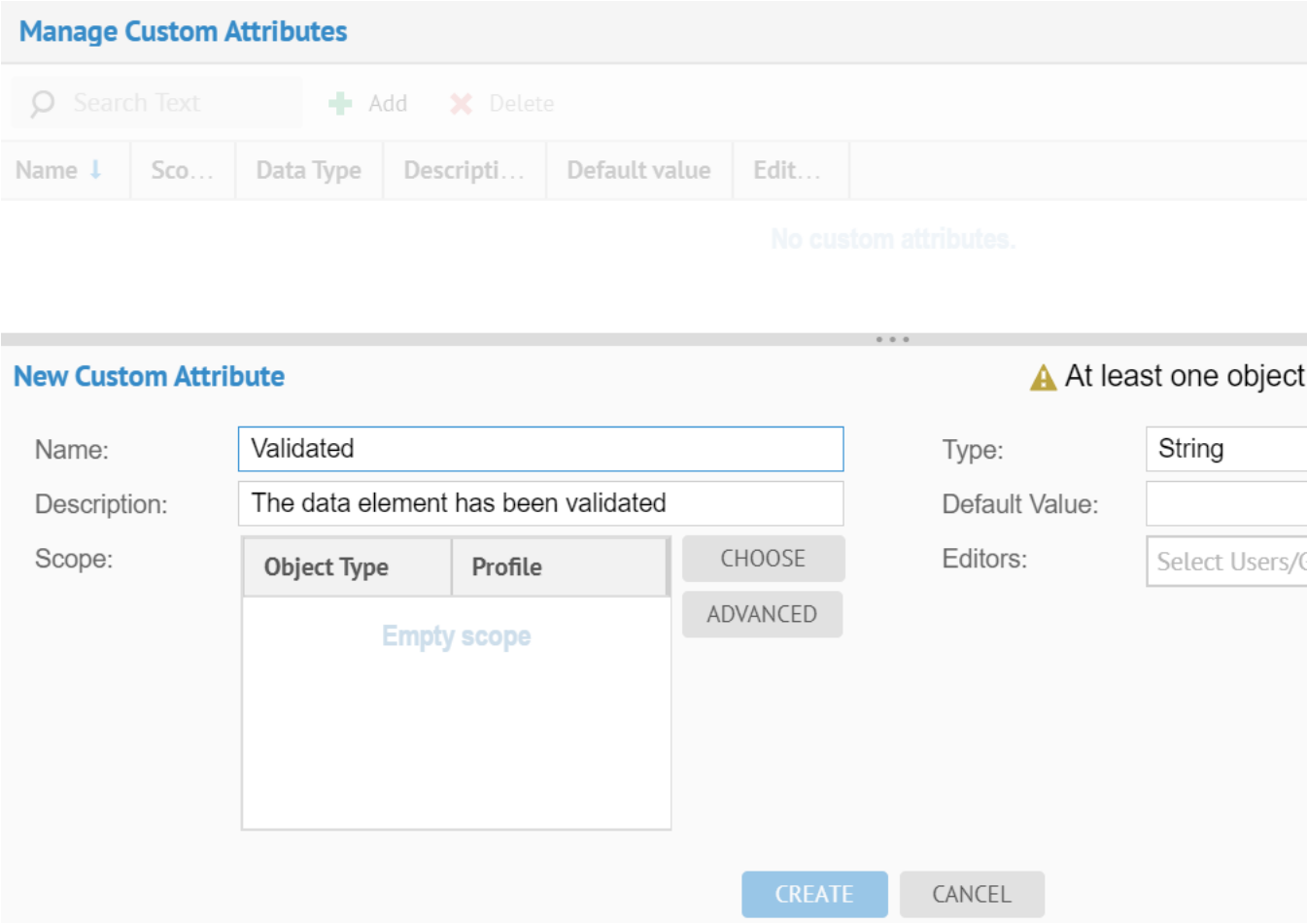
Example

Sign in as Administrator and go to **MANAGE** > **Custom Attributes**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

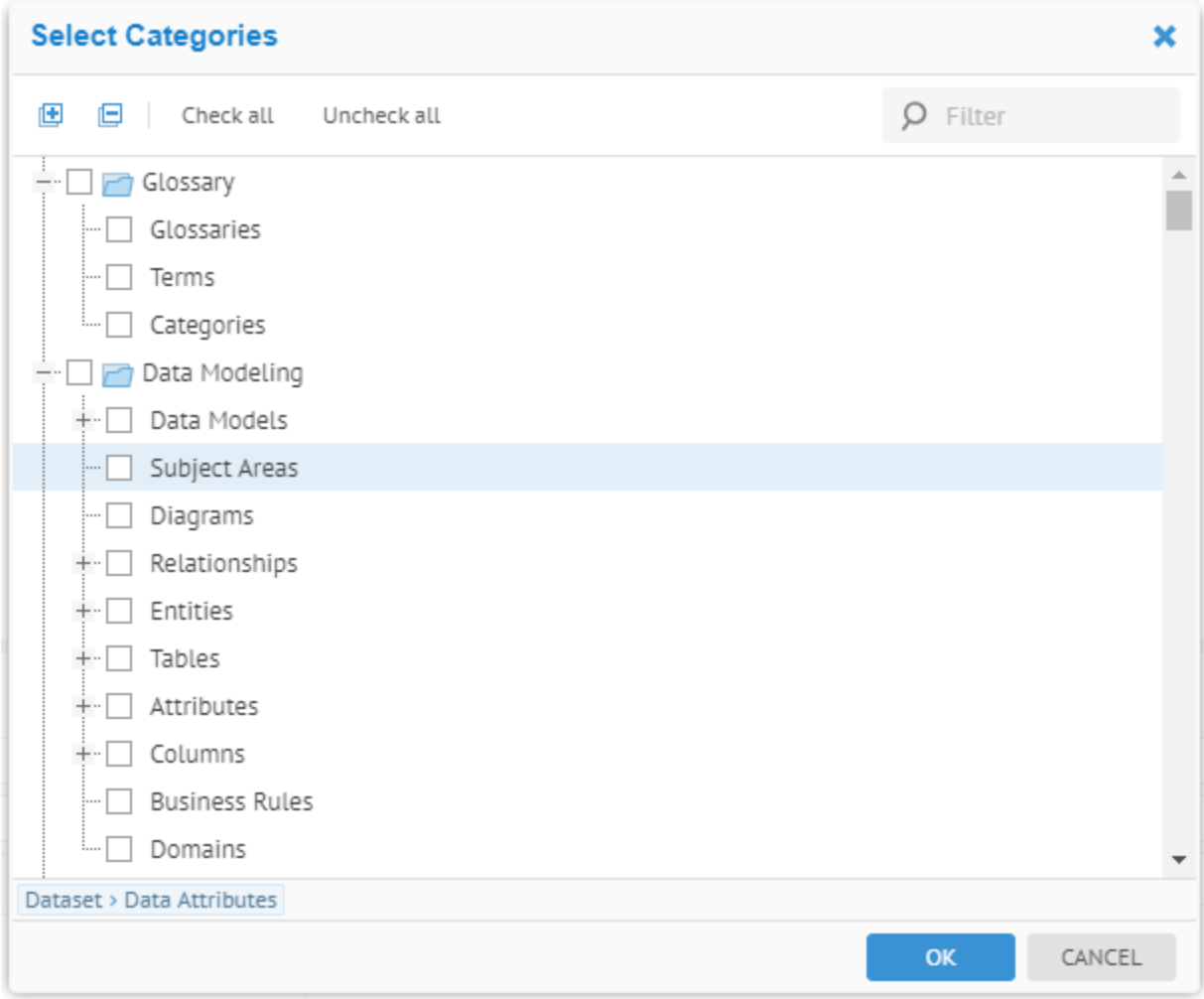


Click the **Add** plus sign, and enter "Validated" for the **Name** and "The data element has been validated" for the **Description** of the custom attribute.



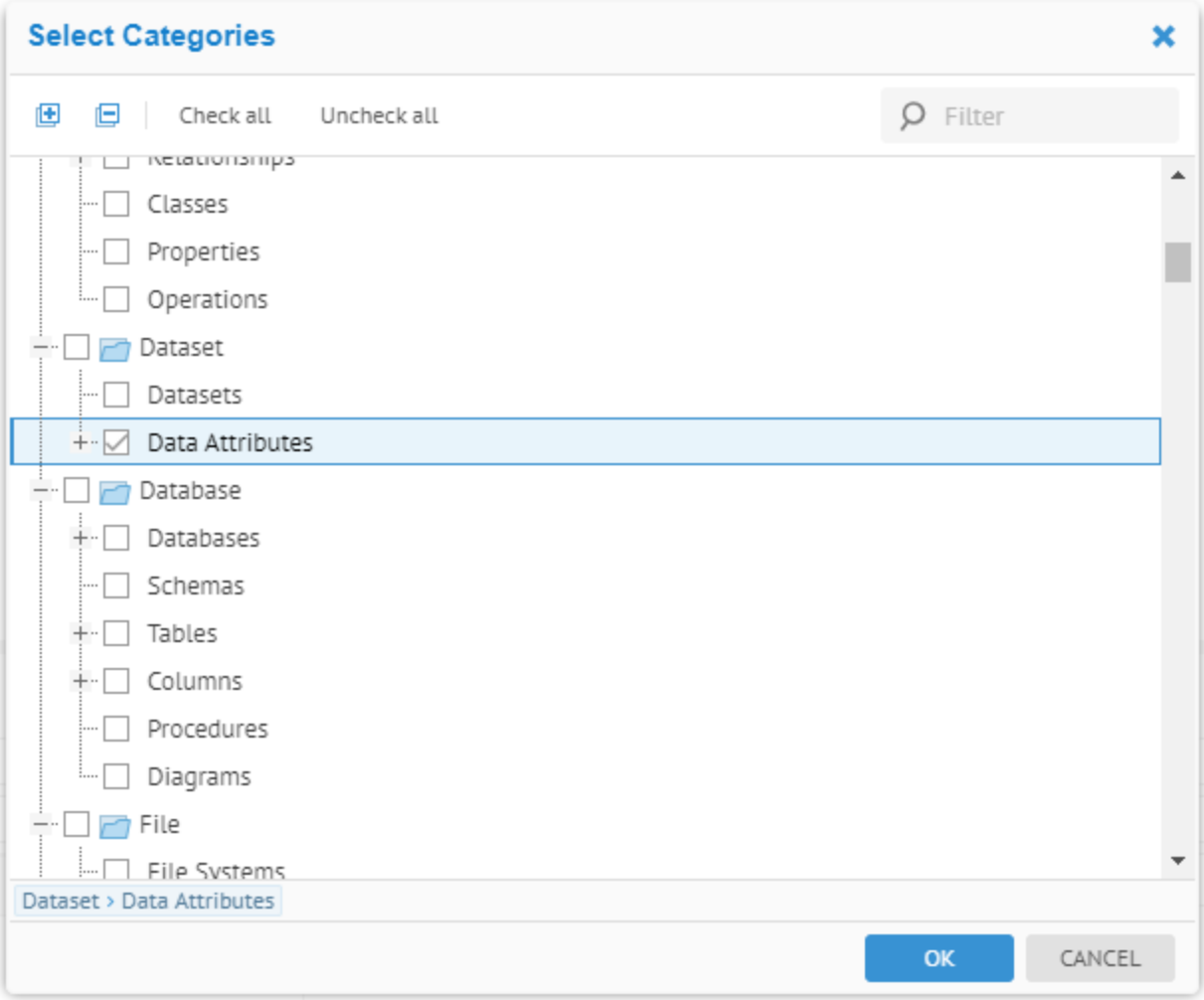
Click **CHOOSE**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Check the **Dataset** > **Data Attributes** checkbox and click **OK**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



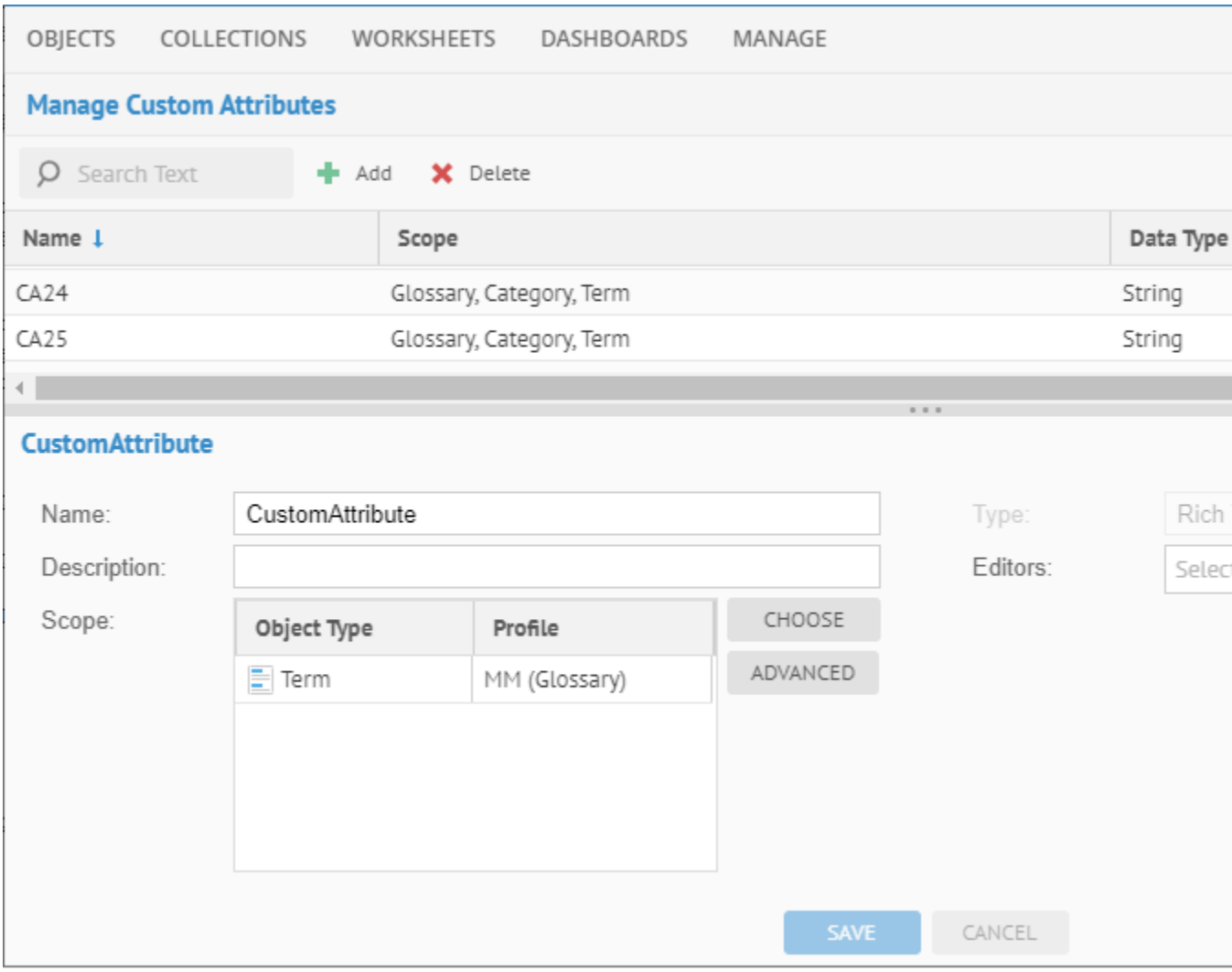
Data Attributes *in the* ***Select Categories*** *dialog is a category group and thus includes all attribute-like data element categories.*

Select **Enumeration** for the **Type**, specify "Validated" and "N/A" as the **Possible Values** and "Validated" as the **Default Value**.

Click **CREATE**.

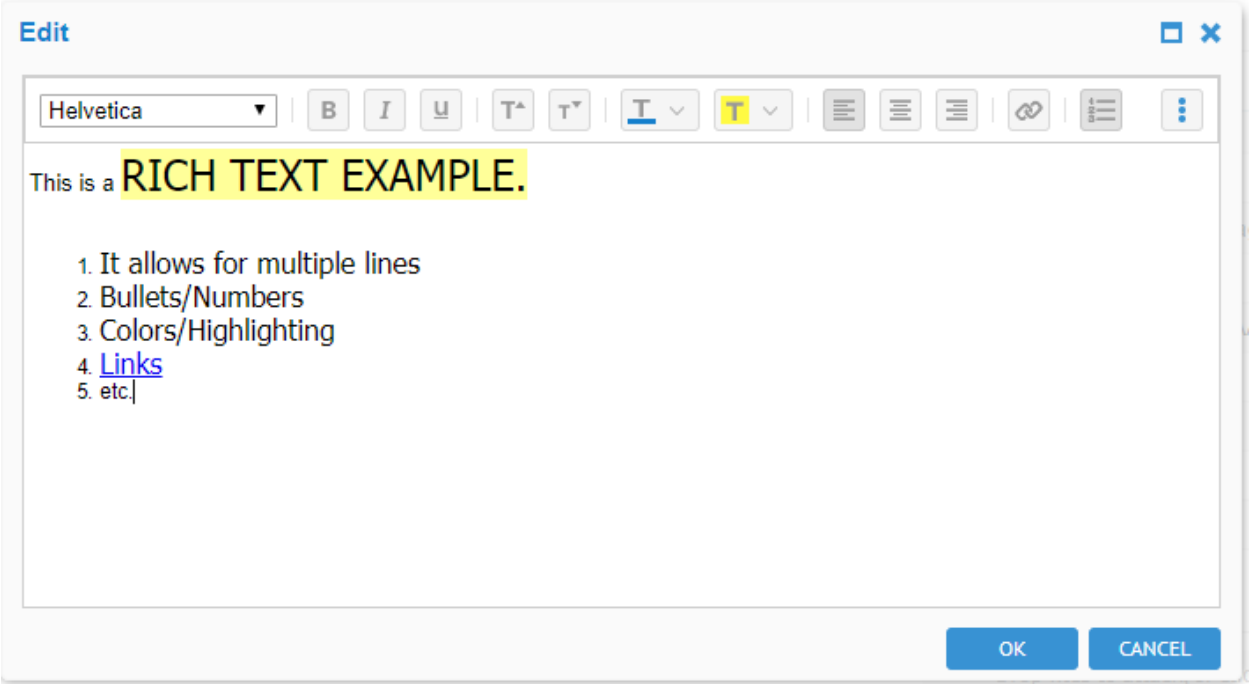
Again, add another custom attribute, of type **Rich Text** and this time for **Terms**:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



And go to a term and add the custom attribute:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Rich Text type custom attributes allow for full editing and formatting.

Remove a Custom Attribute

1. Sign in as a user with at least the **Admin** security role.
2. Go to **MANAGE > Custom Attributes** in the banner.
3. Select the custom attribute to be removed.
4. Click on the Add action in the header.

Manage Email Notification

In order to send out notifications of changes, MIMM requires access to an e-mail server that provides SMTP access for sending mail.

There are two types of notifications in MIMM :

- Notification of model harvest, i.e., import of new model version or synchronization of a physical data model with the underlying data source. Notification can occur whether these events are scheduled or manual.
- Summary report type notification of changes to a glossary which is under workflow control.

For notification of model harvest, one must specify in settings that a model (or physical data model is to be subject to notification emails. That is all that is required from the model perspective.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

These notification e-mails are only sent to the users who are stewards of the particular model, or steward of a term in a workflow glossary. Of course, users who are members of a group that is that type of steward are also notified.

Thus, in order to receive notification, one must have:

- Configured MIMM to use an email server (as above)
- Assigned stewardship to some number of users and groups
- Given e-mail addresses to these groups or users
- For glossary workflow update summaries, a schedule must be created.

Specify the Connectivity Information for the Email

Steps

1. Sign in as a user with at least the **Admin** security role.
   - Go to **MANAGE** > **Email** in the banner.
2. You are presented with the required parameters. Specify
   - The **Host Name** for this SMTP server
   - The **Port** to use when connecting to this SMTP server
   - The **User Name** to use when connecting to the SMTP server
   - The **Password** to use when connecting to the SMTP server
   - The **Sender Address** to provide to the SMTP server that will appear as the sender in e-mail notifications
   - The actual scheduled **Time** to execute the script, which many be
     - **One time** – specify one time for the script to run
     - **Recurring** – specify a recurring scheduled for the script to run
     - **Advanced** – use a cron type scheduling command
3. Click **Add**.

Example

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

From: <DataCatalog@MyCompany.com>
Date: Wed, Apr 29, 2020 at 11:44 AM
Subject: [MyCompany Data Catalog] Notification: Import Successful
To: <bob@MyCompany.com>

MyCompany Data Catalog Notification of Successful Import

Users can explore the new /Enterprise Architecture/Operational Data Stores (ODS)/Accounts Payable which was imp

Repository managers can review the version details and content preview.

Here is a detailed comparison report from the previous version.

Here is a summary of differences detected:

Object Type	Number Added	Number Removed	Number Changed
Column	0	0	8

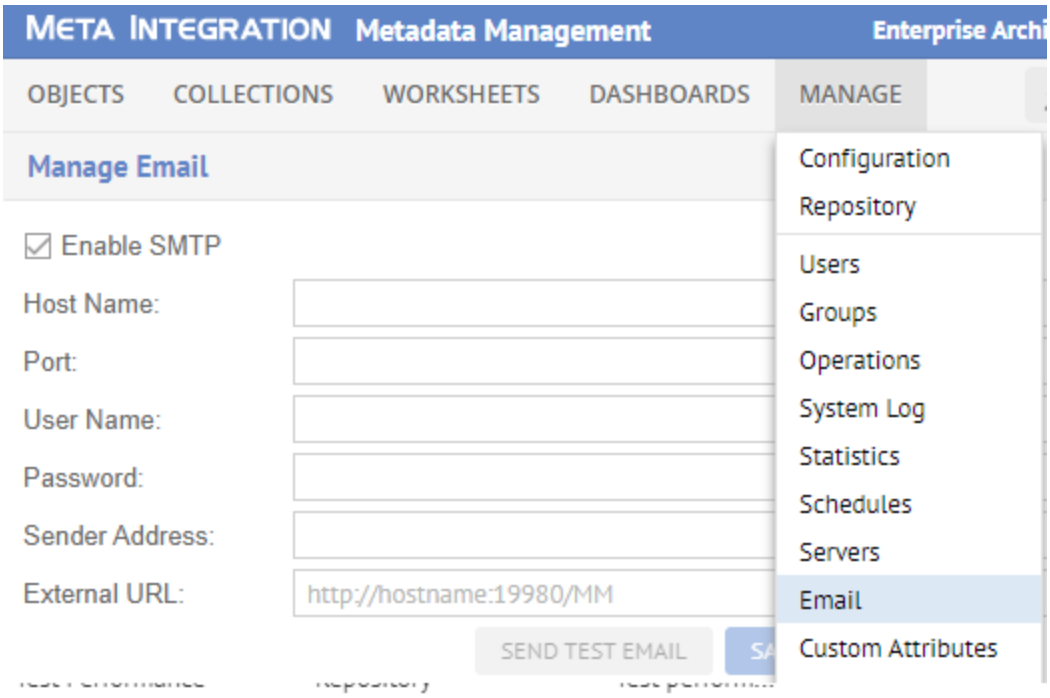
No connections were added or removed. There is no error in the import log.

Explore Further

SSL/TSL

Email notification supports SSL/TSL for email servers. Note, the server detects SSL/TSL automatically and you do not need to explicitly request it.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Summary Report Type Notification of Changes

For summary report type notification of changes to a glossary (which is under workflow control), one must define a schedule as to how often one would like summary report notifications to be sent.

Steps

1. Sign in as a user with at least the **Admin** security role.
2. Go to **MANAGE** > **Email** in the banner.
3. Check the Add icon to add a schedule
4. You are presented with the required scheduling parameters dialog. Specify
   - The **Name** for this schedule
   - The **Description** to describe this schedule
   - The **Object** to apply the schedule to. Browse for a workflow glossary content.
   - The **Script** to apply to the object. In this case you should specify Send glossary workflow notifications.
   - The actual scheduled **Time** to execute the script, which many be

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

- **One time** – specify one time for the script to run
- **Recurring** – specify a recurring scheduled for the script to run
- **Advanced** – use a cron type scheduling command

5. Click Add.

The user may replace the following line in MM installation directory/tomcat/conf/tomcat.properties

M_SERVER_FQDN=localhost{code}

with

M_SERVER_FQDN=<server name>{code}

The glossary notifications will have the server name instead of localhost in the URL.

Example

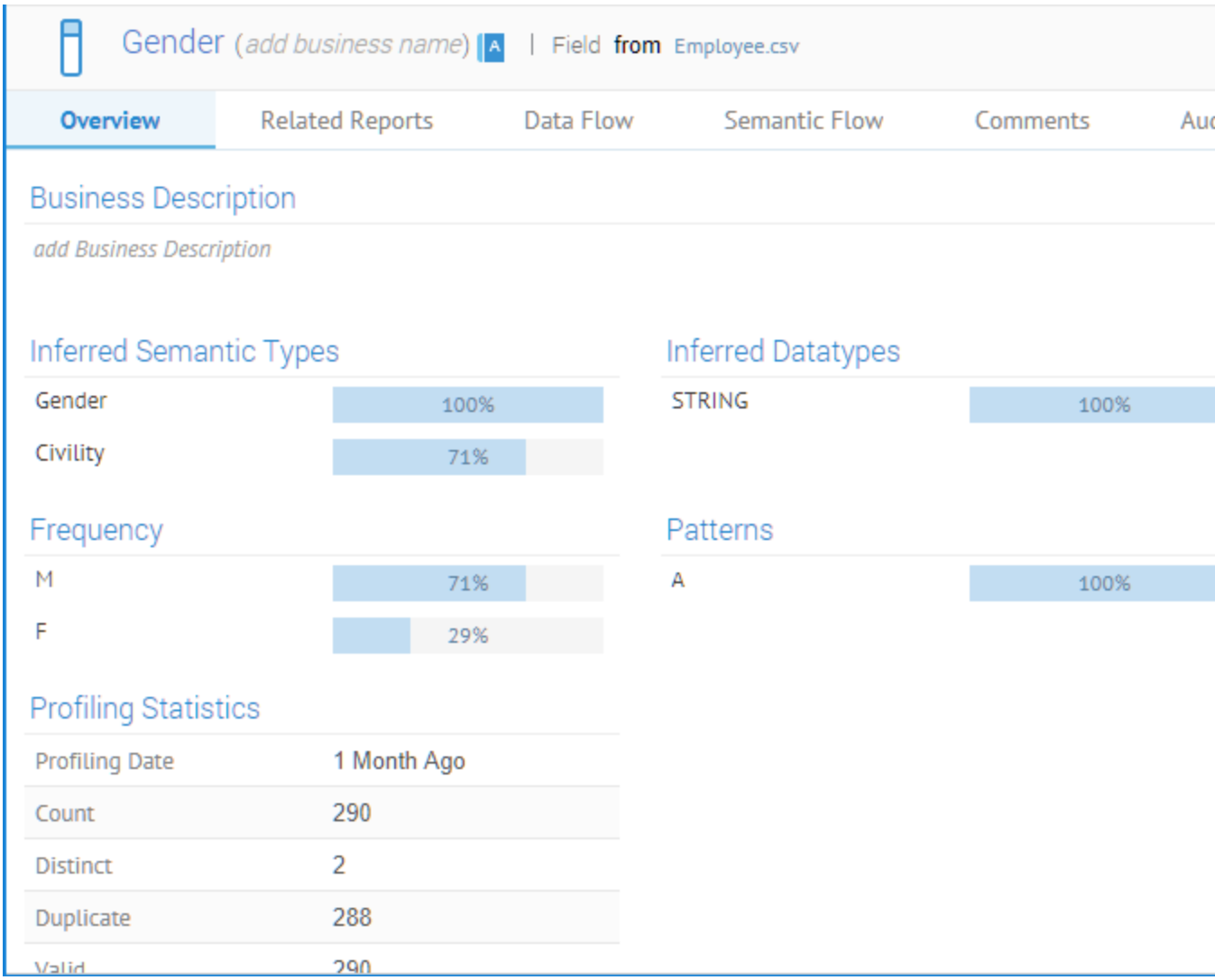
From: <DataCatalog@MyCompany.com>
Date: Fri, May 22, 2020 at 10:17 AM
Subject: [MyCompany Data Catalog] Notification: Glossary workflow notification update since 2020-05-22 10:05:39
To: <Bob@MyCompany.com>

Glossary: Glossary
Approve 1
Your Workflow Tasks report can be found here.

Manage Semantic Types

A field or column may be assigned one or more semantic types. Once that semantic type is assigned, it is a property of the element and may be searched on, filtered by and further edited (remove the assignment).

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



E.g., the field in the example above is assigned the semantic type Gender.

Semantic types are based upon a pool, defined repository-wide. This pool includes a unique name for the type and either a list of valid values or a syntactical rule set used to infer semantic types for metadata elements when sampling the data during harvesting.

Some actions can apply to all metadata elements of a certain semantic type. In particular the Hide/Show property.

Steps

1. Sign in as a user with at least the **Admin** security role.

2. Go to **MANAGE** > **Semantic Types** in the banner.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

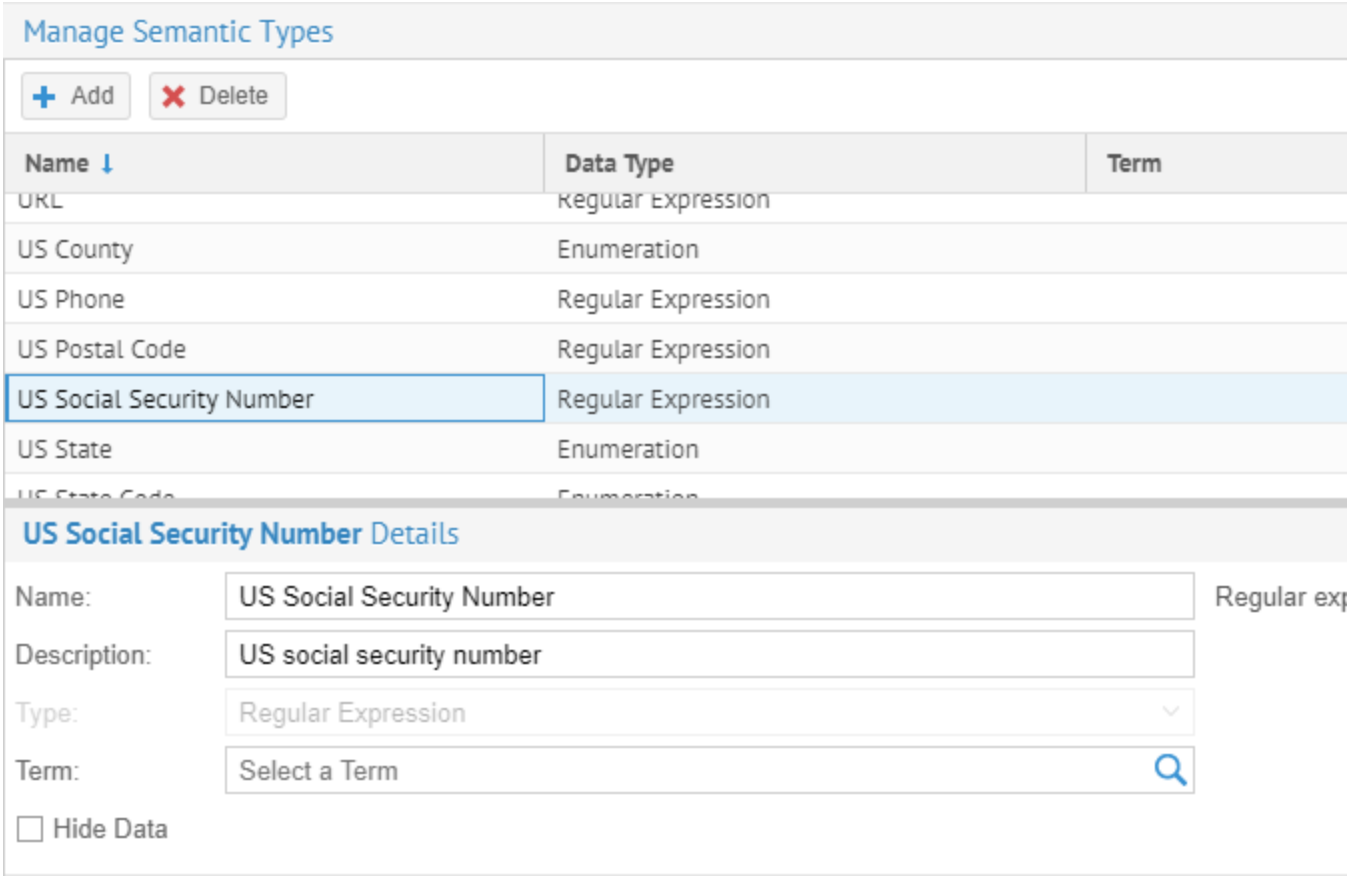
3. The list of semantic types is presented.

Add a Semantic Type

1. Sign in as a user with at least the **Admin** security role.
2. Go to **MANAGE** > **Semantic Types** in the banner.
3. Click the plus sign to **Add** an new semantic type.
4. Specify the **Name** and **Description**.
5. Specify the **Type**, which is either:
   - **Enumeration**: List of valid values for the data of that semantic type.
   - **Regular Expression**: Expression syntax that the data should conform to for that semantic type.
   - Compound: A Compound semantic type is made from multiple semantic types. For example, the compound "CA phone number" semantic type can be made of "North Cal phone number" and "South Cal phone number" semantic types.
6. Enter the enumeration list and/or the regular expression.
7. Check the **Hide Data** box to automatically hide the data of any metadata element that is profiled to match this regular expression.
8. Click **Save**.
9. Click **Publish** in order to make the changes available to bridges when harvesting.

Example

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Edit a Semantic Type

1. Sign in as a user with at least the **Admin** security role.
2. Go to **MANAGE** > **Semantic Types** in the banner
3. Click line with the semantic type.
4. Edit the **Name** and **Description**.
5. You may not edit the **Type** after it has been set. You must create a new semantic type instead.
6. Choose a term in a glossary that is to be associated with a semantic type. This terms will provide semantic definition lookup information (**Name** and **Description**) and allow one to trace semantic usage to any field/column/attribute that is assigned this semantic type.
7. Check the Hide Data checkbox if you wish to hide the sample and profiling data for any field/column/attribute that is assigned this semantic type.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

The Hide Data setting only applies to those field/column/attributes at the time of harvest or profiling/sampling.

8. Enter the enumeration list and/or the regular expression.
9. Check the **Hide Data** box to automatically hide the data of any metadata element that is profiled to match this regular expression.
10. Click **Save**.
11. Click **Publish** in order to make the changes available to bridges when harvesting.

Note: after any new installation of MIMM *you MUST publish your semantic types for the system to generate semantic type detection during the next harvesting/profiling.*

Delete a Semantic Type

1. Sign in as a user with at least the **Admin** security role.
2. Go to **MANAGE** > **Semantic Types** in the banner.
3. Click line with the semantic type.
4. Click the Delete (X) icon.
5. Click OK.

Click on the Publish button in order to make the changes available to bridges when harvesting.

Manage Default Worksheets

One may manage the system type worksheets which when shared can be the default worksheets for various users and groups of user.

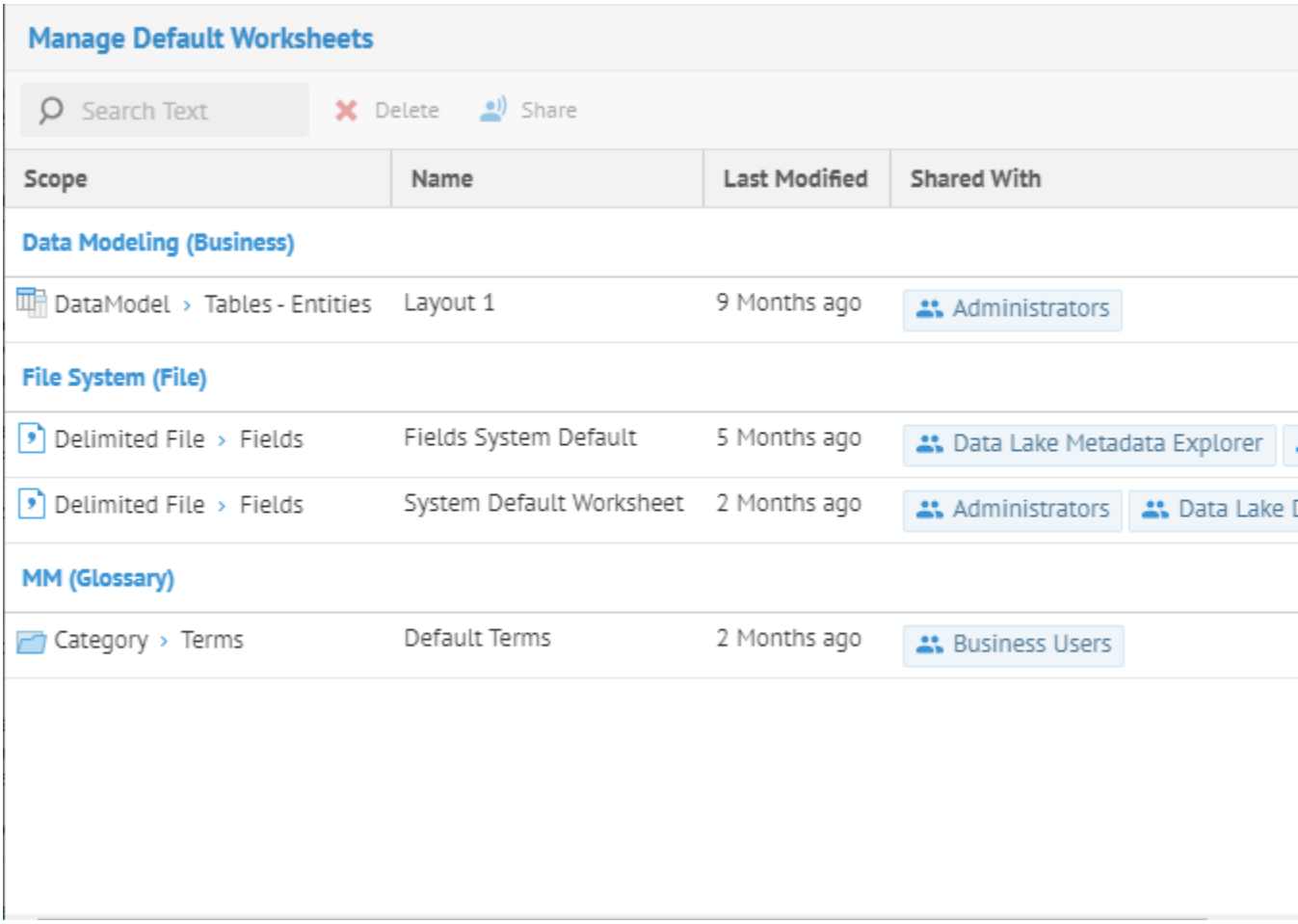
Steps

1. Sign in as a user with at least the **Application Administrator** security role.
2. Go to **MANAGE** > **Default Worksheets** in the banner.
3. From here you may:
   - Rename a worksheet
   - Share a worksheet with users and groups of users
   - Delete a worksheet.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Example

Sign in as Administrator and go to **MANAGE** > **Default Worksheets** in the banner



The worksheets are grouped by category (scope). Within these groups, they may be sorted by clicking that column header.

Manage Default Dashboards

One may manage the system type dashboards which when shared can be the default dashboard and thus home page for various users and groups of user.

Steps

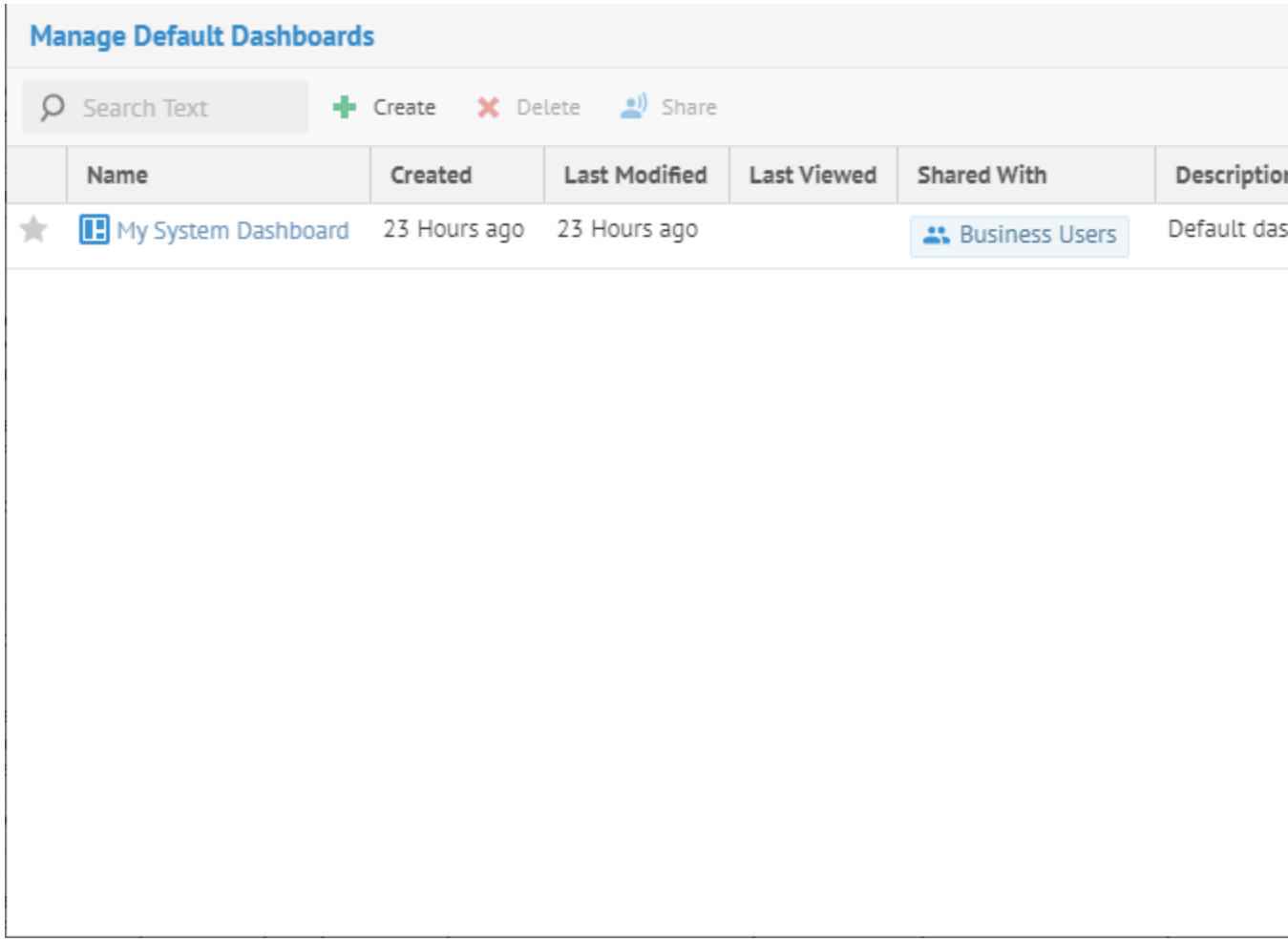
1. Sign in as a user with at least the **Application Administrator** security role.
2. Go to **MANAGE** > **Default Dashboards** in the banner.
3. From here you may:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

- Rename a dashboard
- Share a dashboard with users and groups of users thus making that the default home page for those users
- Delete a dashboard
- Create new default dashboards.

Example

Sign in as Administrator and go to **MANAGE** > **Default Dashboards** in the banner



Manage Presentations

One may manage the system type presenations which when shared can be the default dashboard and thus home page for various users and groups of user.

Steps

1. Sign in as a user with at least the **Application Administrator** security role.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

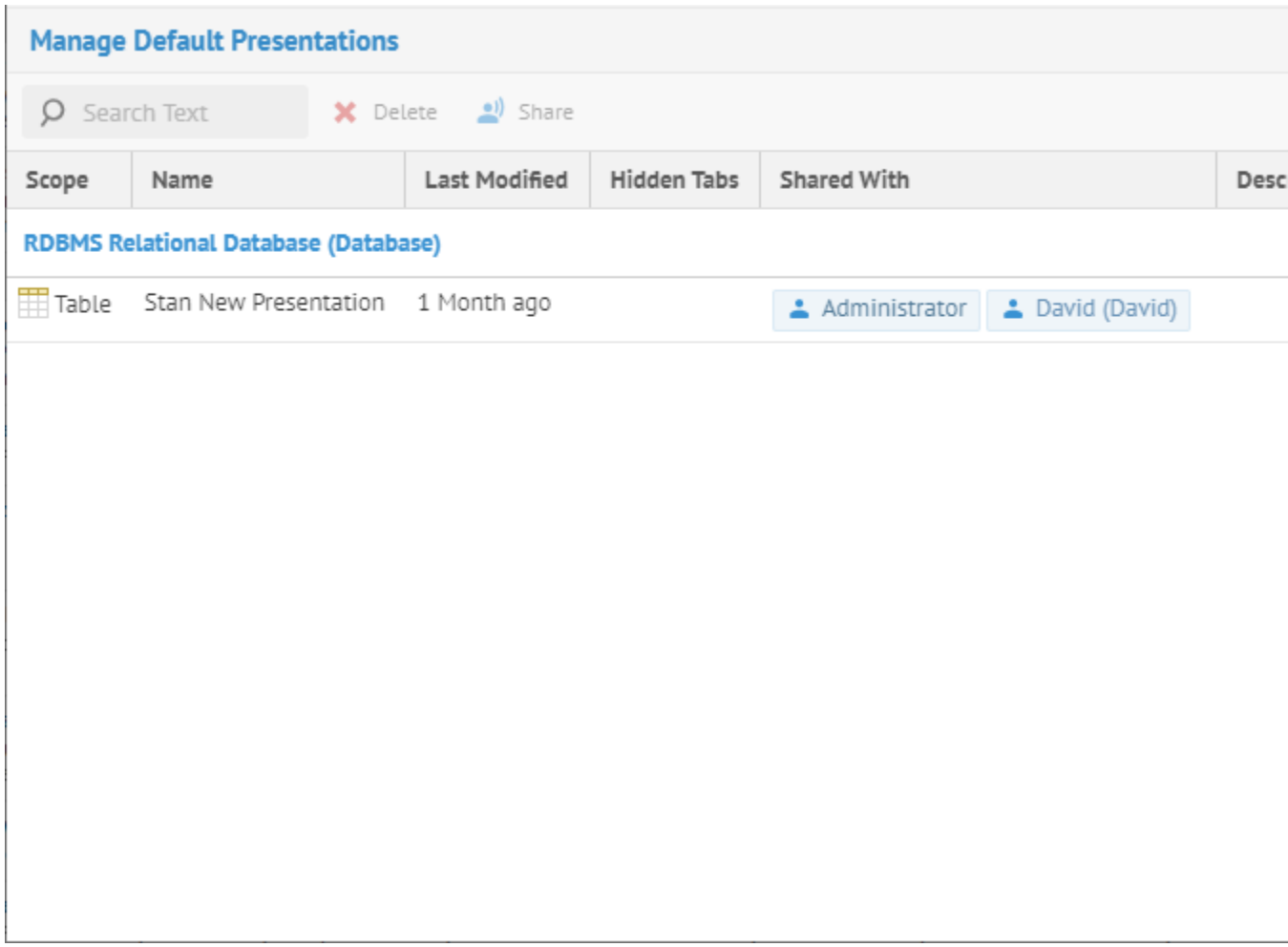
2. Go to **MANAGE** > **Default Presentations** in the banner.

3. From here you may:

   - Rename a presentation
   - Share a presenatation with users and groups of users thus making that the default presentation for that type of object for those users
   - Delete a presentations

Example

Sign in as Administrator and go to **MANAGE** > **Default Presentations** in the banner



The presenations are grouped by category (scope). Within these groups, they may be sorted by clicking that column header.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Manage License

The maximum number of active users allowed depends on your license.

You may see the current status and usage of your license.

Steps

1. Sign in as a user who is a member of the **Administrators** security group.
2. Go to **MANAGE** > **License**.

Example

Sign in as **Administrator** and go to **MANAGE** > **License.**

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Manage License

Update License

License Status

Producer Users: **1** active out of **2** licenses
Consumer Users: **0** active out of 3 licenses

License Usage

From: Select Date 00:00

To: Select Date 00:00

DOWNLOAD LICENSE USAGE

License Text


```xml
<?xml version='1.0' encoding='UTF-8' standalone='no' ?>
<License>
    <HostId>6e67ce06</HostId>
    <MacAdress>f8:b1:56:bf:95:02</MacAdress>
    <Version>10.1.0</Version>
    <ConcurrentConsumers>3</ConcurrentConsumers>
    <ConcurrentProducers>2</ConcurrentProducers>
    <NamedUsers>0</NamedUsers>
    <SoftwarePackages>
        <Package Id='1' Name='Meta Integration Metadata Management (MIMM)' />
        <Package Id='2' Name='Meta Integration Metadata Integration (MIMI)' />
        <Package Id='3' Name='Meta Integration Version Management (MIMV)' />
        <Package Id='4' Name='Meta Integration Metadata Authoring (MIMA)' />
        <Package Id='5' Name='Meta Integration Reporting' />
        <Package Id='43' Name='Meta Integration Data Modeler' />
    </SoftwarePackages>
    <Key>MCwCFAHyyEy+rRlQPXA3VuEMUAnqN32dAhQvY7yoZVKuMPl6Bag/EfvMd+387A==</Key>
</License>
```


The number of users who are acitive and how many are licensed is presented

In addition, the duration of usage of the current license is also presented.

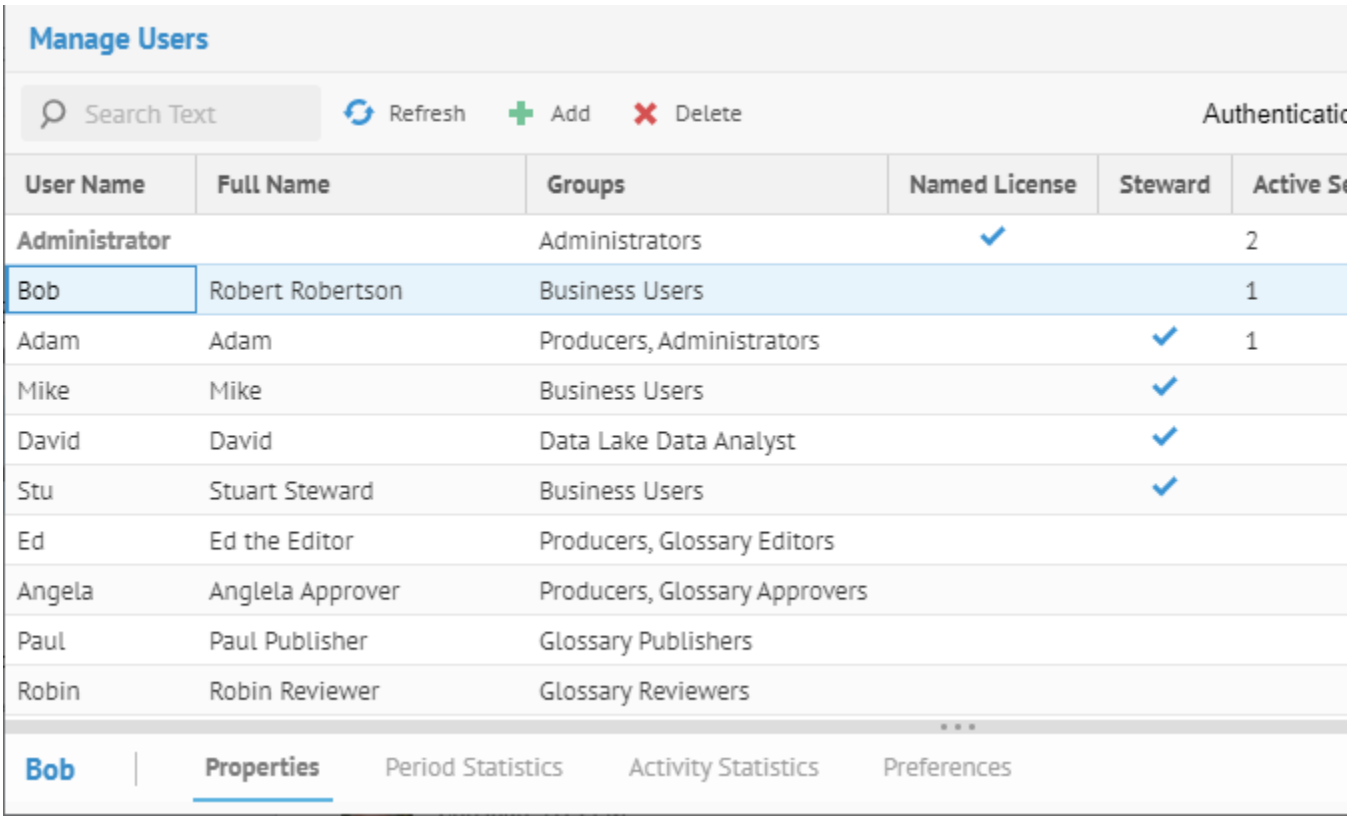
Finally, the actual text inside the license details the features which are included.

*The **Administrator** user is never counted as part of any license maximum number of users as the **Admistrator** user must be able to sign in at any time.*

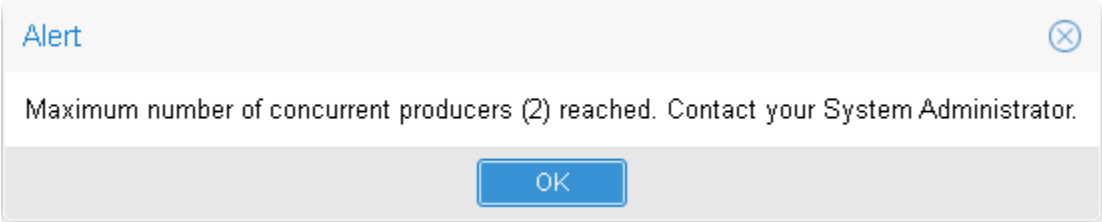
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

If you have an unlimited number of users with your license then any user may log in multiple times with the same user name.

You may also see information about who is a producer vs. consumer and who is active in **MANAGE > Users**.



When someone signs in that would exceed the maximum number of that type of users, a message like this appears:



Explore Further

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Named vs. Concurrent Users

The maximum number can be based on a maximum number of named users, or more likely a maximum number of concurrent users (among all users) which may be active at a given point in time. By default, the maximum number of concurrent users applies to any type of users from advanced administrators to business users.

Producers vs. Consumers

A concurrent user license can be split in two maximum limits:

- *Metadata producers* who are read-write concurrent users such as data architects, data stewards, data modelers, glossary editors, mapping designers, developers and any advanced users with access to all functionalities.
- *Metadata consumers* who are ready-only concurrent users such as data users, analysts, reviewers who can create worksheets/dashboards, add comments/social curation)

With this split license, users are considered to be metadata consumers by default. In order to designate a user as a produces, you must assign them tobe a part of the predefined special group called **Producers**.

Download License Information

In order to request a license, you must first generate the license information (HostInfo.xml file) unique to your application server.

Steps

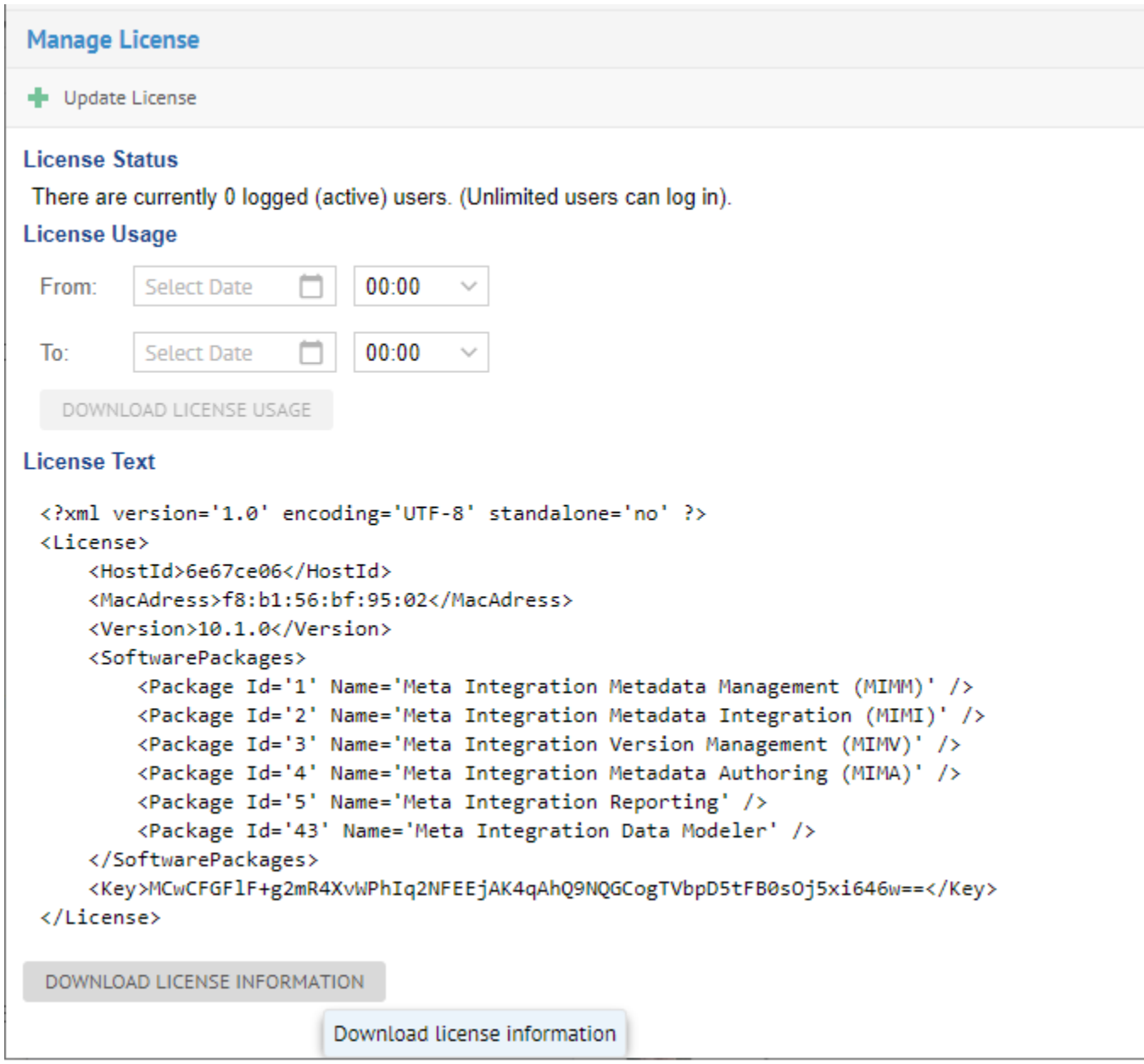
1. Sign in as a user who is a member of the **Administrators** security group.
2. Go to **MANAGE** > **License**.
3. Click **DOWNLOAD LICENSE INFORMATION**.

Example

Sign in as **Administrator**.

Go to **MANAGE** > **License**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click **DOWNLOAD LICENSE INFORMATION.**

You should save the HostInfo.xml file and send to have a .lic file generated.

Update the License

After receiving the .lic file in response to a request a license, you must upload it to your application server.

Steps

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

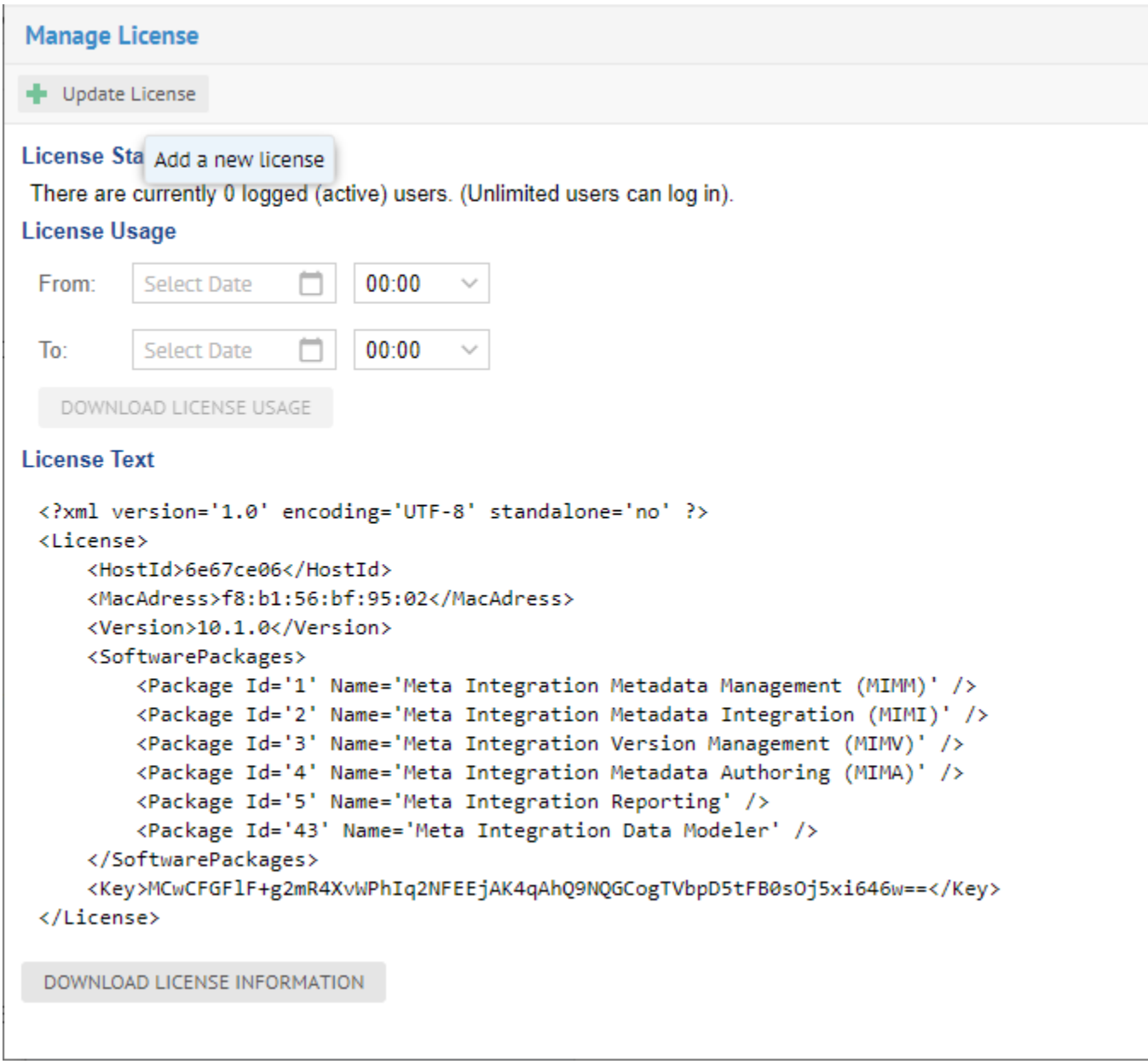
1. Sign in as a user who is a member of the **Administrators** security group.
2. Go to **MANAGE** > **License**.
3. Click **Update License**.

Example

Sign in as **Administrator**.

Go to **MANAGE** > **License**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Click **Update License.**

*The new license has replaced the old. Refresh the browser to see the new **License Text**.*

Manage System

Administer the Database

Many of the common database management tasks may be performed from the **MANAGE > System** UI without the need to connect directly to the database server.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Steps

1. Sign in as a user with at least the **Admin** security role.

2. Go to **MANAGE** > **System** in the banner.

3. Run Database Maintenance

> *The database maintenance is a multi-step operation, including:*
>
> - *it will perform actual purge of model data*
> - *it will maintain the database tables and indexes*
> - *it will maintain the search index*
>
> *This is a fairly heavy operation. So there is another operation to help people who perform large initial imports. The Build Database Table Indices is available also, which simply performs step 2 of the database maintenance operation.*
>
> *The database purge of deleted models is limited to a maximum of 2 hours per database maintenance execution. Therefore, if you have not deleted / cleaned up your models for a long time, it will take several database maintenance executions to purge all deleted models.*

Clear Database Cache

Certain repository objects are cached for faster retrieval. You may clear the cache so that the Repository will load these objects from the database the next time they are accessed.

Steps

1. Sign in as a user with at least the **Admin** security role.

2. Go to **MANAGE** > **System** in the banner.

3. Click on the **Clear Cache** button.

4. Select which cache to clear.

Run performance script

The performance script allows you to assess the relative performance of your system.

Steps

1. Sign in as a user with at least the **Admin** security role.

2. Go to**MANAGE** > **System** in the banner.

3. Click on **Scripts** > **Test Performance**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Enable/disable debug logging

You may turn on debug level logging in order to better diagnose issues you may see reported in the logs or to display internal.

This setting applies to all subsequent actions which produce logs, whether manually invoked or scheduled. It also means that debug messages will appear in the Tomcat logs.

*Debug logging is VERY verbose. Thus, be sure to turn off (**Disabled**) debug level logging as soon as you have captured your diagnostics. In addition, the debug logging is reset to **Disabled** when you restort the application server.*

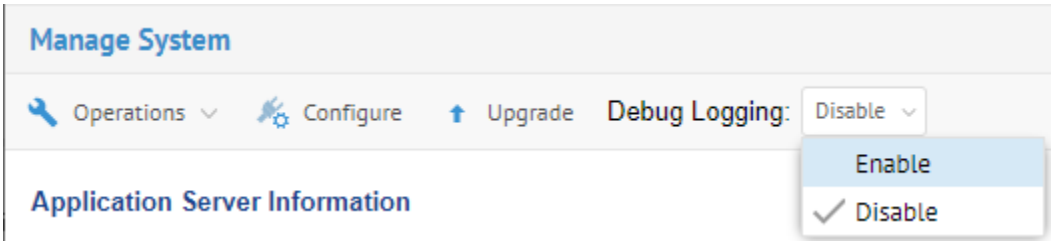
*Debug level messages are not shown **MANAGE > System** Log, nor is it part of the download there. Instead, when you enable debug logging, those messages are written to the Tomcat server logs on the application server machine. You may find these in the installation directory at*

`/data/logs/tomcat/`

Steps

1. Sign in as a user with at least the **Admin** security role.
2. Go to**MANAGE** > **System** in the banner.
3. Select **Enable/Disable** in the **Debug Logging** pull-down.

Example



Upgrade

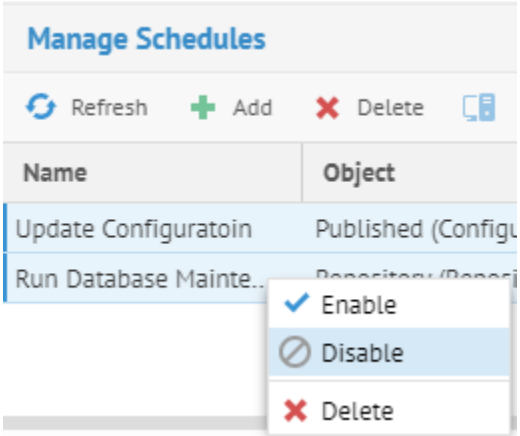
The **Upgrade** operation allows you to apply a software patch to the server from the UI. Each patch is in the ZIP format and is a collection of files and directories organized in the same manner as the home directory of the application server.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

The most critical patches are officially delivered as *cumulative* patches.

You should inspect the currently running Operations and either let them finish or STOP them before the upgrade.

You may disable all schedules without deleting them by selecting the schedules you wish to set in the list and right-clicking.



MIMM Cumulative Patch Upgrade

Contains patches for the application server and UI, in the format:

MIMM-CumulativePatch-1010-20200423.zip

They are delivered in the patch ZIP file in the path **tomcat/webapps.** These cumulative patches include an updated MM.war file which will be automatically deployed by the Tomcat web application server once there are no active operations (e.g., database maintenance or model import).

However, the above upgrade process will NOT wait for all users to be logged out.

The date displayed is the date of from the tomcat\webapps\MM.war which can be slightly older than the MIMM cumulative patch if that patch did not provide and updated .war file.

While Tomcat is re-deploying the new .war file, users may temporarily experience this error message:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Request to the server failed.

Steps

1. Sign in as a user with at least the **Admininstrator** security role.
2. Go to**MANAGE** > **System** in the banner.
3. Click on **Upgrade**.
4. **Browse** for the patch package.
5. Click **UPGRADE**.

Examples

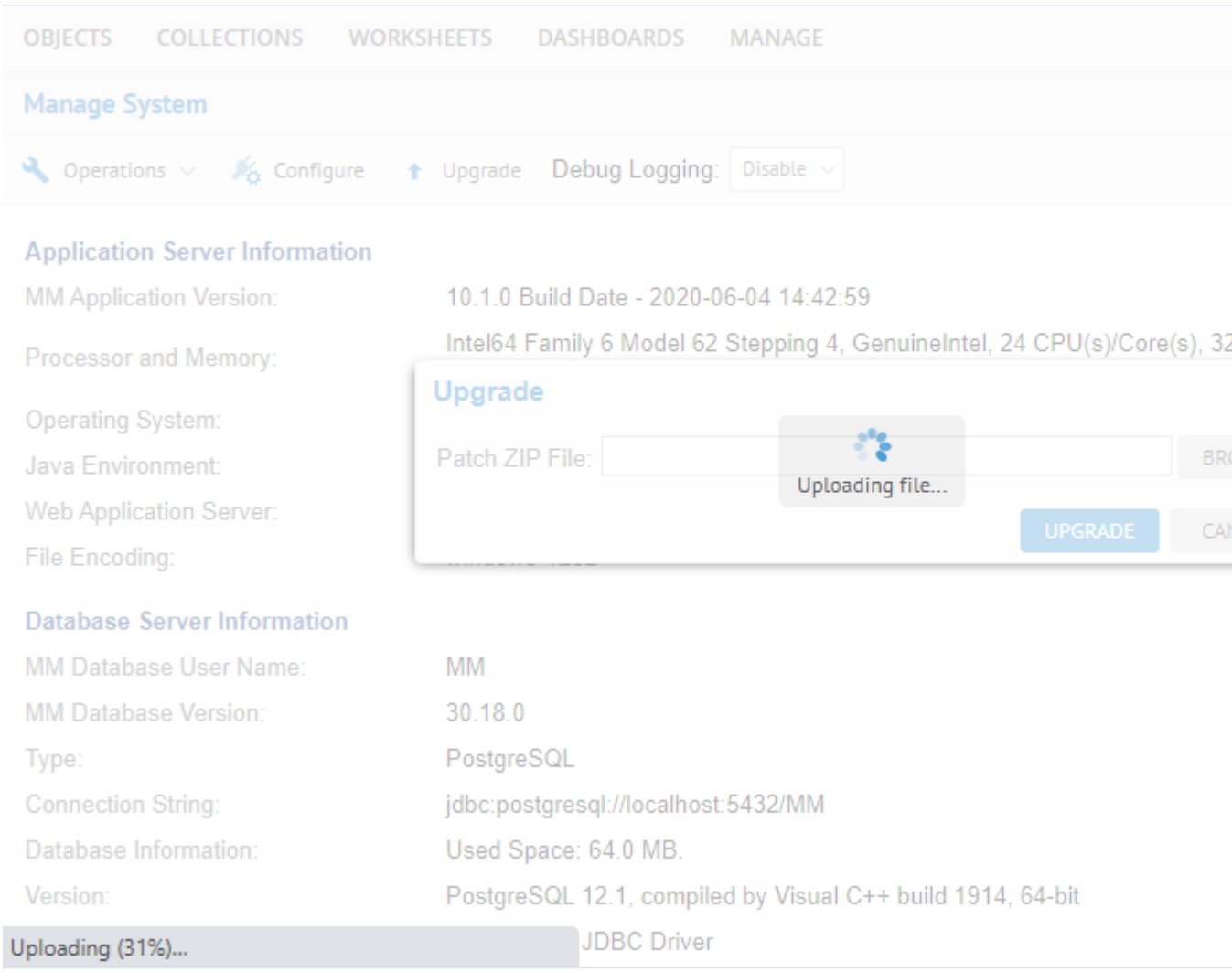
Sign in as **Administrator** and go to **MANAGE > System**.

Click on **Upgrade**.

Browse for the patch package.

Click **UPGRADE**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



MIMM Customization

Contains look & Feel customization, e.g., for the logo and banner of the application server. They are delivered in the patch ZIP file in the path **conf/resources.**

Use the same upgrade process as for the MIMM cumulative patches.

Steps

1. Sign in as a user with at least the **Admin** security role.
2. Go to **MANAGE** > **System** in the banner.
3. Click Upgrade.
4. Browse for the patch file (.ZIP) to apply.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Software Upgrade Specialized Tasks

Migration of single model databases to multi-model databases

As part of the on-going improvements in MIMM , many import bridges are updated to import the source metadata at multi-models, rather than huge single models. This improvement is implemented to ensure that ther are no size limits when importing from exceedingly large sources.

A good example of this improvement is in the database based bridges. For example, a Hadoop based datalake may have thousands of databases each with many thousands of data elements (tables/columns). If imported as one model, this source becomes unwieldy. However, upgrading the bridge so that it impors each database as a separate model, means the content is a multi-model, and each model within is of a manageable size.

In general, one is going to first migrate from an earlier major release of MIMM where database model contents were single-model only, to a newer version of the product where database model contents are multi-models. Thus, first you must follow the instructions to upgrade to the new version of in MIMM . Then, you will have a number of database models contents which are single-model contents which must be migrated.

The migration may be performed per model content basis or on a folder or the entire repository. This last option is the recommendaed route. The process will create new configurations based upon the existing ones for each configuration which contains one or more single model content(s) that are migrated.

The elements which are migrated include:

- The model content itself is re-harvested as a multi-model
- Classifications
- Semantic Mappings
- Stitchings
- Custom Attributes
- Comments and Social Curation
- Table level Relationships.

As part of the migration from single to multi model, certain structural data elements will change:

- **Schema** -> **Database Schema**
- **Database** -> **Database Server**.

This means that any custom attribute on **Schema** or **Database** objects cannot migrate until those same custom attributes are also assigned to the new structure data element (either **Database Schema** or **Database Server**).

Steps

1. Go to **MANAGE** > **Custom Attributes**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

2. Select a custom attribute from the list which applies to either **Scheme** or **Database**.
3. Click **CHOOSE** next to Scope and include either **Database Schema** or **Database Server**.
4. Finish all the other custom attributes from the list which applies to either **Scheme** or **Database**.
5. Go to **MANAGE > Repository**
6. Right-click on the **Repository** at the root of the tree and select **Operations > Migrate to multi-model databases**.

Example

For this example, we used a special import directly from Oracle with two schemas (**Accounts Receivable** and **Accounts Payable**) rather than separate models from SQL Server DDL.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

JDBC 2 schemas | Oracle Database (via JDBC) from Enterprise Architecture

Overview | **Import Setup** | Import Options | Naming Standards | Security | Version

Bridge: Oracle Database (via JDBC)

Import S

Parameter	Value
Driver location ⚠	
Host*	oraapps
Port*	1521
Service*	orcl
User	JDBC
Password	********
Schema	'MITI-FINANCE-AP';'MITI-FINANCE-AR'
Tables, Views	
Stored procedure d...	Signature
Import indexes	False
Miscellaneous	

Help

BRIDGE
Import too
(http://ww
Import int
Model, Da
Stored Pr
(Expressi
Oracle Da
Import bri
08 17:03:

BRIDGE
IMPORTI
USING JD

This bridg
with a phy
physical r
paramete
local conn
workstatio
to the ind
detailed e

Important
The user
session a

Test

We ensure that we are creating a single-model database model by NOT specifying "-multi-model" in the ***Miscellaneous*** *bridge parameter.*

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

PAYTRANS to AR | Metadata Excel Format from Enterprise Architecture/Operational Data Stores (ODS) IMPORT

Overview | Import Setup | Import Options | Security | Versions | Log | Connec

Filter | Edit | View Log | Stitching Report

Connection Name	Usage	Store	Path	Catalog	Schema
Working directory	Source	PAYTRANS		N/A	N/A
Target	Destination	JDBC 2 schemas	N/A	N/A	dbo -> MITI-FI

AR to Staging | Talend Data Integration from Enterprise Architecture/Data Warehouse (DW) IMPORT

Overview | Import Setup | Import Options | Security | Versions | Log | Connectio

Filter | Edit | View Log | Stitching Report

Connection Name	Usage	Store	Path	Catalog	Schema
AccountsReceivable	Source	JDBC 2 schemas	N/A	N/A	MITI-FINANC
Staging-DW	Destination	Staging DW	N/A	N/A	dbo

AP to Staging | Talend Data Integration from Enterprise Architecture/Data Warehouse (DW) IMPORT

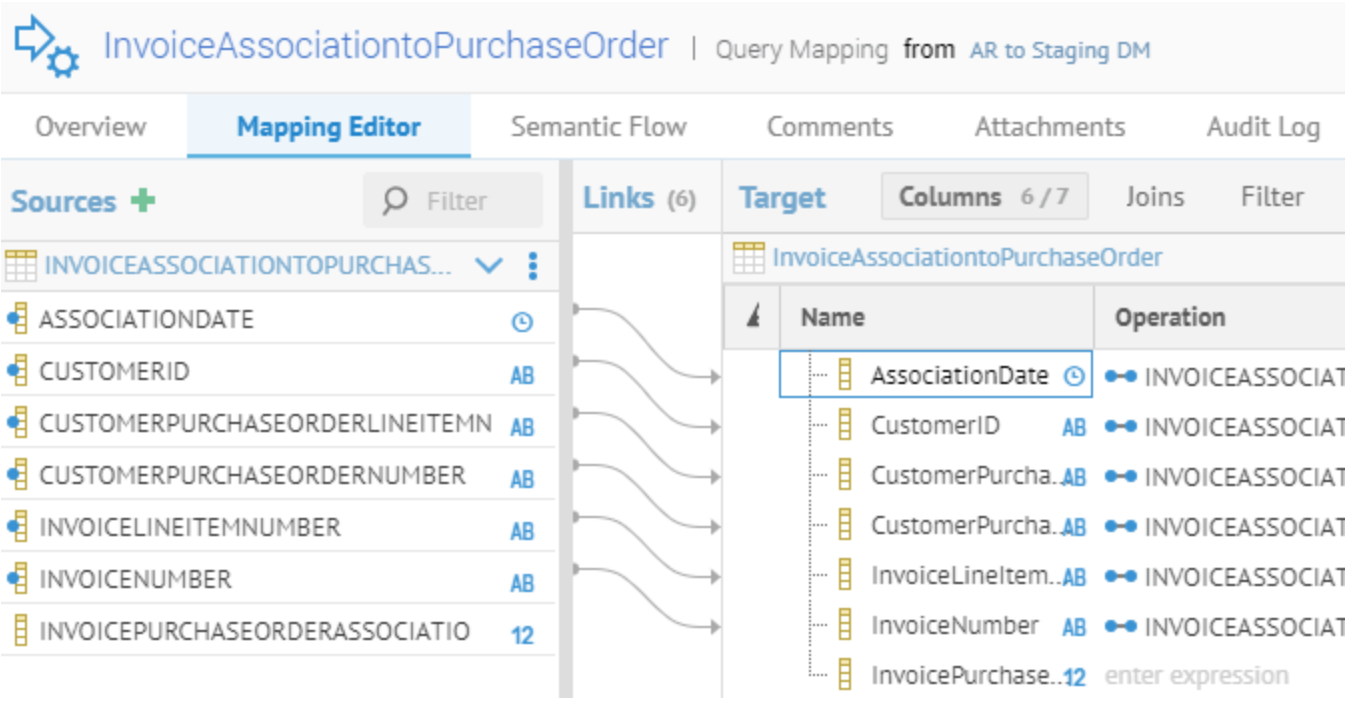
Overview | Import Setup | Import Options | Security | Versions | Log | Connectio

Filter | Edit | View Log | Stitching Report

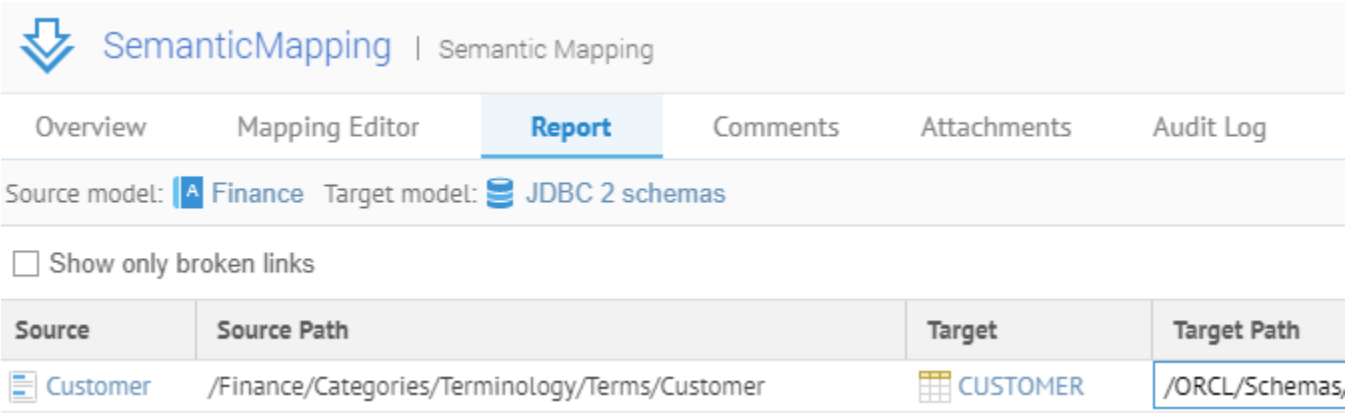
Connection Name	Usage	Store	Path	Catalog	Schem
AccountsPayable	Source	JDBC 2 schemas	N/A	N/A	MITI-F
StagingDW	Source / Destination	Staging DW	N/A	N/A	dbo

*Note, this model is stitched to the existing **PAYTRANS** and **Staging DW** data stores.*

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



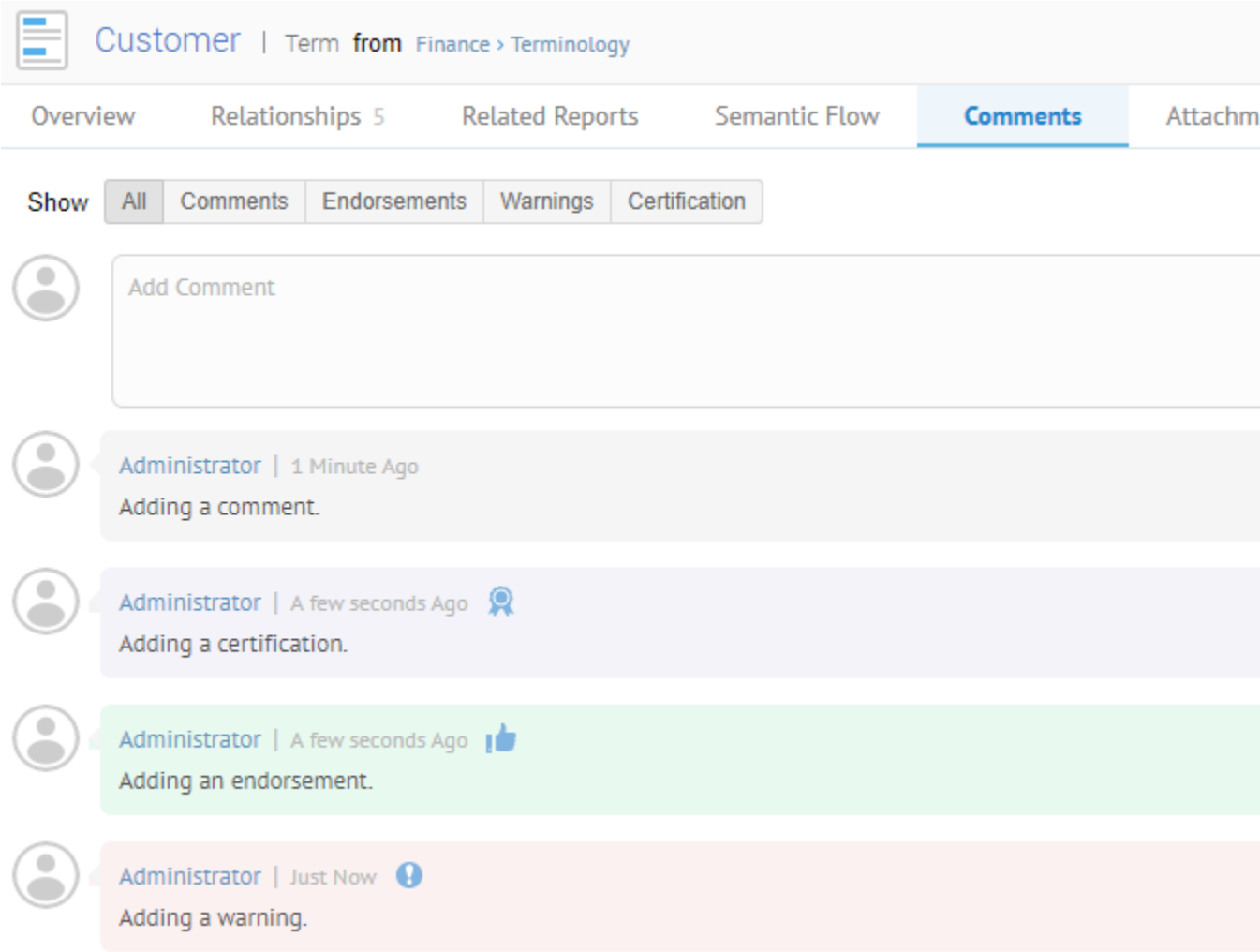
*Mapped using a data mapping to the **Staging DW** model.*



*The **ADDRESS** table is mapped semantically from the **Finance** glossary.*

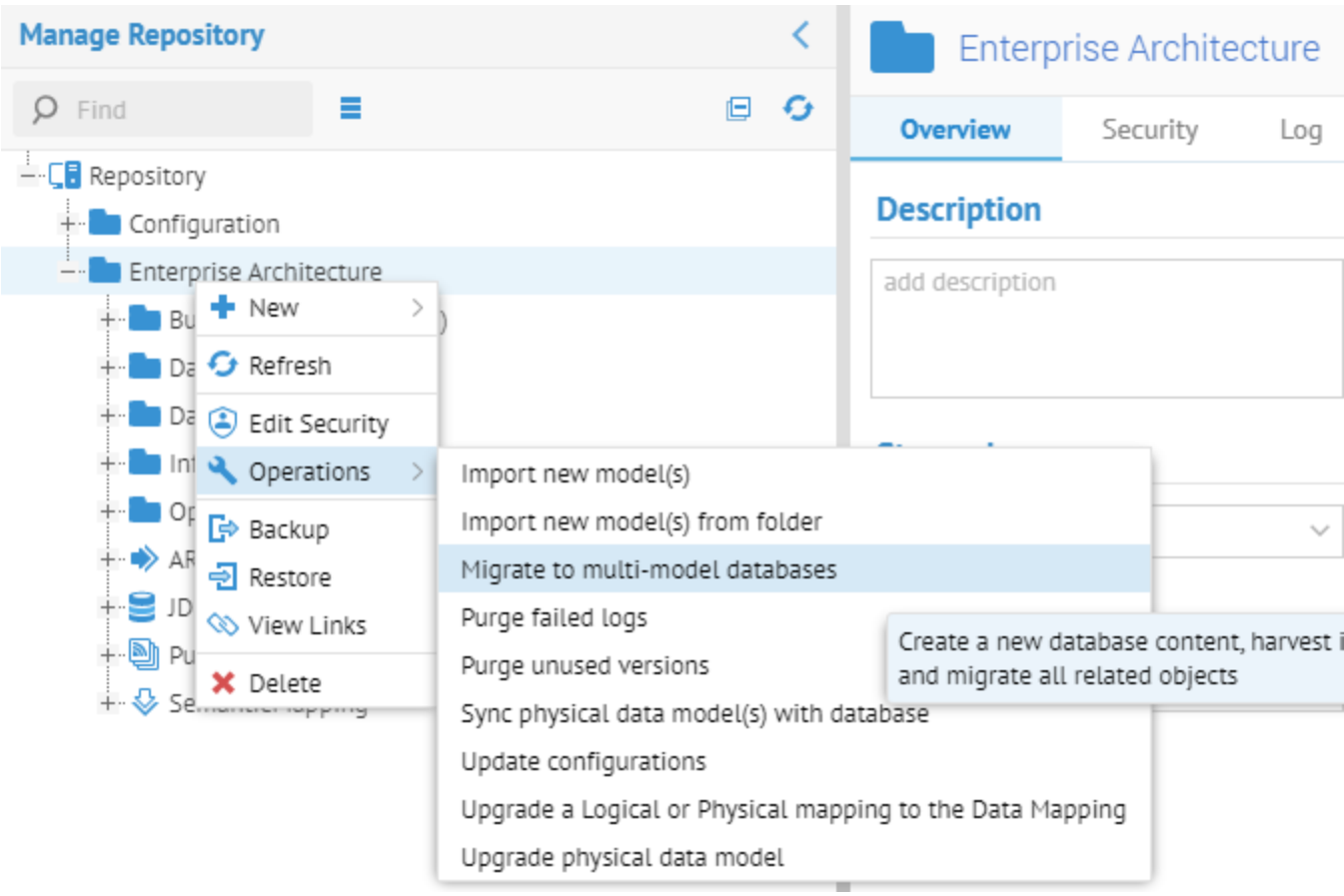
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

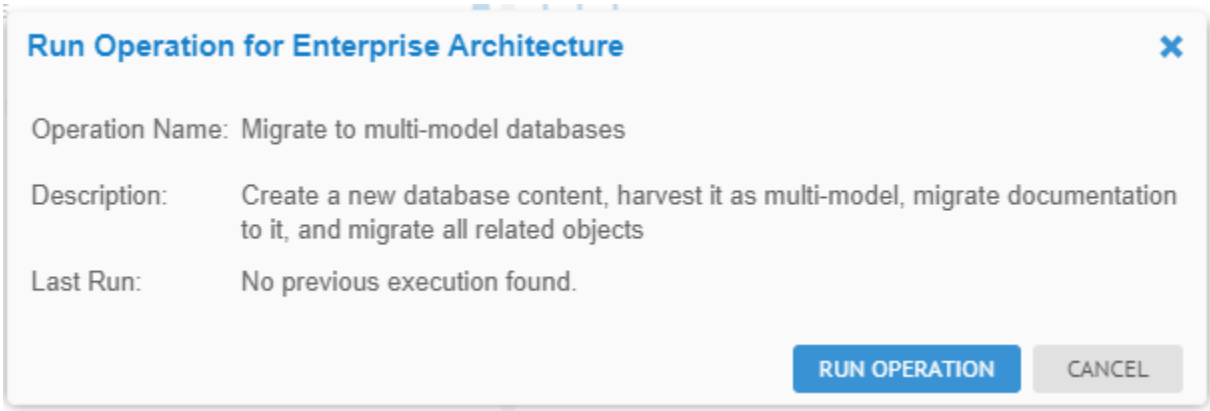
*The **CUSTOMER** table is classified*



*The **CUSTOMER** table is commented on, certified, endorsed and warned, and has custom attribution.*

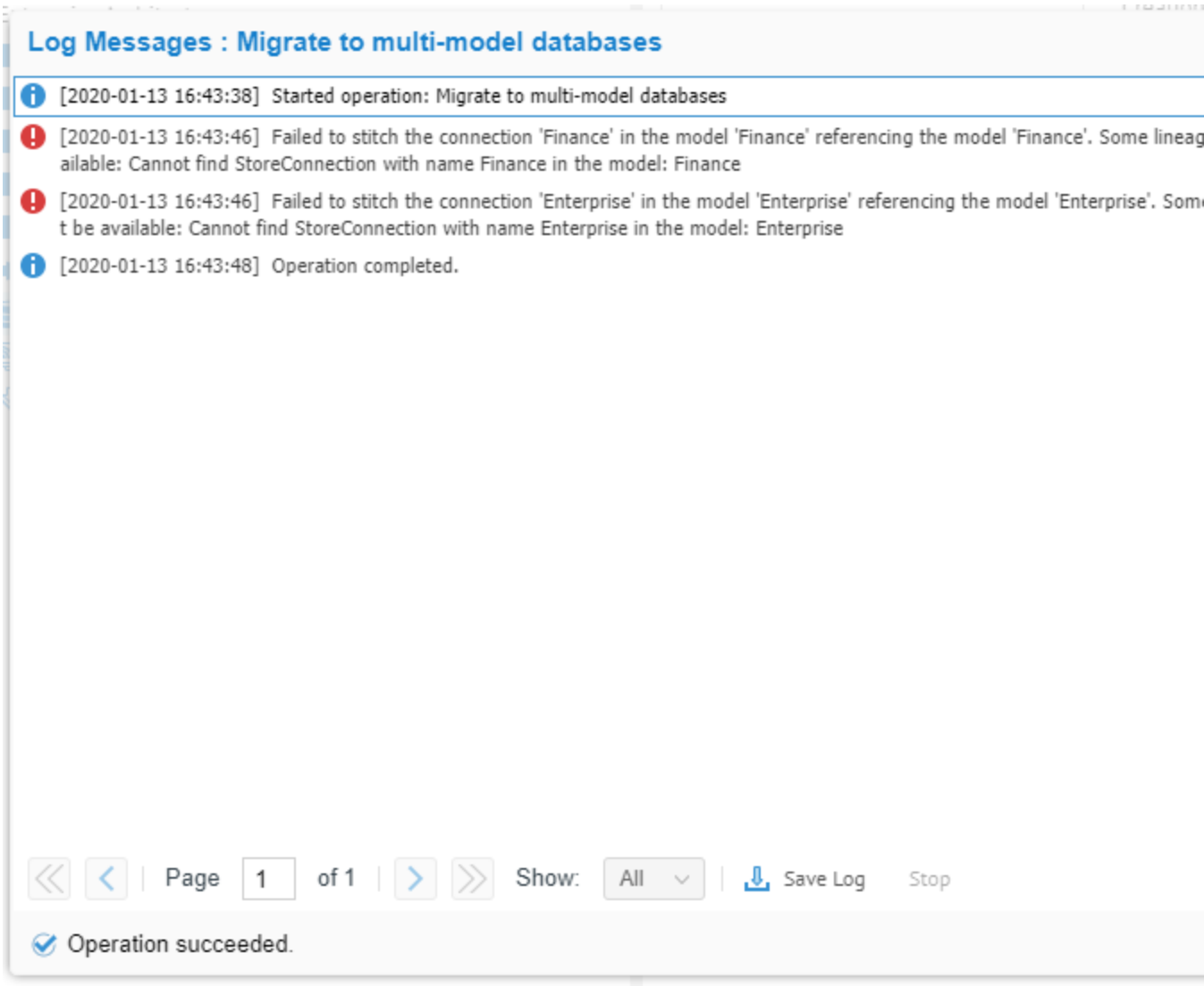
Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)





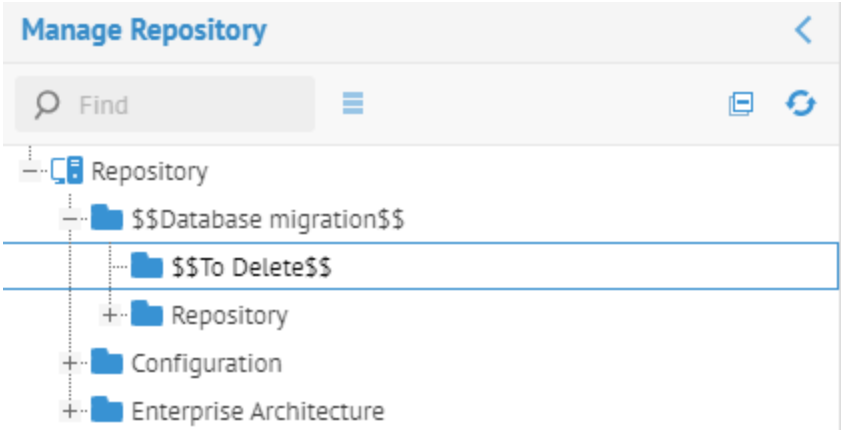
Now, let's migrate. Go to **MANAGE > Repository** and Right-click on the **Repository** at the root of the tree and select **Operations > Migrate to multi-model databases.**

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



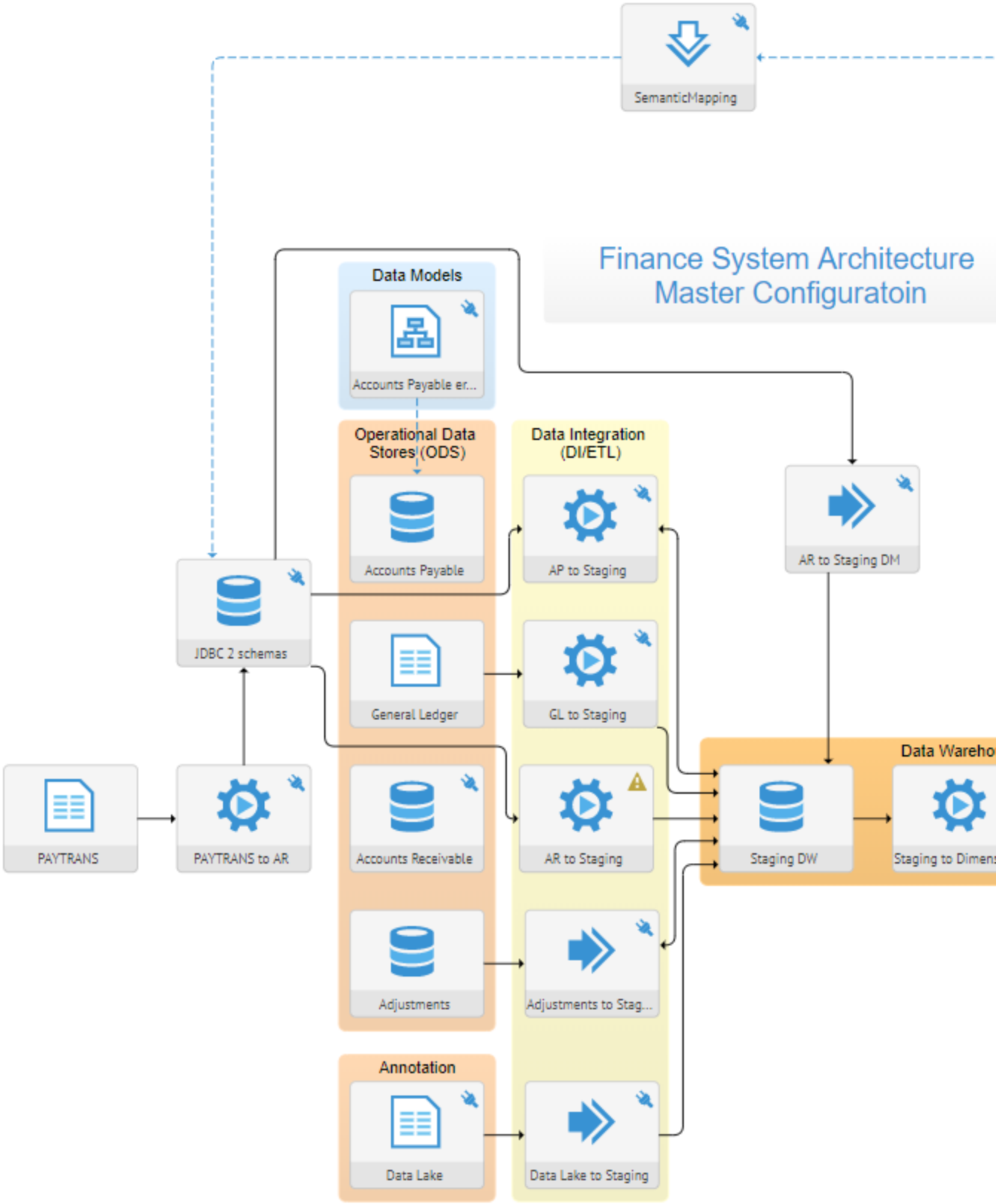
The log presents any issues found.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



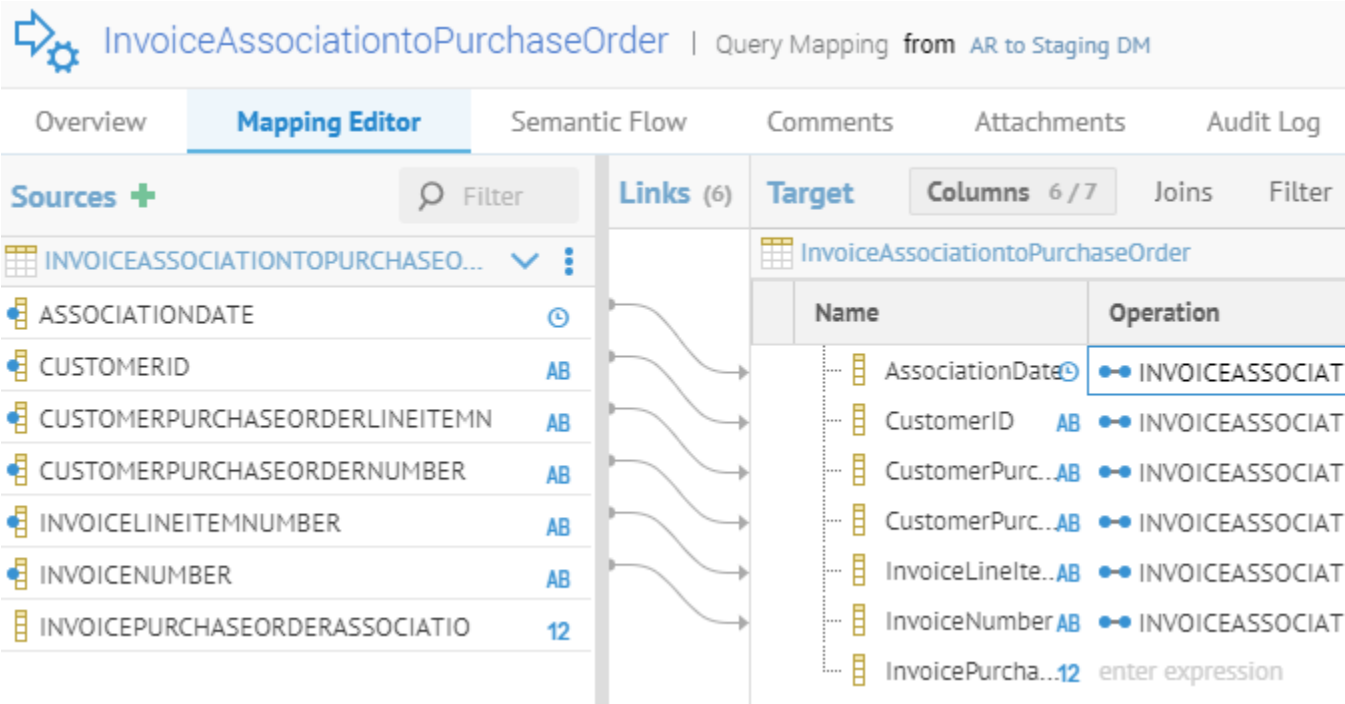
There is a old folder structure with the older configuraton.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

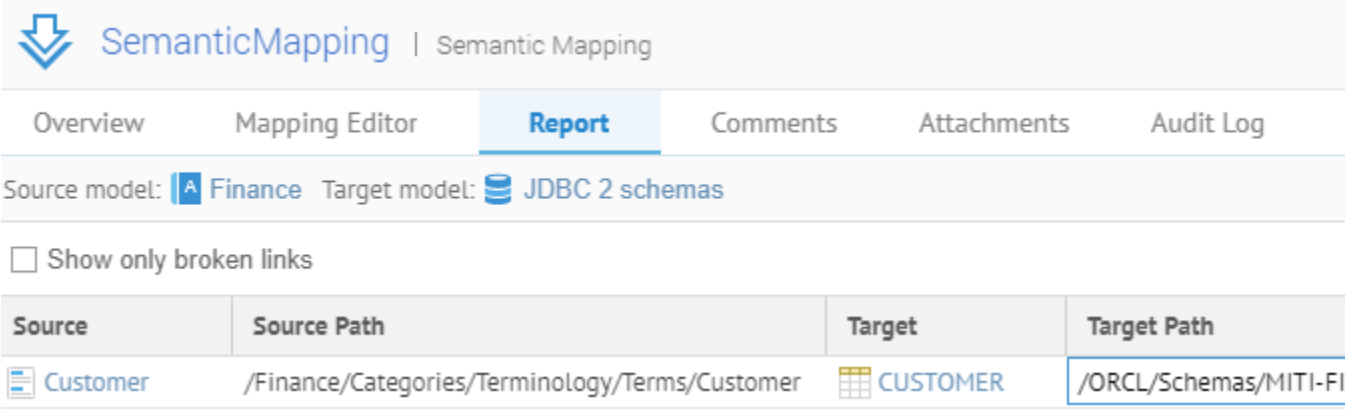


Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

*In the new configuration, we have this new model is stitched to the existing **PAYTRANS** and **Staging DW** data stores.*



*Mapped using a data mapping to the **Staging DW** model.*



*The **CUSTOMER** table is mapped semantically from the **Finance** glossary.*

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

CUSTOMER (Customer *) | Table from JDBC 2 schemas › MITI-FINANCE-AR

Overview | Related Diagrams 0 | Columns 3 | Data Sample | Relationships | Relat

Business Description inferred from Customer

Any entity that has recieved a product and/or service and will be invoiced

Columns 3

- CUSTOMERDESCRIPTION
- CUSTOMERID
- CUSTOMERNAME

Data Sampling and Profiling

Data Profiling has never been run on this object. Request now

Comments 2

Administrator | 4 Days Ago
Another comment

Administrator | 4 Days Ago
Comment on Customer

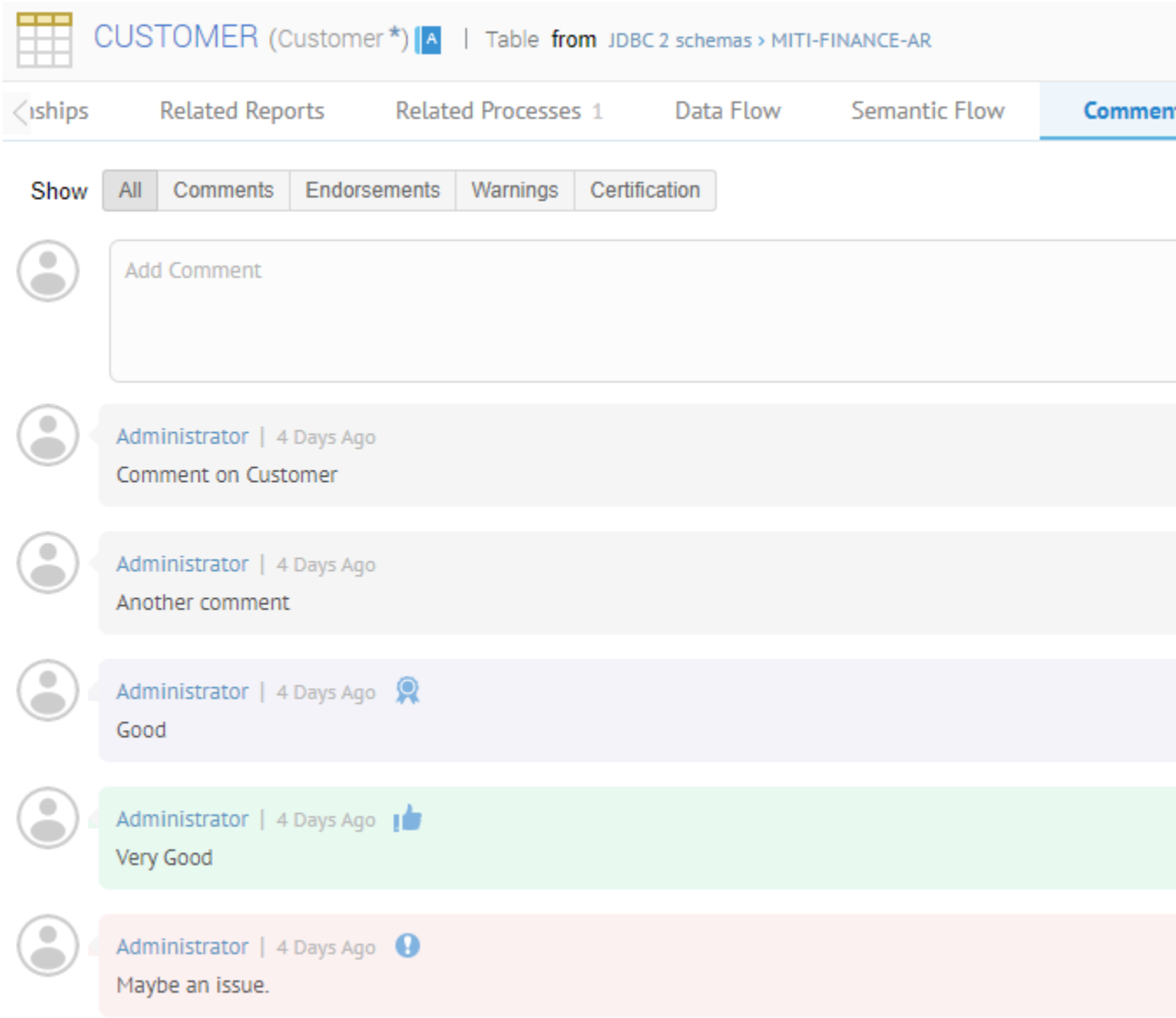
Audit Log 1 - 5 of 5

Administrator | 4 Days Ago
Comment was added:

> Another comment

Copyright

*The **CUSTOMER** table is classified*



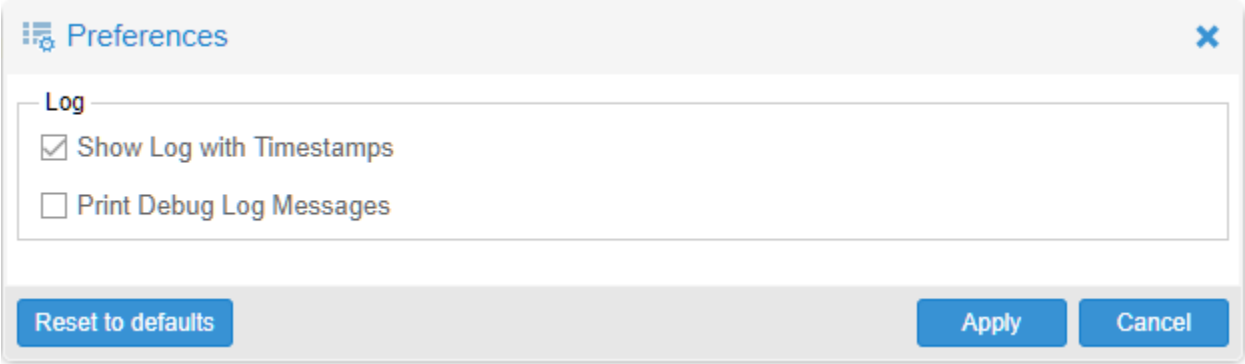
*The **CUSTOMER** table is commented on, certified, endorsed and warned, and has custom attribution.*

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Preferences

Steps

1. Sign in as a user with at least the **Admin** security role.
2. Go to **MANAGE** > **Preferences** in the banner
3. Click the Reset to defaults button to reset all UI customizations to default.



Dates in Worksheets

Dates and times are stored and presented in UTC format in:

- Log entries
- Administration pages
- Etc.

Other Useful Management Tasks

Manage Processes

One may use the Process Manager icon in the upper right to see at a glance whether processes are running and also open their logs.

Obtain an object ID

For many admin task and most RESTful API calls, it is necessary to know the internal **object_id** of particular metadata elements, models, contents, etc.

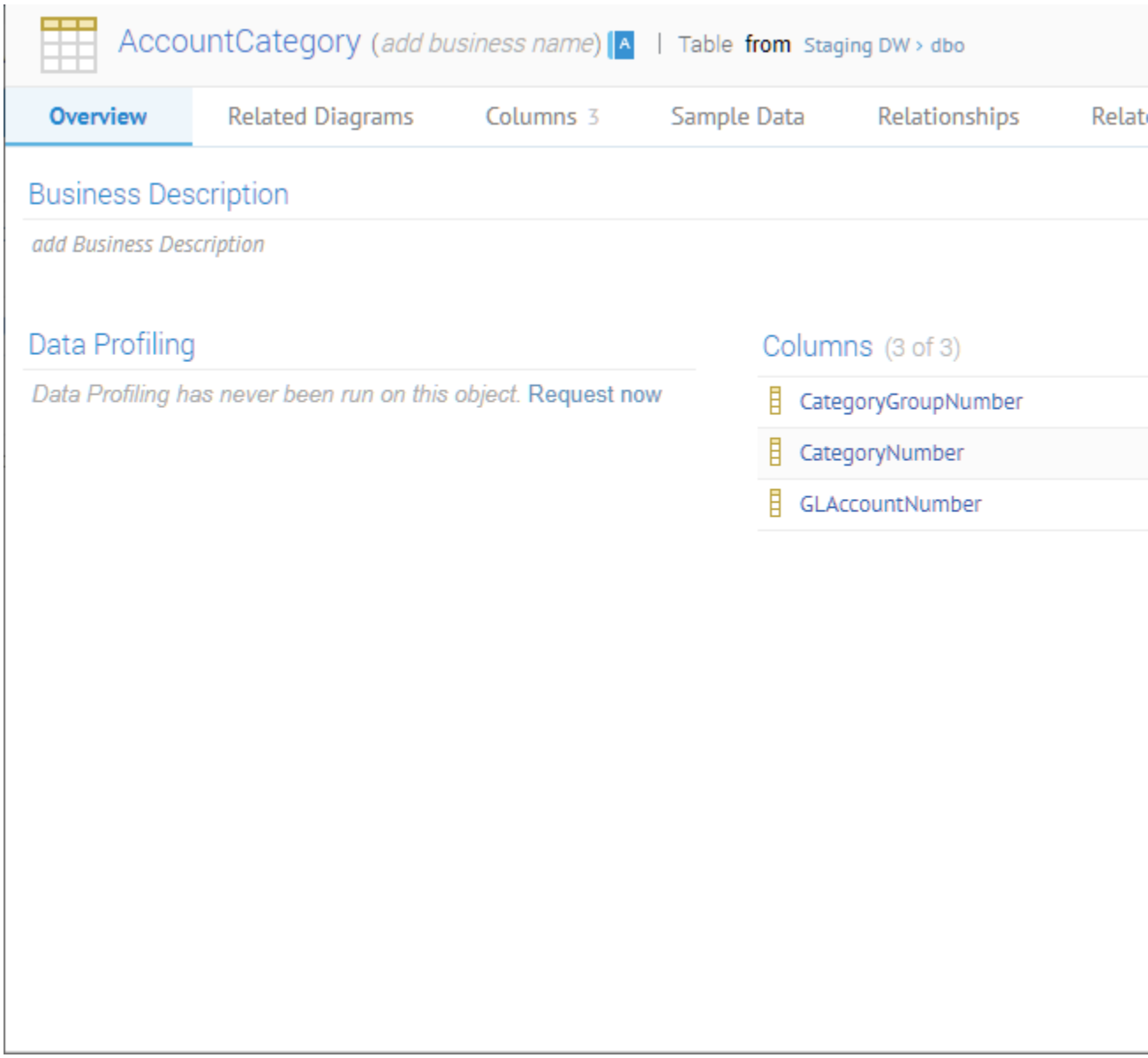
Steps

1. Go to **MANAGE > System** and select **Enable** in the **Debug Logging** pull-down.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

2. Navigate to the details page for the metadata element for which you wish to obtain the **object_id**.

3. In the Properties area of the details page, see the **Model Id** and **Object Id** fields.



The Object Id displayed here is in the context of the model it is in. The universal object_id is the combination of the Model Id and Object Id displayed on the details page.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

The universal (repository wide, rather than model specific) object_id that most API calls are looking for is the concatenation of the Model Id and Object Id displayed on the details page. You must separate them with an underscore ("_").

E.g., in this case, the object_id is 37_30.

Be sure to include any negative or minus-signs (e.g., -1_22)

You may remove the debug preference once you have obtained the object_id, as leaving it enabled will greatly increase logging unnecessarily.

Switch to Metadata Manager UI

Steps

1. Edit the URL, replacing everything from "MM" on with "MM/Manager".

Logging "Popular" Search Queries

MIMM is able to log the search queries executed into a csv file.

Steps

To enable the logging of search queries:

1. Create a "search" directory under the "data\logs" directory in the installation folders
2. Restart MIMM

The log contains the following search query details: time, user ID, configuration, text.

To disable the logging of search queries:

1. Delete the "search" directory under the "data\logs" directory in the installation folders
2. Restart MIMM

View Links

Most repository objects are inter-related in numerous ways, e.g.,

- Configuration versions contain versions of models, mappings and glossaries.
- Mappings have source and target models and glossaries
- Etc.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

In order to see these relationships, one may use the View Links options in the metadata manager UI.

Steps

1. Go to **MANAGE > Repository** and the **Repository Panel**.

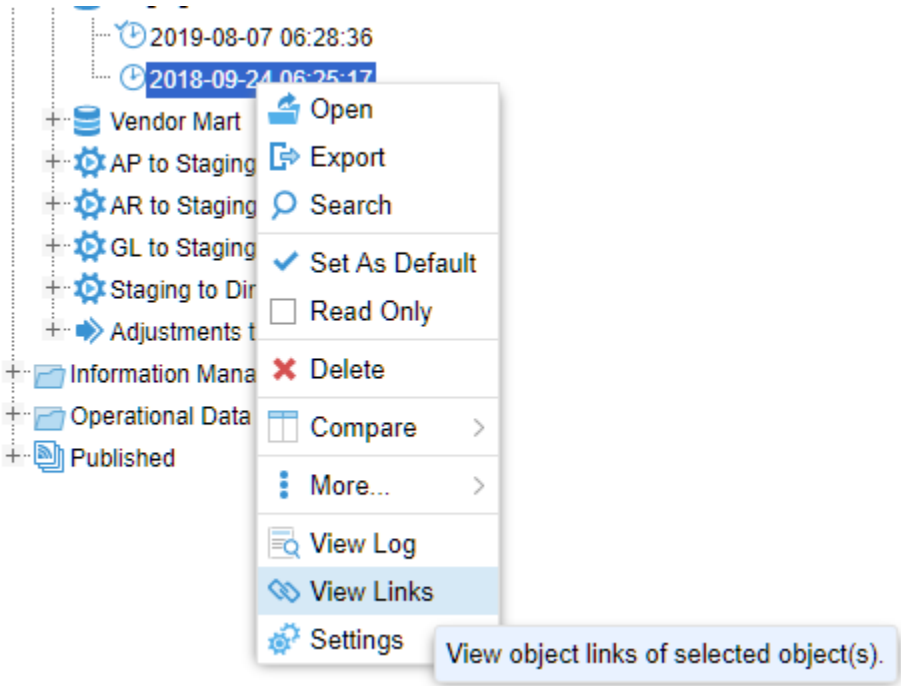
2. Right-click on the object to check select **View Links**.

> *A version of a repository content may have different specific links than other versions of that same content and even from the content as a whole. Be sure to Show versions if necessary.*

Example

Go to the metadata manager user interface and open the **Repository Panel**.

Right-click on the the **Staging DW** model and select **View Links** and note that it is a member of the **Published** configuration version and is the target of mappings.



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

View Links

From Name	From Version	Relationship	To Name
Staging DW	2019-08-07 06:28:36	Membership	Published
Staging DW	2018-09-24 06:25:17	Source/Destination	Adjustments to Sta
Staging DW	2019-08-07 06:28:36	Source/Destination	Adjustments to Sta

Wait more than one hour.

Right-click on the **Data Warehouse** folder and select **More…** > **Operations** > **Purge unused versions**. Click **Run Operation**.

Organize the Repository Tree

You may organize the contents presented in the **Repository Tree** for the Repository as a while.

Repository organization is very important as you may schedule, assign permissions, and perform actions (right-click) by folder.

Steps

1. Sign in as a user with at least the **Editor** security role to the configuration you wish to organize.
2. Go to **MANAGE** > **Repository**.
3. Right-click on the **Repository** or any folder and select **Create** > **Folder** to create folders.

Thus, folders may contain folders.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

4. Drag any content into a folder to organize.

> *Moving a content in the Repository Tree changes the unique path (ID) used to uniquely identify the content, e.g., in the RESTful API or in the URLs. In addition, all permission (security role assignments) are cleared and then re-computed based upon inheritance.*

Analyze Content Statistics

Configuration Statistics

Simple, easy to read statistics report. To be used by any administrator wishing to obtain high level statistics for a given configuration.

Steps

1. Go to **OBJECTS** > **Configuration Statistics** in the banner.

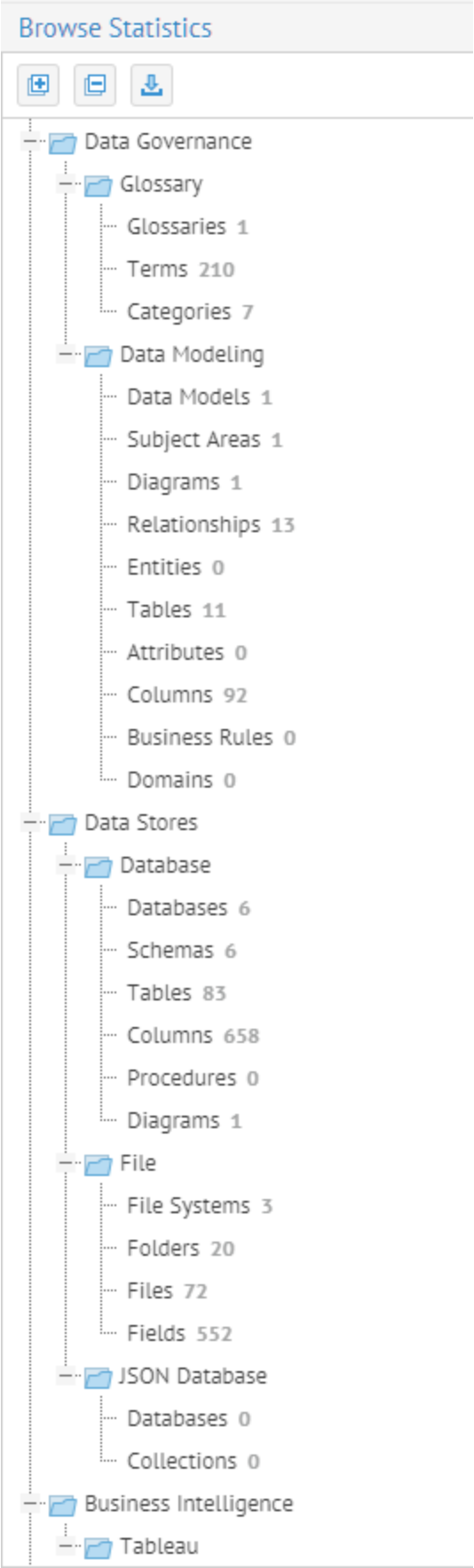
> *The report is presented in the same order as in the **BROWSE > Categories**, as defined in the MM installation directory/conf/MetadtaExplorer.xml file. (See the Customization Tutorial for more details).*

Explore Further

You may download ( ) the report to CSV format.

Example

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Repository Statistics

(Default) Statistics

Simple, easy to read statistics report. To be used by any administrator wishing to obtain high level statistics on the repository content and features used.

Steps

1. Sign in as a user with at least the **Admin** security role.
2. Go to **MANAGE** > **System** in the banner
3. Go to **Scripts** > **Generate repository content statistics**.

Example

[11/Get repository content statistic] 2018-07-25 09:04:37 OPER_S0166

1 Configurations (1 versions)

1 Glossaries (1 versions)

2 Semantic Mappings (2 versions)

3 Data Mappings (3 versions)

18 Models (18 versions)

0 Physical Data Models (0 versions)

0 Naming Standards

0 File Attachments

4 imports from File System (CSV, Excel, XML, JSON, Avro, Parquet)

2 imports from Metadata Excel Format

7 imports from Microsoft SQL Server Database SQL DDL

1 imports from Tableau Server (Repository)

3 imports from Talend Data Integration

1 imports from erwin 9.x Data Modeler (File)

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

1 Servers

1 Schedules

6 Users

4 Groups

1 Folders

System Statistics

To be used exclusively for support purposes debugging DB issues.

Steps

1. Sign in as a user with at least the **Admin** security role.
2. Go to **MANAGE** > **System** in the banner.
3. Go to **Scripts** > **Generate repository system statistics**.

Configuration and Repository Search Statistics

Simple, easy to read statistics report. To be used by any administrator wishing to obtain high level statistics on the repository content and features used.

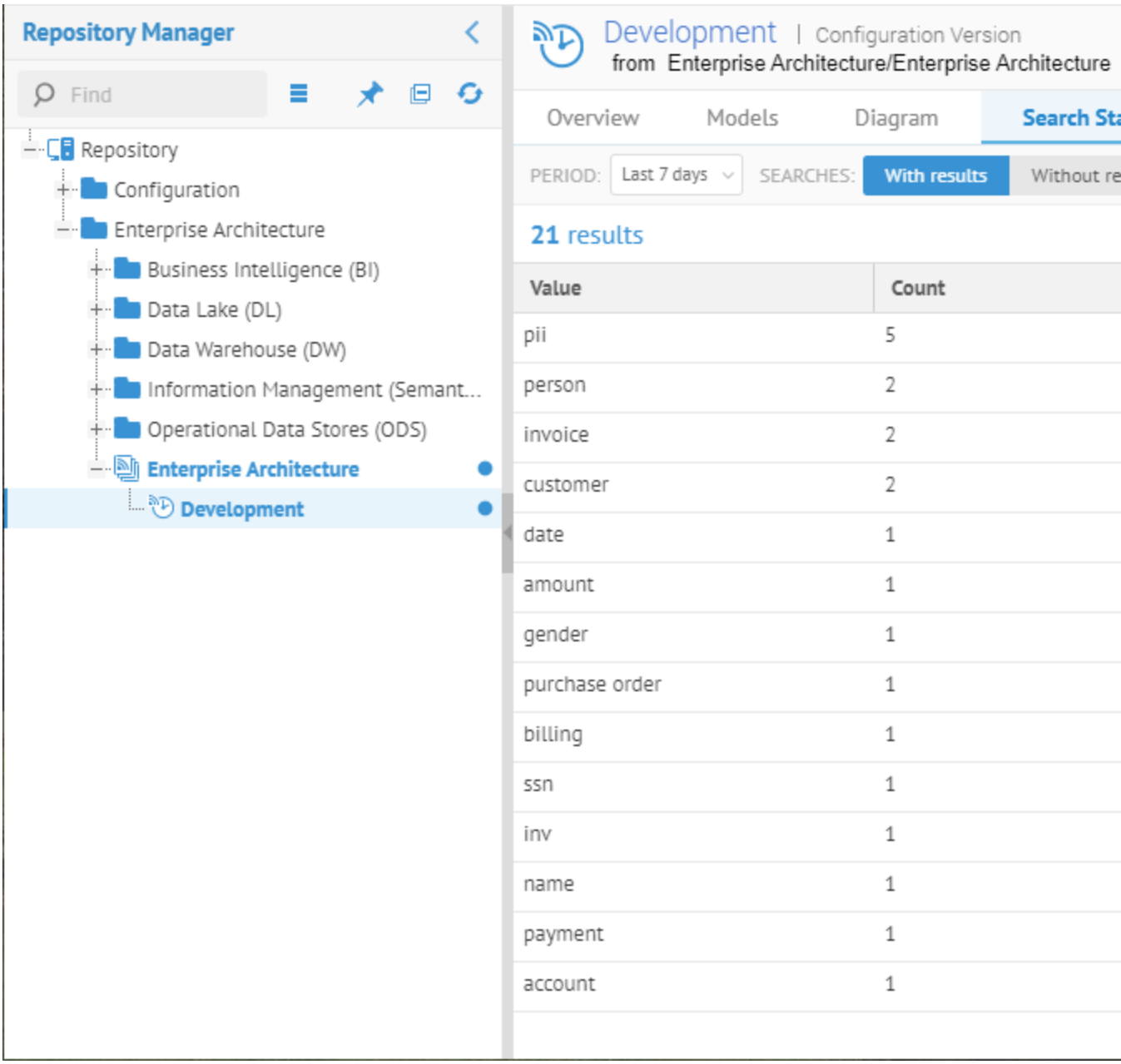
Steps

1. Sign in as a user with at least the **Admin** security role.
2. Go to **MANAGE** > **Repository** in the banner
3. Select either:
   - The Repository root
   - A configuraton version
4. Go to the Search Statistics tab
5. From here you may select the type of presentation with **DISPLAY AS**.
   - Grid
   - Bar
   - Pie
   - Line

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

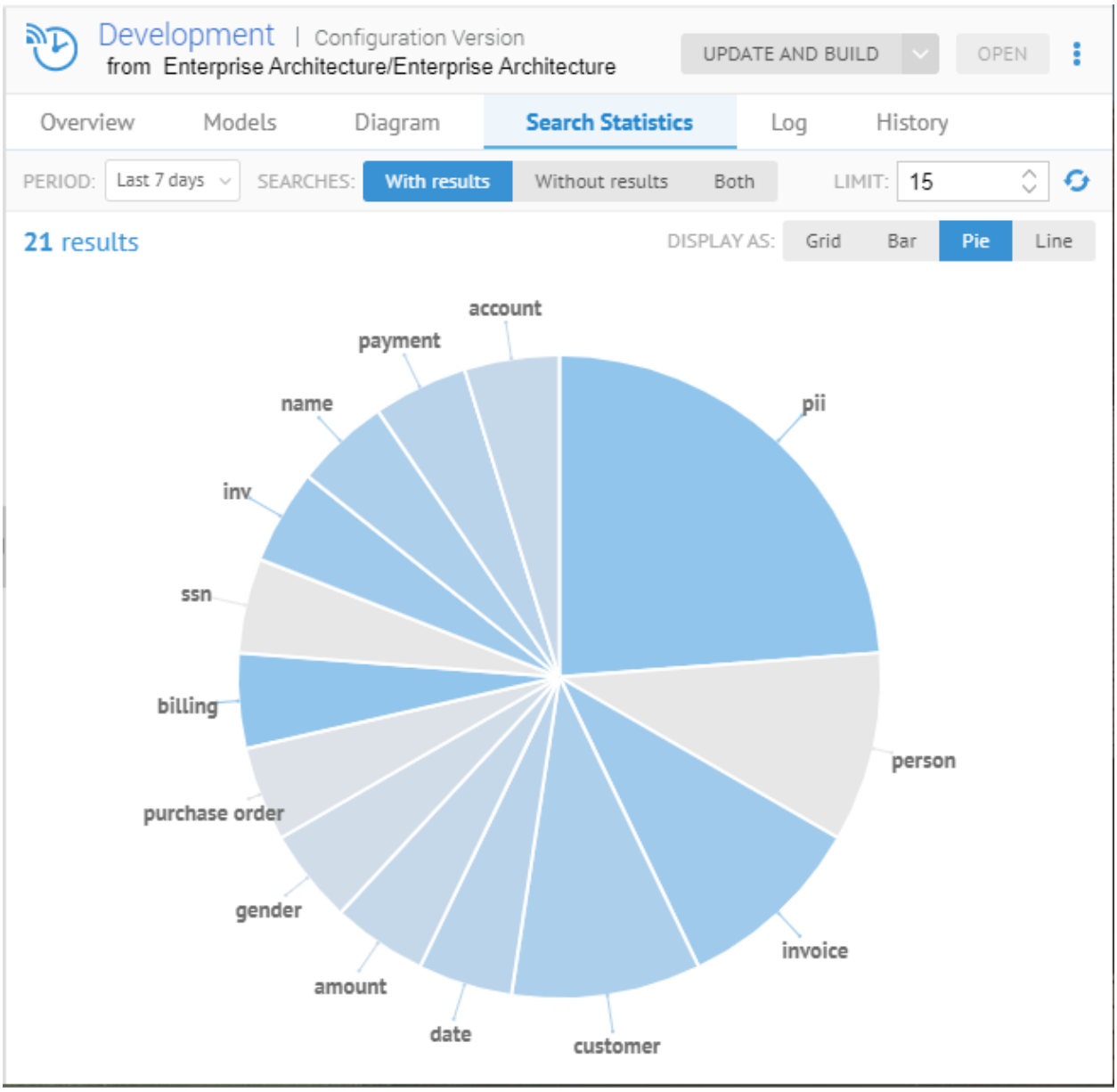
Example

Sign in as **Administrator**, go to **MANAGE** > **Repository**, select the **Repository** root and go to the **Search Statistics** tab.



Click on Pie.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Audit log reporting

Audit Event Type	Notes	Where to find the audit event
Created	A “Created” event is added when a user creates a new repository object, such as a folder or model content. Creating a new configuration, glossary, physical data model, semantic mapping or data mapping content also causes	History tab of the newly created repository object, i.e. folder, content or version

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

	a new version of the content to be created. Therefore a “Created” event is created for the new version as well. A “Created” event is also added when a new model version is imported.	
	A “Created” event is also added when the user creates a new glossary metadata element, such as a category or term, or a physical data model metadata element, such as schema, table, view, column, or primary key, etc.	History tab of the glossary model or physical data model and History tab of the newly created metadata element
	A “Created” event is also added when a user creates a new user, group, semantic type, custom attribute, collection, worksheet or dashboard.	The audit event on the user, group, semantic type, custom attribute, collection, worksheet or dashboard can be found in the csv file generated by “Download user audit log”.
Added child	An “Added child” event is added when a user creates a new repository object, such as folder or model content. The newly created folder or model content becomes a child of the folder where the new folder or model content is placed in. Creating a new configuration, glossary, physical data model, semantic mapping or data mapping content, or importing a new model version causes a new version of the content to be created. The new version becomes a child of the model content.	History tab of the folder where the new folder or model content is placed in and History tab of the model content where the new version belongs to
	An “Added child” event is also added when a user moves a repository object such as a folder or model content from one folder <f1> to another folder <f2>. The	History tab of the destination folder <f2>

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

	repository object becomes a child of <f2>	
Deleted	A “Deleted” event is added when a user deletes a repository object, such as folder, model content or version.	History tab of the folder where the deleted folder or model content was in and History tab of the model content where the deleted version used to belong to
	A “Deleted” event is also added when the user removes a folder or model from a configuration	The “Deleted” audit event on the configuration can be found in the csv file generated by “Download audit log” which should also be found in the History tab of the configuration version
	A “Deleted” event is also added when the user deletes a glossary metadata element, such as a category or term, or a physical data model metadata element, such as schema, table, view, column, or primary key, etc.	History tab of the glossary model or physical data model
	A “Deleted” event is also added when a user deletes a user, group, semantic type, custom attribute, collection, worksheet or dashboard.	The audit event on the user, group, semantic type, custom attribute, collection, worksheet or dashboard can be found in the csv file generated by “Download user audit log”.
Removed child	A “Removed child” event is added when a user deletes a repository object, such as folder or model content from a folder, or deletes a version from a model content.	History tab of the folder where the deleted folder or model content was in and History tab of the model content where the deleted version used to belong to

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

	A “Deleted child” event is also added when a user moves a repository object such as a folder or model content from one folder <f1> to another folder <f2>.	History tab of the source folder <f1>
Move	A “Move” event is added when a user moves a repository object such as a folder or model content from one folder <f1> to another folder <f2>.	History tab of the repository object being moved
Set Attribute	A “Set attribute” event is added when a user updates an attribute of a repository object, such as folder, model content or version. The attribute can be the name, description, import options, naming standards, etc.	History tab of the repository object being updated, i.e. folder, content or version
	A “Set attribute” event is also added when the user updates an updatable attribute of a metadata element, such as name, description, and business name etc.	History tab of the metadata element being updated and History tab of the model that the metadata element belongs to
	A “Set attribute” event is also added when a user updates a user or group	The audit event on the user or group can be found in the csv file generated by “Download user audit log”.
Set custom attribute	A “Set custom attribute” event is added when a user sets a custom attribute on an object	History tab of the metadata element
Comment	A “Comment” event is added when a user enters a comment during another event, such as workflow transition, or setting attribute, etc.	History tab of the metadata element
Link	A “LInk” event is added when a user imports a new model version	History tab of the external content

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

	and sets the new version as the default version of a model content	
	A “Link” event is added when a user creates a relationship from one glossary term <term1> to another glossary term <term2>	History tab of the glossary term <term1>
	A “Link” event is added when a user adds a user into a group or sets a default configuration to a group	The audit event on the user or group can be found in the csv file generated by “Download user audit log”.
Unlink	A “Unlink” event is added when a user removes a relationship from one glossary term <term1> to another glossary term <term2>	History tab of the glossary term <term1>
	A “Unlink” event is added when a user removes a user from a group or cleared the default configuration on a group	The audit event on the user or group can be found in the csv file generated by “Download user audit log”.
Workflow transition	A “Workflow transition” event is added when a user performes a workflow action which changed the status of the term	History tab of the glossary term
Authentication	An “Authentication” event is added when a user logs in successfully, fails to log in, logs out successfully, or the user’s session is expired due to inactivity.	The audit event on the user can be found in the csv file generated by “Download audit log”
Operation	An “Operation” event is added when a user starts an operation	The Operation audit events can be found in the csv file generated by “Download audit log”
Configuration	A “Configuration” event is added when a user lists a configuration	History tab of the configuration version

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

	contents or traces lineage in a configuration	
Assigned	An “Assigned” event is added when a user assigns a domain to a column of a Physical Data Model	History tab of the column
Unassigned	An “Unassigned” event is added when a user clears the domain on a column of a Physical Data Model	History tab of the column
Granted security role	A “Granted security role” event is added when a user assigns a security role to a custom attribute or repository object, or assigns a workflow role to a glossary category	The audit event on the custom attribute can be found in the csv file generated by “Download user audit log”. The audit event on the repository object can be found in the History tab of the repository object. The audit event on the glossary category can be found in the History tab of the category
Revoked security role	A “Revoked security role” event is added when a user removes a security role from a custom attribute or repository object, or removes a workflow role from a glossary category	The audit event on the custom attribute can be found in the csv file generated by “Download user audit log”. The audit event on the repository object can be found in the History tab of the repository object. The audit event on the glossary category can be found in the History tab of the category
Added steward	An “Added steward” event is added when a user assigns a steward to a repository object or	The audit event on the repository object can be

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

	added a steward to a glossary term	found in the History tab of the repository object. The audit event on the glossary term can be found on the History tab of the term
Removed steward	An “Removed steward” event is added when a user removes a steward from a repository object or removes a steward from a glossary term	The audit event on the repository object can be found in the History tab of the repository object. The audit event on the glossary term can be found on the History tab of the term
Added attachment	An “Added attachment” event is added when a user adds an attachment to a metadata element	History tab of the metadata element
Removed attachment	A “Removed attachment” event is added when a user removes an attachment from a metadata element	History tab of the metadata element
Edited	An “Edited” event is added when a user updates a semantic type, collection, worksheet or dashboard.	The audit event on the semantic type, collection, worksheet and dashboard can be found in the csv file generated by “Download user audit log”
	An “Edited” event is also added when a user updates a certification, endorsement, warning or comment of a metadata element	History tab of the metadata element
Added	An “Added” event is added when a user adds a label, semantic type, certification, endorsement, warning or comment to a metadata element	History tab of the metadata element
Removed	A “Removed” event is added when a user removes a label, semantic	History tab of the metadata element

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

	type, certification, endorsement, warning or comment from a metadata element	

Extra notes

Besides the History tab of the metadata elements the audit events can also be downloaded via Manage Users "Download user audit log". They can also be seen on the User Profile's Activity Stream.

There are some discrepancies related to configuration adding/removing models or folders. Removing models and folders are audited as "Deleted" events. However adding models and folders are not audited. I'll create a ticket for this.

The "Deleted" events are not shown in the History tab of the configuration version. I'll create a ticket for this

The user profile activity stream shows all event types except the Authentication, Operation, Granted/Revoked security role event types. Is this intended?

System Backup

Regular backups of contents of the repository are highly recommended. MIMM stores all the data entirely in the database, including models, the cache of what is harvested (to be used when exporting or when populating a glossary from a harvested model, as well as information maintained to support incremental harvesting), users and Admin information, and logs.

The UI based backup/restore is not a substitute for a full database backup, as it does not contain critical admin data, such as logs.

The UI based backup/restore use cases are typically:

- For support to reproduce issues as explained in the Help: http://metaintegration.com/Products/MIMM/OEM/MITI/Help/MetadataManager/#!Documents/reportingissues.htm
- To deliver demos/tutorial
- To deliver from development to production (with a backup without content and harvest
-
- in production)
- To migrate to a new type of database such as PostgreSQL to Oracle.

The rules by which the backup and restore process works are as follows:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

- A repository backup may be performed at the repository root level, or at any repository sub levels. In all cases, the full path of the backup starting level is not recorded within the backup so that it can then be restored at any repository sub-levels later.
- When restoring a repository backup, some repository objects may already exist and will be reused as is (rather than overwritten) by the content of the backup.
- Any repository backup may contain repository objects having repository object dependencies, which is the case of a Directory, Configuration, Data Mapping, Semantic Mapping or Physical Data Model. In such a case, each dependent repository object is saved in the backup with its full path from the root. Therefore, when performing the backup, the start level name must not conflict with any root level object names.

Installation

For installation and configuration details, please refer to the ReadMe document.

HostInfo File and Licensing

When requesting a license, a HostInfo.xml file generated for the server machine is required. One is located in the root of the installation directory after install of the MIMM .

Troubleshooting

General Troubleshooting

For any issue when you see something unexpected

Steps

1. Apply the latest MM Cumulative Patch (and make sure Database Script has run long enough)
2. Go to **MANAGE > System** and select **Enable** in the **Debug Logging** pull-down and then reproduce the issue.
3. Open the process log and be sure to select Show: All. Then, make any changes specified in the log messages.
4. In addition, if you see a error reported like this

   OPERI_E0006 Operation failed: please contact your system administrator

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

The details may be in the System Log. Go to **MANAGE** > **Logs** and then make any changes specified in the log messages.

Explorer Further

UI Troubleshooting

For any issue where you see something unexpected in the UI, please perform the following steps.

Steps

1. Stop MIMM service on the server machine and run MIMM as a desktop app by selecting Start -> All Programs -> Meta Integration -> Server Restart.
2. Close all instances of the web browser you are using.
3. Check that the browser and Adobe Flash are updated to the latest patches.
4. Open an instance of the browser.
5. Clear the cache and recent history on the web browser.
6. Close all instances of the web browser.
7. Open the browser and reconnect to MIMM .
8. Remove any zoom effects on the browser, generally by using Ctrl-0.

Bridge Troubleshooting

For any issue where you see something unexpected when importing a model, please perform the following steps.

Steps

1. Review the tool tips (help) for the bridge in general and each bridge parameter individually to ensure that the bridge is being used correctly.
2. Open the import (or export) log and be sure to select Show: All. Then, make any changes specified in the log messages.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

3. Stop MIMM service on the server machine and run MIMM as a desktop app by selecting Start -> All Programs -> Meta Integration -> Server Restart. If this step resolved the problem, then refer to the MIMM Readme and be sure you have followed:
   - Step (3.) in section (5.1) "Default install on Windows with bundled Tomcat"
   - All the steps in section (6.) "MIMB (Metadata Harvesting)".
4. Clear the import cache directories on the application server machine at:

   C:\ProgramData\Meta Integration\data\MIMB\cache
5. Go to **MANAGE > System** and select **Enable** in the **Debug Logging** pull-down.
6. Run the bridge again and review the log messages.

Configuration Troubleshooting

For any issue where you see something unexpected and neither of the above have resolved the issue.

Steps

1. Ask the system administration staff to review the installation and configuration steps in the ReadMe, especially the sections covering installation and testing of the Application Server and software.

Reporting an Issue

When reporting an issue, there is some information you should collect beforehand.

Steps

1. Sign in as a user with at least the **Admin** security role.
2. Get the Application Server and Database Server Details by going to either:
   - Go to **MANAGE** > **System**
   - Click Download (top right) to obtain a TXT file of the application and database server Information
   - Click Operations (top left) > Get repository content statistics (run script and save log)
   - Click Operations (top left) > Test performance (run script and save log)
3. Get the Database Maintenance Status by going to either:

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

- Go to **MANAGE > Schedules**
- Select the schedule (top panel) **Run Database Maintenance**
- Select the latest execution in the **History** (bottom panel) and click View Log (on the right)
- In the **Log Messages** dialog, click on Show All (bottom), and Save

4. Get the Repository Content Statistics for (each) Configuration by going to:

   - Go to **Objects > Statistics** In the banner, click on Download (top left) the CSV file of the configuration statistics.

5. Get the System Log by going to

   - Go to **MANAGE > System** and select **Enable** in the **Debug Logging** pull-down.
   - Reproduce the issue to report
   - Go to **MANAGE > System** and select **Disable** in the **Debug Logging** pull-down.
   - Zip up the debug logs and attach to the ticket.

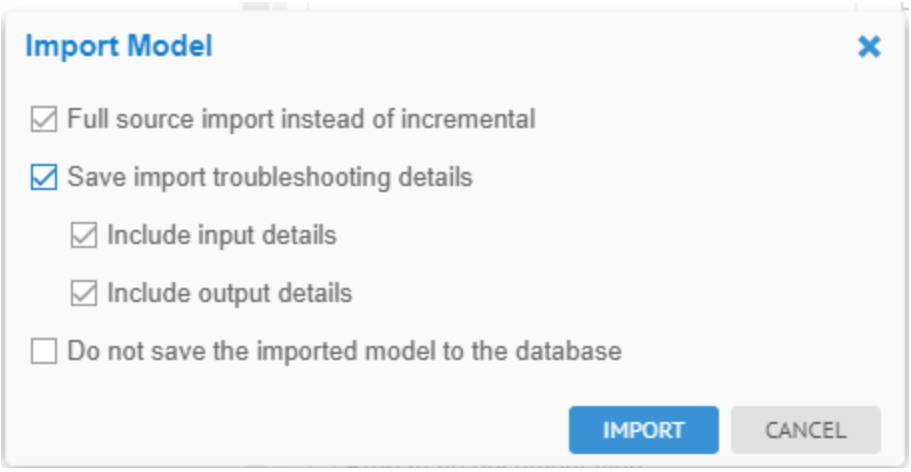
*Debug level messages are not shown in **MANAGE > System Logs**, nor is it part of the download there. Instead, when you enable debug logging, those messages are written to the Tomcat server logs on the application server machine. You may find these in the installation directory at*

```
/data/logs/tomcat/
```

And zip them up there.

6. For any import bridge issues, go to **MANAGE** > **Configuration**, select the model, click **IMPORT** and check the **Full source import instead of incremental** checkboxand the **Save import troubleshooting details** checkbox. Be sure the two sub checkboxes are checked as well

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



*The **Save import troubleshooting details** checkbox causes a debug package to be produced. This package is a zip file that contains the artifacts required to reproduce the issue. Without this information, it may be impossible to reproduce and thus resolve a reported issue.*

7. Open the log when the import is completed and click **Download troubleshooting details**.

8. Attach the debug package (zip file downloaded) to the ticket.

Creating a Backup

In order for Support staff to reproduce an issue you report, please be sure to back up the relevant portion of MIMM . In general, it is best to create a backup of the configuration containing the model or models where the problem was observed.

Steps

1. Sign in as a user with full access privileges to all of the models and configurations contained with the backup scope.

2. For a complete configuration bakup, Go to **MANAGE > Configuration** and **More actions** and select **Backup**

3. For any other backup Go to **MANAGE > Repository**

   - Select the root object in the **Repository Panel** which will be backed up. Remember, all contained models and configurations will also be backed up.

   - Right-click and select **More** -> **Backup**.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

4. Once the dialog appears, browse for a directory on the server machine where you wish to create the backup.

If you specify a directory which does not exist, MIMM *will create it when backing up.*

5. If the issue is related to users, groups, security role assignments or other system configuration settings, be sure to select the check box for **Backup system managed objects** like Groups.

For security reasons, user passwords are reset to their user names.

- Be sure to select the check box for **Backup all versions** of models Content.
- Be sure to select the check box for **Backup all versions of Models Content**, otherwise, it will create a backup without contents, so that when restored, one must re-harvest those contents.

When this option is checked

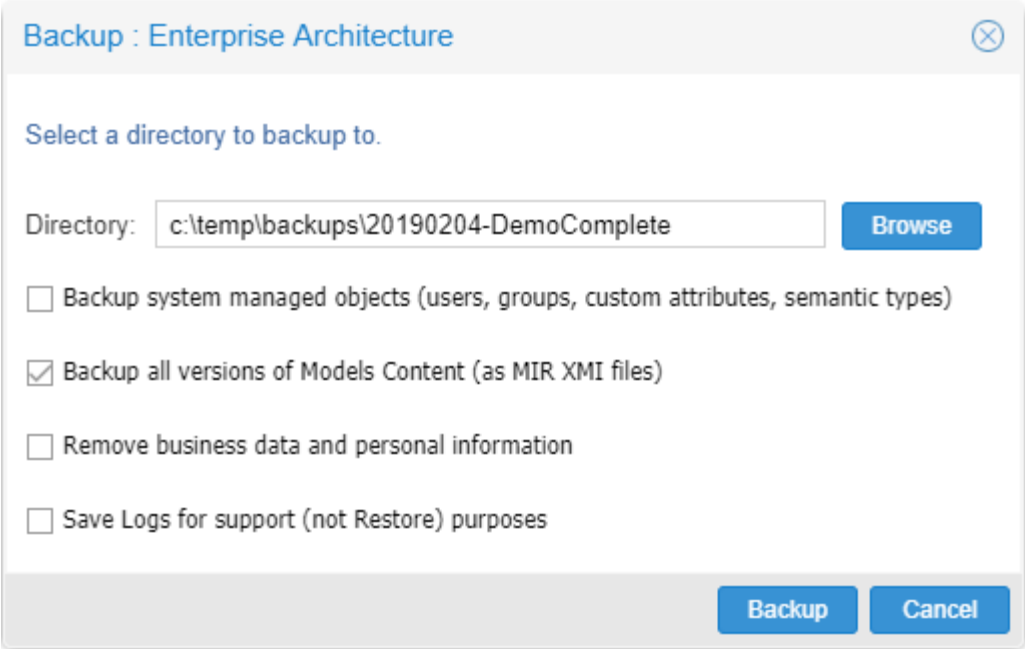
when you backup a content, MIMM *backs up all its versions*

when you backup a configuration, MIMM *backs up only the versions used by the configuration.*

- Click on the Backup button.

Example

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)



Explore Further

Backup system managed objects (users, groups, custom attributes, semantic types)

You may include system objects like Users and groups Check this checkbox to ensure that this information is included in the backup.

For security reasons, user passwords are reset to their user names.

Backup all versions of models content (as MIR XMI files)

You may include all versions of Models Content (as MIR XMI files). By default it will not be included.

If you do not include this option, then only the content definition will be included, and none of the versions imported.

Check this checkbox to ensure that the contents themselves are included in the backup.

Remove business data and personal information

Removes:

- all data profiling and sampling information (retaining only metadata names)
- and removes all personal information including all information on users (names, emails, etc.)
- and all bridge parameters (such as user names and passwords used to connect to databases)

Check this checkbox to ensure that this information is **not** included in the backup.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Save Logs for support (not Restore) purposes

If creating the backup to report an issue, please be sure to include the import and other log information. Please see details here where you may also produce a Troubleshooting package.

Restoring a Backup

One may restore a backup using either the Metadata Manager UI or the Metadata Explorer UI.

When restoring using the Metadata Explorer UI, which is restricted to a specific configuration, the structure of the backup must match the current configuration, including configuration name and folder path in the repository. If they do not match, you should create a new empty folder using the Metadata Manager UI and restore there.

Steps

1. Sign in to the Repository as a user with full access privileges to all of the models and configurations contained with the backup scope.
2. In Metadata Manager UI:
   - Create and empty folder in the **Repository Panel** which will be used to restore the backed up models. Remember, all contained models and configurations will also be restored.
   - Right-click and select **More** -> **Restore**.
   - Browse for a directory on the server machine where you created the backup before
   - Click on the Restore button.
3. In Metadata Explorer UI:
   - Go to **MANAGE > Configuration** .
   - Click **More Actions** > **Restore.**

The restore menu in the Metadata Explorer UI is only visible when the user has write permissions on the configuration and the configuration management and version management features are not enabled, i.e., only with single version and single configuration licenses.

RESTful API

MIMM provides direct API call access via a RESTful API.

There is a full programmers guide build into MIMM .

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)

Steps

4. Go to the **More actions** icon ( ) in the far right of the banner and select **REST API**.
5. Click the **General Info** link on the page for details about utilizing the API.
6. Sign in as a user with permissions to access the API.
7. Then, for any command, you may **Try It Out** to test.

Log and Logging of Search Queries

One may turn on thelogging popular search queries as executed into a log file using log4j. This file may then be used to perform statistical reporting on the types of search queries executed.

Steps

To enable the logging of search queries:

8. Open the file "tomcat\conf\log4j2.xml" in the installation folders.
9. Change the lines near the end of the file:

```
<Logger name="search" level="off" additivity="false">

  <AppenderRef ref="SEARCH"/>

</Logger>
```

to:

```
<Logger name="search" level="all" additivity="false">

  <AppenderRef ref="SEARCH"/>

</Logger>
```

3. Restart the application server.

A search.log file can be found under the "data\logs\search" directory in the installation folders.

The log contains the following search query details: time, thread, user name, context, text.

To disable the logging of search queries, simply change the lines back and restart.

Copyright © 2020, Oracle and/or its affiliates. All Rights Reserved. (12.2.1.4.0 - 2020/10/29)