EMC Smarts Integration Guide

vCenter Operations Manager 1.0

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Contents

EMC Smarts Integration Guide

The *EMC Smarts Integration Guide* describes how to integrate vCenter Operations Manager and EMC Smarts.

Intended Audience

The information in this guide is intended for IT management and system administrators.

Updated Information

The *EMC Smarts Integration Guide* is updated with each release of the product or when necessary.

This table provides the update history of the *EMC Smarts Integration Guide*.

Revision	Description
EN-000540-10	■ Changed the product name to reflect the new licensing model for the 5.6 release. ■ Modified the adapter instance test step in "Add an Adapter Instance," on page 16 for the 5.6 release.
EN-000540-09	■ Added information about the **Server Kind** drop-down menu to "Add an Adapter Instance," on page 16. ■ Added Chapter 5, "Troubleshooting the EMC Smarts Adapter," on page 37. ■ Added more information to the installation instructions in "Install the Adapter in a Standalone Installation," on page 11and "Install the Adapter in a vApp Installation," on page 12.
EN-000540-08	Added limitation information to "Read Events From Notification Lists," on page 28.
EN-000540-07	■ Added information about enabling smart discovery. See "Enable Smart Discovery," on page 29 ■ Added information about configuring how the adapter handles processor metrics. See "Configure How the Adapter Handles Smarts Processor Metrics," on page 30. ■ Added information about finding nonexistent EMC Smarts resources in the vCenter Operations Manager user interface. See "Finding Nonexistent EMC Smarts Resources," on page 36. ■ Added EMC Smarts 9.0 support to "EMC Smarts Compatibility Requirements," on page 10. ■ Corrected the default domain for the INCHARGE-AM-PM-SUITE in step 8 in "Add an Adapter Instance," on page 16.
EN-000540-06	Added information about configuring the adapter to read events from notification lists. See "Read Events From Notification Lists," on page 28.
EN-000540-05	Added information about testing an adapter instance that uses an EMC Smarts SecureBroker Credentials credential kind to "Add an Adapter Instance," on page 16.
EN-000540-04	Added a new credential type to "Add a Credential," on page 17 for Secure Broker mode.
EN-000540-03	Corrected step 3 in "Install and Configure Integration Tools Files," on page 21. Step 3 now instructs you to modify the `Launch-vcops-UI-Object.cmd` file.
EN-000540-02	Added information about downloading and installing the `Launch-vcops-UI-Object.cmd`, `launch-vcops-action-windows.xml`, and `vcops_emc.jar` files to "Install the Adapter in a vApp Installation," on page 12.
EN-000540-01	Changed vCenter Operations Enterprise to vCenter Operations Manager.
EN-000540-00	Initial release.

Introduction to EMC Smarts Integration 1

Integrating vCenter Operations Manager and EMC Smarts improves the performance of both products and makes it easier to predict, diagnose, and prevent problems in your IT infrastructure.

This chapter includes the following topics:

- "Data that vCenter Operations Manager Receives from EMC Smarts," on page 9
- "Data that vCenter Operations Manager Sends to EMC Smarts," on page 9
- "Installation and Configuration Requirements," on page 10
- "Overview of Data Flow," on page 10

Data that vCenter Operations Manager Receives from EMC Smarts

vCenter Operations Manager receives definitions of resources and metric values for attributes that EMC servers monitor in domains that you select. It also receives topology information for container resources that EMC Smarts defines.

vCenter Operations Manager uses the topology information that it receives from EMC Smarts to define container resources, including applications and tiers, in vCenter Operations Manager. Once each day, at a time that you configure, vCenter Operations Manager polls each EMC Smarts adapter instance and adds any new resources that it finds. This feature ensures that the vCenter Operations Manager resource topology always matches the EMC Smarts topology.

EMC Smarts generates change events when resources are unavailable and anomalies when resources are unresponsive. The change events appear in vCenter Operations Manager in the Mashup Charts widget and on the **Mashup** tab on the Alert Detail page for alerts on the associated resource. The vCenter Operations Manager analytics engine considers the anomalies as possible root cause symptoms for related alerts.

See "Viewing EMC Smarts Information in vCenter Operations Manager," on page 34 for examples of how EMC Smarts information appears in the Custom user interface.

Data that vCenter Operations Manager Sends to EMC Smarts

vCenter Operations Manager uses its advanced analytics to analyze metric data that it receives from EMC Smarts and sends alert messages back to EMC Smarts when it detects problems or potential problems.

Alerts that vCenter Operations Manager sends to EMC Smarts appear in the Global Console Notification Log. An operator can double-click an alert message to see more information about the alert in the vCenter Operations Manager custom view panel. From the custom view panel, an operator can click an arrow to open the Alert Detail page in vCenter Operations Manager.

For more information about these features and how to use them, see "Viewing Alerts in EMC Smarts," on page 31.

NOTE   The Global Console is called the EMC Smarts Global Console in EMC Smarts 7.x and the EMC Ionix Global Console in EMC Smarts 8.1 and 9.0.

Installation and Configuration Requirements

Before you configure EMC Smarts integration, verify that your system meets EMC Smarts compatibility and credential requirements.

EMC Smarts Compatibility Requirements

vCenter Operations Manager supports EMC Smarts 7.x, 8.1, and 9.0.

NOTE   For EMC Smarts 9.0, the EMC Smarts adapter can retrieve metrics and events and send alerts, but it is not validated for the vCenter Operations Manager integration tools or the Global Console custom view.
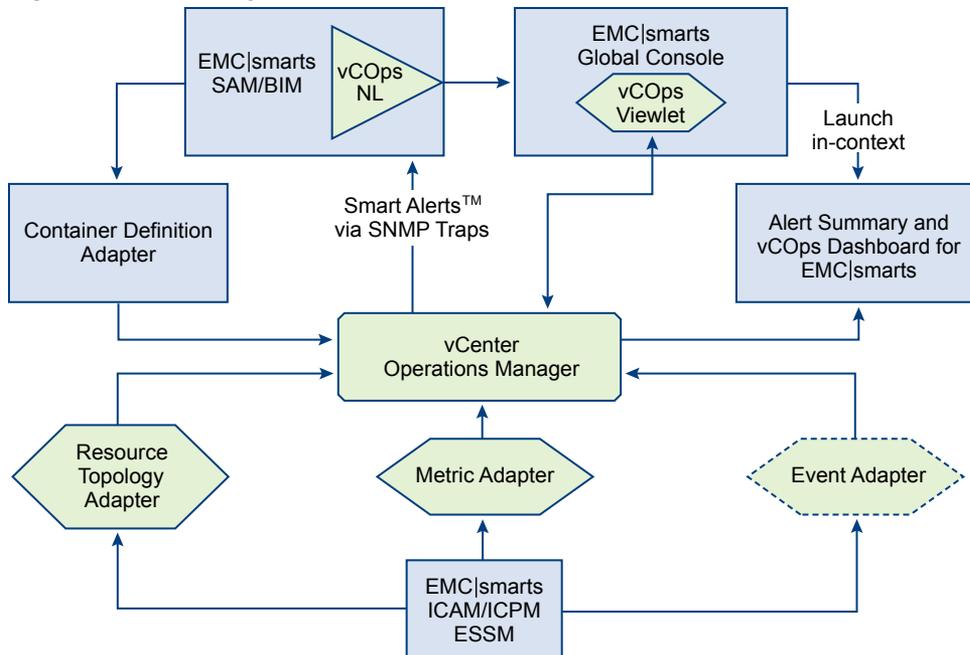
Credential Requirements

You must have a valid EMC Smarts user name and password to create an EMC Smarts adapter instance.

Overview of Data Flow

When you integrate vCenter Operations Manager and EMC Smarts, data moves back and forth among certain components of each product.

Figure 1-1. EMC Integration Data Flow

Installing the EMC Smarts Adapter 2

The EMC Smarts adapter is an embedded adapter for vCenter Operations Manager. The adapter collects metrics, change events, and resource topology information from EMC Smarts.

The procedure you follow to install the EMC Smarts adapter depends on whether you have a vCenter Operations Manager Standalone or vApp installation.

This chapter includes the following topics:

Install the Adapter in a Standalone Installation

If you have a standalone installation, you install the EMC Smarts adapter by extracting the adapter installation files from a TGZ file and running an installation utility.

Prerequisites

- Download the adapter installation TGZ file anonymously from ftp://ftp.integrien.com/.

- Make a note of the build number in the TGZ file name. The build number appears after the adapter name, for example, *adaptername–buildnumber*.tgz.

- Read the release notes that are included with the TGZ file.

Procedure

1   Open the TGZ file and extract the TAR file to a temporary folder on your vCenter Operations Manager server.

2   In the temporary folder, open the TAR file and extract and run the installer for your operating system platform.

3   Log in to the Custom user interface as an administrator.

4   Select **Admin > Support**.

5   On the **Info** tab, find the Adapters Info pane and click the **Describe** icon (⚙).

    The **Describe** icon is located at the top right of the Adapters Info pane.

6   Click **Yes** to start the describe process and click **OK**.

The Custom user interface finds the adapter files, gathers information about the abilities of the adapter, and updates the user interface with information about the adapter. If you have remote collectors, it installs the adapter on the remote collectors.

The describe process might take several minutes. When the describe process is finished, the adapter appears in the Adapters Info pane. The build number is in the Adapter Version column.

7   Verify that the build number in the Adapter Version column for the adapter matches the build number in the TGZ file that you downloaded.

Install the Adapter in a vApp Installation

If you have a vApp installation, you install the EMC Smarts adapter from a PAK file.

Prerequisites

■ Download the adapter installation PAK file from ftp://ftp.integrien.com.

■ Download the `Launch-vcops-UI-Object.cmd`, `launch-vcops-action-windows.xml`, and `vcops_emc.jar` files from the `EMC-Smarts/GlobalConsoleCustomView` folder on ftp://ftp.integrien.com.

■ Read the release notes that are included with the PAK file.

Procedure

1   Save the PAK file in a temporary folder.

2   Save the `Launch-vcops-UI-Object.cmd`, `launch-vcops-action-windows.xml`, and `vcops_emc.jar` in any folder.

You use these files on the EMC Smarts server when you configure the Global Console custom view.

3   Log in to the Admin user interface as the admin user.

For example: **https://*ipaddress*/admin/**

4   On the **Update** tab, click **Browse** to locate the temporary folder and select the PAK file.

5   Click **Update** and click **OK** to confirm the update.

The Admin user interface uploads the PAK file. The upload might take several minutes.

6   Read and accept the EULA and click **OK**.

7   Click **OK** to confirm and start the update process.

The update might take several minutes. Status information appears on the **Update** tab when the update is finished.

8   Log in to the Custom user interface as an administrator.

For example: **https://*ipaddress*/vcops-custom/**

9   Select **Admin > Support**.

10   On the **Info** tab, find the Adapters Info pane and click the **Describe** icon (⊚).

The **Describe** icon is located at the top right of the Adapters Info pane.

11   Click **Yes** to start the describe process and click **OK**.

The Custom user interface finds the adapter files, gathers information about the abilities of the adapter, and updates the user interface with information about the adapter.

The describe process might take several minutes. When the describe process is finished, the adapter appears in the Adapters Info pane. The build number is in the Adapter Version column.

12 Verify that the build number in the Adapter Version column for the adapter matches the build number in the PAK file that you uploaded.

Configuring EMC Smarts Integration 3

To configure EMC Smarts integration, you must perform procedures in vCenter Operations Manager and EMC Smarts.

This chapter includes the following topics:

- "Overview of Configuration Steps," on page 15
- "Add an Adapter Instance," on page 16
- "Discover Resources," on page 18
- "Configuring Outbound Alerts," on page 19
- "Installing and Configuring the Global Console Custom View," on page 20
- "Installing and Configuring Integration Tools in EMC Smarts," on page 21
- "Configuring EMC Smarts Adapter Properties," on page 23

Overview of Configuration Steps

Configuring EMC Smarts integration involves several steps. You must perform these steps in a particular order.

1 Verify that your system meets installation and configuration requirements. See "Installation and Configuration Requirements," on page 10.

2 Verify that EMC Smarts is collecting data from its monitored resources.

3 Add an EMC Smarts adapter instance. See "Add an Adapter Instance," on page 16.

4 If you disable auto-discovery when you add an adapter instance, manually discover resources. See "Discover Resources," on page 18.

5 Configure vCenter Operations Manager to send alerts to EMC Smarts. See "Configuring Outbound Alerts," on page 19.

6 Install and configure the vCenter Operations Manager custom view for the Global Console. See "Installing and Configuring the Global Console Custom View," on page 20.

7 Install and configure the vCenter Operations Manager integration tools in EMC Smarts. See "Installing and Configuring Integration Tools in EMC Smarts," on page 21.

8 (Optional) Modify EMC Smarts adapter properties. See "Configuring EMC Smarts Adapter Properties," on page 23.

Add an Adapter Instance

You must add an adapter instance for each EMC Smarts domain from which vCenter Operations Manager collects data. When you add an adapter instance for the EMC Smarts adapter, you define the adapter type, identify the EMC broker and EMC Smarts domain, and select or add a credential.

Prerequisites

- Install the EMC Smarts adapter. See Chapter 2, "Installing the EMC Smarts Adapter," on page 11.

- Create a credential or, if you plan to create a credential when you add the adapter, become familiar with creating credentials. See "Add a Credential," on page 17.

Procedure

1 Log in to the Custom user interface as an administrator.

2 Select **Environment > Configuration > Adapter Instances**.

3 Select the collector to use from the **Collector** drop-down menu.

Unless you added additional collectors, the only available collector is **vCenter Operations Server**. You can change the name of this collector when you install the standalone version.

4 Select **EMC Smarts** from the **Adapter Kind** drop-down menu.

5 Click the **Add New Adapter Instance** icon.

6 Type a name for the adapter in the **Adapter Instance Name** text box.

7 Type the host name or IP address of the EMC broker and the port number that it listens on in the **Broker** text box.

Use a colon to separate the host name or IP address and the port number.

For example, if the IP address of the EMC broker is 123.45.6.789 and it listens on the default EMC port (426), type `123.45.6.789:426`.

8 Type the name of the EMC Smarts domain to attach to in the **Manager** text box.

The default domain for the INCHARGE-AM-PM-SUITE server kind is INCHARGE-AM-PM.

9 Select the server kind from the **Server Kind** drop-down menu.

The server kind determines which metric subscriptions to assign to the EMC Smarts service. For example, select the INCHARGE-AM-PM-SUITE server kind if the manager is INCHARGE-AM-PM and select the INCHARGE-ESM-SUITE server kind if the manager is INCHARGE-ESM.

10 Select an auto-discovery option from the **Auto Discovery** drop-down menu.

Option	Description
true	Enables auto-discovery for the adapter instance. When auto-discovery is enabled, the data collection process discovers new resources and creates the resources in vCenter Operations Manager. You do not need to manually add new resources.
false	Disables auto-discovery for the adapter instance. When auto-discovery is disabled, you must add resources manually.

11 In the **Discovery Hour of Day (0-24)** text box, type the hour of day, from 0 to 24, when vCenter Operations Manager should check the EMC Smarts domain for new resources.

12 Select the credential to use to sign on to the data source from the **Credential** drop-down menu, or click **Add** to add a new credential.

13   (Optional) Click **Test** to test the adapter instance.

> **IMPORTANT**   In pre-5.6 installations, this test does not provide accurate results if you configured an EMC Smarts SecureBroker Credentials credential kind for the adapter instance. The test always fails, even when the credentials are correct.

14   Click **OK** to save your configuration.

What to do next

By default, the adapter instance collects metrics every five minutes. To change this value, you must edit the adapter instance resource in vCenter Operations Manager. For information about editing resources, see the administration guide for your vCenter Operations Manager version.

Add a Credential

You must add a credential for an EMC Smarts adapter instance. The credential consists of a valid EMC Smarts user name and password.

You can add the credential before you create the adapter instance and select the correct credential when you define the adapter instance, or you can add the credential when you define the adapter instance.

Prerequisites

Install the EMC Smarts adapter. See Chapter 2, "Installing the EMC Smarts Adapter," on page 11.

Procedure

1   Log in to the Custom user interface as an administrator.

2   Select **Environment > Configuration > Credentials**.

3   Select **EMC Smarts** from the **Adapter Kind** drop-dow menu.

4   Select a credential kind from the **Credential Kind** drop-down menu.

Option	Description
EMC Smarts Credentials	Select this credential kind if the EMC Smarts installation is in default mode.
EMC Smarts SecureBroker Credentials	Select this credential kind if the EMC Smarts installation is in Secure Broker mode.

5   At the top of the list of credentials, next to **Action**, click **Add**.

6   Type a unique name for the credential instance in the **Instance name** text box.

7   Type the user name and password to use to connect to EMC Smarts in the **User Name** and **Password** text boxes.

8   If you selected **EMC Smarts SecureBroker Credentials**, type the Broker user name and password in the **Broker Username** and **Broker Password** text boxes.

9   Click **OK** to add the credential for the adapter kind.

The credential appears in the list in the Manage Credentials window.

Discover Resources

If you disable auto discovery when you add an EMC Smarts adapter instance, you must discover resources manually. If you have multiple EMC Smarts adapter instances, discover resources for the AM, PM, or AM-PM instances first followed by the ACM, ESM, and SAM instances.

Although the manual discovery process returns a list of all of the available resources for the adapter instance, you need to add only one resource. After you perform the first manual discovery and add one resource, vCenter Operations Manager adds any additional resources for the adapter instance as it receives metric data.

Prerequisites

- Add an adapter instance. See "Add an Adapter Instance," on page 16.

- If you plan to define a new attribute package during the discovery process, become familiar with creating attribute packages. For information about attribute packages, see the administration guide for your vCenter Operations Manager version.

Procedure

1   Log in to the Custom user interface as an administrator.

2   Select **Environment > Environment Overview**.

3   On the **List** tab, click the **Discover Resources** icon.

4   Select the collector to use from the **Collector** drop-down menu.

    Unless you added additional collectors, the only available collector is **vCenter Operations Server**. You can change the name of this collector when you install the standalone version.

5   Select **EMC Smarts** from the **Adapter Kind** drop-down menu.

6   Select the EMC Smarts adapter instance from the **Adapter Instance** drop-down menu.

7   Select **Initial Resource Import** from the **Discovery Info** drop-down menu.

8   (Optional) To omit resources that have already been added from the discovery results, select the **Only New Resources** check box.

    If vCenter Operations Manager has not added resources for the adapter instance, selecting this check box does not affect the discovery results.

9   Click **OK** to start the discovery process.

    The discovery process can take several seconds to several minutes.

    When the discovery process is finished, the Discovery Results window lists your resource kinds.

10 Add one resource to vCenter Operations Manager.

    a   Select an attribute package or click **Add** to add a new attribute package for the resource kind for the resource.

    b   Double-click the resource kind to see the discovered resources.

    c   Select the **Import** and **Collect** check boxes for the resource to add.

    d   Click **Save**.

11 Click **OK**.

    The Discovery Results window closes and the new resource appears on the **List** tab.
    vCenter Operations Manager adds any additional resources for the adapter instance as it receives metric data.

What to do next

You might want to edit certain resources. For example, you might want to modify hard thresholds for a specific resource or define super metrics for a container resource. For information about editing resources and defining super metrics, see the administration guide for your vCenter Operations Manager version.

Configuring Outbound Alerts

To configure vCenter Operations Manager to send alerts to EMC Smarts, you must add an alert handler instance and select the alerts to send.

Add an Alert Handler Instance

An alert handler instance sends alerts to a defined destination. If you have multiple Global Consoles, you can add an alert handler instance for each console so that all vCenter Operations Manager alerts appear in each console.

NOTE   If you use vCenter Operations Manager to track resources that are outside of the EMC Smarts system, the alert handler instance also sends alerts for those resources.

Procedure

1   Log in to vCenter Operations Manager as an administrator.

2   Select **Admin > Configure Outbound Alert**.

3   Click the **Add Alert Handler** icon.

4   Select **Smarts SAM Notification** from the **Outbound Alert Type** drop-down menu.

5   Type a name for the alert handler instance in the **Instance Name** text box.

6   Type the host name or IP address of the EMC broker and the port number that it listens on in the **Broker** text box.

   Use a colon to separate the host name or IP address and the port number.

   For example, if the IP address of the EMC broker is 123.45.6.789 and it listens on the default EMC port (426), type `123.45.6.789:426`.

7   Type the name of the SAM domain and server to which to send the alerts in the **SAM Server** text box.

8   Type a valid user name for the SAM server in the **User Name** text box and type the password for the user name in the **Password** text box.

9   Click **OK** to save the alert handler instance.

What to do next

Select the alerts to send to EMC Smarts. See .

Select Alerts to Send to EMC Smarts

After you add an alert handler instance to send alerts to EMC Smarts, you must select the alerts to send. The alert handler instance does not send alerts by default.

Prerequisites

■   Add an alert handler instance. See .

■   Become familiar with the alert types and subtypes in vCenter Operations Manager. For more information, see the administration guide for your vCenter Operations Manager version.

Procedure

1 Open the `plugin.properties` file in a text editor.

The `plugin.properties` file is in the *vcenter-ops*`/user/plugins/outbound/Smarts_alertplugin/conf` folder.

2 List the alerts to send in the `sendByType` property.

Type each alert type in the format `Type`*n* and each alert subtype in the format `Subtype`*n*. Separate alert subtypes with a comma.

For example:

`sendByType=Type1::Subtype1,Type1::Subtype2,Type2::Subtype1,Type2::Subtype2`

3 Restart the Smarts SAM Notification alert handler instance.

a Log in to vCenter Operations Manager as an administrator.

b Select **Admin > Configure Outbound Alert**.

c Select the Smarts SAM Notification alert handler instance, click the **Stop** icon, and click the **Start** icon.

The Smarts SAM Notification alert handler instance sends the alert types that you selected to EMC Smarts.

Installing and Configuring the Global Console Custom View

You can install and configure the vCenter Operations Manager custom view so that operators can view alert details in the Global Console.

NOTE The Global Console custom view feature is not validated for EMC Smarts 9.0.

Install the Global Console Custom View

You install the vCenter Operations Manager custom view on the EMC Smarts server.

Prerequisites

- Verify that you have EMC Smarts 7.x or 8.1. The Global Console custom view feature is not validated for EMC Smarts 9.0.

- Verify that you have the `vcops_emc.jar` file. If you have a standalone installation, `vcops_emc.jar` is in the *vcenter-ops*`/tools/smarts` folder on the vCenter Operations Manager server. If you have a vApp installation, you should have downloaded `vcops_emc.jar` when you installed the EMC Smarts adapter. See

Procedure

1 Copy the `vcops_emc.jar` file to the *SmartsRoot*`/SAM/smarts/local/classes` folder on the EMC Smarts server.

SmartsRoot is the root folder of the EMC Smarts installation. The default root folder is `InCharge7` for EMC Smarts 7.x and `InCharge8` for EMC Smarts 8.1.

2 On the EMC Smarts server, open the `runcmd_env.sh` file in a text editor.

The location of the `runcmd_env.sh` file depends on the EMC Smarts version.

Option	Description
7.x	*SmartsRoot*`/SAM/smarts/local/conf/runcmd_env.sh`
8.1	*SmartsRoot*`/CONSOLE/smarts/local/conf/runcmd_env.sh`

3   Set the `SM_CLASSPATH` statement to the path for the `vcops_emc.jar` file.

For example:

```
SM_CLASSPATH= C:\InCharge7\SAM\smarts\local\classes\vcops_emc.jar
```

What to do next

Add the custom view to the Global Console. See

Add the Custom View in the Global Console

After you install the vCenter Operations Manager custom view on the EMC Smarts server, you must add the custom view in the Global Console.

Prerequisites

Install the Global Console custom view. See

Procedure

1   Open the Global Console.

2   Select **View > Add View**.

3   Select **Custom View**.

4   Type `com.integrien.alive.alertsummary.AlertSummaryView` in the **Java Class** text box.

5   Select a location for the custom view from the **Panel** and **Tile** drop-down menus.

6   Click **OK** to save your changes.

Installing and Configuring Integration Tools in EMC Smarts

You can install and configure the vCenter Operations Manager integration tools so that operators can view resource details from the Global Console Notification Log and Topology Tree.

NOTE   The integration tools are not validated for EMC Smarts 9.0.

Install and Configure Integration Tools Files

You install and configure the vCenter Operations Manager integration tools files on the SAM server computer and on each Global Console client.

Prerequisites

■   Verify that you have EMC Smarts 7.x or 8.1. The integration tools are not validated for EMC Smarts 9.0.

■   Verify that you have a valid EMC Smarts user name and password. The `import` command might prompt you for these credentials.

■   Verify that you have the `Launch-vcops-UI-Object.cmd` and `launch-vcops-action-windows.xml` files. If you have a Standalone installation, the files are in the *vcenter-ops*`/tools/smarts/Launch-vcops-UI-Object.cmd` folder on the vCenter Operations Manager server. If you have a vApp installation, you should have downloaded the files when you installed the EMC Smarts adapter. See

Procedure

1   Copy the `Launch-vcops-UI-Object.cmd` file to the `SmartsRoot`/SAM/smarts/local/actions/client folder on each Global Console client computer.

   `SmartsRoot` is the root folder of the EMC Smarts installation. The default root folder is `InCharge7` for EMC Smarts 7.x and `InCharge8` for EMC Smarts 8.1.

2   Copy the `launch-vcops-action-windows.xml` file to the `SmartsRoot`/SAM/smarts/local/conf/ics folder on the SAM server computer.

3   Open the `Launch-vcops-UI-Object.cmd` file in a text editor and set the `VCOPS_HOST_PORT` property to the IP address and port number of the vCenter Operations Manager server.

4   Open the `runcmd_env.sh` file in a text editor and set the `VCOPS_HOST_PORT` property to the IP address and port number of the vCenter Operations Manager server.

   The location of the `runcmd_env.sh` file depends on the EMC Smarts version.

Option	Description
7.x	`SmartsRoot`/SAM/smarts/local/conf/runcmd_env.sh
8.1	`SmartsRoot`/CONSOLE/smarts/local/conf/runcmd_env.sh

5   Import the `launch-vcops-action-windows.xml` file.

   The steps that you perform depend on whether the SAM server is a Windows or Linux system.

Option	Action	
Windows	a	Open a command prompt and change the directory to `SmartsRoot`\SAM\smarts\local\conf\ics.
	b	Type the command `..\..\..\bin\sm_config -s SAM-DOMAIN import --force launch-vcops-action-windows.xml`, where `SAM-DOMAIN` is the SAM domain name for the EMC Smarts deployment. The SAM domain name is usually INCHARGE-SA.
Linux	a	Open a terminal window and change the directory to `SmartsRoot`/SAM/smarts/local/conf/ics.
	b	Type the command `../../../bin/sm_config -s SAM-DOMAIN import --force launch-vcops-action-windows.xml`, where `SAM-DOMAIN` is the SAM domain name for the EMC Smarts deployment. The SAM domain name is usually INCHARGE-SA.

6   If the import command prompts you for credentials, type your EMC Smarts user name and password.

   If the import is successful, the command does not return a message. The command returns a message only if the import fails.

7   Restart the EMC Smarts service.

   The service name is EMC Smarts Service Assurance Manager Server in EMC Smarts 7.x and EMC Ionix Service Assurance Manager Server in EMC Smarts 8.1.

What to do next

Test the integration tools installation. See

Test the Integration Tools Installation

After you install and configure the vCenter Operations Manager integration tools, test the tools to verify that the installation was successful.

Prerequisites

Install and configure the vCenter Operations Manager integration tools. See "Install and Configure Integration Tools Files," on page 21.

Procedure

1   Stop and start the Global Console.

2   In the Global Console Notification Log, right-click a notification that originated in vCenter Operations Manager and select **Client Tools > View Object** or **Client Tools > Browse Object**.

3   Verify that the Resource Detail page for the object related to the notification appears in a new browser window.

    The page URL should be similar to `http://server/emcResponder.naaction?` `mainAction=showResourceDetails&objectName=Host::10.1.10.17`.

4   In the Topology Tree, right-click a UCS-type object, such as a switch or router, and select **Client Tools > Browse Object**.

5   Verify that the Resource Detail page for the object appears in a new browser window.

    The page URL should be similar to `http://server/emcResponder.naaction?` `mainAction=showResourceDetails&objectName=Host::10.1.10.17`.

Configuring EMC Smarts Adapter Properties

vCenter Operations Manager discovers, imports, and collects data only for the resources and metrics that are defined in the `smarts_adapter.properties` file. The `smarts_adapter.properties` file is in the *vcenter–ops*/plugins/inbound/smarts_adapter/conf folder.

You can use a text editor to edit the `smarts_adapter.properties` file. Make a back up copy of the file before you make changes. You must stop and restart the vCenter Operations Manager collector for your changes to take effect.

NOTE   In a vApp installation, you edit the `smarts_adapter.properties` file on the Analytics virtual machine.

■   EMC Smarts Adapter Properties File Format on page 24

    The `smarts_adapter.properties` file contains properties that affect adapter operation, a series of statements that define the parts of the EMC Smarts object hierarchy to include in vCenter Operations Manager, and a series of `topo` statements that define relationships for container resources.

■   Defining Object Classes on page 26

    Each `classes` statement in the `smarts_adapter.properties` file defines a part of the EMC Smarts object hierarchy for a particular domain. Only objects defined by a `classes` statement are included when vCenter Operations Manager performs resource discovery for an adapter instance for that domain.

■   Defining Resource Topologies on page 27

    Each `topo` statement in the `smarts_adapter.properties` file defines an EMC Smarts topology to be replicated in vCenter Operations Manager. vCenter Operations Manager uses the information in the `topo` statement to define an equivalent application topology in vCenter Operations Manager.

- **Add Threads** on page 27

  You can increase the number of threads and connections that vCenter Operations Manager generates to collect metrics from each EMC Smarts adapter instance. Additional threads can improve performance, but they can also use more domain resources.

- **Configure White and Black Lists** on page 28

  You can configure the EMC Smarts adapter to use white and black lists to filter resources.

- **Read Events From Notification Lists** on page 28

  EMC Smarts can store events in notification lists. You can configure the EMC Smarts adapter to read events from these notification lists and send the events to vCenter Operations Manager.

- **Enable Smart Discovery** on page 29

  You can configure the EMC Smarts adapter to use smart discovery to discover resources. When you enable smart discovery, the EMC Smarts adapter performs full discovery during startup and whenever EMC Smarts reports that it has finished its discovery process.

- **Configure How the Adapter Handles Smarts Processor Metrics** on page 30

  You can configure how the EMC Smarts adapter handles Smarts processor metrics.

EMC Smarts Adapter Properties File Format

The `smarts_adapter.properties` file contains properties that affect adapter operation, a series of statements that define the parts of the EMC Smarts object hierarchy to include in vCenter Operations Manager, and a series of `topo` statements that define relationships for container resources.

The following example shows a `smarts_adapter.properties` file.

```
ThreadCount=2
AverageProcessors=true
DoSmartDiscovery=false

#classes
# First pair (:: separated)
#   1) where to start (top/bottom)
#   2) the class to start with
#
# following this is any number of groups representing how to walk the class hierarchy
# each group is 3 items (:: separated)
#   1) Relationship type
#       1.1) op = Operation. This should be a class operation that returns a set of objects and
takes no parameters.
#       1.2) rel = relationship. This is a normal multiple relationship property of the object
(e.g. ComposedOf or InstrumentedBy)
#       1.3) rel1 = single relationship property. It returns only 1 item rather than an array (e.g.
SystemName or SystemPackagedIn)
#   2)Relationship property name (should match the type)
#   3)Base class to expect from the relationship.
#
# subscription is the list of properties to gather as metrics.

#topo
# One pair (:: separated)
#   First element is the smarts class to create the container from
#   Second element is the property to get the children of this container.

ICPM.classes.1=top::UnitaryComputerSystem op::getProcessors::Processor
```

```
                    rel::InstrumentedBy::Processor_Performance
ICPM.subscription.1=CurrentUtilization


ICPM.classes.2=top::UnitaryComputerSystem op::getMemory::Memory
                rel::InstrumentedBy::Memory_Performance
ICPM.subscription.2=BufferMissPct,BufferUtilizationPct,FreeMemory,FreeMemoryPct,
                LargestFreeBuffer,LargestFreeBufferPct,TotalBufferAllocationFailures,TotalMemory


#ICPM.classes.3=top::UnitaryComputerSystem rel1::SystemPackagedIn::Chassis
                 rel::InstrumentedBy::Chassis_Performance
#ICPM.subscription.3=BackplaneUtilization


ICPM.classes.4=top::UnitaryComputerSystem op::getFileSystems::FileSystem
                rel::InstrumentedBy::FileSystem_Performance
ICPM.subscription.4=AvailableSpace,StorageSize,UtilizationPct


ICPM.classes.5=bottom::NetworkAdapter_Performance rel1::Instruments::NetworkAdapter
                 op::getSystem::UnitaryComputerSystem
ICPM.subscription.5=AvgInputPacketSize,AvgOutputPacketSize,CurrentUtilization,
                InputPacketBroadcastPct,InputPacketBroadcastRate,InputPacketDiscardPct,
                InputPacketDiscardRate,InputPacketErrorPct,InputPacketErrorRate,
                InputPacketNoErrorRate,InputPacketQueueDropPct,InputPacketQueueDropRate,
                InputPacketRate,InputPacketsQueuedRate,MaxSpeed,MaxTransferUnit,
                OutputPacketBroadcastPct,OutputPacketBroadcastRate,OutputPacketDiscardPct,
                OutputPacketDiscardRate,OutputPacketErrorPct,OutputPacketErrorRate,
                OutputPacketNoErrorRate,OutputPacketQueueDropPct,OutputPacketQueueDropRate,
                ifInDiscardsRate,ifInErrorsRate,ifInNUcastPktsRate,ifInOctetsRate,
                ifInUcastPktsRate,ifInUnknownProtosRate,ifOutDiscardsRate,ifOutErrorsRate,
                ifOutNUcastPktsRate,ifOutOctetsRate,ifOutUcastPktsRate


ICPM.classes.6=top::UnitaryComputerSystem op::getVoltageSensors::VoltageSensor
                rel::InstrumentedBy::VoltageSensor_Fault
ICPM.subscription.6=CurrentValue


ICPM.classes.7=top::UnitaryComputerSystem op::getTemperatureSensors::TemperatureSensor
                rel::InstrumentedBy::TemperatureSensor_Fault
ICPM.subscription.7=CurrentValue


ICPM.topo.1=VLAN::ConnectedSystems


ACM.classes.1=top::UnitaryComputerSystem rel::HostsServices::SoftwareService
                rel::CheckedBy::SoftwareElementCheck
#ACM.classes.1=bottom::SoftwareElementCheck rel::Checks::SoftwareService
                op::getSystem::UnitaryComputerSystem
ACM.subscription.1=ResponseTime


ESM.classes.1=bottom::ICIM_Processor_Performance rel1::Instruments::ICIM_Processor
                op::getSystem::UnitaryComputerSystem
ESM.subscription.1=CurrentUtilization


ESM.classes.2=bottom::Memory_Performance_WMI rel1::Instruments::Memory
                op::getSystem::UnitaryComputerSystem
ESM.subscription.2=BufferMissPct,BufferUtilizationPct,FreeMemory,LargestFreeBuffer,
                TotalBufferAllocationFailures,TotalMemory,FreeKBytes,FreeMemoryPct,TotalKBytes
```

```
ESM.classes.3=bottom::FileSystem_Performance_WMI rel1::Instruments::FileSystem
            op::getSystem::UnitaryComputerSystem
ESM.subscription.3=AvailableSpace,Mounted,StorageSize,FreeSpaceKB,TotalSizeKB,UtilizationPct

ESM.classes.4=bottom::SpCounter_Instrumentation rel1::Instruments::SpCounter
            op::getSystem::UnitaryComputerSystem
ESM.subscription.4=spProcessCount,spProcessCountRate

SAM.topo.1=RedundancyGroup::ComposedOf
SAM.topo.2=HierarchicalGroup::ConsistsOf
SAM.topo.3=HierarchicalGroup::ChildGroups
SAM.topo.4=ServiceOffering::ConsistsOf

SAM.events.NotificationListName=Default
SAM.events.ValidClasses=UnitaryComputerSystem
SAM.events.NotificationEvent=Down,Unresponsive

#experimental
classfields.UnitaryComputerSystem=Model,Vendor
```

Defining Object Classes

Each `classes` statement in the `smarts_adapter.properties` file defines a part of the EMC Smarts object hierarchy for a particular domain. Only objects defined by a `classes` statement are included when vCenter Operations Manager performs resource discovery for an adapter instance for that domain.

Each `classes` statement is followed by a `subscription` statement, which lists the metrics that vCenter Operations Manager can collect for the objects defined by the `classes` statement.

Sample classes Statement

The following example shows a `classes` statement.

```
ICPM.classes.4=top::UnitaryComputerSystem op::getFileSystems::FileSystem
                    rel::InstrumentedBy::FileSystem_Performance
ICPM.subscription.4=AvailableSpace,StorageSize,UtilizationPct
```

The `classes` statement contains the following components:

- A statement name
- A starting point
- One or more object definition groups
- A subscription statement

Statement Name

The statement name consists of the domain name, the word classes, and a sequential number. Each value is separated by periods. The statement name ends with an equals sign. The statement name in the sample `classes` statement is `ICPM.classes.4=`.

Starting Point

The starting point specifies whether to start at the top or bottom of the object hierarchy. It also defines the object class with which to start. The starting point in the sample `classes` statement is `top::UnitaryComputerSystem`.

Object Definition Groups

An object definition group describes the object hierarchy from the starting point to an object. Each group contains a relationship type, relationship property name, and the base class to expect from the relationship. Each value is separated by double colons (::).

The relationship type can be `op`, `rel`, or `rel1`.

op	A class operation that takes no parameters and returns a set of objects.
rel	A normal multiple-relationship property of the object, such as `ComposedOf` or `InstrumentedBy`.
rel1	A single-relationship property of the object. It returns only one item rather than an array, for example, `SystemName` or `SystemPackagedIn`.

In the sample `classes` statement, the first object definition is `op::getFileSystems::FileSystem`. This object definition performs an operation on the `getFileSystems` property and returns a list of `FileSystem` names.

You can include any number of object definition groups in the `smarts_adapter.properties` file. Each group must be separated by a single space.

Subscription Statement

The `subscription` statement lists the parameters for vCenter Operations Manager to collect for the objects that are defined by the `classes` statement. The `subscription` statement consists of the statement name and a list of EMC Smarts properties for the defined objects.

The statement name matches the `classes` statement name, except it is labeled `subscription` instead of `classes`. The `subscription` statement name in the sample `classes` statement is `ICPM.subscription.4=`.

vCenter Operations Manager imports the properties in the EMC Smarts properties list as metrics for discovered resources. The properties in the sample `subscription` statement are `AvailableSpace,StorageSize,UtilizationPct`.

Defining Resource Topologies

Each `topo` statement in the `smarts_adapter.properties` file defines an EMC Smarts topology to be replicated in vCenter Operations Manager. vCenter Operations Manager uses the information in the `topo` statement to define an equivalent application topology in vCenter Operations Manager.

Each `topo` statement consists of an object class and a property to get that class. For example, the following `topo` statement defines the `RedundancyGroup` object class and `ComposedOf` property.

`SAM.topo.1=RedundancyGroup::ComposedOf`

The result of this statement is a list of the objects under `RedundancyGroup` that are derived from a UCS-type object, such as a router or switch.

Add Threads

You can increase the number of threads and connections that vCenter Operations Manager generates to collect metrics from each EMC Smarts adapter instance. Additional threads can improve performance, but they can also use more domain resources.

Procedure

1   Open the `smarts_adapter.properties` file in a text editor.

In a vApp installation, modify the `smarts_adapter.properties` file on the Analytics virtual machine.

2   Set the `ThreadCount` property to a number between 1 and 4.

Values higher than 4 result in little or no benefit in vCenter Operations Manager and can seriously degrade performance in the EMC Smarts domain. The default is 2.

3   Restart the vCenter Operations Manager collector to make your changes take effect.

Configure White and Black Lists

You can configure the EMC Smarts adapter to use white and black lists to filter resources.

A match occurs when any part of a resource name contains a filter in the white or black list. For example, if the filter is *abc*, all of the following resource names match the filter:

```
bobabc
abcabc
abcbob
bob.department.abc.com
```

Procedure

1   Open the `smarts_adapter.properties` file in a text editor.

In a vApp installation, modify the `smarts_adapter.properties` file on the Analytics virtual machine.

2   If you have a white or black list file, set the `whiteFilterListFileName` or `blackFilterListFileName` property to the file name.

The file must contain one filter per line.

The following example shows the `whiteFilterListFileName` and `blackFilterListFileName` properties on a Windows system:

```
whiteFilterListFileName=C:\vcops\whitelist.txt
blackFilterListFileName=C:\vcops\blacklist.txt
```

The following example shows the `whiteFilterListFileName` and `blackFilterListFileName` properties on a Linux system:

```
whiteFilterListFileName=/var/opt/whitelist
blackFilterListFileName=/var/opt/blacklist
```

3   If you do not have a white or black list file, set the `whiteFilterList` or `blackFilterList` property to a comma-separated list of filters.

For example:

```
whiteFilterList=abc,def,ghi
blackFilterList=abc,def,ghi
```

4   Restart the vCenter Operations Manager collector to make your changes take effect.

Read Events From Notification Lists

EMC Smarts can store events in notification lists. You can configure the EMC Smarts adapter to read events from these notification lists and send the events to vCenter Operations Manager.

By default, the EMC Smarts adapter monitors the default notification list for all events of type `Down` or `Unresponsive` that belong to the `UnitaryComputerSystem` class. When the adapter encounters an event that matches these criteria, it sends the event to vCenter Operations Manager. EMC Smarts events appear as alerts in the vCenter Operations Manager user interface. For information about viewing alerts in vCenter Operations Manager, see the online help.

Unlike performance metrics, which typically come from the INCHARGE-AM-PM suite, events typically come from the INCHARGE-SA suite. You should create a separate EMC Smarts adapter instance to connect to the SA suite to monitor for events.

Events from EMC Smarts appear for a resource in vCenter Operations Manager only if vCenter Operations Manager is actively monitoring for that resource. The EMC Smarts adapter instance that is monitoring for the resource must be running from the same collector as the adapter instance that is monitoring for events.

Prerequisites

Create a separate EMC Smarts adapter instance to connect to the SA suite to monitor for events. See "Add an Adapter Instance," on page 16.

Procedure

1 Open the `smarts_adapter.properties` file in a text editor.

   In a vApp installation, modify the `smarts_adapter.properties` file on the Analytics virtual machine.

2 Set the `NotificationListName` property to the name of the notification list to monitor for events.

   The default setting is `Default`, which corresponds to the default notification list.

   NOTE   Because notification list names are prepended with `ICS_NL-`, the actual name of the default notification list is `ICS_NL-Default`.
   ------

3 Specify each class to monitor in the `ValidClasses` property.

   The adapter filters out events for classes that are not in this list. Use a comma to separate multiple class names in the list. The default setting is `UnitaryComputerSystem`.

4 Specify each event type to monitor in the `NotificationEvent` property.

   The event types that you specify are dependent on the classes that you listed in the `ValidClasses` property. Use a comma to separate mulitple events in the list. The default setting includes `Down` and `Unresponsive`, which are specific to the `UnitaryComputerSystem` class.

   NOTE   The event types that you specify are associated with all of the classes in the `ValidClasses` property. You cannot specify a certain event type only for a certain class.
   ------

5 Restart the vCenter Operations Manager collector to make your changes take effect.

The EMC Smarts adapter captures the events that belong to the classes listed in `ValidClasses` and for which an event type is specified in `NotificationEvent`.

Enable Smart Discovery

You can configure the EMC Smarts adapter to use smart discovery to discover resources. When you enable smart discovery, the EMC Smarts adapter performs full discovery during startup and whenever EMC Smarts reports that it has finished its discovery process.

When smart discovery is disabled (the default behavior), the EMC Smarts adapter performs full discovery during startup and at the hour of day that you configured for the adapter instance.

Procedure

1 Open the `smarts_adapter.properties` file in a text editor.

   In a vApp installation, modify the `smarts_adapter.properties` file on the Analytics virtual machine.

2   Set the `DoSmartDiscovery` property to `true` to enable smart discovery.

      The default is `false`.

3   Restart the vCenter Operations Manager collector to make your changes take effect.

Configure How the Adapter Handles Smarts Processor Metrics

You can configure how the EMC Smarts adapter handles Smarts processor metrics.

Procedure

1   Open the `smarts_adapter.properties` file in a text editor.

      In a vApp installation, modify the `smarts_adapter.properties` file on the Analytics virtual machine.

2   Set the `AverageProcessors` property.

Option	Description
true	The adapter averages Smarts processor metrics before sending the metrics to vCenter Operations Manager. This is the default setting.
false	The adapter does not average Smarts processor metrics and the Custom user interface shows metrics for each processor individually.

3   Restart the vCenter Operations Manager collector to make your changes take effect.

Viewing Alerts and EMC Smarts Information

4

You can view vCenter Operations Manager alerts in EMC Smarts and you can view EMC Smarts information in vCenter Operations Manager.

This chapter includes the following topics:

- "Viewing Alerts in EMC Smarts," on page 31
- "Viewing EMC Smarts Information in vCenter Operations Manager," on page 34

Viewing Alerts in EMC Smarts

When you configure vCenter Operations Manager to send alerts to EMC Smarts, alerts appear on the Global Console Notification Log page in EMC Smarts.

Figure 4-1. Global Console Notification Log Page

When you configure the vCenter Operations Manager custom view for the Global Console, you can click an alert message in the Global Console Notification log to see alert details in the Global Console custom view panel.

Figure 4-2. Global Console Custom View Panel
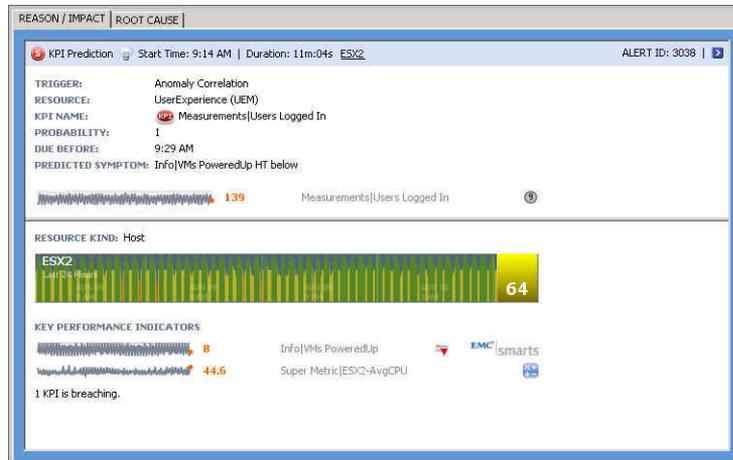
- The blue bar at the top of the page shows the type of alert, when it started, how long it lasted, and the name of the resource that generated it. The internally assigned alert ID appears in the top right of the custom view.

- The middle pane shows information about the event that triggered the alert, including the type of trigger, the associated resource or metric, and details about the trigger.

- The bottom pane shows information related to the alert, including health information for the last six hours for the associated resource and any subcontainers. It also shows a metric graph for up to five metrics for the resource. Breaching KPIs appear first, followed by breaching super metrics, non-breaching KPIs, and non-breaching super metrics.

For information about resolving alerts, see the documentation for your vCenter Operations Manager version.

View Root Cause Information in the Global Console Custom View

You can view information about the calculated root causes of an alert on the **Root Cause** tab in the Global Console custom view panel.

The **Root Cause** tab is similar to the **Root Cause** tab in the vCenter Operations Manager Alert Summary window. For information about the **Root Cause** tab, see the documentation for your vCenter Operations Manager version.

Prerequisites

Install and configure the Global Console custom view. See

Procedure

- Click the **Root Cause** tab in the Global Console custom view panel to see information about the calculated root causes of the alert.

  The information includes the likely root cause container resources ranked by the analytical algorithm on the container resource.

- Double-click a resource on the **Root Cause** tab to see the symptom groups ranked by percentage of possible resources that exhibit symptoms in the group.

- Double-click a group on the **Root Cause** tab to see the top five individual symptoms ranked by percentage of possible resources that exhibit the symptom.

View Alert Details from the Global Console Custom View

You can view alert details in vCenter Operations Manager from the Global Console custom view panel.

Prerequisites

Install and configure the Global Console custom view. See "Installing and Configuring the Global Console Custom View," on page 20.

Procedure

■   Click the arrow at the top right of the Global Console custom view panel to open the Alert Detail page in vCenter Operations Manager.

The Alert Detail page contains information that can help you troubleshoot an alert. It also contains icons that you can click to update the status of an alert in vCenter Operations Manager.

■   Click the resource name in the top line of the Global Console custom view panel to open the Dynamic Dashboard page in vCenter Operations Manager.

The Dynamic Dashboard page shows detailed information about the resource that generated the alert.

If you are not logged in to vCenter Operations Manager, a prompt appears and you must log in before the Alert Detail or Dynamic Dashboard page opens. Use a user name and password that has access rights to view alert or resource details.

NOTE   vCenter Operations Manager opens in a new browser window or tab, depending on your browser settings.

View Resource Details from the Global Console Notification Log

You can view resource details in vCenter Operations Manager from the Global Console Notification Log page.

Prerequisites

Install and configure the vCenter Operations Manager integration tools in EMC Smarts. See "Installing and Configuring Integration Tools in EMC Smarts," on page 21.

Procedure

1   Right-click an alert on the Global Console Notification Log page.

2   From the pop-up menu, select **Client Tools > View Object** or **Client Tools > Browse Object**.

If you are not logged in to vCenter Operations Manager, a prompt appears and you must log in before the Resource Detail page opens. Use a user name and password that has access rights to view resource details.

NOTE   vCenter Operations Manager opens in a new browser window or tab, depending on your browser settings.

View Resource Details from the Global Console Topology Tree

You can view resource details in vCenter Operations Manager from the Topology Tree in the Global Console.

Prerequisites

Install and configure the vCenter Operations Manager integration tools in EMC Smarts. See "Installing and Configuring Integration Tools in EMC Smarts," on page 21.

Procedure

1   Expand the Topology Tree to show the object.

2   Right-click the object in the list.

3   From the pop-up menu, select **Client Tools > View Object in vCenter Operations**.

If you are not logged in to vCenter Operations Manager, a prompt appears and you must log in before the Resource Detail page opens. Use a user name and password that has access rights to view resource details.

NOTE   vCenter Operations Manager opens in a new browser window or tab, depending on your browser settings.

Viewing EMC Smarts Information in vCenter Operations Manager

You can view EMC Smarts information in vCenter Operations Manager dashboards and widgets. A dashboard can contain any combination of vCenter Operations Manager widgets. Each widget shows a specific view of a type of collected data.

For information about using and configuring dashboards and widgets, see the documentation for your vCenter Operations Manager version.

Resource Health Dashboard Example

This dashboard shows the overall health of a section of the resource tree.

**Figure 4-3.** Dashboard that Shows Resource Health
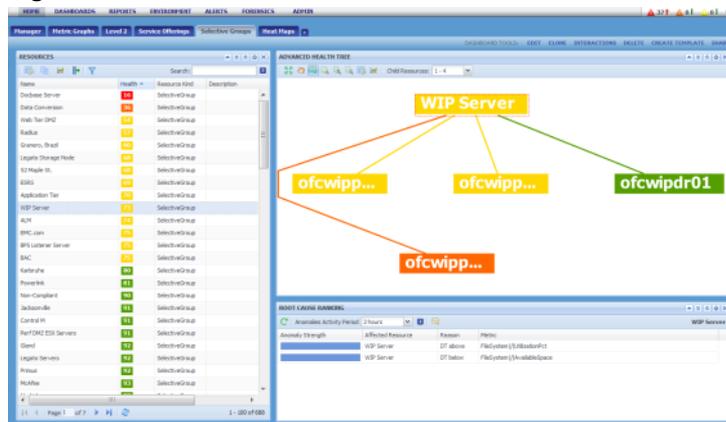
■   The Resources widget lists the EMC Smarts resources defined in vCenter Operations Manager and the health score for each resource.

■   The Advanced Health Tree widget shows the parent and child relationships for the resources selected in the Resources widget. The resources are color-coded by health.

■   The Root Cause Ranking widget shows the metrics that vCenter Operations Manager has determined are the biggest contributors to the health problem of the selected resources.

Real-Time Performance Dashboard Example

This dashboard shows the real-time performance of the CPU use and overall health metrics for all of the resources imported from EMC Smarts.

Figure 4-4. Real-Time Performance Information
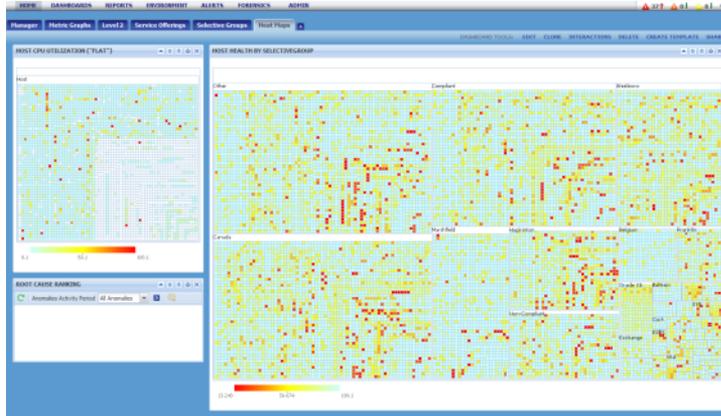
Each Heat Map widget shows a color-coded square for each defined resource. Red indicates a poorly performing resource and green indicates good performance. The predominate color of the widget indicates the overall performance of the metric.

You can click a resource square to show the root cause metrics for the performance problems of that resource in the Root Cause Ranking widget.

Metric Performance Charts Dashboard Example

This dashboard shows performance charts for selected metrics for the previous six hours, including the minimum and maximum values, the moving average value, and the calculated dynamic thresholds for the metric.

Figure 4-5. Performance Charts for Selected Metrics
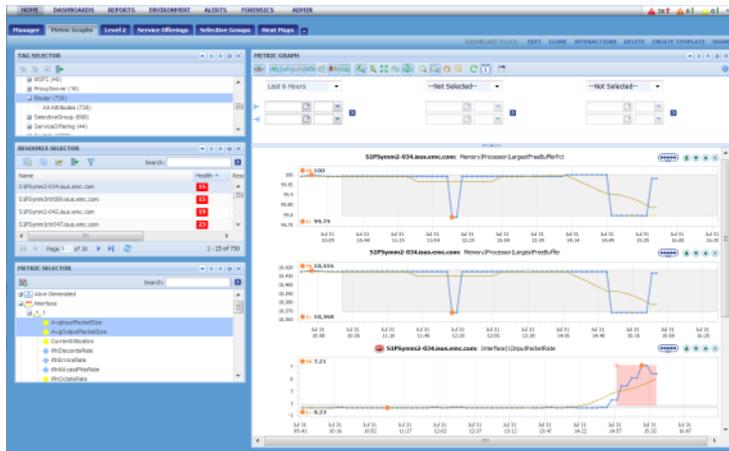
When you select a resource and metrics on the left, a graph shows the metric data in the Metric Graph widget on the right. The Metric Graph widget offers many options of chart type, time period, and what to include on the graph.

Finding Nonexistent EMC Smarts Resources

The EMC Smarts adapter creates the SMARTS Entity Status resource tag in the vCenter Operations Manager user interface. You can select the NotExisting value for this resource tag to find resources that the EMC Smarts adapter discovered that were later removed in EMC Smarts.

When resources are removed in EMC Smarts, they remain in the vCenter Operations Manager user interface until you delete them.

The NotExisting resource tag value includes the name of the EMC Smarts adapter instance and the number of resources that are no longer present in EMC Smarts. The adapter instance in the following example is named smartsAMPM and one resource is no longer present in EMC Smarts.

Figure 4-6. SMARTS Entity Status Resource Tag
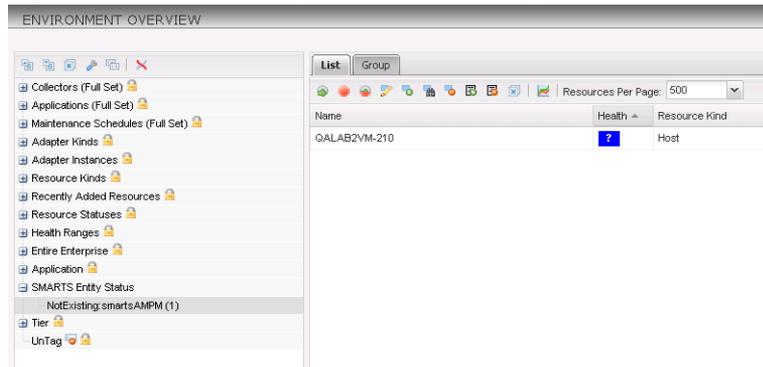
NOTE   Only resources that are no longer present in EMC Smarts are tagged NotExisting. If a resource stops providing metrics and it is still present in EMC Smarts, it is not tagged NotExisting.

Troubleshooting the EMC Smarts Adapter

<div style="text-align: right">

5

</div>

Known troubleshooting information can help you diagnose and correct problems with the EMC Smarts adapter.

This chapter includes the following topics:

- "Troubleshooting an EMC Smarts Adapter Instance," on page 37

- "Viewing System Log Files," on page 37

- "Resolving Common Problems," on page 38

Troubleshooting an EMC Smarts Adapter Instance

Perform these general troubleshooting steps to diagnose and correct problems with an EMC Smarts adapter instance.

1 Verify that you can connect to the host for the EMC broker.

2 Verify that you configured the correct credential kind for the adapter instance. See "Add a Credential," on page 17.

3 Verify the collection status and collection state of the EMC Smarts adpater instance resource on the Environment Overview page in vCenter Operations Manager. For more information about viewing resources in the user interface, see the online help.

4 Check the adapter and collector logs for errors. See "Viewing System Log Files," on page 37.

Viewing System Log Files

You can view EMC Smarts adapter errors in the adapter and collector log files in vCenter Operations Manager. You can view adapter and collector log files in the user interface or in an external log viewer.

EMC Smarts adapter log files are in the *vcenter–ops*/`user/log/adapters` folder. Collector log files are in the *vcenter–ops*/`users/log` folder.

The logging level is set to ERROR by default. To troubleshoot issues, set the logging level to INFO. To view detailed messages, including micro steps, queries, and returned results, set the logging level to DEBUG.

You can set the log level for each class in the `log4.properties` file in the *vcenter–ops*/`log/conf/collector` folder, for example:

```
log4.logger.com.integrien.adapter3.symmetrix.objects.LunDataPointObject=DEBUG
```

NOTE   If you set the logging level to DEBUG, log files can become large very quickly. Set the logging level to DEBUG only for short periods of time.

For information about viewing log files and modifying logging levels, see the online help.

Resolving Common Problems

Follow recommended procedures when you resolve problems with the EMC Smarts adapter.

Log Files Contain Class Not Found Errors

The log files contain exceptions of type MR-E-CLASS_NOT_FOUND_EX.

Problem

Exceptions similar to the following example appear in the log files:

```
2012–08–15 18:13:37,853 ERROR [Collector worker thread 8] (3547)
com.integrien.adapter3.smarts.connection.icServerAccess.printSmRemoteExceptionMsg –
SmRemoteException: An Exception has occured in a remote Domain Manager.
com.smarts.remote.SmRemoteException: MR–E–CLASS_NOT_FOUND_EX–Cannot find class
'SpCounter_Instrumentation'; in file
"t:/DMT–9.0.0.X/1304/smarts/repos/servif/SM_RepositoryServer.c" at line 555
at com.smarts.remote.SmRemoteInterfaceHandler.getResponse(SmRemoteInterfaceHandler.java:116)
```

Cause

The EMC Smarts service and server kind are not configured correctly for the EMC Smarts adapter instance or the referenced class does not exist in the EMC Smarts system.

When you add an EMC Smarts adapter instance, you type the name of the EMC Smarts service in the **Manager** text box and select the server kind from the **Server Kind** drop-down menu. If these values do not match, the adapter instance looks for metrics in a service where the metrics are not defined. For information about configuring the EMC Smarts service and server kind, see "Add an Adapter Instance," on page 16.

A subscription might invoke a class that does not exist in the EMC Smarts system if you modify the `smarts_adapter.properties` file to subscribe to more metrics than the default subscriptions. For information about modifying classes in the `smarts_adapter.properties` file, see "Defining Object Classes," on page 26.

Solution

Edit the adapter instance and correct the EMC Smarts service or server kind, or comment out the subscription that is invoking the missing class in the `smarts_adapter.properties` file.

Log Files Contain Object Not Found Errors

The log files contain exceptions of type MR-E-OBJECT_NOT_FOUND.

Problem

When an object in EMC Smarts no longer exists, errors similar to the following example appear in the log files:

```
2012–03–12 12:26:49,908 ERROR [Smarts Collection Thread (Instance:414) worker thread 2] (414)
com.integrien.adapter3.smarts.workitem.CollectWorkItem.run – Error getting data for instance I–
Port_Performance_MIB2–PORT–10.118.52.34/1
2012–03–12 12:26:49,908 INFO [Smarts Collection Thread (Instance:414) worker thread 2] (414)
com.integrien.adapter3.smarts.workitem.CollectWorkItem.run –
com.smarts.remote.SmRemoteException: MR–E–OBJECT_NOT_FOUND–Object of given name and class
```

```
NetworkAdapter_Performance::I-Port_Performance_MIB2-PORT-10.118.52.34/1 not found; in file
"t:/DMT-9.0.0.X/1304/smarts/repos/mr/dyn_acc.c" at line 1587
at com.smarts.remote.SmRemoteInterfaceHandler.getResponse(SmRemoteInterfaceHandler.java:116)
at com.smarts.remote.SmRemoteInterfaceHandler.getProperties(SmRemoteInterfaceHandler.java:4817)
at com.smarts.remote.SmRemoteInterfaceHandler.getProperties(SmRemoteInterfaceHandler.java:4791)
at com.integrien.adapter3.smarts.connection.icServerAccess.getPropertyValues(icServerAccess.java:
373)
at
com.integrien.adapter3.smarts.workitem.FullDiscoveryCollectWorkItem.getMetricValues(FullDiscovery
CollectWorkItem.java:471)
at com.integrien.adapter3.smarts.workitem.CollectWorkItem.collect(CollectWorkItem.java:65)
at com.integrien.adapter3.smarts.workitem.CollectWorkItem.run(CollectWorkItem.java:36)
at com.integrien.alive.common.util.ThreadPool$WorkerItem.run(ThreadPool.java:224)
at java.util.concurrent.ThreadPoolExecutor$Worker.runTask(ThreadPoolExecutor.java:886)
at java.util.concurrent.ThreadPoolExecutor$Worker.run(ThreadPoolExecutor.java:908)
at java.lang.Thread.run(Thread.java:619)
```

If the collector process reaches the limit of open handles, exceptions occur in different processes, for example:

```
2012-03-10 01:39:53,233 ERROR [Collector worker thread 20] (416)
com.integrien.adapter3.smarts.connection.icServerAccess.checkDomainConnected - Exception trying
to reconnect
java.net.SocketException: Too many open files
at java.net.Socket.createImpl(Socket.java:397)
at java.net.Socket.<init>(Socket.java:371)
at java.net.Socket.<init>(Socket.java:218)
at com.smarts.net.JI_FlowTCP.doOpen(JI_FlowTCP.java:331)
at com.smarts.net.JI_FlowPhysical.open(JI_FlowPhysical.java:203)
at com.smarts.net.JI_Flow.connectToServer(JI_Flow.java:684)
at com.smarts.net.JI_Flow.connectToServer(JI_Flow.java:632)
at com.smarts.remote.SmRemoteDomainManager.attach(SmRemoteDomainManager.java:494)
at com.smarts.remote.SmRemoteDomainManager.attach(SmRemoteDomainManager.java:427)
at com.smarts.remote.SmRemoteBroker.attach(SmRemoteBroker.java:197)
at
com.integrien.adapter3.smarts.connection.icServerAccess.checkDomainConnected(icServerAccess.java:
168)
at com.integrien.adapter3.smarts.SmartsAdapter.startEventProcessThread(SmartsAdapter.java:967)
at com.integrien.adapter3.smarts.SmartsAdapter.onCollect(SmartsAdapter.java:227)
at com.integrien.alive.common.adapter3.AdapterBase.collectBase(AdapterBase.java:552)
at com.integrien.alive.common.adapter3.AdapterBase.collect(AdapterBase.java:371)
at com.integrien.alive.collector.CollectorWorkItem3.run(CollectorWorkItem3.java:42)
at com.integrien.alive.common.util.ThreadPool$WorkerItem.run(ThreadPool.java:224)
at java.util.concurrent.ThreadPoolExecutor$Worker.runTask(ThreadPoolExecutor.java:886)
at java.util.concurrent.ThreadPoolExecutor$Worker.run(ThreadPoolExecutor.java:908)
at java.lang.Thread.run(Thread.java:619)
```

Cause

TCP connections are continuously allocated. This problem can occur if the EMC Smarts adapter build is earlier than 650155.

Solution

Upgrade the EMC Smarts adapter to a build later than 650155.

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