ORACLE

Extend EM Monitoring using Plug-ins, Connectors, and Notification Methods

Extensibility

Desiree Abrokwa
Product Manager

Safe harbor statement

The following is intended to outline our general product direction. It is intended for information purposes only, and may not be incorporated into any contract. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decisions. The development, release, timing, and pricing of any features or functionality described for Oracle's products may change and remains at the sole discretion of Oracle Corporation.

Agenda

Monitor non-Oracle technologies using plug-ins

Send notifications for incidents or events to external systems and stakeholders

Agenda

Monitor non-Oracle technologies using plug-ins

Send notifications for incidents or events to external systems and stakeholders

Monitor targets in Enterprise Manager

Enterprise Manager (EM) can be used for monitoring Oracle and non-Oracle technologies such as Oracle Database, Microsoft SQL Server and Apache Tomcat

Monitor non-Oracle technologies as targets in EM using their corresponding plug-in

How to use plug-ins:

- Download plug-in from Self-Update
- Deploy plug-in first to the Oracle Management Service (OMS) and then to the EM agent
- Discover targets
- Start monitoring using homepages

MySQL
Database plug-in

Comprehensive monitoring

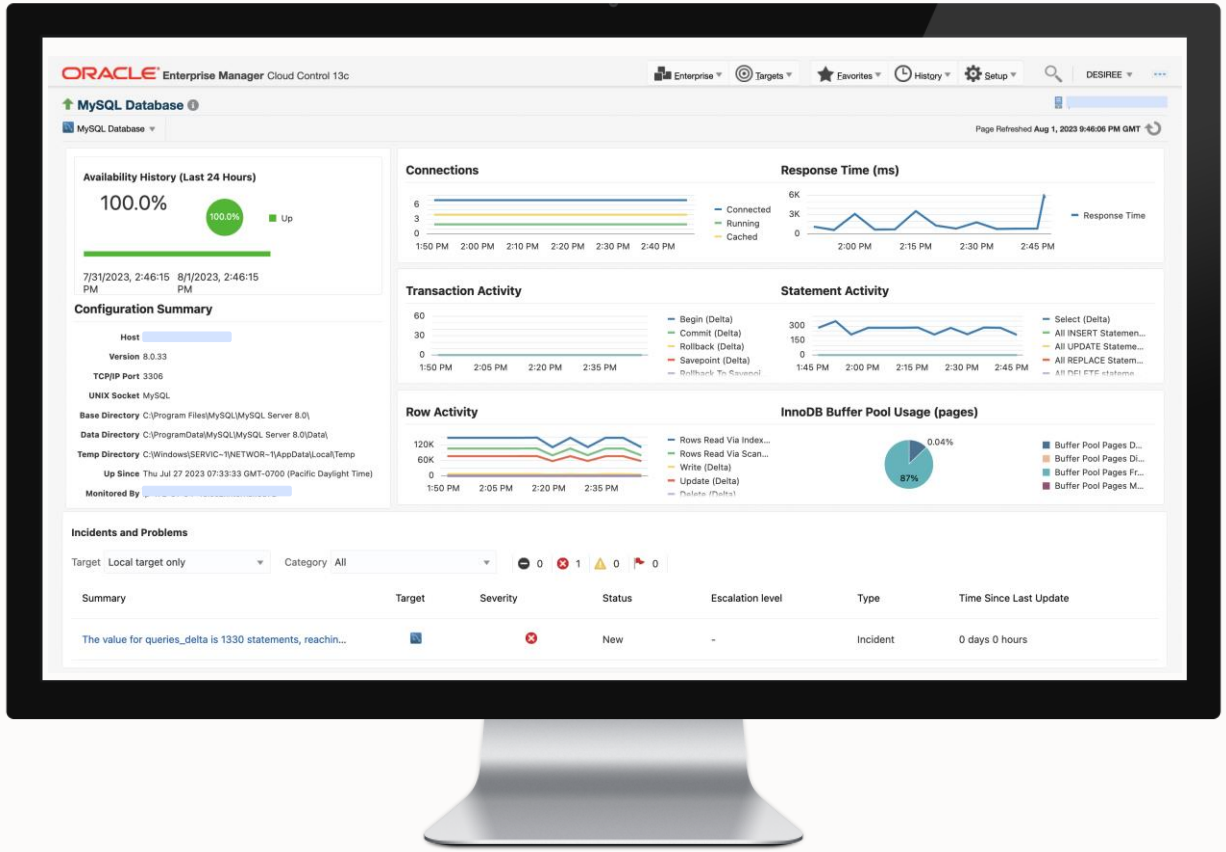
- Use homepages to monitor aspects of MySQL health such as status, response time, and performance
- Monitor and view topology of InnoDB Cluster/ClusterSet
- View metrics on query activity, InnoDB buffer pool usage, replication activity and more
- Create Corrective Actions to auto-resolve alerts for MySQL down

Identify of slow queries using Query Analyzer

- View a point-in-time snapshot of the top 100 queries/statements ordered by total latency

Compliance management

- Evaluate compliance against best practices for performance, replication, security, schema, and administration
- Comply with industry security frameworks for MySQL such as DISA STIG and CIS Benchmark



MySQL Homepage

Microsoft SQL Server
Database plug-in

Comprehensive monitoring

- Use homepages to monitor status and health of SQL Server instance and all its individual databases
- View metrics on query performance, memory and space usage, associated services, and more

Leverage job system for automation

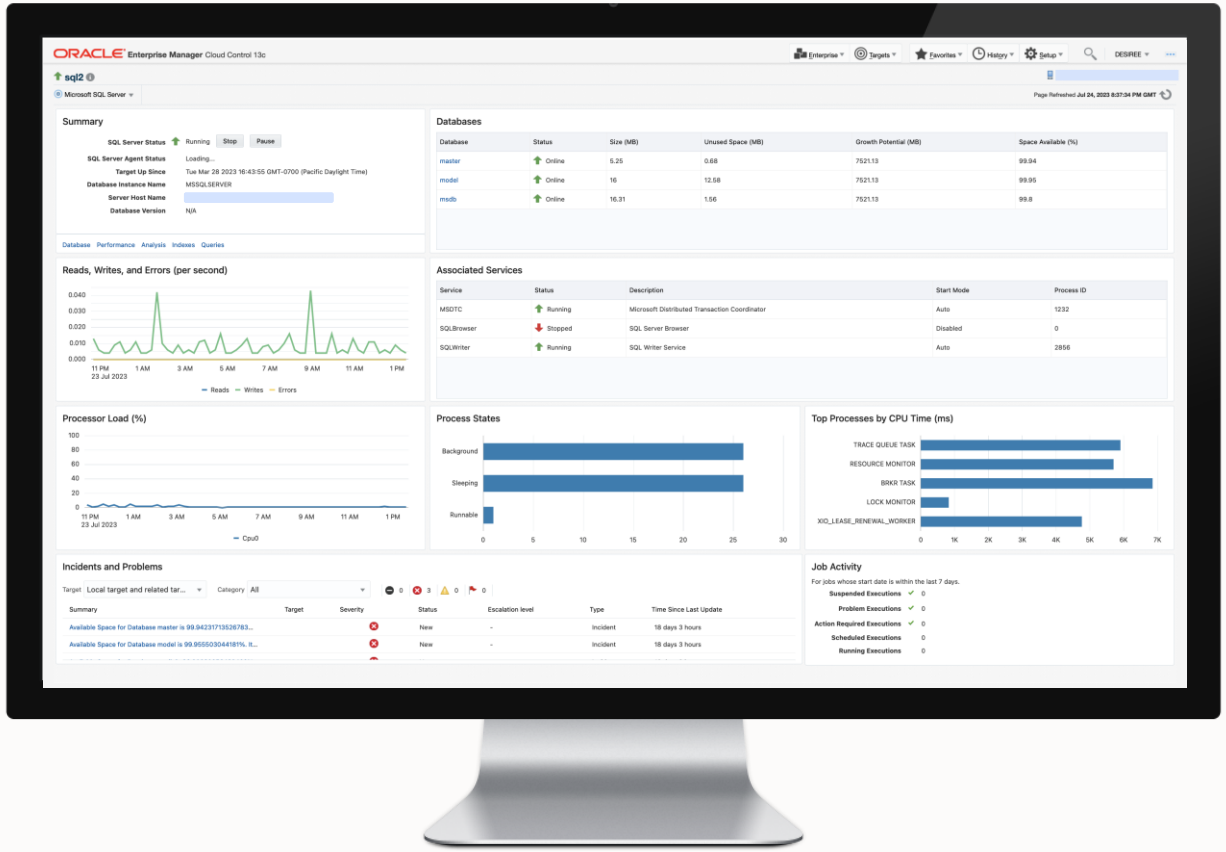
- Start/Stop SQL Agent
- Schedule/Restore/Delete SQL Server Backup
- Kill Session

Drill down into session and query statistics

- Identify top session statistics by CPU time and memory usage
- Identify top queries impacting performance by CPU time, execution count and blocked time

Compliance management

- Evaluate compliance of SQL Server against configuration best practices for backup frequency, index rebuild and more



SQL Server Homepage

IBM DB2
Database plug-in

Comprehensive monitoring

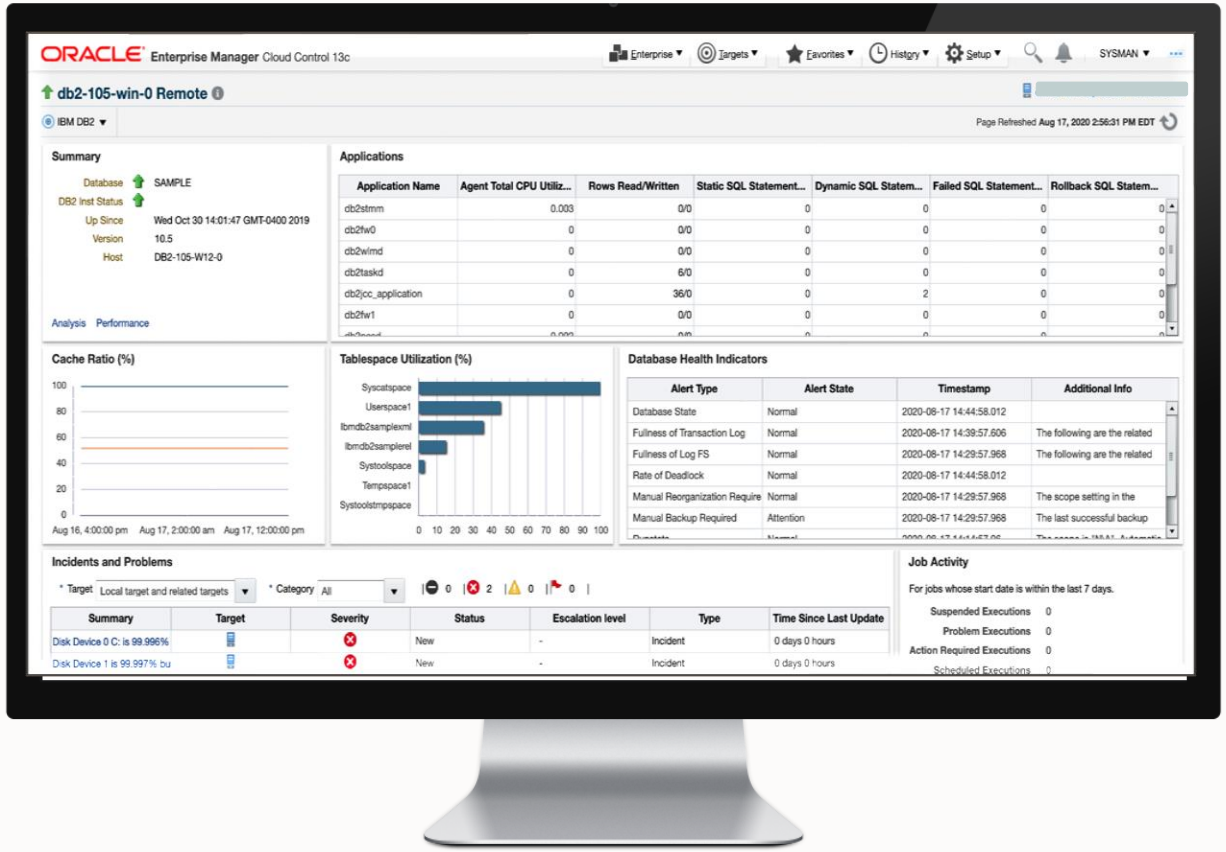
- Use homepages to monitor status and health of DB2
- View metrics for query performance, tablespace utilization, High Availability Disaster Recovery (HADR) cluster status, lock waits and more
- Apply Monitoring Templates with thresholds on I/O as well as locks and deadlocks

Leverage job system for automation

- Startup/Shutdown DB2
- Quiesce/Unquiesce DB2 during maintenance modes
- Kill DB2 Application

View top SQL activity and lock waits

- Identify top SQL queries by execution count and CPU time
- Identify lock waits by blocking application, blocked application and table



IBM DB2 Homepage

Non-Oracle Middleware plug-ins

Apache Tomcat

- Supports versions: 8.0, 8.5, 9.0, 10

JBoss Enterprise Application Platform

- Supports versions: 6, 7

Microsoft Internet Information Server (IIS)

- Supports version 10

IBM WebSphere Application Server

- Supports versions: 8.5.5, 9.0

Features

- Status and performance monitoring
- Out-of-box performance metrics and configuration settings
- Jobs to automate start & stop target servers
- Information Publisher Reports

Features across all target types

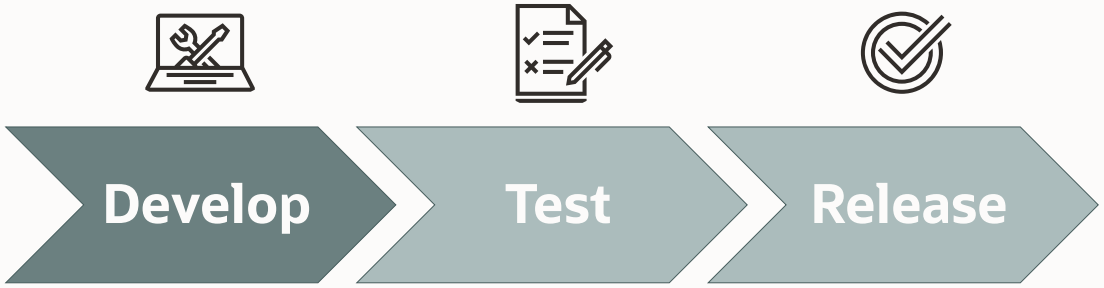
Monitoring Setup	• Corrective Actions to automate alert resolution • Metric Extensions to create custom metrics • Monitoring Templates to contain alert thresholds, Corrective Actions and Metric Extensions • Administration Groups to automate monitoring template apply operations
Incident Management	• Incident creation from actionable events • Event Compression Policies to reduce incident volume by grouping related events into incidents • Notifications via email, Slack, Webhooks, SNMP Traps, OS Commands and PL/SQL Statements • Integration with ticketing and event management systems such as ServiceNow and Microsoft SCOM • Dynamic Runbooks to encapsulate executable steps to diagnose and resolve an issue • Blackouts to suspend unwanted alerts during planned maintenances
Compliance Management	• Compliance Standards to evaluate compliance against best practices • Fleet-wide compliance view with dashboards • Evaluation Report to view list of compliance violations and recommended remediations

How to monitor other infrastructure or apps

Create custom target type

Extensibility Development Kit (EDK)

- Develop
  - Define infrastructure or apps to include as a target type
  - Identify performance and configuration metrics needed
  - Construct metadata files (in XML) of the target types including details such as metrics, target properties and credentials
- Test
  - Evaluate plug-in in a test environment
- Release
  - Distribute plug-in for use to other EM admins
  - Deploy plug-in first to the Oracle Management Service (OMS) and then to the EM agent
  - Use as any other plug-in

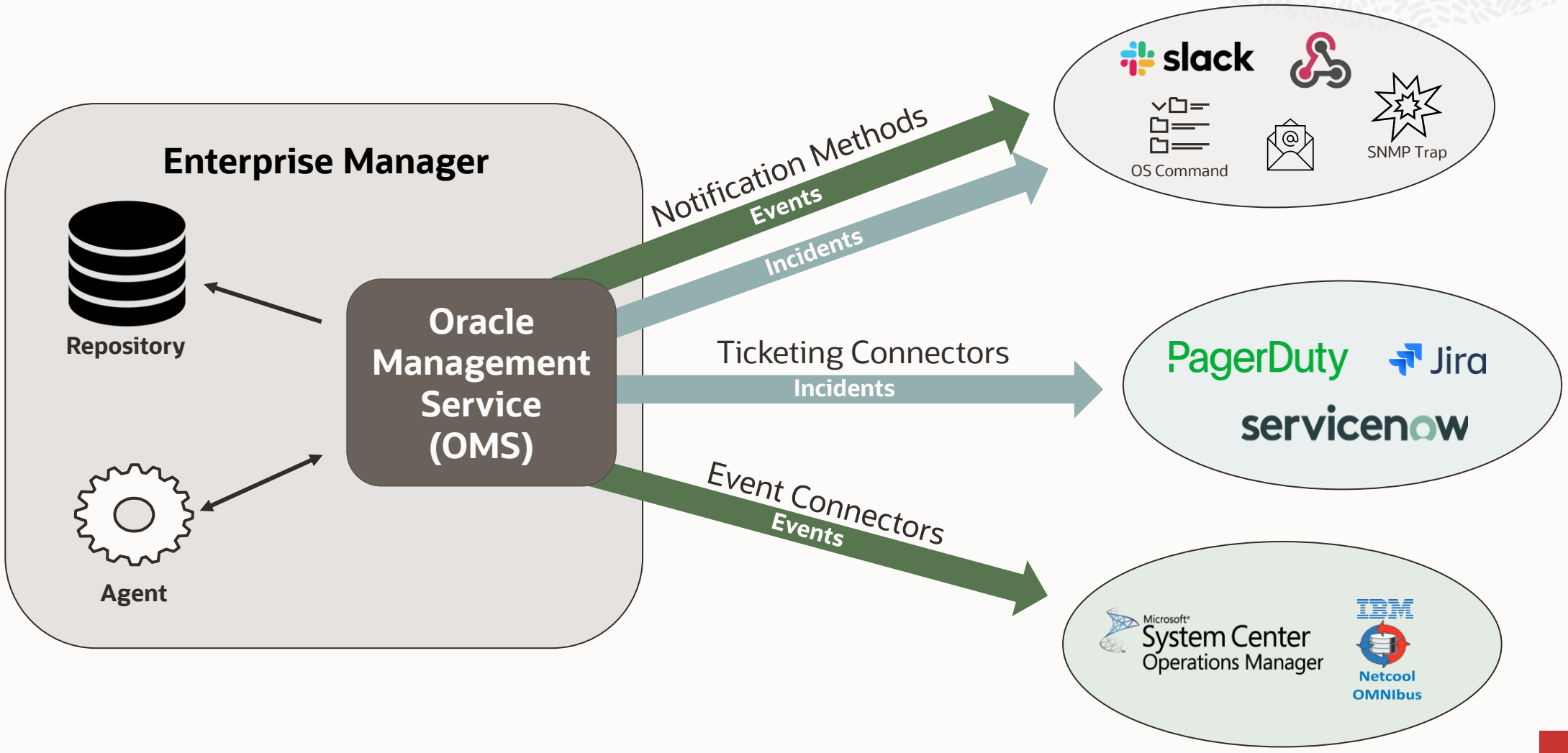


Agenda

Monitor non-Oracle technologies using plug-ins

Send notifications for incidents or events to external systems and stakeholders

Send notifications for incidents or events



Open tickets or share events with external systems using connectors

Management connectors

Ticketing Connectors

- Open tickets in external ticketing systems based on EM incidents/incidents with compressed events

Event Connectors

- Share EM events with external event management systems

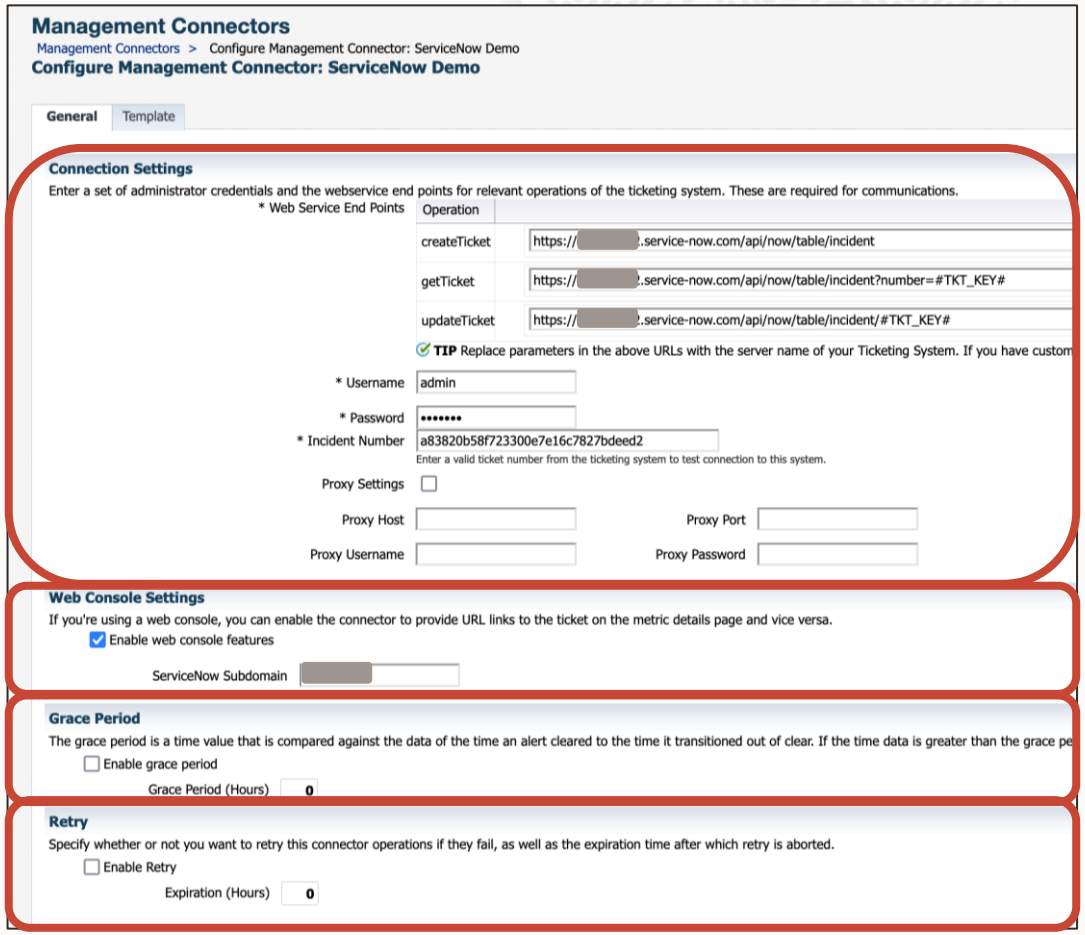
Three steps to use:

1. Configure connector settings
2. Use ticket/event templates
3. Use connector in Incident/Event Rules

Step 1 – Configure ticketing connector
ServiceNow

Configure connector with a few properties:

- **Connection Settings** – communicates to ServiceNow for ticket creation and update
- **Web Console Settings** – enables links to ServiceNow tickets from Incident Manager
- **Grace Period** – time window in which the reoccurrence of the same incident should reopen the existing ticket rather than creating a new one
- **Retry** – enables a failed ticketing request to be re-tried



Step 2 – Review ticket template

ServiceNow

Ticket templates specify mappings from EM incident attributes to ServiceNow ticket attributes

Use one of the out-of-box ServiceNow ticket templates:

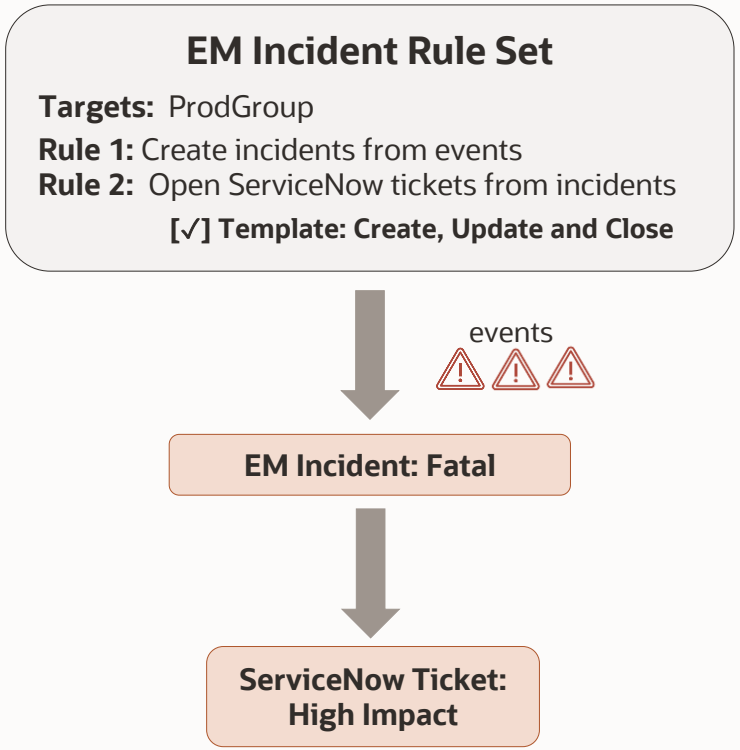
- Create and Update
- Create, Update and Resolve
- Create, Update and Close

OR customize ticket templates to change mappings

- Example: Map ‘Warning’ incidents in EM to ‘Low Impact’ tickets in ServiceNow

OR create new ticketing template

Workflow: Create, Update and Close Ticket Template



Step 2 – Review ticket template

ServiceNow

Ticket templates specify mappings from EM incident attributes to ServiceNow ticket attributes

Use one of the out-of-box ServiceNow ticket templates:

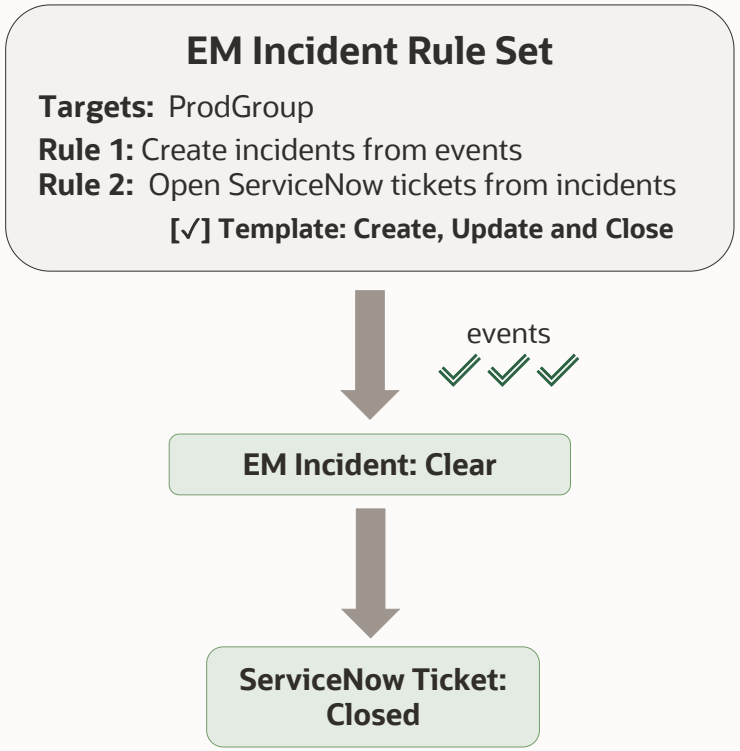
- Create and Update
- Create, Update and Resolve
- Create, Update and Close

OR customize ticket templates to change mappings

- Example: Map ‘Warning’ incidents in EM to ‘Low Impact’ tickets in ServiceNow

OR create new ticketing template

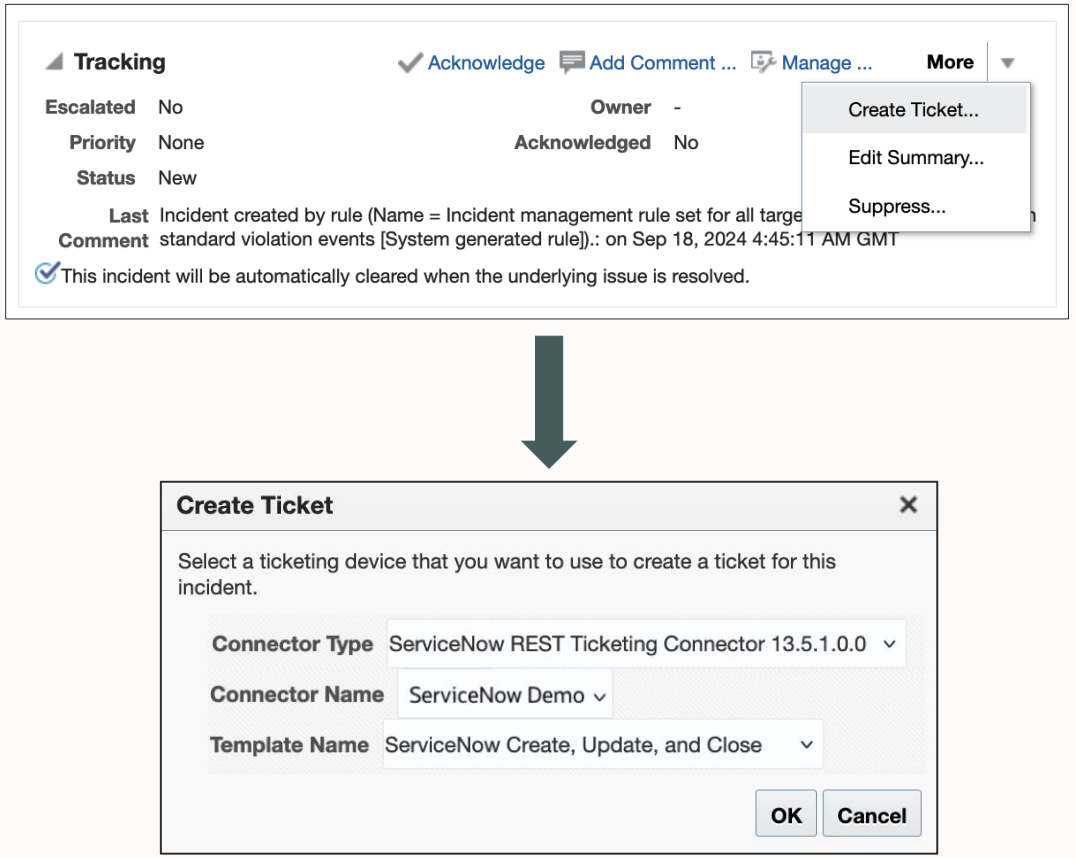
Workflow: Create, Update and Close Ticket Template



Step 3A – Create ticket
ServiceNow

1. Set up Event Rule to create incidents from events

2. Create ServiceNow tickets from EM incidents
   - **Automatically** create ServiceNow tickets from EM incidents via Incident Rules
     - Specify template to use



Step 3B – Create ticket

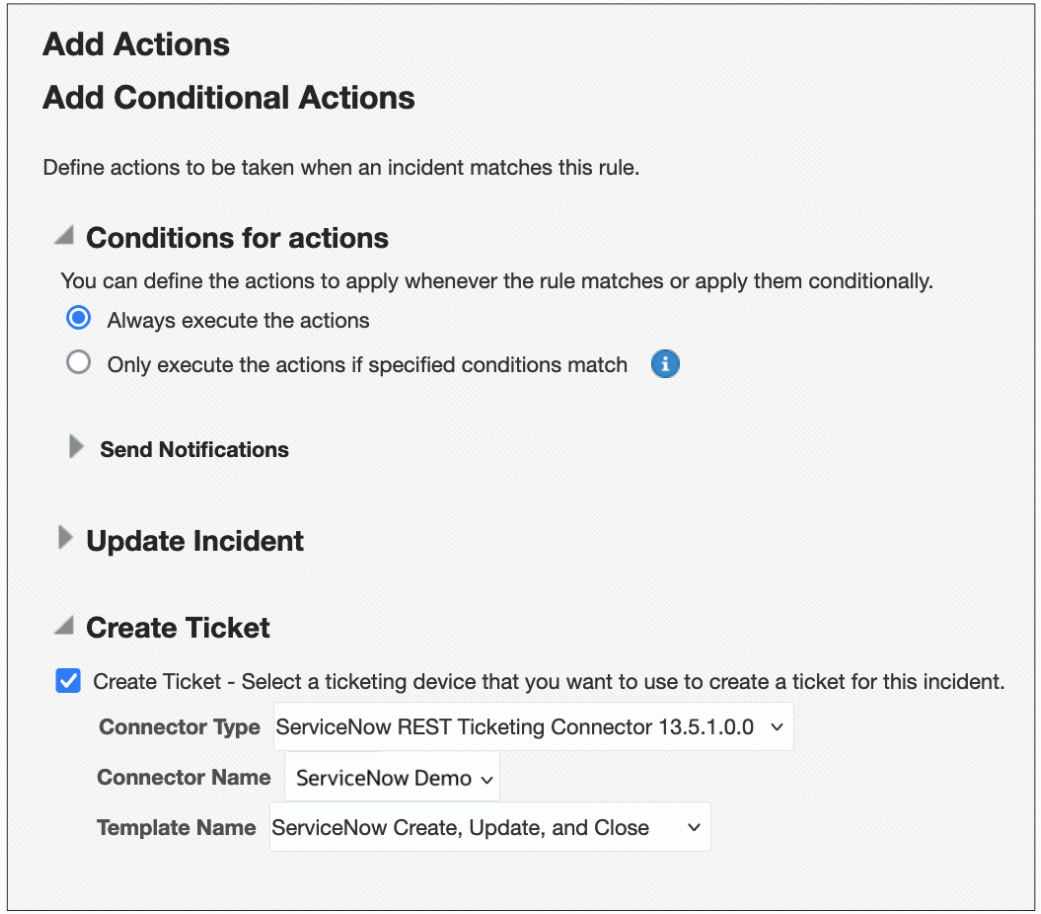
ServiceNow

1. Set up Event Rule to create incidents from events

2. Create ServiceNow tickets from EM incidents
   - **Automatically** create ServiceNow tickets from EM incidents via Incident Rules
     - Specify template to use

   OR

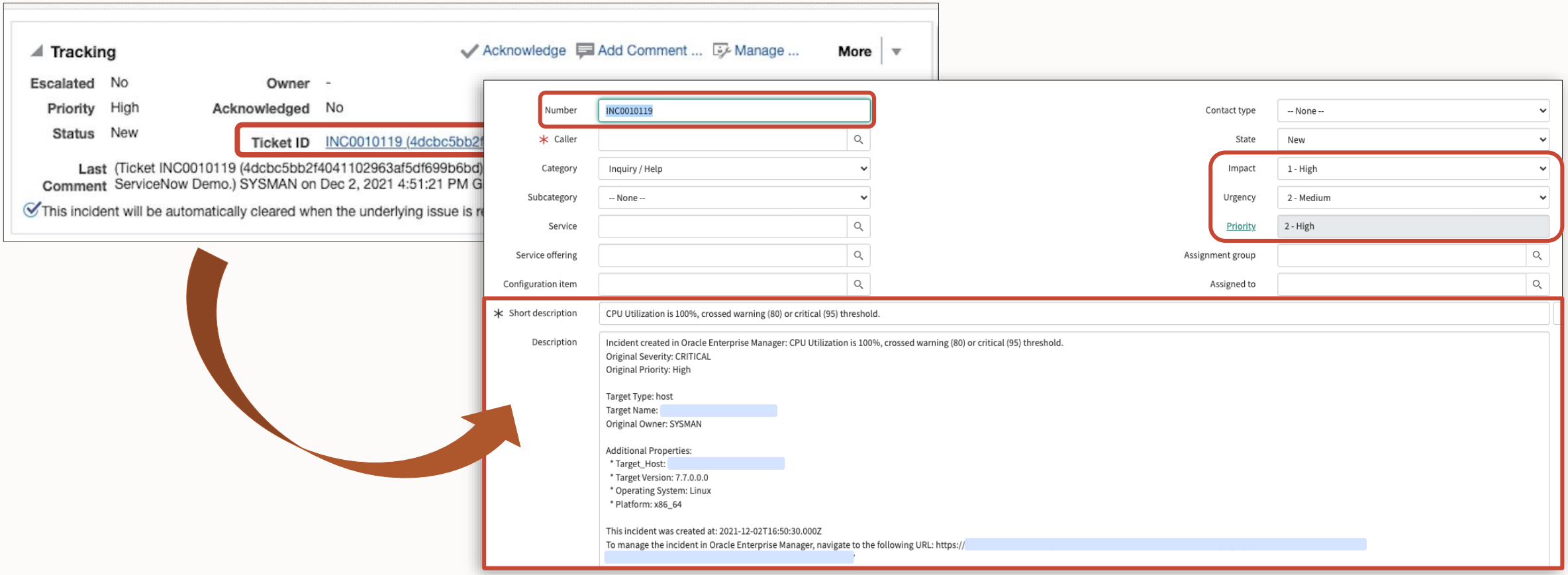
   - **Manually** create ServiceNow tickets in Incident Manager
     - Specify template to use



Access ticket from Enterprise Manager

ServiceNow

Access ServiceNow ticket directly from the context of an incident in Incident Manager



How do I integrate with systems that aren't covered by the connectors?

Ticketing systems

- Create your own ticketing connector
  - **Use Connector Framework** to build ticketing connectors via XML and XSLT metadata files
  - **Requires a web service** in the ticketing system to create and update ticket information

- Notification methods
  - Webhooks
  - SNMP Traps
  - OS Commands

Event management systems

- Create your own event connector
  - **Use Connector Framework** to build event connectors via XML and XSLT metadata files
  - **Requires a web service** in the event management system to create and update event information

- Notification methods
  - Webhooks
  - SNMP Traps
  - OS Commands

Notification methods

Send EM events and incidents/incidents with event compression to external systems

Email

- Send emails to individuals or distributions lists
- Customize email subject and body

Webhook

- Send notifications to any external application that accepts webhook requests and can parse payload specific content

Slack

- Send notifications to Slack

SNMP Trap

- Send SNMP traps to SNMP-enabled external systems

OS Command

- Execute OS commands or scripts to send notifications to external systems

PL/SQL Statement

- Pass EM incident and event payload to PL/SQL procedures to share with external systems

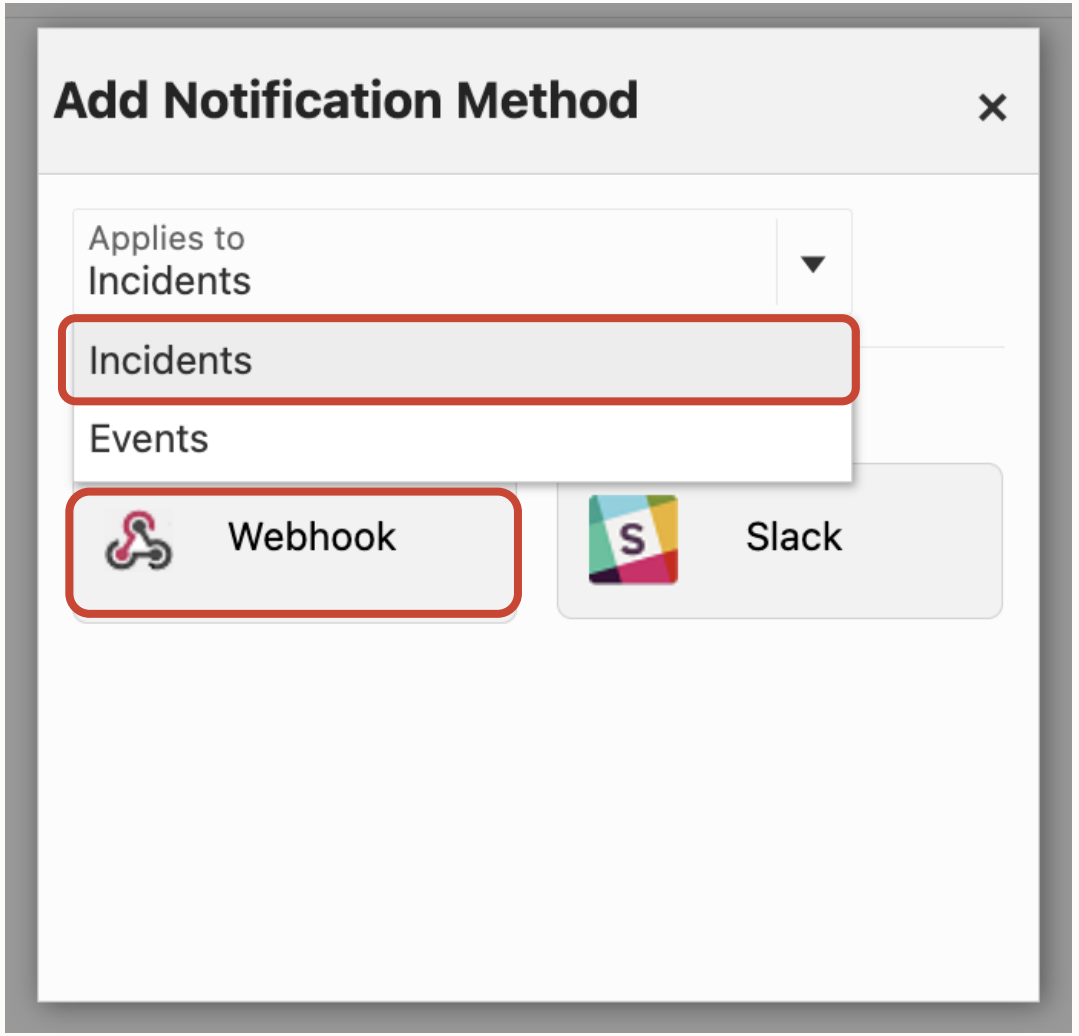
Two steps to use:

1. Configure notification method
2. Use notification method in Incident/Event Rule actions

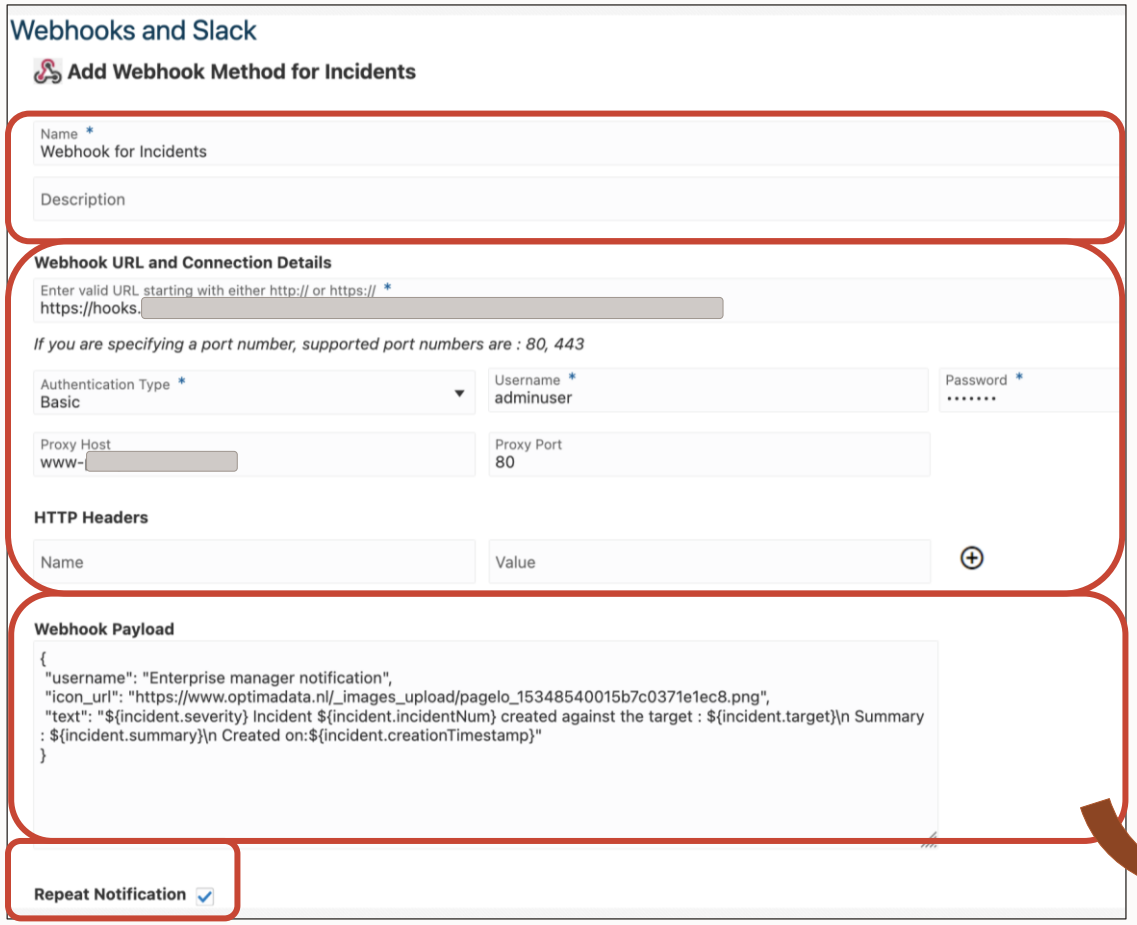
Step 1A – Configure Webhook Notification Method

Applies to:

- **Incidents** – Select this option to integrate with ticketing systems
- **Events** – Select this option to integrate with event management systems



Step 1B – Configure Webhook Notification Method



Payload variables

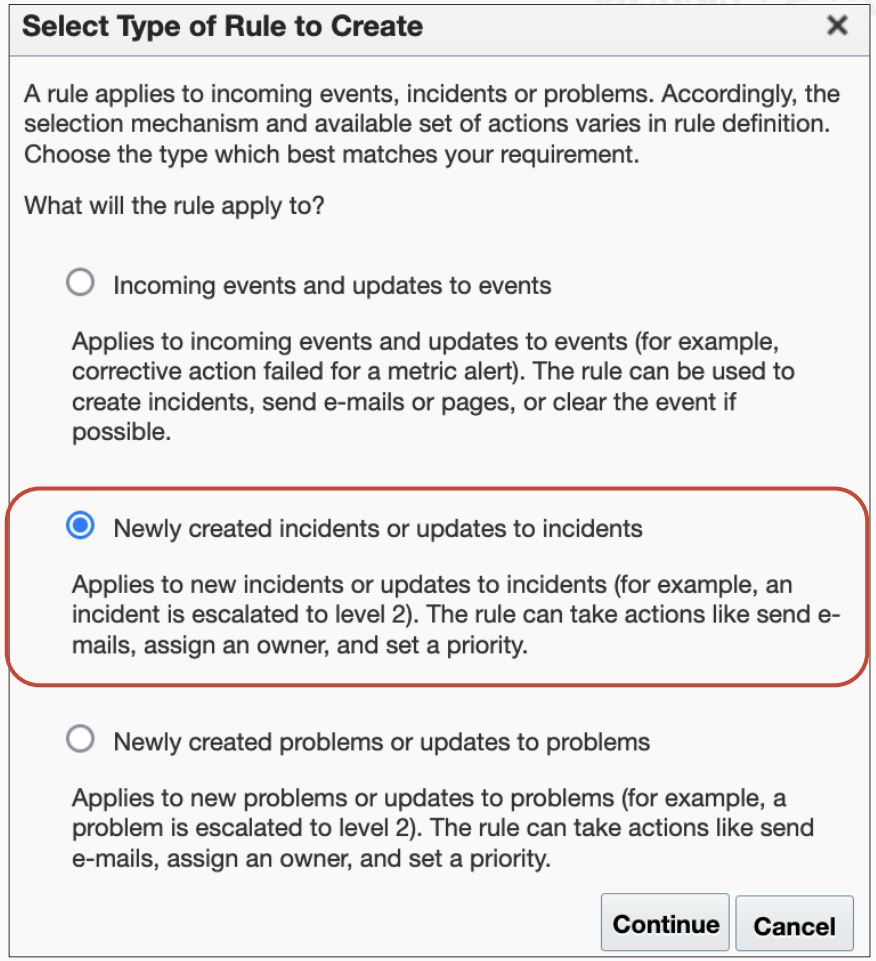
Token Name	Description
${incident.incidentID}	ID of the incident
${incident.incidentNum}	Display ID for the incident
${incident.severity}	Severity for the incident
${incident.target}	Name of the target
${incident.targetType}	Target type
${incident.creationTimestamp}	Incident creation timestamp
${incident.summary}	Summary message for the incident
${incident.resolutionStatus}	Resolution state for the incident
${incident.owner}	Owner of the incident

Step 2A – Use notification method in Incident Rule actions

Select type of rule to create

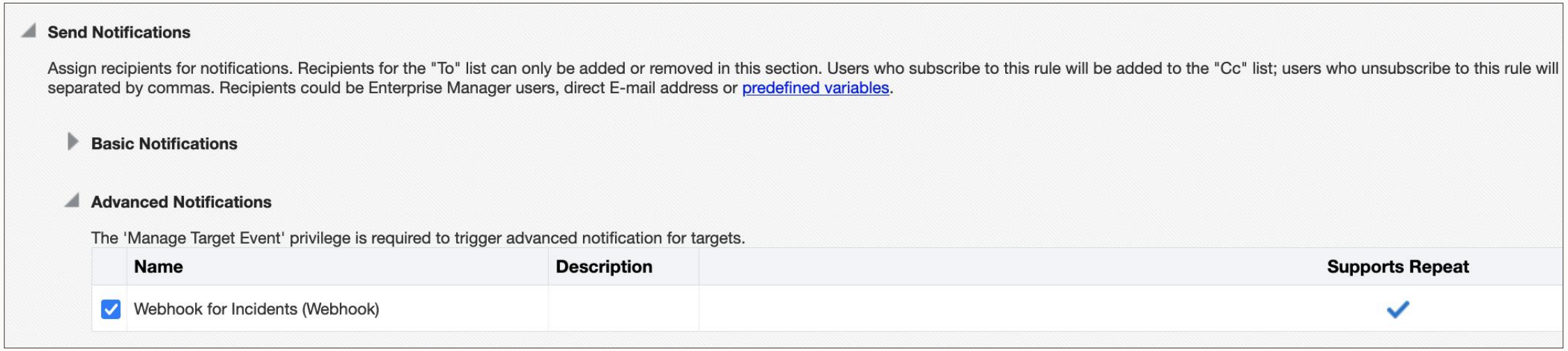
1. Set up Event Rule to create incidents from events

2. Set up Incident Rule to send incident notifications via Webhooks:
   - **Newly created incidents or updates to incidents**



Step 2B – Use notification method in Incident Rule actions

Select notification method



"Add Actions" in Incident Rule

Summary

Enterprise Manager: Central monitoring solution for all infrastructure and apps

Monitor non-Oracle technologies using plug-ins

- MySQL
- SQL Server
- IBM DB2
- Apache Tomcat
- JBoss
- Microsoft IIS
- IBM WebSphere Application Server
- Custom plug-ins using Extensibility Development Kit (EDK)

Send notifications for events or incidents

- Connectors
  - ServiceNow
  - Jira
  - PagerDuty
  - Microsoft SCOM
  - IBM Tivoli Netcool/OMNIBus
  - Custom connectors using Connector Framework
- Notification Methods
  - Email
  - Webhooks
  - Slack
  - SNMP Traps
  - OS Commands
  - PL/SQL Statements

Q&A
Learn More

Hands-on-labs

Web: oracle.com/enterprisemanager

Videos: youtube.com/OracleEnterpriseMgr

Blogs: blogs.oracle.com/observability

Docs: http://docs.oracle.com/en/enterprise-manager

Search in your browser for the following docs:

- Custom Plug-ins: Enterprise Manager 24.1 - Extensibility Programmer's Guide
- Custom Connectors: Enterprise Manager 24.1 - Connectors Integration Guide

Oracle Cloud Free Tier

Always Free
Services you can use for unlimited time

+

30-Day Free Trial
Free credits you can use for more services

www.oracle.com/cloud/free