

Integrating Oracle Enterprise
Manager 10^g Grid Control with
Your Management Infrastructure
for Seamless Data Center
Management

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INTRODUCTION

Many IT organizations are using a variety of tools, such as event managers, network managers and help desk systems, to monitor and manage their IT environment. Traditionally, each tool has been used by different groups within an organization, such as by Network Administrators or DBAs, and it has been difficult to share information between the groups. However, as companies attempt to implement Service Level Management and CMDB strategies, they desperately need to integrate these tools to get a holistic view of their entire IT environment, enable information sharing, and perform better diagnostics and root cause analysis. Since the introduction of Release 3 Oracle Enterprise Manager 10g has delivered out-of-box, bi-directional integration with key management tools and help desk systems, as well as on enabled partners and customers to develop their own, custom Enterprise Manager Connectors for integration with 3rd party tools and custom IT applications.

MANAGEMENT CONNECTORS: SEAMLESS DATA CENTER MANAGEMENT

By seamlessly integrating different tools within the IT environment, organizations can streamline key support processes, consolidate monitoring information in their tool of choice, reduce the total cost of ownership, and perform cross-platform diagnostics and root cause analysis. Enterprise Manager comes with the following management connectors: Management Connector for Remedy Service Desk

- Management Connector for PeopleSoft Help Desk
- Management Connector for Siebel Help Desk
- Management Connector for Microsoft Operations Manager

In addition, custom Management Connectors can be built by Oracle, partners and customers using the Management Connector Framework available with Enterprise Manager. The Management Connector Framework supports industry-standard interfaces, such as Web Services and JMS, enabling integrators to build connectors without writing any Enterprise Manager-specific code, making it straightforward for Oracle customers to integrate Enterprise Manager with their home grown IT applications.

Visit Enterprise Manager extensibility page:
<http://www.oracle.com/technology/products/oem/extensions/index.html>
to browse through the list of Management Connectors available.

MANAGEMENT CONNECTORS FOR HELP DESKS

Help desk systems enable organizations to automate support processes, thereby increasing employee productivity and improving service support. The Enterprise Manager 10g Grid Control Management Connectors for Remedy Service Desk, PeopleSoft Help Desk, and Siebel Help Desk allow customers to further streamline their support processes and improve operational efficiencies, while and facilitating compliance with ITIL Service and Support processes.

The sections that follow contain information about the Management Connector for Remedy Help Desk, but the same concepts apply to the integrations with PeopleSoft and Siebel Help Desks.

Automatic and Manual Ticket Creation

The Management Connector for Remedy Help Desk enables administrators to open service requests automatically or manually in response to Enterprise Manager alerts. Using a newly available notification method within Enterprise Manager, “Remedy Help Desk”, administrators can automatically open Remedy Service Requests as part of their Enterprise Manager notification rules setup. For example, an administrator can create a new notification rule that will automatically open a service request whenever a Tablespace Full alert occurs on any of the production databases that Enterprise Manager monitors.

While it is usually desirable to open trouble tickets automatically in response to specified Enterprise Manager alerts, administrators may also prefer to only initiate a service request after an incident has occurred and they have reviewed the situation. In this case, the Management Connector for Remedy Help Desk also allows administrators to open a service requests for any open alert manually, right from the Metric Details page in the Enterprise Manager Console.

Once the service request has been created, Enterprise Manager will automatically keep track of the request ID and update the Remedy system every time the state of the alert changes. In addition, in-context launch of Enterprise Manager from the Remedy service request and vice versa is supported, thereby improving support efficiency and facilitating problem resolution.

In Enterprise Manager, the service request information is displayed in context of the alert, allowing administrators to launch the Remedy Web Console to view or update the request details. In Remedy, a link to the alert details is provided, enabling the support operator to navigate to the Metric Details page for that specific alert in the Enterprise Manager Console.

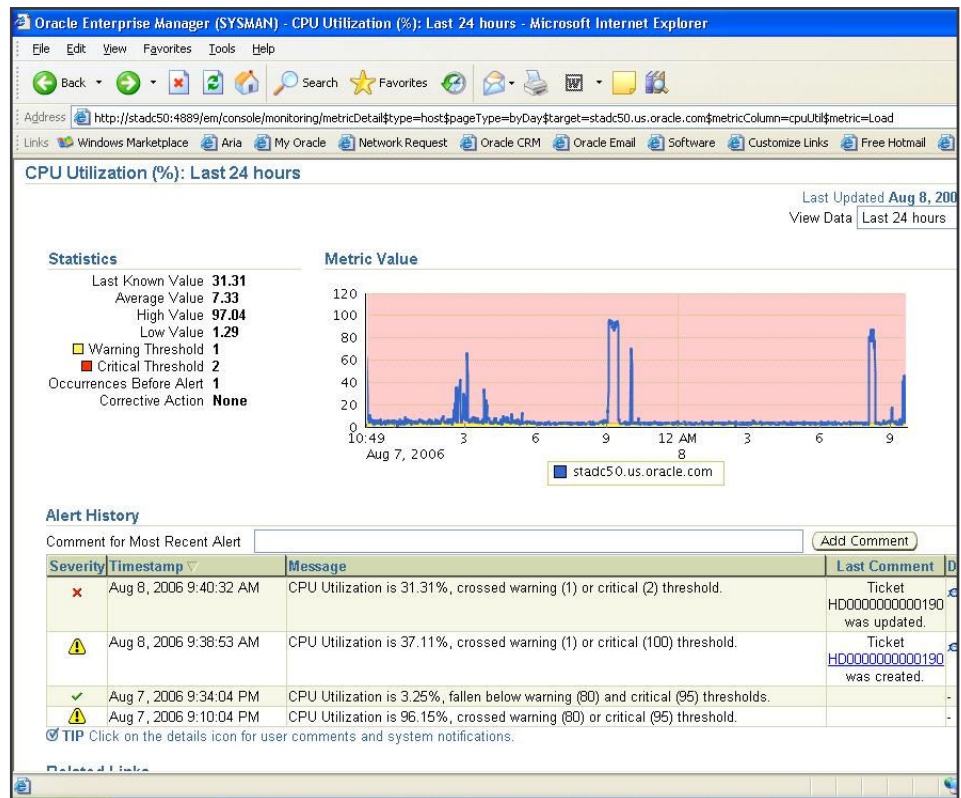


Figure 1. Shows Metric Details page in the Enterprise Manager Console. Ticket creation and ticket update are documented as part of Alert History. An administrator can click on the ticket ID for an in-context launch of the Remedy Console.

Fully Customizable Ticket Creation via Ticket Templates

When opening service requests from Enterprise Manager, certain Remedy fields have to get populated with key information such as priority, incident type, description, category, etc. However, since Remedy is extremely customizable, no two Remedy installations are alike. For example, some customers may have Summary, Group and Case Type as required fields, while others may have Description, Priority, and Case Type as required fields. The Management Connector for Remedy Help Desk accommodates any Remedy implementation by providing the same level of customization via ticket templates.

Ticket templates allow administrators to specify which Remedy fields should be populated and what data those fields should be populated with. The Management Connector for Remedy Help Desk comes with a number of out-of-box templates, which are based on the default Remedy configuration. Customers can easily customize the out-of-box templates to fit their operational needs. For example, administrators may create a Production Database template, a Test Database template, and a Development Database Template, and assign different priorities and service level agreements based on the type of environment.

When customizing ticket template, the following options for assigning values to Remedy fields are available:

- **Deriving Remedy fields based on the context of the alert.** For example, some customers may choose to pass Metric Name and Alert Severity as the Summary field in Remedy. Others may choose to assign Category based on Target Type.
- **Pre-seeding Remedy fields with specific values.** For example, when creating the Production Database template, the administrator may choose to always assign the service requests to a DBA Group.

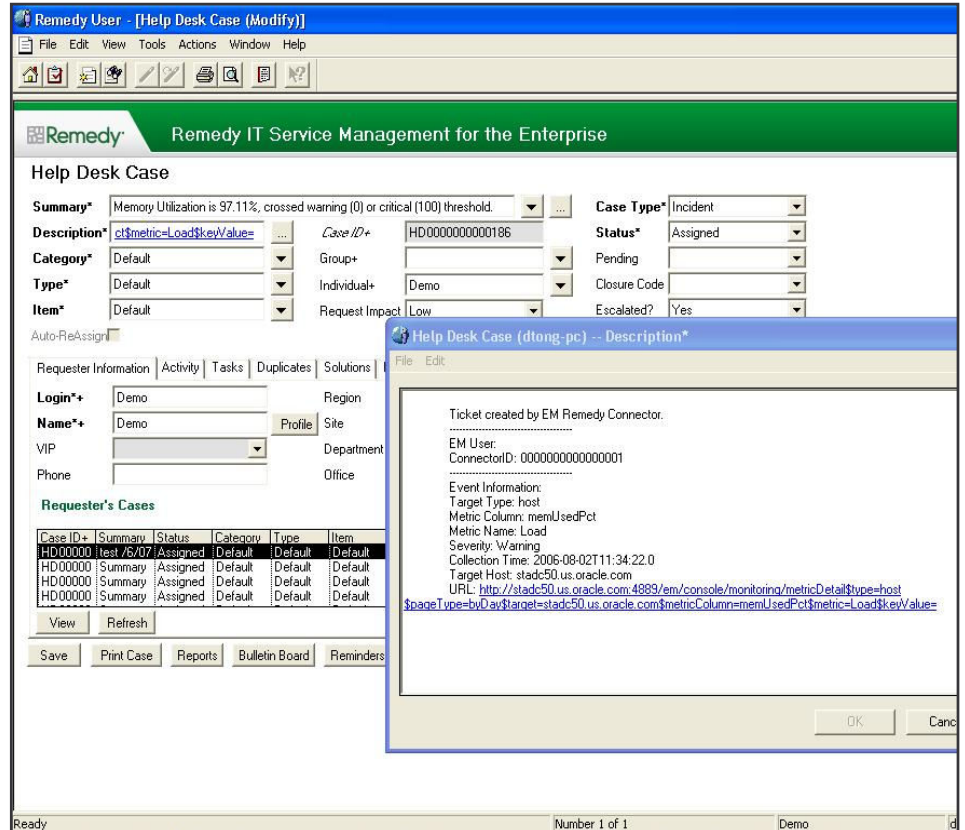


Figure 2. Shows a service request that resulted from a Memory Utilization alert. The operator can navigate to the Metric Details page in Enterprise Manager by clicking on the link provided.

MANAGEMENT CONNECTOR FOR ORACLE BUSINESS ACTIVITY MANAGER

Oracle Business Activity Manager (BAM) is part of Oracle's SOA Suite family of products. Business Activity Monitoring is used to gain real-time visibility into business entities and their interactions, and as a means to enable automated actions to be performed. BAM's main features are:

- Monitor key business metrics in real-time, e.g. Key Performance Indicators (KPIs) or Service-Level Agreements (SLAs)
- Analyze real-time data to identify bottlenecks, exceptions, and solutions to business problems
- Act on current conditions either automatically or manually from a dashboard in order to meet business needs

However, monitoring business performance is not enough. A common dilemma in organizations is balancing business needs with IT spending. CIOs constantly try to satisfy business owners while keeping a lid on spending and increasing IT efficiency. Key questions the CIO would like answered are: What is the impact of IT on business? When changes happen in my IT environment, what is the impact on the business? How do I prioritize IT activities? What are the IT dependencies of a business process?

For example, a manufacturing company's operation manager needs to better manage his company's "Order-to-Cash" operations cycle. Orders placed through various channels such as the web, phone, and mail and are then processed via various different application services for fulfillment, shipping and billing via manual and/or automated business processes. The manager would like to continuously monitor overall order flow and escalate any scenarios where orders are 'stuck' for a period of time exceeding a predefined duration. He would like to automatically determine if the 'stuck' processes are due to specific business process issues (measured by business KPIs), or system IT problems (measured by system metrics).

In order to help align IT with business priorities, Enterprise Manager Grid Control has been integrated with Oracle BAM. The connector enables business owners and IT managers to work off a common monitoring system. It simplifies root cause analysis, and enables Service Level Agreements (SLAs) based on a combination of business KPIs and system metrics.

Key features of the BAM-Enterprise Manager integration are:

- **Associating BAM KPIs with Services in Enterprise Manager:** Enterprise Manager administrators can bring in KPIs from BAM as business metrics, and associate these metrics with existing services. This enables administrators to correlate business metrics with service availability, performance and usage measured by Enterprise Manager, and perform better diagnostics and root cause analysis.
- **SLAs based on end-user experience, system metrics and business data:** In addition to end user experience and system metrics, the connector allows administrators to incorporate KPIs from BAM in SLA definitions. This enables administrators to define Service Level Agreements that incorporate all factors affecting the business service.
- **Forwarding Enterprise Manager alerts and metrics to BAM:** The Management Connector for Oracle BAM enables selective forwarding of

availability, alerts and metrics information from Enterprise Manager to BAM. Administrators can forward information about any combination of targets (such as Databases, Hosts, Application Servers, and BPEL PM servers), metrics (such as CPU utilization, and memory usage) and alerts (such as database up/down). In BAM, administrators can include Enterprise Manager data on the BAM dashboard, and correlate the system data with business KPIs.

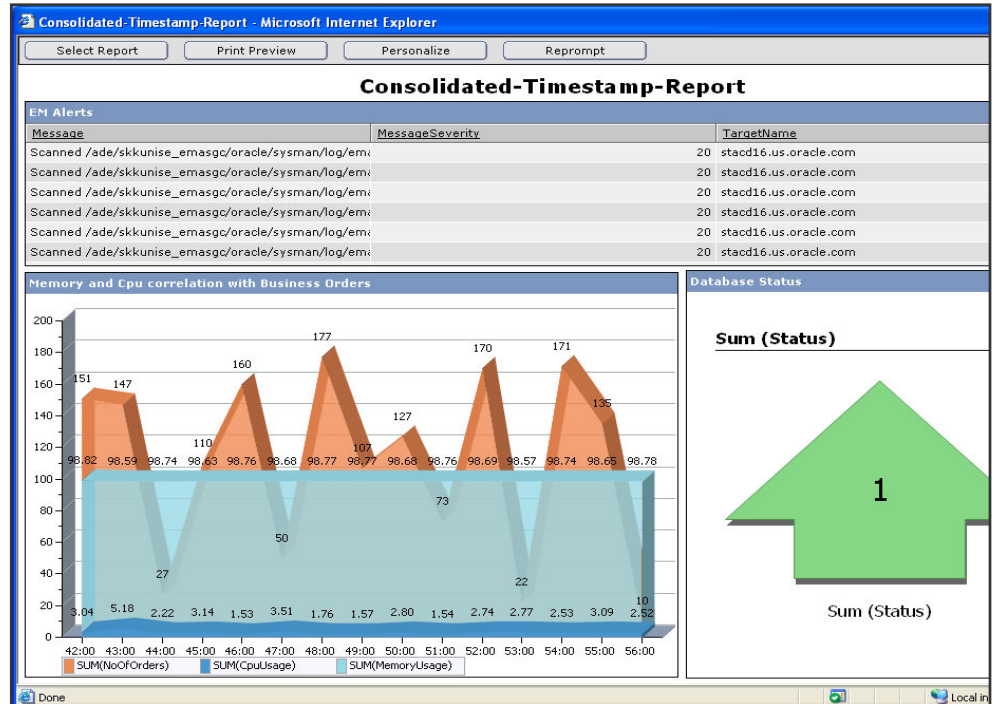


Figure 3. Shows BAM dashboard, which displays both business KPIs and system information forwarded from Enterprise Manager.

MANAGEMENT CONNECTOR FOR MICROSOFT OPERATIONS MANAGER

Enterprise Manager 10g Grid Control Management Connector for Microsoft Operations Manager (MOM) allows administrators to forward MOM events to Enterprise Manager as well as forward Enterprise Manager alerts to MOM, thereby enabling better correlation of IT problems across the technology stack. Customers who have a best-of-breed corporate policy, which requires them to manage Oracle products with Enterprise Manager and Microsoft products with MOM, can now consolidate all the information in a single console, improve modeling and monitoring of their business services and perform comprehensive root cause analysis. For example, an administrator managing a Service running on top of Microsoft Internet Information Services (IIS), Oracle Database, and F5 BigIP Local Traffic Manager, can continue monitoring IIS with MOM, and Oracle Database and F5 BigIP with Enterprise Manager, while getting a holistic view of the application and its topology in the Enterprise Manager Console.

Flexible modeling options in Enterprise Manager

Each component managed by Enterprise Manager is called a target. Different types of components correspond to different target types, such as Databases, Applications Servers and Host Servers. Microsoft Operations Manager, on the other hand, has a computer-centric management model. This implies that every alert on a component managed by MOM, be it a SQL Server or an IIS alert, is associated with a computer on which this component is running.

The Management Connector for Microsoft Operations Manager categorizes all of the alerts that are forwarded to Enterprise Manager for a particular computer by the type of component that triggered the alerts. For this purpose, new metrics are automatically created for each type of component running on a computer. For example, all of the alerts triggered by an Exchange Server on a particular computer are associated with the “Exchange Server” metric in Enterprise Manager. In addition, in cases where Microsoft Operations Manager does not have the information about the component type that triggered the event, the connector associates the alert with a General metric. This mapping enables administrators to quickly isolate alerts for a particular component type and perform better diagnostics and root cause analysis.

The Management Connector for Microsoft Operations Manager also provides great flexibility when mapping events in MOM to targets in Enterprise Manager. Customers can use any combination of the following options when configuring the connector:

- **Generic MOM Managed Host target:** This option allows administrators to associate all of the alerts coming from MOM with a single target instance. When using this option, customers can quickly bring all of the relevant MOM events into Enterprise Manager and view those events in the context of the Oracle Environment. This option is enabled by default.
- **Mapping MOM computers to targets in Enterprise Manager:** This option allows administrators to model individual computers in MOM as instances of MOM Managed Host target type in Enterprise Manager. By performing computer to target mapping, administrators can view MOM events at a greater level of granularity. For example, when a certain component is responsible for running a critical application, administrators can model the computer hosting that component as a separate target in Enterprise Manager, and view only the alerts relevant to their business service.

Forwarding MOM Alerts to Enterprise Manager

In Microsoft Operations Manager, administrators specify when and how alerts should be triggered by configuring Event Rules. When an alert is raised, it is assigned a default resolution state specified by the administrator. Enterprise Manager Management Connector for Microsoft Operations Manager creates a new resolution state specifically for the purpose of this integration. Administrators can forward alerts to Enterprise Manager automatically, by specifying the connector

resolution state in the Event Rules. In addition, administrators can manually forward any existing MOM event to Enterprise Manager by changing the resolution state of the alert.

Once the alerts have been forwarded to Enterprise Manager, they will be associated with the appropriate targets, depending on the mapping option(s) selected by the administrator. The Management Connector for Microsoft Operations Manager keeps track of all of the events forwarded from MOM, and automatically updates information in Enterprise Manager once changes in MOM occur. This ensures that the two systems are always in synch, arming Enterprise Manager administrators with up-to-date information about their Microsoft environment.

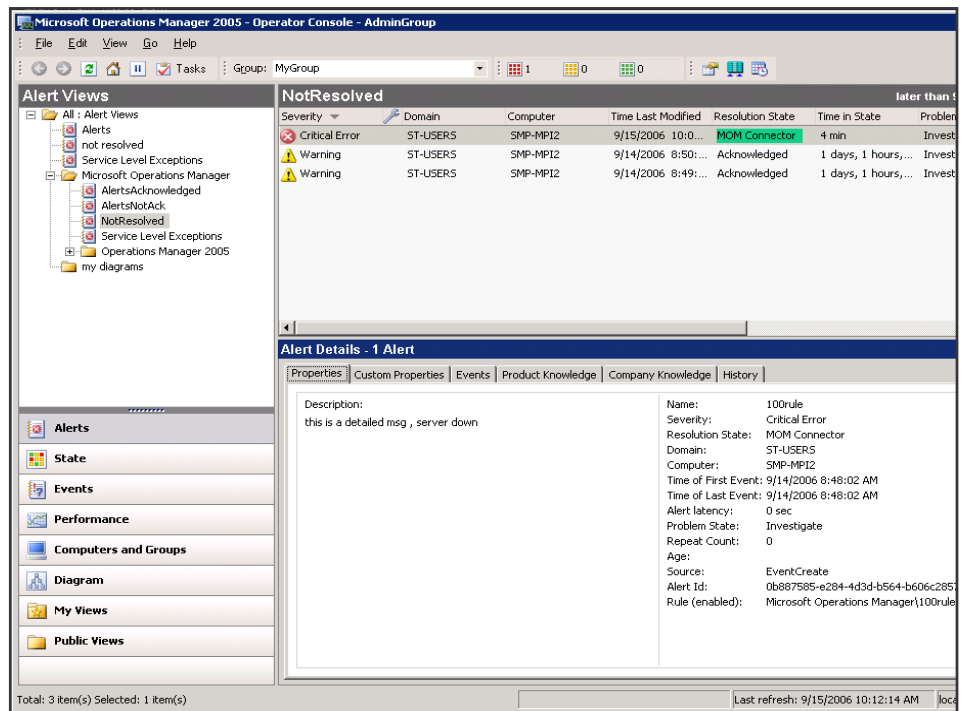


Figure 4. Shows Alerts in the Operator Console of Microsoft Operations Manager. The first alert has a Resolution State set to “MOM Connector”. This indicates that the alert has been forwarded to Enterprise Manager.

MANAGEMENT CONNECTOR FRAMEWORK: CUSTOM CONNECTORS

Enterprise Manager’s Management Connector Framework enables customers and partners to integrate Enterprise Manager with other management tools and help desk systems, including in-house systems. Partners can integrate their own management tools with Enterprise Manager, thereby delivering better solution to joint customers.

Building Your Own Help Desk Connector

For customers and partners looking to integrate Enterprise Manager with help desk systems, Enterprise Manager provides a metadata-driven way of building feature-rich connectors. The custom connectors automatically inherit similar features available for the Oracle-built help desk integrations, such as automatic and manual ticket creation, synchronization of the two systems, ticket templates, and in-context launch of Enterprise Manager from the help desk system and vice versa. The only pre-requisite for the integration is that the help desk system must expose the operations to Create Ticket, Update Ticket and Get Ticket ID as Web Services. Once the help desk system has been Web Services-enabled, all the integrator needs to do is define the following XML files:

- **Connector descriptor file:** describes the metadata of the connector and configuration properties of the connector, such as Web services end points, authentication schema, and ticket URL pattern. The integrators can pre-seed some of the configuration parameters, while allowing customers to input parameters specific to their environments.
- **Default Ticket Template XSL file(s):** ticket templates are used to populate the fields on the help desk system when the ticket gets created. The integrator should supply one or more default templates, which the customers can customize to fit their operational standards.
- **Response XSL file:** a file that describes how to transform the response from the help desk system when opening a service request, in order to extract the ticket ID.

In order to package the connector, integrators need to create a “.jar” file containing the above XML files. Once the connector is deployed, customers can configure it as required from the Enterprise Manager Console.

If the help desk system does not support Web services, integrators can create a custom notification method that will enable automatic opening of trouble tickets by running an OS Script or by sending SNMP traps. This integration approach does not support ticket templates or in-context launch of the two systems, and should be used only if the Web services-based integration is not possible.

Building Your Own Event Connector

Customers and partners can integrate Enterprise Manager with other third party and custom event management tools using standards-based protocols, such as Web services, JMS or SNMP. These integrations allow customers to realize better return on investment of owning multiple products and provide greater flexibility in managing the IT environment.

Web Services-based Integration

If the other management system exposes Web services APIs to Get, Update, and Acknowledge alerts, integrators can build feature-rich connectors without writing

any custom code. The connectors can have features such as: forwarding of alerts from the other system to Enterprise Manager, flexible modeling options and keeping the two systems synchronized. To take advantage of this approach, the integrators need to define the following XML files:

- **Connector descriptor XML file:** describes the metadata of the connector and configuration properties of the connector, such as Web services end points, and authentication schema.
- **Request XSL files:** provide transformations between Enterprise Manager requests to Get / Update/ Acknowledge alerts into a valid XML request expected by the other system.
- **Response XSL files:** provide transformations between alerts received from the external system and the Enterprise Manager alert schema.
- **Target Type Definition:** provides a target type definition for the components managed by the external system. This is similar to the MOM Managed Host target type described earlier in the paper.

JMS-based integration

Another way of integrating Enterprise Manager with other management tools is via Oracle Enterprise Manager Grid Control's data exchange hub. A data exchange hub is a JMS compliant logical connection to Enterprise Manager. An Enterprise Service Bus (ESB) and OC4J JMS are examples of data exchange hubs. Within Enterprise Manager, administrators can configure what information should be exchanged between the two systems. For example, administrators can configure Enterprise Manager to receive business KPIs and events from the external system, and attach those events to existing targets. Conversely, Enterprise Manager can push target status, alerts and metrics for consumption by other monitoring systems. The integrators need to ensure that the data forwarded to Enterprise Manager adheres to the published XML schema, and that they transform the Enterprise Manager data into the format expected by the external system.

Follow EM Integration Guide:

http://download.oracle.com/docs/cd/B16240_01/doc/em.102/b32521.pdf

for a step-by-step guide to building Connectors for Oracle Enterprise Manager

ENTERPRISE MANAGER PARTNER PROGRAM

There are a few, well-documented steps to follow in order to become an Enterprise Manager Partner. First, all Oracle partners are required to be members of the Oracle Partner Network, which paves the way for promotional benefits and developer software licenses. Once OPN membership has been secured, a modest

amount of documentation (e.g., a simple collateral packet) and an expressed interest in developing Enterprise Manager solutions are all that's needed to get started. Partners who choose to develop Connectors for Enterprise Manager must submit a more comprehensive collateral packet, with business and technical components. Development partners will gain access to tools that help them develop and test successful operation of their Connector. These results must be submitted at the time the Connector is to be published. All partner information is regularly compiled for cataloging and solution promotion.

Partners interested in developing and promoting Connectors for Enterprise Manager must complete and submit the additional documents to Oracle, including:

- 1) A connector data sheet with product overview, key features, and key benefits
- 2) A connector technical frequently asked questions (FAQs) document
- 3) A connector architecture diagrams and descriptions, illustrating how the solution will work with Enterprise Manager
- 4) Product details, showing how the connector works
- 5) Installation instructions and help documentation for the connector

Installation instructions and help documentation will be made available alongside the link to the Connector through the Enterprise Manager OTN Extensions Exchange.

Want to integrate your management system with Enterprise Manager?
<http://www.oracle.com/partners/home/pf/global/emgc/unauth/index.html>
Apply for the Enterprise Manager Grid Control Product Focus through OPN.

CONCLUSION

Significant investment has been made to enable integrations with non-Oracle management solutions and help desk systems to allow customers to leverage these investments without losing the unique value they gain from Enterprise Manager. By integrating help desks and other management tools with Enterprise Manager, administrators can facilitate information sharing, consolidate information in their tool of choice, and perform better diagnostics and root cause analysis.



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