Oracle Enterprise Manager
Oracle Fusion Middleware Management

SOA Management Lab

Session S318968
Oracle Enterprise Manager 11g
SOA Management
Hands-on Lab

*Introduction to Enterprise Manager 11g*

*Oracle Enterprise Manager 11g* is the centerpiece of Oracle's integrated IT management strategy, which rejects the notion of management as an after-thought. At Oracle, we design manageability into each product from the start, enabling Oracle Enterprise Manager to then serve as the integrator of manageability across the entire stack encompassing Oracle and non-Oracle technologies. Fueled by this unique vision, Oracle Enterprise Manager 11g has introduced *business-driven IT management* to help IT deliver greater business value through three highly differentiated capabilities:

- **Business-driven application management**, which combines industry-leading capabilities in real user experience management, business transaction management and business service management to improve application users' productivity while enhancing business transaction availability
- **Integrated application-to-disk management**, which provides deep management across the entire Oracle stack to reduce IT management complexity and eliminate disparate point tools
- **Integrated systems management and support**, which utilizes industry-first technology bring support services into the IT management console; enabling proactive IT administration, increased application and system availability, and improved customer satisfaction

*Oracle SOA Management*

More and more, organizations are turning to composite applications to implement critical business activities. Common examples include: Cellular Provisioning and Activation, Insurance Claims Processing, B2B Procurement etc.

SOA technologies, such as the Oracle SOA Suite and Oracle Service Bus, allow customers to re-use and compose new services for customers and stakeholders more quickly and with lower cost than ever before. However, when adopting these more feature-filled platforms, new management challenges need to be addressed:

- Managing multi-tier transaction flow
  - Span shared components / services
  - Deployed across several tiers in different containers
  - Across the enterprise
- Performance and visibility into SOA services
  - Beyond generic Java classes and methods
  - Framework and metadata visibility
  - Specific knowledge of the Oracle platform
- Control over configuration changes
- Time consuming administrative tasks
  - Cloning and scale-up

Oracle SOA Management Pack Enterprise Addition addresses these challenges and helps customers reduce the total cost of ownership for their SOA infrastructure.
This lab will demonstrate:

- Infrastructure Oriented SOA 11g Metrics
- Logical Application Oriented SOA 11g Metrics
- Infrastructure Oriented OSB Metrics
- Logical Application Oriented OSB Metrics
- SOA Configuration Management

Please feel free to seek assistance from the instructor or Oracle Demo staff at any point in time.

Before we start taking you through the demonstration, please note the following:

- You will be given a virtual machine address to use for this lab. For ease of reference, you may want to write this below:
  
  VM Address: ________________________________

- You will connect to Enterprise Manager Grid Control using a simple browser connection using Firefox. The username and password are:

  Username: sysman
  Password: welcome1

For these labs, please use Internet Explorer 7.x or higher as your browser.
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Infrastructure Oriented SOA 11g Metrics

Enterprise Manager Grid Control 11g helps customers gain visibility into the health and performance of their Oracle SOA Suite environments. Administrators who need to understand and monitor the behavior of production SOA applications can use Enterprise Manager to gain the required visibility.

Estimated Duration: 10 minutes

Log into the EM Grid Control web interface

Point your browser at https://<emgc-external-ip>:<emgc-port>/em
Login in the the credentials: <emgc username> / <emgc password>

This is the Enterprise Manager home page, which shows a summary of the availability and alerts on all of the targets that your user is entitled to view.

Middleware Targets Tab

Click on the Targets tab and then the Middleware sub-tab
The middleware targets tab shows a collapsible, expandable, and searchable view of all middleware in your environment that is accessible to your user. This view shows the availability status of the middleware targets and columns with customizable summary metrics. This provides a single entry point into large-scale multi-domain management, allow users to search, filter, and navigate into WebLogic, SOA, and OSB domains across their enterprise.

**SOA Infrastructure Home**

Click on the `/Farm_FOD_Single_fod_single/fod_single/AdminServer/soa-infra` target (which is of type SOA Infrastructure).
The soa-infra home page shows a summary of the SOA 11g running in the selected domain. Aggregated throughput metrics for the whole soa-infra, summary metrics for the service engines, and summaries for the SOA composites are displayed in tabular form.

Administrators can use this screen to get a quick overview of the health, status, and performance of the SOA domain.

**SOA Infrastructure Fault Summary**

Click on the **Faults and Rejected Messages** tab

This tab shows summary metrics for the faults on each composite during the time frame covered by the last metric collection. A list of faults is displayed on the bottom-half of the pane listing out information about the individual faults.

**Service Engine Home**

Click on the **Home** tab to return to the soa-infra home page
Click on the **Mediator** link in the **Service Engines** table
The Mediator Engine home page shows a summary of all the mediator components across all SOA composites. There are analogous pages for all service engines in the SOA Suite.

**Composite Home**

In the left-side navigation tree, expand Farm_FOD_Single_fod_single / SOA / soa-infra and then click on the OrderBookingComposite node. (Alternatively, you can click on the browser’s back button to return to the soa-infra home page and then click on the OrderBookingComposite in the Deployed Composites table)

The SOA Composite home page shows a summary of a specific SOA composite. Metrics are provided for all of the services and references defined in the composite, and for all of the components within the composite. A graph summarizing throughput on the composite is displayed. You may wave your mouse over the line in the graph to see values for individual data points.
Additionally, you may click on any numerical value in a table in order to bring up a mini-graph with the recent values for that metric.
SOA Configuration Management

Oracle Enterprise Manager automatically monitors configuration parameters in the SOA infrastructure and offers functionality to track change history, compare, and snapshot configuration settings. Customer can use this for a variety of purposes, such as comparing settings for environments that are supposed to be identical but are deployed to different data centers, comparing test to production, and tracking configuration change drift.

Estimated Duration: 10 minutes

**Middleware Targets Tab**

Click on the Targets tab and then the Middleware sub-tab

The middleware tab is our basic navigational entry point across the enterprise.

**SOA Infrastructure Home**

Click on the /Farm_FOD_Single_fod_single/fod_single/AdminServer/soa-infra target (which is of type SOA Infrastructure).
Operations relating to the SOA infrastructure start here as a navigational starting point.

**Last Collected Configuration**

Click on the main **SOA Infrastructure** target menu and select **Configuration / Last Collected**
This page lists out the current configuration of the SOA infrastructure, separating out the configuration settings by engine and category. Anchor links to jump to a specific section are available across the top of the page. Buttons to access additional configuration capability are just below those links. The Save button, in particular, allows us to store the current configuration with a name that we can use for comparison later. Don’t hit this button now, we’ll used saved configurations later.

**Configuration History**

Click on the History button

This page shows a list of historical changes on the target, grouped by category. The History Records column shows how many changes were made on that particular category on that particular collection. In the event that there were a large number of changes in a particular category, we could click on the link to list those changes. However, since all of the changes in this particular case seem to be one-field-at-a-time, we can flatten this list.

Click on the View History Records drop-down and select Show All
Now we can see a flattened list of the attributes which were changed in each change record.

**Configuration Comparison**

Use the back button and return to the Last Collected Configuration page which was titled “View Configuration: SOA-Infra Configuration”

Click on the Compare button

We can compare configurations between different servers and against specific saved configurations, perhaps one that we consider to be the “gold master” configuration. In this case, we only have one SOA server, so we’ll do the comparison against a saved configuration.

Click on the Saved Configurations link

Select the configuration with the Description "The Night Before"

Click Compare
Configuration in Enterprise Manager Grid Control is tailored to each type of monitored target, so rather than just getting a simple line number based diff, we get a summarized comparison with details. Under the **Summary** header, the different categories are marked with icons indicating whether there was a difference in that area. Then you can click on the anchor link to go to that section and see what the specific changes were.
Logical Application Oriented SOA 11g Metrics

Application architects may often be interested in viewing metrics organized based on logical context and to visualize an application's dependencies along with performance metrics. Enterprise Manager’s Application Dependency and Performance feature allows users to view metrics in-context to their applications structure in a manner native to the SOA platform.

Estimated Duration: 10 minutes
Use Internet Explorer 7.x or higher as your browser for this exercise.

Middleware Related Links

Click on the Targets tab and then the Middleware tab

As before, this is our main landing page which we will use to navigate across different targets.

Composites Node in Application Dependency and Performance

In the Related Links section at the bottom of the Middleware home page, click on the Application Dependency and Performance link. Expand the left-side navigation tree down to Oracle Enterprise Manager / Composites Click on the Composites node
This view shows summary metrics for the components across all of the SOA composites known to this particular ADP manager, and is the starting point for navigating into the SOA composites that have been deployed.

**Individual Composite node in ADP**

Click on the **OrderBookingComposite(1.0)** node in the navigation tree.

The Summary tab on an individual composite gives an in-depth overview of the performance of the components, services, reference, and dehydration behavior. Users can quickly look across the service engines and subsystems to determine whether or not there are performance anomalies in a particular area. Of particular note is the **SCA Dehydration Performance** table which shows the components which are performing dehydration and the average time spent executing dehydration SQL for the instances which completed during the time frame. Since dehydration is often a source of performance latency, this metric enables users to quickly understand how their composite instance execution times may be impacted.

**SOA Composite Static Topology**

Click on the **Topology** tab
The static topology view for a SOA composite shows you all of the defined relationships that were discovered. Based on the project metadata, all defined dependencies (wires) are shown between the services, references, and components within this composite. Using this view, administrators can understand what the potential impact of changes or performance issues on specific components are, based upon the deployed configuration.

**SOA Composite Dynamic Topology**

The dynamic topology view for a SOA composite shows you dependencies between services, references, and components based on invocation metrics. Edges in this graph represent actual invocations that were observed between two components. Using this view, administrators can understand how actual invocations flowed between components within the composite.
BPEL Process Summary

Expand the navigation tree from OrderBookingComposite(1.0) down to Components / BPEL / OrderProcessor
Click on the OrderProcessor node

This page shows a performance summary of this BPEL process. The arrivals (process starts) and completes (process ends) occurring within the view’s time frame are displayed in tabular and graphical form. The average, maximum, and minimum execution time for processes which ended within the time frame are also displayed. An error metric indicates the number of completions on fault handlers which occurred.

Tabs across the top allow the user to access additional details, like a localized topology for this particular BPEL component.

BPEL Delay Analysis

Click on the Delay Analysis tab
The delay analysis shows a relative breakdown of time contribution per node in the BPEL process. Users can use this to identify bottlenecks when they are experiencing performance problems with process executions.

**BPEL Functional View**

Right-click on the OrderProcessor node in the navigation tree and select Display Functional View

The BPEL functional view provides visibility into the performance of each BPEL activity using visualization and navigation that is native to the way BPEL is represented across the development and deployment lifecycle. This ensures that all stakeholders from administrators to developers use a common set of terminology and share common context.

**Invoke Node Architecture View**

Right click on the InvokeFindCustomer node and select Display Architecture View
Invoke nodes can have additional functionality in them such as SQL execution or external calls. An architecture view is available for BPEL invoke activities to show a breakdown of the time spend in the execution of this specific activity. The left-side diagram shows the call tree of certain components that are commonly present within invoke nodes. The pie chart breaks down the % time contribution of each of the boxes shown in the diagram. In this case, we see that the majority of time was spent in JDBC.

**SQL Statements in Architecture View**

Click on the SQL Statements tab in the right-side pane.
Individual SQL statements executed within the BPEL activity are listed with metrics in this view. If there is significant time contribution spent in JDBC, we can see the breakdown across SQL statements here.
Infrastructure Oriented OSB Metrics

Grid Control also monitors Oracle Service Bus starting with ALSB 2.6 and higher, although some metrics are not available in 2.6 and 2.6.1. Through the EM target model, users can gain visibility into the Oracle Service Bus running with a WebLogic domain.

Estimated Duration: 10 minutes

Middleware Targets Tab

Click on the Targets tab and then the Middleware sub-tab.

As usual, the middleware targets page is our top-level navigation point for entering into different types of WebLogic and SOA related targets.

Oracle Service Bus Home Page

Click on the /Farm_OSB_Loan_servicebus/servicebus/xbusServer/xbusServer_osb target link (which is of type Oracle Service Bus)
This is the top-level page for the Oracle Service Bus target that contains high-level aggregated metrics for the whole server and regions for alerts and configuration management.

**OSB Performance Page**

**Click on the OSB Performance sub-tab**

This page gives a graphed overview of the top proxy and business services executing within the OSB server, useful as a more detailed summary of the server’s overall behavior.

**OSB Services Page**

**Click on the OSB Services page**
The OSB services page shows a hierarchy of the folders, business services, and proxy services. This page shows a simple numerical summary of each service and is a starting point for navigating into deeper metrics related to one specific service.

**OSB Proxy Service Page**

Click on the **LoanGateway3** link

This page shows summary information specific to the specific proxy service we clicked on. There are overview metrics for this service, as well as a link into the EM services subsystem. Under the **EM Services** header is the ability to promote this proxy service into an EM service, and then display the status of the one or more EM services which may be associated to this proxy service. The **References** header shows the inbound endpoint information and the outbound business services that this proxy is related to. If we can detect a SOAP URL and WSDL for an endpoint, a radio button will be available to create web service test for an SLM beacon to execute.
**OSB Proxy Service Details**

Click on the **Details** sub-tab

This page shows details about the pipelines within the proxy service. Each of the linked metric values brings up a graph page for that metric.

**Metric Page**

Click on one of the links in the **Average Execution Time (ms)** column in the Flow Components table.

This page shows the value of this single metrics, graphed over time.
Logical Application Oriented OSB Metrics

Application architects may often be interested in viewing metrics organized based on logical context and to visualize an application’s dependencies along with performance metrics. Enterprise Manager’s Application Dependency and Performance feature allows users to view metrics in-context to their applications structure in a manner native to the SOA platform.

Estimated Duration: 10 minutes
Use Internet Explorer 7.x or higher as your browser for this exercise.

**Middleware Related Links**

Click on the Targets tab and then the Middleware sub-tab.

Again, the Middleware tab is our main navigation point for accessing functionality.

**OSB Node in Application Dependency and Performance**

In the Related Links section at the bottom of the Middleware home page, click on the Application Dependency and Performance link.
Expand the left-side navigation tree down to Oracle Enterprise Manager / OSB
Click on the OSB node
The top-level OSB node shows a summary of all the business services and proxy services across the monitored environment and across all of the monitored domains.

**Proxy Service node**

Expand the navigation tree under the OSB node down to MortgageBroker/ProxyServices / Proxy Services

Click on the loanGateway3 node

On the node for a specific proxy service, we can see a summary of the proxy service’s performance in tabular and in graphical form, as well as a summary of the performance of each of the pipeline nodes.
OSB Topology

Click on the OSB Topology tab
Wait for the in-frame Java applet to load

The OSB topology view shows the defined and actual invocation dependencies between proxy services, business services, and certain related J2EE components. This diagram can be used to understand the runtime and design time dependencies of an OSB service, and to navigate to metrics on particular components. The dark links represent design-time dependencies discovered from metadata analysis. The red and blue lines represent dynamic dependencies discovered based on actual invocation metrics. Each of the boxes can be double-clicked to drill down to metric screens associated with the component.

OSB Proxy Service Functional View

Double-click on the loanGateway3 box in the topology view

This view visualizes the pipelines within the OSB proxy service, showing the stages and pipeline nodes in the implementation. In the default context (which you can return to by clicking on the background of the diagram), we see summary metrics for all of the pipeline nodes and a graph of their historical performance.
**Individual Pipeline Node Performance**

Click on the PipelinePairNode1_request node

When we click on individual nodes in the diagram, we can see metrics in the right-side pane for the selected pipeline node. Note that it is possible to unfold certain nodes (particularly RouteNodes) beyond what we have useful metadata for. In particular, actions in route nodes are not supported; icons with GUIDs are rendered which appear to correspond to actions, based on discovered metadata, but no metrics or useful names are currently available.

**Business Service Node**

Close the OSB functional view window
Expand the navigation tree under OSB down to MortgageBroker/BusinessServices / Business Services / CreditRatingService
Business services are simpler than proxy services, so there isn’t any functional view for them. Here we see the metrics for the business service, and tabs are available to see some of the underlying OSB service health information and the topology view centered on this particular service.
This concludes the Oracle Enterprise Manager Hands-on Lab.

Additional information can be found at:
Demo Booths located at {Location}
Additional Sessions:
Moscone South: Enterprise Manager # XXXX
Moscone West: Enterprise Manager # XXXX

For additional information, visit:
Oracle Enterprise Manager: SOA, WebLogic Server, and Middleware Management

Oracle Application Management
http://www.oracle.com/technology/products/oem/prod_focus/app_mgmt.html

Oracle Enterprise Manager
http://www.oracle.com/technetwork/oem/grid-control/overview/index.html