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# **SAS<sup>®</sup> Environment Manager 2.5**

User's Guide  
**Second Edition**

The correct bibliographic citation for this manual is as follows: SAS Institute Inc. 2015. *SAS® Environment Manager 2.5: User's Guide, Second Edition*. Cary, NC: SAS Institute Inc.

**SAS® Environment Manager 2.5: User's Guide, Second Edition**

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March 2016

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## What's New

# What's New in SAS Environment Manager 2.5

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## Overview

SAS Environment Manager has the following new features and enhancements:

- Log collection and discovery has been improved.
- Support has been added for collecting metric data from a SAS grid.
- Support has been added in SAS Environment Manager Administration for management of SAS users, servers, and libraries.
- The SAS Environment Management Data Mart now supports a federated data mart.
- Changes in tables in SAS Environment Manager Data Mart: ACM.IOMSERVERS table has been replaced by ACM.SASAPPSERVERS and ACM.SASLOGICALSERVERS tables.
- The stored process reports in the Report Center have been changed from stored process report objects to stored process objects.

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## **Log Collection and Discovery**

The method of discovering and collecting data from SAS logs has been improved. Rather than relying on log locations that are stored in metadata, the ETL processes look through the directory structure of a SAS deployment to find log files.

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## **SAS Grid Support**

Support has been added for collecting metric data from a SAS grid and from the servers that make up the grid. Grid resources are discovered automatically.

---

## **SAS Management Console Administration Functions**

Functions have been added to the Administration section of SAS Environment Manager to enable you to manage metadata definitions for SAS servers, libraries, and users. Information about using the Administration functions has been moved to *SAS Environment Manager Administration: User's Guide*.

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## **Federated Data Mart**

Support for a federated data mart has been added. A federated data mart is separate from the SAS Environment Manager data mart, and enables you to collect metric data in data marts for several SAS deployments, copy that data to a single collector deployment, and view the collected metric data in one place.



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## **Report Center**

The reports in the Report Center (part of the service architecture) have been changed from stored process report objects to stored process objects, which makes the reports more dynamic. The reports are now re-generated at every request, rather than being cached after the first time they are generated. Each stored process is generated using prompts that enable you to alter the contents and appearance of the report.

**x** *SAS Environment Manager*



# Part 1

## Understanding SAS Environment Manager

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## 1

# Introduction to SAS Environment Manager

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## Starting SAS Environment Manager

To access SAS Environment Manager, use your web browser to go to `http://<localhost>:7080`, where *localhost* is the machine on which the SAS Environment Manager server is installed. The SAS Login Manager prompts you for your credentials and the application starts. After you specify your credentials in the SAS Login Manager, the main SAS Environment Manager application appears.

---

## What is SAS Environment Manager?

SAS Environment Manager is a web-based administration solution for a SAS environment. The application enables you to perform these tasks:

- administer, monitor, and manage SAS resources, including administering the SAS Web Application Server and monitoring SAS foundation servers
- collect and chart data on metrics for monitored SAS resources, which creates a comprehensive view of resource health and operation
- monitor log events and reporting alerts
- Incorporate the monitoring and managing of IT and SAS resources into a service management strategy by using the detailed metric information stored in the SAS Environment Manager Data Mart and the reports provided in the Report Center

SAS Environment Manager agents run on all SAS platforms except for z/OS.

**Note:** Using SAS Environment Manager to monitor Hadoop nodes is not recommended. In order to monitor Hadoop nodes, the SAS Environment Manager agent must run with root access, which introduces security risks.

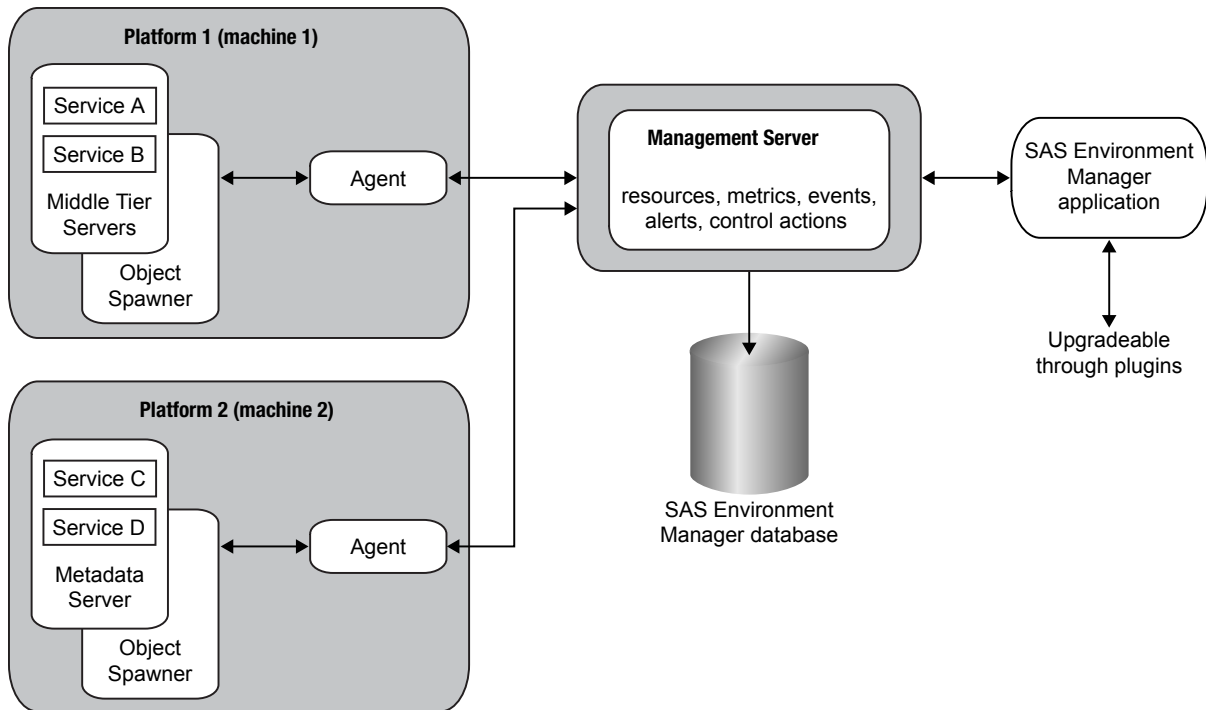
SAS Environment Manager cannot run behind the SAS Web Server or any other reverse proxy server.

SAS Environment Manager is based on VMWare's Hyperic product, with customizations and plugins to optimize the product specifically for a SAS environment. Some terms and concepts used in SAS Environment Manager are different than in other parts of SAS, but these are noted in this document.

SAS Environment Manager is licensed for and restricted to the monitoring and management of SAS Technologies, solutions, and the necessary associated supporting infrastructures. Other uses are restricted in accordance with your SAS Master License Agreement.

The basic architecture of SAS Environment Manager consists of an agent process running on each platform in a SAS deployment that communicates to a central

management server. Agents monitor detected resources and periodically report resource metrics back to the server. The server provides an interface for interacting with those agents, managing the data collected by the agents, distributing plugins, creating alerts and escalation procedures based on collected metrics, and graphing the metrics provided through the installed plugins.



There are five main components to SAS Environment Manager:

#### agent

An agent is a software process that runs on each platform (middle-tier and server-tier machine) in a SAS deployment. The agent is responsible for tasks such as discovering software components on its platform, gathering metric and availability data for the platform and components, and performing resource control actions. The agents communicate with the management server. Plugins are used to provide the agents with the information needed to discover SAS resources installed on a platform.

## management server

The management server is responsible for communicating with the agents. It collects information about items such as discovered resources, metrics, and availability, and issues control actions received from the SAS Environment Manager application.

Collected data is stored in the SAS Environment Manager database.

## SAS Environment Manager database

The database is a repository for all of the information that is known about all of the resources known to SAS Environment Manager. It uses PostgreSQL, and uses the SAS Web Infrastructure Platform Data Server when that server is configured to use PostgreSQL. After resources are discovered and added to your inventory, the database stores data collected from the agents about the resources.

## SAS Environment Manager application

The application is the web-based interface to the SAS Environment Manager system. Resources discovered by the agents and added to the inventory are displayed and monitored. Metric and availability data collected by the agents and stored in the database is displayed and charted. Events and metric data are used to generate alerts. Control actions are sent back through the management server to the agents to control resources on the platforms. The application also includes a framework to add functions specific to SAS, such as server, library, and user administration.

## plugins

Plugins enable agents to discover and monitor resources in a SAS environment.

Each plugin is associated with a specific resource, and provides the agents with the instructions needed to recognize the resource during auto-discovery and to monitor and collect metrics for the resource.

Although open-source plugins are available for VMWare Hyperic, these plugins are not supported by SAS Environment Manager. You should use only plugins provided by SAS.

Beginning with SAS Environment Manager 2.4, SAS Environment Manager Service Architecture is also included. Extract, transform, and load (ETL) processes obtain metric information from the SAS Environment Manager agent and from SAS logs, standardize the data, and store the data in the SAS Environment Manager Data Mart. From there,



the data is used to produce predefined reports from stored processes in the Report Center.

The basic framework for SAS Environment Manager Service Architecture is provided by SAS Environment Manager Extended Monitoring. In addition to providing the infrastructure for the data mart and the Report Center, the extended monitoring package includes predefined alerts, groups, and logging configurations. Initializing extended monitoring automates the task of setting up SAS Environment Manager, and enables you to start using the application right away.

---

## Resource Inventory Model

### Overview

The SAS Environment resource inventory model contains three levels:

platform

A container such as an operating system or a SAS server tier that holds servers and services

server

Software product or process, such as a SAS Metadata Server, that runs on a platform

service

A task-specific software component, such as a SAS logical server, that runs on a server or platform

### Platforms

Platforms are the highest level of resource type in SAS Environment Manager. They are containers that host other software and services. There are three major categories of platforms:

- operating system platforms

- SAS Application Server Tier
- virtual and network platforms

An operating system platform consists of a computer (physical or virtual) and the operating system that runs on it. SAS Environment Manager uses the system plugin to teach the agent how to auto-discover the operating system platform. You cannot manually add an operating system platform to inventory. SAS Environment Manager supports most of the operating systems on which SAS is supported.

The SAS Application Server Tier platform is an instantiation of a SAS deployment and a collective store of deployment-wide information such as license information and clustering. Resources in the SAS Application Server Tier platform include SAS Metadata Server and SAS Application Server and their logical servers (such as SAS Workspace Servers, SAS OLAP Servers, and SAS Stored Process Servers). The agent automatically discovers and creates the SAS Application Server through direct communication with the SAS metadata server as a platform resource.

Virtual and network platforms include a variety of platform types that do not map to an individual physical machine running a traditional operating system and are managed by an agent proxy. These include the following:

- resources that an agent monitors remotely over the network, such as network hosts and devices
- virtual resources such as VMware vSphere hosts and virtual machines
- distributed sets of resources, such as GemFire Distributed Systems

The agent does not automatically discover platforms other than the host operating system and the SAS Application Server Tier. You must manually create other platforms or supply resource properties data that enable the agent to manage them. Below are the virtual and network platform types that SAS Environment Manager supports:

- Cisco IOS
- GemFire Distributed System
- Network Device
- Network Host

- VMware vSphere Host
- VMware vSphere VM

## Servers

In SAS Environment Manager, a server is commonly a software product or process that runs on a platform. Servers provide a communication interface and perform specific tasks upon request. The Monitoring Defaults page on the **Manage** tab lists all of the server types (along with platform and service types) that SAS Environment Manager supports.

Most server types are auto-discovered by a server type-specific SAS Environment Manager plugin. If the plugin that manages a server does not support auto-discovery, or if auto-discovery of a server fails, you might need to manually create a server. See [“Manually Adding a Server” on page 54](#).

Examples of server types include the following:

- SAS Metadata Server
- SAS Object Spawner
- Postgres server
- SAS Home Directory Service

## Services

In SAS Environment Manager, a service is a software component dedicated to a particular task that runs on a server or platform. A service that runs on a server is a service, and a service that runs on a platform is a platform service.

The resource plugin that discovers a platform or server also discovers key services, such as CPUs, network interfaces, and file systems that are running on the platform.

You can also configure a platform service that serves as a proxy for a resource that the SAS Environment Manager agent can monitor over the network. Examples include

- DNS service

- POP3 service
- Fileserver mount
- Windows service
- Network host storage

For more information, see [“Manually Configuring a Service” on page 55](#).

Services that run on a server can be either an internal component of the server or a deployed item. Logical SAS servers are considered to be services that run on SAS server resources. Examples of services that run on servers include the following:

- PostgreSQL database
- SAS Object Spawner
- SAS Logical Workspace Server
- SpringSource tc Runtime Cache

The Monitoring Defaults page on the **Manage** tab lists the supported platform service types (along with platform types and server types) provided by the installed plugins.

---

## Deciding Which Components to Initialize

After you have used the SAS Deployment Wizard to install SAS Environment Manager, you must perform additional steps to configure resources (either automatically or manually), create the dashboard, and enable SAS Environment Manager Service Architecture. The following steps outline the process.

- 1 After the installation process has completed, sign on to SAS Environment Manager. The application autodiscovers the resources in your environment.
- 2 Decide whether you want to enable SAS Environment Manager Extended Monitoring. If you enable extended monitoring, SAS Environment Manager is automatically set up by using tuned resource configurations, alert definitions, and

metrics. The SAS Environment Manager Data Mart infrastructure is also configured, so if you plan to use the data mart, you must enable extended monitoring. If you choose to not enable extended monitoring, you must configure resources and define alerts manually.

- 3 If you choose to use extended monitoring, run the command to enable extended monitoring. See [“Initializing SAS Environment Manager Extended Monitoring” on page 113](#) for more information..
- 4 If you choose not to use extended monitoring, you must manually configure the resources in SAS Environment Manager and manually define alerts. See [Appendix 3, “Manual Setup Examples,” on page 179](#) for examples.
- 5 Set up your dashboard. See [“Using the Dashboard” on page 28](#).
- 6 If you decided to use SAS Environment Manager Service Architecture, you must decide what type of data you want to populate the data mart with. APM ETL provides forensic data from SAS logs, ACM ETL provides real-time data from the computing resources in your environment, and solution kits ETL provide data specific to individual SAS solutions. If you initialize and enable extended monitoring and all three ETL components, you will obtain the most complete and comprehensive view of your system. However, initializing all of these components does consume more resources and impact performance.
- 7 If you are populating the data mart with forensic data from SAS logs, initialize and enable APM ETL. See [“Enabling and Initializing the APM ETL” on page 116](#). You can perform this step at any time, not just during the initial setup.
- 8 If you are populating the data mart with current data from the computing resources in your SAS environment, enable ACM ETL. See [“Enabling ACM ETL” on page 119](#). You can perform this step at any time, not just during the initial setup.



## 2

## Finding Your Way Around

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# Finding Your Way Around

The SAS Environment Manager interface is organized around five main areas, as illustrated in this figure:

The following table describes the main functional areas of SAS Environment Manager:

Main Page	Contents
Dashboard	Configurable collections of portlets; this is the initial view when starting SAS Environment Manager.
Resources	Resource-level monitoring and management.
Analyze	Deployment-wide views of events and alerts.
Administration	Metadata definitions for folders and objects, servers, libraries, users, and metadata security and access controls
Manage	Native users, roles, permissions, plugins.

---

## Viewing Important Information at a Glance: the Dashboard

The Dashboard is the starting point when you sign in to SAS Environment Manager. The page consists of a collection of views (called portlets) of resources, metrics, and events that are the most important to your environment. The Dashboard is customizable, so you can specify how many portlets are displayed, which metrics and functions they present, and which resources they cover. For example, your Dashboard could contain a portlet to display recently auto-discovered resources, a portlet to display recent alerts, or a portlet to display the availability of a group of selected servers.



Selecting an entry (such as a resource or an alert) in a portlet takes you to detailed information about the entry.

Each user can access their own personal Dashboard as well as a Dashboard for each of the native roles of which the user is a member. Each Dashboard can be customized to meet the needs of the user or role. For more information about roles, see [“About Native Roles and Users”](#) on page 83.

An example Dashboard page is displayed in this figure.

**Figure 2.1** Example Dashboard

The screenshot shows the SAS Environment Manager dashboard. At the top, there's a header with 'SAS® Environment Manager', 'Recent Alerts: 11:10 AM - Supervisor Failure, 11:00 AM - I/O Subsystem', and user information 'Welcome, HQ, Sign Out, Help'. Below the header is a navigation bar with 'Dashboard', 'Resources', 'Analyze', 'Administration', and 'Manage'. The main content area has a 'Select a Dashboard' dropdown set to 'Super User Role' and a 'Make Default' button. The dashboard is divided into several portlets:

- Auto-Discovery:** No resources to display.
- Recent Alerts:** A table with columns: Date / Time, Alert Name, Resource Name, Fixed, Ack. It lists four alerts:
 

Date / Time	Alert Name	Resource Name	Fixed	Ack
02/28/2013 11:10 AM	Supervisor Failure	SASMeta - Metadata Server	No	
02/28/2013 11:00 AM	I/O Subsystem	SASMeta - Metadata Server	No	
02/27/2013 02:01 PM	Log Monitoring	SASMeta - Metadata Server	No	
02/27/2013 01:33 PM	Log Monitoring	SASMeta - Metadata Server	No	
- Problem Resources:** A table with columns: Resource Name, Availability, Alerts, OOB, Last. It shows one resource: 'Metadata Server' with 'SASMeta - Metadata Server' as the resource name.
- Recently Added:** No resources to display.
- Control Actions:** A table with columns: Resource Name, Control Action, Date / Time, Message. It shows one action: 'Resume' for 'Metadata Server' on '02/28/2013 11:56 AM'. The message includes details about the server's status and logs.
- Quick Control Frequency:** A table with columns: Resource Name, # of Control Actions, Most Frequent Control Action. It shows two actions: 'Resume' and 'Pause' for 'Metadata Server'.

## Monitoring Platforms, Servers, and Services: the Resources Pages

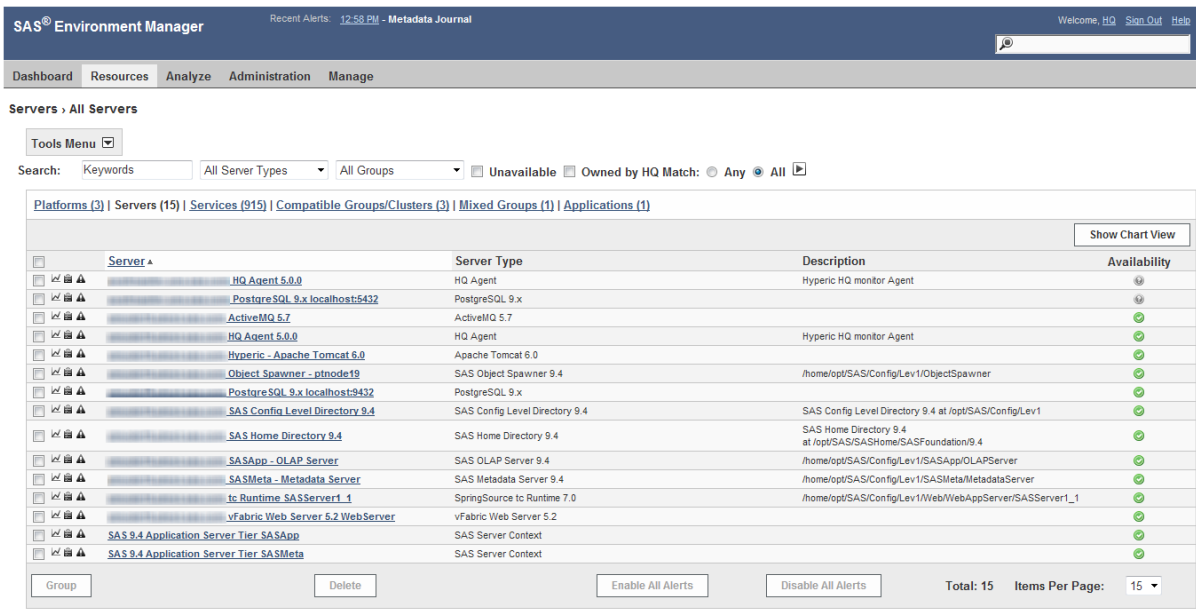
Use the **Resources** pages to monitor, configure, and manage inventory resources. The main Resources page lists the inventory of resources, organized by type:

- Platforms
- Servers

- Services
- Compatible Groups/Clusters
- Mixed Groups
- Applications

Other selections under Resources enable you to view only resources that are currently down or to select from recently viewed resources. This figure shows a server resource list.

Figure 2.2 Resource List




The icons on the left of the resource name enable you to quickly jump to the Monitor, Inventory, or Alerts page for the resource. Selecting the resource name displays the Monitor page for the resource. A lock icon indicates that, because of your permissions, a particular feature is not available for a particular resource.

Use these strategies to locate resources on the **Resources** page:

- Only one inventory type is displayed at a time. To access resources of a different inventory type, click a link in the table header.

[Platforms \(3\)](#) | [Servers \(15\)](#) | [Services \(1177\)](#) | [Compatible Groups/Clusters \(3\)](#) | [Mixed Groups \(1\)](#) | [Applications \(1\)](#)

- To further limit the display, you can specify criteria in the **Search** row and then click  (at the end of the **Search** row). Not all criteria are supported for all inventory types.
- To include only resources that you own, select the **Owned by** check box.
- There might be multiple pages of resources in the list. Use the controls below the list to navigate.
- You can use **Resources** ► **Recently Viewed** ► *the page name* to quickly return to a page that you recently viewed.
- As an alternative to browsing and filtering on the **Resources** page, you can use the search field (on the right side of the application banner) to quickly locate a resource by its name.
- To view a list of resources that are not currently available, select **Resources** ► **Currently Down**.
- You can initiate resource management tasks from the **Resources** page.

---

## Monitoring Resources: the Analyze Pages

### Overview

The **Analyze** pages contain the Alert Center, the Event Center, the Operations Center and the Environment Snapshot. If you have enabled SAS Environment Manager Service Architecture, the Report Center is also included. These pages enable you to quickly view and work with alerts, events, system status, and performance and usage reporting throughout your system.

An event is any sort of activity in a resource that you are monitoring. Alerts are a user-defined type of event that acknowledges a critical condition in a selected resource. You

can configure SAS Environment Manager to also log events for log messages and resource configuration changes.

## Alert Center

The Alert Center page provides a deployment-wide view of alerts and alert definitions.

The default view of the Alert Center is the **Alerts** tab, which displays a table with information about currently active alerts. You can use the filter controls to filter by criteria such as status, type, and priority. Clicking on an entry in the **Alert Definition** column in the table displays detailed information about the alert.

To access the Alert Center, select **Analyze ► Alert Center**.

Alert Center

AlertsDefinition

Alert Filter

Show:

☐ Not Fixed

☐ In Escalation

☒ All

Alert type:

Resource

Minimum priority:

! Low

In the last:

day

Group:

-- All Groups --

Resource Alerts

PreviousPage 1Next

<input type="checkbox"/>	Date	Alert Definition	Resource	Platform	Fixed	Ack	Priority
<input type="checkbox"/>	3/25/13 9:55 AM	<a href="#">Host Credentials</a>	<a href="#">Object Spawner - ptnode20</a>		No		Med
<input type="checkbox"/>	3/25/13 3:47 AM	<a href="#">Stored Process Canceled</a>	<a href="#">Object Spawner - ptnode20</a> <a href="#">SASApp - Stored Process Server</a>		No		Med
<input type="checkbox"/>	3/24/13 7:45 PM	<a href="#">Server Not Running</a>	<a href="#">Object Spawner - ptnode20</a> <a href="#">SASApp - Pooled Workspace Server</a>		No		Med
<input type="checkbox"/>	3/24/13 4:45 PM	<a href="#">Server Launch</a>	<a href="#">Object Spawner - ptnode20</a>		No		Med

Fixed

Acknowledge

Click the icon to acknowledge an alert

You can select the check box next to an alert and click **Fixed** to identify the problem as having been corrected. A window appears that enables you to enter information about the how the alert was resolved.

You can also click an entry in the **Alert Definition** column in the table to display the Detail page for the alert. From the Detail page, you can mark the alert as fixed and specify information about the resolution of the alert.

Object Spawner - SASApp - Stored Process Server: Stored Process Canceled: Alert Detail

[<< Resource Alert List](#)

Alert Properties	
<b>Name:</b> <a href="#">Stored Process Canceled</a>	<b>Priority:</b> II - Medium
<b>Resource:</b> <a href="#">Object Spawner - SASApp - Stored Process Server</a>	<b>Alert Date:</b> 03/25/2013 03:47 AM
<b>Description:</b> Stored process has been canceled at the user's request	<b>Alert Status:</b> Not Fixed

Condition Set
<b>If Condition:</b> Event/Log Level(ERR) and matching substring "Stored process canceled at user's request" <b>Actual Value:</b> mayhem /home/opt/SAS/Config/Lev1/SASApp/StoredProcessServer/Logs/SASApp_STPSTPServer_mayhem.log: Stored process canceled at user's request. <b>Enable Action(s):</b> Each time conditions are met.

**Control Type:** none

Notification Actions
<b>Notify Roles:</b> (none)
<b>Notify Users:</b> (none)

Fix
<b>Resolution for Fix:</b> <input type="text"/>
<input type="button" value="Fixed"/> Click the "Fixed" button to mark alert condition as fixed

[<< Resource Alert List](#)

The **Definition** tab in the Alert Center contains a table listing all of the defined alerts. Clicking on an alert takes you to the definition page for the alert, where you can view more detailed information or edit the alert.

## Event Center

The Event Center page provides a deployment-wide view of all events that have been logged for resources. Alerts are automatically logged as events. You can configure SAS Environment Manager to also log events for log messages, resource configuration changes, and resource metric triggers.

To access the Event Center, select **Analyze ► Event Center**.

SAS® Environment Manager

Recent Alerts: 10/21/16 - Stored Process Cancelled  
10/20/16 - Access Denied

Welcome, HQ SASADM 130

DashboardResourcesAnalyzeAdministrationManage

Event Center

Filters

Minimum Status

Any

Type

All

Time Range

Last 4 hours

In Groups

Unselect All

File Mounts

Key Web Applications

RPC Socket Response

SAS Spawnd Servers

Date	Status	Resource	Subject	Detail
10/21/2016 2:09 PM	Error	SASMeta - Metadata Server	mayhem.homeopt\SAS\Config\Lev1\SASMetaMetadataServer Log\SASMeta_MetadataServer_mayhem.log	The SAS Metadata Supervisor failed to initialize
10/21/2016 2:09 PM	Alert	SASMeta - Metadata Server	Supervisor Failure	mayhem.homeopt\SAS\Config\Lev1\SASMetaMetadataServer Log\SASMeta_MetadataServer_mayhem.log The SAS Metadata Supervisor failed to initialize
10/21/2016 2:07 PM	Error	SASMeta - Metadata Server	mayhem.homeopt\SAS\Config\Lev1\SASMetaMetadataServer Log\SASMeta_MetadataServer_mayhem.log	The SAS Metadata Supervisor failed to initialize
10/21/2016 2:07 PM	Alert	SASMeta - Metadata Server	Supervisor Failure	mayhem.homeopt\SAS\Config\Lev1\SASMetaMetadataServer Log\SASMeta_MetadataServer_mayhem.log The SAS Metadata Supervisor failed to initialize
10/21/2016 2:03 PM	Alert	Process Server	Object Spawner - ptnode13.SASApp - Stored	Stored Process Cancelled
10/21/2016 2:03 PM	Error	Process Server	Object Spawner - ptnode13.SASApp - Stored	Stored process canceled at user's request.
10/21/2016 2:03 PM	Error	Process Server	Object Spawner - ptnode13.SASApp - Stored	Stored process canceled at user's request.
10/21/2016 2:03 PM	Error	Process Server	Object Spawner - ptnode13.SASApp - Stored	Access is denied. File: mayhem._secrets.txt
10/21/2016 2:03 PM	Alert	Process Server	Object Spawner - ptnode13.SASApp - Stored	Access Denied

# Operations Center

The Operations Center lists resources that are down or have active alerts. You can use filters to find resources and problem types of interest. This concise view displays the current number of unavailable resources and active alerts, and a one line problem summary for each resource.

To access the Operations Center, select **Analyze ► Operations Center**.

Operations Center

Display Filters

Status Type: All Alerts

Platform Filter:

Group Filter: None

Resources

Down Platforms: N/A

Down Resources: N/A

Current Filter Totals

Alerts				
Low	Medium	High	Total	
Unfixed Alerts	4	9	0	13
Alerts in Escalation	0	0	0	0

Table Controls

Items per page: 50

Refresh interval: 1 minute

Updated at 11:06:41, population took 151 ms.

Resource Details for All Hosts

Platform	Resource	Alert Name	Priority	Status Type	Last Escalation	Last Check	Duration	State	Status Information
ptnode22.ates1.sas.com	ptnode22.ates1.sas.com	TCF Attempt Fails	1	Alert		5/25/14 11:05 AM	11:01:41		21 occurrences. If Top Attempt Fails per Minute > 20.0% of Baseline (actual value = 0.2). Current value = 0.0.
ptnode22.ates1.sas.com	SASMeta - Metadata Server	Metadata Time in Calls per Minute	1	Alert		5/25/14 11:05 AM	154:21:41		20 occurrences. Last event: sas_...Config\Lev1\SASMetaMetadataServer Log\SASMeta_MetadataServer_2014-05-20_11:00:00_12844.log New client connection (10000) needed from server port 8581 for user mayhem\Server. Peer address and port are 10.10.10.10:8581 for AFPRAMELogin Manager 5.4.1 Time in Calls per Minute > 300.0% of Baseline (actual value = 13.22ms). Current value 5.21ms.
ptnode22.ates1.sas.com	ptnode22.ates1.sas.com	PostgreSQL - PostgreSQL	1	Alert		5/25/14 11:00 AM	191:06:41		2 occurrences. If Memory Size > 50.0% of Baseline (actual value = 3.9 GB). Current value = 31.9 GB.
ptnode22.ates1.sas.com	Object Spawner - ptnode13.SASApp - Pooled Workspace Server	Pooled Workspace Server ERROR: maxconn in use	1	Alert		5/15/14 3:24 PM	307:42:32		23 occurrences. Last event: sas_...Log\SASAppPooledWorkspaceServer Log\SASApp_PooledWorkspaceServer_2014-05-15_11:00:00_5381.log ERROR: Errors printed on page 2. If EventLog Leve1(2000) and matching subdirectory "ERROR" Log server: ...Log\SASAppPooledWorkspaceServer Log\SASApp_PooledWorkspaceServer_2014-05-15_11:00:00_5381.log ERROR: Errors printed on page 2.
ptnode22.ates1.sas.com	HQ Agent - 5.6.0	HQ Time Agent Sends Patching Metrics	1	Alert		5/25/14 11:05 AM	454:26:41		143 occurrences. If Total Time Spent Fetching Metrics per Minute > 1s (actual value = 24.044s). Current value = 907.512ms.
ptnode22.ates1.sas.com	Object Spawner - ptnode13.SASApp - Pooled Workspace Server	Object Spawner Major User1 Fails	1	Alert		5/25/14 11:05 AM	455:01:41		1 occurrences. Last event: sas_...Log\SASConfig\Lev1\ObjSpawner Log\ObjSpawner_2014-05-16_11:00:00_3203.log The server is not running (passed/detected this node?). If Process Major Faults per Minute > 10.0% of Baseline (actual value = 0.2). Current value = 0.0.
ptnode22.ates1.sas.com	ptnode22.ates1.sas.com	HQ Agent Memory	1	Alert		5/25/14 11:05 AM	648:11:41		1 occurrences. If JVM Free Memory < 14.3 MB (actual value = 13.4 MB). Current value = 26.1 MB.
ptnode22.ates1.sas.com	ptnode22.ates1.sas.com	TCF Attempt Fails	1	Alert		5/25/14 11:05 AM	10:31:41		155 occurrences. If Top Attempt Fails per Minute > 20.0% of Baseline (actual value = 0.2). Current value = 0.0.

## Environment Snapshot

Environment Snapshot contains a comprehensive listing of the system information in the SAS Environment Manager database. Although Environment Snapshot was originally designed to provide SAS Technical Support with a method for quickly diagnosing system issues, it also provides you with valuable information about your system. Environment Snapshot collects and displays the most current performance measures and configuration parameters from the SAS Environment Manager database, and also executes and gathers real-time usage information.

In addition, you can take a snapshot of the information, which saves all of the data in a text file. This file is useful when working with SAS Technical Support, because it provides an easy way to communicate the status and configuration of your system.

To access the Environment Snapshot, select **Analyze ► Environment Snapshot**.

The screenshot displays the 'Environment Snapshot' web application. On the left, there is a 'Summary Table' section with a dropdown menu and a 'Create a Snapshot' section with checkboxes for 'Include Live System Queries', 'Include Events', and 'Include Alerts', along with a 'Snapshot Environment' button. The main content area features a navigation bar with tabs: Hardware, System, Network, Mounts, Servers, Services, Logs, Central Actions, SAS, Live System Queries, Datamart, and Snapshots. Below the navigation bar, the 'Hardware Summary' section is active, showing a table of system properties and their values. Below that, the 'CPU Summary' section shows a table of CPU usage for 17 processors.

Property	Value
CPU Speed	24 @ 2200 MHz (2x12)
Free Memory	76.3 GB
Load Average 5 Minutes	0.68
RAM	96744 MB
Swap Used	0.0 B

Processor	CPU Usage
Linux CPU 1 (2200MHz AMD Opteron)	0.8%
Linux CPU 2 (2200MHz AMD Opteron)	0.84%
Linux CPU 3 (2200MHz AMD Opteron)	1.21%
Linux CPU 4 (2200MHz AMD Opteron)	0.62%
Linux CPU 5 (2200MHz AMD Opteron)	0.59%
Linux CPU 6 (2200MHz AMD Opteron)	0.53%
Linux CPU 7 (2200MHz AMD Opteron)	0.3%
Linux CPU 8 (2200MHz AMD Opteron)	0.17%
Linux CPU 9 (2200MHz AMD Opteron)	0.12%
Linux CPU 10 (2200MHz AMD Opteron)	0.11%
Linux CPU 11 (2200MHz AMD Opteron)	0.09%
Linux CPU 12 (2200MHz AMD Opteron)	0.18%
Linux CPU 13 (2200MHz AMD Opteron)	1.12%
Linux CPU 14 (2200MHz AMD Opteron)	0.65%
Linux CPU 15 (2200MHz AMD Opteron)	1.0%
Linux CPU 16 (2200MHz AMD Opteron)	0.69%
Linux CPU 17 (2200MHz AMD Opteron)	0.42%

## Report Center

The Report Center is collection of SAS Stored Processes that use data in the SAS Environment Manager Data Mart. These reports are created to provide a

comprehensive view of the performance and status of your SAS environment and its resources.

The reports in the Report Center are created when you initialize SAS Environment Manager Extended Monitoring. However, the reports operate only on data stored in the data mart by APM or ACM ETL processes. Unless you initialize and enable one of those packages, no reports will be produced. Solution kits, which provide monitoring and reporting for specific applications or SAS solutions, can also add solution-specific reports to the Report Center.

**Note:** The reports in the Report Center are provided as a best efforts resource to assist in the troubleshooting and performance tuning of your SAS deployment. However, many other factors might influence your user experience, some of which are beyond the monitoring capabilities of SAS Environment Manager. For additional assistance in performance tuning and hardware configuration references, please contact the SAS Professional Services Division.



Stored Processes

Log Off SAS Administrator

SAS

Stored Processes

- Products
  - SAS Environment Manager
    - Custom
      - Dynamic Reports
        - Datamart
          - ACM Data Mart Platform Resource
          - ACM Data Mart Platform Types and
          - ACM Data Mart Server Resources
          - ACM Data Mart Services Resource
          - Alerts Enabled By Resource
          - Alerts Enabled Listing Rpt
          - All Alert Definitions
          - Data Mart ACM Listing
          - Data Mart Artifact Listing
          - Data Mart Proc Contents Full Listing
          - Plugin To Discovered Resource Ma
        - Metadata Inventory
        - Nightly Reports
      - System
      - User Folders

The DATASETS Procedure

Directory	
Libref	ACM
Engine	BASE
Access	READONLY
Physical Name	/opt/SAS/Config/Lev1/Web/SASEnvironmentManager/emi-framework/Datamart/acm
Filename	/opt/SAS/Config/Lev1/Web/SASEnvironmentManager/emi-framework/Datamart/acm
Inode Number	1322309
Access Permission	IRWXRI-X
Owner Name	sas
File Size (bytes)	4096

#	Name	Member Type	File Size	Last Modified
1	AVAILABILITY	DATA	458752	07/22/2014 01:00:38
2	EVENTS	DATA	393216	07/22/2014 12:09:50
3	FILEMOUNTS	DATA	7340032	07/22/2014 01:00:54
4	GROUPINVENTORY	DATA	262144	07/22/2014 01:00:32
5	HOSTPLATFORMS	DATA	2883584	07/22/2014 01:00:53
6	HTTPCHECKS	DATA	1179648	07/22/2014 01:00:55
7	IOMSERVERS	DATA	3407872	07/22/2014 01:00:54
8	MEASUREINVENTORY	DATA	2088960	07/22/2014 01:00:33
	MEASUREINVENTORY	INDEX	163840	07/22/2014 01:00:33
9	METADATASVRS	DATA	1572864	07/22/2014 01:00:54
10	NETWORKINTERFACE	DATA	5898240	07/22/2014 01:00:54
11	RESOURCEINVENTORY	DATA	524288	07/22/2014 01:00:32
12	TCSERVERMGRS	DATA	23592960	07/22/2014 01:00:56
13	WEBAPP SERVER	DATA	1310720	07/22/2014 01:00:54
14	WIPDATADB	DATA	3932160	07/22/2014 01:00:55

The DATASETS Procedure

Data Set Name	ACM.AVAILABILITY	Observations	1530
Member Type	DATA	Variables	9
Engine	BASE	Indexes	0
Created	07/22/2014 01:00:39	Observation Length	284
Last Modified	07/22/2014 01:00:39	Deleted Observations	0
Protection		Compressed	CHAR

## Performing SAS Tasks: the Administration Page

The Administration page enables you to manage resource definitions in SAS metadata. The page contains a set of modules, each of which enable you to manage a type of metadata definition:

### Folders

- view and update metadata folders and objects

### Servers

- view definitions for servers in SAS metadata, create and modify definitions for SAS LASR Analytic Servers

## Libraries

view definitions for libraries in SAS metadata, create and modify definitions for Base and SAS LASR libraries

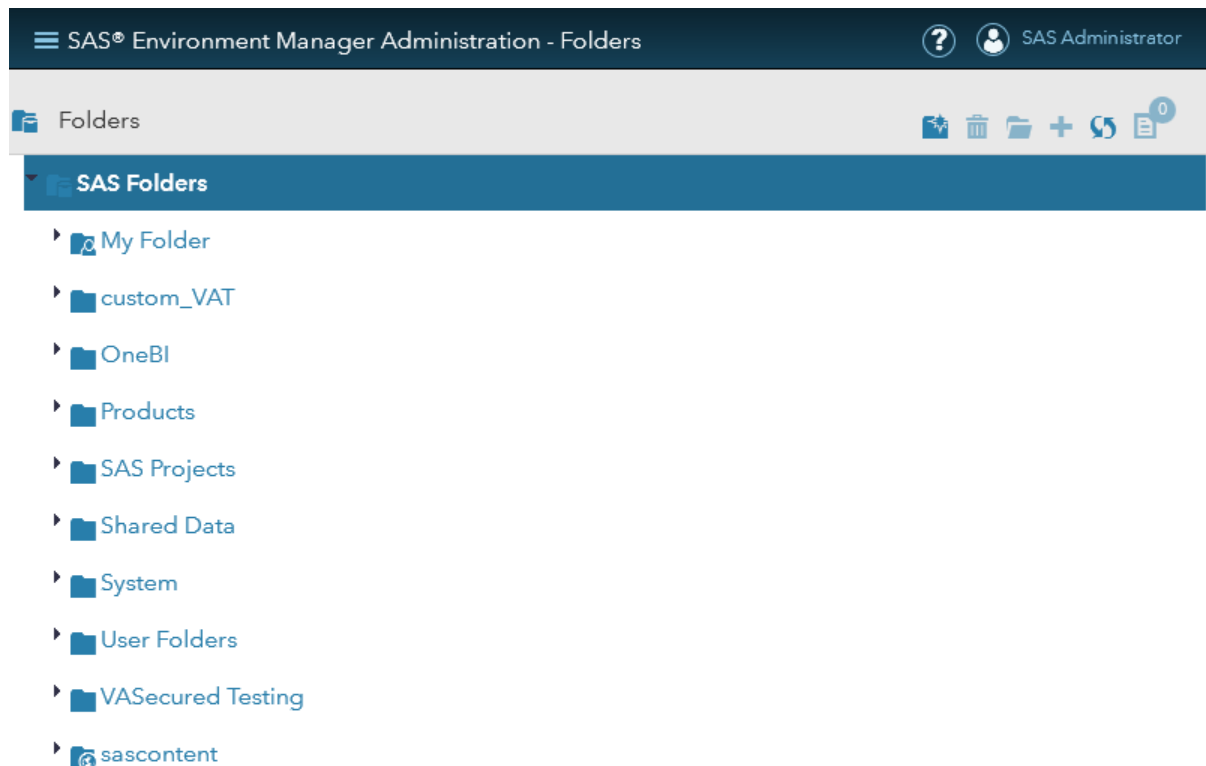
## Users

View and modify metadata definitions for SAS users, metadata roles, and role capabilities

## Authorization

View and modify metadata access controls on metadata object definitions

In addition, other SAS applications can add their own modules (such as SAS Grid Manager) to the Administration page.



For more information about using the administration functions, see *SAS Environment Manager Administration: User's Guide*.

---

## Configuring SAS Environment Manager: the Manage Page

### Overview

Use the pages under Manage to control how the SAS Environment Manager application operates.

### Authentication/Authorization

The **Authentication/Authorization** area enables you to manage SAS Environment Manager users and user roles. These users and roles are not the same as the users and roles in SAS metadata that control access to SAS metadata objects, although SAS Environment Manager users are synchronized with users that are defined in metadata and added to specific groups.

In order to distinguish between the SAS Environment Manager access features and those in SAS metadata, this document and the SAS Environment Manager online Help refers to features internal to SAS Environment Manager as native features (such as native users or native roles). However, the SAS Environment Manager interface does not use the native terminology.

### Server Settings

The **Server Settings** area enables you to change the settings for the SAS Environment Manager server, the defaults for monitoring, the configuration of escalation schemes, and the SAS Environment Manager plugins.

#### Server Settings

- contains settings for the SAS Environment Manager server, including global alert properties, email configuration, and notification properties

## Monitoring Defaults

contains default monitoring and alerting definitions for all types of platforms, platform services, and servers supported by SAS Environment Manager.

## Escalation Schemes Configuration

enables you to define notification or logging actions that are taken for alerts.

## Plugin Manager

lists all currently loaded plugins and enables you to delete and update existing plugins, and load new ones. Deleting or updating a plugin cannot be reversed. Always save a copy before deleting or updating a plugin. You can find additional plugins for SAS Environment Manager at the Enterprise Management Integration area of SAS Customer Support on the web ([support.sas.com/rnd/emi](http://support.sas.com/rnd/emi)).

## Plugins

The **Plugins** area contains functions that are added to the functionality of SAS Environment Manager to perform a specific action. Plugins include the following:

- Network and Host Dependency Manager
- Groovy Console
- HQ Health
- HQ Web Services API
- tc Server Command-line Interface

## Licenses Usage Status

The **Licenses Usage Status** area displays the number of licenses in use on the platform as well as the total number of licenses allowed.

## 3

## Viewing Information at a Glance: Using the Dashboard

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## Using the Dashboard

The Dashboard is your first view when you start SAS Environment Manager. It is an at-a-glance view of the things that are most important to you when administering your environment, such as favorite resources, recent alerts, and resources that are currently experiencing problems.

The page contains a collection of portlets that provide information at a glance about the SAS environment. You can select which portlets appear on the Dashboard, so the Dashboard shows you the information that you want to see. Selecting an entry in a portlet takes you to more detailed information about the entry. For example, selecting an entry in the **Recent Alerts** portlet takes you to the Alert Detail page for that alert. The following figure illustrates a sample Dashboard portlet.

Figure 3.1 Sample Portlet



Availability Summary	
Resource Type	Availability
<a href="#">SAS Application Server Tier</a>	1
<a href="#">SAS Home Directory 9.4 SAS Directory</a>	1
Updated: 10:31 AM	

The Dashboard is divided into two columns, and the portlets that can appear differ between the left column and the right column. Some portlets can appear only once on a Dashboard, whereas other portlets can appear more than once. The portlets that can appear more than once are ones that display information about a selected group of resources. Each instance of the portlet displays information about different resources. The portlets that can appear only once display information for the entire environment.

This table lists the portlets that you can choose to appear on a Dashboard, as well as where they can appear and how many instances are allowed.

**Table 3.1** Portlets

Name	Description	Location	Instances
Auto-Discovery	Lists new and changed resources and enables you to add them to the inventory. Check this portlet after you install a plug-in to accept the newly discovered resources into the inventory.	Right	One
Availability Summary	Indicates the availability of selected resources, grouped by resource type. This portlet refreshes every minute.	Left	Multiple
Control Actions	Lists recently performed actions on managed resources and upcoming scheduled actions. Also indicates which quick control actions are most frequently performed.	Right	One
Favorite Resources	Lists selected resources.	Right	One
Saved Charts	Displays selected charts as a slide show.	Left	One
Recent Alerts	Lists the most recently triggered alerts for selected resources. This portlet refreshes every minute.	Right	Multiple
Recently Added	Lists platforms that have been recently added to inventory.	Left	One
Search Resources	Enables you to search for resources. The search supports case-insensitive, partial-term queries for a specified inventory type.	Left	One

Name	Description	Location	Instances
Summary Counts	Displays a count of managed resources by inventory type. Only those resources that you are allowed to access are displayed.	Left	One
Group Alerts Summary	Displays traffic light indicators for resource alerts and group alerts for selected groups. To view a list of alerts that have fired for a group, click that group's traffic light. To view a group page, click that group's name.	Right	One
Metric Viewer	Displays selected metrics for selected resources. This portlet refreshes every minute.	Right	Multiple
Problem Resources	Lists all resources that have problem metrics and provides details, including availability status, number of alerts per resource, number of times the metric has been out of bounds, and the most recent time that the out-of-bounds metric was collected.	Right	One

Because the Dashboard page can be customized, each user has access to multiple Dashboards, and each Dashboard can be modified according to different needs. Each user has access to a personal Dashboard, which contains portlets selected by the user. In addition, each user can also access a Dashboard for each of the native roles of which the user is a member. Each of those Dashboards is customized with the portlets that are most useful for that role. To choose a different Dashboard, select the one that you want to use from the **Select a Dashboard** field.


A new Dashboard type is automatically created whenever you create a new native role. For more information about roles, see [“About Native Roles and Users” on page 83](#).

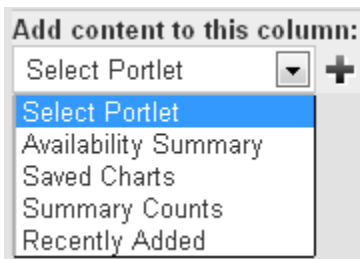


---


## Customizing Your Dashboard

You can customize any Dashboard to which you have access by selecting portlets to appear on your Dashboard and by selecting the information that is displayed in each portlet.

To add a portlet to your Dashboard, use the **Add content to this column** menu to select from the available portlets and then click the Add icon , which is beside the field. The portlets displayed in the list depend on whether you are adding a portlet to the right or left column and which portlets have already been added to the Dashboard.




After the portlet is placed on your Dashboard, you can click and drag the portlet header to move it to a different location. However, you cannot move a portlet from one column to another.

To change the information that a portlet displays, click on the configuration icon  in the portlet's header. Use the Portlet Configuration page to select options that narrow the focus of the information displayed in the portlet. The options available are unique to each portlet. Examples include the following:

- how many of the most recent control actions are displayed (**Control Actions** portlet)
- the number and priority of alerts displayed for selected resources (**Recent Alerts** portlet)
- specified resources (**Availability Summary** portlet)

You can use groups (compatible groups, mixed groups, and application groups) to make your Dashboard portlets more useful. Groups enable you to organize resources by type


or function within your organization. You can then configure portlets to display information about resources in particular groups, so your Dashboard contains information about the resources that are most vital to you.


To remove a portlet from the Dashboard, click on the delete icon  for the portlet.


## Summary Portlet Examples


### Adding Summary Portlets

Here are the basic steps for adding a summary portlet to your Dashboard page.

- 1 On the left side of the Dashboard page, select **Availability Summary** in the **Add Content to this column** field and click the Add icon . A blank **Availability Summary** portlet is added to your Dashboard.



The screenshot shows the 'Availability Summary' portlet. It has a title bar with a configuration icon and a close icon. Below the title bar, there are two columns: 'Resource Type' and 'Availability'. The main content area is empty and contains the text: 'No resources to display, please click the  icon above to add resources to portlet.'

- 2 Click the Configuration icon  to display the Dashboard Settings page for the portlet.



The screenshot shows the 'Dashboard Settings: Availability Summary' configuration page. It has a title bar. Below the title bar, there are two sections: 'Display Settings' and 'Selected Resources'. The 'Display Settings' section has a 'Description' field and a 'Display Range' dropdown set to '10' with the text 'resource types.' below it. The 'Selected Resources' section has a table with columns 'Resource' and 'Description'. There are 'Add to List' and 'Remove from List' buttons. At the bottom, there are 'OK', 'Reset', and 'Cancel' buttons. The status bar at the bottom right shows 'Total: 0' and 'Items Per Page: 15'.

- 3 Specify a name for the portlet in the **Description** field. This name will appear in the header for the portlet, after the portlet type.

- 4 In the **Selected Resources** area, click **Add to List** to display the Add/Remove Resources page.

Dashboard Settings: Availability Summary Add Remove Resources

**Resources**

View: Platforms All Types



Filter By Name:

<input type="checkbox"/> Name	Description
<input type="checkbox"/> postslave	Red Hat Enterprise Linux 6
<input type="checkbox"/> Microsoft Windows 2008	Microsoft Windows 2008
<input type="checkbox"/> Red Hat Enterprise Linux 6	Red Hat Enterprise Linux 6
<input type="checkbox"/> Red Hat Enterprise Linux 6	Red Hat Enterprise Linux 6
<input type="checkbox"/> SAS 9.4 Application Server Tier	
<input type="checkbox"/> Red Hat Enterprise Linux 6	Red Hat Enterprise Linux 6

**Add Resources**


<input type="checkbox"/> Name	Description

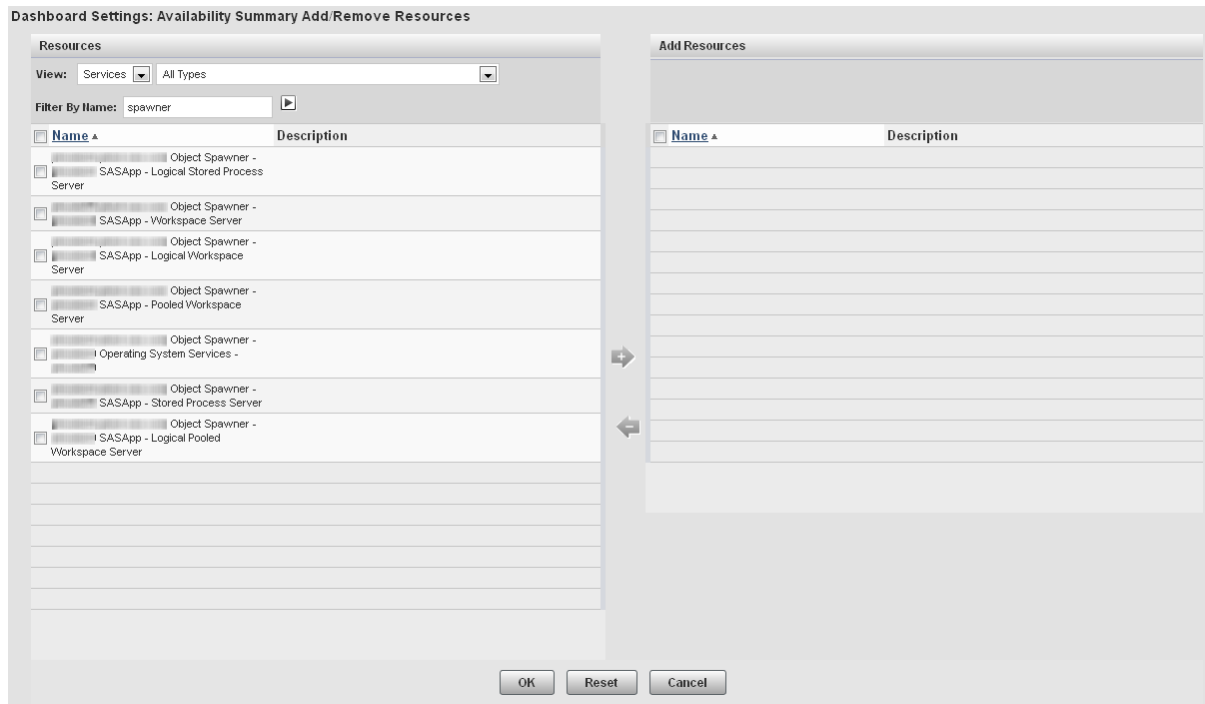
OK Reset Cancel

- 5 To display the resources that you want to use for the summary, specify values in the **View** and **Filter By Name** fields. If you specify a value in the **Filter By Name** field, click  to filter the table contents.
- 6 In the Resources table, select the check boxes for the resources that you want to use in the summary. Click  to move the resources to the **Add Resources** list.
- 7 After you select the resources that you want to use in the Add/Remove Resources window, click **OK** to return to the Availability Summary window. Click **OK** to create the portlet and add it to your Dashboard page.

## Example: Adding a Summary Portlet for SAS Servers That Can Be Spawnd

This example explains how to add a portlet to your Dashboard page that monitors the availability of SAS Workspace Servers that are running under a SAS Object Spawner.

- 1 Follow the basic procedure for creating an availability summary portlet in “[Adding Summary Portlets](#)” on page 32. Follow the basic procedure for creating an availability
- 2 On the Add/Remove Resources window, in the **View** field, select **Services**. Logical SAS servers are listed as services in SAS Environment Manager.
- 3 In the **Filter By Name** field, enter **spawner** and click . The **Resources** list displays the services running under the SAS Object Spawner.



- 4 Select the resources **Workspace Server** and **Pooled Workspace Server** and move them to the Add Resources table.

## Dashboard Settings: Availability Summary Add/Remove Resources

**Resources**

View: Services All Types

Filter By Name: spawner

Name	Description
Object Spawner - SASApp - Logical Stored Process Server	
Object Spawner - Operating System Services -	
Object Spawner - SASApp - Stored Process Server	

**Add Resources**

Name	Description
Object Spawner - SASApp - Workspace Server	
Object Spawner - SASApp - Pooled Workspace Server	
Object Spawner - SASApp - Logical Workspace Server	
Object Spawner - SASApp - Logical Pooled Workspace Server	

OK Reset Cancel

- 5 Finish the procedure for creating the portlet. The portlet displays the availability information for the servers that can be spawned.

Availability Summary	
Resource Type	Availability
<a href="#">SAS Object Spawner 9.4 SAS Logical Pooled Workspace Server</a>	✓ 1
<a href="#">SAS Object Spawner 9.4 SAS Pooled Workspace Server</a>	✓ 1
<a href="#">SAS Object Spawner 9.4 SAS Workspace Server</a>	✓ 1

Update

## Example: Adding a Platform Availability Summary Portlet

To add a portlet to monitor the availability of all of the platforms in the environment, follow these steps:

- 1 Follow the basic procedure for creating an availability summary portlet in [“Adding Summary Portlets”](#) on page 32.

- 2 In the Add/Remove Resources page, select **Platforms** in the **View** field and select the check box beside the **Name** column in the **Resources** table. This selects all of the listed platforms.

Dashboard Settings: Availability Summary Add/Remove Resources

Resources

View: Platforms All Types

Filter By Name:


<input checked="" type="checkbox"/> Name ▲	Description
<input checked="" type="checkbox"/> SAS 9.4 Application Server Tier	
<input checked="" type="checkbox"/> HTTP SAS BI Dashboard	HTTP SAS BI Dashboard
<input checked="" type="checkbox"/> [Auto-Generated] Linux Platform rnb	[Auto-Generated] Linux Platform rnb
<input checked="" type="checkbox"/> TrapProxyRNB	

- 3 Complete portlet creation process to add the portlet to your dashboard.

## Metric Viewer Portlet Examples

### Adding Metric Viewer Portlets



Here are the basic steps for adding a metric viewer portlet to your Dashboard page.

- 1 On the right side of the Dashboard page, select **Metric Viewer** in the **Add Content to this column** field and click the Add icon . A blank **Metric Viewer** portlet is added to your Dashboard.

Metric Viewer

No resources to display, please click the  icon above to add resources to portlet.



- 5 To display the resources that you want to use for the metric, specify values in the **View** and **Filter By Name** fields. If you specify a value in the **Filter By Name** field, click  to filter the table contents.
- 6 In the **Resources** table, select the check boxes for the resources that you want to use in the metric. Click  to move the resources to the **Add Resources** list.
- 7 After you select the resources that you want to use in the Add/Remove Resources window, click **OK** to return to the Dashboard Settings page. Click **OK** to create the portlet and add it to your Dashboard page.

## Example: Adding a SASWork Disk Space Metric Viewer

To add a portlet for viewing the usage of the SASWork directory, follow these steps.

- 1 Follow the basic procedure for creating a metric viewer portlet at [“Adding Metric Viewer Portlets” on page 36](#).
- 2 On the Dashboard Settings page, specify the following information:

### Description

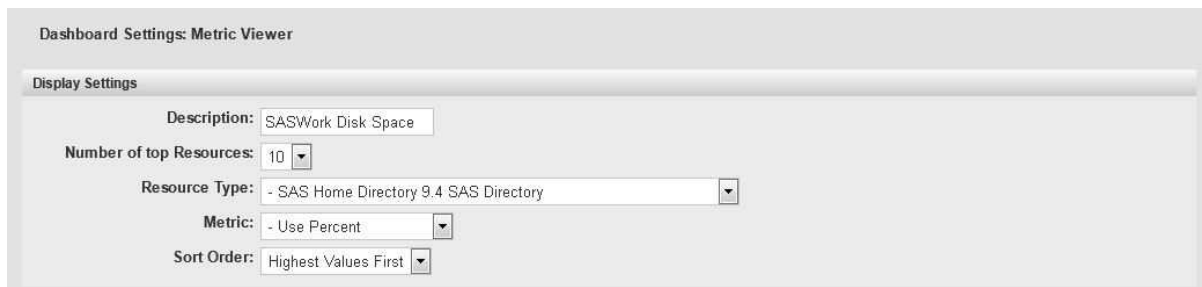
specify a name for the portlet

### Resource Type

select **SAS Home Directory 9.4 SAS Directory**

### Metric

select **Use Percent**



Dashboard Settings: Metric Viewer

Display Settings

Description: SASWork Disk Space

Number of top Resources: 10

Resource Type: - SAS Home Directory 9.4 SAS Directory

Metric: - Use Percent

Sort Order: Highest Values First



- 3** In the **Selected Resources** area, click **Add to List** to display the Metric Viewer Add/Remove Resources window.
- 4** In the Metric Viewer Add/Remove Resources window, select all resources in the **Resources** table, click the **Add** icon to move them to the **Add Resources** table, and click **OK**.
- 5** Complete the procedure to add the portlet to your **Dashboard** page.

## **Example: Adding a WebApp Login Response Time Metric Viewer**

To add a portlet for viewing the response time for all web applications, follow these steps.

- 1** Follow the basic procedure for creating a metric viewer portlet at [“Adding Metric Viewer Portlets” on page 36](#).
- 2** On the Dashboard Settings page, specify the following information:

### **Description**

specify a name for the portlet

### **Resource Type**

select **HTTP**

### **Metric**

select **Response Time**

Dashboard Settings: Metric Viewer

Display Settings

Description: WebApp Login Respons

Display Range: Display top 10 resources.

Resource Type: - HTTP

Metric: - Response Time

Sort Order: Highest Values First

- 3 In the Add Resources window, select all resources in the **Resources** table, click the **Add** icon to move them to the **Add Resources** table, and click **OK**.
- 4 Complete the procedure to add the portlet to your **Dashboard** page.

## Example: Adding a PostgreSQL Data Volume Metric Viewer

To add a portlet for viewing the volume of data in all PostgreSQL databases, follow these steps.

- 1 Follow the basic procedure for creating a metric viewer portlet at [“Adding Metric Viewer Portlets” on page 36](#).
- 2 On the Dashboard Settings page, specify the following information:

### Description

specify a name for the portlet

### Resource Type

select **PostgreSQL 9.x DataBase**

### Metric

select **Data Space Used**

**Dashboard Settings: Metric Viewer**

**Display Settings**

**Description:** PostgreSQL

**Display Range:** Display top 10 resources.

**Resource Type:** - PostgreSQL 9.x DataBase

**Metric:** - Data Space Used

**Sort Order:** Highest Values First

- 3 In the Add Resources window, select all resources in the **Resources** table, click the **Add** icon to move them to the **Add Resources** table, and click **OK**.
- 4 Complete the procedure to add the portlet to your **Dashboard** page.

## Example: Adding a tc Runtime Manager Active Sessions Metric Viewer

To add a portlet for viewing the number of active sessions for all web applications, follow these steps.

- 1 Follow the basic procedure for creating a metric viewer portlet at [“Adding Metric Viewer Portlets” on page 36](#).
- 2 On the Dashboard Settings page, specify the following information:

### Description

specify a name for the portlet

### Resource Type

select **SpringSource tc Runtime 7.0 Manager**

### Metric

select **Active Sessions**

Dashboard Settings: Metric Viewer

Display Settings

Description: tc Runtime Manager Act

Display Range: Display top 10 resources.

Resource Type: - SpringSource tc Runtime 7.0 Manager

Metric: - Active Sessions

Sort Order: Highest Values First

3 On the Add/Remove Resources page, in the **View** field, select **Servers**. In the **Resources** table, select these servers:

- <server\_name> tc Runtime SASServer1\_1/SASWebReportStudio localhost Manager
- <server\_name> tc Runtime SASServer1\_1/SASAdmin localhost Manager
- <server\_name> tc Runtime SASServer1\_1/SASContentServer localhost Manager
- <server\_name> tc Runtime SASServer1\_1/SASBIDashboard localhost Manager
- <server\_name> tc Runtime SASServer1\_1/SASWebDoc localhost Manager
- <server\_name> tc Runtime SASServer1\_1/SASPortal localhost Manager
- <server\_name> tc Runtime SASServer1\_1/SASLogon localhost Manager
- <server\_name> tc Runtime SASServer1\_1/SASStoredProcess localhost Manager

Some of these servers might be on the second page of the list (click the page number at the bottom of the list to navigate between pages). Click the **Add** icon to move the selected servers on one page before moving to another page.

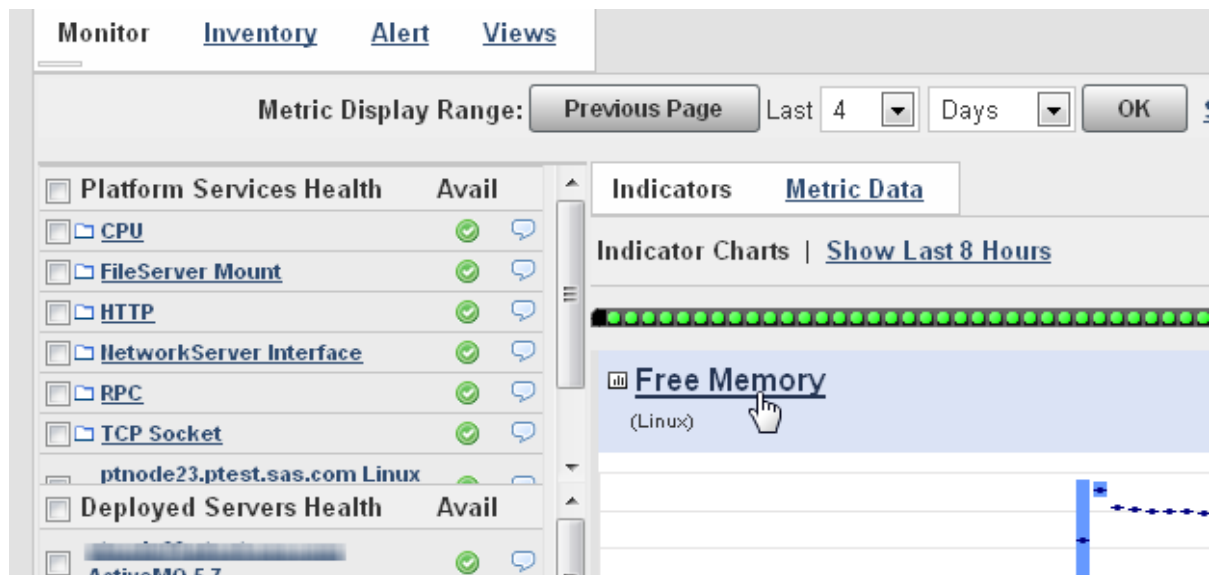
4 Complete the procedure to add the portlet to your **Dashboard** page.

## Metric Chart Examples

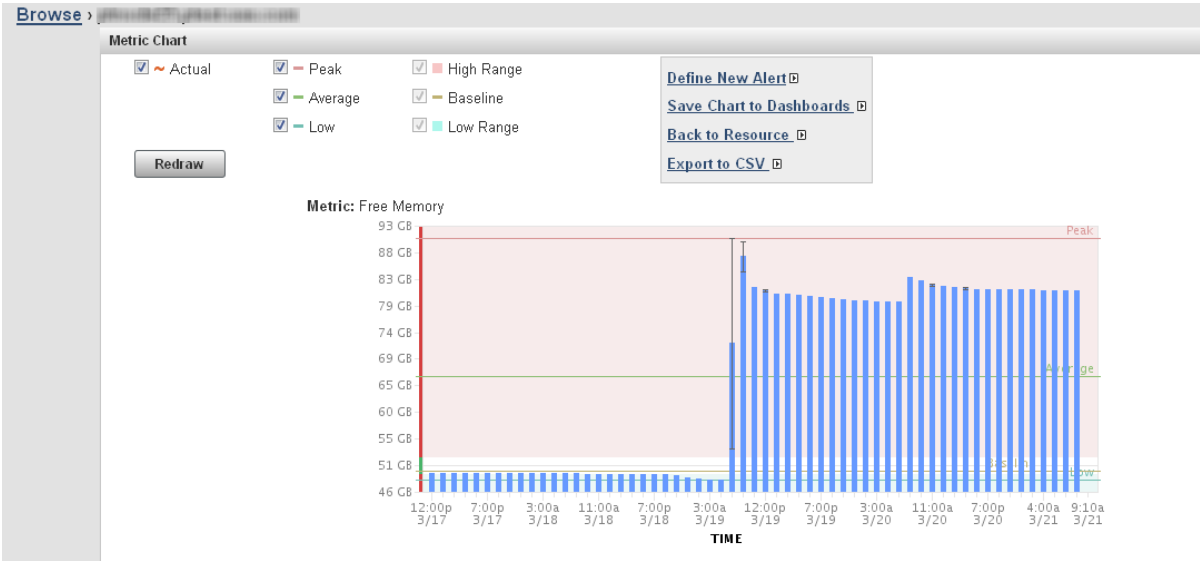
### Creating a Free Memory Chart

To create a chart of the free memory on a server and save the chart to be displayed by the Saved Chart portlet on your dashboard, follow these steps.

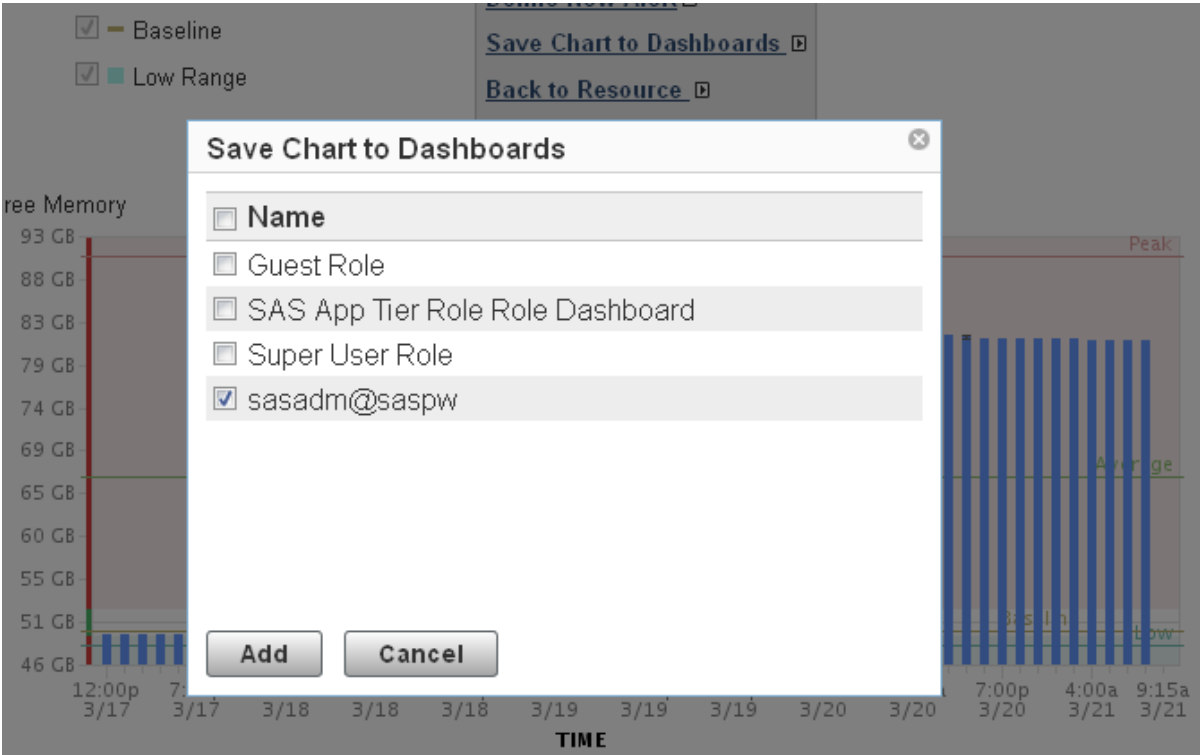
- 1 On the SAS Environment Manager menu bar, select **Resources** ► **Browse**.
- 2 On the Resources page, select **Platforms**.
- 3 In the table of resources, click on the name of your server to display the resource detail page.
- 4 On the resource detail page, one of the displayed metric charts is **Free Memory**. Click on the name of the chart to display the Metric Chart page.



- 5 On the Metric Chart page, select **Save Chart to Dashboards**.




- 6 The Save Chart to Dashboards dialog box appears. Select the dashboards on which the saved chart should appear. Click **Add** to save the chart.

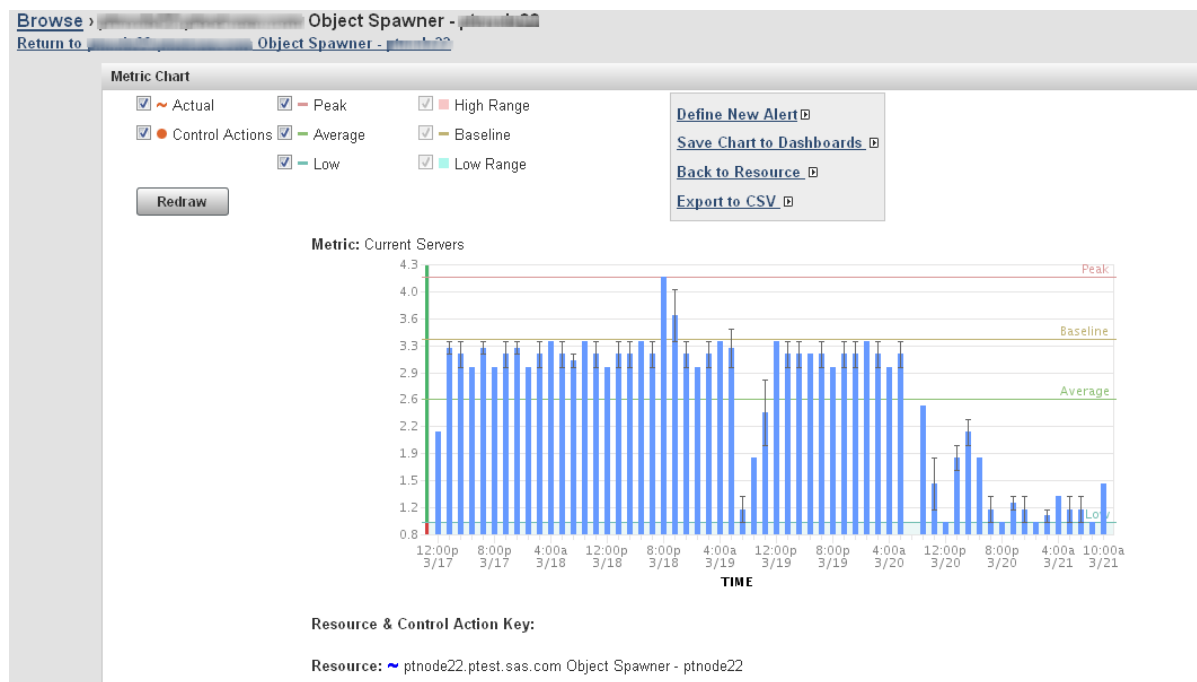


**Note:** The chart will not appear on your dashboard until you create a Saved Chart portlet. See [“Adding a Saved Charts Portlet” on page 48](#) for instructions on creating the portlet.

## Creating a Number of Spawned Servers Chart

To create a chart of the current number of spawned servers and save the chart to be displayed by the Saved Chart portlet on your dashboard, follow these steps.

- 1 On the SAS Environment Manager menu bar, select **Resources** ► **Browse** ► **Servers**.
- 2 On the Resources page, in the **All Server Types** field, select **SAS Object Spawner 9.4** and then click on the arrow  at the right of the filter fields.
- 3 In the table of resources, click on the name of the object spawner to display the resource detail page.
- 4 On the resource detail page, one of the displayed metric charts is **Current Servers**. Click on the name of the chart to display the Metric Chart page.



- 5 On the Metric Chart page, select **Save Chart to Dashboards**.
- 6 The Save Chart to Dashboards dialog box appears. Select the dashboards on which the saved chart should appear. Click **Add** to save the chart.


**Note:** The chart will not appear on your dashboard until you create a Saved Chart portlet. See “[Adding a Saved Charts Portlet](#)” on page 48 for instructions on creating the portlet.

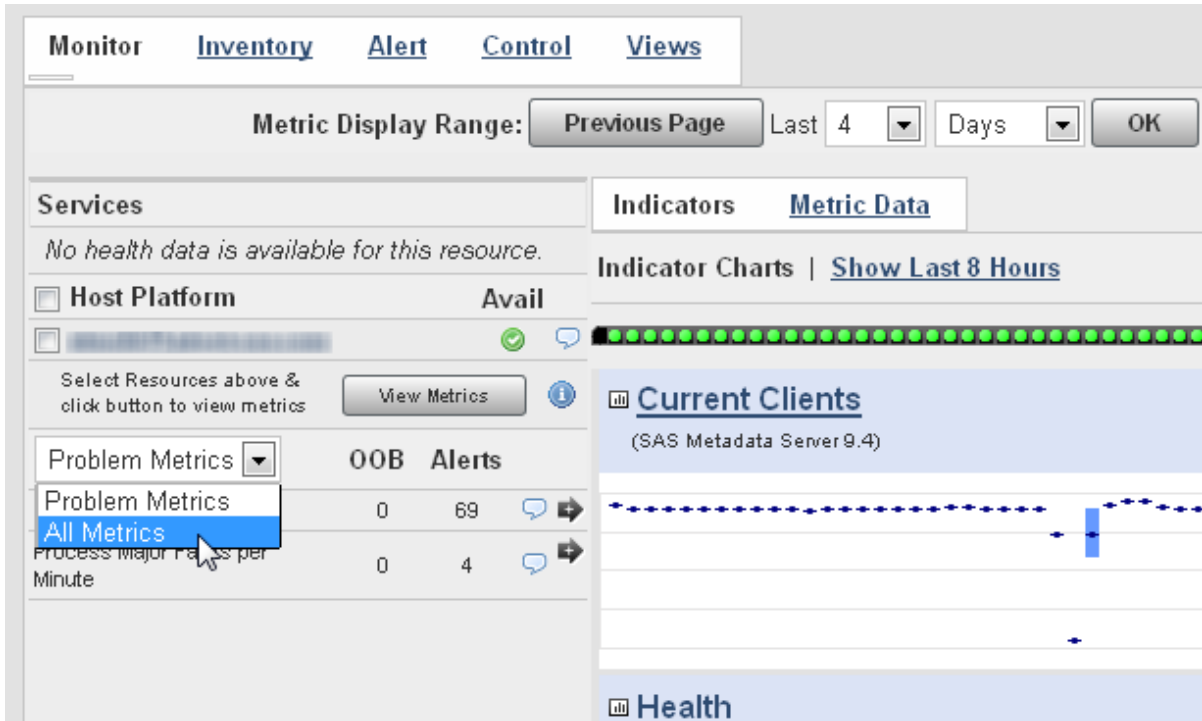
## Creating a Metadata Users Chart

To create a chart of the current number of users per minute of the SAS Metadata Server and save the chart to be displayed by the Saved Chart portlet on your dashboard, follow these steps.

- 1 On the SAS Environment Manager menu bar, select **Resources** ► **Browse** ► **Servers**.




- 2 On the Resources page, in the **All Server Types** field, select **SAS Metadata Server 9.4** and then click on the arrow  at the right of the filter fields.
- 3 In the table of resources, click on the name of the metadata server to display the resource detail page.
- 4 On the left side of the resource detail page, select **All Metrics** from the menu.



The screenshot shows the SAS Monitoring console interface. At the top, there are tabs for Monitor, Inventory, Alert, Control, and Views. Below these, a 'Metric Display Range' section includes a 'Previous Page' button, a 'Last' dropdown set to 4, a 'Days' dropdown, and an 'OK' button. The main content area is divided into two columns. The left column, titled 'Services', shows a table of resources. The first row is for 'Host Platform' with a status of 'Avail'. Below this, there is a 'View Metrics' button and a dropdown menu for 'Problem Metrics'. The dropdown menu is open, showing 'Problem Metrics' and 'All Metrics', with 'All Metrics' selected. The right column, titled 'Indicators', shows a 'Metric Data' tab and a 'Show Last 8 Hours' link. Below this, there is a 'Current Clients' chart for the 'SAS Metadata Server 9.4' and a 'Health' section.

Problem Metrics	OOB	Alerts
Problem Metrics	0	69
All Metrics	0	4

- 5 In the table of metrics, find **Total Clients per Minute** and position your mouse pointer over the information icon . The metric information tooltip appears.

Process Resident Memory Size	0	0	
Resource: SAS Metadata Server 9.4	0		
Time in Calls	0	0	
Time in Calls per Minute	0	71	
<a href="#">Chart Metric in Indicators</a>	0	0	
<a href="#">View Full Chart</a>	0	0	
Total Calls per Minute	0	0	
<a href="#">Metric Data</a>	0	0	
Total Clients per Minute	0	0	
Availability	0	0	

- On the tooltip, select **View Full Chart**. The Metric Chart page appears.
- On the Metric Chart page, select **Save Chart to Dashboards**.
- The Save Chart to Dashboards dialog box appears. Select the dashboards on which the saved chart should appear. Click **Add** to save the chart.

**Note:** The chart will not appear on your dashboard until you create a Saved Chart portlet. See [“Adding a Saved Charts Portlet” on page 48](#) for instructions on creating the portlet.

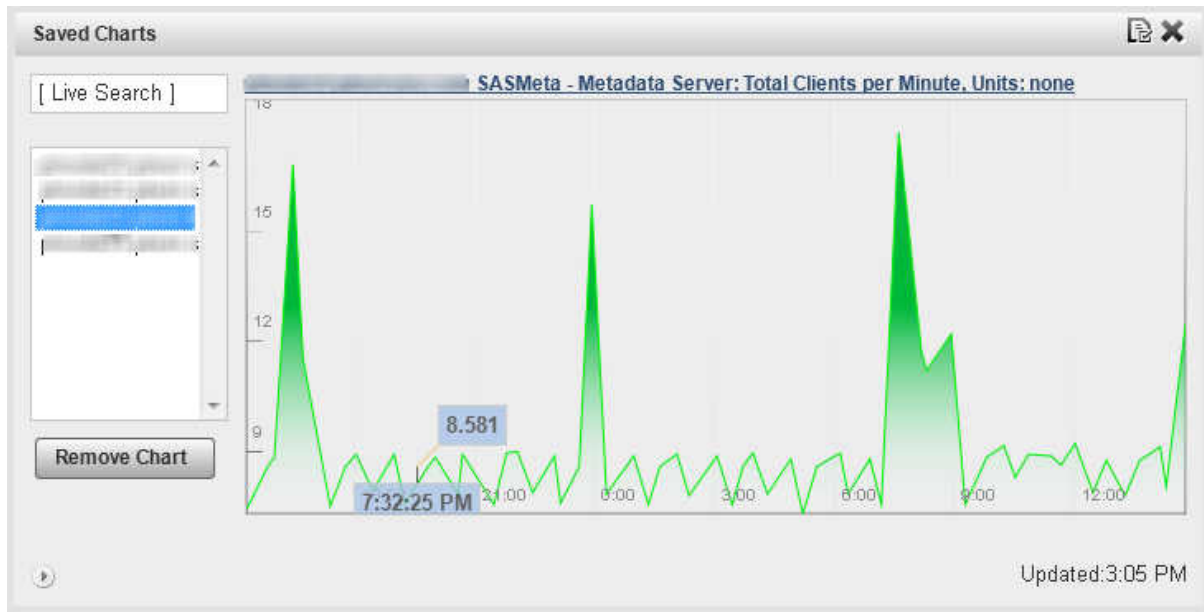
## Adding a Saved Charts Portlet

The Saved Charts portlet displays a rotation of all of the resource metric charts that you have saved. You can create this portlet before or after you save charts. If you create the portlet before saving charts, the saved charts will automatically appear in the portlet as you save them. If you create the portlet after saving charts, the saved charts will not appear on your dashboard until you create the portlet.

Follow these steps to add a Save Charts portlet.

- Click **Dashboard** on the menu bar.
- On the left side of the Dashboard page, select **Saved Charts** in the **Add Content to this column** field and click the Add icon **+**.

A **Saved Charts** portlet is added to your Dashboard and automatically displays a slideshow of the charts that you previously saved.



- 3 To change how long each chart is displayed or the time period displayed on the chart, click the Configuration icon .

**Saved Charts**

**Configuration**

Chart Rotation ☒

Rotation Interval 10 second(s)

Time Range 1 day(s)

Save Cancel



## 4

## Finding Resources in Your System

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---

### Automatically Discovering and Adding SAS Resources

When the SAS Deployment Wizard installs SAS applications, it creates a file called `auto-approved.properties`. This file is located in the `<agenthome>/conf` directory. This file lists all of the resource types that are automatically monitored after they have been discovered. When you run SAS Environment Manager for the first time, the application auto-discovers and auto-accepts the resources listed in the `auto-approved.properties` file. All of the resources in your initial SAS installation are automatically in your inventory when you start using SAS Environment Manager. Resource types that are not listed in this file must be accepted for monitoring after they have been discovered.

---

## Using the Auto-Discovery Portlet

The Auto-Discovery portlet displays a list of servers and platform services that are auto-discovered but not auto-accepted. All SAS resources should be auto-discovered and auto-accepted, so they will not appear in this portlet. Resources that are listed on the portlet are known but are not yet being monitored. After the resources from the initial SAS installation have been discovered and added to the inventory, the Auto-Discovery portlet lists new resources from custom plug-ins that have been added to the monitored platforms.

To discover and add resources, follow these steps:

- 1 On the Dashboard, check the **Auto-Discovery** portlet to see whether new resources are listed.
- 2 Select the check box beside the resources that you want to monitor and select **Add to Inventory**.
- 3 Go to the Resources page. The resources you just added are listed in the appropriate table, together with any resources that are already being monitored. However, an Unknown icon (🔍) is displayed in the **Availability** column for the new resources, because SAS Environment Manager has not begun to collect monitoring data. SAS Environment Manager collects data at intervals rather than continuously, so you must wait for the next data-collection cycle.
- 4 After approximately five minutes, data should be collected for the new resources and the **Availability** column reflects the status of the resources.

If the status of a new resource is displayed as Unknown even after a period of waiting, then the resource might not be completely configured for data collection. To configure the resource, follow these steps:

- 1 In the Resource page, locate the resource whose status is unknown and click on the entry in the Resources table. The Monitor page for the selected resource is displayed.

- 2 A message is displayed if the resource needs to be configured. If you need to perform additional configuration steps, select **Inventory** to display configuration details for the resource.
- 3 Scroll to the **Configuration Properties** area of the page and verify that the properties are correct. Click **Edit** to make changes to the properties.

---

## Performing an Auto-Discovery Scan

If you know that resources have been added on a platform that you are monitoring, you can run an auto-discovery scan on the platform to locate the resources. Once the resources have been discovered, you can add them to your inventory for monitoring.

To perform an auto-discovery scan of a platform, follow these steps.

- 1 Using the **Resources** tab, go to the Detail page for the platform that you want to scan.
- 2 Select **Tools Menu ► New Auto-Discovery**
- 3 If you want to scan for all servers and system processes on the platform, click **OK**.
- 4 If you want to scan for specific server types, select the check boxes for the server types that you want to scan for. You can also select attributes such as directories to include or exclude from the scan and the depth at which to scan. When you have specified the scanning criteria, click **OK** to start the scan.


---

## Rediscovering Resources

After resources have been auto-discovered, there might be some resources that cannot be added to the inventory for some reason. If this happens, you can clear the contents of the auto-discovery queue and try discovering them again. After the resources are

removed from the queue, and you restart the agent, the agent will rediscover the resources.

To clear the auto-discovery queue follow these steps:

- 1 Select **Manage ► HQ Health** to display the HQ Health page.
- 2 On the HQ Health page, select the **Database** tab.
- 3 In the **Action** field, select **Purge AIQ Data** and click .

You can also manually delete any server resources from the Resources page. The servers are then rediscovered when you run an auto-discovery scan.

---

## Manually Adding a Server

There might be some instances where you need to monitor a server that is not auto-discovered by the SAS Environment Manager agent. To manually add a server, follow these steps:

- 1 Navigate to the Resource Detail page for the platform on which the server runs.
- 2 Select **Tools Menu ► New Server** to display the New Server page.
- 3 On the New Server page, specify the server name.
- 4 Use the **Server Type** menu to select the type of server. If the server type that you want to add is not listed, it is not supported by SAS Environment Manager and cannot be added.
- 5 In the **Install Path** field, specify the full pathname to the server software.
- 6 Click **OK** to complete the server definition.

**Note:** Because the agent does not update data continuously, it might take several minutes before metric data begins appearing for the new server.



---

## Manually Configuring a Service

There might be some instances where you need to monitor a service that is not auto-discovered by the SAS Environment Manager agent. To manually add a service, follow these steps:

- 1 In the Resources view, select the platform that contains the service that you want to monitor.
- 2 In the Detail view for the selected platform, select **Tools Menu ► New Platform Service**.
- 3 Specify a name for the service and select the service type. Common selections include **HTTP**, **Fileserver File**, and **TCP**.
- 4 Click **OK** to create the service and display the service details. Select the **Configuration Properties** link on the page.
- 5 Use the instructions on the Configuration Properties page to specify the options needed to monitor the service.



# 5

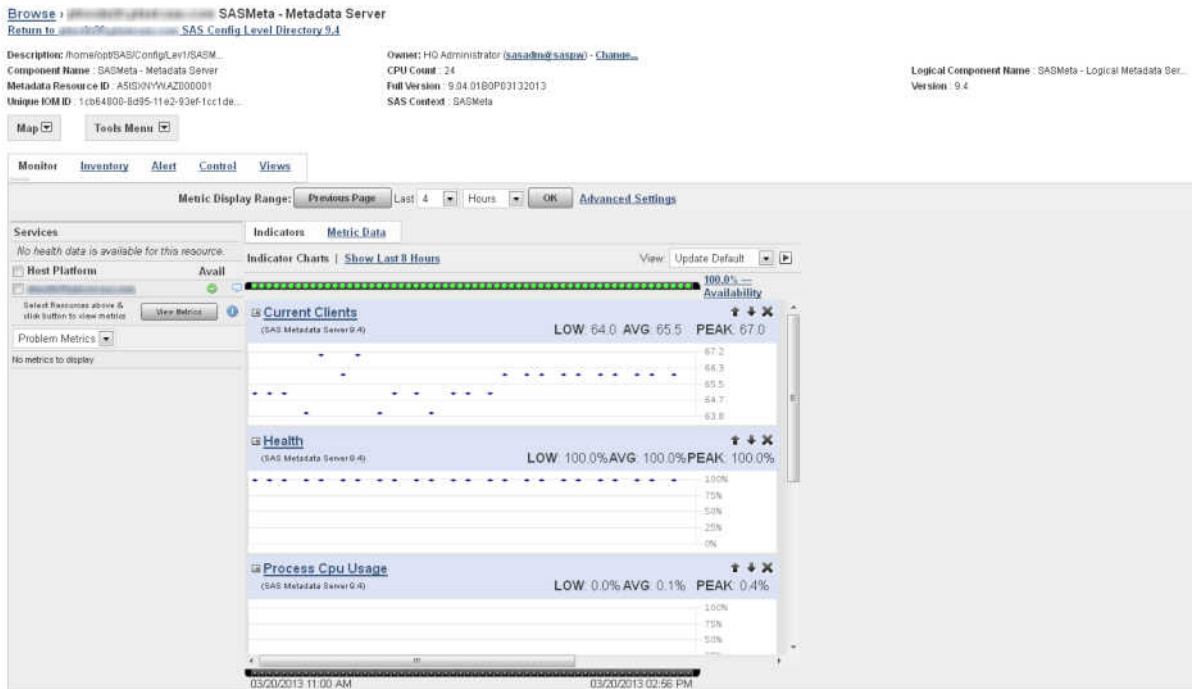
## Monitoring and Controlling Resources

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## Monitoring Resources

A central capability of SAS Environment Manager is the ability to monitor resources. Monitoring enables you to track a resource's availability and overall health. A variety of metric data is displayed, both in numeric and graphic format, to enable you to examine detailed information about the resource's operation.

To view the monitoring information for a resource, select a resource from the table on the Resources page.



The fastest way to check the status of the selected resource is to use the availability bar, which is above the indicator charts. The availability bar displays a color-coded dot that represents the availability during a time slice. The length of each time slice depends on the display range that you select (for example, if you display the past eight hours of data, each dot corresponds to approximately eight minutes). The percentage of time that the resource was available is displayed at the end of the availability bar.

The dots are color-coded using the following format:

Green

100% availability

Yellow

Partial availability; between 0% and 100%

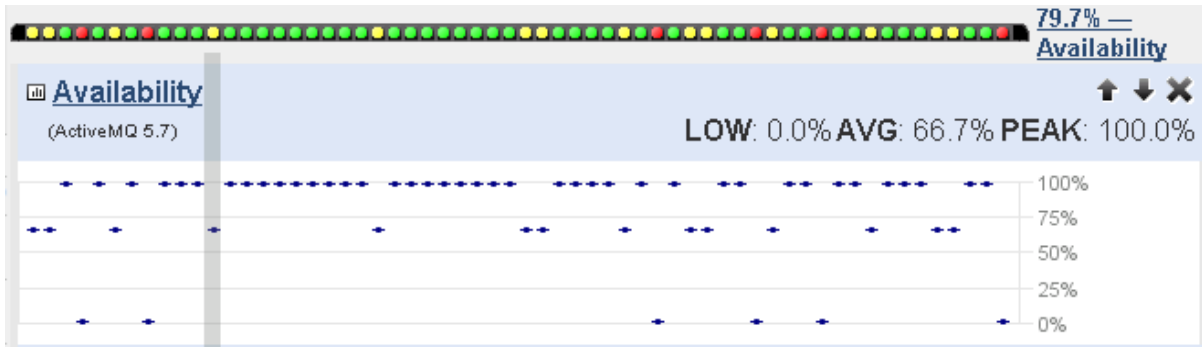
Red

0% availability

An availability bar such as the one in the following figure shows that the resource fluctuated between being available, partially available, and unavailable over the most recent time slices.



To help determine the cause of availability problems, click on the dot for a particular time slice. The selected time slice is highlighted on the indicator charts below the availability bar. This function helps you quickly check the charts for data that might correspond to the availability problem.



To change the metrics that are displayed in the metric charts, use the menu on the left side of the page to select either **All Metrics** or **Problem Metrics**, and then click **View Metrics** to display a list of available metrics. Click the arrow beside a metric to add the chart to those displayed on the page.

Select Resources above & click button to view metrics
View Metrics

All Metrics
OOB Alerts

Process Cpu Usage	0	0	ⓘ ➡
Process Resident Memory Size	0	0	ⓘ ➡
Availability	0	0	ⓘ ➡

The events bar is displayed below the indicator charts. It is similar to the availability bar, with dots representing time slices. The bar displays only a purple dot if an event occurs during a time slice. If no event occurs, the bar remains black.



# Managing SAS Resources

## SAS Server Names

Because SAS Environment Manager is based on VMWare’s Hyperic, some server names in SAS Environment Manager do not match the names that are used in a SAS deployment. Use this table to determine the name of the server that you are interested in.

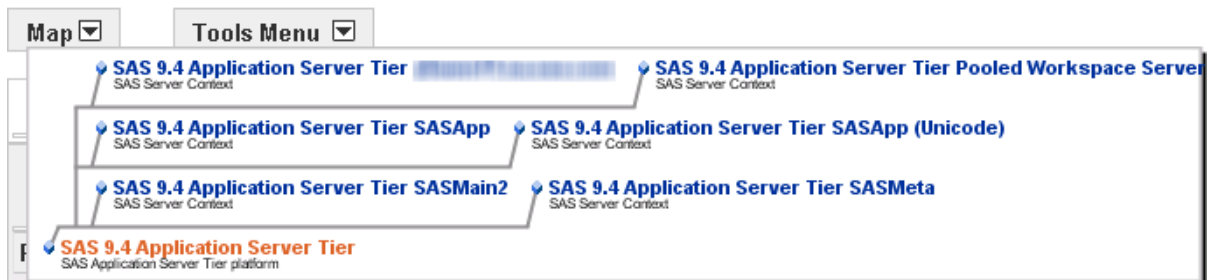
SAS Server Name	Server Name Displayed in SAS Environment Manager
SAS Environment Manager	Apache Tomcat 5.5, 6.0, 7.0
SAS Environment Manager Agent	HQ Agent
SAS Web Server	Pivotal Web Server 5.1, 5.2
SAS Web Application Server	SpringSource tc Runtime 7.0
SAS Web Infrastructure Platform Data Server	PostgreSQL 9.x
SAS JMS Broker	Active MQ 4.0, 5.0, 5.1, 5.2, 5.3, 5.4, 5.7

## Using the Map Control

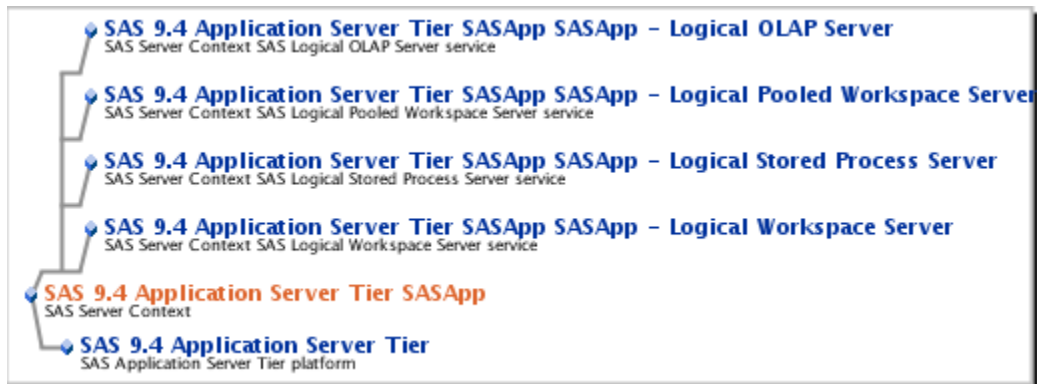
The **Map** control provides a visual representation of resources and the next level of parent and child resources. You can click on any of the resources listed on the map to go to the Monitor page for that resource. The **Map** control is available on the Monitor page for a resource.

The map for a platform displays the servers under the platform, and the map for a server displays the services under the server. You can use the map to better understand how a SAS environment is presented in SAS Environment Manager.

In SAS Environment Manager, the SAS Application Server Tier is a platform. The map for the platform illustrates the SAS servers that are part of the server tier.



Logical SAS servers, such as logical workspace servers or logical stored process servers, are SAS Environment Manager services, so they are displayed as children under the SASApp server.



For a SAS Object Spawner, the services listed in the map are the servers that are spawned by the spawner.



## Making Resources Easier to Locate

### Organizing Resources into Groups

In SAS Environment Manager, resources are organized into groups to make them easier to locate and manage. There are six different types of groups:

- platform resource groups
- server resource groups
- service resource groups
- compatible groups
- mixed groups
- applications



### resource groups

These groups are automatically created. When resources are discovered and then added to the inventory of monitored resources, they are added to the appropriate resource group. The three resource groups that are automatically created in SAS Environment Manager are platforms, servers, and services. It is important to note how SAS resources map to the resource hierarchy. For example, logical SAS servers are added to the services group.

### compatible groups

These groups contain selected instances of a single type of resource (for example, SAS Object Spawners). Creating a compatible group enables you to view aggregate metrics for a resource type. Compatible groups also make it easier for you to locate resources that you need to monitor. For example, you can create a group containing several servers of critical importance, which prevents you from having to search for those servers among the large numbers that might be on your site. After you create a compatible group, you can add resources to the group if they match the selected group type.

### mixed groups

These groups are user-created groups that can contain multiple types of resources. Mixed groups can contain other groups, platforms, servers, and services, or applications. Availability is the only metric that is available for a mixed group. This type of group is useful for functions such as checking the availability of a SAS Object Spawner and all of the spawned services or for viewing the collective availability of a group of resources.

### application

These groups are a set of selected services, usually running in different servers on multiple platforms, that together fulfill a single business purpose. Creating application groups enables you to manage your infrastructure from an application perspective, as opposed to a hardware perspective.

If you initialize SAS Environment Manager Extended Monitoring, a set of default compatible and mixed groups is created. These groups provide commonly used collections of resources in a SAS environment. They are automatically updated as you add and remove resources. See [“Initializing SAS Environment Manager Extended Monitoring” on page 113](#) for initialization instructions.

## Create a Group

To create and populate a group:

- 1 On the Resources page, select **Tools Menu ► New Group**.
- 2 On the New Group page, specify a name for the group.
- 3 Use the **Contains Resources** menu to select the type of group that you want to create.
- 4 Use the **Select Resource Type** menu to select the type of resource that the group will contain.
- 5 Click **OK** to create the group.
- 6 On the Resources page, click on a resource that you want to add to the group.
- 7 On the Details page for the selected resource, select **Tools Menu ► Add To Group**.
- 8 On the Group Manager page, select the group to which you want to add the resource. If the group that you want to add the resource to is not listed, then the selected resource type is not the same as the resource types that are specified for the group.

## Create an Application

To create and populate an application:

- 1 On the Resources page, select **Tools Menu ► New Application**.
- 2 On the New Application page, specify a name for the application. Click **OK** to create the application. The Configuration page for the application appears.
- 3 In the **Services** area, click **Add to List** to select resources for the application.

- 4 In the **Services List**, select the services in the **Services** list that you want to add to the application and use the arrow button to move them to the **Add Services** list. Click **OK** when you finish selecting services, and then click **OK** again to create the application.

---

## Controlling Resources Using Control Actions

### What is a Control Action?

Control actions enable you to control certain types of servers and services from SAS Environment Manager. You can create control actions to perform operations such as starting, stopping, restarting, pausing, and resuming a server or starting, stopping, and sending messages through a service. The specific actions available depend on the server or service type selected. You can define resource actions to run immediately, to run on a schedule, or to run in response to an alert.


You can use control actions to control these types of servers:

- PostgreSQL SAS Web Infrastructure Platform Data Server (PostgreSQL 9.x)
- SAS Object Spawner
- SAS OLAP Server
- SAS Metadata Server
- SAS Web Application Server (SpringSource tc Runtime)

### Performing Immediate Resource Control Actions

To use a control action to perform an immediate action on a resource, follow these steps:

- 1 In the Resource Details page for the selected server or service, click **Control**. If this menu item is not present, the resource does not support control actions. The Control Action page is displayed.

- 2 In the **Quick Control** area, select the type of action that you want to perform in the **Control Action** field.
- 3 Specify any arguments for the action in the **Control Arguments** field.
- 4 Click  to perform the action.

## Scheduling Resource Control Actions

To create a scheduled resource control action, follow these steps:

- 1 In the Resource Details page for the selected resource, click **Control**. If this menu item is not present, the resource does not support control actions. The Control Action page is displayed.
- 2 In the **Control Action Schedule** area, click **New**. The Scheduled Control Action page is displayed.
- 3 Select the action that you want to perform in the **Control Action** field.
- 4 In the **Schedule** area, select the radio button next to the date and specify the date and time that the scheduled action should take place.
- 5 Specify how often the action should recur and when the scheduled recurrence should end.

The screenshot shows the 'Control Action Properties' dialog box. At the top, there's a 'Control Action' dropdown menu currently set to 'Restart'. To its right is a 'Description' text area. Below this is the 'Schedule' section. Under 'Start', there are two options: 'Immediately' (selected) and a date/time picker showing 'Jun 12, 2014' at '11:00 PM'. A note says 'Specify date & time to view recurrence options:'. Under 'Recurs', there's a 'Weekly' dropdown, a 'Every 1' text field, and a 'Week(s) On' section with checkboxes for 'Sunday', 'Monday', 'Tuesday', 'Wednesday', 'Thursday' (checked), 'Friday' (checked), and 'Saturday' (checked). Under 'Recurrence Ends', there's a 'No End' option (selected) and a date picker showing 'Oct 5, 2015'. At the bottom are 'OK', 'Reset', and 'Cancel' buttons.

6 Click **OK** to save the scheduled control action.

To view the list of scheduled control actions for the resource, click **Control** in the Resource Details page for the selected resource. All scheduled control actions are listed in the **Control Action Schedule** area.

## Performing Control Actions in Response to an Alert

To define a control action to occur in response to an alert, follow these steps:

- 1 Create or edit an alert definition. See [“Defining an Alert” on page 77](#) for more information. On the Alert Definition page, click **Control Action**, then click **Edit**. The Add Control Action page is displayed
- 2 Use the **Resource Type** field to select the type of server or service for which you want to create the control action.
- 3 After you select the resource type, the **Resource Name** field is populated with all instances of the selected resource type. Select the instance for which you want to create the control action.
- 4 Select the type of action to be performed in the **Control Type** field. The field contains only actions that are supported on the selected resource type.
- 5 Click **OK** to define the control action. The defined action now takes place whenever the associated alert occurs.



# 6

## Working with Events and Alerts

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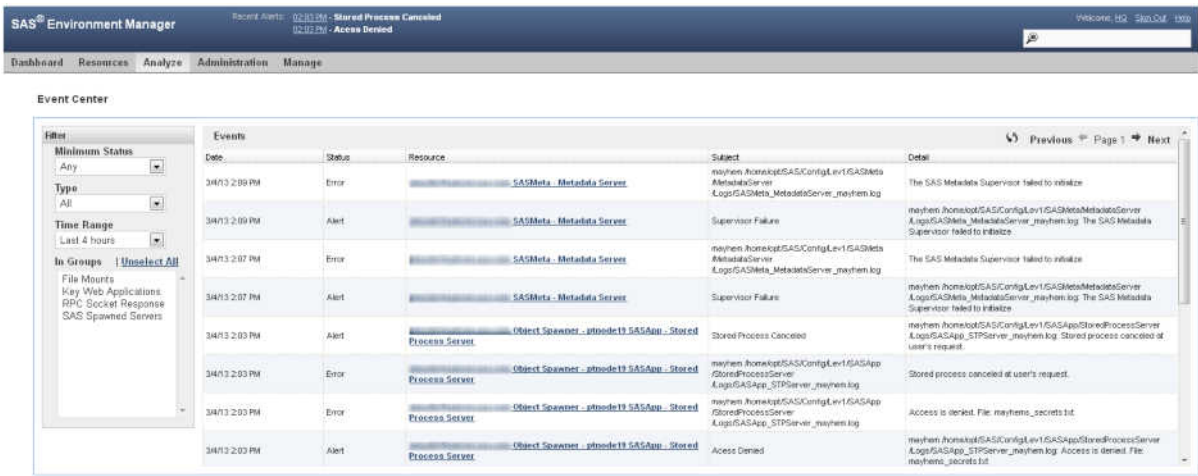
## Creating Resource Events

### Overview of Events

SAS Environment Manager provides the capability to monitor metrics, scan log files, manage configuration changes, and monitor availability. When there is a change in a resource's threshold value for one of these items, an event is recorded in SAS Environment Manager's event message system. Events are also automatically created

for certain types of entries in SAS server logs, and you can specify other criteria that will create events based on SAS server logs. All events throughout the entire deployment are displayed in the Event Center. To access the Event Center, select **Analyze ► Event Center**.

Figure 6.1 Event Center



The table shows information about recently recorded events, including the status, the resource involved, and information about what caused the event to be triggered. You can subset the table to locate events more quickly. For example, you can show only the events that have at least Error status, or only the ones that affect resources in a specified group.

Clicking on the name of the resource in the event table takes you to the resource's Detail page.

## Creating Events Based on SAS Server Logs

SAS Environment Manager monitors the log files for SAS servers and automatically creates events for error messages recorded in those logs. These logs use the standard logging facilities of SAS. For more information, see *SAS Logging: Configuration and Programming Reference*. The events are added to the rest of the events recorded by SAS Environment Manager.

The types of SAS servers whose logs are used to create events are as follows:



- SAS Metadata Server
- OLAP server
- Object spawner
- Stored process server
- CONNECT spawner
- Workspace server
- Pooled workspace server

You can also change the configuration to look for specific types of SAS server log entries in addition to errors. The file `sev_logtracker_plugin.properties` contains entries for each type of SAS server log entry that SAS Environment Manager looks for. You can add to this file to create events for criteria of your choosing. Each SAS server has its own properties file, so logging events can be created for specific server types.

For example, all `sev_logtracker_plugin.properties` files contain these entries by default:

```
# All fatal
level.fatal.1=.*

#
# All errors
level.error.1=.*
#
# User lockout warnings
level.warn.1=.*Access to this account.*is locked out.*
```

The entries in this file use the format

```
level.[level_of_message].[sequential_number]=[regular_expression]
```

.

`level.fatal.1=.*` specifies that an event is created whenever a message appears in the SAS log with a level of Fatal. The message can contain any text. The second entry produces the same result for Error messages.

`level.warn.1=.*Access to this account.*is locked out.*` specifies that an event is created whenever a message with a level of Warn appears that also contains the text `Access to this account.*is locked out.`

To add your own entries to the properties file in order to create events for specific messages, follow these steps:

**1** Edit the file `<server_config_directory>/sev_logtracker_plugin.properties` (for example, `/opt/SAS/Lev1/SASApp/OLAPServer/sev_logtracker_plugin.properties`)

**2** Add a line for the message that you want to track. The format is

```
level.[level_of_message].[sequential_number]=[regular_expression]
```

For example, this entry looks for an INFO message containing the phrase “AUTOEXEC processing beginning”:

```
level.info.1=.*AUTOEXEC processing beginning.*
```

.

**3** If you add multiple entries to look for messages at the same log level, increment the number, for example:

```
level.info.2=.*Message text here.*
```

**4** Save the file. SAS Environment Manager automatically uses the revised file.

---

## Importing and Exporting Events

### Overview

SAS Environment Manager provides services that enable you to import and export event data. Event importing provides a specified location and format for external applications or SAS code to write events to. When data is written to the specified location, SAS Environment Manager creates an event, which can then be handled just like any other event in the application. Event exporting operates in a similar manner. Every time an event occurs in SAS Environment Manager, the application creates an entry in a specified location, using a specified format. You can then configure third-party monitoring tools to monitor the location for new entries and handle the exported events.

## Import Events

To import events, you must first create an event importer service.

- 1 Select **Resources** ► **Browse** ► **Platforms**, and then select the platform on which you want to create the service.
- 2 On the detail page for the selected platform, select **Tools Menu** ► **New Platform Service**.
- 3 On the New Service page, specify a name for the service and select **SAS Event Importer** in the **Service Type** field. Click **OK** to define the service.
- 4 Select **Resources** ► **Browse** ► **Services**, and then select the SAS Event Importer service that you just defined.
- 5 The detail page for the service displays a message indicating that the service has not been configured. Click the **Configuration Properties** link.
- 6 On the Configuration Properties page, select the **importer.enable** check box to turn on event importing. Also select the **service.log\_track.enable** check box to enable log tracking. Specify the log file that you want to track in the **service.log\_track.files** field. The file that you specify in this field is the log file that external SAS applications or programs write to. Specify a single log file in this field, and do not use wildcards in the filename. Click **OK** to save the configuration.

If you want a SAS program to create an event, add the EVEVENT macro. This macro creates an event in the proper format and stores it in a specified directory.

The format of an event that can be imported is as follows:

```
dateTtimeoffset | msglevel | source | message
```

The *date* is specified as *yyyy-MM-dd*.

The *time* is specified as *HH:mm:ss*.

The *msglevel* must be one of these values: ERROR, WARN, INFO, DEBUG.

**Note:** In order to use the EVEVENT macro, you must access the code for the macro. Use %INCLUDE statements to include the code for the %EVEVENT and %EVERRMSG macros in your program. The source code for the macros is located in the `/emi-framework/SASMacro` directory.

The syntax for the macro is as follows:

```
%macro evevent(src=source_message_string,msglevel=message_level
,msgtext=message_string);
```

src=

specifies the originator of the event. You can also use this parameter to specify the format of the text in the msgtext= parameter. The value that you specify for the format is specified by the parser. Use a colon (:) to separate the originator and the format information.

msglevel=

specifies the level of the event. Valid values are `DEBUG`, `INFO`, `WARN`, and `ERROR`.

msgtext=

specifies the text of the event message.

## Exporting Events

To export events, you must create an event exporter service.

- 1 Select **Resources** ► **Browse** ► **Platforms**, and then select the platform on which you want to create the service.
- 2 On the detail page for the selected platform, select **Tools Menu** ► **New Platform Service**.
- 3 On the New Service page, specify a name for the service and select **SAS Event Exporter** in the **Service Type** field. Click **OK** to define the service.
- 4 Select **Resources** ► **Browse** ► **Services**, and then select the SAS Event Exporter service that you just defined

- 5 The detail page for the service displays a message indicating that the service has not been configured. Click the **Configuration Properties** link.
- 6 On the Configuration Properties page, select the **exporter.enable** check box to turn on event exporting. Click **OK** to save the configuration.
- 7 Specify the user ID and password of a SAS Environment Manager user that is used to query events. The user ID that you specify must be a member of the Super User role and must also be defined in SAS metadata. You cannot specify the user IDs `sasadm@saspw` or `sasadm`, because these user IDs are specified differently in SAS metadata and SAS Environment Manager. The best practice is to use SAS Management Console to define a user in the form `domain\newuserID`, add that user to the user group SAS Environment Manager Super Users, and then synchronize the users in SAS Environment Manager. You can then specify the user ID `newuserID` in the event exporter service.
- 8 In the **exporter.filename** field, specify the filename and location where event records are to be written. You need to point your third-party monitoring application to this location in order to read events as they are recorded. Click **OK** to save the configuration.

The format of an exported event is as follows:

```
dateTtimeoffset | msglevel | source | message
```

The *date* is specified as *yyyy-MM-dd*.

The *time* is specified as *HH:mm:ss*.

The *msglevel* must be one of these values: ERROR, WARN, INFO, DEBUG.

Here is an example of an exported event:

```
2014-08-06T14:59:20-0400|WARN|EMI Framework|emiInit ran with -f force option
```

# Working with Resource Alerts

## Overview of Alerts

If you want to identify a type of event for notification or further action, you can create an alert. Alerts are a user-defined type of event that indicates a critical condition in a selected resource. When an alert occurs, it must be fixed or acknowledged, and alerts are listed until they are marked as being fixed. You can define escalation schemes to identify the actions that happen if an alert is not fixed within a specified time. You can also create SNMP notifications for critical alerts. See [“Example: Defining an SNMP Alert Notification” on page 182](#) for information.

Alerts are logged by the agents and all events throughout the entire deployment are displayed in the Alert Center. To access the Alert Center, select **Analyze ► Event Center**.

Alert Center

AlertsDefinition

Alert Filter

Show:

Not Fixed

In Escalation

All

Alert type:

Resource

Minimum priority:

Low

In the last:

day

Group:

-- All Groups --

Resource Alerts

PreviousPage 1Next

<input type="checkbox"/>	Date	Alert Definition	Resource	Platform	Fixed	Ack	Priority
<input type="checkbox"/>	3/25/13 9:55 AM	<a href="#">Host Credentials</a>	<a href="#">Object Spawner - ptnode20</a>		No		Med
<input type="checkbox"/>	3/25/13 3:47 AM	<a href="#">Stored Process Canceled</a>	<a href="#">Object Spawner - ptnode20</a> <a href="#">SASApp - Stored Process Server</a>		No		Med
<input type="checkbox"/>	3/24/13 7:45 PM	<a href="#">Server Not Running</a>	<a href="#">Object Spawner - ptnode20</a> <a href="#">SASApp - Pooled Workspace Server</a>		No		Med
<input type="checkbox"/>	3/24/13 4:45 PM	<a href="#">Server Launch</a>	<a href="#">Object Spawner - ptnode20</a>		No		Med

Fixed

Acknowledge

Click the icon to acknowledge an alert

You can filter the alerts, for example, so that only the most recent ones or the ones of a specified type are displayed.

You can mark alerts as fixed or acknowledged. You can acknowledge an alert only if an escalation scheme has been defined for it. If an escalation scheme has not been defined for the alert, you can mark the alert only as fixed. Select the check box next to an alert, and then click **Fixed** or **Acknowledge**. You can also click on the entry in the **Alert Definition** column to display the Alert Details page, where you can view details about the alert and mark the alert as fixed and add comments.

Object Spawner - SASApp - Stored Process Server: Stored Process Canceled: Alert Detail

[<< Resource Alert List](#)

Alert Properties	
<b>Name:</b> <a href="#">Stored Process Canceled</a>	<b>Priority:</b> !! - Medium
<b>Resource:</b> <a href="#">Object Spawner - SASApp - Stored Process Server</a>	<b>Alert Date:</b> 03/25/2013 03:47 AM
<b>Description:</b> Stored process has been canceled at the user's request	<b>Alert Status:</b> <span style="color: red;">!</span> Not Fixed


Condition Set
<b>If Condition:</b> Event/Log Level(ERR) and matching substring "Stored process canceled at user's request" <b>Actual Value:</b> mayhem /home/opt/SAS/Config/Lev1/SASApp/StoredProcessServer/Logs/SASApp_STPServer_mayhem.log: Stored process canceled at user's request. <b>Enable Action(s):</b> Each time conditions are met.

**Control Type:** none

Notification Actions
<b>Notify Roles:</b> (none) <b>Notify Users:</b> (none)

**Fix**

**Resolution for Fix:**





 Click the "Fixed" button to mark alert condition as fixed

[<< Resource Alert List](#)

If you initialize SAS Environment Manager Extended Monitoring, a set of alerts is automatically created for you. These alerts identify the most common problems in a SAS environment. Using the alerts in extended monitoring enables you to start working with SAS Environment Manager quickly, without having to manually define alerts. See [“Initializing SAS Environment Manager Extended Monitoring” on page 113](#) for initialization instructions.

## Defining an Alert

To define an alert, follow these steps:



- 1 Select **Resources** ► **Browse** or use a dashboard portlet to locate the resource for which you want to create an alert.
- 2 There are three icons on the left of the entry for the resource in the table   . Click on the alert icon , which is on the right of the group. The Alerts page for the resource appears.

[Browse](#) > [ptnode22.pttest.sas.com](#) Object Spawner - ptnode22

Description: /opt/SAS/Config/Lev1/ObjSpa...  
Component Name : Object Spawner - ptnode22  
Full Version : 9.04.01M1P10302013  
SAS Context : N/A

Owner: HQ Administrator ([sasadm@saspw](#)) - [Change...](#)  
CPU Count : 24  
Version : 9.4

Metadata Resource ID : A5KE8INU.AZ000003  
Unique IOM ID : 1267f000-aa6b-11e3-932b-d48564...

Map Tools Menu 


MonitorInventoryAlertControlViews

AlertsConfigure


<input type="checkbox"/>	Alert Definition ^	Description	Date Created	Last Modified	Active
<input type="checkbox"/>	* <a href="#">Object Spawner ERROR message in log</a>	Object Spawner ERROR message in log	03/04/2014 07:48 AM	03/29/2014 10:05 PM	Yes
<input type="checkbox"/>	* <a href="#">Object Spawner User Lockout</a>	User account lockout on Object Spawner due to excessive login failures	03/04/2014 07:48 AM	03/29/2014 10:05 PM	Yes
<input type="checkbox"/>	* <a href="#">Object Spawner Failed Connections</a>	Object Spawner failed to spawn server request	03/03/2014 03:20 PM	03/29/2014 10:05 PM	Yes
<input type="checkbox"/>	* <a href="#">Object Spawner Major (page) Faults</a>	Major Faults are page faults requiring disk activity. Possible indication of a memory constraint causing slow performance	03/04/2014 08:19 AM	03/29/2014 10:05 PM	Yes
<input type="checkbox"/>	* <a href="#">Object Spawner Server Health % &lt; 100</a>	Object Spawner Health < 100%. Service Ping (equivalent of SASMC Validate) to confirm server is responding	03/03/2014 03:28 PM	03/29/2014 10:05 PM	Yes

New...

Delete

Set Active: Yes 

Total: 5

Items Per Page: 15 


\* Resource Type Alert Definitions (cannot be deleted)

- 3 Click **New** to display the New Alert page.

Alert Properties




Name:


Description:



Priority:  Medium

Active: ☒ Yes ☐ No



Condition Set


\*  Conditions  Metric:  Select...

 > (Greater than)  (absolute value)

 > (Greater than)  % of 


☐ value changes



☐ Control Action:  Select... = (Equal to)  Select...

☐ Events/Logs Level: Any  Substring to Match (optional, 150 chars max):

☐ Config changed and match file name (optional, 150 chars max):

Add Another Condition

Recovery Alert: Select alert name:  Select...

\*  Enable Action(s):  Each time conditions are met

☐ Within a time period of:  minutes  Occurrence:

Enable Action Filters: ☐ Generate one alert and then disable alert definition until fixed

☐ Disregard control actions that are defined for related alerts

OK

Reset

Cancel

- 4 In the **Alert Properties** area, specify the name and priority for the alert and whether it is active.



- 5 In the **Condition Set** area, specify the conditions that must be met in order for the alert to be triggered. You can specify up to three conditions for each alert. Use these fields to specify the condition that triggers the alert

### **Metric**

specifies that the alert is triggered based on the value of a metric that is monitored for the resource. You can specify that the condition is based on comparison to a fixed value, a percentage of a value, or a change in value. If you want to create an alert for a metric that is not listed, you must first enable collection of that metric.

Update the metric collection settings for the resource type (choose **Monitoring Defaults** from the Manage page) or for the specific resource (click **Metrics** on the resource's Monitor page).

### **Inventory Property**

specifies that the alert is triggered based on a change in the value of a resource property (such as version number). This condition is available only for certain types of resources (such as platforms and SAS Metadata Servers).

### **Control Action**

specifies that the alert is triggered when an action meets a specified condition (such as the action of stopping a failed server). This condition is available only for servers that can be controlled through control actions. See [“Controlling Resources Using Control Actions” on page 65](#) for more information.

### **Events/Logs Level**

specifies that the alert is triggered when a selected type of log entry (such as Error) and an optional accompanying text string appears in the log.

If you are defining an alert based on events from SAS server logs, the available values in this field do not match the logging levels available in SAS server logs. The four SAS Environment Manager levels must match the six levels in SAS server logs. Selecting Error in this field matches both the Fatal and Error levels in SAS server logs. Selecting Debug in this field matches both the Trace and Debug levels in SAS server logs.

**Config changed**

specifies that the alert is triggered when a configuration file changes (you can choose to specify the name of the configuration file).

- 6 In the **Enable Action** field, specify whether the alert is triggered only once, or periodically as long as the alert condition persists.
- 7 Click **OK** to define the alert and display the Alert Configuration page.

<a href="#">Escalation</a>	<a href="#">Control Action</a>	<a href="#">Notify Roles</a>	<a href="#">Notify Users</a>	<a href="#">Notify Other Recipients</a>	<a href="#">Script</a>	<a href="#">OpenNMS</a>
<input type="checkbox"/> <a href="#">First Name</a>	<a href="#">Last Name</a>	<a href="#">Username ▲</a>	<a href="#">Email</a>	<a href="#">Department</a>		
<input type="checkbox"/> HQ	Administrator	<a href="#">sasadm@saspw</a>	<a href="#">sasadm@saspw</a>			
<a href="#">Add to List</a>		<a href="#">Remove from List</a>		Total: 1		Items Per Page: 15 ▼

[<< Return to Alert Definitions](#)

- 8 On the Alert Configuration page, you can specify an escalation scheme and identify the users and roles that should be notified when the alert occurs. To create an escalation scheme, see “[Defining an Escalation Scheme](#)” on page 80.
- 9 Click **Return to Alert Definitions** when you are finished.

**Defining an Escalation Scheme**

An escalation scheme is a series of actions that take place when an alert is not acknowledged or fixed within a certain period of time. An escalation scheme can be applied to multiple alerts. You can define an escalation scheme to perform any of these actions:

- send an email or SMS text message
- make an entry in a system log
- issue an SNMP notification

To define an escalation scheme, select **Manage ► Escalation Schemes Configuration** (in the **Server Settings** area).

## Escalation Schemes Configuration

[<< Return to Manage](#)

Escalation Name:	An escalation scheme allows you to order alert notifications and actions. It can be applied to one or more alert definitions.
Default Escalation	

**Step 1 - Create New Escalation Scheme:**

**\* Name:**

**Description:**

**If the alert is acknowledged:**

☐ Allow user to pause escalation for 
☒ Continue escalation without pausing

**If the alert state has changed:**

☒ Notify previously notified users of the change
 ☐ Notify entire escalation chain of the change

**If alert is not fixed when escalation ends:**

☒ Stop escalation execution
 ☐ Repeat escalation actions

For information about the information required when defining an escalation scheme, refer to the Help for the page.

## Notifying Users of an Alert

There might be some types of alerts that you want members of your organization to be informed of if they occur. For users that are defined in SAS Environment Manager, you can notify specific users or roles. For users that are not defined in SAS Environment Manager, you can notify these users by email.

To notify users of alerts, follow these steps:

- 1 Select **Analyze ► Alert Center ► Definition** to display the table of alert definitions.
- 2 Click on the entry in the Alert Center table for the alert for which you want to send notifications.
- 3 At the bottom of the Alert Definition window, select one of the following:

### Notify Roles

whenever the alert occurs, notify all SAS Environment Manager users who are members of a specified role. Select **Add to List** to select the roles that should be notified.

### Notify Users

whenever the alert occurs, notify specific SAS Environment Manager users. Select **Add to List** to select the users that should be notified. You can select only users that have been defined in metadata and synchronized with SAS Environment Manager. See [“SAS Environment Manager and SAS Metadata Users” on page 84](#) for more information.

### Notify Other Recipients

whenever the alert occurs, notify users by email. Select **Add to List** and specify the email addresses that should be notified.

## Specifying Email System Parameters

The SMTP email server that SAS Environment Manager uses is specified by the SAS Deployment Wizard during installation and configuration of your SAS system. However, if your email server is restricted or uses a port other than the default, you must modify the configuration file where these parameters are stored.

To change the email server parameters, modify the file `[SAS_config]/Levn/Web/SASEnvironmentManager/server-5.8.0-EE/conf/hq-server.conf`. Specify these parameters:

```
server.mail.host=mailhost
```

specifies the email (SMTP) server. The default value is the host name that was specified in the SAS Deployment Wizard during installation.

```
mail.user=SMTPuser
```

specifies the user ID required to log on to a restricted email server.

```
mail.password=SMTPpassword
```

specifies the password required to log on SMTPuser into the email server.

```
mail.smtp.port=port
```

specifies the port used to connect to the email server. The default value for an unsecured server is 25, and the default value for a secured server is 587.

7

# Controlling Access to SAS Environment Manager

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## Controlling Access to SAS Environment Manager

### About Native Roles and Users

SAS Environment Manager controls access and permissions within the application with its own registry of users and its own system of roles and permissions. In order to distinguish between the SAS Environment Manager access features and those in SAS metadata, this document and the SAS Environment Manager online Help refers to features internal to SAS Environment Manager as native features (such as native users or native roles). However, the SAS Environment Manager interface does not use the native terminology.

Although native user definitions are internal to SAS Environment Manager, they are mapped to user definitions created in SAS metadata. Native users are created by first creating the user definition in metadata and then synchronizing the user information with SAS Environment Manager. You cannot create or edit native user definitions in SAS Environment Manager directly.

Native roles enable you to grant capabilities and permissions for actions in SAS Environment Manager to selected users. For example, an administrator role could be granted full permissions for all resource types and the ability to acknowledge and fix alerts, whereas a guest role could be denied the ability to fix or acknowledge alerts and have only Read permission for resources. Assigning a native role to a native user determines the actions that the user can perform in SAS Environment Manager.

Each native role also has its own unique Dashboard page. Each user has access to their own personal Dashboard page and the Dashboard pages of all native roles of which they are a member.

## SAS Environment Manager and SAS Metadata Users

Users in SAS Environment Manager are mapped to users created in SAS metadata. During installation, three user groups are created in SAS metadata to contain SAS Environment Manager users. Users and subgroups that are members of these groups are mapped to user definitions in SAS Environment Manager with corresponding roles. The user groups and their corresponding roles are as follows:

Group name in SAS metadata	Role in SAS Environment Manager
SAS_EV_Super_User	Super User role
SAS_EV_Guest	Guest role
SAS_EV_AppServer_Tier	SAS App Tier role

For example, users that are members of the group SAS\_EV\_Guest in metadata are created as users in SAS Environment Manager and are assigned to the Guest role when the users are synchronized.

When you install SAS Environment Manager, all existing SAS Environment Manager user definitions are automatically added to the SAS\_EV\_Guest group in metadata. After the existing users have been added to the SAS\_EV\_Guest group, use SAS Management Console to modify the user definitions or assign users to other SAS\_EV groups in metadata.

After you have defined new users in SAS metadata, sign on to SAS Environment Manager, and select **Manage ► Synchronize Users**. User definitions are created for all users that are defined in the three SAS\_EV groups in metadata. Any SAS Environment Manager users that are not associated with user definitions in metadata are deleted. When synchronizing, user definitions are not treated as case-sensitive (for example, sasuser@domain and SASUSER@domain are treated as the same user). Synchronization will fail for any users whose display name in metadata is longer than 100 characters.

**Note:** Only users who are assigned to the Super User role can perform the Synchronize Users action.

If you sign on to SAS Environment Manager using a user ID that is defined in metadata, is a member of one of the SAS\_EV groups, but is not defined in SAS Environment Manager, then a user definition is automatically created in SAS Environment Manager and assigned to the correct group.

The mapping between user information in metadata and in a SAS Environment Manager user definition is as follows:

Metadata field	SAS Environment Manager field
Display Name	Display Name
Name	Display Name if the Display Name is not specified in metadata
Metadata user	Username
Email (only the first email address specified is mapped)	Email
Phone (only the first phone number specified is mapped)	Phone

To create a new SAS Environment Manager user, select **Administration ► Users** in SAS Environment Manager to define the user in metadata and assign it to the appropriate SAS\_EV user group, and then select **Manage ► Synchronize Users** to create the native user and assign the user to the proper role.

The users in the SAS App Tier role are automatically granted access to the resources in these resource groups:

- SAS App Tier group
- SAS App Tier Server group
- SAS App Tier Services group

An internal account, sasevs (sasevs@saspw), is also created during installation. This account is assigned to the SAS Environment Manager roles SAS App Tier Role and Guest Role (which map to the SAS\_EV\_AppServer\_Tier and SAS\_EV\_Guest groups in SAS metadata). The account is used for communications between the SAS Environment Manager agent and server and enables plugins to access the SAS Metadata Server. The internal account sasadm@saspw is the default account for signing on to SAS Environment Manager.

**CAUTION!** All accounts in the SAS Environment Manager Super User group have access to the gconsole plugin, which allows Groovy code to be submitted. A side effect of this capability is that Groovy code can be executed as the server process owner, which is typically the SAS installer account. If your security policy does not permit this account to have this capability, you can move or delete the gconsole plugin. Move or delete the directory `<levelroot>/Web/SASEnvironmentManager/server-5.8.0-EE/hq-engine/hq-server/webapps/ROOT/hqu/gconsole`.

The SAS Logon Manager is used to control the process of logging on to SAS Environment Manager. The application uses the same authentication process and authentication provider as the other SAS web applications. User credentials are case-sensitive only on Linux platforms.

In the third maintenance release after SAS 9.4, the method of storing SAS Environment Manager user accounts in the database changed. In previous releases, when a user logged on to SAS Environment Manager, the account name that they used to log on



was also used to identify them in the SAS Environment Manager session. In the third maintenance release after SAS 9.4, a user logs on using the same account name, but SAS Environment Manager uses their SAS identity to identify the user. This change does not affect how users log on to SAS Environment Manager. Users will continue to use the same accounts and credentials. However, the SAS Environment Manager database contains only the SAS user name for each user account, rather than multiple account names for each user.

## Updating Passwords for SAS Environment Manager Metadata Identities

To update the password for the sasevs@saspw account, follow these steps:

- 1 Stop SAS Environment Manager and all SAS Environment Manager agents on the system.
- 2 On the middle-tier machine, use the SAS Deployment Manager to change the password for the sasevs account.
- 3 Use the SAS Deployment Manager to update the sasevs password on the machines in the other tiers in the system.
- 4 Restart SAS Environment Manager and the SAS Environment Manager agents.

## Creating a Native Role

To create a native role, follow these steps:

- 1 On the Manage page, select **New Role**.
- 2 On the New Role page, specify a name for the role and select the native permissions and capabilities for each resource type. If you grant the **Read Only** permission for a resource type, you can also select the native capabilities for the resource type. For all other permissions, the capabilities are automatically selected or disabled and cannot be changed.

3 Use these guidelines to determine the native permissions to set:

Adding a resource to the inventory and creating alert definitions

Select **Full** or **Read / Write** permissions. Users can also respond to alerts and control resources.

Monitoring resources, responding to alerts, controlling resources

Select the **Read Only** permission and grant the capability to acknowledge and fix alerts and to control resources. Users can respond to alerts and control resources but cannot create or modify alerts or resources.

Monitoring resources

Select the **Read Only** permission, but do not grant capabilities for alerts resource control. Users can view and monitor only resources.

- 4 When you click **OK**, the role and associated Dashboard page are created, and the Role Properties page is displayed. Use this page to select native users and resource groups that should be associated with the role and to create an alert calendar.
- 5 To create an alert calendar, select the days and times during which the roles' users will be notified of alerts. Make sure that at least one role is available during every time period.

Day	From	To	Except	From	To
<input checked="" type="checkbox"/> Monday	12 AM	12 AM	<input type="checkbox"/> Except	1 AM	2 AM
<input checked="" type="checkbox"/> Tuesday	12 AM	12 AM	<input type="checkbox"/> Except	1 AM	2 AM
<input checked="" type="checkbox"/> Wednesday	12 AM	12 AM	<input type="checkbox"/> Except	1 AM	2 AM
<input checked="" type="checkbox"/> Thursday	12 AM	12 AM	<input type="checkbox"/> Except	1 AM	2 AM
<input checked="" type="checkbox"/> Friday	12 AM	12 AM	<input type="checkbox"/> Except	1 AM	2 AM
<input checked="" type="checkbox"/> Saturday	12 AM	12 AM	<input type="checkbox"/> Except	1 AM	2 AM
<input checked="" type="checkbox"/> Sunday	12 AM	12 AM	<input type="checkbox"/> Except	1 AM	2 AM

Cancel

---

## Creating SAS Middle-Tier Administrator IDs

Administrators for SAS middle-tier servers must be defined in SAS metadata as well as in SAS Environment Manager. To create a middle-tier administrator user ID, follow these steps:

- 1 From the **Administration** tab in SAS Environment Manager, use the User Manager to create a user definition for a middle-tier administrator.
- 2 Assign the user to the SAS\_EV\_AppServer\_Tier user group. This group is created during the installation and configuration process.
- 3 Sign in to SAS Environment Manager using the sasevs@saspw credentials, which is the default administrative identity.
- 4 Click **Manage** ► **Synchronize Users** to synchronize the SAS Environment Manager users with the SAS metadata users..
- 5 Click **List Users** to view the list of all users.
- 6 Locate the entry in the user table for the new user and click the user name entry to display the Properties page.
- 7 In the Roles Assigned To section, verify that the user is assigned to the **SAS App Tier** role.





# Part 2

## Operations Integration, Audits, and Performance Analysis

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# 8

## Understanding SAS Environment Manager Service Architecture

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## Understanding SAS Environment Manager Service Architecture

SAS Environment Manager Service Architecture provides functions and capabilities that enable SAS Environment Manager to fit into a service-oriented architecture (SOA). The package implements best practices for resource monitoring, automates and extends the application's auditing and user monitoring capabilities, and follows industry standards to enable servers to use Application Response Measurement (ARM). These functions enable SAS Environment Manager to function as a key component in providing service-level management in a strategy that is based on the IT Infrastructure Library (ITIL).

SAS Environment Manager Service Architecture uses extract, transform, and load (ETL) processes to obtain metric data, convert it to a standard format, and load it into the SAS Environment Manager Data Mart. You can then leverage the data by using the supplied stored process reports and reporting tools or by using your own preferred reporting tools.

SAS Environment Service Architecture consists of the following components:

### SAS Environment Manager Data Mart

The data mart is the key component of the Service Architecture and is created if you enable either one or both of the ETL processes in the service architecture. The data mart consists of a set of tables that hold the data collected by the ETL processes.

The collected data is stored in a standard format, which makes it easy to run reports and perform analysis. The stored processes in the Report Center use the data in the data mart to produce pre-defined reports. Data is retained in the data mart for 60 days. The infrastructure for the data mart is provided in the SAS Environment Manager Extended Monitoring package.

### Audit, Performance, and Measurement (APM) ETL

When this component is initialized, it collects information from various log files (including those generated by SAS servers and web application servers), standardizes it, and stores it in the data mart. A log discovery process runs approximately every 15 minutes to locate all of the logs that need to be included in



the APM ETL. After the data is stored in the data mart, you can use it to produce reports in the Report Center or to perform custom reporting and analysis.

#### Agent-Collected Metrics (ACM) ETL

When this component is initialized, it uses information that was collected by the SAS Environment Manager agent from the computing resources and components in your deployment. The data is processed and loaded into the data mart. After the data is stored in the data mart, you can use it to produce reports in the Report Center or to perform custom reporting and analysis.

#### Report Center

The Report Center provides a convenient access point for the reports that are provided as part of the Service Architecture. Once one or more of the ETL components have been initialized and enabled, data is available in the data mart. This data is then used to feed the predefined reports in the Report Center. The Report Center is not available until either one or both of the ETL processes is enabled.

#### Solution kit framework

The solution kit framework can extend the capabilities of SAS Environment Manager to support specific solutions or applications. The framework includes support for collecting and storing operation information about the solution in the data mart and for using the associated reporting capabilities.

#### SAS Visual Analytics data feed

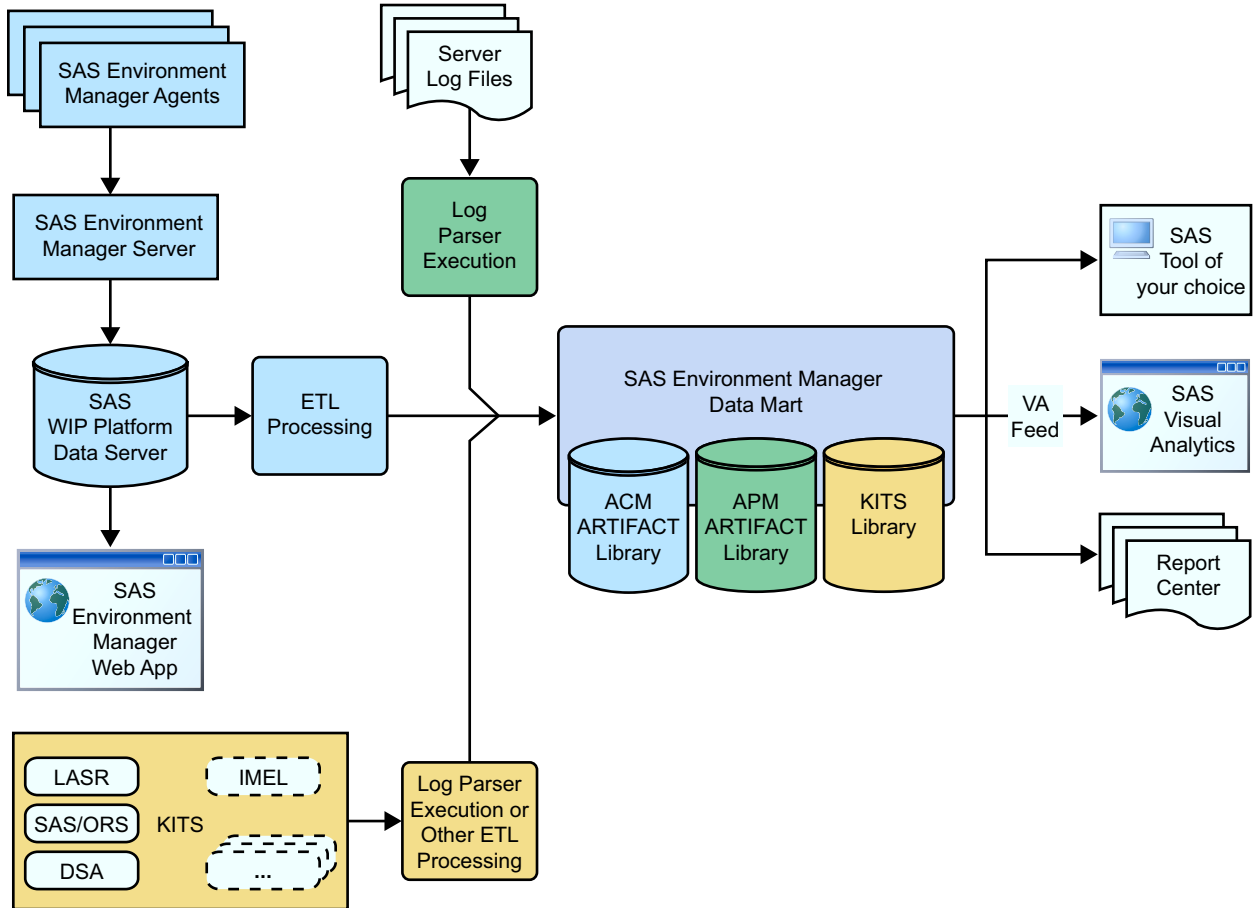
Data from the data mart can be easily loaded into SAS Visual Analytics. If the data feed option is enabled in SAS Environment Manager, selected data tables from the data mart are copied to a specified drop zone directory. SAS Visual Analytics can then automatically load the tables from the drop zone into the application.

#### Federated data mart

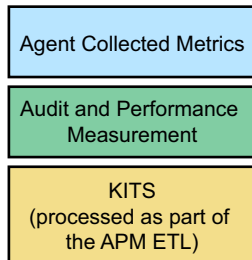
If you are using a data mart on multiple deployments in your organization, you can create a federated data mart to consolidate analysis and monitoring for all of the deployments. The federated data mart collects into one location the ACM data from the data marts of each deployment. Each deployment still retains its own data mart, but the federated data mart enables you to easily compare the metric data across your organization.

**Note:** The alerts and reports in the Service Architecture are provided as a best efforts resource to assist in the troubleshooting and performance tuning of your SAS deployment. However, many other factors might influence your user experience, some of which are beyond the monitoring capabilities of SAS Environment Manager. If you need additional assistance or reference information about performance tuning and hardware configuration, please contact the SAS Professional Services Division.

The following diagram illustrates how the components of the Service Architecture work together.



#### Legend



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## Working with SAS Environment Manager Extended Monitoring

### Purpose and Components

Extended monitoring implements best practices for SAS Environment Manager and also provides the framework needed for SAS Environment Manager Service Architecture.

Extended monitoring provides these two separate categories of components:

SAS Environment Manager setup

- creates a predefined set of alerts, resource groups, and best-practice metric configurations. This step quickly optimizes your SAS Environment Manager configuration and implements best practices in how your environment is monitored

Data mart infrastructure

- provides empty data tables, stored processes, and reports that are populated by data that is provided by the APM or ACM ETL processes

Extended monitoring components are not active until you initialize the service architecture.

### Understanding the SAS Environment Manager Setup Components

Even if you are not using the extended monitoring and reporting capabilities of SAS Environment Manager Service Architecture, extended monitoring provides key components for your resource monitoring strategy. The SAS Environment Manager setup components configure extended monitoring to provide best practices in resource monitoring and alerting. These configurations and definitions enable you to begin using SAS Environment Manager right away, without having to perform manual configuration and definition processes. Extended monitoring includes these components:

## resource configuration

You must configure resources such as platforms and servers that are added to your SAS Environment Manager inventory during installation so that they can begin collecting metric data. Initializing extended monitoring automates the process of configuring these resources, enabling you to start monitoring resources without having to go through a manual configuration process.

## tuned alerts

Extended monitoring provides a set of optimized alerts, developed by SAS. These alerts notify you of operational issues that might be encountered in a SAS environment (such as storage issues, server status, and hardware issues). See [“Service Architecture Alert Definitions” on page 219](#) for a list of the alerts created by Service Architecture extended monitoring.

## defined resource groups

Resources that form a logical group (such as all platforms, servers, and services in the SAS App Tier) are automatically collected into predefined groups that are defined in extended monitoring. These groups are automatically updated as you add and delete resources, so they always stay current. A resource group for every reporting table in the data mart is automatically created and maintained.

## event importing and exporting

You can export events that are generated by SAS Environment Manager to support third-party monitoring applications. In addition, you can import events from other SAS applications and from third-party applications into SAS Environment Manager for processing.

## HTTP checks of web applications

Enabling extended monitoring defines a set of resources that monitor the availability and responsiveness of key SAS web applications such as SAS Stored Process Web Application.

## adjustments to monitoring metrics

As part of the process of optimizing resource monitoring, some adjustments are made in the metrics collected for system resources. Collection is started for some metrics, and graphing intervals are changed for others in order to make them easier to follow.

## Data Mart Infrastructure

If you are using the Service Architecture, extended monitoring provides the framework and key components that enable the ETL packages to operate. Extended monitoring provides these infrastructure components:

### SAS Environment Manager Data Mart

Extended monitoring creates the tables that comprise the data mart. However, extended monitoring does not provide a mechanism for loading data into the tables. Data is loaded into the tables by the ACM or APM ETL processes.

### Report Center processes and reports

Much like with the data mart, extended monitoring creates the stored processes that produce the reports in the Report Center. However, these processes and reports remain unusable until one or more of the ETL processes is enabled and loads data into the data mart.

---

## Working with the APM ETL

### Overview

The APM ETL process extracts performance metric information from various SAS server logs, HTTP access logs, SAS job logs, and SAS metadata audit data and loads that information into the data mart. Custom parsers can be added to enable the ETL to process information specific to a SAS solution or application. As with other information in the data mart, you can use this information to produce predefined reports or to conduct custom analysis and reporting.

**Note:** Enabling the APM ETL process causes a separate log to be created for each spawned SAS Workspace Server. You must plan for the large number of log files that this process could create. A best practice is to create a daily archive file of the day's log files, and then to copy the file to archive storage.

## Log Collection Process

APM data is processed and loaded into the data mart in these steps:

- 1 The logs in your SAS deployment are discovered. The log discovery process runs for the first time when the APM ETL is initialized. This process scans the components in your SAS system for log files and includes the logs that it finds that are supported by the APM ETL. By default, the log discovery process runs every 15 minutes throughout each day, so any new logs created by new components in your SAS environment are discovered and included in the log collection process. You can also choose to run the log discovery process manually through a control action, which enables you to start collecting log data sooner than if you waited for the scheduled process. This discovery process improves the accuracy of the collected log data, because it reflects the SAS applications that are actually installed. The discovery process runs when the APM ETL is initialized, and runs at regular intervals after initialization is complete. You can also run the log discovery process manually at any time.

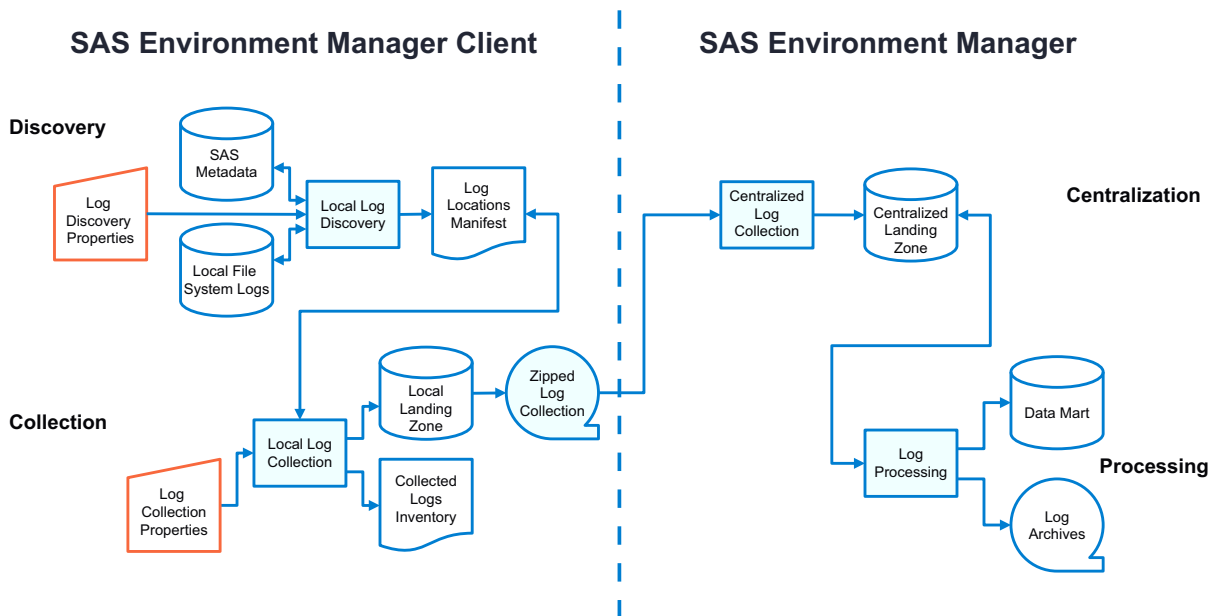
See [“Manually Discovering and Collecting Logs” on page 102](#) for information about manual processes.

- 2 The discovered logs are collected locally on the machine where they are created. The logs are stored in the landing zone directory, which is `[LevelRoot]/Web/SASEnvironmentManager/emi-client/LandingZone`. By default, the logs are collected nightly, but they can be collected manually as often as every 30 minutes in order to obtain an update view of the log information.
- 3 The locally collected logs are collected from the local landing zone directories to a central landing zone directory, which is located on the SAS Environment Manager Enablement Kit Server. This machine is the machine containing the alphabetically first SAS Application Server context that contains a SAS Workspace Server. Beginning with the third maintenance release after SAS 9.4, you can use SAS Deployment Agent to automatically copy the log files from the local landing zone directories to the central landing zone directory. You can also set up file mounts or NFS shares to the local landing zone directories so that the central landing zone directory has access to the log files whenever they are saved to the local landing

zone directories. After the logs are collected in the central landing zone directory, they are deleted from the local landing zone directories.

- 4 The ETL process parses the logs in the central landing zone directory, puts the information into a standard format, and archives the original log files. The data is then put into the appropriate tables in the data mart.
- 5 APM data in the data mart is available for analysis and reporting.

The following figure illustrates the log collection process.




## Manually Discovering and Collecting Logs

Follow these steps to manually run the APM ETL process to discover and collect logs:

- 1 Select **Resources** ► **Browse** ► **Services**. Select the **APM ETL Processing** entry in the table.
- 2 On the page for the APM ETL Processing service, select **Control**.



- 3 In the **Quick Control** area, select **Run** in the **Control Action** field and then click the **Run** icon .

You can also start the log collection process from a command line by using the `master_apm_etl` script. You can automate this process by using a job scheduler to run the script. See [“Running the APM ETL Processes By Using `master\_apm\_etl`”](#) on page 148 for more information and syntax.

## Generating Reports

Reports that are produced by APM display the following types of information:

- the most heavily used SAS procedures
- the top ten users of the SAS Workspace Server
- the number of times per day each user ID has accessed the SAS Metadata Server
- each instance of an authentication error or of an unauthorized login attempt
- the response time and run time for SAS stored processes

---

## Working with ACM ETL

The ACM ETL process extracts and stores metric data that is collected by the SAS Environment Manager agents into the data mart. Storing the data in the data mart enables you to access the data for a longer period of time than if it was stored only in the SAS Environment Manager web application.

ACM data is processed and loaded into the data mart in these steps:

- 1 Metric data is collected from the SAS Environment Manager agents and sent to the SAS Environment Manager database.
- 2 At specified intervals, the ACM ETL process runs. The process copies data from the database, standardizes the data, and loads the data into the data mart.

### 3 ACM data in the data mart is available for analysis and reporting.

The Report Center contains reports that are produced by ACM that display the following types of information:

- response time for SAS HTTP web services
- workload, CPU usage, and memory usage for each platform in your environment
- usage and response information for file mounts
- total number of clients per minute on the SAS Metadata Server machine

---

## Creating a Federated Data Mart

A federated data mart enables you to use the data mart capabilities to perform analysis and monitoring for multiple deployments in your organization. You can consolidate ACM data from the data marts of multiple systems into one location, which enables you to compare system performance and availability across your organization. Each deployment still retains its own data mart, but the federated data mart enables you to analyze data across deployments. For example, you could set up a federated data mart to contain data from DEV/TEST/PROD deployments, or from multiple departmental deployments. The federated data mart is available following the third maintenance release of SAS 9.4.

**Note:** APM metric data is not included in a federated data mart.

To create a federated data mart, follow these steps:

- 1 Verify that SAS Environment Manager is running on all of the deployments that you want to include in the federated data mart.
- 2 Configure SAS Environment Management Service Architecture on all of the systems, and ensure that the ACM ETL is enabled. This step ensures that each deployment includes a data mart containing ACM data. Before attempting to implement the federated data mart, you should allow the data mart to operate on

each deployment for several weeks in order to verify that the data marts are operating as expected and to understand the data that is being collected.

- 3 Choose which deployment will host the federated data mart and which deployments will be contributors to the data mart. On the host deployment, run the `fedInit` script to create the directories and structure needed for the federated data mart. See [“Exporting Data Mart Contents By Using `exportDataMart`” on page 156](#). The script also creates a server resource on the host deployment named Federated Data Mart. You can monitor this server resource as you would any other resource in SAS Environment Manager. See [“Monitoring Resources” on page 57](#).
- 4 To populate the federated data mart, perform a full export of all the data in the data marts of the contributor deployments. This ensures that you have a current view of all of the data in the data marts.

To perform a full export, run the `bin/exportDataMart` script on each deployment. This script creates a `.tar` file in the `Datamart/Exports` directory.

- 5 To enable the exported files to be imported by the host deployment, move all export files that you want to import to the `emi-framework/LandingZone/FedDataMart` directory on the host deployment.
- 6 When the exported data has been copied to the directory on the host deployment, import the data into the federated data mart. To import the data, run either the `bin/updateFedDataMart` script or run the Load Data control action.

The import process extracts data from the `.tar` files and transform the data so that the data from all of the contributor deployments can be merged. Although the data is merged, the federated data mart retains information that identifies the contributor deployments and adjust identifiers so that they remain unique across the deployments. After the data is imported, the federated data mart contains merged data for each contributor system.

- 7 Whenever you want export additional data into the Federated Data Mart, use the Export Data Mart control action or run the `bin/exportDataMart` script on a contributor deployment.

- 8 You can also set up an automatic export of data from a contributor deployment. To set up automatic export, modify the `sasev.properties` file (found in the Service Architecture root directory) and set the `datamart.export.withETL` property to `true`. When this property is set to `true`, the ACM ETL script automatically creates an export file with the latest data. This export file contains only the updates since the last time the ETL job was run. It is important to note the difference between this file and the export file that is generated by the manual export process. The manual export process creates an export file containing all of the data in the contributor deployment. The federated data mart's update processing automatically detects and handles either a full export or an incremental export.

Regardless of whether you use a manual, full export or the automatic, incremental export, you must move the export files to the proper location on the federated data mart host machine. The automatic export process handles only the export process, and does not handle the movement of the export file from the individual contributor deployments. It also does not automate the loading of the new data into the federated data mart.

Because the automatic export contains only incremental data, the export files that it creates are smaller than those generated by the manual export process. On the other hand, many more files are generated. In addition, the files are generated every time that the ACM ETL process runs (typically nightly), rather than only when you are ready to run the Import Data process on the federated data mart host machine.

---

## Working with the Solution Kits Infrastructure

SAS solutions can provide solution kits, which include their own set of log parsers, resource definitions, tuned metrics, and reports. A solution kit, developed and delivered by SAS, enables you to easily add data to the data mart for SAS solutions as you add them to your environment. The ETL framework of the kits provides the infrastructure required for the solution kits to work seamlessly with SAS Environment Manager and the data mart. Solution kits ensure that the data collected by SAS Environment Manager for a specific SAS solution is available from the data mart.

---

## Feeding Data from the Data Mart into SAS Visual Analytics

You can enable a nightly transfer of selected tables from the SAS Environment Manager data mart to the SAS Visual Analytics administrative reporting drop zone. If autoloading is enabled for associated LASR library, the copied tables are loaded to a SAS LASR Analytic Server. For more information see *SAS Visual Analytics: Administration Guide*

**Note:** Although data tables that are copied to the drop zone can be loaded into SAS Visual Analytics, predefined reports and analytic processing for the data might not be available in SAS Visual Analytics.

You should ensure that the SAS Visual Analytics drop zone location is accessible from the SAS Environment Manager Enablement Kit Server machine, which is the location where the ETL processes run. Follow these steps:

- 1 Log on to SAS Management Console.
- 2 Using the **Data Library Manager** plug-in, locate the entry for the **Environment Manager Data Mart LASR** library.
- 3 Right-click on the library, and select **Properties**.
- 4 In the **Extended Attributes** tab, note the value of the **VA.AutoLoadLocation** attribute. This is the default path that the SAS Environment Manager ETL processes will use when copying data from the data mart. Verify that this location is accessible from both the SAS Environment Manager Enablement Kit Server machine and from the SAS Visual Analytics server machine.

If you specify a new location for the **VA.AutoLoadLocation** attribute, ensure that the directory contains the subdirectories Append, Formats, Logs, and Unload.

To enable the data feed for SAS Visual Analytics, follow these steps:

- 1 On the machine on which SAS Environment Manager is installed, change to the `<Levelroot>/Web/SASEnvironmentManager/emi-framework/bin` (UNIX) or

`<Levelroot>\Web\SASEnvironmentManager\emi-framework\bin`  
(Windows) directory.

- 2 From a command line, issue the command `emi_init.sh -vafeed ON` (UNIX) or `emi_init.bat -vafeed ON` (Windows).

If SAS Visual Analytics and SAS Environment Manager are not running on the same machine, you must modify the `sasev.properties` file to identify the target location for the data tables that are to be loaded into SAS Visual Analytics. Modify the `vafeed.destDir=` property to specify the location on the SAS Environment Manager machine where the data tables should be copied. The target directory that you specify must have a subdirectory named `/Formats`. You must then move the data tables from the SAS Environment Manager machine to the SAS Visual Analytics machine. You can use techniques such as FTP transfer or NFS mounts to move the data tables.

If the machines that run SAS Visual Analytics and SAS Environment Manager are also using different operating systems, you must use PROC CPORT to create a machine-independent export file of the data and then use PROC CIMPORT to load the data into the proper format for the SAS Visual Analytics machine. The basic procedure consists of these steps:

- 1 The nightly ETL processes copy the data from SAS Environment Manager to the location specified by the `vafeed.destDir` property.
- 2 Run SAS code containing PROC CPORT statements to create CPT files for the data sets and catalog that are to be loaded into SAS Visual Analytics.
- 3 Move the CPT files to the SAS Visual Analytics machine.
- 4 Run SAS code containing PROC CIMPORT statements to read the CPT files and create the data sets and catalog on the SAS Visual Analytics machine.
- 5 Move the data sets and catalog to the drop zone.

The tables copied from the data mart to the drop zone are suitable for analysis and reporting with SAS Visual Analytics. The specific set of tables and their structure might change over time and in future releases. By default, the following are the tables that are copied:

**ACM.FILEMOUNTS**

metric data for the file mounts in your environment

**ACM.HOSTPLATFORMS**

metrics for the platform-level resource monitored by SAS Environment Manager that correspond to operating systems

**ACM.HTTPCHECKS**

metric data for the HTTP response-checking resources created by SAS Environment Manager Extended Monitoring

**ACM.SASAPPSERVERS**

metric data for the SAS application servers

**ACM.SASLOGICALSERVERS**

metric data for the SAS logical servers

**ACM.METADATASVRS**

metric data for the SAS Metadata Servers

**ACM.NETWORKINTERFACE**

metric data for the network interfaces

**ACM.TCSEVERMGRS**

metric data for individual SAS web applications

**ACM.WEBAPPSERVER**

metric data for SAS Web Application Server instances

**ACM.WIPDATADB**

metric data for the databases within the Web Infrastructure Platform Data Server

**KITS.EMI\_INFO**

metrics on the performance of SAS Environment Manager ETL processes

For information about the contents of these tables, see [Appendix 4, “Data Mart Table Reference,”](#) on page 199.





# 9

## Initializing and Enabling the Service Architecture

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### Overview and Prerequisites

The process of initializing and configuring the service architecture consists of two main processes:

- 1 Validating the service architecture framework and initializing extended monitoring

## 2 Enabling the ACM, kit, and APM ETL framework, and initializing the APM ETL framework

In this chapter, `<levelroot>` refers to the fully qualified location of the LevN directory within your SAS configuration directory (for example, `/opt/SAS/Config/Lev1`).

Before you begin initializing and enabling the service architecture, ensure the following:

- Ensure that you know the ID and password of the SAS installer account. These are external host credentials.
- Ensure that you know the path to your SAS Environment Manager Solution Architecture framework directory. This directory is on the machine on which you deploy the service architecture framework, which is referred to as the SAS Environment Manager Enablement Kit Server. This machine is the machine containing the alphabetically first SAS Application Server context that contains a SAS Workspace Server.

The framework is deployed in the `<levelroot>/Web/SASEnvironmentManager/emi-framework` directory.

- Ensure that your SAS deployment contains a functioning Stored Process server. The server must be defined on the SAS Environment Manager Enablement Kit Server, and it cannot be load balanced across multiple machines.
- Ensure that you know the name of your SAS Application Server contexts on all of the hosts in your deployment.
- Ensure that you know the SAS administration ID and password (for example, `sasadm@saspw`).
- If you are deploying on multiple machines, ensure that the APM ETL has remote access (through NFS mounts or Windows shares) to the `<levelroot>` directory on each of the remote machines.
- If you have configured your SAS deployment to use certificates, SSL, and the HTTPS protocol, rather than the HTTP protocol, confirm that you can use the HTTPS protocol to access SAS web applications.
- If you are using AIX, add the `sasevs@saspw` account to the SAS Environment Managers Super User Role. Follow these steps:

- 1 Select **Manage ► List Roles**.
- 2 Select **Super User Role**.
- 3 In the **Assigned Users** area, select **Add to List**.
- 4 Select the check box for **sasevs@saspw** in the **Users** table, click the plus (+) arrow, and then click **OK**.

---

## Initializing SAS Environment Manager Extended Monitoring

### Overview of Extended Monitoring Initialization

When you initialize extended monitoring , two main categories of actions are performed:

- initialization of predefined alerts, groups, and configurations to enable you to start using SAS Environment Manager without having to go through a manual setup process
- initialization of the SAS Environment Manager Data Mart

The initialization process performs both sets of actions. If you are not planning to use the data mart, initializing its infrastructure does not impact performance of SAS Environment Manager.

The following setup tasks are performed during the initialization of SAS Environment Manager:

configuration of discovered resources

Resources such as platforms and servers that were added to the SAS Environment Manager inventory during installation are configured so that they can begin collecting metric data.

#### creation of compatible groups and mixed groups

A set of standard resource groups is created and then populated by resources that were discovered in your environment. After the groups are created, the groups are automatically updated as part of ETL processing.

#### adjustment of monitoring metrics

The metrics provided by SAS Environment Manager are optimized for monitoring of a SAS environment. The optimization process includes turning data collection on or off for certain metrics and changing sampling intervals for others.

#### creation of HTTP checks of SAS web applications

These HTTP checks are services that check SAS web applications such as the stored process server to make sure they are operational. The check also generates data such as the length of time the query took.

#### creation of alerts

The process creates a collection of alerts that signal common operational problems in a SAS environment, such as hardware problems, server issues, and storage issues.

The following tasks are performed for the data mart:

#### preparation of the data mart

The initialization process creates infrastructure data sets for the data mart.

#### loading of the Report Center

The initialization process loads the stored processes for the Report Center reports. However, unless one or more of the ETL packages are enabled and initialized, the data required to produce the reports is not present and the Report Center is not available from SAS Environment Manager.

#### creation of associated metadata objects

The initialization process imports SAS package files to the SAS Metadata Server that contain ACTs and user groups to support the data mart.

## SAS Environment Manager Extended Monitoring Steps

To initialize extended monitoring, follow these steps:

- 1 On the Enablement Kit Server machine, change to the `<levelroot>/Web/SASEnvironmentManager/emi-framework/bin` directory.  
  
**Note:** Directory paths that are provided in this section are UNIX paths, which use a forward slash (/). In Windows environments, replace the forward slash with a backward slash (\).
- 2 Validate the framework by issuing the command `./validate.sh --level 2` (UNIX) or `validate.bat --level 2` (Windows).
- 3 If you are using UNIX, set the DISPLAY environment variable to an X11 server.
- 4 From a command line, issue the command `./emi_init.sh -i` (UNIX) or `emi_init.bat -i` (Windows). Review the log messages to ensure that the command executed without errors.
- 5 Restart the SAS Object Spawners by issuing the command `<levelroot>/ObjectSpawner/ObjectSpawner.sh restart` (UNIX) or `<levelroot>\ObjectSpawner\ObjectSpawner.bat restart` (Windows).
- 6 From a command line, issue the command `./validate.sh --level 3` (UNIX) or `validate.bat --level 3` (Windows). This command verifies that the framework was successfully initialized.
- 7 Review the messages produced by the validation script for errors. If you make any changes to your deployment in order to correct errors, issue the command `./emi_init.sh -i-f` (UNIX) or `emi_init.bat -i-f` (Windows) and rerun the `./validate.sh --level 3` or `validate.bat --level 3` command.

Detailed information about the initialization is contained in the log file `emi-framework/Logs/emiInit.<datetime>.log`

---

## Enabling and Initializing the APM ETL

### Overview of the APM ETL Enablement and Initialization Process

When you enable and initialize the APM ETL package, the following actions are performed:

#### Enablement of Application Response Measurement (ARM)

The SAS Application server environment is modified to enable ARM.

#### Activation of loggers and appenders

SAS logging facility loggers and log appenders are activated to support the ARM-enabled SASApp deployment

**Note:** One of the SAS resources for which logging is enabled is the SAS Workspace Server. Logging of this server causes a separate log file to be created in the `Lev1/SASApp/WorkspaceServer/PerfLogs` directory for each spawned SAS Workspace Server. You must be aware of the potential for the large number of log files that can be created in this directory. This situation can occur if you have a large number of SAS Enterprise Guide or SAS Data Integration Studio users, because each session for those applications generates a separate log file. You can create a daily archive of the logs in a .zip or .tar file and then copy the daily archive to another storage location. This process enables you to manage the large number of log files while maintaining IT best practices for retaining usage logs.

**Note:** SAS Workspace Servers are typically configured to run under the client's user identity. In order for logging of SAS Workspace Servers to function correctly, you must ensure that the permissions are specified correctly on the log directories. All users of the SAS Workspace Server and all SAS Environment Manager users that run the APM ETL processes must have Read, Write, and Execute permissions for the `/SAS/Config/Lev1/SASApp/WorkspaceServer/Logs` and `/SAS/Config/Lev1/SASApp/WorkspaceServer/PerfLogs` directories.

After the APM ETL is enabled and initialized, the ETL process begins extracting data from SAS logs and loading that data into the data mart so that the applicable stored processes and stored process reports have data to work with. Data is extracted from the SAS logs only when the logs roll over (usually after midnight). You must wait until after midnight before data appears in Service Architecture metrics and reports.

## APM ETL Enablement and Initialization Steps

To enable and initialize APM ETL:

- 1 Ensure that extended monitoring has been initialized.
- 2 Back up your configuration files and the SAS metadata repository.
- 3 On the Enablement Kit Server machine, change to the `<levelroot>/Web/SASEnvironmentManager/emi-framework/bin` directory.
- 4 Verify that the SAS Metadata Server is running, and then run the command `./apm_init.sh` (UNIX) or `apm_init.bat` (Windows).
- 5 Check the logs under the `emi-framework/Logs` directory for errors.
- 6 The `apm_init` command issues a series of control actions so that each SAS Environment Manager agent runs the log discovery and configure APM processes on each agent's local machine. If an error message from the `apm_init` command indicates that a control action failed, check the most recent login in the `SASEnvironmentManager/emi-client/Logs` directory for errors. The logs are named `logDiscovery_[datetime].log`.
- 7 On each machine in your deployment, ensure that no other users are working in the SAS server environment, and then restart the SAS Metadata Server, SAS Object Spawner, SAS OLAP Server, and Connect Server. Because you should not restart the SAS Environment Manager Server, do not issue the `sas.servers restart` command..

On UNIX, issue these commands for each SAS Application Server context:

```
<levelroot>/SASMeta/MetadataServer.sh restart
<levelroot>/ObjectSpawner/ObjectSpawner.sh restart
```

```
<levelroot>/ConnectSpawner/ConnectSpawner.sh restart
<levelroot>/SASApp/OLAPServer/OLAPServer.sh restart
```

On Windows, the servers are usually deployed as Windows services. Follow these steps to restart the servers:

- a Run Windows using an administrative user ID, and then select **Windows Start ► Control Panel ► Administrative Tools ► Services**. The Services window appears.
  - b Right-click **SAS [Config-Lev1] SASMeta – Metadata Server** and select **Restart** from the pop-up menu. A dialog box appears, warning you that other services will also be restarted. Select **Yes** in this dialog box, which automatically restarts the OLAP Server, the connect spawner, and the object spawner.
- 8 After the configuration commands have completed, sign on to SAS Management Console. Using the Server Manager plug-in, validate the SAS Metadata Server and the other Enterprise BI servers. The servers generate initial entries in the associated `/Logs` or `/PerfLogs` directories. Log off from SAS Management Console after you validate the servers.
  - 9 On the service architecture framework machine, change to the `[levelroot]/Web/SASEnvironmentManager/emi-framework/bin` directory.
  - 10 From a command line, issue the command `./emi_init.sh --enable APM` (UNIX) or `emi_init.bat --enable APM` (Windows) to enable only the APM ETL. Issue the command `./emi_init.sh --enable ALL` (UNIX) or `emi_init.bat --enable ALL` (Windows) if you want to enable the APM, ACM, and kits ETLs
  - 11 From a command line, issue the command `./validate.sh --level 3` (UNIX) or `validate.bat --level 3` (Windows) to validate the initialization. Check the logs and messages for errors.



---

## Enabling ACM ETL

When you enable the ACM ETL, the ETL processes begin extracting metric data from the SAS Environment Manager agent and loading the data into the SAS Environment Manager Data Mart.

To enable ACM ETL:

- 1 On the Enablement Kit Server machine, change to the `<levelroot>/Web/SASEnvironmentManager/emi-framework/bin` directory.
- 2 From a command line, issue the command `./emi_init.sh --enable ACM` (UNIX) or `emi_init.bat --enable ACM` (Windows).
- 3 From a command line, issue the command `./validate.sh --level 3` (UNIX) or `validate.bat --level 3` (Windows) to validate the initialization. Check the logs and messages for errors.

---

## Updating the Service Architecture in SAS Environment Manager 2.5

If you have not modified your service architecture configuration, the SAS Environment Manager 2.5 update process will update your service architecture without you needing to make any changes. However, if you modified your original service architecture, you must make these changes when updating:

- If you stored content in the metadata folders that were used by the report center, the update process exported that content as a SAS package file, then deleted the folders. To recover the content, use the metadata import wizard in SAS Management Console to import `SASEVProductsFolderBackup.spk`, which is in the `SASPackages` subdirectory under the update backup directory. The update backup

directory is named `\emi-framework_date_time`, where *date* and *time* correspond to the date and time at which the update process began.

- If you used the SAS Management Console Configuration Manager plug-in to change the service architecture configuration properties, those changes might have been overwritten. Review the current configuration settings and make changes where needed.
- If you used a method such as soft link or NFS mounts to locate the data mart libraries at a location other than the default, you must review the updated data mart to determine whether the data was successfully moved. If it was not moved, re-establish the redirection and run the `uglplnit` script to restructure the data.
- If you modified any of the `LIBNAME` statements in the service architecture `autoexec` files, those changes were overwritten, so you will need to make the corresponding changes in the new `autoexec` files. You can refer to the old files, which are located in the backup directory, but you cannot replace the new files with the old files. Doing so will cause the service architecture to not work.

---

## Changing ETL Configuration Settings

After you have initialized and enabled the Service Architecture, you can change some of the default configuration settings for the ETL processes. To change the settings, follow these steps:

- 1 Log on to SAS Management Console.
- 2 On the **Plug-ins** tab, select **Application Management ► Configuration Manager**.
- 3 Right-click **EnvMgr Enablement Kit 2.2** and select **Properties**.
- 4 In the EnvMgr Enablement Kit 2.2 Properties dialog box, click the **Settings** tab.
- 5 In the navigation area for the **Settings** tab, select **Data Mart ETL Setting**. You can change the following configuration properties:

**ACM Number of Days of Raw Records**

specifies the number of days that data collected by the ACM ETL is retained in the raw library. This library contains metric data that has been extracted from the SAS Environment Manager database and has undergone limited transformation. This data is used to provide a pool of historical data to create reporting data sets. The tables in this library are not available to users. They are used internally only by the service architecture as part of the ACM ETL process. The default value is 11 days.

**CAUTION! Do not change this value unless instructed to by SAS Technical Support.**

**Number of Days of Resource Records in Data Mart**

specifies the number of days that metric data that is collected by the ETL processes is retained in the data mart libraries. The default value is 60 days.

**Number of Days of Audit Records to Retain in Data Mart**

specifies the number of days that audit data (from resource activity) that is collected by the ETL processes is retained in the data mart. The default value is 365 days.

**Delay Threshold**

specifies the number of minutes that the ETL process should subtract from the current time to calculate the end of the data extraction time period. For example, if the ACM ETL process runs at 1:00 AM and the Delay Threshold is set to 7, the ETL process queries for all data between the last time it ran and 12:53 AM. This property accounts for data that might be lost because of communication delays between the SAS Environment Manager agent and server.

**CAUTION! Do not change this value unless instructed to by SAS Technical Support.**

**ext**

This is an internal property and should not be changed.

**Datamart Time Zone**

specifies the time zone in which the data was produced. The default value specifies to use the current setting for the SAS option.

- 6** Click **OK** to save your changes. The new settings are applied the next time the ETL process runs.

# 10

## Using the Report Center

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## What is the Report Center?

The Report Center is collection of stored processes that produce reports from data in the SAS Environment Manager Data Mart. These reports are created to provide a view of the performance and status of your SAS environment and its resources and are created to be representative samples of the types of reports that can be produced by the available metric data. You can also create your own reports to meet your individual requirements.

The stored processes in the Report Center are created when you initialize SAS Environment Manager Extended Monitoring. However, the stored processes operate only on data that was stored in the SAS Environment Manager Data Mart by the APM or ACM ETL processes. Unless you initialize and enable one of those packages, no reports are produced.

**Note:** The reports in the Report Center are provided as a best efforts resource to assist in the troubleshooting and performance tuning of your SAS deployment. However, many other factors might influence your user experience, some of which are beyond the monitoring capabilities of SAS Environment Manager. For additional assistance in performance tuning and hardware configuration references, please contact the SAS Professional Services Division.

To access the Report Center, select **Analyze ► Report Center**. The Report Center is displayed in a separate window or tab in your browser. If your browser blocks pop-up windows, you must disable pop-up blocking for SAS Environment Manager. When the Report Center window appears, it is titled Stored Processes.

---

## Use the Report Center

When you open the Report Center, you see three main folders:

## Products

contains most of the stored processes to generate reports based on APM or ACM ETL processes

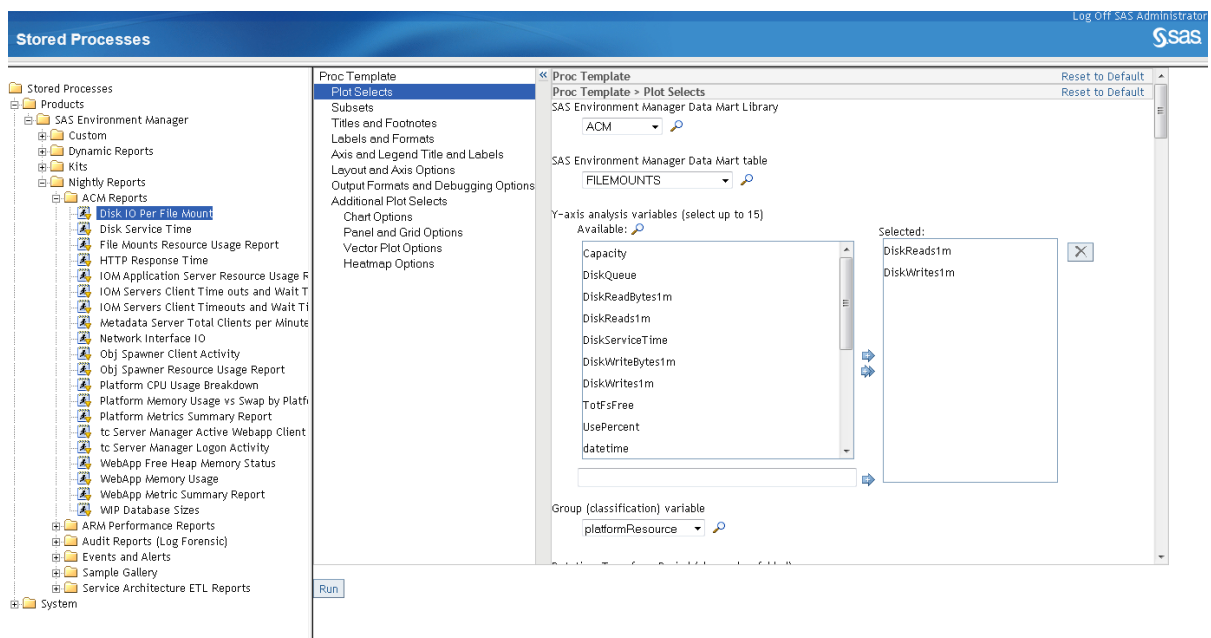
## System

Contains stored processes for ad hoc reports

## user folders

Contains any custom reports that you have created and saved in your user folder

To create a report, expand the folders until you find the stored process that you want to run, and then click on the stored process entry. The viewing pane of the Report Center window displays prompts for the information in the report. The Report Center uses the SAS Stored Process web application, so the window title is Stored Processes.



Use each prompt to select the information required to produce the report. Select the categories of inputs on the left side of the display area to fully customize the report.

The stored processes are based on standard procedures from Base SAS and ODS. Where applicable, the procedures used are indicated on the stored process prompts. Refer to the appropriate Base SAS or ODS documentation for information about specific prompts.

When you have specified all of the information required to produce the report, click **Run** to produce the report. An error message appears if the information that you specified cannot produce a valid report.

**Note:** Some reports might be blank, even though SAS Environment Manager is working properly. If data has not been generated that a report depends on, then the report will be blank. For example, a report that displays metadata activity will contain data only if there has been any activity on the SAS Metadata Server. If a report is blank, you can verify that the report is being generated properly by performing an activity that will generate data for the report. For example, to verify a metadata activity report, you could perform an action that would cause a metadata change, such as creating a user definition in metadata.

---

## Change Report Parameters

You can change global settings (such as font, graph style, and legend options) for the reports in the Report Center.

**CAUTION!** Be careful when changing these parameters. Specifying incorrect values might cause reports to fail. Make a note of any value that you change so that you can return to the original value in case of problems.

To change the report parameters:

- 1 Log on to SAS Management Console.
- 2 On the **Plug-ins** tab, select **Application Management ► Configuration Manager**.
- 3 Right-click **EnvMgr Enablement Kit 2.1** and select **Properties**.
- 4 In the EnvMgr Enablement Kit 2.1 Properties dialog box, click the **Settings** tab.
- 5 Use the pages on the **Settings** tab to change the parameters for the Report Center reports. Some of the settings apply to the SAS Environment Manager Data Mart, rather than only to the reports. Any change that you make in the parameters are applied to all of the reports in the Report Center the next time they are run.



- 6 Click **OK** when you have finished making changes.

---

## Finding the Reports You Need

### Data Mart Reports

These stored processes generate reports that display information about the content of the SAS Environment Manager Data Mart tables, the resources that support the data mart, and the alerts that are defined in the data mart. Some example reports include:

- All Alert Definitions
- ACM Data Mart Server Resources
- Data Mart Proc Contents Full Listing

The reports are located at **Stored Processes ► Products ► SAS Environment Manager ► Dynamic Reports ► Datamart**.

### Metadata Inventory Reports

These stored processes generate reports that display information about the metadata that is stored on the SAS Metadata Server. Some example reports include:

- Groups Roles and Users
- Metadata Content
- Server Properties

The reports are located at **Stored Processes ► Products ► SAS Environment Manager ► Dynamic Reports ► Metadata Inventory**.

## ACM Reports

These stored processes generate reports that display and chart detailed metrics for the computing resources in your environment. They are generated by data from ACM ETL processes. Some example reports include:

- File Mounts Summary Report
- Metadata Server Total Clients per Minute
- Platform Workload 1 Min Average

The reports are located at **Stored Processes ► Products ► SAS Environment Manager ► Nightly Reports ► ACM Reports**.

## APM Reports

These stored processes generate reports that display and chart detailed metrics and information for SAS jobs and processes. They are generated by data from APM ETL processes. Some example reports include:

- Proc Usage
- Server Usage By User
- Workspace Users By Session (Top 10)

The reports are located at **Stored Processes ► Products ► SAS Environment Manager ► Nightly Reports ► APM Performance Reports**.

**Note:** In APM reports, time metrics are charted in seconds and memory and capacity metrics are charted in kilobytes.

## Metadata Audit Reports

These stored processes generate reports that display events recorded in SAS logs. They are generated by data from APM ETL processes. Some example reports include:

- Access Activity Events
- Metadata Client Activity
- Group Changes

The reports are located at **Stored Processes ► Products ► SAS Environment Manager ► Nightly Reports ► Audit Reports (Log Forensic)**.

## **SAS Environment Manager Service Architecture Framework ETL Process Reports**

These stored processes generate reports that display information and metrics about the APM ETL processes. Some example reports include:

- ETL logfile analysis
- Logfile analysis overview report
- Proc Usage Summary

The reports are located at **Stored Processes ► Products ► SAS Environment Manager ► Nightly Reports ► Service Architecture ETL Reports**.

## **Event Reports**

These stored processes generate reports that display information and metrics about the events that are generated and recorded in the data mart. They are generated by data from ACM ETL processes. Some example reports include:

- Event Summary Chart
- Event Summary Counts
- Log Event Triggers

The reports are located at **Stored Processes ► Products ► SAS Environment Manager ► Nightly Reports ► Events and Alerts**.

## Solution Kit Reports

These stored processes generate reports that display information that was stored in the data mart by solution kits. Each kit contains its own set of stored processes and custom reports.

The reports are located at **Stored Processes ► Products ► SAS Environment Manager ► Kits ► *solution kit name***.

## Log File Job Reports

These stored processes generate reports that display information about the jobs and processes used to analyze the SAS logs. They are generated by data from APM ETL processes. Some example reports include:

- Logfile Analysis Overview
- Logfile Summary by Logfile and Jobname
- Proc Usage Summary

The reports are located at **Stored Processes ► Products ► SAS Environment Manager ► Kits ► SASJobs**.

## Sample Reports

These stored processes generate samples of different types of report styles. They are generated by data from APM ETL processes. Some example reports include:

- Pie Chart CPU Usage Profile by Platform
- Daily Resource Usage Summary
- Top 5 Ranked on CPU Usage

The reports are located at **Stored Processes ► Products ► SAS Environment Manager ► Nightly Reports ► Sample Gallery**.

---

## Adding Reports to the Report Center

Although the Service Architecture provides a set of reports that cover many aspects of monitoring a SAS environment, you might want to add your own reports to the Report Center. Because the reports in the Report Center are produced by stored processes, adding a report involves creating a new stored process and registering it in metadata. You can also create your own reports by copying and modifying existing reports.

### Creating a New Report

To create a new report in the Report Center, follow these steps:

- 1 Create a stored process to produce the report that you need. Refer to *SAS Stored Processes: Developer's Guide* for information about creating a stored process.
- 2 Log on to SAS Management Console.
- 3 In the navigation area, click on the **Folders** tab.
- 4 In the Folders area, open the folder **SAS Folders ► Products ► SAS Environment Manager ► Custom**.
- 5 Select **Actions ► New ► Stored Process** to open the **New Stored Process** wizard.
- 6 In the New Stored Process window, specify the name and description of the stored process. In the **Keywords** area, click **New** and specify **Environment Manager** as a new keyword in the **Keywords** dialog box. You must specify this keyword in order for the report to appear in the Report Center. Click **Next** when you are finished.
- 7 Select the application server that will run the stored process, select the source code repository, and specify the file that contains the stored process. Select both the **Stream** and **Package** check boxes in the **Result Capabilities** area.

- 8 Complete the New Stored Process wizard by specifying the stored process parameters, data sources, targets, and authorization. See “Registering the Stored Process Metadata” in *SAS Stored Processes: Developer's Guide* for more information.
- 9 Click **Finish** to close the wizard and register the stored process. After the stored process is registered, it is available in the Report Center.

## Copying and Modifying an Existing Report

To modify a copy of an existing report, follow these steps:

- 1 Log on to SAS Management Console.
- 2 In the navigation area, click on the **Folders** tab.
- 3 In the Folders area, open the folder that contains the stored process for the report that you want to use. Stored processes for the Report Center reports are located in **SAS Folders ► Products ► SAS Environment Manager** and **SAS Folders ► System ► Applications ► SAS Environment Manager ► Ad Hoc Reporting**.
- 4 Select the stored process that you want to modify. Select **Edit ► Copy** to copy the stored process. Open the folder **SAS Folders ► Products ► SAS Environment Manager ► Custom** and select **Edit ► Paste**.
- 5 Select **Actions ► Rename** the copy of the stored process that you just created.
- 6 Select **File ► Properties** to open the Properties window for the stored process. Use the fields in the window to modify the stored process and change the source code if needed.
- 7 When you are finished modifying the stored process, click **OK**. The new report produced by the stored process is available in the Report Center.

---

## Deprecated Reports

The following reports are deprecated, starting with the third maintenance release after SAS 9.4:

- IOM Server Call Activity
- IOM Server Client Activity
- IOM Server Summary Reports
- IOM Total Calls and Time in Calls
- IOM Total Calls vs. Time in Calls

Because the data table used for these reports is also deprecated, these reports should not be used. If these reports are still present after upgrading to the third maintenance release after SAS 9.4, they should be deleted.





# 11

## Using Service Architecture to Perform Common Administration Tasks

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## Usage Tasks

### Monitoring User Activity

To determine which users have accessed specific SAS Application Servers, go to **Report Center ▶ Products ▶ SAS Environment Manager ▶ Nightly Reports ▶ APM Reports ▶ Server Usage By User**.

To determine the number of system accesses per day, per user, go to **Report Center ▶ Products ▶ SAS Environment Manager ▶ Nightly Reports ▶ Audit Reports ▶ Access Activity by UserID and Access Activity Event Summary by UserID**.

To determine which SAS procedures have been run and by which users, go to **Report Center ▶ Products ▶ SAS Environment Manager ▶ Nightly Reports ▶ APM Reports ▶ Proc Usage**.

### Finding User Login Errors

To determine which users have been locked out or have had failed login attempts, and to see how many users are currently logged in, go to **Report Center ▶ Products ▶ SAS Environment Manager ▶ Nightly Reports ▶ Audit Reports ▶ Authentication Error and Login Not Authorized**.

### Evaluating SAS Work Directory Usage

Go to **Resources ▶ Browse ▶ Services** and locate the resource *machine\_name SAS Home Directory 9.4 SAS work directory*. You can also locate this resource as under the *machine\_name SAS Home Directory* server resource.

The metrics for this resource are for the volume that contains the SAS work directory.

The **SAS Work Directory** field in the left corner of the window specifies the name of the SAS work directory on the volume being monitored.

In the charts or table of metric data, check **Total kBytes Free** and **Use Percent** for problems.

You can also use Environment Snapshot. Follow these steps:

- 1 Select **Analyze ► Environment Snapshot**.
- 2 In the **Summary Table** field, select the machine name.
- 3 Select the **Live System Queries** tab, and then select the **Df** tab.
- 4 The **Df Output** table contains the size, amount used, amount available, and percentage used for all directories on the machine. Locate the entry for the directory used for the SAS work directory to determine the usage.

## Evaluating Log Directory Usage

To monitor a directory containing log files, follow these steps:

- 1 Select **Resources ► Browse ► Platforms** and select the platform containing the log directory that you want to monitor.
- 2 On the page for the selected platform, select **Tools Menu ► New Platform Service**.
- 3 On the New Service page, specify the name for the service and specify **FileServer Directory** in the **Service Type** field. Click **OK**.
- 4 The page for the new service automatically appears, with a warning message that the resource has not been configured. Click the **Configuration Properties** link in the warning message.
- 5 Specify the full path to the log directory in the **path** field. Click **OK**.
- 6 The new platform service appears in the Resource table under Services. After the service has had time to collect data, select the service to view its metrics. The Disk Usage and Regular Files metrics are useful for determining the usage of the directory.

## Evaluating Memory Usage on a Host

To determine the memory usage (including total memory, free memory, and swap space usage) for a host in a deployment, select **Resources** ► **Browse** ► **Platforms** and select the platform whose memory you want to check.

On the page for the platform, the **RAM** field (in the upper right) specifies the total memory for the host.

Click on **Metric Data** to view the table of metrics for the host. Use these metrics to evaluate memory usage for the host:

- Total Memory (this value will match the value of the **RAM** field, although **RAM** is specified in MB and Total Memory in GB)
- Used Memory
- Used Memory (–buffers/cache)
- Percent Used Memory
- Percent Free Memory

Use these metrics to evaluate swap space usage:

- Swap Free
- Percent Swap Free
- Percent Swap used

Click on **Indicators** to view these metrics in chart form. The charts are useful for evaluating changes in memory usage over time. If the chart for one or more of the metrics is not displayed, select the **Problem Metrics** field and change the selection to **All Metrics**.

## Evaluating Resource Usage for Hosts

To determine CPU and I/O usage for a host in a deployment, select **Resources** ► **Browse** ► **Platforms** and select the platform whose resources you want to check.

On the page for the platform, the **CPU Speed** field (in the upper left) specifies the number and speed of the processors on the machine.

Click on **Metric Data** to view the table of metrics for the host. Use these metrics to evaluate CPU usage for the host:


- CPU Usage
- CPU Wait
- User CPU
- CPU Idle
- CPU IRQ

Use the File System Read/Writes per Minute metric to evaluate I/O performance over time.

Click on **Indicators** to view these metrics in chart form. The charts are useful for evaluating changes in memory usage over time. If the chart for one or more of the metrics is not displayed, select the **Problem Metrics** field and change the selection to **All Metrics**.

## Evaluating Disk Usage on a UNIX Machine

To determine usage for a file mount on a UNIX machine, follow these steps:

- 1** Select **Resources** ► **Browse** ► **Services**.
- 2** Select **FileServer Mount** in the **All Service Types** field and click the arrow  at the end of the search bar.
- 3** Select the file mount that you want to view.
- 4** Use these metrics to evaluate usage for the file mount:
  - Capacity
  - Total Bytes Used
  - Use Percent

## Evaluating Disk Usage for the postgresQL Database

You might want to check the amount of disk space used by the entire Postgres database or by individual databases. The ones that are of the most interest are SharedServices (which is the web interface platform database) and EVManager (which is the SAS Environment Manager database).

**Note:** PostgreSQL metrics cannot be collected unless you supply a user ID and password for the postgresQL resource.

To check the space used by a postgresQL database, select **Resources ► Browse ► Servers**. Select the server resource ***machine\_name* PostgreSQL 9.x localhost:9432** in the table.

In the Services area, select the entry for the database that you want to view. Use the Data Space Used metric to evaluate the amount of space used by the database.

## Evaluating Disk Usage on a Windows Machine

To determine usage on a Windows machine, follow these steps:

- 1 Select **Resources ► Browse ► Platforms**.
- 2 Select the Windows machine whose disk usage you want to view.
- 3 In the page for the selected machine, select a **File System (drive:) local/NTFS** entry in the **Platform Services Health** area.
- 4 Use these metrics to evaluate disk usage:
  - Capacity
  - Total Bytes Free
  - Use Percent

## Resource Health and Status Tasks

### Determining Whether a Server Has Been Down

To determine whether a server has been down, go to **Resources** ► **Browse** ► **Servers** and select the server whose availability you want to check.

On the page for the server, an availability bar is displayed above the metric charts. The availability bar displays a color-coded dot that represents the availability during a time slice. The length of each time slice depends on the display range that you select (for example, if you display the past eight hours of data, each dot corresponds to approximately eight minutes). The percentage of time that the resource was available is displayed at the end of the availability bar.

The dots are color-coded using the following format:

Green

100% availability

Yellow

Partial availability; between 0% and 100%

Red

0% availability

An availability bar such as the one in the following figure shows that the resource fluctuated between being available, partially available, and unavailable over the most recent time slices.



By default, the availability bar displays information for the past eight hours. To change the display range for the availability bar (as well as the metric charts), select new values

in the **Metric Display Range** fields. You can select display ranges from four minutes to 120 days.

You can use this same process to check the availability of any resource.

## Finding Long-Running Stored Processes

To find stored processes that have been running for a long time, go to **Report Center ► Products ► SAS Environment Manager ► Nightly Reports ► APM Reports ► Stored Process Average Response Time**. This report displays the average response time for each stored process. A stored process with a high average response time is an indication of a long-running stored process.

You can also go to **Report Center ► Products ► SAS Environment Manager ► Nightly Reports ► APM Reports ► Artifact Consumption Statistics**. This report displays statistics for the stored processes in the Report Center. Use the `maxElapsedTime` column to find long-running stored processes.

## Monitoring Stored Process Performance

To evaluate the performance of stored processes, refer to the report **Report Center ► Products ► SAS Environment Manager ► Nightly Reports ► APM Reports ► stp Avg Response Time**.

---

# System Configuration Tasks

## Tracking Changes to Configuration Files

You can use SAS Environment Manager to track changes to configuration files for a resource. However, configuration file tracking is not enabled by default. To turn on configuration file tracking for a resource, follow these steps:

- 1 Select **Resources ► Browse ► Platforms or Servers**.
- 2 Select the resource whose changes in configuration files you want to track.



- 3** On the page for the resource, select **Edit** in the **Configuration Properties** area.
- 4** On the Configuration Properties page, select the ***resource\_type.config\_track.enable*** check box. This option turns on configuration file tracking.
- 5** Specify the files that you want to track in the ***resource\_type.config\_track.files*** field. Separate entries with a comma. You can use regular expressions when specifying files. Refer to the Help text at the bottom of the page to determine the directory where relative paths resolve.

## Identifying Inactive Users

SAS Environment Manager identifies users as inactive if they have not logged on in at least 60 days. To identify these users, go to **Report Center ► Products ► SAS Environment Manager ► Nightly Reports ► Audit Reports ► Metadata Client Activity**. This report lists all user logon activity, and identifies inactive users.

## Finding Your SAS License Expiration Date

To determine the date on which your SAS site license expires, go to **Resources ► Browse ► Platforms ► SAS 9.4 Application Server Tier**. The **License Expiration** field displays the expiration date for your SAS site license. You must be logged in as an administrator to view this information.

You can also select **Analyze ► Environment Snapshot**. Specify the system in the **Summary Table** field, and then select the **SAS** tab and the **License** subtab. This tab displays the number of days until license expiration, termination warning, and termination.



# 12

## Working With Commands

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---

## Performing Functions By Using a Command Line

### Overview

You can issue commands to call SAS Environment Manager script files, which enable you to perform actions such as running the ETLs, installing kits, or enabling new HTTP checks. The files (.sh files for UNIX and .bat files for Windows) are provided in the directory `[levelroot]/Web/SASEnvironmentManager/emi-framework/bin` (UNIX) or `[Levelroot]\Web\SASEnvironmentManager\emi-framework\bin` (Windows). Some commands are for commonly used functions, and others are for utilities or functions that are used infrequently. The following commands are provided:

#### ■ commonly used commands

- `emi_init`
- `master_acm_etl`
- `master_apm_etl`

- ☐ validate
- **utility commands**
  - ☐ agentClone
  - ☐ apm\_init
  - ☐ create\_event
  - ☐ create\_http\_checks
  - ☐ ev\_kit\_installer
  - ☐ exportDataMart
  - ☐ fedInit
  - ☐ runSASJob
  - ☐ updateFedDataMart
  - ☐ ugiplnit

Specify the `-h` option on any command to display the Help.

**Note:** The `/emi-framework/bin` directory contains additional commands that are not documented in this chapter. These commands are used by internal SAS Environment Manager processes, and are not intended to be run separately. Do not run these undocumented commands unless directed to by SAS Technical Support.

## Working with Commonly Used Commands

### Initializing the EMI Framework Using `emi_init`

Use the `emi_init` command to initialize the EMI framework (provided as part of extended monitoring), or to enable the ACM ETL, APM ETL, or solution kits ETL. Issue this command as part of the process of initializing and enabling the components of the Service Architecture. See [Chapter 9, “Initializing and Enabling the Service Architecture,” on page 111](#) for more information about using this command.

The syntax of the command is: `emi_init(.sh|.bat) [-dfhisv] [(--enable|  
--disable) <ACM,APM,ALL>] [--vafeed <ON|OFF>] [--resetDB --  
resetFlags]`

Options are:

- d (--debug)  
enables debug output
- f (--force)  
re-initializes the framework and overwrites settings
- h (--help)  
displays help for the command
- i (--initialize)  
initializes the framework
- s (--status)  
reports the operational status of the EMI framework
- v (--verbose)  
enables verbose output
- --enable <[APM,ACM,ALL]>  
specifies the components to enable. ALL enables the APM, ACM, and solution kits ETL.
- --disable <[APM,ACM,ALL]>  
specifies the components to disable. ALL disables the APM, ACM, and solution kits ETL.
- vafeed <ON|OFF>  
enables or disables the nightly feed of data mart tables to a drop zone directory, where they are autoloaded into SAS Visual Analytics
- resetDB  
resets the data mart and purges all data; you cannot recover the data after issuing this command

**Note:** If you run the command `emi_init -f --resetDB`, you must restart your SAS Application servers. If you do not restart the servers, logs are collected without the original header information for the logs. In order for the ETL process to be able to fully parse and characterize the contents of the log files, the header information must be present.

`--resetFlags`

resets the flags that identify the components that have been initialized and enabled

## Running the APM ETL Processes By Using `master_apm_etl`

The APM ETL processes are specified to run at 1 AM by default (this time can be changed in SAS Environment Manager). Use the `master_apm_etl` command if you want to run the processes manually or at another time. The command runs the processes to extract the information from the SAS logs and load it into the data mart. You can use a scheduler to issue the command at a specified time to run the ETL processes at a time other than the default. You can also issue the command yourself to run the processes immediately. However, because the SAS logs roll over at midnight, whenever the ETL processes run after midnight, they always use the same data that was collected during the previous 24 hours.

Although you can run the ETL process at any time, the reports use data from the last time the ETL process was run.

The syntax of the command is: `master_apm_init(.sh|.bat) [-dhv --evdebug <0-3>]`

Options are:

`-d (--debug)`

enables debug output

`-h (--help)`

displays help for the command

`-v (--verbose)`

enables verbose output

`--evdebug <0-3>`

specifies the debug level for SAS sessions

## Running the ACM ETL Processes Using `master_acm_etl`

The ACM ETL processes are specified to run at 12 midnight by default (this time can be changed in SAS Environment Manager). Use the `master_acm_etl` command if you want to run the processes manually or at another time. The command runs the processes to extract the ACM data and load it into the data mart. You can use a scheduler to issue the command at a specified time to run the ETL processes at a time other than the default. You can also issue the command yourself to run the processes immediately.

Although you can run the ETL process at any time, the reports use data from the last time the ETL process was run.

The syntax of the command is: `master_acm_init(.sh|.bat) [-dhv --evdebug <0-3>]`

Options are:

- `-d (--debug)`  
enables debug output
- `-h (--help)`  
displays help for the command
- `-v (--verbose)`  
enables verbose output
- `--evdebug <0-3>`  
specifies the debug level for SAS sessions

## Validating the SAS Environment Manager Framework By Using `validate`

Use the `validate` command to validate the structure of the SAS Environment Manager framework and to find any errors or changes. This command runs during the initialization process to verify that the framework is correct before anything new is added. The command has four levels:

- 1  
verifies that the command-line interface is functioning properly

- 2  
validates connections to the SAS execution environment and the SAS Environment Manager server
- 3  
verifies that the framework is initialized and functioning properly and that all enabled ETL components are running successfully
- 4  
checks all of the files associated with SAS Environment Manager that should not be changed and notes any changes to any of these files

The syntax of the command is: `validate(.sh|.bat) [-qvdh] [-l <1|2|3|4>] [-p| --userPolicy <IGNORE|WARN|ERROR>]`

Options are:

- q (--quiet)  
specifies that the command should run in quiet mode
- v (--verbose)  
enables verbose output
- d (--debug)  
enables debug output
- h (--help)  
displays help for the command
- l --level <1|2|3|4>  
specifies the level of validation to perform; default value is 1
- p --userPolicy <IGNORE|WARN|ERROR>  
specifies the policy if the current user does not match the install user



## Working with Utility Commands

### Cloning an Agent By Using agentClone

Use the `agentClone` command to create a machine-neutral bundle (TAR or ZIP) file of the SAS Environment Manager agent. This script enables SAS Environment Manager to monitor machines in your environment that do not have SAS deployed on the machines (such as grid nodes, machines that contain databases used by SAS, or machines in a Hadoop cluster).

To use this script to monitor a machine in your environment, follow these steps:

- 1** Use the `agentClone` script to create the TAR or ZIP bundle.
- 2** Copy the bundle file to a server (such as a SAS grid server) that is not part of the standard SAS environment installed by the SAS Deployment Wizard. This machine is referred to as the target machine in this procedure.
- 3** Extract the file.
- 4** Verify that the directory `/agent/Logs` exists on the target machine. Create the directory if it does not exist.
- 5** Compare the values for `JAVA_HOME` and `JAVA_HQ_HOME` on the target machine against the values on the SAS Environment Manager server. If the values are different on the target machine, change the values in the files `hq-agent(.sh|.bat)` and `hq-agent.nowrapper(.sh|.bat)` on the target machine so that they match the value on the SAS Environment Manager server.
- 6** Start the agent on the target machine. When you start the agent, it automatically registers with the SAS Environment Manager server.

If you change the password for the `sasevs@saspw` account on the SAS Environment Manager server, you must update the password value in the `agent.setup.camPword` property in the `agent.properties` file on the target machine.

The syntax of the command is: `agentClone(.sh|.bat) [-vdh] [--javahome <javahome>] [--sasconfig <sasconfig>] [--sashome <sashome>] [-t <Minimal|Select>] [-w <workingDir>] [bundlefile]`

Options are:

- v (--verbose)  
enables verbose output
- d (--debug)  
enables debug output
- h (--help)  
displays help for the command
- javahome <javahome>  
specifies the default location of Java for the agent bundle
- sasconfig <sasconfig>  
specifies the SAS root level directory for the agent bundle
- sashome <sashome>  
specifies the SAS home directory for the agent bundle
- t (--type) <Minimal|Select>  
specifies whether certain plug-ins are included (Select) or omitted (Minimal) to minimize the size of the clone file and the memory required
- w (--workdir) <workingDir>  
specifies the directory to use when constructing the TAR or ZIP file
- bundlefile*  
specifies the name of the TAR or ZIP file that contains the clone of the SAS Environment Manager agent

## Initializing the APM Processes By Using `apm_init`

Use the `apm_init` command to initialize the APM ETL processes. Manual steps are also required after you run this command. See [“Enabling and Initializing the APM ETL” on page 116](#) for complete information about the initialization process.

The syntax of the command is: `apm_init(.sh|.bat) [-fvdh --hostAlias]`

Options are:

- d (--debug)  
enables debug output
- f (--force)  
forces configuration to occur, even if a previous version of APM is found, or if APM has already been initialized
- h (--help)  
displays help for the command
- hostAlias  
specifies the host alias for the machine
- v (--verbose)  
enables verbose output

## Creating an Event By Using create\_event

Use the `create_event` command to manually create a SAS Environment Manager event. After it is created, the event appears in the SAS Environment Manager Event Center.

The syntax of the command is: `createEvent(.sh|.bat) [-vdh] [-f <file>] [-l <INFO|WARN|ERROR>] [-s <source>]`

Options are:

- v (--verbose)  
enables verbose output
- d (--debug)  
enables debug output
- h (--help)  
displays help for the command
- f (--file) <file>  
specifies the event file

**-l (--level) <INFO|WARN|ERROR>**

specifies the level of the event to create (INFO is the default value)

**-s (--source)source**

specifies the source of the event

## Creating an HTTP Check By Using `create_http_checks`

Use the `create_http_checks` command to create an HTTP check service based on the definitions in the file `httpChecks.json`. This file contains all of the predefined HTTP check definitions, but not all of these definitions are created by default. To create one of the definitions:

- 1 After you have initialized the framework (part of the extended monitoring initialization), edit the file `[levelroot]/Web/SASEnvironmentManager/emi-framework/Conf/httpChecks.json` (UNIX) or `[Levelroot]\Web\SASEnvironmentManager\emi-framework\Conf\httpChecks.json` (Windows).
- 2 Locate the entry for the HTTP check that you want to create. This is an example entry:

```
{
  "name": "HTTP Check for SASTheme_default",
  "desc": "[Auto-Generate] HTTP Monitoring URL: /SASTheme_default",
  "enable": "false",
  "method": "GET",
  "port": "7980",
  "sotimeout": "30",
  "platform": "ptnode19.ptest.sas.com",
  "path": "/SASTheme_default",
  "follow": "true",
  "pattern": "SASTheme_default"
},
```

- 3 Change the value of the `enable` parameter from `false` to `true`. `"enable": "false",`
- 4 Save the `httpChecks.json` file.
- 5 Run the `create_http_checks` command.

To verify that the service has been created, sign on to SAS Environment Manager and select **Browse ► Services**. The new HTTP check service is listed,

The syntax of the command is: `create_http_checks(.sh|.bat) [-fxvdh] [-t <taskfile>]`

Options are:

- t (--taskfile) <taskfile>  
specifies that the HTTP checks should not be generated, but should be based on the specified JSON task file
- f (--force)  
re-initializes the HTTP checks and overwrites settings
- x (--noexit)  
specifies that the Java virtual machine should not exit after the command is completed
- v (--verbose)  
enables verbose output
- d (--debug)  
enables debug output
- h (--help)  
displays help for the command

## Installing a Solution Kit By Using `ev_kit_installer`

Solution kits provide customized metrics and reports to support specific SAS solutions and applications. Use the `ev_kit_installer` command to install new solution kits.

The syntax of the command is: `ev_kit_installer(.sh|.bat) [-fvdh] [-k <kitname|ALL>]`

Options are:

- f (--force)  
replaces the existing kit configurations

- v (--verbose)  
enables verbose output
- d (--debug)  
enables debug output
- h (--help)  
displays help for the command
- k (--kitName) <kitname|ALL>  
specifies the name of the kit to install, or that all kits should be installed

## Exporting Data Mart Contents By Using `exportDataMart`

You can set up a federated data mart, which merges data from the data marts of several contributor deployments into the data mart of a host deployment. See [“Creating a Federated Data Mart” on page 104](#) for complete information. Although you can set up an automatic nightly process to export the changes in a contributor’s data mart, there might be instances when you might want to export the entire contents of the data mart. For example, when you first set up the federated data mart, you can run a complete export to ensure that the federated data mart is complete.

The syntax of the command is: `exportDataMart (.sh|.bat) --deploymentID (altDeployment_ID) --runID (altRun_ID)`

Options are:

- `--deploymentID altDeployment_ID`  
specifies an alternate deployment identifier. This option is useful in cases where multiple deployments use the same deployment identifier.
- `--runID altRun_ID`  
specifies an alternate identifier for the export job. The identifier is used in the filename of the TAR file that contains the exported data mart data.

## Initializing a Federated Data Mart By Using `fedInit`

Use the `fedInit` command to create and initialize a federated data mart. Run this script on the machine that will host the federated data mart directories. After you run this script, you must perform additional steps in order to implement the federated data mart. See [“Creating a Federated Data Mart” on page 104](#) for instructions.

The syntax of the command is: `fed_init(.sh|.bat) [-vdh] [--resetDB]`

Options are as follows:

- v (--verbose)  
enables verbose output.
- d (--debug)  
enables debug output.
- h (--help)  
displays help for the command.
- resetDB  
resets the federated data mart by purging all of the existing data.

**CAUTION!** If you use the --resetDB option, the deleted data cannot be recovered.

## Accessing SAS Environment Manager with a SAS Job By Using runSASJob

Use the `runSASJob` command to run a SAS program with the SAS autoexec and environment necessary for the program to access the data mart and the EMI framework.

**CAUTION! Do not run this command unless directed to by SAS Technical Support. Running this command incorrectly could corrupt the data mart and cause loss of data.**

The syntax of the command is: `runSASJob(.sh|.bat) [-bdhv] [--args <args>] [--autocall <autocall_dir>] [--autoexec <(BATCH|APM|KITS|STP) | <autoexec_file>] [--config <config_file>] [--evdebug <0-3>] [--log <log_results_file>] [--nodms] [--printfile <output_file>] [--work <saswork_dir>] [--workdir <working_dir>]`

Options are:

- b (--batch)  
specifies that the SAS program runs in batch mode (with the SAS options -batch -noterminal)

- d (--debug)  
enables debug output
- h (--help)  
displays help for the command
- v (--verbose)  
enables verbose output
- args <args>  
specifies any SAS command line arguments to be appended to the SAS invocation command
- autocall <autocall\_dir>  
specifies the autocall directory to use
- autoexec <(BATCH|STP) | <autoexec\_file>  
specifies whether to use a defined autoexec file (such as BATCH or STP) or a specified autoexec file
- config <config\_file>  
specifies a custom configuration file to use
- evdebug <0–3>  
specifies the debug level for the SAS session
- log <log\_results\_file>  
specifies the file to contain the log results
- nodms  
specifies that SAS should run in line mode with the framework enabled
- printfile <output\_file>  
specifies the output file for SAS procedures
- work <saswork\_dir>  
specifies the SAS Work directory
- workdir <working\_dir>  
specifies the relative working directory (or parent path) used when running a SAS program



## Importing Contributing Data Mart Contents By Using `updateFedDataMart`

You can set up a federated data mart, which merges data from the data marts of several contributor deployments into the data mart of a host deployment. See [“Creating a Federated Data Mart” on page 104](#) for complete information. The contributor deployments export data from their data marts (contained in a TAR file) through automatic or manual processes. After the data is exported, you must copy it to the `emi-framework/LandingZone/FedDataMart` directory on the host deployment. After the files are in this directory, you can run the `updateDataMart` script to load the data from the contributor deployments into the federated data mart. By default, the script imports all files that are in the `LandingZone` directory that follow the naming convention `SASEVDM_EXPORT#deployID#runID.tar`.

The syntax of the command is: `updateFedDataMart(.sh|.bat) --inputfile (filename) --altDeployID (override_ID) --altDeployLabel (override_label)`

Options are:

`--inputfile filename`

specifies a filename to import, rather than having the script search the directory.

`--altDeployID override_ID)`

specifies an alternate deployment identifier for the file specified by the `--inputfile` option.

`--altDeployLabel override_label`

specifies an alternate deployment label for the file specified by the `--inputfile` option.

## Updating a Modified Data Mart By Using `ugipInit`

If you modified your service architecture and updated to SAS Environment Manager 2.5, you must make manual changes to the service architecture, then run the `ugipInit` command. See [“Updating the Service Architecture in SAS Environment Manager 2.5” on page 119](#) for complete information.

The syntax of the command is `ugipInit.(sh|.bat).`

**CAUTION!** This command is normally run automatically as part of the upgrade process. Do not run this command unless directed to by SAS Technical Support.





# Part 3

## Appendixes

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# Appendix 1

## Installing SAS Environment Manager in a SAS Grid

If you are installing SAS Environment Manager in a grid environment where more than one grid machines share a configuration directory, you must perform manual configuration steps so that the SAS Environment Manager agents point to the correct machine. A script is available on [support.sas.com](http://support.sas.com) to automate this process. The manual steps are provided below.

The following procedure is for two grid machines running on UNIX. Follow these steps:

- 1 Stop the SAS Environment Manager agent running on the SAS Grid Control server.

```
$SAS_config/Web/SASEnvironmentManager/agent-5.8.0-EE/bin/hq-agent.sh stop
```

- 2 Create a target directory for the SAS Environment Manager agent on a grid node.

```
mkdir -p $SAS_config/Web/SASEnvironmentManager/grid/$grid_node
```

*grid\_node* is the name of a grid node machine.

- 3 Copy the agent directory structure from the SAS Grid Control server into the target directory on the grid node

```
cp -pr $SAS_config/Web/SASEnvironmentManager/agent-5.8.0-EE  
$SAS_config/Web/SASEnvironmentManager/grid/$grid_node
```

- 4 Remove the agent **data/** directory on the grid node machine.

```
rm -rf $SAS_config/Web/SASEnvironmentManager/grid/$grid_node/agent-5.8.0-EE/data
```

- 5 Create a backup of the agent property file on the grid node machine.

```
mv $SAS_config/Web/SASEnvironmentManager/grid/$grid_node/agent-5.8.0-EE/conf/agent.properties  
$SAS_config/Web/SASEnvironmentManager/grid/$grid_node/agent-5.8.0-EE/conf/agent.properties.orig
```

**6** Update the agent property file on the grid node machine.

```
sed "s/^agent.setup.agentIP=.* /agent.setup.agentIP=$grid_host/"  
$SAS_config/Web/SASEnvironmentManager/grid/$grid_node/agent-5.8.0-EE/conf/agent.properties.orig >  
$SAS_config/Web/SASEnvironmentManager/grid/$grid_node/agent-5.8.0-EE/conf/agent.properties
```

**7** Create a backup of the SAS custom agent property on the grid node machine.

```
mv $SAS_config/Web/SASEnvironmentManager/grid/$grid_node/agent-5.8.0-EE/conf/sas.properties  
$SAS_config/Web/SASEnvironmentManager/grid/$grid_node/agent-5.8.0-EE/conf/sas.properties.orig
```

**8** Link the SAS custom agent property file to the original custom agent property file on the grid node machine.

```
ln -s $SAS_config/Web/SASEnvironmentManager/agent-5.8.0-EE/conf/sas.properties  
$SAS_config/Web/SASEnvironmentManager/grid/$grid_node/agent-5.8.0-EE/conf/sas.properties
```

**9** Repeat steps 2 through 8 for all grid mode machines.

**10** Start the SAS Environment Manager agent on the SAS Grid Control server.

```
$SAS_config/Web/SASEnvironmentManager/agent-5.8.0-EE/bin/hq-agent.sh start
```

See *Grid Computing in SAS* for information about using SAS Environment Manager to monitor and control grid resources.

# Appendix 2

## Troubleshooting

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### Resolving Problems with SAS Environment Manager

**When you add auto-discovered resources into the inventory, you might see the following error message**

```
Unable to import platform :
org.hyperic.hq.common.SystemException:
org.hibernate.ObjectNotFoundException:No row the the given
identifier exists: [org.hyperic.hq.autoinventory.Allp#10001]
```

Purge the AIQ data in the SAS Environment Monitor database. Follow these steps:

- 1** Select **Manage** ► **HQ Health** ► **Database tab**
- 2** Select **Purge AIQ Data** from the **Action** menu.

These messages appear:

- DELETE FROM EAM\_AIQ\_IP: 0 rows

- DELETE FROM EAM\_AIQ\_SERVICE: 0 rows
- DELETE FROM EAM\_AIQ\_SERVER: 0 rows
- DELETE FROM EAM\_AIQ\_PLATFORM: 0 rows

### 3 Restart the agents.

**If you add a resource that has been discovered but does not have any availability information to an Availability Summary portlet, the portlet will never display any information for the resource. The server log contains this information:**

- 1 On the **Resources** tab, delete the platform that contains the resource.
- 2 Stop the agent.
- 3 Delete the tokendata, keystore, and keyvals files from the directory `<SAS-configuration-directory>/Lev2/Web/SASEnvironmentManager/agent-5.8.0-EE/data`.
- 4 Issue the command `hq-agent.bat/sh restart` from the command console.

### **Connections for gathering metrics and performing health checks might cause problems with SAS IOM servers.**

The direct connections that SAS Environment Manager makes with some SAS IOM servers (such as SAS workspace servers, SAS stored process servers, and SAS object spawners) might cause problems with server operations. Examples of these problems include the following:

- SAS Environment Manager starting jobs that never complete on SAS pooled workspace servers and SAS stored process servers
- SAS stored process servers attempting to start every minute and failing each time

To prevent these problems, follow these steps to disable the metric collection processes that might cause problems.

#### 1 Select **Manage ► Monitoring Defaults**



- 2 In the **Server Types** table on the Monitoring Defaults page, select **Edit Metric Template** for the entry **SAS Object Spawner 9.4 SAS Workspace Server**.
- 3 Select the **Availability** check box, and then select **Disable Collection**. Select **OK** when you are asked to confirm the change.
- 4 On the Monitoring Defaults page, select **Edit Metric Template** for the entry **SAS Object Spawner 9.4 SAS Stored Process Server**.
- 5 Select the **Availability** check box and the **Utilization** check box (which also selects the check boxes under the **Utilization** heading), and then select **Disable Collection**. Select **OK** when you are asked to confirm the change.
- 6 In the **Server Types** table on the Monitoring Defaults page, select **Edit Metric Template** for the entry **SAS Object Spawner 9.4 SAS Pooled Workspace Server**.
- 7 Select the **Availability** check box, and then select **Disable Collection**. Select **OK** when you are asked to confirm the change.

**If you are using Microsoft Internet Explorer, newly created folders might not show up in the folder tree.**

To ensure that new folders appear, from the Internet Explorer menu, select **Tools ► F12 Developer Tools**. From the Internet Explorer **Developer Tools** menu, select **Cache ► Always refresh from server**.

**If you cause an error when you rename a folder (because, for example, you used invalid characters in the name or specified a blank name), the folder is not saved and the Validate Result dialog box appears.**

To view details about the error, click the text **Basic Properties page failed** in the dialog box.

**When you configure the SAS Environment Manager Server, SSL 3.0 is enabled by default. SSL 3.0 is vulnerable to the POODLE security attack.**

To disable SSL 3.0 in the SAS Environment Manager Server, follow these steps:

- 1 Open the server.xml file that is in the directory `server-5.0.0-EE/hq-engine/hq-server/conf` under the SAS Environment Manager directory.
- 2 Locate the `<Connector>` element that specifies `SSLEnabled="true"`
- 3 Specify the `sslProtocols` parameter in the `<Connector>` element.  

```
<Connector ... sslProtocols="TLSv1,TLSv1.1,TLSv1.2"/>
```
- 4 Save the file and restart the SAS Environment Manager Server.

**Note:** Depending on your release of SAS Environment Manager, the `sslProtocols` parameter might already be specified. If this is the case, SSL 3.0 is already disabled and you do not need to take any further action.

### The User Manager might not appear when you are using SAS Environment Manager with Microsoft Internet Explorer version 9 or version 11.

If you are using Microsoft Internet Explorer version 9, follow these steps:

- 1 From the Internet Explorer menu bar, select **Tools ► F12 developer tools**. The developer tools area appears at the bottom of the window.
- 2 In the menu bar of the developer tools area, locate the **Developer Tools** entry.
- 3 If the entry appears as **Developer Tools: Quirks**, click on the entry and select **Internet Explorer 9 standards** from the pop-up menu.
- 4 From the developer tools menu bar, select **File ► Exit**.

If you are using Microsoft Internet Explorer version 11, follow these steps:

- 1 Select the **Tools** icon in the upper right corner of the Internet Explorer window to display the **Tools** menu.
- 2 Select **Compatibility View settings** from the **Tools** menu.
- 3 In the Compatibility View Settings window, clear the check box **Display intranet sites in Compatibility View**.

- 4 Close the Compatibility View Settings window.

---

## Resolving Problems with SAS Environment Manager Agents

**When you try to configure the SAS Environment Manager Agent, it does not start and you receive the error message** `No token file found, waiting for Agent to initialize`

- 1 Stop the SAS Environment Manager agent.
- 2 Verify that the agent wrapper processes and the agent Java processes have stopped.
- 3 On the W6X platform, verify that the directory `%SystemRoot%/TEMP` exists. Remove the file `%SystemRoot%/TEMP/agent.encrypt.lock`.

On all other UNIX platforms, search for the `java.io.tmpdir` environment variable in the agent wrapper process and the agent Java process. By default, the value of the variable will be set to the `/tmp` or `/var/tmp` directory. If the variable exists, remove the file `agent.encrypt.lock` under the specified directory.

**The agent.log file contains the message** `java.lang.OutOfMemoryError: GC overhead limit exceeded`

Include these JVM options in the start-up script for each agent:

```
-XX:NewRatio=8
-XX:+CMSClassUnloadingEnabled
-XX:+UseTLAB
-XX:+UseCompressedOops
```

Modify the file `SAS-configuration_directory/LevX/Web/SASEnvironmentManager/agent-5.8.0-EE/bundles/agent-5.8.0/bin/hq-agent.sh` or `hq-agent.bat` and add these JVM options to the `CLIENT_CMD` variable:

```
CLIENT_CMD="$ {HQ_JAVA} \
```

```
-D${AGENT_INSTALL_HOME_PROP}=${AGENT_INSTALL_HOME} \
-D${AGENT_BUNDLE_HOME_PROP}=${AGENT_BUNDLE_HOME} \
-XX:NewRatio=8 \
-XX:+CMSClassUnloadingEnabled \
-XX:+UseTLAB \
-XX:+UseCompressedOops \
-cp ${CLIENT_CLASSPATH} ${CLIENT_CLASS}"
```

**After the agent successfully starts, some agent properties might get encrypted. If the agent cannot read the agent.scu file (which contains the encryption keys), it cannot decrypt the properties. The agent will not start and the agent.log or the wrapper.log file contains the error**

```
org.jasypt.exceptions.EncryptionOperationNotPossibleException.
```

- 1** Stop the SAS Environment Manager agent.
- 2** In the directory `SAS-configuration/Lev2/Web/SASEnvironmentManager/agent-5.8.0-EE`, delete the `/data` directory.
- 3** In the directory `SAS-configuration/Lev2/Web/SASEnvironmentManager/agent-5.8.0-EE/conf`, delete the `agent.scu` file.
- 4** Modify the encrypted property to a plain text value. In the file `SAS-configuration/Lev2/Web/SASEnvironmentManager/agent-5.8.0-EE/agent.properties`, set the property `agent.setup.camPword` to a plain text value (if it is encrypted, it will appear as `ENC(XXXXXXXXXX)`).
- 5** In the file `SAS-configuration/Lev2/Web/SASEnvironmentManager/agent-5.8.0-EE/auto-approve.properties`, change all values to `True`.
- 6** Restart the agent.

**On Windows, if you use Windows Services to stop the Hyperic Agent service, you will receive the error message** Windows could not stop the SAS[SAS94-Lev1] SAS Environment Manager Agent on Local Computer. **Clicking OK in the error message dialog box seems to stop the service, but the System Event Log contains the error** The SAS [SAS94-Lev1] SAS Environment Manager Agent service terminated with service-specific error Incorrect function..

Use the command line, rather than Windows Services, to stop the agent. The command to stop the agent is `<sas_configuration_directory>/Lev2/Web/SASEnvironmentManager/agent-5.8.0-EE/bin/hq-agent.bat stop`.

---

## Resolving Problems with SAS Environment Manager Plugins

**After a PostgreSQL server is added into inventory, the Dashboard page indicates that the resource is not configured properly**

In order to monitor this resource, you must provide PostgreSQL credentials in the resource definition. If you choose to not provide these credentials, the resource will not be monitored, but SAS Environment Manager will otherwise operate normally. The information that you specify depends on the type of PostgreSQL server that was added. If you choose to provide credentials, go to the Configuration Properties page for the server and specify this information:

postgresql.user

specify the user name for the PostgreSQL server. The user name that you specify differs, depending on the type of PostgreSQL server. Specify one of the following:

Web Infrastructure Platform Data Server

specify the Web Infrastructure Platform Data Server database user name. This user was created during installation. The default value is dbmsowner.

Job Monitor Data Server

specify the Job Monitor Data Server database user name. This user was created during installation. The default value is jmdbuser.

Data Remediation Data Server

specify the Data Remediation Data Server database user name. This user was created during installation. The default value is rmdbuser.

Data Management Data Server

specify the Data Management Data Server database user name. This user was created during installation. The default value is dmbdnadmin.

**postgresql.pass**

specify the password for the user name

**postgresql.program**

specify the path to the postgres.bat or postgres.sh file (on UNIX); or the postgres.exe or postgres.bat file (on Windows). The path that you specify depends on the type of PostgreSQL server. Specify one of the following values:

**Web Infrastructure Platform Data Server**

`/opt/sas/Lev1/SASWebInfrastructurePlatformDataServer/  
webinfdsvrc.sh` (UNIX) or `<SAS_Configuration_Directory>  
\Lev1\SASWebInfrastructurePlatformDataServer\webinfdsvrc.bat`  
(Windows)

**Job Monitor Data Server**

`/opt/sas/Lev1/JobMonitorDataServer/jobmnrdsvrc.sh` (UNIX) or  
`<SAS_Configuration_Directory>\Lev1\JobMonitorDataServer  
\jobmnrdsvrc.bat` (Windows)

**Data Remediation Data Server**

`/opt/sas/Lev1/DataRemediationDataServer/dmrmdtdsvrc.sh` (UNIX)  
or `<SAS_Configuration_Directory>  
\Lev1\DataRemediationDataServer\dmrmdtdsvrc.bat` (Windows)

**Data Management Data Server**

`/opt/sas/Lev1/DataManagementDataServer/dmdsvrc.sh` (UNIX) or  
`<SAS_Configuration_Directory>\Lev1\DataManagementDataServer  
\dmdsvrc.bat` (Windows)

**On the AIX platform, the Apache Tomcat 6.0 server Resource page displays the**

**error** This resource is turned off or has not been configured properly. The problem is: Invalid configuration: Error contacting resource: Can't connect to MBeanServer url.

- 1 Open the file `SAS_configuration_directory/Lev1/Web/SASEnvironmentManager/server-5.8.0-EE/hq-engine/hq-server/conf/hq-catalina.properties` and find the `jmx.url` port number. The default value is 1099.

**2** On the Configuration Properties page for the server, specify the following property:

```
jmx.url
service:jmx.rmi:///jndi/rmi://localhost:port_number
```

**On the H6I platform, no tcServer instances can be discovered.**

HPUX has a limit of 1020 characters on command line queries. The parameters that the tcServer plugin uses to identify the tcServer process are not seen by the agent because they fall after the 1020 character limit has been reached. Edit the start-up script so that the parameters that the plugin needs are seen before the 1020 character limit.

Edit the catalina.sh script. Change this section of the script:

```
eval \"$_RUNJAVA\" \"$LOGGING_CONFIG\" $JAVA_OPTS $CATALINA_OPTS \
-Djava.endorsed.dirs=\"$_JAVA_ENDORSED_DIRS\" -classpath \"$_CLASSPATH\" \
-Dcatalina.base=\"$_CATALINA_BASE\" \
-Dcatalina.home=\"$_CATALINA_HOME\" \
-Djava.io.tmpdir=\"$_CATALINA_TMPDIR\" \
org.apache.catalina.startup.Bootstrap \"$@\" start \
>> \"$_CATALINA_OUT\" 2>&1 "&"
```

Change the script to this:

```
eval \"$_RUNJAVA\" \"$LOGGING_CONFIG\" \
-Dcatalina.base=\"$_CATALINA_BASE\" \
-Dcatalina.home=\"$_CATALINA_HOME\" \
$JAVA_OPTS \
$CATALINA_OPTS \
-Djava.endorsed.dirs=\"$_JAVA_ENDORSED_DIRS\" -classpath \"$_CLASSPATH\" \
-Djava.io.tmpdir=\"$_CATALINA_TMPDIR\" \
org.apache.catalina.startup.Bootstrap \"$@\" start \
>> \"$_CATALINA_OUT\" 2>&1 "&"
```

**Cannot start the SAS Environment Manager Agent by using the start script \$SAS-configuration\_directory/LevX/Web/SASEnvironmentManager/agent-5.8.0-EE/bin/hq-agent.sh start.**

The console displays this message:

```
Starting HQ Agent.....Removed stale pid file:
/local/install/cfgsas1/config/Lev1/Web/SASEnvironmentManager/agent-5.8.0-EE/wrapper
/../../wrapper/hq-agent.pid
WARNING: HQ Agent may have failed to start.
```

Use the `unset` command to remove the `COLUMNS` environment variable.

---

## Resolving Problems with the Service Architecture

### Unable to connect to the SAS Environment Manager Server

Confirm that the SAS Environment Manager server is running. Connect to the SAS Environment Manager web application using a URL in the format `http://myserver:7080`

### **[program]** failed with return code **[ rc]**

Check the logs produced by the service architecture for detailed information about the error. The service architecture logs are stored in the `/emi-framework/Logs` directory.

### SAS plugins were not found in SAS Environment Manager

Select **Manage ► Plug-in Manager**. Use the **Plug-in Manager** table to verify that the `sas - servers` plugin is installed. If the plugin is not installed, contact SAS Technical Support.

### SAS EMI Framework plugin is not loaded

Select **Manage ► Plug-in Manager**. Use the **Plug-in Manager** table to verify that the `emi-framework` plugin is installed. If the plugin is not installed, contact SAS Technical Support.

### **[user]** is not a member of the Super Users Role

Select **Manage ► List Roles** and then select the **Super User Role** entry. Check to see whether the user entry is listed in the Assigned User table as a member of the Super User Role. If it is not, select **Add to List** to open the Assign Users to Role page, where you can add the user to the role.

### Local SAS Environment Agent is not properly initialized

Confirm that the SAS Environment Manager agent is running properly on both the local and host machines. If an agent is not running properly, restart the agent. Go to <



`levelroot > /Web/SASEnvironmentManager/agent - 5.8.8 - EE/bin`  
and issue the command `hq - agent.(sh/bat) restart.`

### **The script [*scriptname*] failed to compile**

The local copy of the [*scriptname*] script has been changed, either because it has been edited or because it is corrupt. If the script was edited, remove the edits. If the script has been corrupted, contact SAS Contact Technical Support for a replacement script.

### **SAS Metadata server [*servername*] failed gyByName query**

The SAS Metadata Server did not response to a ping request to its IP address. To restart the server, run the command `sas.servers start` or `MetadataServers.(sh/bat).`

### **Error: rc = [*rc*] running master\_acm\_etl.(sh/ bat) or master\_apm\_etl.(sh/bat). Check log and return initialization with - f**

An error was detected in one of the ETL processes (ACM or APM). Review the log messages in the `emi-framework/Logs` directory to determine the error and the specific ETL process that is reporting the error. Possible causes include inadequate storage, permissions errors, or the SAS Environment Manager server or SAS Metadata server not running. After you have fixed the error, run either `master_acm_etl.(sh/ bat)` or `master_apm_etl.(sh/bat)` to verify that the error has been corrected.

### **Request to enable APM with APM Initialized = false**

You attempted to enable APM ETL without having first initialized it. See [“Enabling and Initializing the APM ETL” on page 116](#) for the complete procedure.

### **APM is not initialized / There was a problem validating external APM files**

An error occurred when enabling the APM ARM. Run the command `bin/apm_init.(sh/bat) -f.`

### **APM has not been fully initialized. The file {...} /emi-framework/Conf/log\_definitions.json needs to be updated (line *nn*)**

For multi-machine deployments, you must edit the file `emi-framework/Conf/log_definitions.json` and specify the local paths to mount points for the SAS *levelroot* directories on the remote machines.

### **SAS Deployment Agent security is enabled for [remote - host] Automatic log copying will be disabled**

The `log_centralize.sh` script cannot gather log archives from remote hosts if the SAS Deployment Agent on the remote host is running in secured mode. To collect the logs, you can either use a method such as file mounts or manual transfer, or you can run SAS Deployment Agent in unsecured mode.

To run the SAS Deployment Agent without security, follow these steps:

- 1 On a host for which you want to change the security settings, edit the file `<SASHome>/SASDeploymentAgent/9.4/config/agent.properties`.
- 2 In the file, change the value of the property `solstice.security.enabled` to `false` and save the file.
- 3 Use the SAS Deployment Manager or the `agent.sh` script to restart the SAS Deployment Agent.
- 4 Repeat these steps for all hosts that are part of the SAS Environment Manager multi-machine installation.

### **INFO: (logarmprocesslog) Partial arm log. Source [logfile] does not appear to have been processed, ignoring log file.**

This message appears if the processes for log collection and log processing encounter a partial log from a different SAS deployment that is missing header information. It also appears if you run the command `emi_init - resetDB - f` without stopping and restarting the SAS Application server. To re-create the rolling logs and the log headers, restart the SAS Application server.

**When upgrading to a new version of SAS Environment Manager, the `UpdateInstructions.html` file contains the message “A problem was encountered while updating the SAS Environment Manager Service Architecture.”**

If you have never previously enabled or initialized the service architecture in your deployment, you can ignore this message. Run the command `emi_init.sh --status` to check whether the service architecture has been enabled.

If you previously enabled the service architecture in the deployment that you are upgrading and the deployment contains multiple machines, an upgrade-in-place of the service architecture will fail. To resolve this error, first complete the upgrade process on all machines in your deployment. After you have upgraded all the machines, use the `ugipInit` command to upgrade the service architecture. See [“Updating a Modified Data Mart By Using `ugipInit`” on page 159](#).

If neither of these conditions apply, review the log files identified in the `UpdateInstructions.html` message to determine the cause of the error. Also review the files `ugipInit_{TimeStamp}.log` and `ugipInit_{TimeStamp}.sas.log`, which are located in the `emi-framework/Logs` directory.

### **Validate.sh fails with the message “unable to resolve class org.apache.http.conn.HttpHostConnectException”**

The SAS Environment Manager Agent must be configured because `validate.sh` relies on class `org.apache.http.conn.HttpHostConnectException`, which is provided by the SAS Environment Manager Agent. Verify that the Environment Manager Agent is configured and `<levelroot>/Web/SASEnvironmentManager/agent-5.8.8-EE` exists.



# Appendix 3

## Manual Setup Examples

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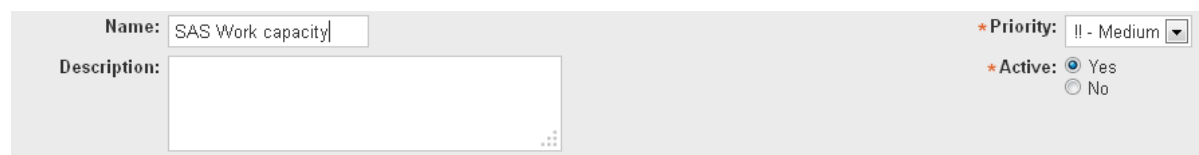
---

## Alert Definition Examples

### Example: Defining an Alert for SAS Work Directory

This example provides information for setting up an alert to be triggered whenever the volume on which the SAS Work directory resides reaches 90% of its capacity. The alert should be issued once every two hours until the condition is cleared. When the alert is triggered, users with the Operations role should be notified.

- 1 Locate the service **SAS Home Directory 9.4 SAS work directory**. The service is under the **SAS Home Directory 9.4** server.
- 2 Navigate to the Resource Detail page for the service. On the Detail page, select **Alert ► Configure** to display the Alert Configuration page. Click **New** to display the New Alert Configuration page.
- 3 Name the alert, select the priority, and specify that the alert should be active.



The screenshot shows a form for defining a new alert. It has a light gray background. On the left, there are two labels: "Name:" and "Description:". The "Name:" label is followed by a text input field containing the text "SAS Work capacity". The "Description:" label is followed by a larger, empty text area. On the right side of the form, there are two settings. The first is "Priority:" with a dropdown menu showing "!! - Medium". The second is "Active:" with two radio buttons: "Yes" (which is selected) and "No".

- 4 In the **If Condition** area, select the **Metric** radio button, then select **Use Percent** in the **Metric** field.
- 5 To specify 90% capacity, enter .9 in the **absolute value** field. To specify that the alert is triggered whenever the used capacity exceeds 90%, specify and select **> (Greater than)** from the comparison menu.

★ **If Condition:** ☒ Metric: Use Percent ▼

☒ is > (Greater than) ▼ .9 (absolute value)  
☐ is > (Greater than) ▼ % of Select... ▼  
☐ value changes

- 6** In the **Enable Action(s)** field, specify **1** for the number of times the alert is issued, **2** for the timer period, and select **hours** for the time period units. These values specify that the alert is issued one time every two hours while the alert conditions are met.

★ **Enable Action(s):** ☐ Each time conditions are met

☒ Once every  times conditions are met within a time period of  hours ▼

- 7** Click **OK** to define the alert and display the Configuration page for the new alert.
- 8** Select **Notify Roles**, and then select **Add to List**.
- 9** Select the check box beside **Operations** in the **Roles** list and use the arrow control to move the role to the **Add Role Notification** list.
- 10** Click **OK** to close the Role Selection page and then **Return to Alert Definitions** to complete the process of defining the alert.

## Example: Defining an Alert for a SAS Server Log File

This example provides information for setting up an alert to be triggered whenever a warning message for the I/O Subsystem appears in the log of the SAS Metadata Server. The alert should be issued every time an error appears in the log.

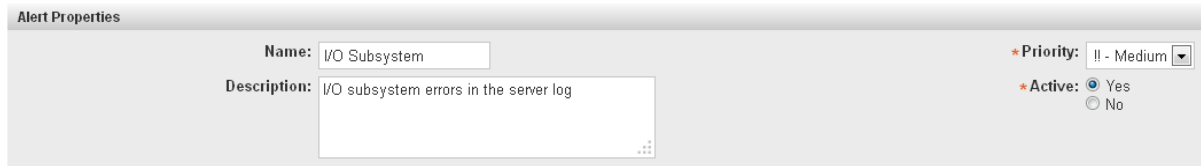
- 1** Follow the procedure in [“Creating Events Based on SAS Server Logs”](#) on page 70 to create an event from the SAS Metadata Server log file. Add the entry

```
level.warn.2=.*I/O Subsystem.*
```

to the sev\_logtracker\_plugin.properties file for the SAS Metadata Server.

- 2** Locate the server **SASMeta – SAS Metadata Server** in the Resource page.

- 3 Navigate to the Resource Detail page for the server. On the Detail page, select **Alert** ► **Configure** to display the Alert Configuration page. Click **New** to display the New Alert Configuration page
- 4 Name the alert, select the priority, and specify that the alert should be active.



The image shows the 'Alert Properties' dialog box. It has a 'Name' field with the value 'I/O Subsystem'. The 'Description' field contains the text 'I/O subsystem errors in the server log'. On the right side, there is a 'Priority' dropdown menu set to '!! - Medium' and an 'Active' section with two radio buttons: 'Yes' (which is selected) and 'No'.

- 5 In the **If Condition** area, select the **Event/Logs Level** radio button, then select **Warn** in the **Event/Logs Level** field.

In the **match substring** field, enter **I/O Subsystem**. These values specify that an alert is issued whenever an event is found for a Warn message from the log containing the string “I/O Subsystem.”



The image shows a configuration row for the 'Events/Logs Level' condition. It features a radio button that is selected, followed by a dropdown menu set to 'Warn'. To the right of this is the text 'and match substring (optional, 150 chars max):' followed by a text input field containing the value 'I/O Subsystem'.

- 6 In the **Enable Action(s)** area, select the **Each time conditions are met** radio button. This specifies that the alert is triggered each time an I/O Subsystem warning appears in the log.
- 7 Click **OK** to define the alert.

## Example: Defining an SNMP Alert Notification

Creating a SAS Management Console alert that results in an SNMP trap notification is a process that can be difficult to troubleshoot. There are many potential problem areas, such as routing and filtering, that can mask any configuration errors. If you are using SAS Environment Manager with an enterprise monitoring application, SNMP alerts enable you to receive real-time notifications for critical alerts, while using event exporting for the audit tracking of all alerts.

In order to eliminate external issues with SNMP alerts, the best practice is to configure a local SNMP trap receiver on the SAS Environment Manager server, test everything



locally by sending a trap from SAS Environment Manager to a trap receiver that is also configured on the SAS Environment Manager server. After testing is complete, you can then change the configuration to use the production settings. The following steps provide an example of this testing process:

- 1** Configure a local SNMP trap receiver for testing.
- 2** Verify that the trap receiver works correctly by using an operating system-based trap sender.
- 3** In SAS Environment Manager, enable SNMP trap sending and specify the SNMP configuration parameters.
- 4** Create a sample SAS Environment Manager alert that causes an SNMP trap notification to be sent.
- 5** Verify that the alert caused an SNMP trap notification to be sent.
- 6** Change the settings to point to the production trap receiver instead of the local test trap receiver.

To configure the alert, follow these steps:

### ***Step1: Configure a Local SNMP Trap Receiver for Testing***

Perform these steps as the root user ID.

- 1** Set the Security Enhanced Linux to permissive so that the trap messages can be redirected. To change the state only for the currently session, issue the command `setenforce 0`.

To change the state permanently, modify the file `/etc/selinux/config` as root, change the value for the `SELINUX=` parameter to `permissive`, save the file, and reboot the machine.

- 2** Edit the `snmptrapd.conf` file, located in the `/etc` directory.
- 3** Add these two lines to the file:

```
authCommunity log,execute,net public
```

```
logOption f /tmp/snmptraps.log
```

The `logOption` line specifies that `snmptrapd` should write trap messages to the external file `/tmp/smptraps.log`.

- 4 Create a file named `UCD-TRAP-TEST-MIB.txt` in the directory `/usr/share/snmp/mibs`. Enter the following as the contents of the file:

```
UCD-TRAP-TEST-MIB DEFINITIONS ::= BEGIN
    IMPORTS ucdExperimental FROM UCD-SNMP-MIB;

    demotraps OBJECT IDENTIFIER ::= { ucdExperimental 990 }

    demoTrap TRAP-TYPE
        ENTERPRISE demotraps
        VARIABLES { sysLocation }
        DESCRIPTION "An example of an SMIV1 trap"
        ::= 17

END
```

- 5 Restart the `snmptrapd` server by issuing this command:

```
# service snmptrapd restart
```

Verify that you receive a response of `OK` from the server restart command.

- 6 Restart the `SNMP` server by issuing this command:

```
# service snmpd restart
```

Verify that you receive a response of `OK` from the server restart command.

## Step 2: Verify the SNMP Trap Receiver

After you configure the test configuration, verify that the trap is working as expected. If you are using Windows, you can verify the operation using an `snmptrap` receiver tool.

- 7 Verify that the `snmpd` server is operating correctly by issuing these commands:

```
snmptest -v 2c -c public <host>
Variable: system.sysDescr.0
Variable:<blank>
```

The value for *host* is the FQDN name or IP address of the SAS Environment Manager server.

Verify that the system responds by returning the MIB system description, for example:

```
SNMPv2-MIB::sysDescr.0 = STRING: Linux <host> 2.6.32-220.17.1.el6.x86_64 #1 SMP Thu Apr 26 13:37:13 E
```

**8** Issue a simple and local snmptrap command. For example:

```
snmptrap -v 1 -c public <host> UCD-TRAP-TEST-MIB::demotraps "" 6 17 "" \
SNMPv2-MIB::sysLocation.0 s "snmp test string"
```

The value of *host* is the is the FQDN name or IP address of the SAS Environment Manager server. Use a value of `localhost` if you execute the command on the SAS Environment Manager server.

**9** Verify that the following log entry has been written to your `/tmp/snmptraps.log`:

```
2015-03-13 11:03:04 192.193.194.195(via UDP: [10.122.32.74]:43576->[10.122.32.74]) TRAP, SNMP v1, community public
iso.2.3.4.5.6 Enterprise Specific Trap (99) Uptime: 0:00:00.55
iso.11.12.13.14.15 = STRING: "SNMP trap test string"
```

### **Step 3: Enable SNMP Trap Sending in SAS Environment Manager**

Before you can create an alert in SAS Environment Manager that uses SNMP, you must enable SNMP trap sending. At this point in the process, you are configuring SAS Environment Manager to send SNMP traps to the local test receiver.

**10** In SAS Environment Manager, select **Manage ► Server Settings** to display the Edit Server Settings page.

**11** In the Edit Server Settings page, locate the **SNMP Server Configuration Properties** area and select **1** in the **SNMP Protocol Version** field.

**12** Specify these values for the **SNMP Server Configuration Properties**:

#### **SNMP Trap OID**

The selected OID value for the test (for example, 1.3.6.1.2.1.11.0.6). This value is the OID of the local test trap receiver.

**Community**

**public** (the default value).

**Generic ID**

**0**

**Enterprise OID**

The selected OID value for the test (for example, 1.3.6.1.2.1.11.0.6). This value is the OID of the local test trap receiver.

**Default Notification Mechanism**

**v1 Trap**

**Specific ID**

leave blank

**Agent Address**

Specify the IP address of the SAS Environment Manager server.

**Step 4: Create a Test Alert in SAS Environment Manager**

After you have verified that the SNMP trap works as expected, use SAS Environment Manager to create a test alert that causes an SNMP trap to be sent. This example creates an alert that will trigger when the File System Reads/Writes per Minute metric is greater than 10. Because this alert will be triggered every time SAS Environment Manager scans for new alerts, it will test the SNMP trap configuration relatively quickly.

**13** In SAS Environment Manager, select **Resources ► Browse ► Platform**. Locate the entry in the platform table for the SAS Environment Manager platform and select the **Alert** icon to the left of the platform entry to display the Alerts page

**14** On the Alerts page, select **New** to display the New Alert Definition page.

**15** In the New Alert Definition page, specify the following information to define the alert:

**If Condition Metric**

Select **File System Reads/Writes per Minute**

**If Condition comparison**

Select **Greater than** and specify **10** for the comparison value.

**Enable Action**

Select **Each time conditions are met**.

**16** Click **OK** to define the alert and display the Alert Definition page. Select **SNMP Notification**.

**17** Specify these values:

**IP Address**

Specify the IP address of the SAS Environment Manager server, followed by a slash and the SNMP trap port (typically 162). An example entry might be 10.122.32.74/162.

**Notification Mechanism**

Select **v1 Trap**.

**OID**

Specify the OID value for the local test trap receiver (for example, 1.3.6.1.2.1.11.0.6). This value should match the value of the **SNMP Trap OID** field on the **SNMP Server Configuration Properties** page.

Click **Save Changes** to save the alert.

**Step 5: Verify That the Alert Sent an SNMP Trap**

After you define the alert, verify that an occurrence of the alert writes a record to the SNMP trap log, which verifies that the SNMP trap was successfully sent from SAS Environment Manager to the local test trap receiver.

**18** Wait until the alert triggers. By default, alerts are scanned every five minutes, and the alert should be triggered whenever the alerts are scanned. When the alert triggers, a trap should be written to the location specified in step 2 (in this example, /tmp/snmptrap.log). Because the trap is sent to the local test receiver, this location is on the SAS Environment Manager Server machine.

**19** Verify that snmptrapd on the receiver received the trap. The trap should be similar to the following:

```
2015-03-13 11:00:23 ptnode24.ptest.sas.com [10.122.32.74] (via UDP: [10.122.32.74]:60162->[10.122.32.74]) TRAP, SNMP v1, community public
SNMPv2-MIB::snmp.0.6 Cold Start Trap (0) Uptime: 0:00:00.00
```

```
SNMPv2-MIB::snmp.0.6 = STRING: "SNMP trap example:SNMP trap example <host> File System Reads/Writes per Minute (433.0)
```

### **Step 6: Change the Alert Settings to Send Traps to the Production Receiver**

- 20** After you verify that the alert works properly with the local trap receiver, you must change the settings in SAS Environment Manager to send traps to the production trap receiver. Contact your IT staff to determine the values for your organization's production SNMP trap receiver. You will need to know the IP address and port for the receiver, as well as the OID value.
- 21** In SAS Environment Manager, select **Manage ► Server Settings** to edit the SNMP server configuration properties. Replace the test OID values with your production OID values.
- 22** Edit the alert definition in SAS Environment Manager. Change the alert conditions to specify the alert that you want to cause an SNMP notification. Specify your organization's values for **IP Address** and **OID** and save the alert.
- 23** If you want to create more alerts with SNMP notification, create the alert normally and specify the values for the production SNMP trap receiver.

---

## **Manually Configuring HTTP Components and Applications**

### **Creating Platform Services for Monitoring SAS Web Applications**

You must create several platform services in order to monitor access to SAS web applications. This is the basic procedure for creating and configuring a platform service. If you enable SAS Environment Manager Extended Editing, these services are created automatically.

- 1** Select **Resources ► Browse**
- 2** Select **Platforms**.

- 3 Select the entry in the **Platform** table for your server.
- 4 On the Details page for the selected platform, select **Tools Menu ► New Platform Service**. The New Service window appears.
- 5 Specify a name for the service and select **HTTP** in the **Service Type** field. Click **OK**.

The screenshot shows the 'New Service' dialog box with two main sections: 'General Properties' and 'Type & Host Properties'. In the 'General Properties' section, the 'Name' field is populated with 'Stored Process Web Ap' and the 'Description' field is empty. In the 'Type & Host Properties' section, the 'Service Type' dropdown menu is open, showing a list of service types. The 'HTTP' option is highlighted. To the right of the dropdown, there are three buttons: 'OK', 'Reset', and 'Cancel'.

- 6 The **Details** page for the new service page appears. A message is displayed that the resource has not been configured. Click the **Configuration Properties** link to configure the service.
- 7 On the Configuration Properties page, specify the information required for the service. Values for each service are provided in the following sections.

**Configuration Properties**

**Shared**

Use SSL ☒

Port 7980

Path /SASStoredProcess

Pass Password

Request Method GET

Follow Redirects ☒

Proxy Connection Proxy

Secret Request Arguments: arg0=va0,arg1=va1,...

Hostname localhost

Socket Timeout (in seconds) 10

User Username sasdmo

Realm Realm

Host Header Host Header

Pattern SASStoredProcess

Response Match (substring or regex)

Request Arguments: arg0=va0,arg1=va1,...

**Monitoring**

Enable Log Tracking ☒

Track event log level Info

Log Pattern Match Stored

Log Pattern Exclude

OK Reset Cancel

8 Click **OK** to complete the configuration process.

## Configuring a Platform Service for SAS Stored Process Web Application

Follow the steps in “[Creating Platform Services for Monitoring SAS Web Applications](#)” on page 188 to create the service. Specify the following information on the Configuration Properties page.

### port

specify 7980

### path

specify /SASStoredProcess

### user

specify a user name (such as sasdmo)

### pass

specify the password for the specified user

### method

select **GET**

### follow

select this check box



**pattern**

specify `SASStoredProcess`

**service.log.track.enable**

select this check box

**service.log.track.level**

select **Info**

**service.log.track.include**

specify `Stored`

## Configuring a Platform Service for SAS Content Server

Follow the steps in [“Creating Platform Services for Monitoring SAS Web Applications” on page 188](#) to create the service. Specify the following information on the Configuration Properties page.

**port**

specify `7980`

**path**

specify `/SASContentServer`

**user**

specify `sasadm@saspw`

**pass**

specify the password for the user

**method**

select **GET**

**follow**

select this check box

**pattern**

specify `SASContentServer`

**service.log.track.enable**

select this check box

**service.log.track.level**

select **Info**

**service.log.track.include**

specify **Content**

## Configuring a Platform Service for SAS Web Report Studio

Follow the steps in [“Creating Platform Services for Monitoring SAS Web Applications” on page 188](#) to create the service. Specify the following information on the Configuration Properties page.

**port**

specify 7980

**path**

specify **/SASWebReportStudio**

**user**

specify a user name (such as sasdemo)

**pass**

specify the password for the user

**method**

select **GET**

**follow**

select this check box

**pattern**

specify **SASWebReportStudio**

**service.log.track.enable**

select this check box

**service.log.track.level**

select **Info**

**service.log.track.include**

specify **Report**

## **Configuring a Platform Service for SAS BI Dashboard**

Follow the steps in [“Creating Platform Services for Monitoring SAS Web Applications” on page 188](#) to create the service. Specify the following information on the Configuration Properties page.

**port**

specify **7980**

**path**

specify **/SASBIDashboard**

**user**

specify a user name (such as **sasdemo**)

**pass**

specify the password for the user

**method**

select **GET**

**follow**

select this check box

**pattern**

specify **SASBIDashboard**

**service.log.track.enable**

select this check box

**service.log.track.level**

select **Info**

**service.log.track.include**

specify `Dashboard`

## Configuring a Platform Service for SAS Help Viewer for Middle-Tier Applications

Follow the steps in “[Creating Platform Services for Monitoring SAS Web Applications](#)” on page 188 to create the service. Specify the following information on the Configuration Properties page.

**port**

specify `7980`

**path**

specify `/SASWebDoc`

**method**

select **GET**

**follow**

select this check box

**pattern**

specify `SASWebDoc`

**service.log.track.enable**

select this check box

**service.log.track.level**

select **Info**

**service.log.track.include**

specify `Documentation`

## Configuring a Platform Service for SAS Information Delivery Portal

Follow the steps in [“Creating Platform Services for Monitoring SAS Web Applications” on page 188](#) to create the service. Specify the following information on the Configuration Properties page.

**port**

specify 7980

**path**

specify `/SASPortal`

**user**

specify a user name (such as sasdemo)

**pass**

specify the password for the user

**method**

select **GET**

**follow**

select this check box

**pattern**

specify `SASPortal`

**service.log.track.enable**

select this check box

**service.log.track.level**

select **Info**

**service.log.track.include**

specify `Portal`

## Configuring a Platform Service for SAS Web Administration Console

Follow the steps in [“Creating Platform Services for Monitoring SAS Web Applications” on page 188](#) to create the service. Specify the following information on the Configuration Properties page.

**port**

specify 7980

**path**

specify /SASAdmin

**user**

specify `sasadm@saspw`

**pass**

specify the password for the user

**method**

select **GET**

**follow**

select this check box

**pattern**

specify `SASAdmin`

**service.log.track.enable**

select this check box

**service.log.track.level**

select **Info**

**service.log.track.include**

specify `Administration`

## Configuring a Platform Service for SAS Logon Manager

Follow the steps in [“Creating Platform Services for Monitoring SAS Web Applications” on page 188](#) to create the service. Specify the following information on the Configuration Properties page.

**port**

specify 7980

**path**

specify /SASLogon

**user**

specify `sasadm@saspw`

**pass**

specify the password for the user

**method**

select **GET**

**follow**

select this check box

**pattern**

specify `SASLogon`

**service.log.track.enable**

select this check box

**service.log.track.level**

select **Info**

**service.log.track.include**

specify `Logon`





# Appendix 4

## Data Mart Table Reference

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## About SAS Environment Manager Data Mart Tables

The following topics contain an overview of the use and contents of the tables in the data mart. Although the topics list the columns in the tables that contain metric or inventory information, the tables also contain other columns that are not listed. Those columns provide information such as the date and time that a metric was recorded, the ID and name of the involved resource, and the time zone offset and shift for when the metric was recorded.

The columns listed for each table represent the metric and inventory data that is collected by default. If you use SAS Environment Manager to start collecting data for a metric that is not currently activated, a column for the new metric appears in the appropriate table. Even if you stop collecting data for a metric, the corresponding column remains in the data table to avoid losing the previously collected data.

---

## ACM Tables

These tables are located in the directory `[levelroot]/Web/SASEnvironmentManager/emi-framework/Datamart/acm`.

### ACM.AVAILABILITY Table

The ACM.AVAILABILITY table contains data about resource availability.

This table contains the following metric data columns:

avail	endtime
starttime	minutes

### ACM.FILEMOUNTS Table

The ACM.FILEMOUNTS table contains usage data for the file mounts in your SAS environment. If the feed to SAS Visual Analytics is enabled, this table is copied to the drop zone.

By default, this table contains the following metric data columns:

diskWrites1m	DiskQueue
diskReads1m	DiskSeviceTime
UsePercent	DiskReadBytes1m
TotFsFree	DiskWriteBytes1m
Capacity	

### ACM.GROUPINVENTORY Table

The ACM.GROUPINVENTORY table contains data about the resource groups that are defined in SAS Environment Manager.

This table contains the following inventory columns:

id	desc
name	

ACM.EVENTS Table

The ACM.EVENTS table contains data about the events that are logged by SAS Environment Manager.

This table contains the following metric data columns:

msg	resource_id
fixdate	status
datetime	what
duration	who
eventType	

ACM.HOSTPLATFORMS Table

The ACM.HOSTPLATFORMS table contains metrics for the platforms. If the feed to SAS Visual Analytics is enabled, this table is copied to the drop zone.

By default, this table contains the following metric data columns:

MemFree	PercentUsedSwap
SwapUsed	ZombieProcesses
CpuUsage	PercentFreeSwap
LoadAverage1	RunningProcesses
CpuSoftLrq	TcpInErrs1m
CpuStolen	SwapPagesOut1m
SwapFree	TcpPassiveOpens1m
TotalProcesses	TcpRetransSegs1m
CpuLrq	Commit1m

CpuSys	Write1m
CpuNice	TcpEstabResets1m
TcpOutboundConnections	Read1m
CpuIdle	TcpOutRsts1m
LoadAverage2	TcpAttemptFails1m
MemUsed	TcpActiveOpens1m
ActualMemUsed	SwapPagesIn1m
PercentFreeMemory	Access1m
PercentUsedMemory	FileSystemReadsWrites1m
CpuUser	SwapTotal
LoadAverage0	ActualMemFree
CpuWait	NumCPUs
TcpInboundConnections	MemTotal

## ACM.HTTPCHECKS Table

The ACM.HTTPCHECKS table contains metric data for HTTP checks of web services. If the feed to SAS Visual Analytics is enabled, this table is copied to the drop zone.

By default, this table contains the following metric data columns:

AllInboundConnections	ResponseTime
InboundConnections	OutboundConnections
AllOutboundConnections	ResponseCode
StateTIME_WAIT	LastModified

## ACM.IOMSERVERS Table

This table is deprecated, beginning with the third maintenance release after SAS 9.4. The following reports, which are created from data from this table, are also deprecated:

- IOM Server Call Activity

- IOM Server Client Activity
- IOM Server Summary Reports
- IOM Total Calls and Time in Calls
- IOM Total Calls vs. Time in Calls

These reports should be deleted.

## ACM.MEASUREINVENTORY Table

The ACM.MEASUREINVENTORY table contains data about the measurements that are being performed.

This table contains the following inventory columns:

measurement_id	UNITS
resource_id	type
enabled	MONITORABLE_TYPE_ID
NAME	category
PLUGIN	resource_desc
ALIAS	deleted

## ACM.METADATASVRS Table

The ACM.METADATASVRS table contains metric data for the SAS Metadata Servers in the environment. If the feed to SAS Visual Analytics is enabled, this table is copied to the drop zone.

By default, this table contains the following metric data columns:

serverState	ProcessShare
ProcessEnd_Last_Time	SystemTime
HighestThreadCount	health
ProcessStartTime	UserTime
CurrentClients	ProcessThreads

ProcessUserID	Usage
ProcessGroupID	ProcessMajorFaults
CounterJournalSpaceAvailable	TotalCalls1m
HighestMemoryUsage	CounterJournalDataWrite1m
CurrentThreadCount	ProcessPageFaults1m
CurrentMemoryUsage	CounterJournalTransProcessed1m
TotalClients1m	ProcessMinorFaults1m
ProcessResidentMemorySize	TimeInCalls1m
TotalTime	CounerJournalTransQueued1m
ProcessVirtualMemorySize	

## ACM.NETWORKINTERFACE Table

The ACM.NETWORKINTERFACE table contains metric data for the network performance in your environment. If the feed to SAS Visual Analytics is enabled, this table is copied to the drop zone.

By default, this table contains the following metric data columns:

BitsIn1s	RxDropped1m
PacketsOut1m	BytesOut1m
BitsOut1m	TxCollisions1m
PacketsOut1m	TxDropped1m
RxErrors1m	BytesIn1m
TxErrors1m	

## ACM.RESOURCEINVENTORY Table

The ACM.RESOURCEINVENTORY table contains information about the resources in the SAS Environment Manager inventory.

This table contains the following inventory columns:

ID	type
desc	prototype
platformResource	invLevel
serverResource	shortname
serviceResource	deleted
name	

**ACM.SASAPPSERVERS Table**

The ACM.SASAPPSERVERS table contains metric data for SAS Application Server resources. If the feed to SAS Visual Analytics is enabled, this table is copied to the drop zone.

By default, this table contains the following metric data columns:

ServerState	NumProcesses
UnauthorizedAccesses	TotalClients1m
LastAccessState	CurrentClients
CurrentRunningServers_Local	Usage
ActivePeers	ResidentMemSize
CurrentPendingClients	MemSize
TotalWaitingTime	TotalTime1m
CurrentWaitingClients	UserTime1m
CurrentConnectedClients	SystemTime1m
TotalTimedOutClients	TimeInCalls1m
CurrentWaitingClients_Local	TotalCalls1m
CurrentRunningServers	



## ACM.SASLOGICALSERVERS Table

The ACM.SASLOGICALSERVERS table contains metric data for SAS logical server resources. If the feed to SAS Visual Analytics is enabled, this table is copied to the drop zone.

By default, this table contains the following metric data columns:

ServerState	NumProcesses
UnauthorizedAccesses	TotalClients1m
LastAccessState	CurrentClients
CurrentRunningServers_Local	Usage
ActivePeers	ResidentMemSize
CurrentPendingClients	MemSize
TotalWaitingTime	TotalTime1m
CurrentWaitingClients	UserTime1m
CurrentConnectedClients	SystemTime1m
TotalTimedOutClients	TimeInCalls1m
CurrentWaitingClients_Local	TotalCalls1m
CurrentRunningServers	

## ACM.TCSSERVERMGRS Table

The ACM.TCSSERVERMGRS table contains metric data for tcServers in the system. If the feed to SAS Visual Analytics is enabled, this table is copied to the drop zone.

By default, this table contains the following metric data columns:

rejectedSessions1m	activeSessions
sessionCreateRate	sessionExpireRate
sessionAverageAliveTime	processingTime

## ACM.WEBAPPSERVER Table

The ACM.WEBAPPSERVER table contains metric data for SAS web applications. If the feed to SAS Visual Analytics is enabled, this table is copied to the drop zone.

By default, this table contains the following metric data columns:

HeapMemoryMax	HeapMemoryUsed
HeapMemoryFree	DeadlocksDetected
PercentUpTimeinGarbageCollection	OpenFileDescriptionCount
Uptime	ThreadCount1m
HeapMemoryCommitted	

## ACM.WIPDATADB Table

The ACM.WIPDATADB table contains metric data for the SAS Web Infrastructure Platform. If the feed to SAS Visual Analytics is enabled, this table is copied to the drop zone.

By default, this table contains the following metric data columns:

DataSpaceUsed	seq_scan1m
idx_tup_read1m	idx_blks_read1m
tup_fetched1s	xact_rollback1s
numbackends	xact_commit1s
blks_hit_p	blks_read1s
granted_locks	tup_altered1s

---

## APM Tables

These tables are located in the directory `[levelroot]/Web/SASEnvironmentManager/emi-framework/Datamart/artifacts`.

## ARTIFACT.RELATIONSHIPS Table

The ARTIFACT.RELATIONSHIPS table contains information about the relationships between artifacts that are defined in other tables.

By default, this table contains the following metric data columns:

artifact1	relationshipSubType
artifact2	distance
relationshipType	_loadtm

## ARTIFACT.ARTIFACTS Table

The ARTIFACT.ARTIFACTS table contains information about the artifacts (such as libraries, directories, and stored processes) in your environment.

By default, this table contains the following metric data columns:

ID	type
Name	_loadtm
Desc	path
Created	physicalPath
Updated	

## ARTIFACT.ARTIFACTSPHYSICALLOCATION Table

The ARTIFACT.ARTIFACTSPHYSICALLOCATION table contains information about the physical location of artifacts.

By default, this table contains the following metric data columns:

ID	type
Name	_loadtm

Desc	path
Created	physicalPath
Updated	directoryName

**ARTIFACT.ARTIFACTUSAGEDETAILS Table**

The ARTIFACT.ARTIFACTUSAGEDETAILS table contains usage information about artifacts.

By default, this table contains the following metric data columns:

HostName	elapsedUserCPUTime
TotalIOCount	hour
TotalMemoryUsage	level
_loadtm	measurementSubType
artifact	measurementType
artifactType	minute
client_context	parentUsage
currentUsage	sourceId
datetime	startSystemCPUTime
datetimeMinute	startUserCPUTime
dayOfMonth	stopSystemCPUTime
dayOfWeek	stopUserCPUTime
elapsedSystemCPUTime	subType
elapsedTime	type
elapsedTotalCPUTime	usageId

**ARTIFACT.ARTIFACTUSAGESESSIONS Table**

The ARTIFACT.ARTIFACTUSAGESESSIONS table contains usage information about artifacts in a session.

By default, this table contains the following metric data columns:

HostName	hour
_loadtm	level
artifact	measurementType
artifactType	minute
client_context	parentUsage
currentUsage	sourceId
datetime	stopdt
datetimeMinute	subType
dayOfMonth	type
dayOfWeek	usageId
elapsedTime	

## **ARTIFACT.AUDIT\_ACCESSC Table**

The ARTIFACT.AUDIT\_ACCESSC table contains audit records for object access events.

By default, this table contains the following metric data columns:

A_ACT_Message	A_ObjType
A_ActiveUserid	A_RecordEvent
A_IdentityName	A_RecordT
A_Level	A_Thread
A_ObjID	Log_Line

## **ARTIFACT.AUDIT\_ADMUSER Table**

The ARTIFACT.AUDIT\_ADMUSER table contains audit information for the administrative user activities.

By default, this table contains the following metric data columns:

A_ActiveUserid	A_Thread
----------------	----------

A_Level	Log_Line
A_RecordT	

**ARTIFACT.AUDIT\_GROUP Table**

The ARTIFACT.AUDIT\_GROUP table contains audit information for identity groups.

By default, this table contains the following metric data columns:

A_ActiveUserid	A_ObjID
A_IdentityName	A_ObjType
A_IdentityTargetName	A_RecordEvent
A_IdentityTargetObjID	A_RecordT
A_IdentityTargetType	A_Thread
A_IdentityType	Log_Line
A_Level	

**ARTIFACT.AUDIT\_TRANSACTIONS Table**

The ARTIFACT.AUDIT\_TRANSACTIONS table contains audit information for transactions.

By default, this table contains the following metric data columns:

A_ACT_Message	A_MetaUserid
A_ActiveUserid	A_ObjID
A_AuthDomain	A_ObjType
A_ClientID	A_PermissionName
A_ClientIPAddr	A_PermissionType
A_ClientPort	A_RecordEvent
A_IdentityName	A_RecordT
A_IdentityTargetName	A_Repository
A_IdentityTargetObjID	A_Thread

A_IdentityTargetType	Client_Context
A_IdentityType	Log_File
A_Level	Log_Line

## **ARTIFACT.AUDITACCESSCONTROLDETAIL Table**

The ARTIFACT.AUDITACCESSCONTROLDETAIL table contains detailed audit information about access requests.

By default, this table contains the following metric data columns:

A_ActiveUserid	Insert
A_ClientID	Read
A_ObjID	ReadMetadata
Administer	References
Alter_Table	Select
CheckInMetadata	Update
Create	User_Group
Create_Table	Write
Delete	WriteMemberMetadata
Drop_Table	WriteMetadata
Execute	

## **ARTIFACT.AUDITIM Table**

The ARTIFACT.AUDITIM table contains audit information recorded by time.

By default, this table contains the following metric data columns:

A_ActiveUserid	A_ObjID
ActionID	Path
Action	Map

ActionType	resourceType
SessionID	webApp

**ARTIFACT.DTINFOALL Table**

The ARTIFACT.DTINFOALL table contains information about log file access.

By default, this table contains the following metric data columns:

ArchiveLoc	file
_loactm	maxDT

**ARTIFACT.LIBRARIES Table**

The ARTIFACT.LIBRARIES table contains information about the SAS libraries in the environment.

By default, this table contains the following metric data columns:

libname	orapath
ServerContext	host
AuthDomain	install_loc
port	LASR_Name
tag	desc
hpath	libref
opt	engine
sqldatasrc	

**ARTIFACT.SERVERTYPEBYUSER Table**

The ARTIFACT.SERVERTYPEBYUSER table contains information about server access.

By default, this table contains the following metric data columns:

ServerType	description
------------	-------------



ServerUser	sourceId
dayOfMonth	user
dayOfWeek	

**ARTIFACT.SERVERUSAGEBYUSER Table**

The ARTIFACT.SERVERUSAGEBYUSER table contains usage information about SAS servers recorded by user.

By default, this table contains the following metric data columns:

ServerType	description
ServerUser	sourceId
dayOfMonth	user
dayOfWeek	

---

**Solution Kits Table**

These tables are located in the directory [levelroot]/Web/SASEnvironmentManager/emi-framework/Datamart/kits.

**KITS.EMI\_INFO Table**

The KITS.EMI\_INFO table contains metrics for SAS Environment Manager ETL processes. If the feed to SAS Visual Analytics is enabled, this table is copied to the drop zone.

By default, this table contains the following metric data columns:

logfile	blkinput
stepname	blkoutput
step	obsin
hostname	obsout

portdate	varsout
platform	memused
scp	osmem
realtime	sumsize
usertime	sortsize
systime	memsize
pageflt	jobname
pagercl	stepcnt
pageswp	pid
osvconsw	parm
osiconsw	

## KITS.HTTPACCESS

The KITS.HTTPACCESS table contains metrics for the SAS Web Server.

By default, this table contains the following metric data columns:

bytesreturned	referrer
clientAddress	rfc1413
clientSoftware	shift
clientMethod	statuscode
clientsrc	tzoneoff
clientsubsrc	username
datetime	

## KITS.SASJobs\_INFO Table

The KITS.SASJobs\_INFO table contains metrics for SAS jobs.

By default, this table contains the following metric data columns:

logfile	blkinput
---------	----------

stepname	blkoutput
step	obsin
hostname	obsout
portdate	varsout
platform	memused
scp	osmem
realtime	sumsize
usertime	sortsize
systime	memsize
pageflt	jobname
pagercl	stepcnt
pageswp	pid
osvconsw	parm
osiconsw	

**KITS.VALASR\_INFO**

The KITS.VALASR\_INFO table contains metrics for the SAS LASR Analytic Server.

By default, this table contains the following metric data columns:

A_Date	datetime
Action	host
Client_Context	id
LASRServer	pid
LASRTable	port
StatusMsg	runtime
UserName	shift
a_datetime	tzoneoff



# Appendix 5

## Service Architecture Alerts

The following alerts are defined when you initialize the SAS Environment Manager Service Architecture.

**Note:** Alerts that are triggered by comparison to a baseline value require that the metric for the alert be monitored long enough to first establish a baseline value.

*Table A5.1 Platform Alerts*

Resource	Alert name	Description
Linux	CPU Count	Triggered if the number of CPUs on the platform changes. This alert indicates a possible hardware problem.
	CPU Usage >70	Triggered if the overall CPU usage in the system exceeds 70%.
	CPU Usage >95	Triggered if the overall CPU usage in the system exceeds 95%.
	Pct Free Memory	Triggered if the percentage of free memory falls below 20% of the maximum free memory.
	Pct Free Swap	Triggered if the percentage of free swap memory falls below 20% of the maximum free swap memory

Resource	Alert name	Description
	Swap Out Rate	<p>Triggered if the number of pages swapped out of memory exceeds 20% of the baseline value of page swaps.</p> <p>This alert indicates that your system is memory constrained. Swapping occurs when the system requires more memory than is physically available.</p>
	TCP Attempt Fails	<p>Triggered if the number of failed attempts to connect to the TCP service exceeds 20% of the baseline value of attempted connections. The number of failed attempts should normally be close to zero.</p>
	TCP In Errors	<p>Triggered if the number of TCP interface errors exceeds 20% of the baseline value of TCP interface requests. The number of TCP interface errors should normally be close to zero.</p>
	Zombie Processes	<p>Triggered if the number of zombie processes exceeds 20% of the baseline value of total processes. Zombie processes are processes that have completed execution but still have entries in the process table. This alert indicates an application problem.</p>
Win32	CPU Count	<p>Triggered if the number of CPUs on the platform changes. This alert indicates a possible hardware problem.</p>
	CPU Usage >70	<p>Triggered if the overall CPU usage in the system exceeds 70%.</p>
	CPU Usage >95	<p>Triggered if the overall CPU usage in the system exceeds 95%.</p>
	Pct Free Memory	<p>Triggered if the percentage of free memory falls below 20% of the maximum free memory.</p>

Resource	Alert name	Description
	Pct Free Swap	Triggered if the percentage of free swap memory falls below 20% of the maximum free swap memory.
	Swap Out Rate	<p>Triggered if the number of pages swapped out of memory exceeds 20% of the baseline value of page swaps.</p> <p>This alert indicates that your system is memory constrained. Swapping occurs when the system requires more memory than is physically available.</p>
	TCP Attempt Fails	Triggered if the number of failed attempts to connect to the TCP service exceeds 20% of the baseline value of attempted connections. The number of failed attempts should normally be close to zero.
	TCP In Errors	Triggered if the number of TCP interface errors exceeds 20% of the baseline value of TCP interface requests. The number of TCP interface errors should normally be close to zero.
	Zombie Processes	Triggered if the number of zombie processes exceeds 20% of the baseline value of total processes. Zombie processes are processes that have completed execution but still have entries in the process table. This alert indicates an application problem.
AIX	CPU Count	Triggered if the number of CPUs on the platform changes. This alert indicates a possible hardware problem.
	CPU Usage >70	Triggered if the overall CPU usage in the system exceeds 70%.
	CPU Usage >95	Triggered if the overall CPU usage in the system exceeds 95%.

Resource	Alert name	Description
	Pct Free Memory	Triggered if the percentage of free memory falls below 20% of the maximum free memory.
	Pct Free Swap	Triggered if the percentage of free swap memory falls below 20% of the maximum free swap memory.
	Swap Out Rate	<p>Triggered if the number of pages swapped out of memory exceeds 20% of the baseline value of page swaps.</p> <p>This alert indicates that your system is memory constrained. Swapping occurs when the system requires more memory than is physically available.</p>
	TCP Attempt Fails	Triggered if the number of failed attempts to connect to the TCP service exceeds 20% of the baseline value of attempted connections. The number of failed attempts should normally be close to zero.
	TCP In Errors	Triggered if the number of TCP interface errors exceeds 20% of the baseline value of TCP interface requests. The number of TCP interface errors should normally be close to zero.
	Zombie Processes	Triggered if the number of zombie processes exceeds 20% of the baseline value of total processes. Zombie processes are processes that have completed execution but still have entries in the process table. This alert indicates an application problem.
SAS Application Server Tier	Metadata Cluster Avail	Triggered if the availability of the SAS Metadata Server cluster falls below 100%.



Resource	Alert name	Description
	Metadata Quorum Chg	Triggered if the SAS Metadata Server cluster is not in quorum.
	SAS License Termination	Triggered if there are fewer than 30 days remaining before the SAS license terminates. If this alert is triggered, it recurs once every 12 hours.

**Table A5.2** *Server Alerts*

Resource	Alert name	Description
HQ Agent	HQ Agent ERROR message in log	Triggered if an error message appears in the HQ agent log.
	HQ Agent Memory	Triggered if the JVM free memory for the HQ agent falls below 14.3 MB.
	HQ Time Agent Spends Fetching Metrics	Triggered if the time that the HQ agent spends collecting metric data exceeds five seconds per minute. This alert might indicate an overloaded agent or a problem with the scheduling thread. These problems might be present even with values for this metric greater than 3 or 4 seconds per minute.
PostgreSQL 9.x	PostgreSQL 9.x - Availability	Triggered if the availability of PostgreSQL falls below 100%.
	pg: Buffer Hits % <50% of Max	Triggered if the number of buffer hits is less than 50% of the total block read requests. A buffer hit is a block read request that is avoided because the block is in the buffer cache). This alert might indicate that more system memory is needed or that you need to adjust the shared buffers.

Resource	Alert name	Description
	pg: Commits per Second >20	Triggered if the number of commits to PostgreSQL is greater than 20 per second. This alert indicates that you might need to provide a durable write cache to prevent potential data loss.
	pg: Connection Usage >80% of Max	Triggered if the number of connections used is greater than 80% of the maximum number allowed. This alert indicates that you might need to increase the maximum number of available connections in order to prevent denial of service.
	pg: Memory Size changed	Triggered if the memory used by PostgreSQL falls below 90% of the baseline value. If this condition is met, the alert is triggered once every 12 hours.
SAS Config Level Directory 9.4	SASConfig Disk Use % > 95	Triggered if the volume that contains the SASConfig directory is more than 95% full.
SAS Connect Spawner 9.4	Connect Spawner Health % < 100	Triggered if the health of the SAS Connect Spawner falls below 100%. This metric is the equivalent of the <b>Validate</b> command in SAS Management Console, and confirms that the server is responding.
SAS Home Directory 9.4	SASHome Disk Use % > 95	Triggered if the volume that contains the SASHome directory is more than 95% full.
SAS Metadata Server 9.4	Metadata - Availability	Triggered if the availability of the SAS Metadata Server falls below 100%.

Resource	Alert name	Description
	Metadata Major (page) Faults	Triggered if the number of page faults that require disk activity is above 10% of the baseline value of total page faults. This alert might indicate a memory constraint that is causing slow performance.
	Metadata Server ERROR message in log	Triggered if an error message appears in the SAS Metadata Server log.
	Metadata Server Health % < 100	Triggered if the health of the SAS Metadata Server falls below 100%. This metric is the equivalent of the <b>Validate</b> command in SAS Management Console, and confirms that the server is responding.
	Metadata Time in Calls per Minute	Triggered if the time taken by calls to the SAS Metadata Server exceeds 300% of the baseline value of calls to the server. This alert might be an indication of slow performance.
	Metadata User Lockout	Triggered if the message “locked out due to excessive log on failures” appears in the SAS Metadata Server log.
SAS OLAP Server 9.4	OLAP - Availability	Triggered if the availability of the OLAP server falls below 100%.
	OLAP Server ERROR message in log	Triggered if an error message appears in the OLAP server log.
	OLAP Server Health % < 100	Triggered if the health of the OLAP server falls below 100%. This metric is the equivalent of the <b>Validate</b> command in SAS Management Console, and confirms that the server is responding.

Resource	Alert name	Description
SAS Object Spawner 9.4	OLAP Server User Lockout	Triggered if the message “locked out due to excessive log on failures” appears in the OLAP server log.
	Object Spawner ERROR message in log	Triggered if an error message appears in the SAS Object Spawner log.
	Object Spawner User Lockout	Triggered if the message “locked out due to excessive log on failures” appears in the SAS Object Spawner log.
	Object Spawner - Availability	Triggered if the availability of the SAS Object Spawner falls below 100%.
	Object Spawner Failed Connections	Triggered if the SAS Object Spawner fails to spawn a server.
	Object Spawner Major (page) Faults	Triggered if the number of page faults that require disk activity is above 10% of the baseline value of total page faults. This alert might indicate a memory constraint that is causing slow performance.
SAS SMP LASR Server	Object Spawner Server Health % < 100	Triggered if the health of the SAS Object Spawner falls below 100%. This metric is the equivalent of the <b>Validate</b> command in SAS Management Console, and confirms that the server is responding.
	LASR SMP Major (page) Faults	Triggered if the number of page faults that require disk activity is above 10% of the baseline value of total page faults. This alert might indicate a memory constraint that is causing slow performance.
	SMP LASR - Availability	Triggered if the availability of the SAS LASR Analytic Server falls below 100%.

Resource	Alert name	Description
SAS System Info	EMI Event Log Alert	<p>This alert is a template for detecting a string in the EMI Events log (sasev.events). This log contains messages generated by the SAS Environment Manager application. Through the use of macros, you can also write log messages from SAS applications to this log.</p> <p>To have the alert trigger when a specific string appears in the log, edit the alert and replace the string “match this text” with the string that you want to use.</p>
SpringSource tc Runtime 6.0	Deadlocks Detected	Triggered if a deadlock is detected. A deadlock occurs when multiple actions are waiting for the other to complete, so none of the actions ever finish.
	Excessive Time Spent in Garbage Collection	Triggered if the amount of time spent in garbage collection exceeds 40% of the total process time.
SpringSource tc Runtime 7.0	Deadlocks Detected	Triggered if a deadlock is detected. A deadlock occurs when multiple actions are waiting for the other to complete, so none of the actions ever finish.
	Excessive Time Spent in Garbage Collection	Triggered if the amount of time spent in garbage collection exceeds 40% of the total process time.
	Webapp CPU Time in Garbage Collection >30%	Triggered if the amount of time spent in garbage collection exceeds 30% of the total process time.
	Webapp Heap Free Memory < 5% of Max	Triggered if the free JVM heap memory falls below 5% of the total memory. It is recommended that you have a minimum of 400MB of free heap space (calculated after garbage collection).

Resource	Alert name	Description
vFabric Web Server 5.2	Web Server: Apache Idle Workers <20	Triggered if the number of available idle workers falls below 20% of the maximum number of workers. If no idle workers are available, a service interrupt occurs.

Table A5.3 Service Alerts

Resource	Alert name	Description
FileServer Mount	File Mount Use Pct	Triggered if the percentage of space used on the file mount exceeds 95%.
HTTP	HTTP Response Server Error Code => 500	Triggered if the response code for an HTTP service ping is greater than 500, indicating an error. Possible response codes are: 500 Unexpected Error 501 Does Not Support 502 Overload 503 Gateway Timeout
Network Server Interface	NetIF Rcv Dropped	Triggered if the number of dropped network receive packets exceeds 20% of the baseline value of total network receive packets. This alert requires that the metrics be monitored long enough to establish a baseline value of network packets for your system.

Resource	Alert name	Description
	NetIF Rcv Errors	Triggered if the number of network receive errors exceeds 20% of the baseline value of total network attempts. This alert requires that the metrics be monitored long enough to establish a baseline value of network traffic for your system.
	NetIF Tx Collisions	Triggered if the number of network interface transmit collisions exceeds 20% of the baseline value of total network attempts. This alert requires that the metrics be monitored long enough to establish a baseline value of network traffic for your system.
HQ Agent	HQ Agent ERROR message in log	Triggered if an error message appears in the HQ agent log.
	HQ Agent Memory	Triggered if the JVM free memory for the HQ agent falls below 14.3 MB.
	HQ Time Agent Spends Fetching Metrics	Triggered if the time that the HQ agent spends collecting metric data exceeds five seconds per minute. This alert might indicate an overloaded agent or a problem with the scheduling thread. These problems might be present even with values for this metric greater than 3 or 4 seconds per minute.
PostgreSQL 9.x	PostgreSQL 9.x - Availability	Triggered if the availability of PostgreSQL falls below 100%.
	pg: Buffer Hits % <50% of Max	Triggered if the number of buffer hits is less than 50% of the total block read requests. (A buffer hit is a block read request that is avoided because the block is in the buffer cache). This alert might indicate that more system memory is needed or that you need to adjust the shared buffers.

Resource	Alert name	Description
	pg: Commits per Second >20	Triggered if the number of commits to PostgreSQL is greater than 20 per second. This alert indicates that you might need to provide a durable write cache to prevent potential data loss.
	pg: Connection Usage >80% of Max	Triggered if the number of connections used is greater than 80% of the maximum number allowed. This alert indicates that you might need to increase the maximum number of available connections in order to prevent denial of service.
	pg: Memory Size changed	Triggered if the memory used by PostgreSQL falls below 90% of the baseline value. If this condition is met, the alert is triggered once every 12 hours.
SAS Environment Manager Data Mart 9.4 ACM ETL Processing	Data Mart ACM ETL	Triggered if the availability of the ACM ETL process falls below 100%.
SAS Environment Manager Data Mart 9.4 APM ETL Processing	Data Mart APM ETL	Triggered if the availability of the APM ETL process falls below 100%.
SAS Environment Manager Data Mart 9.4 Kits ETL Processing	Data Mart Kits ETL	Triggered if the availability of the kits ETL process falls below 100%.
SAS Home Directory 9.4 SAS Directory	SASWork Disk Use % > 70	Triggered if the volume that contains the SASWork directory is more than 70% full.
	SASWork Disk Use % > 95	Triggered if the volume that contains the SASWork directory is more than 95% full.



Resource	Alert name	Description
SAS Object Spawner 9.4 SAS Logical Pooled Workspace Server	Logical Pooled Workspace Server Timed Out Clients	Triggered if there are any failed connections between the logical pooled workspace server and applications that are trying to connect to the server.
	Logical Pooled Workspace Server Unauthorized Accesses	Triggered if there are any unauthorized accesses to the logical pooled workspace server.
SAS Object Spawner 9.4 SAS Logical Stored Process Server	Logical Stored Process Server Timed Out Clients	Triggered if there are any failed connections between the logical stored process server and applications that are trying to connect to the server.
	Logical Stored Process Server Unauthorized Accesses	Triggered if there are any unauthorized accesses to the logical stored process server.
SAS Object Spawner 9.4 SAS Logical Workspace Server	Logical Workspace Server Unauthorized Accesses	Triggered if there are any unauthorized accesses to the logical workspace server.
SAS Object Spawner 9.4 SAS Pooled Workspace Server	Pooled Workspace Server ERROR message in log	Triggered if an error message appears in the pooled workspace server log.
SAS Object Spawner 9.4 SAS Stored Process Server	Stored Process Server ERROR message in log	Triggered if an error message appears in the stored process server log.
SAS Object Spawner 9.4 SAS Workspace Server	Workspace Server ERROR message in log	Triggered if an error message appears in the workspace server log.
Spring Insight Application	Application error rate is high	Triggered if the application error rate for the past five minutes exceeds 10%.
SpringSource tc Runtime 6.0 Thread Diagnostics Context	Slow or Failed Request	Triggered if a record is written to the log for the service. This alert indicates that a request is taking too long or has failed.

Resource	Alert name	Description
SpringSource tc Runtime 6.0 Thread Diagnostics Engine	Slow or Failed Request	Triggered if a request is taking too long or has failed, which is indicated by an entry appearing in the service's log.
SpringSource tc Runtime 6.0 Thread Diagnostics Host	Slow or Failed Request	Triggered if a record is written to the log for the service. This alert indicates that a request is taking too long or has failed..
SpringSource tc Runtime 6.0 Tomcat JDBC Connection Pool Context	JDBC Connection Abandoned	Triggered if a JDBC connection was abandoned, identified by a "CONNECTION ABANDONED" entry in the log.
	JDBC Connection Failed	Triggered if a JDBC connection failed, identified by a "CONNECTION FAILED" entry in the log.
	JDBC Query Failed	Triggered if a JDBC query failed, identified by a "FAILED QUERY" entry in the log.
	Slow JDBC Query	Triggered if some JDBC queries are taking a long time to execute, identified by a "SLOW QUERY" entry in the log.
SpringSource tc Runtime 6.0 Tomcat JDBC Connection Pool Global	JDBC Connection Abandoned	Triggered if a JDBC connection was abandoned, identified by a "CONNECTION ABANDONED" entry in the log.
	JDBC Connection Failed	Triggered if a JDBC query failed, identified by a "FAILED QUERY" entry in the log.
	JDBC Query Failed	Triggered if a JDBC query failed, identified by a "FAILED QUERY" entry in the log.
	Slow JDBC Query	Triggered if some JDBC queries are taking a long time to execute, identified by a "SLOW QUERY" entry in the log.

Resource	Alert name	Description
SpringSource tc Runtime 7.0 Executor	Webapp Active Thread Count >250	<p>Triggered if the number of active threads exceeds 250, which indicates heavy use. You can add additional servers to provide load balancing.</p> <p>The maximum number of threads allowed is 300, and the minimum is 50. If the number of active threads exceeds 300, the thread queue resets to 100, and then additional threads are refused.</p>
SpringSource tc Runtime 7.0 Manager	Webapp Manager Rejected Sessions	Triggered if the number of rejected sessions exceeds 10% of the baseline number of sessions.
SpringSource tc Runtime 7.0 Thread Diagnostics Context	Slow or Failed Request	Triggered if a record is written to the log for the service. This alert indicates that a request is taking too long or has failed.
SpringSource tc Runtime 7.0 Thread Diagnostics Engine	Slow or Failed Request	Triggered if a record is written to the log for the service. This alert indicates that a request is taking too long or has failed.
SpringSource tc Runtime 7.0 Thread Diagnostics Host	Slow or Failed Request	Triggered if a record is written to the log for the service. This alert indicates that a request is taking too long or has failed.
SpringSource tc Runtime 7.0 Tomcat JDBC Connection Pool Context	JDBC Connection Abandoned	Triggered if a JDBC connection was abandoned, identified by a "CONNECTION ABANDONED" entry in the log.
	JDBC Connection Failed	Triggered if a JDBC connection failed, identified by a "CONNECTION FAILED" entry in the log.
	JDBC Query Failed	Triggered if a JDBC query failed, identified by a "FAILED QUERY" entry in the log.
	Slow JDBC Query	Triggered if some JDBC queries are taking a long time to execute, identified by a "SLOW QUERY" entry in the log.

Resource	Alert name	Description
SpringSource tc Runtime 7.0 Tomcat JDBC Connection Pool Global	JDBC Connection Abandoned	Triggered if a JDBC connection was abandoned, identified by a “CONNECTION ABANDONED” entry in the log.
	JDBC Connection Failed	Triggered if a JDBC connection failed, identified by a “CONNECTION FAILED” entry in the log.
	JDBC Query Failed	Triggered if a JDBC query failed, identified by a “FAILED QUERY” entry in the log.
	Slow JDBC Query	Triggered if some JDBC queries are taking a long time to execute, identified by a “SLOW QUERY” entry in the log.
	Application health is degrading	Triggered if the application health metric (measured over the past five minutes) falls below 85%.

## Recommended Reading

Here is the recommended reading list for this title:

- The online Help for SAS Environment Manager 2.4.
- *SAS Intelligence Platform: Middle-Tier Administration Guide.*
- *SAS Intelligence Platform: System Administration Guide.*
- *SAS Logging: Configuration and Programming Reference*

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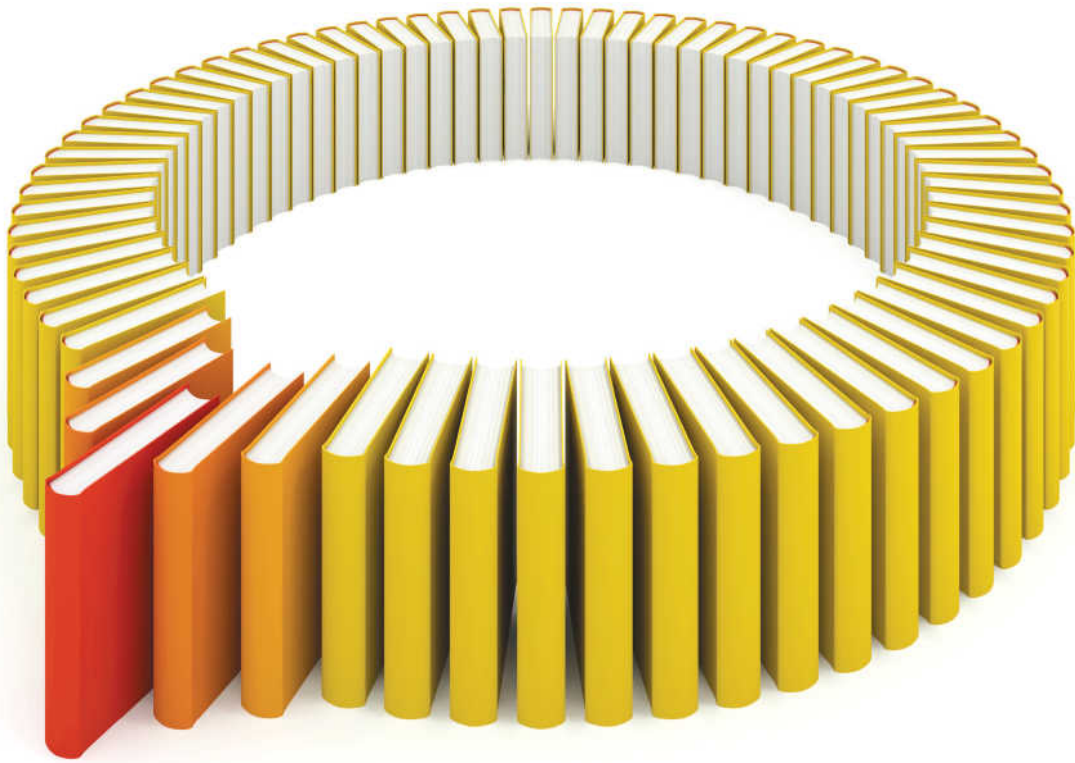
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