ORACLE ENTERPRISE MANAGER 12c ORACLE E-BUSINESS SUITE

Effective System Management Using Oracle Application Management Suite for Oracle E-Business Suite

Case Study based on Oracle Global Single Instance

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Executive Summary

This document highlights the process and results of the real-world implementation of the Oracle Application Management Suite for Oracle E-Business Suite for Oracle Corporation's Global Single Instance (GSI) of Oracle E-Business Suite. This document provides an overview of the monitoring and management capabilities of the Oracle Application Management Suite, as well as practical guidance on using functionality such as Metrics, Monitoring Templates, Administrative Groups, Incidents, Notifications, Reports, Dashboards, and Service Level Monitoring was applied to the management of Oracle E-Business Suite components.

Some of the benefits of implementing Oracle Application Management Suite are as follows:

- 66% reduction in error resolution time for Oracle E-Business Suite-related issues.
- Automation of routing operations freed up DBA time by approximately 35%, allowing administrators to concentrate on higher value-added tasks, projects, and new features.
- Monitoring capabilities enabled system administrators to manage their Oracle E-Business Suite instances more proactively, thereby improving system availability, reliability, and predictability.
- Proactive monitoring capabilities enabled executive management to make better, timelier decisions on the use of resources – both hardware and personnel.

The implementation allowed the GSI team to re-engineer their support structure by:

- Eliminating proprietary tools/solutions
- Centralizing on a common toolset and reporting structure
- Standardizing processes
- Expanding the usage and footprint of Oracle Enterprise Manager
- For the first time, administrators were able to obtain Oracle E-Business Suite-specific activity and data, such as:
- Java Virtual Machine (JVM) usage -The ability to quickly and easily determine JVM activity, including CPU, memory, active threads, memory pools, metrics, and more.
- Concurrent Manager -The ability to streamline the monitoring, alerting, and reporting on various aspects of concurrent processing, ensuring maximum availability.
- Forms and OA Framework Services - The ability to monitor services and metrics associated with Forms (socket-mode) and Self-Service Apps.
- Workflow - The ability to report on activity, availability status, metrics, and manage Workflow activity.
- Configuration Management - The ability to archive point-in-time configurations (snapshots), for either auditing or comparison purposes to quickly find the drifts in the configuration due to changes or human errors. The ability to compare the patches applied, personalization's, custom objects, key

profile options, workflow services, and so forth helped immensely during the troubleshooting of application issues.

- Metrics - Administrators were able to proactively manage Oracle E-Business Suite instances by using out of box metrics and metric extensions (user defined) and setting up notifications based on warning and critical thresholds.
- Monitoring Templates - Monitoring templates helped to standardize the metrics and thresholds to ensure all environments are monitored using minimum set of standard metrics. Templates also helped to monitor metrics specific to certain targets resulting in speeding up the discovery process and facilitating better comparison of metrics between any two targets.
- Administrative Groups - This functionality allowed grouping related targets together as a single unit facilitating mass updates of settings to multiple targets within same group and managing application service levels by groups.
- Reporting and Dashboards - Standard and custom reporting capabilities including trend analysis, and historical data analysis could be viewed online within minutes thus eliminating or reducing the need for manual reporting, saving several hours of worth of efforts from in house resources on a regular basis.

Scope

This document is not intended to describe the installation process of Oracle Application Management Suite for Oracle E-Business Suite. It is assumed that Oracle Application Management Suite is successfully installed based on the guidelines provided in the getting started My Oracle Support knowledge document for specific releases and User Guides. It is also assumed Oracle E-Business Suite environments were successfully discovered and all systems are up and running smoothly. Oracle GSI mainly uses the Monitoring and System Management capabilities of Oracle Application Management suite. Therefore the scope of this document is limited to Monitoring and System Management functionality of the product. Note that some of the screen shots may not contain lot of data either intentionally or just the sample screens that represent the functionality being used and not necessarily from actual production environment of Oracle Global Single Instance.

Introduction to Application Management Suite

The Oracle Application Management Suite leverages Enterprise Manager Cloud Control framework and delivers capabilities such as system management, change management, application cloning to effectively manage Oracle E-Business Suite systems. The following is a list of key features delivered by the Oracle Application Management Suite for Oracle E-Business Suite:

System Management

- Automated Discovery Oracle E-Business Suite services and components
  - For example concurrent managers/programs, workflow, forms services, JVM and so on.
- Ability to generate incidents, notifications based on metric thresholds and take automated corrective actions
- Dashboards to show all the Oracle E-Business Suite targets, availability status of instances, services and components. Ability to drill down on each service and component to view the related metrics, graphical representation of performance and health check information.
- Extended Target Modeling: Ability to add additional targets such as LDAP, SSO etc to availability definition

- Configuration Management: Centralized storage of configuration that helps to view, track configuration changes and compare configurations between two or more Oracle E-Business Suite instances. Ability to compare configuration snapshots taken at different time intervals to easily check the impact of changes or catch unintended changes or human errors.
- Compliance Standards: Out of box Oracle E-Business Suite specific seeded compliant standards to check security standards and database configuration standards such as mandatory parameters in init.ora.
- Integration with Real User Experience Insight (RUEI) to proactively monitor and diagnose end user applications performance issues.
- Monitor performance and activities of users, sessions, concurrent processing, JVM usage, Workflow and other technology stack components.

Change Management

- Patch Management: Patch Management delivers simplified user interface based process to manage Oracle delivered patches and/or custom patches. Using Patch Management users can schedule patches automatically, promote patches from pre-production to production instances, check pre-requisites, apply patches to multiple E-Business targets by creating new patching procedures using existing one, and view or download patch worker logs.
- Customization Management: Customization Manager helps developers to check out the files from third party source control systems, create packages and deploy these as custom patches similar to Oracle patches. Customization Manager also checks customizations for Oracle development standards and customers can add additional checks that are required by the IT department in-house.
- Automated Cloning: Automated cloning allows efficiently clone application tier of Oracle E-Business Suite. Automated cloning eliminates the command line operations and reduces effort in apps tier cloning, Allows custom steps to be added to the cloning procedures and ability to schedule the cloning, and ability to copy an existing cloning procedure and re-submit it with changes.
- Oracle VM for Oracle E-Business Suite: Ability to quickly provision multiple EBS instances for training, development or testing purposes.

For further detailed information regarding Oracle Application Management Suite for E-Business refer to the Data sheet and User Guide.

About Oracle Corporation's Global Single Instance

Oracle Corporation's GSI (Global Single Instance) refers to the Oracle E-Business Suite production instance that Oracle uses internally enterprise wide for conducting daily business operations and financial reporting.

Oracle Corporation GSI has many Oracle E-Business Suite application products implementing including Financials, Supply Chain Planning, Human Resources and Self service applications.

The key characteristics of the GSI are:

- Database size: 39.6 Terabytes
- Number of users: 120,000+
- Platforms: SUN X4170_M3 (Mid-tier); SUN SPARC_M6 - 4 node cluster (Database-tier)
- Version of Oracle E-Business Suite: 12.1.3
- Version of Enterprise Manager: 12c (12.1.0.4.0)
- Version of Oracle E-Business Suite Plug-in: 12.1.0.3.0

- Besides Application Management Suite, GSI is using additional Enterprise Management packs and plug-ins to manage the environment. Database Lifecycle management, Performance and Tuning Packs, EMC Plug-in and NetApp Plug-in.

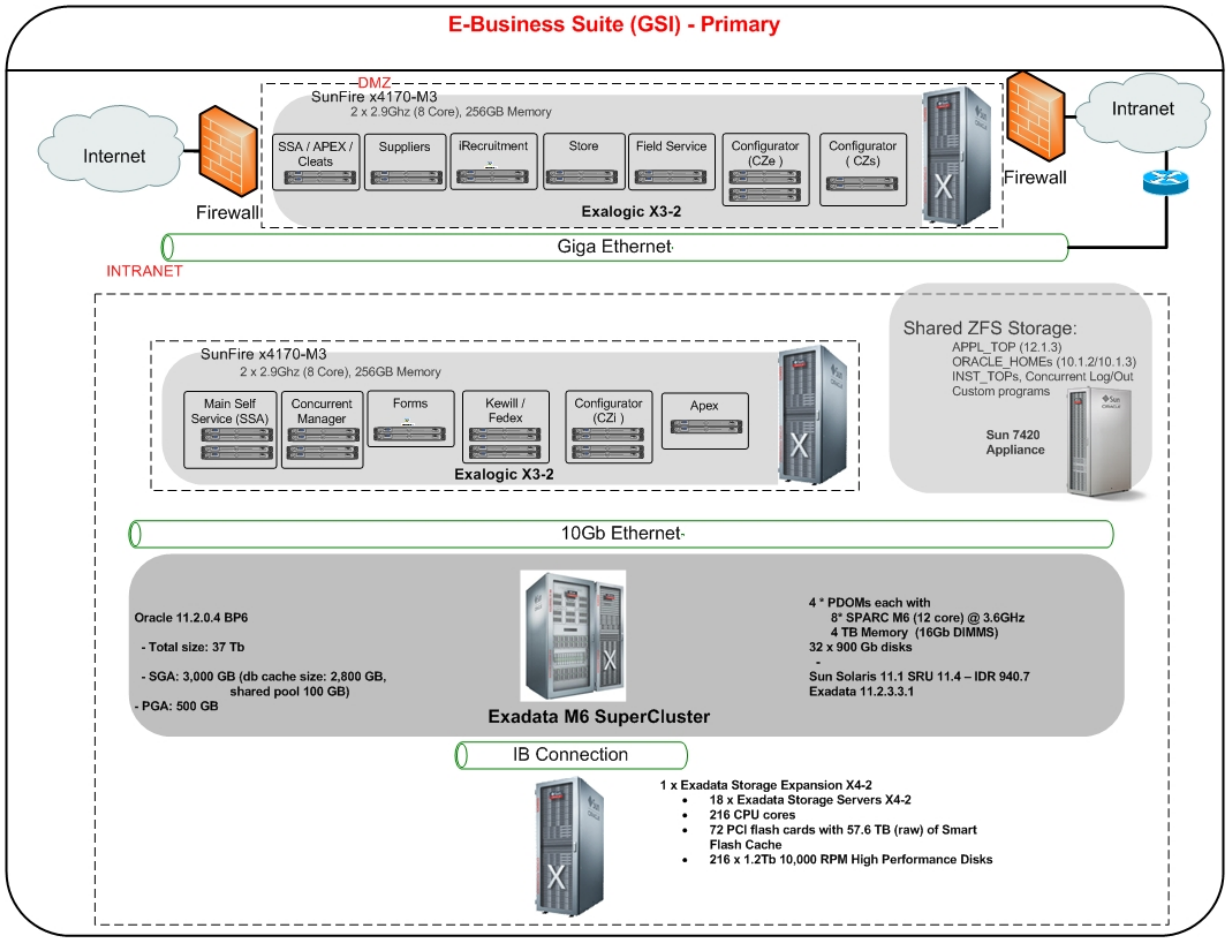
Organizational Responsibilities/Matrix

As a best practice GSI has clearly identified organizational roles to separate out the roles and responsibilities of resources engaged in operating this massive and complex infrastructure. Enterprise Manager has allowed GSI to define these role based access levels to provide adequate controls and clarity in responsibilities.

The following different groups are responsible for managing the environments:

Role / Group	***Responsibility***
Global IT (GIT)	Disk Infrastructure/Host (Database and Middleware)
Product DEV IT (PDIT) Business Apps Database Services	Database/Listener/ASM/DR/Concurrent Manager
Product DEV IT(PDIT) Business App Services	Middleware/Context Files/BigIP
Global IT (GIT)	Backups
Product DEV IT (PDIT) Patching Services	Patching

The following diagram represents an example of architecture of the Oracle E-Business Suite GSI:



Benefits of Implementation

Oracle Application Management Suite for Oracle E-Business Suite has immensely benefitted GSI operations, application services group, and performance services groups. The ability to centralize and standardize monitoring processes, proactive notifications, and diagnostic capabilities have reduced issue resolution time by over 66%.

GSI operation was able to standardize the support process, response documentation, eliminate manual work for team members, reduce human errors, and ensure continuous enhancements to the knowledge base.

Consolidation of Management Tools to Increase Efficiency and Lower costs

Improved Productivity

Prior to the deployment of the Management Suite, GSI administrators struggled with lack of a clear overview of technology components they have to monitor and manage and were unable to proactively review, triage and diagnose problems. Oracle Application Management Suite allowed administrators to create system groups to provide a top down view of throughput data, performance data for all Oracle E-Business Suite modules at each transaction level or each user level. The most important benefit was the ability to diagnose JVM issues real time by viewing JVM CPU usage, heap usage and active threads. They were able to generate BI reports using Enterprise Manager to view historical information. Proactive management of Oracle E-Business Suite by monitoring exceptions using incidents, notifications and ability to take corrective actions increased the productivity of administrator and reduce their need for custom scripts.

Consolidation of tools and increased efficiency

GSI was able to eliminate various tools that were no integrated together to monitor various middleware components. Oracle Application Management Suite and Enterprise Manager delivered capabilities to create a unified support model to monitor and manage middleware components such as forms servers, HTTP processes, and Java Virtual Machines. GSI was able to reduce the use of crontab entries, take advantage of automated corrective actions, and dramatically reduce the need for human intervention to correct problems.

This enabled the administrators to focus on the more strategic aspects of the business, instead of routine, redundant day-to-day tactical issues.

Performance Management

Given the magnitude of GSI implementation across different countries across the globe, number of users performing critical transactions on a daily basis, it is imperative the GSI production environment is performing optimally. GSI was unable to monitor performance consistently with existing disparate tools and custom scripts. By implementing Application Management Suite, GSI performance team was able to retire various tools, custom scripts and standardize the performance management. This resulted in over 60% reduction in performance issues. GSI was able to utilize Oracle Application Management Suite to accomplish following tasks:

1. Collate and review performance data from a holistic, end-to-end perspective
2. Locate and highlight possible “hot spots” in the Oracle E-Business Suite application
3. Proactively identify potential performance issues and avoid negative impact on application performance and availability.

24/7 Visibility, faster and timely reporting for critical decision making

Prior to Oracle Application Management Suite implementation, GSI administrators and management did not have visibility of all the technology assets, end to end performance issues, trend analysis, in depth information on forms users, web users, concurrent processing, workflow managers, and JVM usage. The Oracle Application

Management Suite provided the much needed 24/7 visibility into overall availability and performance data, historical data analysis that assisted in capacity planning for specific time period such as corporate period end closings.

It used to take several hours or in some cases days to gather, parse and collates data for database, host, and Applications metrics prior to implementation of Application Management Suite. The ability of Enterprise Manager to collect metrics related to performance and configuration allowed administrators to produce management reports within minutes by either using standard view of Enterprise Manager. For example, GSI administrators were able to provide clear-cut justification in a matter of minutes for capacity requirements based on the data tracked in the Application Management Suite.

Implementation of Best Practices

The following section describes the implementation process followed by GSI to successfully install and use the Oracle Application Management Suite for Oracle E-Business Suite.

AutoConfig

AutoConfig is a mandatory prerequisite for Application Management Suite, so GSI made sure AutoConfig was run to ensure that all the technology stack setups, configurations, and context files are clean, accurate, and up-to-date.

Running AutoConfig and prediscovery validation/diagnostics option delivered by Oracle Application Management suite helped to ensure there are no errors during Oracle E-Business Suite target discovery process. GSI administrators frequently check and ensure the status of Oracle E-Business Suite availability status in Oracle Application Management Suite is reflected accurately and run AutoConfig periodically during scheduled maintenance windows.

Socket vs. Servlet Mode

After the discovery process is completed GSI reviewed the Forms setup and validated the use of socket mode or servlet mode forms. Also, GSI team removed all targets from the Oracle E-Business Suite that were not active.

Leveraging Single Sign-On

Single Sign-On (SSO) provides a central and secure tool that simplifies the logon process for various applications in our enterprise including the Oracle E-Business Suite. Implementation of SSO helped GSI to reduce the administration overhead for end user access by 75%.

In addition, SSO streamlined GSI's auditing process, ensuring that they maintained compliance with the Sarbanes–Oxley Act of 2002.

Finally, GSI was able to integrate the Enterprise Manager console into the SSO infrastructure. For further information on SSO refer to the documents on Oracle.com under the section: Oracle Enterprise Single Sign-On Suite Plus

Middleware Changes

During implementation GSI updated a number of permissions and made setup changes for the middleware as well as the JVMs supporting the Oracle E-Business Suite infrastructure. However, these permission changes are no longer needed if TXK IO Patch 17751026 is applied. This is documented in the Getting started note for 12.1.0.3.0. At the time of publishing of this document a new release of Application Management Suite is available and you can find the Getting started note for 12.1.0.4.0 in My Oracle Support.

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As a best practice it is recommended to run AutoConfig, if any changes as the middleware technology stack (Application Server).

Java Virtual Machine (JVM)

Prior to running the discovery process, changes were required for the JVMs to make sure the agent owner at the OS level and the tech stack owner were not the same. If the changes are not complete, the data in the Oracle E-Business Suite plug-in will be inaccurate or, in some cases, missing.

Finally, there were some metrics collection errors for the JVM targets and these issues have since been fixed in the latest releases of Oracle Application Management Suite.

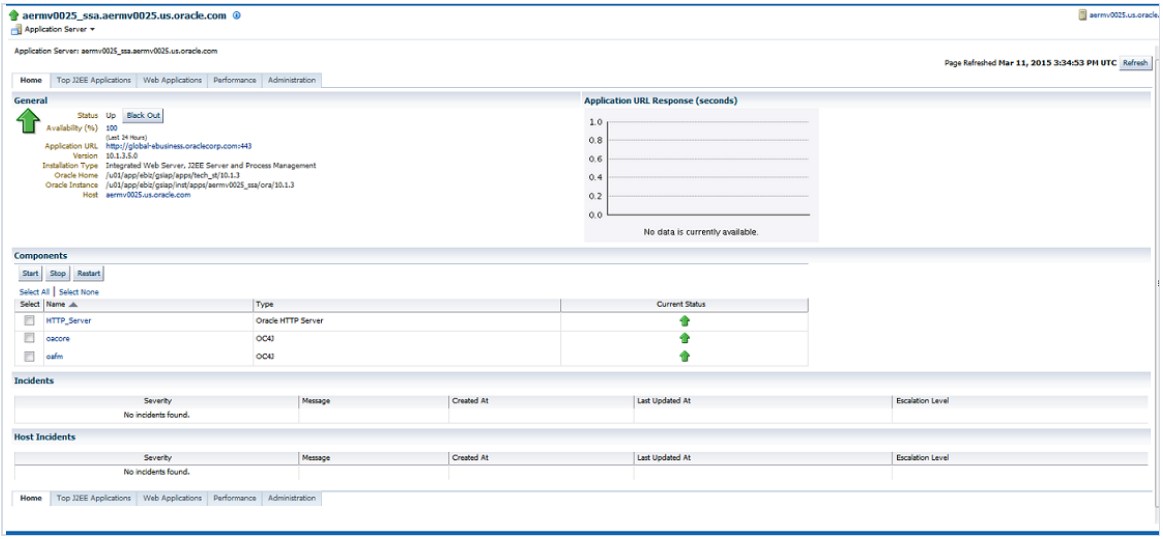
Setting up Application Management Suite

Once the Oracle E-Business Suite instance was discovered, the metrics and policies that are relevant to the various target types in each particular instance were reviewed.

Since each instance is different, it was critical to set the metrics and then review the trend over a period of time to ensure the proper settings. GSI completed this at each target level, setting the thresholds on required metrics. Once the thresholds were set, administrators then adjusted the templates for an enterprise wide change or at the specific target level, based on incidents seen.

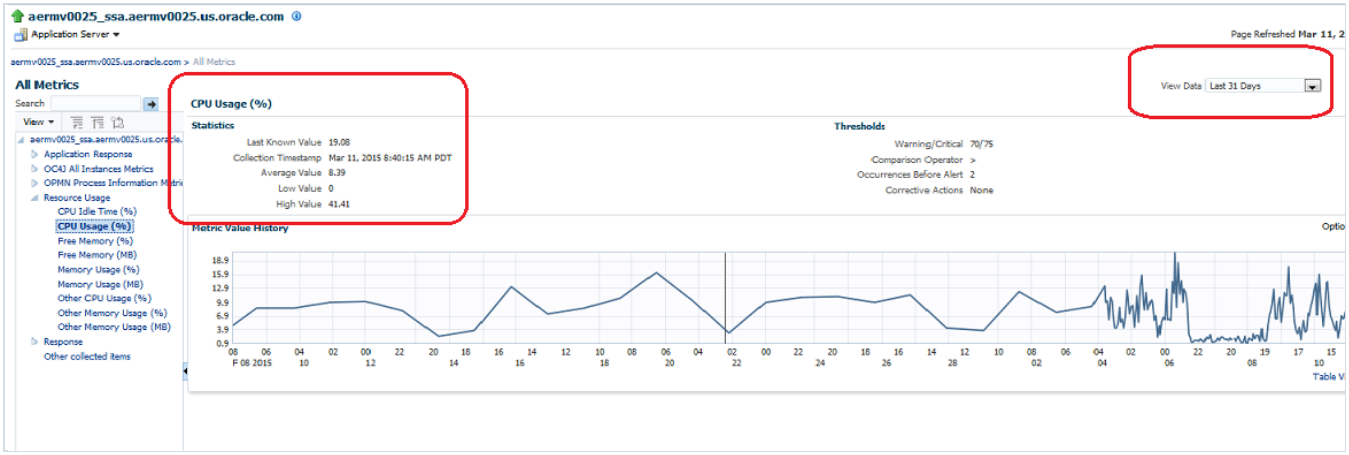
Oracle Application Management Suite shows the trend for any given metric over a certain time period (such as weekly, monthly, or custom period).

As an example, GSI was interested in establishing metrics and thresholds for middleware “CPU Usage %”. GSI was able to observe the trend for this metrics using following process:



- Navigate to a middleware (IAS) target home page. Go to the top left Menu ‘Application Server’ drop down to Monitoring – All Metrics.

- The “CPU Usage (%)” metric is located under the “Resources Usage” metric Set. Expand the metric and click on CPU Usage. Change the View Data drop down to “31 Days”. This displays the average, maximum, and minimum for a 31 day period.



In this particular example, the “High Value” data point over the last 31 days hasn’t been above 42%. Therefore, an initial setting on this metric for this target of 75% (as a warning threshold) and 75% (as a critical threshold) would be probably being appropriate. Obviously, these thresholds can continue to be fine-tuned as more data is available.

Application Management Suite: Metrics

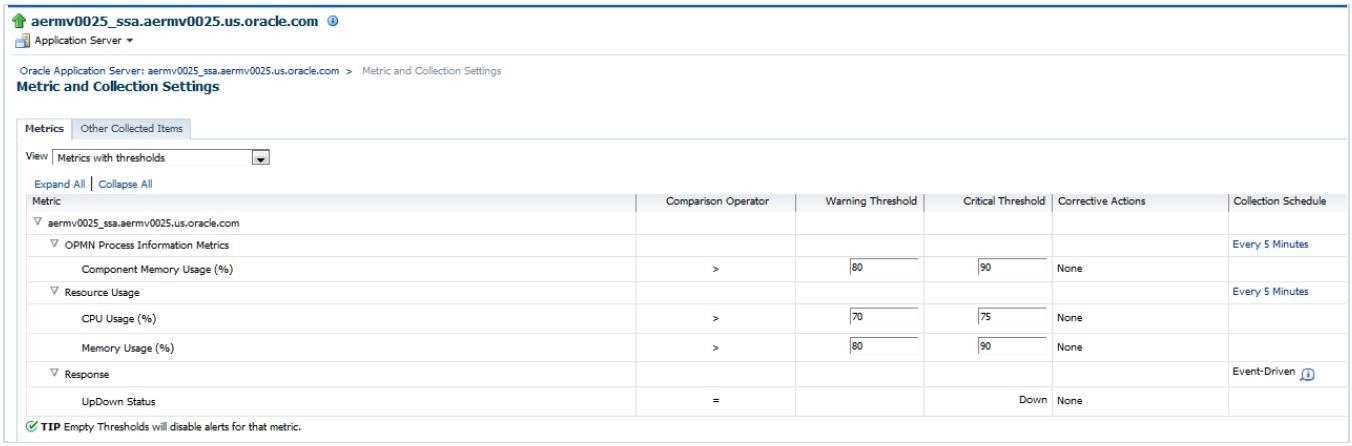
Oracle Application Management Suite delivers several Oracle E-Business Suite specific “standard” metrics to collect performance and configuration data for Oracle E-Business Suite and Technology Stack components. GSI made use of these metrics effectively to monitor and manage Oracle E-Business Suite environments proactively. Metrics allows administrators to manage several environments by setting up metric thresholds and receiving notifications based on any exceptions that occur in the system. Administrators can also setup automated correcting actions to reduce manual intervention. GSI reviewed the baseline for each of these metrics and obtained the baselines for each E-Business suit monitored. For each target metrics thresholds, type of metric and overall number of metrics monitored could be different.

The key aspects from the GSI implementation are:

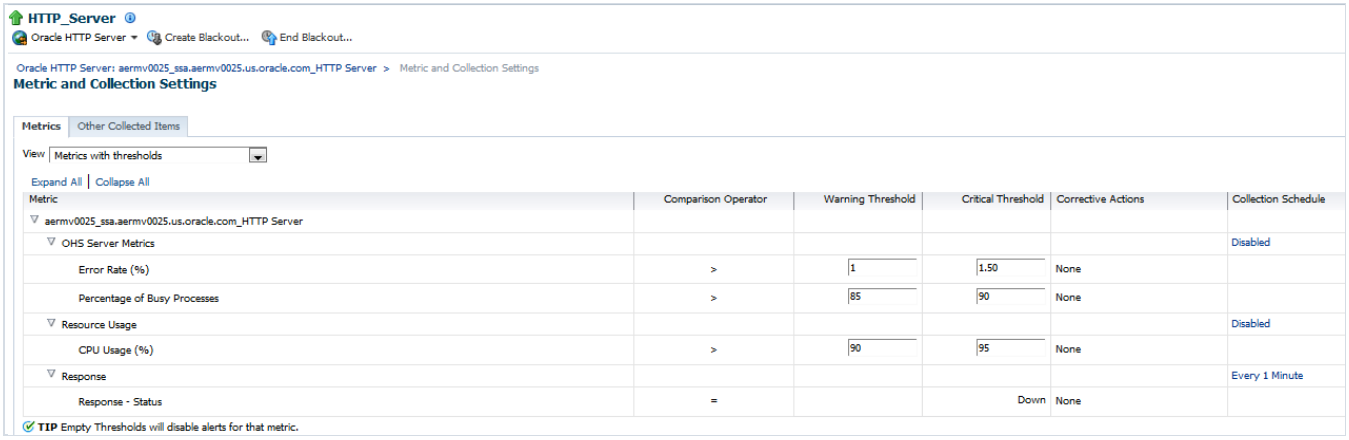
- Completed the review of the standard metrics delivered by Oracle Application Management Suite and then add or remove custom metrics based on GSI specific requirements.
- After the metrics baseline was established, set up metrics thresholds on the specific environment and then observe the incidents trend for 31 days. This can be done by reviewing the incidents shown on the home page of the Enterprise Manager.
- Once the initial 31 day trend results were obtained and analyzed, GSI adjusted the metrics on a single target – and used those settings to create a metrics template.

The screenshots below provide examples of the thresholds that were set for the GSI environment for Middleware and Oracle E-Business Suite targets.

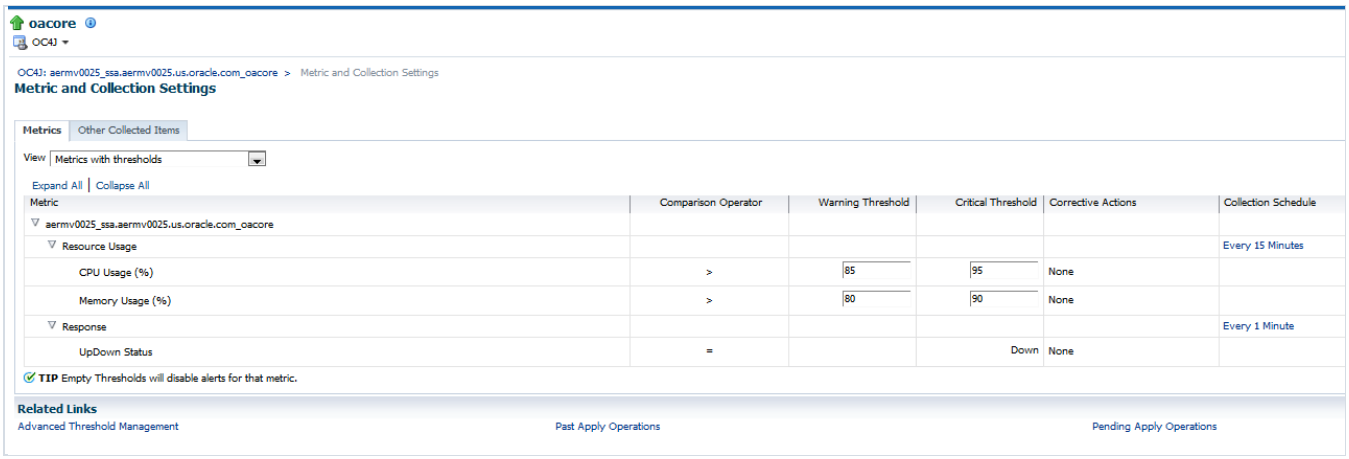
Middleware (IAS):



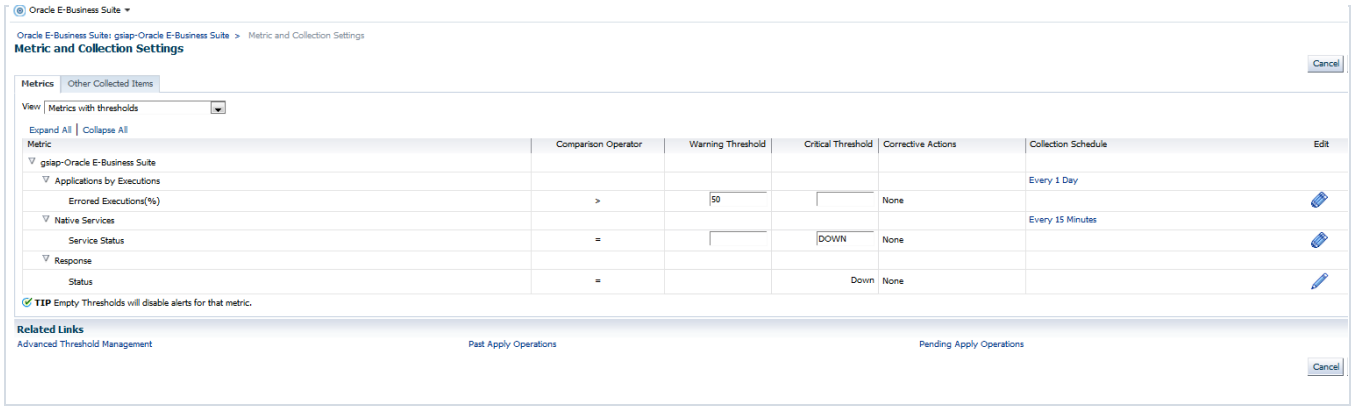
Middleware (HTTP):



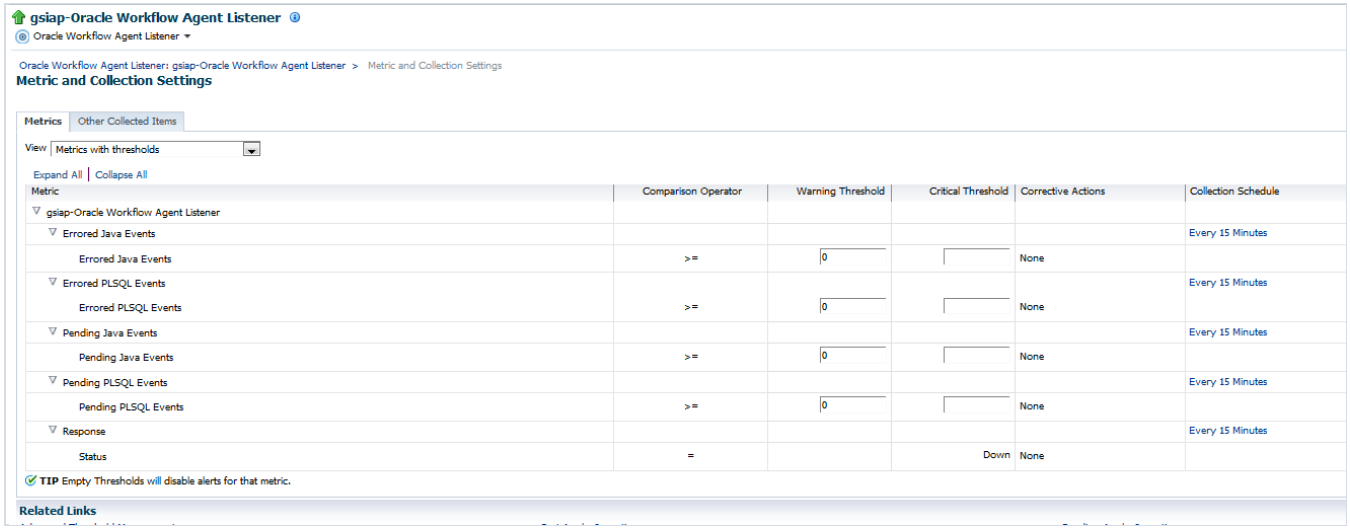
Middleware (OACORE):



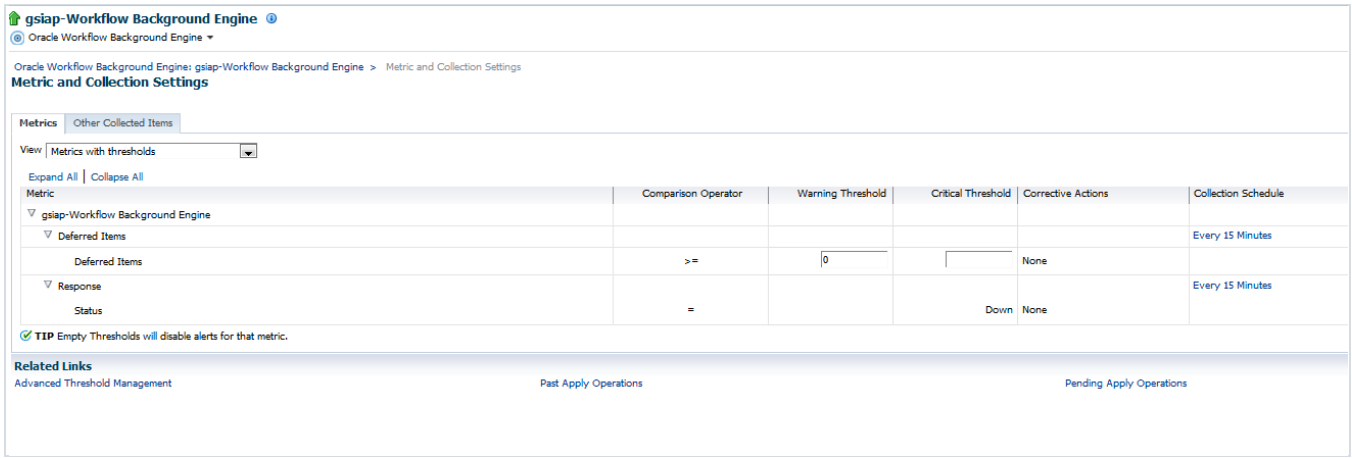
Oracle E-Business Suite (Home):



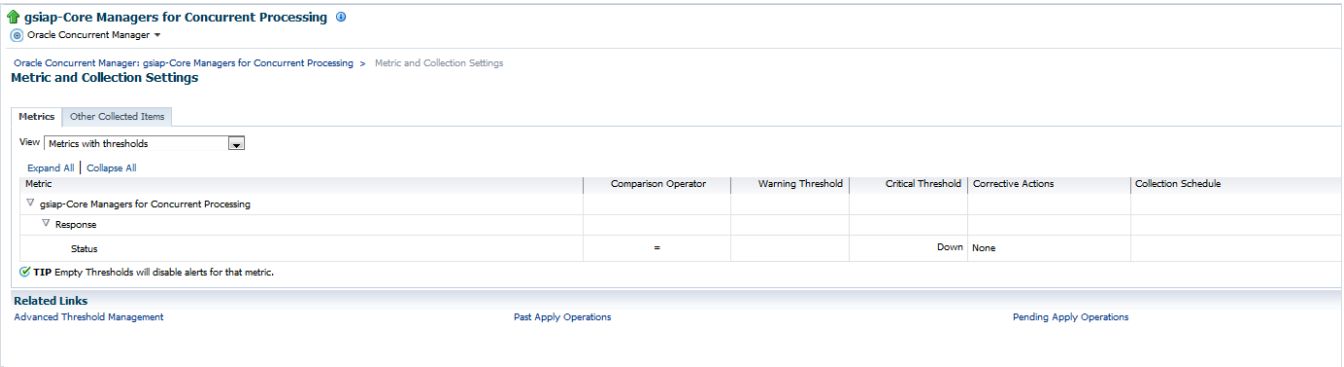
Workflow Notification (Listener):



Workflow Notification (Engine):



Concurrent Manager:



Metric Extensions

In addition to standard metrics delivered by Application Management Suite, GSI used the Metric Extensions feature to define additional metrics. These user defined metrics allowed GSI administrators to tailor the monitoring capabilities to specific reporting requirements mandated by Executives.

The user defined metric enables the administrator to create scripts that can be scheduled at the target level with thresholds that will notify when a specific issue is seen. This can be at the host level, the database level or the application server level.

The key aspects of GSI implementation are as follows:

- GSI was able to migrate from custom user defined metrics to standard metrics around status of the workflow and concurrent manager status.
- GSI was able to extend the metrics at the host, database and middleware level to meet the special requirements when standard metrics are not available or not adequate to meet the reporting requirements.
- GSI considers it is important to assign logical, intuitive names to the user defined metrics to make it intuitive and easier to manage.
- A user defined metric created on the master target was also be included in the monitoring template. Therefore, all user defined metrics that were part of the baseline was created on the first target. Once created, the template is created and applied to all the remaining targets of that type.

Additional information on metric extensions can be found in Enterprise Manager Cloud Control Administrator's Guide Document.

Monitoring Templates

GSI used monitoring templates to ensure the metrics were applied across all like targets. GSI recognized that it is important to ensure metrics on like target types have a baseline standard setup. Oracle Application Management Suite delivers out of box seeded monitoring templates for Oracle E-Business Suite.

Best practices followed by GSI are as follows:

- Reviewed and set all standard metrics prior to discovering the middleware targets.
- Identify the need for additional custom metrics.
- Discover middleware targets.

- Add standard and custom metrics to standard monitoring templates. This will help to establish standard baseline templates.
- Assign as single user to administer the baseline templates to ensure consistency and reduce errors.
- Established logical/intuitive naming conventions for the monitoring templates. In GSI's case, user administrators were established for the database, mid-tier and applications templates. Therefore, when working with the application templates, the applications template/notification rule owner is used to administer.
- Here is an example of the naming convention for the templates:
- Admin User:
- APPS_CR_TS_NOTIFY (APPS_<**C**ritical>_<**T**est/**S**tage>_NOTIFY)
- Template Name: APPS_EBIZ_GSI (APPS_<Type>_<Environment>)
- Target Type: Oracle Applications
- Once the template is created, it was applied to multiple targets.

Configuration templates were used compare configurations (based on configuration metrics data collected) between different targets Oracle E-Business Suite instances. Oracle Application Management Suite delivers comprehensive configuration comparison capability that helps GSI to compare multiple Oracle E-Business Suite system configurations and/or compare the configuration snapshots taken at different time intervals.

Leveraging Group Functionality

GSI leveraged grouping of many targets into single unit to increase the effectiveness of notifications and manageability of targets. Administrators were able to update the settings easily and ensure standards were applied to using standardized templates.

The ability to create system groups associated with web transactions helped in proactive monitoring and helped in identifying infrastructure outages for any application transaction. Creating system groups was critical in setting up Application Service Management

Group Administration

After all required targets were discovered, the next step was to create groups to facilitate ease of administration of multiple, related targets. It was critical that the grouping of targets is completed in a very organized fashion.

In the GSI implementation, a number of best practices were followed:

- Separate the groups by mid-tier hosts, database hosts and application targets.
- For the application groups, the naming convention included the application supported with the suffix "_apps" (for example, gsiap_apps). This group includes all Oracle Applications Oracle E-Business Suite target types for a given environment.
- For the mid-tier groups, we used the same naming convention specific to the environment with the suffix "_mts". This group included the host, agent, application service level management transactions, and the application server targets.

This configuration enabled the following capabilities:

- The use of group level dashboard (located on the right side of the group home page).
- The ability to compare targets in the group against user defined templates. Under the group administration tab, one can search the configuration for the targets in that group.
- The ability to obtain a deployment summary around hardware, OS levels and Oracle Homes.

Incident Management

Incident rules are the drivers for incidents received when a metric threshold is breached. It is critical that the rules are properly configured and implemented.

Incident rules for GSI are included in the Enterprise Rule set for ERP applications. They are based on target type and severity levels. GSI production is part of an EOTD Model (Eyes on the Dashboard), which means that the targets are constantly monitored by a designated administrator using the Enterprise Manager dashboard. If an incident is raised against a GSI target and it isn't acknowledged within 10 minutes, then a priority1 bug is raised by the administrator.

Incident rules are created and administered at the Enterprise Manager user level. GSI is part of the ERP/CRM dashboard group. There is a designated notify user for ERP/CRM who owns all the incident rule sets for the ERP applications. The password for this user is only available to the business and application support teams.

Once the rules are created, administrators can then associate a group that was previously created with the rule. This simplifies the administration of incident rules. When the groups are created with various targets, the group can be associated with an incident rule. An incident rule is driven by the target type and notifications will be sent out only for those target types that are addressed in the rule. This process makes adding and removing targets from incident rules easier.

When a new target is discovered, an administrator can simply add the new target to the required group. After the metrics template is applied, the rule will then notify the administrator based on the required metrics. In addition, when it is required to stop metrics or remove a target, administrators can simply remove the target in question from the group and the notifications will stop.

Performance Monitoring

Performance monitoring of a complex global single instance used by over 125,000 users of Oracle can be challenging. The following section is intended to cover performance capabilities of Oracle Application Management Suite used by GSI to troubleshoot performance issues:

- Oracle Application Management Suite offers two main summary pages. The first one is the Oracle E-Business Suite summary page that shows all the Oracle E-Business Suite target instances, availability status, and summary of performance, security incidents and compliance details applicable to all Oracle E-Business Suite systems. Second is the summary page- Oracle E-Business Suite Instance home page - that shows details of a specific Oracle E-Business Suite instance such as monitored services, status of the services and technology stack components, multi-node information and incidents specific to that instance.
- Administrators can see the health of each middleware environment and a list of any outstanding alerts for that environment, based on metrics thresholds set.
- From the E-Business instance homepage in Application Management Suite, administrators can immediately see the session activity. Since GSI team was familiar with the trends in their environment, they could quickly see if the user counts on that environment are "out of bounds".
- For example, if there was an influx in users, administrators would take note to further review the JVM status as well as host level statistics to see if the end user is experiencing any application issues. Conversely, if there is a sharp reduction in user count, this could indicate that there are infrastructure problems as users are not able to access the application.
- Administrators can view and manage the concurrent processing activities, user sessions, and workflow throughput.

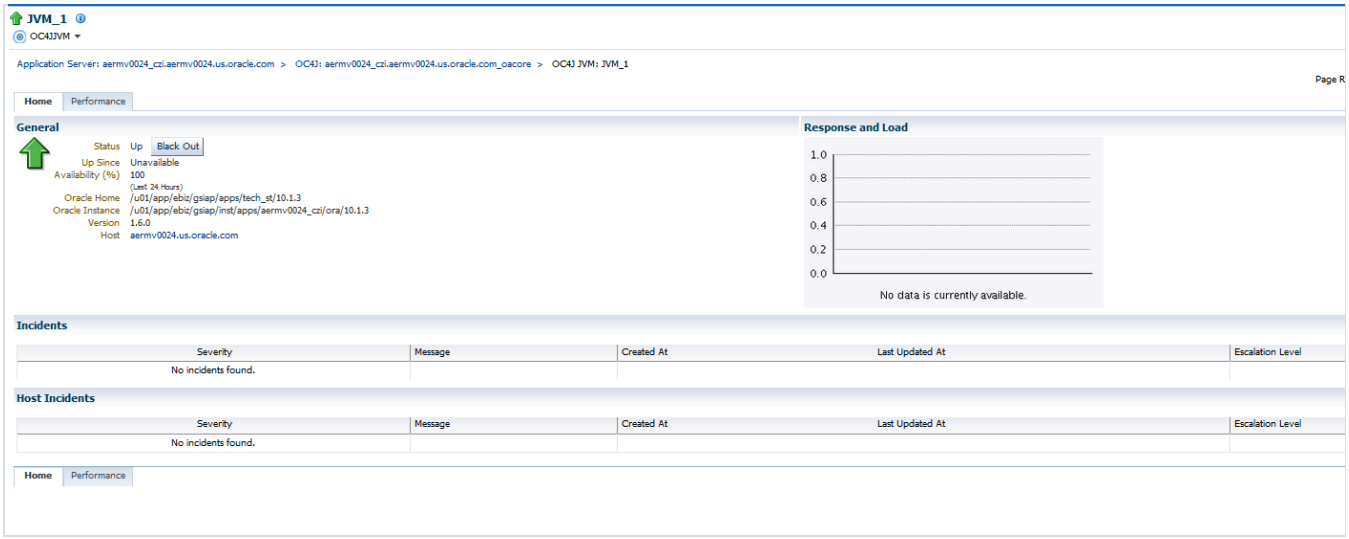
» Oracle Application Management Suite shows the trend analysis for the services and components, usage history, and drill down capabilities to quickly diagnose performance capabilities for a specific user or a session and narrow down the problems to underlying SQL, or Java process, or DB locks, Java thread problems like leaks, locks and so on.

Java Virtual Machine (JVM) Administration and Monitoring

Ensuring JVMs that supports Oracle E-Business Suite applications are healthy is critical for the performance of applications. Oracle Application Management Suite allows administrators to proactively monitor and gather real-time data of JVM usage.

Prior to implementing the Application Management Suite, tracking and understanding JVM usage was a difficult process despite having custom tools. With the capabilities delivered by Application Management Suite, GSI was able to standardize and centralize this effort, and improve the ability to detect possible performance issues with the application before it affects the application users.

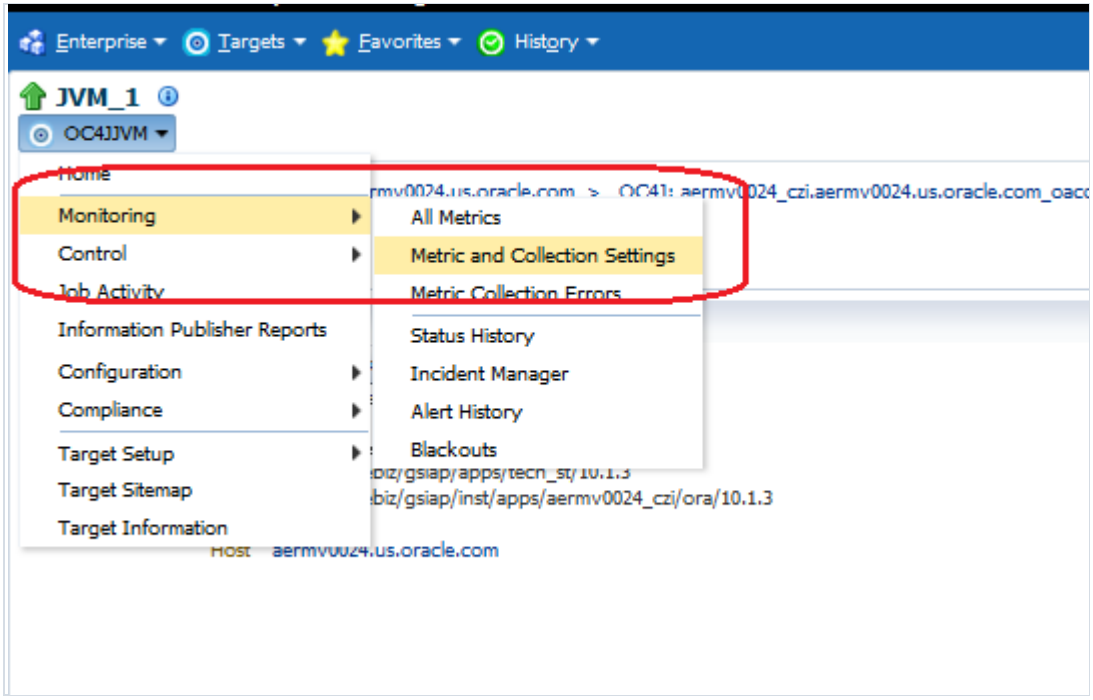
Drilling down into a specific JVM shows the details specific to the JVM usage:



The sample screen shot above, shows that it is very easy to determine the JVM activity, to quickly ascertain any outstanding issues around CPU, Memory and active threads.

Administrators can view statistics for the memory pools and garbage collection. From our experience, it is critical that the garbage collection process isn't running too often for a JVM. Frequent execution of the garbage collection process can shed light on a potential problem.

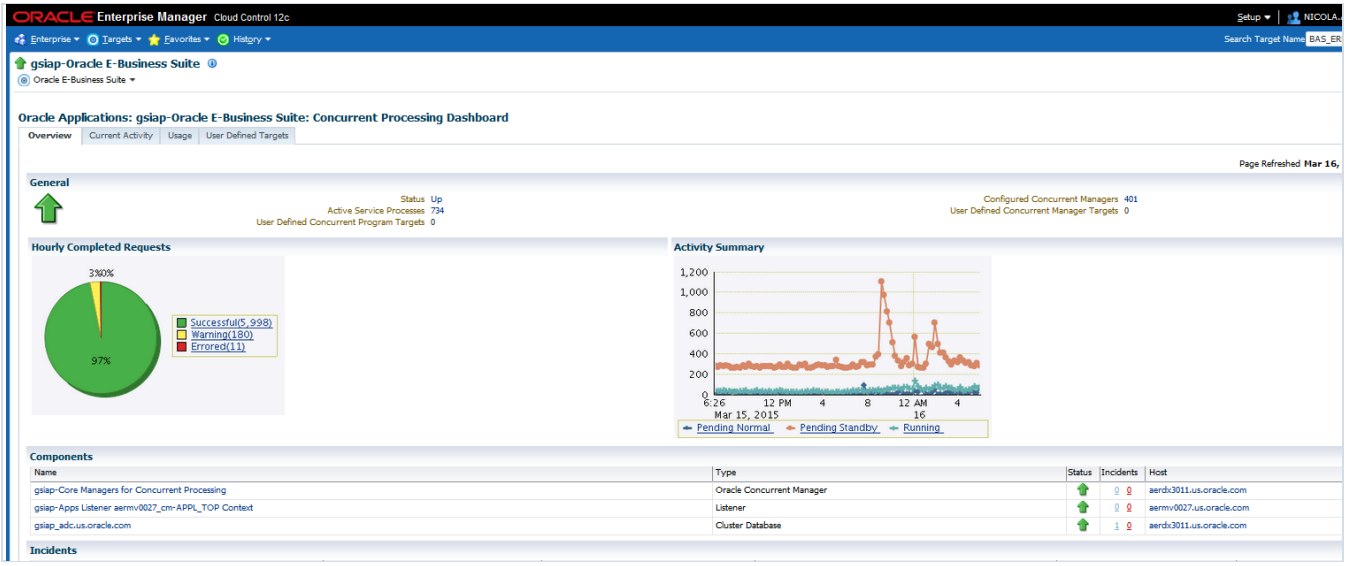
Administrators can establish metrics for JVMs and monitor the metrics using metric and collection settings as shown below:



Monitoring Concurrent Processing

GSI was able to use out of box Oracle Application Management Suite capabilities to monitor and administer concurrent managers. Administrators could easily check if the concurrent processing services are available, view status of concurrent managers, programs, requests and performance metrics for various components of concurrent processing.

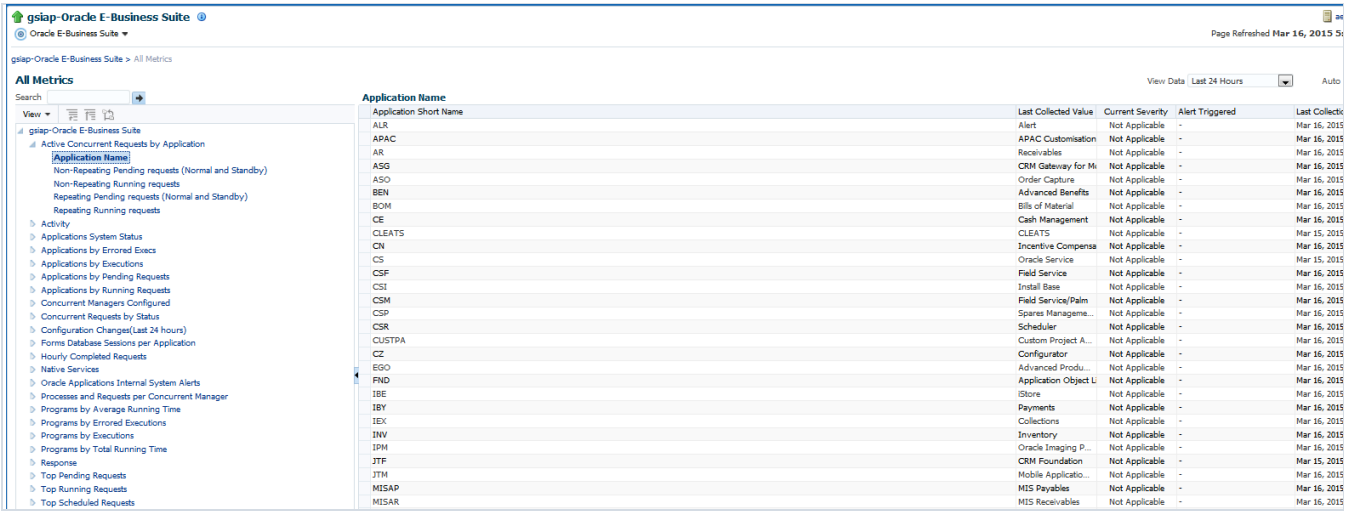
The screenshot below shows an example of concurrent processing dashboard. This dashboard shows a quick overview of the health of a certain concurrent process. All of the data points in this dashboard can be setup with metrics.



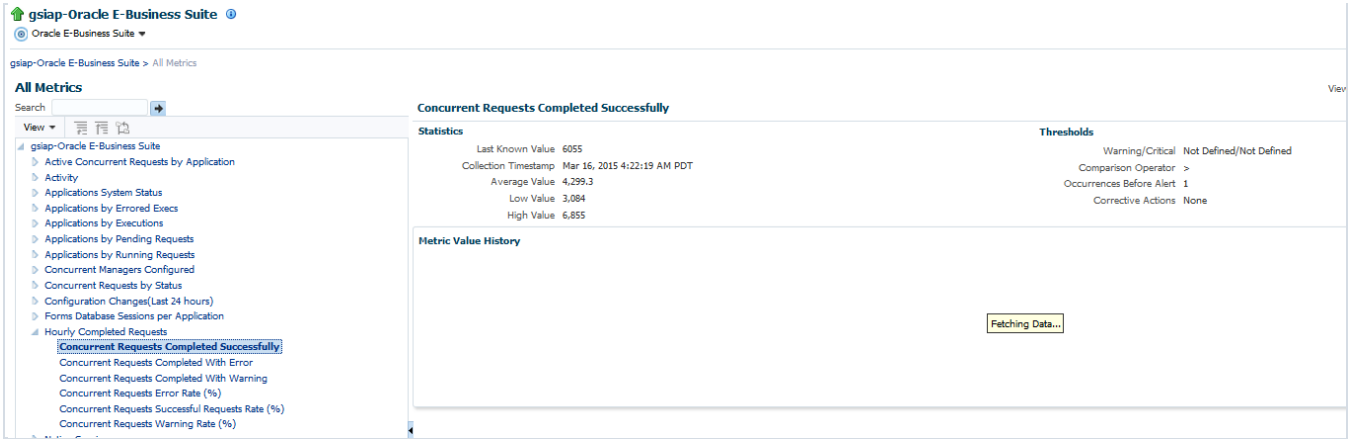
In this specific example, there are 651 active processes. Clicking on this number shows the average, maximum and current status for the last 24 hours.

The GSI implementation used this data to establish trends and then set metrics to generate notifications when warning and critical thresholds were reached for each metric. Administrators can review current activity and usage data by concurrent manager process.

As shown in the following screenshot, administrators can also view active concurrent requests by each Oracle E-Business Suite application:

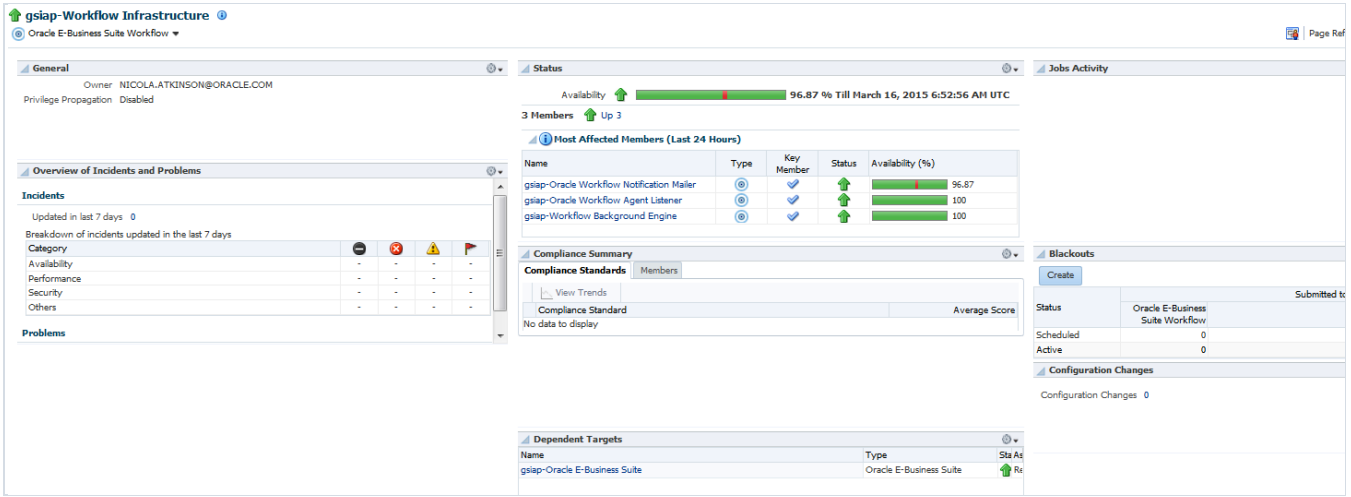


The following is another example that shows the hourly completed concurrent requests review:



Administrators can define custom concurrent managers and also create a user defined watch list of concurrent programs that are critical for their daily business operations or during financial period closing. The screen shot above also shows as example of average, low and high values for the metric that helps to set warning and critical thresholds for any metric.

Monitoring Workflow Infrastructure, Workflow Dashboard:



Management Reporting and Dashboards

Enterprise Manager delivers the capability to customize the dashboards that suits specific customer reporting needs. The data presented in these dashboards can be directly consumed by managers and executives to understand the current status, trends, and analytical information that is required for critical decision making around engaging resources and meeting service levels.

The Oracle Application Management Suite leverages this capability to deliver Oracle E-Business Suite specific content by using these dashboards. Some of the key information delivered out of box includes configuration

information, adherence to compliance standards, topology, service level management dashboards, and overview of all technology assets tracked by Enterprise Manger.

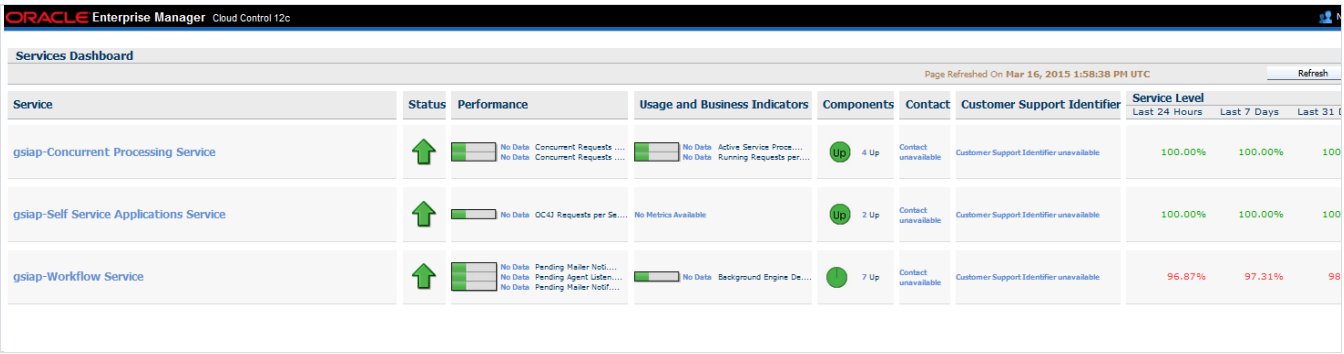
The GSI team created various custom reports to provide additional insight into system status, capacity utilization and configuration. The “BAS_ERP_NOTIFY” user is used to administer and configure the production reports. Many reports in GSI are set to “public access”. This enables administrators to provide report access to management groups without having to log into the Enterprise Manager console.

The publishing of a public report can be accomplished by simply setting the proper privileges for the report to run and then setting the report public under the “Access” section for any report created. After this step is completed, it is possible to link the report in other web pages for centralized access.

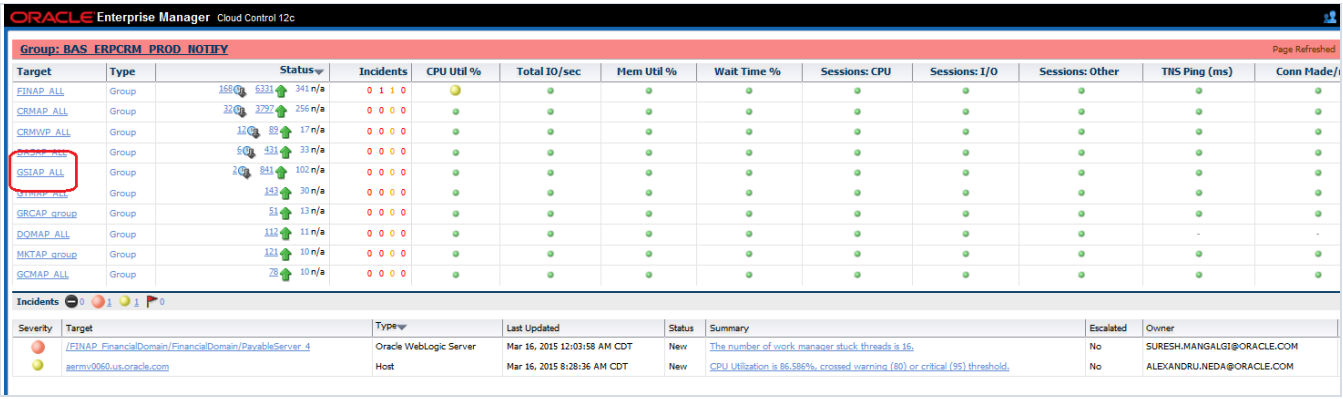
The following are some of the custom reports that GSI team has created:

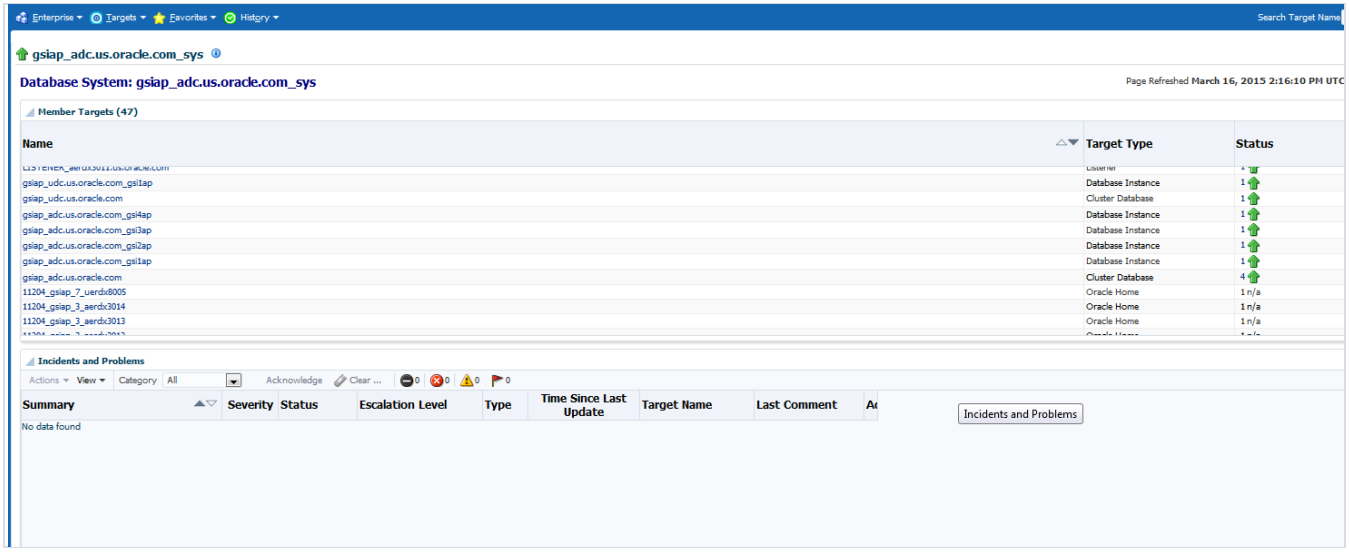
- Database Capacity Trend Analysis
- Application Availability Dashboards
- Services Dashboards

Oracle E-Business Suite Services Dashboard:



GSIAP EOTD group Dashboard





Service Tests

The Oracle Application Management Suite delivers capabilities to integrate service tests that will allow administrators to integrate and automate status and performance related tests to automatically check and confirm the health and availability of services. This allows administrators to proactively monitor availability from the end user perspective and not wait for end users to complain about down services. For example, Oracle Application Management Suite delivers a self service login test that can be scheduled to check if end users can log into a specific Oracle E-Business Suite instance. These tests can be scheduled to run periodically or at certain times and send out notifications to the administrators if there are failures. These service tests utilize the beacon functionality and can be implemented to monitor end user experience from any global location.

The GSI environment has beacons located in India, United Kingdom, Singapore, Texas and Colorado. This gives a good overview of performance for our general employee population.

The transactions that were recorded were simple login/logout transactions that ensure that (simulated) users can access the application by using the standard URL. As a best practice, administrators should review the "success strings" for each step in the transaction. Success strings are critical as this will ensure that the transaction is working properly. If the success strings are not properly configured, the transaction will assume that any return of data from the step in the transaction is valid - in some cases, this could give you a false positive.

From a naming convention perspective, as always, thought should be put in to the way things are named. We used the following format:

- <Application>-Application Login-<module name>

The module name would be the specific application for a given environment (i.e., some applications have separate sections need to be accessed in order to ensure a successful login.

It is important to note, in addition to simulated user tests, Oracle Application Management Suite also offers capabilities to monitor real time user experience using Real User Experience Insight (RUEI). By using RUEI, end user experience can be monitored; performance bottlenecks can be eliminated regardless of where the problem is occurring in the Oracle E-Business Suite technology stack including applications, middleware, network or the database.

Further Information

The Oracle Application Management Suite is often referred by many names such as Application Management Pack for Oracle E-Business Suite, AMP or Oracle E-Business Suite plug-in.

You can find the user guide for Oracle Application Management Suite for Oracle E-Business Suite in the Oracle Enterprise Manager documentation, under Management.

Conclusion

Oracle Global Single Instance is a large, complex and mission critical environment that supports day to day operations of the company globally. Oracle Enterprise Manger and Oracle Application Management Suite for Oracle E-Business Suite deliver the capability to manage the production and related pre-production environments. The functionality of these products allows administrators to proactively monitor the environments, manage by exceptions by effectively utilizing metrics, monitoring templates, incidents and notifications framework as well as deliver timely, meaningful, and actionable management reports.

GSI implementation recommends that it is critical to plan ahead to map out the requirements and accordingly the plan the set up of users, roles, credentials and all other aspects of Oracle Application Management Suite for Oracle E-Business Suite. Enterprise Manager is robust and can handle the growth and expansion and therefore a well planed implementation will prevent or reduce major changes afterwards.

As a best practice, it is critical to install a test environment to test Oracle Enterprise Manager, Oracle Application Management Suite and Oracle E-Business Suite application patches.

Finally, Enterprise Manager and Oracle Application Management Suite has helped GSI to enforce standards, centralize the configuration management, tailor the management reporting by utilizing standard and custom metrics, manage end user experience, reduce or eliminate performance bottlenecks, automate routing operations to manage large number of Oracle E-Business Suite targets effectively, and efficiently and to lower the total cost of application ownership.

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