Monitoring SAP ABAP Server

eG Innovations Product Documentation

eG

Total Performance Visibility

Table of Contents

Table of Figures

Chapter 1: Introduction

SAP NetWeaver is SAP's integrated technology computing platform and is the technical foundation for many SAP applications since the SAP Business Suite. It provides the development and runtime environment for SAP applications and can be used for custom development and integration with other applications and systems.

One of the vital components of SAP NetWeaver is its Application Platform, which is implemented by the SAP NetWeaver Application Server (a.k.a, the SAP NetWeaver AS or the SAP NW AS).

The SAP NetWeaver Application Server can execute ABAP and/or Java programs, based on how you install the server.

If you install the SAP Netweaver Application Server as an ABAP system, you will be able to run only ABAP programs on that server. SAP ERP 6 is one example of a SAP business application that predominantly runs on NW AS ABAP. If the SAP NW AS is installed as a Java system, then you will only be able to run Java programs on it. The SAP NetWeaver Portal 7.0 application for instance, runs on NW AS Java. Alternatively, SAP NW AS can also be installed as a dual-stack system, where both ABAP and Java programs can be run. For example, SAP PI 7.1 (Process Integration) runs on a dual stack that includes both AS ABAP and AS Java platforms.
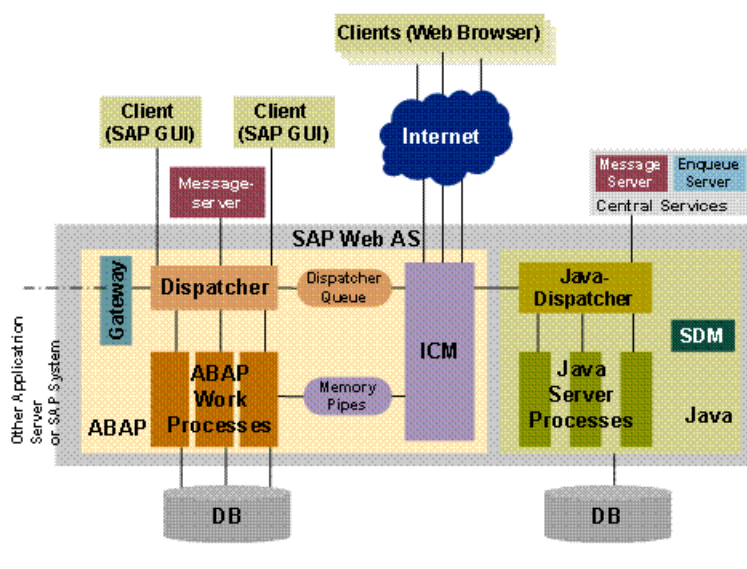
Figure 1.1: A SAP dual-stack system

To ensure that potential performance aberrations with the ABAP/Java systems are captured and resolved before users complain, eG Enterprise provides two dedicated monitoring models – one for

each of the installation modes of the SAP NW AS. While the SAP ABAP Instance monitoring model focuses on the problems and performance of SAP NW AS ABAP system, the SAP WAS monitoring model focuses on the health and issues related to the SAP NW AS Java system.

This chapter elaborately discusses the SAP NW AS ABAP system and the SAP ABAP Instance monitoring model that corresponds to it.

1.1 Why Monitor the SAP AS ABAP System?

ABAP application servers are important software components of NetWeaver AS ABAP since all ABAP programs run on these servers. These application servers execute ABAP applications and communicate with the presentation components, the database, and also with each other, using the message server. The following diagram shows the structure of an ABAP application server:
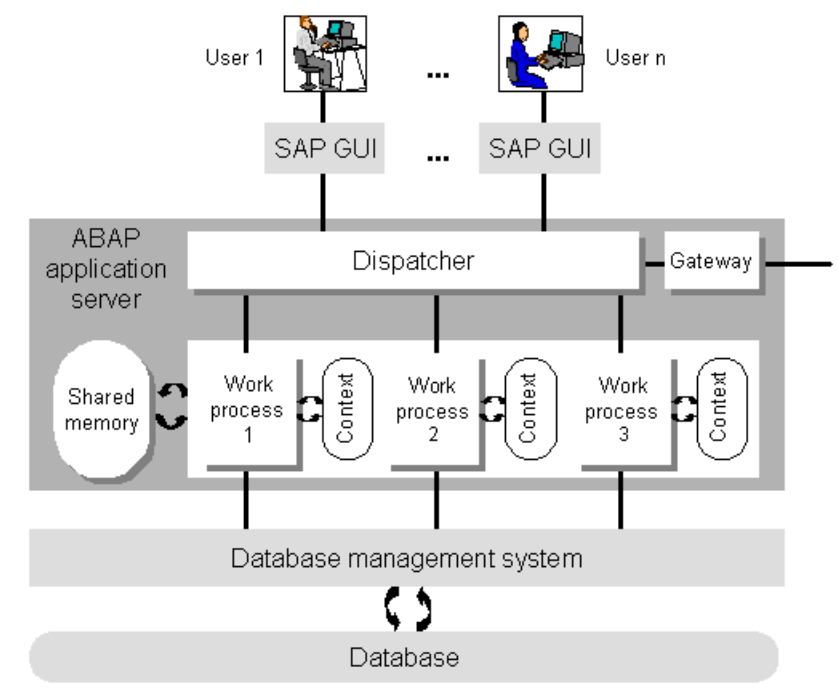
Figure 1.2: The structure of an ABAP application server

As can be inferred from 1.1, a typical SAP NetWeaver ABAP framework is structured as a multi-tier infrastructure, where the SAP GUI serves as the web front-end through which users login and place requests, the ABAP application server serves as the middle-ware that processes the user requests and sends out responses to the user, and a database server functions as the backend where processed data is stored for posterity.

If you zoom into the ABAP application server tier, you will notice that, in addition to several work processes, the ABAP application server contains a dispatcher, a gateway and the shared memory. The tasks of these components are briefly described in the following:

- **Work Processes**: Work processes are components that are able to execute an application (that is, one dialog step each). Each work process is linked to a memory area containing the context of the application being run. The context contains the current data for the application program. This needs to be available in each dialog step.

- **Dispatcher**: The dispatcher is the link between the work processes and the users logged onto the ABAP application server (that is, the SAP GUIs of theseusers). Its task is to receive requests for dialog steps from the SAP GUI and direct them to a free work process. In the same way, it directs screen output resulting from the dialog step back to the appropriate user.

- **Gateway**: This is the interface for the communication protocols of NetWeaver AS ABAP (RFC, CPI/C). It can communicate with other ABAP application servers of the same NW AS, with other SAP Systems, or with external non-SAP systems.

- **Shared Memory**: All of the work processes on an ABAP application server use a common main memory area called shared memory to save contexts or to buffer constant data locally. The resources that all work processes use (such as programs and table contents) are contained in shared memory

Since these components are closely inter-related to each other, the problem in any one component can adversely impact the performance of the other components, ultimately delaying the access to and the execution of ABAP applications running on the AS ABAP application server. SAP administrators are therefore faced with the challenge of not just proactively detecting such a slowdown, but also quickly and accurately diagnosing the reason for the same – is it because the dispatcher is unavailable? is it because the gateway has failed? Is it owing to the lack of free work processes? or is due to poor memory management by the ABAP system? This is where eG's SAP AS ABAP Instance monitoring model (see Chapter 3) helps!

Chapter 2: How to Monitor SAP ABAP Server Using eG Enterprise?

eG Enterprise monitors the SAP ABAP Instance in an agent-based approach and an agentless approach. To obtain all the critical measures pertaining to the performance of the SAP ABAP Instance, it is recommended that you use eG's Agent-based Monitor. Regardless of the monitoring approach, a set of pre-requisites should be fulfilled before attempting to monitor the SAP ABAP server. These requirements are discussed below.

2.1 Pre-requisites for Monitoring a SAP ABAP Instance Using eG Enterprise

Before attempting to monitor a SAP ABAP instance, make sure that the following are in place:

- For running tests on the SAP ABAP instance and pulling the desired metrics, the eG agent uses a few SAP JCO connector files. Make sure that these files are downloaded from the SAP Marketplace to the eG agent host. To know how, refer to the Section **2.1.1**.

To connect to a SAP ABAP instance and run tests on it, the eG agent needs to be configured with the following:

- The name/number of the SAP client as what the eG agent has to connect to the SAP ABAP instance; to know what client ID to provide, use the procedure detailed in the Section **2.1.3**.

- The SAP user as who the eG agent has to connect the SAP ABAP instance; typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_ DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ADM*. Ideally, you should create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. To know how to do this, refer to Section **2.1.4**.

- The system number of the SAP ABAP instance to be monitored; make sure that you know the system number of the target SAP ABAP instance before you begin monitoring. To determine the system number of the instance being monitored, use the steps detailed in Section **2.1.2**.

- Where a SAP router is used, the router string of the target SAP ABAP instance; make sure you figure out what the router string is before you set out to monitor the ABAP instance. To determine the router string of the instance being monitored, use the steps detailed in Section **2.1.2**.

When monitoring a SAP ABAP Instance, eG Enterprise also monitors the SAP Messaging server using the following tests: **SAP Messages** test, **Application Server Connectivity** test, and **SAP Group Load Balancer** test. In order for these tests to function smoothly, the following pre-requisites will have to be fulfilled.

- These tests use an **lgtst** command to extract critical statistics from the SAP Messaging server. With this command, you can check the active instances of your SAP System and check existing logon groups directly at the operating system level. To ensure that this test functions smoothly, the **lgtst** command needs to be copied to the **/opt/egurkha/bin** directory (on Unix, or the <EG_ INSTALL_DIR>\bin on Windows).

- Another pre-requisite for the smooth execution of this test is that, in the transaction SMLG, the External RFC Permitted attribute will have to be defined for any one of the logon groups on the SAP Messaging server.

2.1.1 Downloading the SAP JCO Connector files Required for Monitoring

If the target SAP ABAP Instance is installed on a Unix environment, then, execute the *uname -a* command to figure out the exact operating system name and the kernel bit version of the operating system. Using this information, proceed to locate the appropriate zip file for the operating system and the bit version of the eG agent.

Follow the steps below to download the SAP JCO connector files:

1. Go to http://service.sap.com/connectors.

2. Login with your service market place ID.

3. Click on the **SAP Java Connectors** link.

4. Click on **Tools & Services**.

5. Scroll down to the **Download SAP JCo Release 3.0** section.
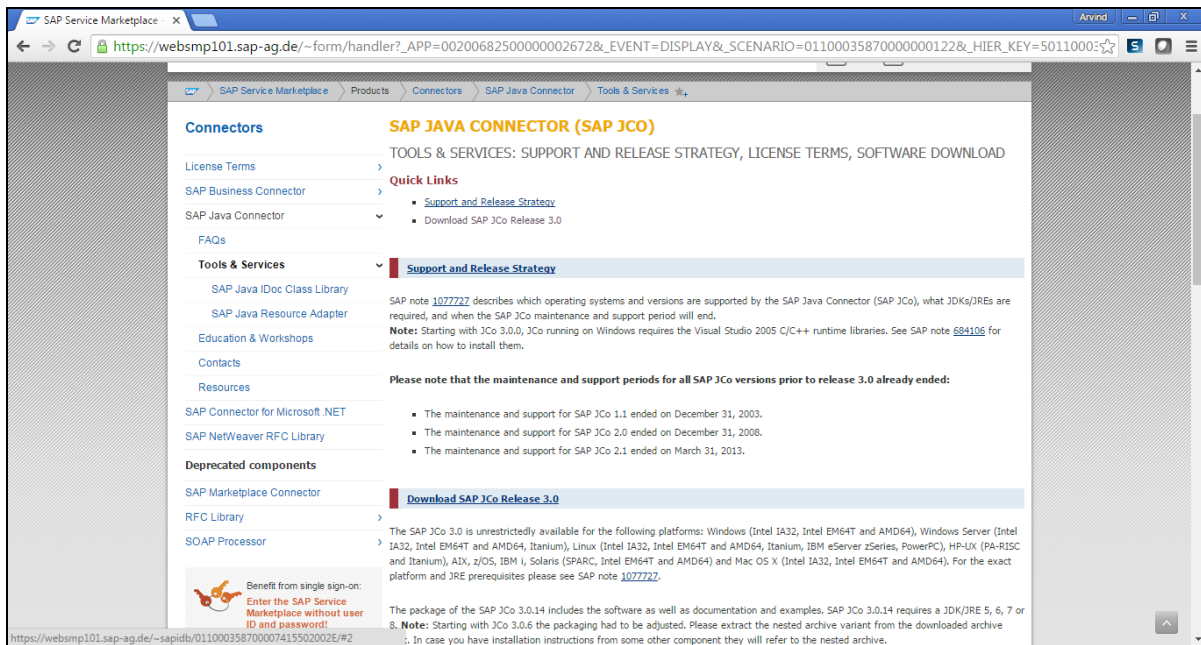
Figure 2.1: Locating the Download SAP JCO Release 3.0 section

6. Locate the appropriate zip file for the operating system and bit version of the eG agent. For example, if a Windows 2008 64-bit agent is to be used for monitoring the SAP ABAP instance, choose the zip file link 64bit x86 under the *Microsoft Windows and Windows Server:* section.
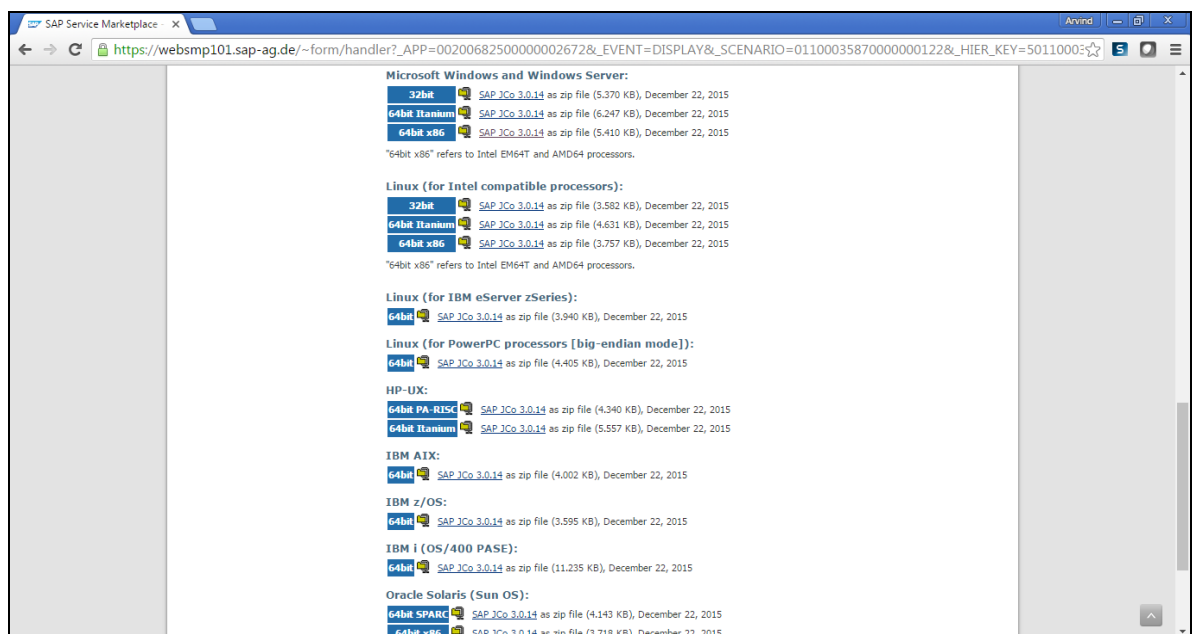
Figure 2.2: Downloading the zip file that corresponds to the operating system and bit-rate of eG agent

7. Download the zip file to any location on the eG agent host.

8. Extract the contents of the zip file to the same location.

9. If you have downloaded a Windows JCO 3 to a Windows agent host, then, from the extracted contents, copy the following files alone to the <EG_AGENT_INSTALL_DIR>\agent\lib directory on Unix, this will be the):

   - sapjco3.jar

   - sapjco3.dll

10. If you have downloaded a Unix JCO 3 to a Unix agent host, then copy the following files alone to the **/opt/egurkha/agent/lib** directory:

    - libsapjco3.so

    - sapjco3.jar

11. If you have downloaded the Windows JCO 3, then remember that for it to work, appropriate Visual C++ runtime DLL files should also be installed on the eG agent host. For that, first go to the URL: http://www.microsoft.com/en-us/download/details.aspx?id=14431

12. Click **Download** and choose the correct **vcredist_<bit_version>.exe** file as per the eG agent's bit version.

13. Execute the downloaded **vcredist.exe** file to install the appropriate VC++ runtime dlls.

14. Restart the eG agent.

2.1.2 Identifying the SAP Router String and System Number

For this, follow the procedure detailed below:

- Open the SAP Logon client.

- Choose the system / shortcut that connects to the instance being monitored. Then, click the **Change item** button to view the properties of the connection.
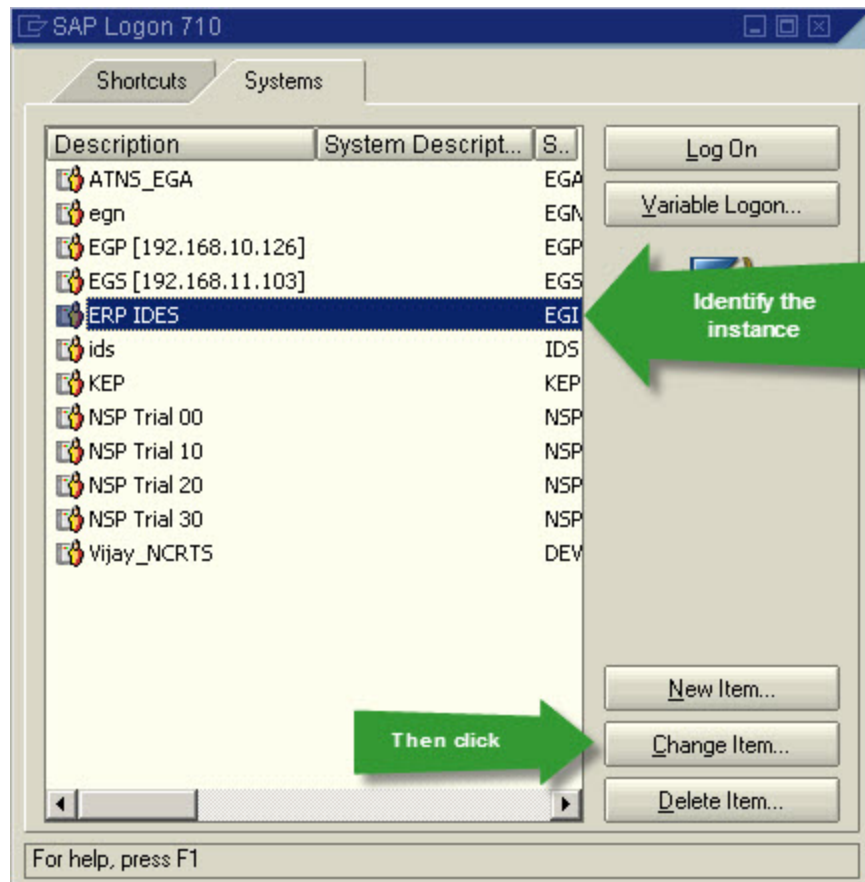
Figure 2.3: Choosing to view the properties of a connection

- When the **Connection** tab page opens, note down the **System Number** and **SAP Router String** values in that tab page.
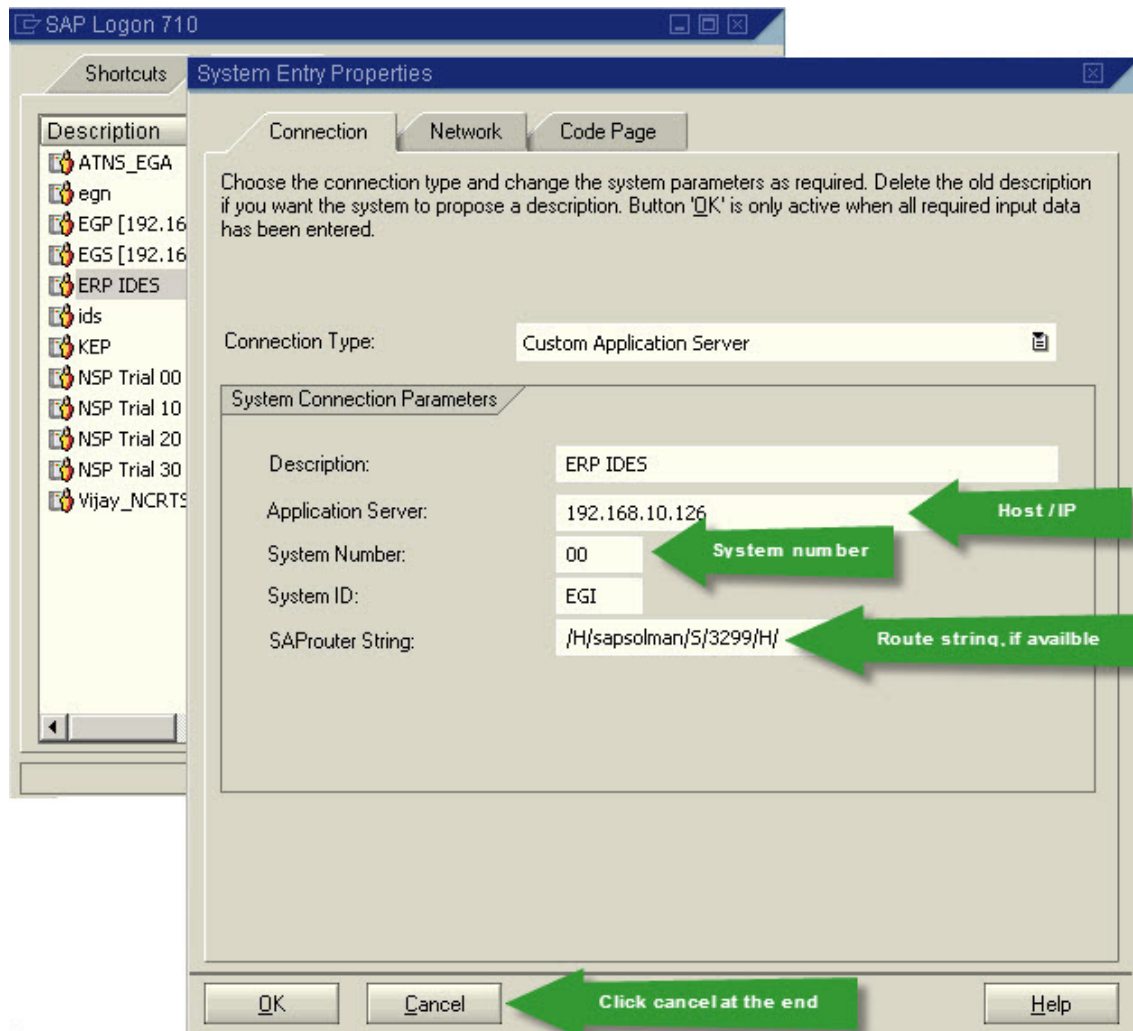
Figure 2.4: Noting down the System Number and SAP Router string values

- Finally, click Cancel in Figure 2.5 to exit the tab page.

- Make sure you configure the **SYSNO** and **ROUTER** parameter of the SAP ABAP tests with the values you noted.

2.1.3 Determining the Client ID/Name for the eG Agent to Connect to the SAP ABAP Instance

To know which client ID to configure, do the following:

1. From any SAP client, execute the **SAPlogon** tool using the menu sequence: *Start -> Programs -> SAP Front End -> SAPlogon* (see Figure 2.5).
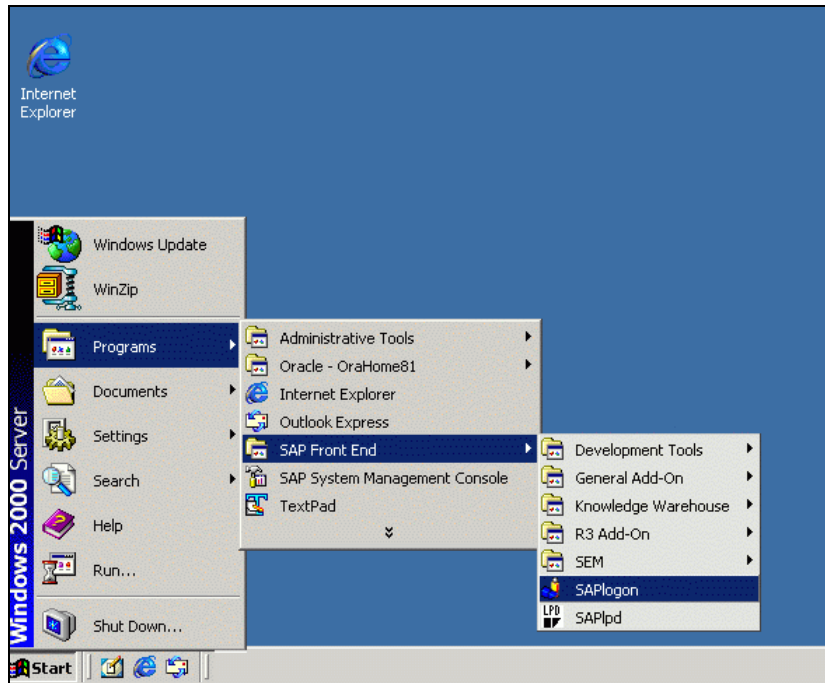
Figure 2.5: Opening the SAPlogon tool

2. Select a connection from the right panel of Figure 2.6, click on the **Logon** button, and login to the SAP ABAP Instance using a valid user name and password (see Figure 2.7).
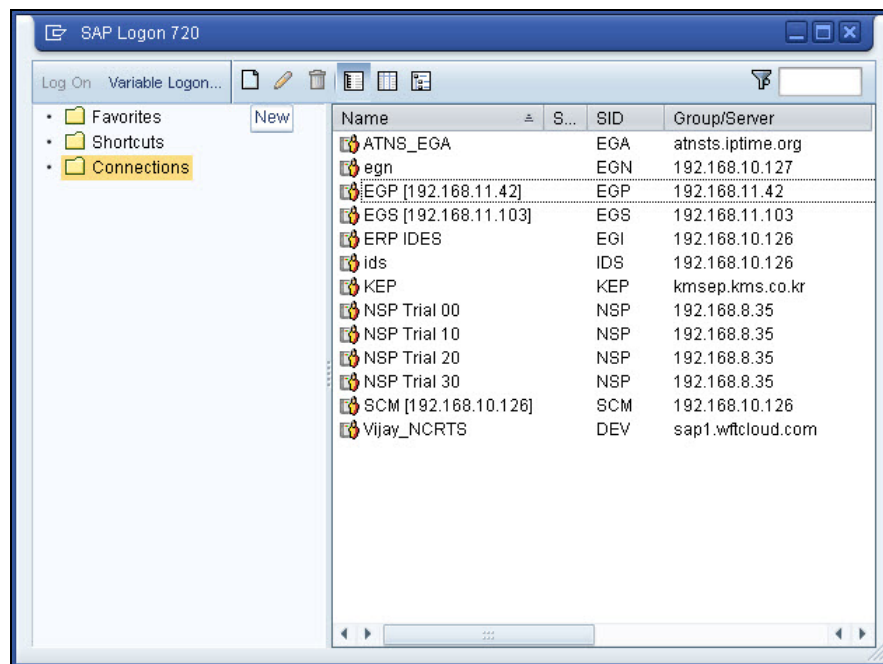
Figure 2.6: Clicking on the Logon button
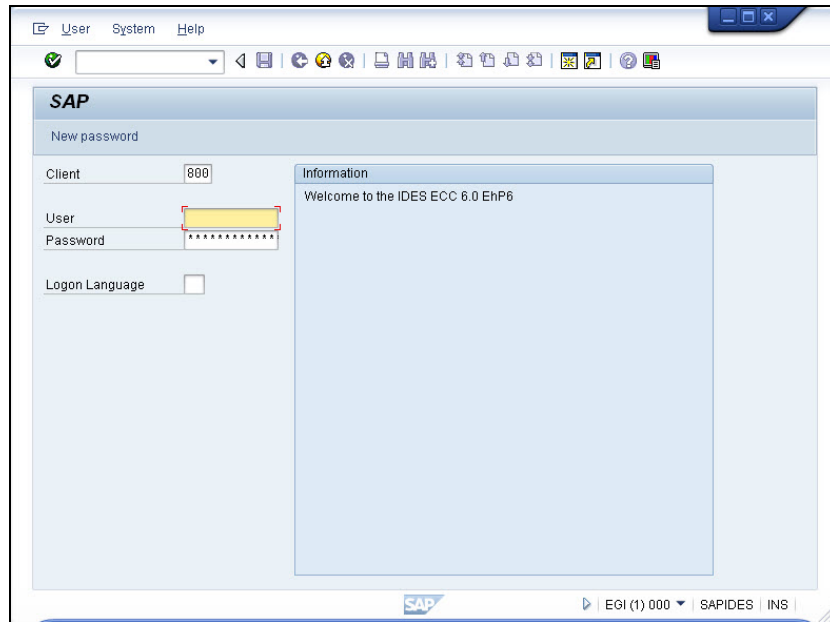
Figure 2.7: Logging into the SAP Easy access console

3. Once Figure 2.8 appears, type the transaction code **SCC4** in the area indicated by Figure 2.8.
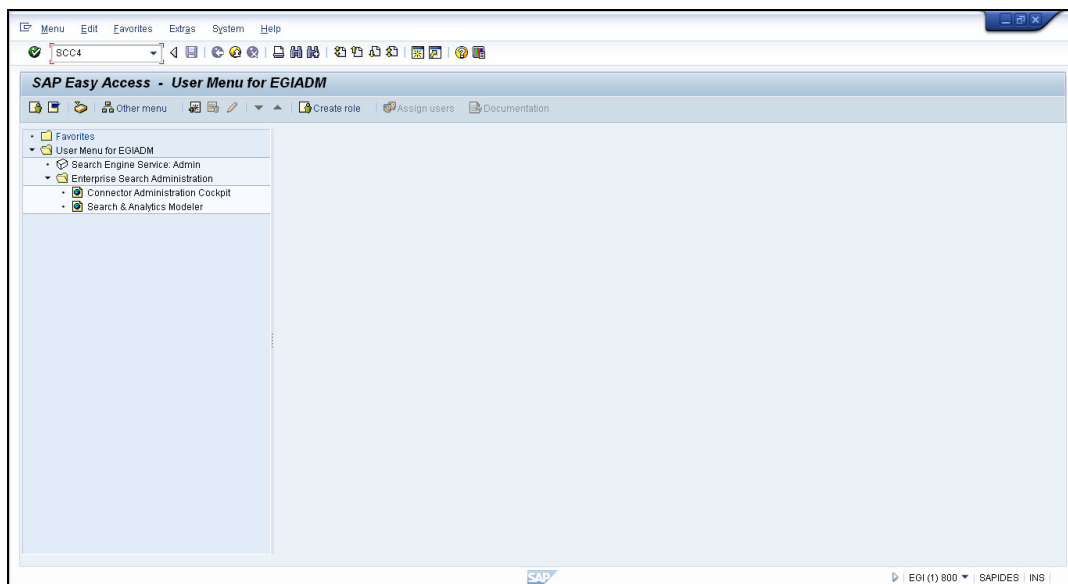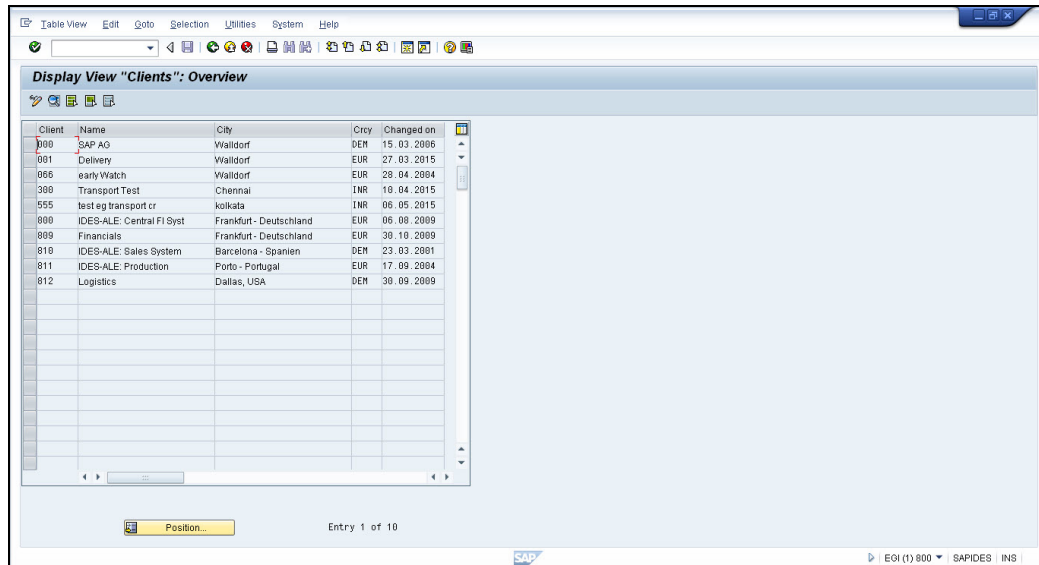
Figure 2.8: Accessing the Client Maintenance node

4. A **Display View "Clients"** page will appear (see Figure 2.9), which will display the details of SAP clients. Identify the client ID that you want the eG agent to use for connecting to the SAP ABAP instance, and configure the **CLIENTNAME** parameter of the eG tests with it.

Figure 2.9: The Clients list

2.1.4 Creating a New User Role for Monitoring and Assigning it to a SAP User

Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ADM*. Ideally, you can create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user.

To achieve this, follow the steps below:

1. Login to the SAP ABAP instance as a SAP administrator.

2. Launch the **SAP Easy Access** console and type the transaction code, **PFCG**, in the area indicated by Figure 2.10 below:
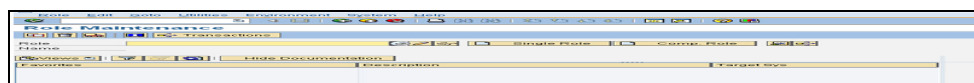
Figure 2.10: Executing the PFCG transaction

3. Figure 2.11 will then appear. Create a new role by specifying a unique role name against **Role** in Figure 2.11. To create a single role with the given name, click on **Single Role**.
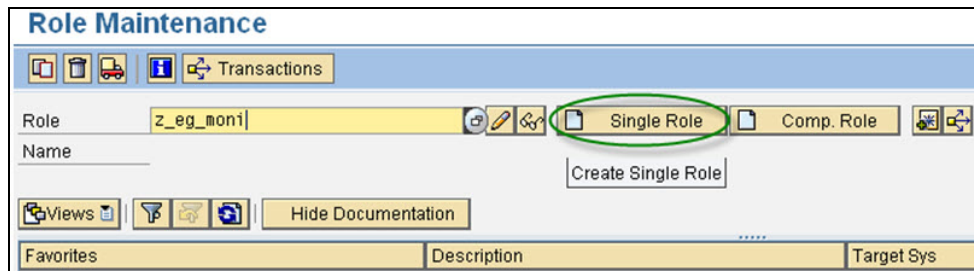
Figure 2.11: Creating a role

4. When Figure 2.12 appears, click on the **Authorizations** tab page. To propose a profile name, click on the button indicated by Figure 2.12, in the **Information About Authorization Profile** section.
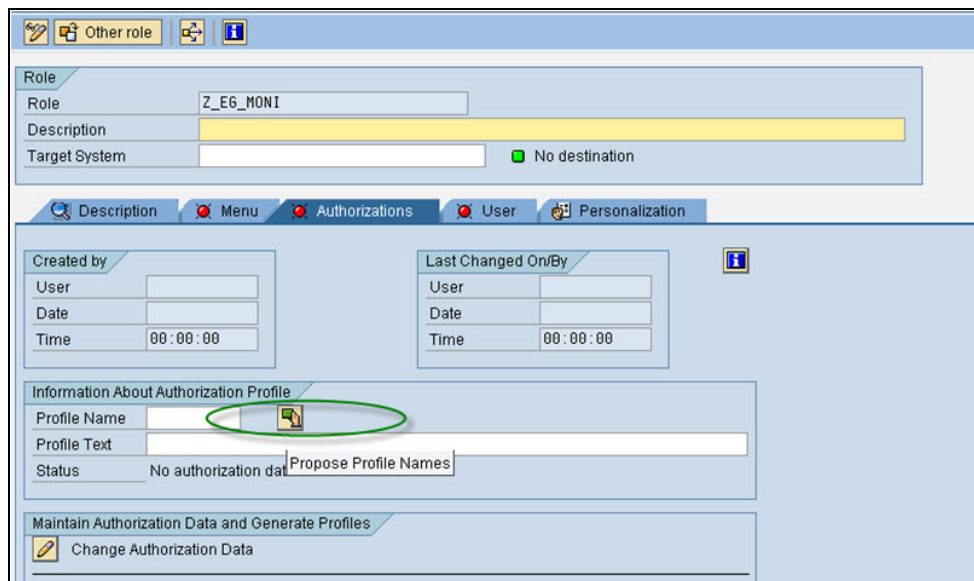
Figure 2.12: Proposing profile name

5. Figure 2.13 will then appear, wherein the proposed profile name will be displayed.
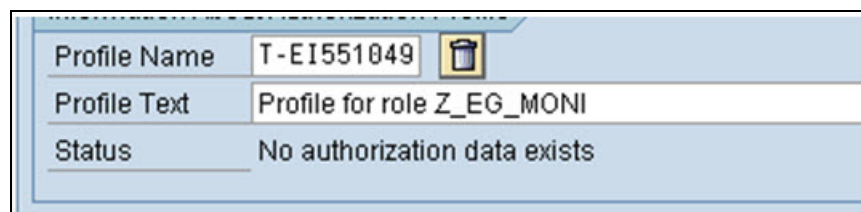
Figure 2.13: Viewing the proposed profile name

6. Accept the proposed name and then click on the button indicated by Figure 2.14 below to change

the authorization data.
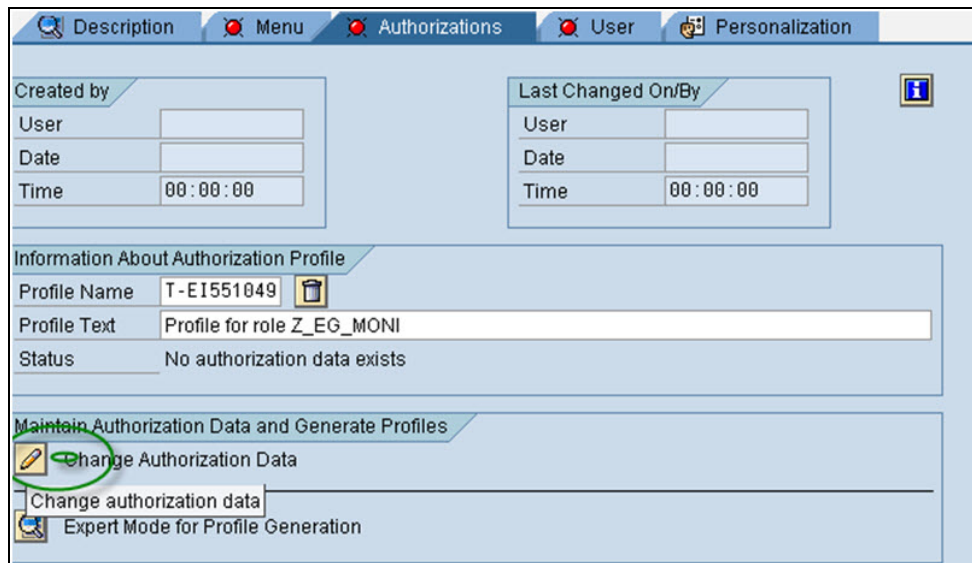
Figure 2.14: Choosing to change the authorization data

7. To change the authorization data manually, click on **Manually** in Figure 2.15 that appears.
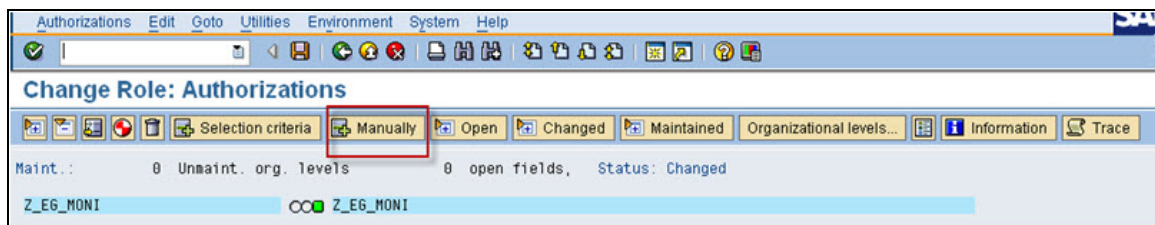
Figure 2.15: Clicking on the 'Manually' button

8. When Figure 2.16 appears, manually specify every authorization object – i.e., privilege – that you want to add to the new role.
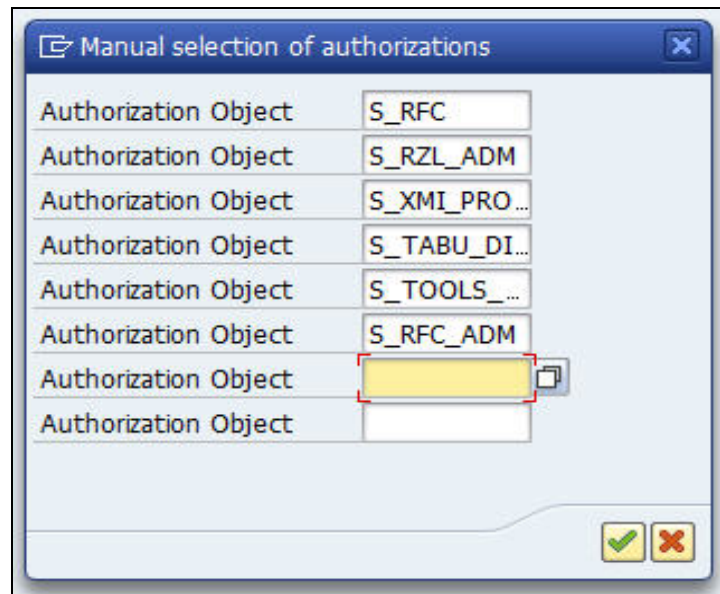
Figure 2.16: Manually specifying the authorization objects for the role

For the purpose of monitoring, the following authorization objects will have to be added to the new role:

Auth. Object	Description	When do you need it?
S_RFC	Authorization check for RFC access	Authorization check when using RFC to access program modules.
SRFC_ADM	Administration for RFC destination	Responsible for monitoring the availability of RFC destinations.
S_TABU_DIS	Table maintenance	Used to check the authorization for displaying and maintaining table contents
S_XMI_PROD	Auth. For external management interfaces(XMI)	This authorization object is used to define which SAP ABAP user, acting on behalf of which external tool, may use which XMI interface.
S_TOOLS_EX	Tools Performance Monitor	Tools Performance Monitor gives Access to special functions.(Authorization to display external statistics records in monitoring tools)
S_RZL_ADM	System Administration	Is responsible for SAP ABAP System administration using the CCMS.

9. Once the authorization objects are specified, click the button indicated by Figure 2.16 to save the

specification. Figure 2.17 will then appear.
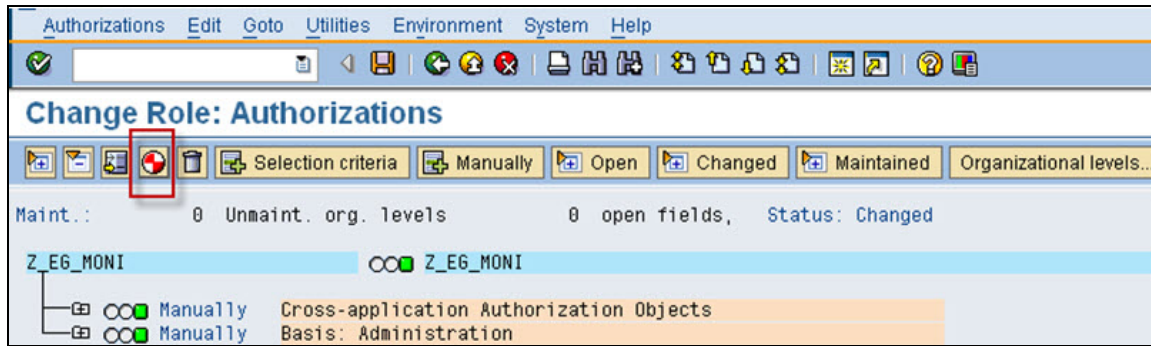
Figure 2.17: Generating the objects

10. Now, click the '+' button that precedes the **Cross-application Authorization Objects** node in Figure 2.21 to reveal the **Authorization Check for RFC Access** sub-node. Expand that sub-node to view the **Activity**, **Name of RFC to be protected**, and the **Type of RFC object to be protected** fields. Configure these three fields with the values depicted by Figure 2.18. The table below indicates these values>

Field	Value
Activity	Execute
Name of RFC to be protected	*
Type of RFC object to be protected	Function Module
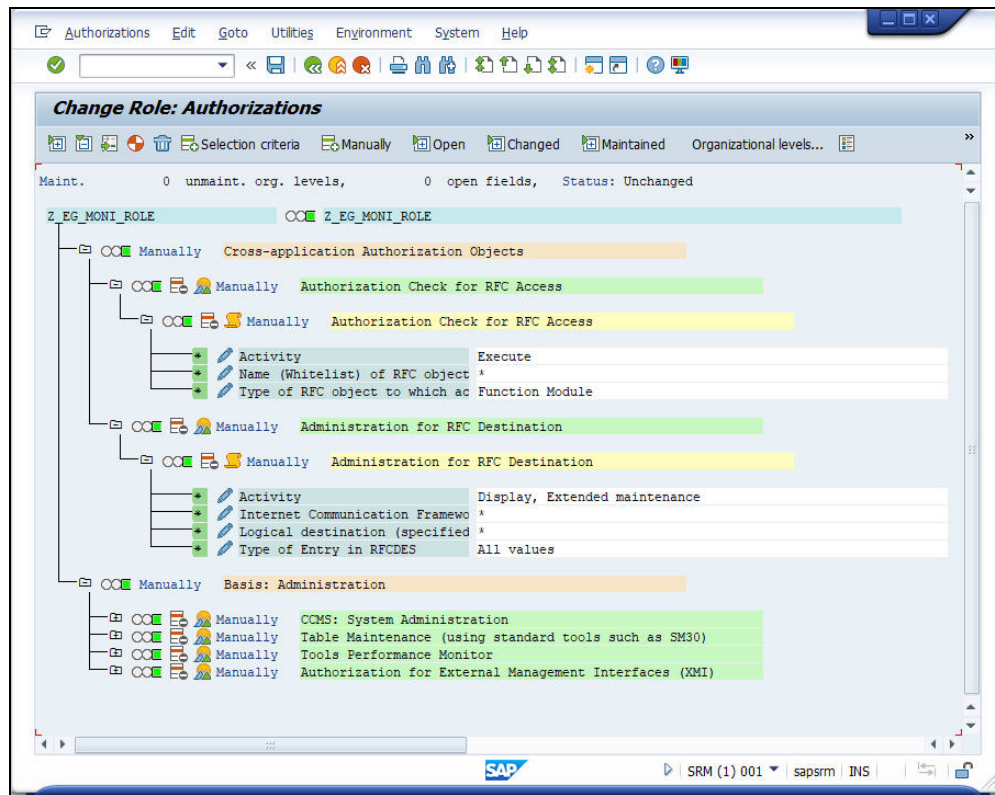
Figure 2.18: Configuring Cross-application authorization objects

11. Next, expand the **Basis Administration** node by clicking the '+' button that precedes it. This will reveal the following sub-nodes:

- CCMS: System Administration

- Table Maintenance

- Tools Performance Monitor

- Authorization for External Interfaces

12. Expanding each of these sub-nodes will reveal the fields that you will have to configure for each sub-node. These fields and the values that you need to provide have been clearly indicated in Figure 2.19.
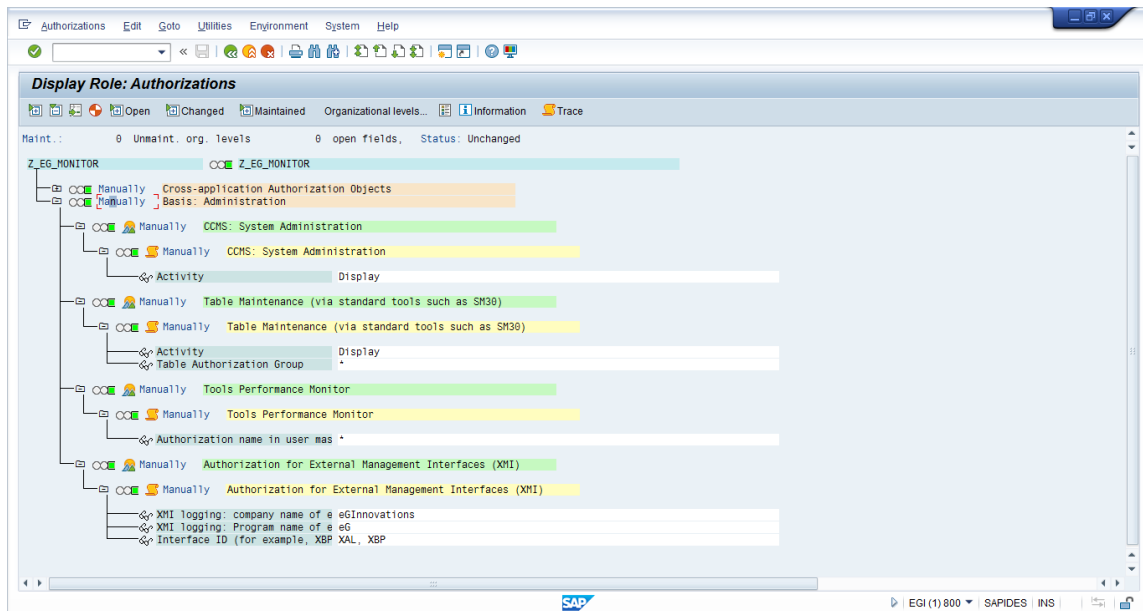
Figure 2.19: Configuring the Basis administration objects

You can also refer to the table below to understand what value to configure for which field under which sub-node.

Sub-node	Field	Value
CCMS: System Administration	Activity	Display
Table Maintenance	Activity	Display
	Table Authorization Group	*
Tools Performance Monitor	Authorization name in user mas	*
Authorization for External Management Interfaces	XMI logging: company name	eGInnovations
	XMI logging: Program name	eG
	Interface ID	XAL, XBP

13. Then, click on the button indicated by Figure 2.17 to generate the objects. With that, the new role is generated.

14. Now, proceed to assign the new role to an existing SAP user. For this, type **SU01** as the transaction code in the area indicated by Figure 2.20.
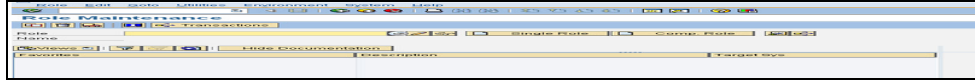
Figure 2.20: Executing the SU01 transaction

15. This will invoke Figure 2.21. Click on the button indicated by Figure 2.21 to select the SAP user to whom you want to assign the new role.
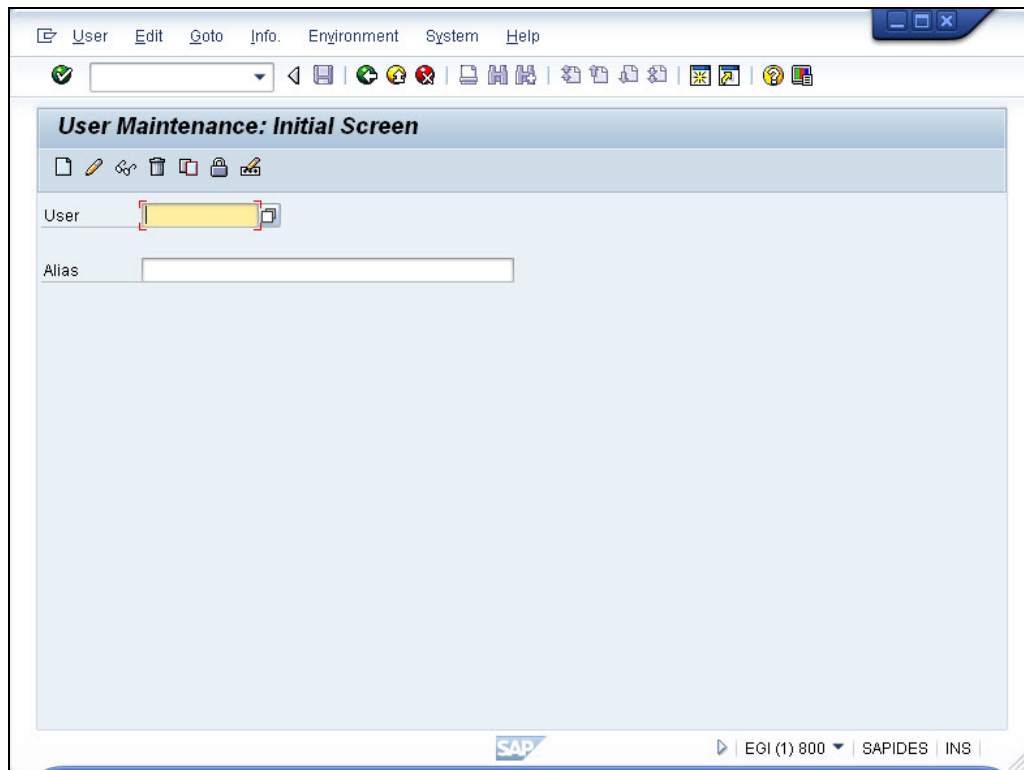
Figure 2.21: Selecting the user whose profile is to be edited

16. Once that user's profile opens, click on the **Logon Data** tab page and set the **User Type** as *Communication Data* (see Figure 2.22).

Note:

For monitoring purposes, the recommended user type is *Communication Data*. However, you can also set the user type to System or Dialog, if required.
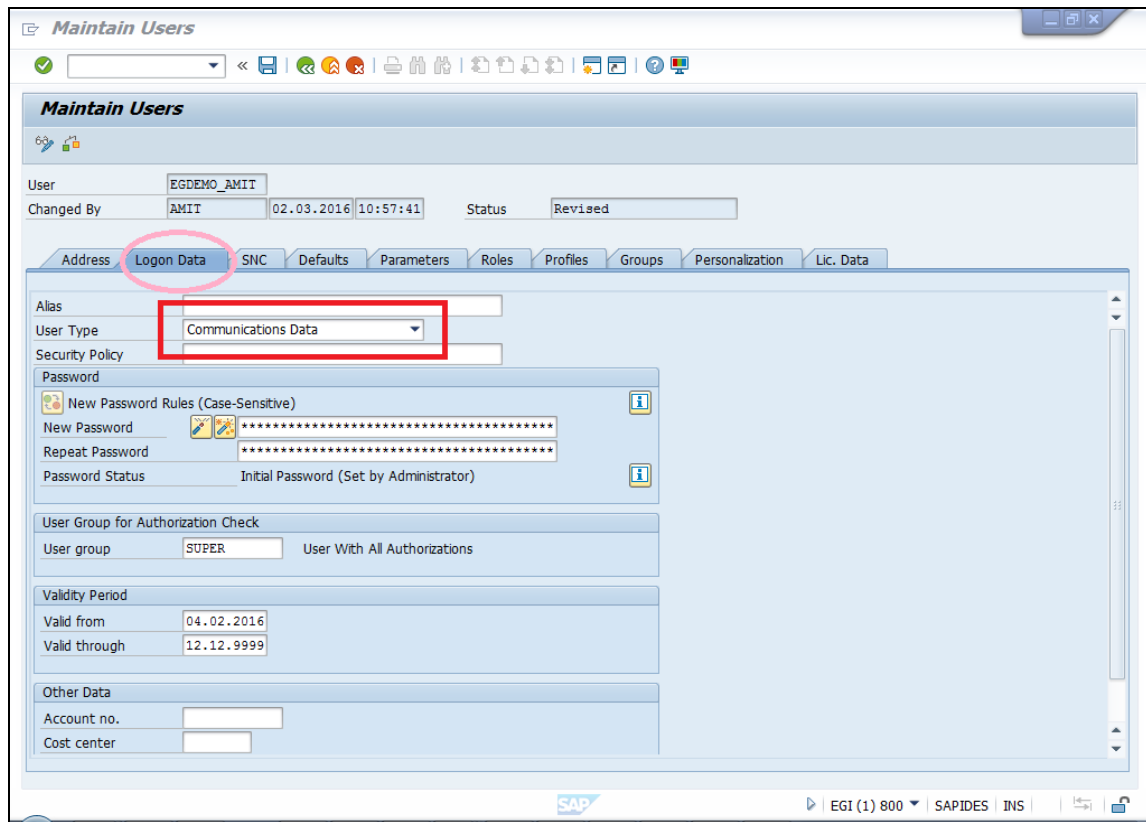
Figure 2.22: Setting the user type as Communication Data

17. Next, click the **Roles** tab page in Figure 2.22.
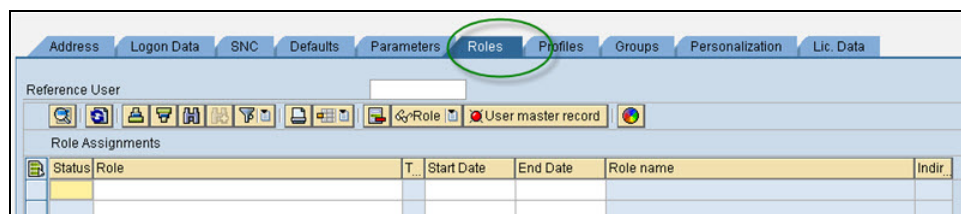
Figure 2.23: Clicking the Roles tab page

18. When Figure 2.24 appears, first, click on the **Role** column in the first row of the **Role Assignments** table therein. The button indicated by Figure 2.24 will then appear. Click on this button to select the new role. This will automatically populate the first row of the **Role Assignments** table with the details of the new role, thus indicating that the new role has been assigned to the SAP user.
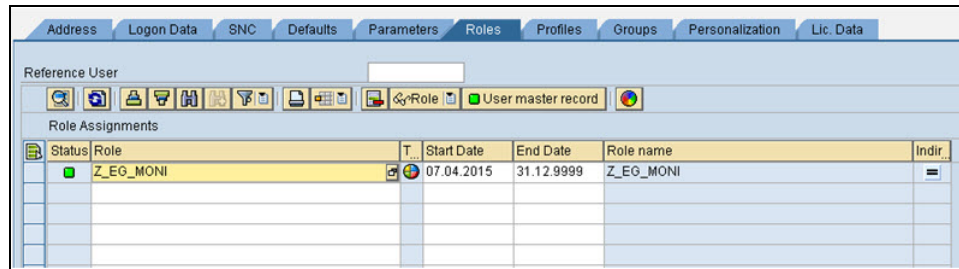
Figure 2.24: Assigning the role to a user

19. Finally, save the user specification.

20. Once the pre-requisites are fulfilled and the tests are duly configured, the eG agent will be able to pull a wealth of information from the SAP ABAP instance. The metrics so collected enable SAP administrators to find answers to queries that have for long hounded SAP ABAP administrators:

SAP Service Monitoring	• Is the SAP service working well? What are the response times? Is any step slowing down the entire service interaction? • Are the critical application processes running? What is their resource usage?
Network & System Monitoring	• How is the network performance impacting the overall service performance? • Are the servers properly sized in terms of CPU, memory, disk activity, etc.? • Are there any critical alerts in the system event logs?
Web Application Server Monitoring	• How many sessions are currently being handled by the SAP web/application server, and are there sufficient processes configured to handle the load? • Is the workload properly balanced across SAP web application server instances? • What is the processing time of critical transactions on the server? • Were there any errors while connecting to the SAP ABAP server? • Is the application server's memory adequately sized? Is the free memory too low?

SAP ABAP Instance Monitoring	• Are the buffers of the SAP ABAP instance sized appropriately? Are there unusually high swap ins/outs?
	• How many requests are queued waiting for free worker processes or data locks?
	• What jobs are executing on the server ? Is the server adequately configured to handle the load?
	• What time of day/day of week is the server activity at its peak and what jobs are executing then?
	• Are there sufficient dialog processes configured to handle incoming user requests?
	• Are there any ABAP dumps happening, indicating errors in the SAP ABAP system?
SAP ABAP Instance Database Monitoring	• Is the SAP ABAP database accessible? How are the critical cache hit ratios of the database server?
	• Are any of the database tablespaces reaching capacity?
Monitoring SAP ABAP Instance Alerts	• How many alerts have been raised on the SAP ABAP instance? Are too many alerts active?
	• Have too many red and yellow alerts been raised on the SAP ABAP instance?
	• Have any alerts auto-completed?
Monitoring Performance Attributes of the SAP ABAP Instance	• How many performance attributes are available for each of the configured monitors?
	• Does any monitor have too many red and yellow performance attributes? If so, which monitor is this?
	• Which monitor has inactive performance attributes?

This document will discuss the top 7 layers of the layer model, as all the other layers have been discussed in the *Monitoring Unix and Windows Servers* document.

2.2 Configuring SAP ABAP Instance for Monitoring by eG Enterprise suite

In Windows installations of the SAP ABAP Instance, ensure that the following steps are adhered to before attempting to monitor the SAP ABAP Instance:

1. Download the **SAPJCO API** from the SAP Marketplace.

2. The API will be available in the SAP Marketplace as a zip file. After downloading the API, extract the following files from the zip:

   - sapjcorfc.dll

   - librfc32.dll

   - sapjco.jar

3. Copy the extracted files to the <EG_INSTALL_DIR>\lib directory on the eG agent host. The classpath is already set for this jar file.

   Note:

   - The eG Enterprise suite requires **SAPJCO 2.0** for monitoring the SAP ABAP Instance. This in turn needs JRE 1.2 or higher. If **SAPJCO 2.1** is downloaded instead, then ensure that a minimum of JRE 1.3 is available.

   - The eG agents use the BC-XAL interface to connect to SAP ABAP INSTANCE for monitoring. This interface is compatible only with SAP ABAP INSTANCE release 4.5b and higher.

For SAP installations on Unix, follow the steps given below:

1. Download the **SAPJCO API** from the SAP Marketplace.

2. Extract the following files from the zipped API and copy them to the **/opt/egurkha/lib** directory:

   - libsapjcorfc.so (in AIX systems, this would be libsapjcorfc.o)

   - librfccm.so (in AIX systems, this would be librfccm.o)

   - sapjco.jar

3. The path of these files should be set in **LD_LIBRARY_PATH** variable.

4. Finally, restart the eG agent.

Note:

The SAP_R3_server component of the eG Enterprise suite also monitors the SAP Messaging server, using the following tests: SapMsgTest, SapMsgInfoTest, and SapGroupLbTest. In order for these tests to function smoothly, the following pre-requisites will have to be fulfilled.

- These tests use an **lgtst** command to extract critical statistics from the SAP Message server. With this command, you can check the active instances of your SAP System and check existing logon groups directly at the operating system level. To ensure that this test functions smoothly, the **lgtst** command needs to be copied to the **/opt/egurkha/bin** directory (on Unix, or the <EG_INSTALL_ DIR>\bin on Windows).

- Another pre-requisite for the smooth execution of this test is that, in the transaction SMLG, the **External RFC Permitted** attribute will have to be defined for any one of the logon groups on the SAP Message server.

2.3 Determining names of Monitors and Monitor Sets

1. While configuring the **MONITOR DETAILS** , you may want to know the exact names of the monitors and monitor sets that form part of your specification. To determine this, do the following:

2. Open the **SAP Logon** tool using the *Start -> Programs -> SAP Front End -> SAP Logon* menu sequence.

3. Pick a system from Figure 2.25 that appears, and click on the **Logon** button therein to connect to the chosen system.
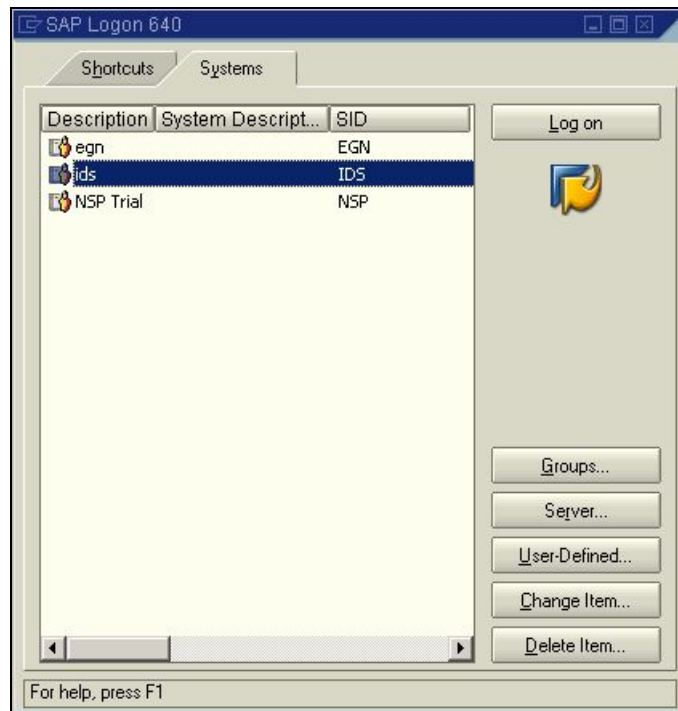
Figure 2.25: Selecting a system to login to

4. Then, login to the chosen system by providing the required **Client**, **User**, and **Password** credentials. Once the **Password** is provided, press the **Enter** key on your keyboard to login (see Figure 2.26).
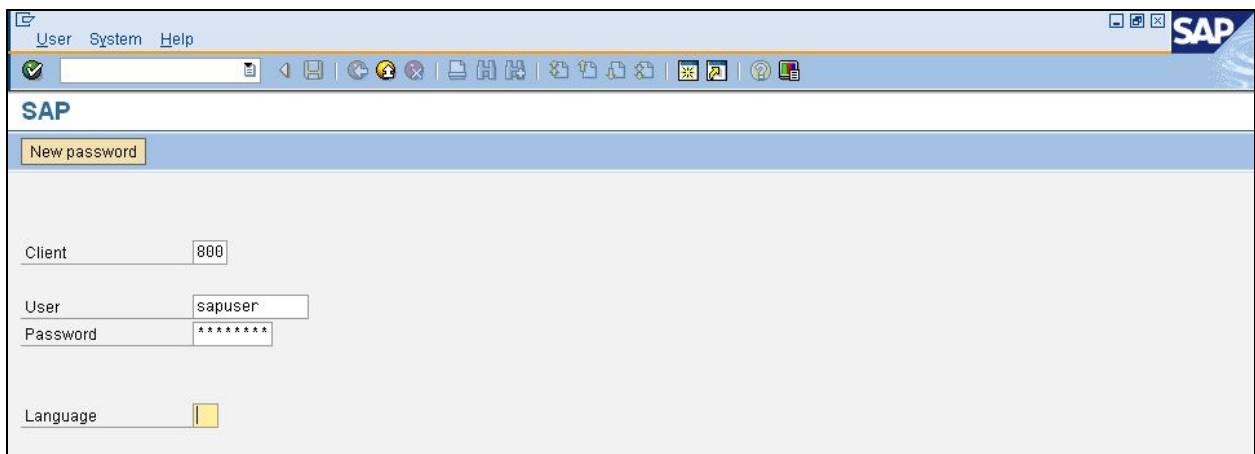
Figure 2.26: Logging into the chosen system

5. Upon logging in successfully, the **SAP Easy Access** interface will appear (see Figure 2.27). In the tree-structure in the left panel of the interface, follow the node sequence, *SAP Menu -> Tools -> CCMS -> Control/Monitoring*. Then, double-click on the *RZ20-CCMS Monitor Sets* sub-node under the *Control/Monitoring* node.
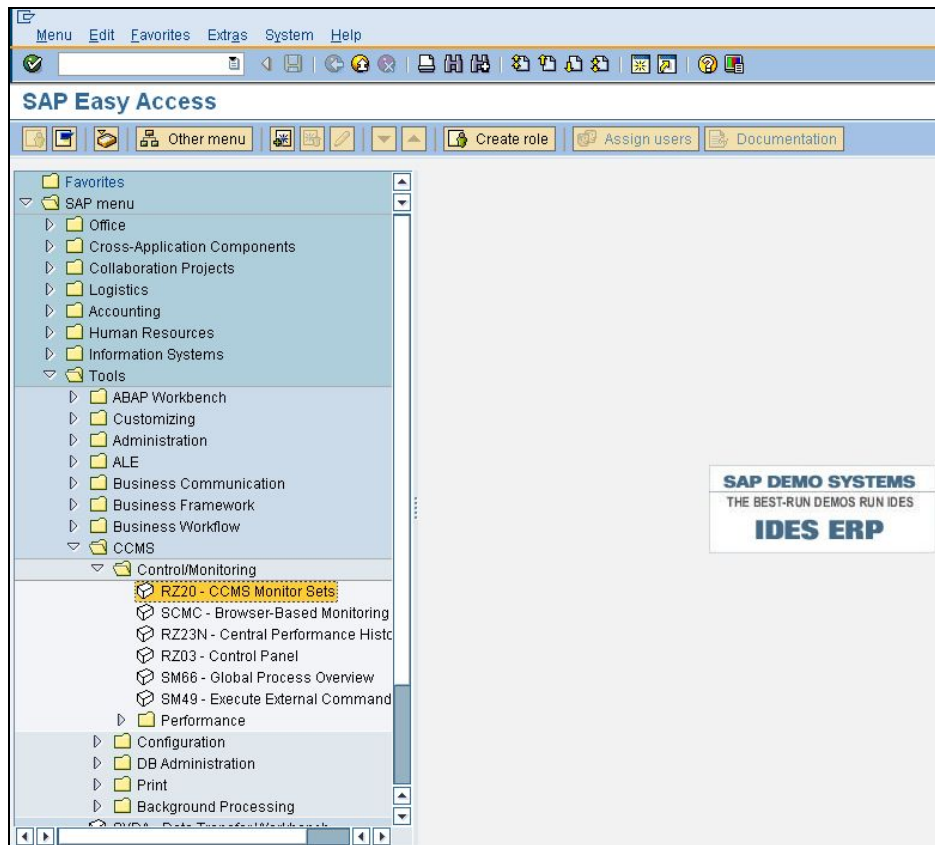
Figure 2.27: Double-clicking on the CCMS Monitor Sets sub-node

6. This will invoke Figure 2.28, where the complete list of monitor sets will be displayed. Expand a monitor set to view the monitors within. Use these details to configure the *monitor set:monitors* in the monitor details text box.
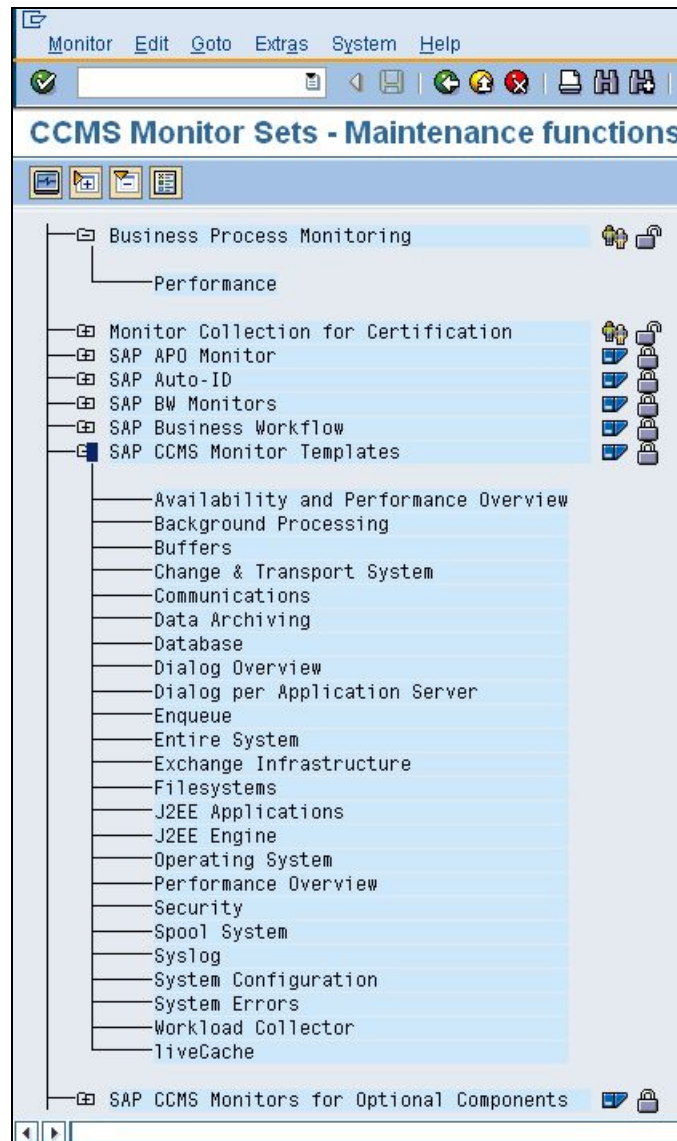
Figure 2.28: Viewing the monitor sets and monitors

Note:

While collecting metrics from the SAP ABAP Instance, you will find that the values always appear as integer values, though they may be floating point values. Follow the configuration steps provided here to change this occurrence.

- Run transaction **SE11** from the SAP menu.

- Type "**ALPERFOB**" in the "**database tables**" field, in the screen that appears.

- In the "**DECIMALS**" field the value will be 0. Press the "**Change**" button and change the value.

2.4 Managing SAP ABAP Instance

eG Enterprise can automatically discover the SAP ABAP Instance in the environment and also lets you to add the SAP ABAP Instance component if the ABAP Instance is not auto-discovered. The following steps explain you how to manage the server that is auto-discovered using the eG administrative interface.

1. Log into the eG administrative interface.

2. If a SAP ABAP Instance is already discovered, then directly proceed towards managing it using the **COMPONENTS – MANAGE/UNMANAGE** page.

3. However, if it is yet to be discovered, then run discovery (Infrastructure -> Components -> Discover) to get it discovered or add the component manually using the **COMPONENTS** page (Infrastructure -> Components -> Add/Modify). Remember that components manually added are managed automatically. Discovered components, however, are managed using the **COMPONENTS – MANAGE / UNMANAGE** page.

4. To manage the SAP ABAP Instance component that is auto-discovered, follow the Infrastructure -> Components -> Manage/Unmanage in the **Infrastructure** tile of the **Admin** menu.

5. In the **COMPONENTS – MANAGE/UNMANAGE** page that appears next, select *SAP ABAP Instance* as the **Component type**. Then, the auto-discovered components will be displayed under the **Unmanaged Components** section.

6. Next choose the component to be managed from the from the **Unmanaged Components** section. Figure 2.29 and Figure 2.30 clearly illustrate the process of managing the SAP ABAP Instance.
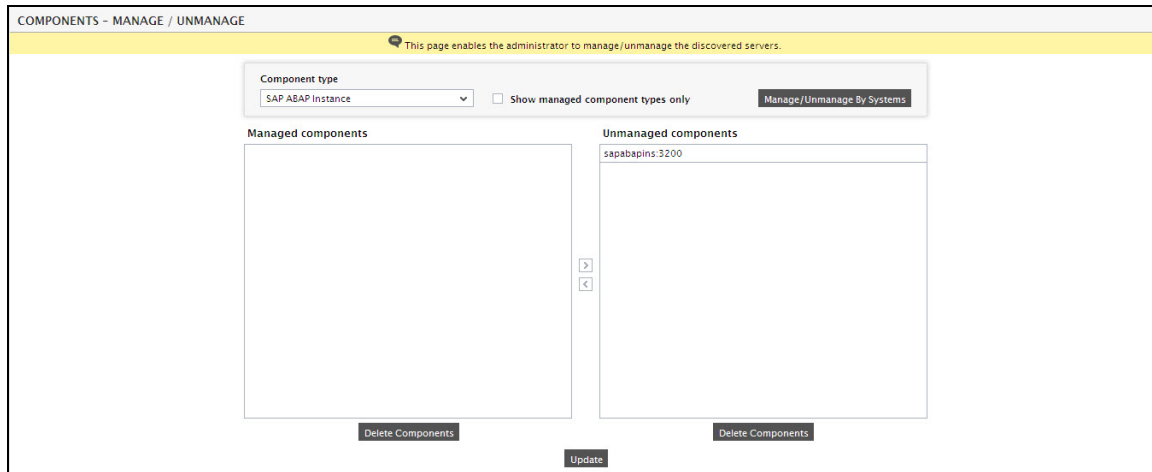
Figure 2.29: Selecting a SAP ABAP Instance for monitoring
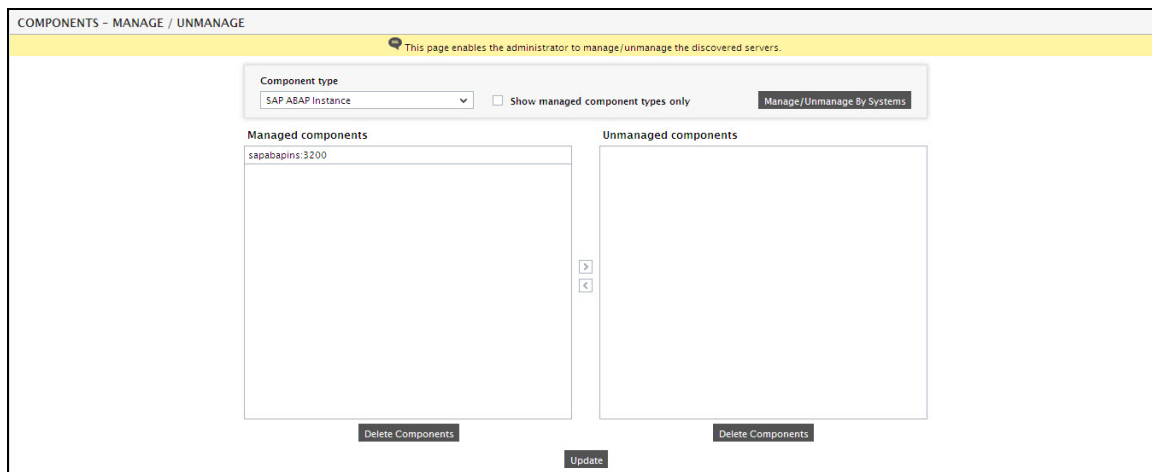
Figure 2.30: Managing a SAP ABAP Instance

7. Then, try to sign out of the eG administrative interface. Upon doing so, Figure 2.31 will appear listing the unconfigured tests for the SAP server.

List of unconfigured tests for 'SAP ABAP Instance'		
Performance		sapabap:3200
ABAP Job Statistics	Work Processes	ABAP Instance Memory
Active Task Types	Active Transactions	Active Users
Background Jobs	Background Services	Batch Inputs
CTS Monitor	Database Buffer	Database Consistency
Dialog Activity	Dialog Response	Enqueue
Enqueue Status	Event Linkages	Gateways
IDoc Statistics	Idoc Wait Monitor	Instance Buffers
Instance Connection	Internet Communication Manager	QRFC Queues
RFC Destinations	Roll Page	Spool Requests
Spool Service	Syslog Errors	Table Space
TemSe	TRFC Calls	Update Performance
Update Requests	User Session Memory	User Sessions By Type
Central Services Process Status	SAP Process Status	

Figure 2.31: The list of unconfigured tests for the SAP ABAP Instance

8. Click on any test in the list of unconfigured tests. For instance, click on the **ABAP Instance History** test to configure it. In the page that appears, specify the parameters as shown in Figure 2.32.

ABAP Instance Memory parameters to be configured for sapabap:3200 (SAP ABAP Instance)

TEST PERIOD	5 mins
HOST	192.168.10.1
PORT	3200
INSTANCENAME	default
TIMEOUT	120
* SAPUSER	sam
* PASSWORD	•••••
* CONFIRM PASSWORD	•••••
* SYSNO	01
* CLIENTNAME	asdf
ROUTER	none
JCO VERSION	2.x
ISPASSIVE	false

Validate   Update

Figure 2.32: Configuring the ABAP Instance History test

9. To know how to configure parameters, refer to **Monitoring the SAP ABAP Instance** chapter.

10. Finally, signout of the eG administrative interface.

Chapter 3: Monitoring the SAP ABAP Instance

eG Enterprise offers a specialized monitoring model for continuously monitoring performance of the SAP ABAP Instance.
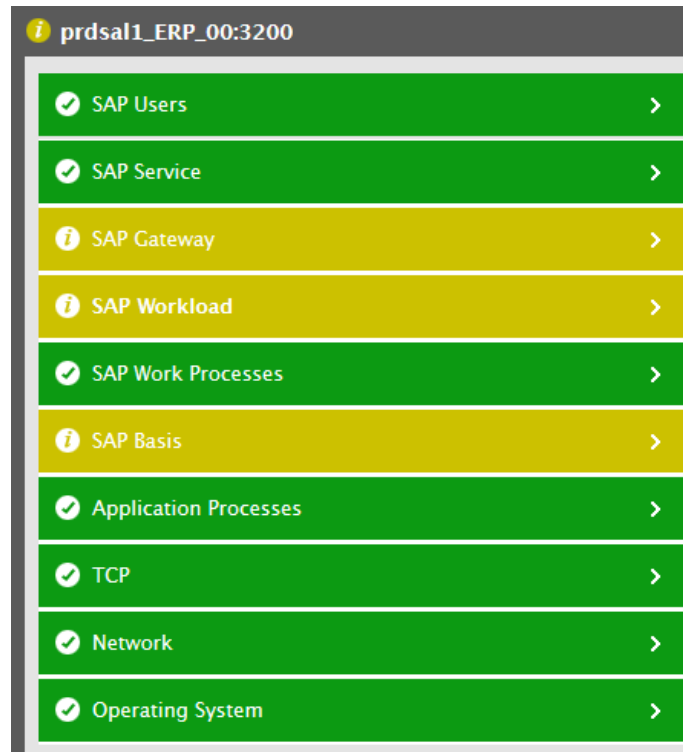
Figure 3.1: The layer model of a SAP ABAP Instance

This model determines what metrics are collected, how often, how the results of the monitoring are interpreted to provide proactive alerts, and how the metrics are correlated to determine where the root-cause of problems lie.

3.1 The Application Processes Layer

For a SAP ABAP instance, this layer is mapped to a **Processes** test, which will report the status and resource usage of process patterns that have been explicitly configured for monitoring. In addition to the **Processes** test, additional tests are also mapped to this layer to figure out the status of each central services process and SAP process, ascertain if each central services process and SAP process is running.
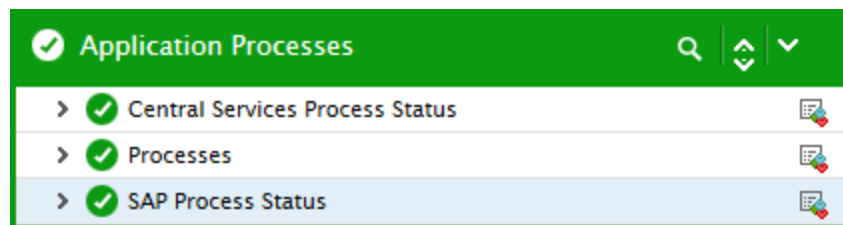
Figure 3.2: The tests pertaining to the Application Processes layer

Since the **Processes** test has been discussed in detail in the *Monitoring Unix and Windows Servers* document, the sections that follow will discuss the remaining tests mapped to this layer at length.

3.1.1 Central Services Process Status Test

Central services form the basis of communication and synchronization for the SAP ABAP cluster. They are responsible for lock administration, message exchange, and load balancing within the cluster.

Central services run on one physical machine and constitute a separate instance. This SAP Central Services Instance (SCS) comprises the message server and the enqueue server.

The message server keeps a list of all server processes in the SAP ABAP cluster and provides information about their availability to Internet Communication Manager (ICM). It also represents the infrastructure for data exchange between the participating server processes.

The enqueue server manages logical locks. The enqueue server runs on the Central Services instance of the SAP ABAP cluster. It manages the lock table in the main memory and receives requests for setting or releasing locks. It maps the logical locks to the database.

If one of these processes is not running or is error prone, then, the data requests cannot be catered as the locks cannot be set or released. Sometimes, the process may suddenly stop while a lock is being held. This may cause data overhead which leads to performance bottlenecks on the target SAP ABAP Instance. To avoid such performance implications, it is necessary to monitor the status of the central services round the clock! The **Central Services Process Status** test helps administrators in this regard.

This test auto-discovers the central service processes and for each process, reports the current status. This test also reveals if the process is running or not and if the process was restarted recently. In addition, administrators may also be enlightened to the uptime of the process. This way, administrators may be able to figure out which process is actually lagging behind to run and is contributing to performance bottlenecks.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for each process on the target SAP ABAP Instance being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
Port	Enter the port to which the specified host listens.
Central WSDL Port	This test uses the SAPControl web service to pull metrics on application and service status. To enable the test to communicate with the web service, you need to configure the test with the port number of the web service. Therefore, specify the port number of the SAPControl web service against WSDL Port. To determine the exact port number of the SAPControl web service, you can look up the **etc/services** file on the SAP WAS being monitored. If the port number is not declared in the **etc/services** file, you can specify the default port number of the web service against WSDL Port. If the web service is not SSL-enabled, then the default port number of the web service will be: 5<NR>13. Similarly, if the web service is SSL-enabled, then the default port number of the web service will be: 5<NR>14. <NR> in the port number refers to the system number of the SAP server being monitored. The system number is an indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the system number will be '00'. Similarly, if the SAP server port is 3201, the system number will have to be specified as '01'. Accordingly, the default port number of an SSL-enabled SAPControl web service will be 50014 , if the system number is 00, or 50114, if the system number is 01.
SSL	Set this flag to **Yes**, if the SAPControl web service is SSL-enabled. Set this flag to **No**, if the SAPControl web service is not SSL-enabled.
OS Username and OS Password	To enable the test to access the SAPControl web service and determine component state, you need to configure the OS Username and OS Password parameters of the test with the credentials (i.e., name and password) of an OS user, who fulfills one of the following conditions: • The name of the OS user should be declared using the service\admin_users profile parameter; (OR) • The name of the user group to which the OS user belongs should be declared using the service\admin_groups profile parameter; (OR)

Parameter	Description
	• The OS user should have the permission to execute the **sapstartsrv** executable
Confirm Password	Confirm the password by retyping it here.
DD Frequency	Refers to the frequency with which detailed diagnosis measures are to be generated for this test. The default is *1:1*. This indicates that, by default, detailed measures will be generated every time this test runs, and also every time the test detects a problem. You can modify this frequency, if you so desire. Also, if you intend to disable the detailed diagnosis capability for this test, you can do so by specifying *none* against DD Frequency.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.
	The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:
	• The eG manager license should allow the detailed diagnosis capability
	• Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Status	Indicates the current state of this process.		The values reported by this measure and its numeric equivalents are mentioned in the table below: 	Measure value	Numeric Value	 |---|---| 	Normal	1	 	Critical	2	 	Error	3	 	Offline	4	 **Note:**

Measurement	Description	Measurement Unit	Interpretation
			By default, this measure reports the **Measure Value**s listed in the table above to indicate the current status of this process. The graph of this measure however, is represented using the numeric equivalents only i.e., *1* to *4*.
Is process running?	Indicates whether/not this process is running.		The values reported by this measure and its numeric equivalents are mentioned in the table below: | Measure value	Numeric Value
---	---
Yes	1
No	0	 **Note:** By default, this measure reports the **Measure Value**s listed in the table above to indicate whether/not this process is running. The graph of this measure however, is represented using the numeric equivalents only i.e., *0* or *1*.
Has process restarted?	Indicates whether/not this process was restarted during the last measurement period.		The values reported by this measure and its numeric equivalents are mentioned in the table below: | Measure value	Numeric Value
---	---
Yes	1
No	0	 **Note:** By default, this measure reports the **Measure Value**s listed in the table above to indicate whether/not this process was restarted. The graph of this measure however, is represented

Measurement	Description	Measurement Unit	Interpretation
			using the numeric equivalents only i.e., *0* or *1*.
Elapsed time	Indicates the time elapsed since this process was restarted.	Seconds	

3.1.2 SAP Process Status Test

The following processes are considered key for the proper functioning of a SAP ABAP instance:

- **Dispatcher**: The ABAP dispatcher is the central process of the SAP ABAP. The main task of the ABAP dispatcher is to distribute requests to its work processes.

- **Message server**: The SAP message server runs as a separate process, mostly on the same host as the central instance, and performs the following tasks in the SAP ABAP system:

  - Serves as a central communication channel between the individual application servers (instances) of the system;

  - Performs load distribution of logons using SAP GUI and RFC with logon group;

  - Acts as an information point for the Web Dispatcher and the application servers

- **IGS Watchdog**: The Internet Graphics Service (IGS) constitutes the infrastructure to enable the application developers to display graphics in an Internet browser with a minimum of effort. The IGS has been integrated in the different SAP UI technologies from HTML GUI to Web Dynpro ABAP/Java and provides a server architecture where data from an SAP system or another source can be used to generate graphical or non-graphical output.

If any of these processes is offline, or experiences Critical errors, or reboots often, then the SAP ABAP system may not be able to perform the related operations. For instance, if say, the **Dispatcher** process is offline, then request processing will come to a standstill. Likewise, if the message server is not running, then no communication will happen between SAP instances. To avoid such issues, administrators should periodically run the **SAP Process Status** test to check on the health state (whether Critical, Normal, Offline, or Online) and operational state (whether running or not running) of each of the critical processes described above, and capture process failures before they impact the critical operations of the SAP ABAP system.

Target of the test : A SAP ABAP Instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for the Dispatcher, IGS Watchdog, and Message server processes.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
Use SAPControl	Set this flag to **Yes** if you want the test to use the SAPControl web service for determining the current state of the critical processes. Set this flag to **No** if you want the test to use the SAPJCO to report on process state. By default, this flag is set to **Yes**.
WSDL Port	**This parameter appears only if the Use SAPControl flag is set to Yes – i.e., if the test uses the SAPControl web service for collecting measures**. In this text box, specify the port number of the SAPControl web service. To determine the exact port number of the SAPControl web service, you can look up the etc/services file on the SAP ABAP system being monitored. If the port number is not declared in the etc/services file, you can specify the default port number of the web service against WSDL Port If the web service is not SSL-enabled, then the default port number of the web service will be: 5<NR>13. Similarly, if the web service is SSL-enabled, then the default port number of the web service will be: 5<NR>14. <NR> in the port number refers to the system number of the SAP server being monitored. The system number is an indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the system number will be '00'. Similarly, if the SAP server port is 3201, the system number will have to be specified as '01'. Accordingly, the default port number of an SSL-enabled SAPControl web service will be 50014 , if the system number is 00, or 50114, if the system number is 01.
OS Username and OS Password	**This parameter appears only if the Use SAPControl flag is set to Yes – i.e., if the test uses the SAPControl web service for collecting measure**.To enable the test to access the SAPControl web service and determine process state, you need to configure the OS Username and OS Password parameters of the test with the credentials (i.e., name and password) of an OS user, who fulfills one of the following conditions: • The name of the OS user should be declared using the service\admin_users profile parameter; (OR) • The name of the user group to which the OS user belongs should be declared

Parameter	Description
	using the service\admin_groups profile parameter; (OR)
	• The OS user should have the permission to execute the **sapstartsrv** executable
Confirm Password	**This parameter appears only if the Use SAPControl flag is set to Yes – i.e., if the test uses the SAPControl web service for collecting measures**. Confirm the os password by retyping it here.
SSL	**This parameter appears only if the Use SAPControl flag is set to Yes – i.e., if the test uses the SAPControl web service for collecting measures**. Set this flag to **Yes**, if the SAPControl web service is SSL-enabled. Set this flag to **No**, if the SAPControl web service is not SSL-enabled.
DD Frequency	Refers to the frequency with which detailed diagnosis measures are to be generated for this test. The default is *1:1*. This indicates that, by default, detailed measures will be generated every time this test runs, and also every time the test detects a problem. You can modify this frequency, if you so desire. Also, if you intend to disable the detailed diagnosis capability for this test, you can do so by specifying *none* against DD Frequency.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.
	The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:
	• The eG manager license should allow the detailed diagnosis capability
	• Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Process status	Indicates the current health state of this process.		The values that this measure can report and their corresponding numeric values are discussed in the table below:

Measurement	Description	Measurement Unit	Interpretation
			<table><tr><th>Measure Value</th><th>Numeric Value</th></tr><tr><td>Normal</td><td>1</td></tr><tr><td>Critical</td><td>2</td></tr><tr><td>Error</td><td>3</td></tr><tr><td>Offline</td><td>4</td></tr></table> **Note:** By default, the test reports the **Measure Value**s in the table above to indicate process state. In the graph of this measure however, the same is represented using the numeric equivalents only. If the value of this measure is Critical, Error, or Offline, you can use the detailed diagnosis of the measure to determine the probable cause of the abnormal process status. The detailed diagnosis will also reveal when the process was started and the elapsed time of the process. From this information, you can figure out when the problem could have occurred and how long the problem may have persisted.
Is process running?	Indicates whether/not this process is running currently.		The values that this measure can report and their corresponding numeric values are discussed in the table below: <table><tr><th>Measure Value</th><th>Numeric Value</th></tr><tr><td>Yes</td><td>1</td></tr><tr><td>No</td><td>2</td></tr></table> **Note:**

Measurement	Description	Measurement Unit	Interpretation
			By default, the test reports the **Measure Value**s in the table above to indicate whether a process is running or not. In the graph of this measure however, the same is represented using the numeric equivalents only.
Has process restarted?	Indicates whether/not the process was restarted in the last measurement period.		The values that this measure can report and their corresponding numeric values are discussed in the table below:

Measure Value	Numeric Value
No	1
Yes	2

Note:

By default, the test reports the **Measure Value**s in the table above to indicate whether a process was restarted or not. In the graph of this measure however, the same is represented using the numeric equivalents only.

3.2 The SAP Basis Layer

Using the tests depicted by Figure 3.3, administrators can assess the efficiency with which the SAP ABAP Instance manages its memory resources.
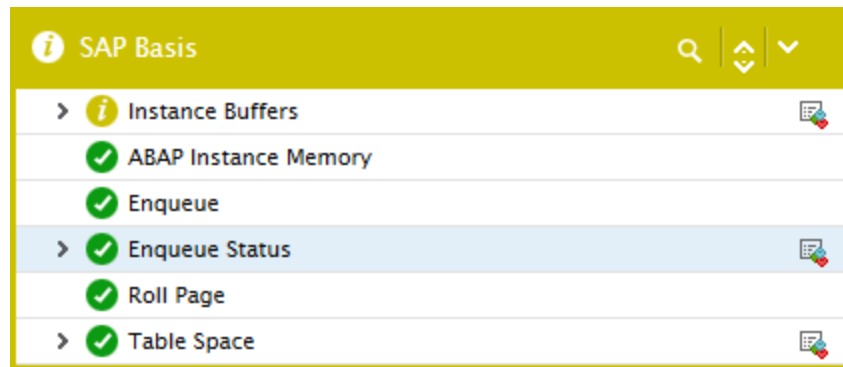
Figure 3.3: The tests associated with the SAP Basis layer

3.2.1 Enqueue Test

The Enqueue service allows SAP ABAP applications to lock data so that only they can use it. Locking the data prevents parallel changes to the same data, which would lead to data inconsistency. There is one instance of an enqueue service for each system - this instance becomes the central instance of the system by virtue of having this service. This Enqueue Client collects performance values for requests from other instances to this service. The Enqueue server provides the enqueue service for the system.

This test monitors the performance of the enqueue service and reports how well the owner IDs in the lock table were utilized. In addition, this test reports how well the elementary lock IDs were utilized and how many errors were encountered in the enqueue work process.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every SAP ABAP instance being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.

Parameter	Description
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Client enqueue frequency	The rate of Enqueue operations (logical data locks) coming from another instance to the central instance.	Locks/Min	This is a relative measure of activity in the system, useful only for analyzing unusual events or patterns of activity in an application server. The SAP ABAP enqueue service is capable of handling very high rates of operation. Should an alert occur, it indicates that the wait times for lock operations are having an adverse effect on the overall dialog response time. These situations are of a temporary nature and should correct themselves. They are likely to occur only under unusual circumstances, such as massively parallel execution of RFC calls to a particular server.
Server queue length	The percentage length of the wait queue for the enqueue service	Percent	If an error occurs in this MTE, analyze the problem by executing the following diagnosis function in the lock management: Call Transaction SM12 and choose Extras -> Diagnosis or -> Diagnosis in update. With SAP'S agreement, you can use the extended diagnosis functions that are displayed by entering the OK codes "TEST".
Owner names utilization	Indicates the percentage of owner IDs in the lock table that are currently utilized.	Percent	Every time the enqueue server receives a lock request, the system checks the lock table to determine whether the request collides with an existing lock. If this is the case, the request is rejected. Otherwise, the new lock is written to the lock table. This lock table available in the main memory of the enqueue server records the current locks in the system.

Measurement	Description	Measurement Unit	Interpretation
			For each elementary lock, the table specifies the owner, lock mode, name, and the fields in the locked table. If the value of this measure is close to 100%, it indicates that all the owner IDs in the lock table are exhausted and hence, new locks cannot be created unless the existing locks assigned to the owner IDs are released.
Granule arguments utilization	Indicates the percentage of lock arguments in the lock table that are currently utilized.	Percent	The locks of different owners or with different lock modes containing the same lock argument occupy one entry in the lock table. If the value of this measure is close to 100%, it indicates that all the lock argument s in the lock table are exhausted and new locks cannot be created unless the existing locks are released.
Granule entries utilization	Indicates the percentage of elementary locks in the lock table that are currently utilized.	Percent	An elementary lock corresponds to a data record in the lock table. For each elementary lock, the table specifies the owner, lock mode, name, and the fields in the locked table. If the value of this measure is close to 100%. It indicates that all the elementary locks in the lock table are utilized and hence, new locks cannot be created unless the existing elementary locks are released from the lock table.
Enqueue work process errors	Indicates the number of errors encountered by the enqueue work process.	Number	Ideally, the value of this measure should be zero.
Enqueue work process error rate	Indicates the rate of enqueue work process errors encountered.	Errors/Min	

3.2.2 Enqueue Status Test

The Enqueue service allows ABAP applications to lock data so that only they can use it. The locking of the data avoids parallel changes to the data, which would lead to data inconsistency. The enqueue work process is in charge of the lock management system. It allows multiple application servers to synchronize their access to the database and maintain data consistency. The locks are managed by the enqueue work process using a lock table that resides in the main memory. The enqueue work process sets an SAP lock by writing entries in the lock table; but prior to that, the enqueue work process checks the lock table to determine whether/not the requested lock object is already locked, and if locked, what type of lock is active on the object.

While SAP supports many types of locks, from a performance perspective, the following types are most critical:

- **Exclusive:** Exclusive locks are used to avoid parallel modification of the data, which means that exclusively locked data can be displayed or modified by only one user.

- **Exclusive but not cumulative:** Locks of this type can be called only once. So a lock request will be rejected if an *exclusive lock* already exists.

Too many exclusive locks held for long durations can be detrimental to SAP system performance, as they can block users from updating critical transactions. This is why, SAP administrators need to keep track of such locks, promptly detect unreleased locks, and figure out the reasons for the same. To enable this lock analysis, eG Enterprise provides the **Enqueue Status** test. For each exclusive lock type (i.e., exclusive and exclusive but not cumulative), this test reports the number of locks of that type for which entries exist in the lock table and the number of locks that have remained active over different time periods ranging from 1 hour to over 1 day. In the process, the test points administrators to those lock types that were unreleased for significantly long time windows, thus impacting SAP system performance. Detailed metrics provided by the test will lead administrators straight to the exact locks that were held for broad time frames and the user who held them!

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for each exclusive lock type and one set of results for an *All* descriptor that reports aggregated performance results across all lock types.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull

Parameter	Description
	out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
DD Frequency	Refers to the frequency with which detailed diagnosis measures are to be generated for this test. The default is *1:1*. This indicates that, by default, detailed measures will be generated every time this test runs, and also every time the test detects a problem. You can modify this frequency, if you so desire. Also, if you intend to disable the detailed diagnosis capability for this test, you can do so by specifying *none* against DD Frequency.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option. The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled: • The eG manager license should allow the detailed diagnosis capability • Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Number of locks	Indicates the number of locks of this type currently held.	Number	A low value is desired for this measure. Compare the value of this measure across lock types to know which lock type contains the maximum number of locks.
Percentage of locks	Indicates the percentage of total locks currently held that are of this type.	Percent	A low value is desired for both exclusive lock types. A high value indicates that a majority of the locks

Measurement	Description	Measurement Unit	Interpretation
			are exclusive locks, which is a cause for concern.
5 mins to 1 hour locks	Indicates the number of locks of this type that were held for a duration between 5 minutes to 1 hour.	Number	Normally, locks are automatically released when transactions are committed or when users finish working on the data. If locks remain unreleased for long time periods, it may not always be a cause for alarm, as it may be owing to something as routine as long-running background jobs that update the database. Some other times, unreleased locks can cause serious performance issues to the SAP system. This is why, high values reported by any of these measures cannot be ignored. In such situations, it is best to immediately investigate the reason why locks were held for such a long duration. To know which precise locks were unreleased by which user and why, use the detailed diagnosis of this measure. Some of the most common reasons for unreleased locks are as follows: • **Abnormal termination of the SAP GUI**: If users shut down their PCs without logging off SAP, or if the SAP GUI terminates for other reasons, such as network or communication problems, the user session may remain active in the SAP system. If this happens while the user had lock entries, sometimes these locks remain

Measurement	Description	Measurement Unit	Interpretation
			unreleased since the user is no longer active in the system. In these cases, you can manually release the lock by deleting it from the lock entry list, or you can force log off the user from the User Overview Monitor in the application server where the user was logged on.
1 hour to 1 day locks	Indicates the number of locks of this type that were held for a duration between 1 hour to 1 day.	Number	• **Inactive SAP GUI**: When users currently working on the system leave their presentation services with unfinished transactions, locks will not be released. You can release such locks by deleting them from the lock entry list, but only after confirming that they are not coming from important background jobs.
Locks older than 1 day	Indicates the number of locks of this type that were held for over a day.	Number	• **Problems in update processing**: When there are update modules that are unprocessed by the system, these modules do not release the locks. The update module releases the locks only when the update records have been completely processed or they have abnormally terminated with an error status. Only update modules with status INIT or AUTO can hold locks.

3.2.3 Instance Buffers Test

This test reports statistics relating to the SAP ABAP instance's buffers. The goal of buffer setting is to have a sufficiently large buffer to maintain a high hit rate and to do so with a low rate of swapping and a minimal effect on operating system paging. The test contains values for the following SAP buffers, sorted by application server:

Name of the MTE	Contents of the Buffer
Program	Compiled SAP programs
Generic Key	Wholly or partly buffered database tables
SingleRecord	Individual records from utilized database tables
Screen	Screen pages from ABAP programs
CUA	Menus and pushbuttons from the ABAP screen pages
TableDefinition	Table Definitions from the SAP ABAP Instance Repository
FieldDescription	Field descriptions from the SAP ABAP INSTANCE Repository
InitialRecords	Initial record layout (initial values for the fields of a database segment) for a table
ShortNameTAB	Combination of TTAB and FTAB buffers

In the table above, the term **MTE** stands for a Monitoring Tree Element. According to the SAP monitoring architecture, every SAP component/sub-system requiring monitoring, such as the buffer system, the dialog system, background processing etc., is termed as a *Monitor*. Each of these *Monitors* and their respective attributes are organized in the form of a tree-structure known as the monitoring tree, where the *Monitor* itself will be the pivotal node, and its key attributes the sub-nodes. Each of these attributes is otherwise referred to as a monitoring tree element (MTE).

Figure 3.4 depicts the tree-structure of the *Buffers Monitor*. From this figure it can be inferred that the name of the *monitor,* **Buffers**, is the primary node of the monitoring tree. Each of the buffer types, which are the sub-nodes of **Buffers**, will therefore become MTEs. Similarly, the attributes such as *DirectoryUsed, SpaceUsed*, etc., that are associated with every buffer type, also become MTEs. The eG agent executing the Instance Buffers Test reports the values of these attributes only.
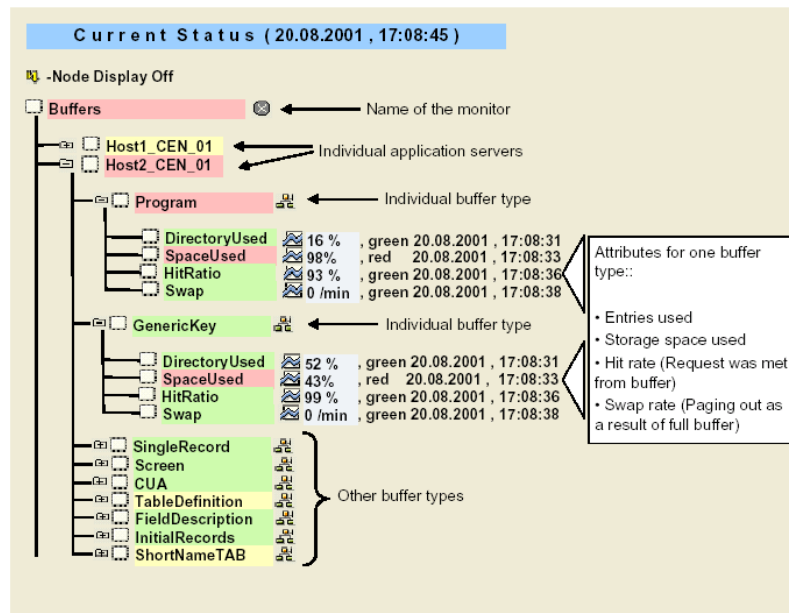
Figure 3.4: The Buffers Monitor tree-structure

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every MTE.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been

Parameter	Description
	provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Directory entries used	The percentage usage of the directory (number of entries)	Percent	The buffer directories point to the location of the objects stored in the buffer. If one runs out of directory entries , then no new objects can be placed in the buffer, and the free space cannot be used.
Buffer space used	The percentage of buffer storage space been used currently.	Percent	If the buffer size is less, then for many requests the buffer cannot be used leading to more swapping; therefore, the buffer size has to be increased.
Hit ratio	The percentage of database queries that were met from the buffer.	Percent	In general, poor buffer quality means that a buffer is too small. If a buffer is too small, then the chances increase that requested objects (table entries, programs, and so on) will not be found in it. The result is a lower hit ratio, and, if the buffer is already full, increased swapping.

To improve the hit ratio, increase the size of a buffer. |
| Buffer swaps | The rate of swaps due to a filled buffer. | Swaps/Min | Swapping increases as requested objects force older objects out of the buffer.

Increase the size of the buffer if the swap rate is very high and the hit ratio is low. |

3.2.4 ABAP Instance Memory Test

This test monitors the basic functions of the SAP Memory Management System and advises on how best to configure the system depending upon the platform used, the available resources, etc. It also sheds light on the hardware and operating system usage.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every SAP ABAP instance being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.

Parameter	Description
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Heap memory total allocation	The total size of heap memory (private memory).	MB	
Heap memory actual usage	The percentage of heap memory actually used.	Percent	Heap memory is a local memory assigned for the work process in SAP. Heap memory contains user contexts. Typically, if a dialog work process fully utilizes the extended memory, it starts . Once the heap memory is assigned to a work process, the work process will switch to the PRIV mode. This means that the work process is reserved for processing the current user context until the context releases the work process again when the request has ended. If this measure reports a non-zero value, it implies that heap memory has been used – i.e., one/more work processes are in the PRIV mode. For best performance, not too many dialog work processes should be in the

Measurement	Description	Measurement Unit	Interpretation
			PRIV mode simultaneously.
Extended memory allocated	Indicates the total size of the extended memory.	MB	
Extended memory actual usage	The actual usage of extended memory.	Percent	
Extended memory attached	The percentage of extended memory in user contexts that is active in WPs now.	Percent	
Number of extended memory slots	The number of extended memory slots.	Number	
Usage of extended memory slots	The percentage of extended memory slots actually used.	Percent	
Private work processes	The number of restarted private work processes.	Number	
Dialog work processes restarted	The number of restarted dialog processes.	Number	
Non-dialog work process restarts	The number of non-dialog processes restarted.	Number	

3.2.5 Memory Management Test

This test monitors the basic functions of the SAP Memory Management System and advises on how best to configure the system depending upon the platform used, the available resources, etc. It also sheds light on the hardware and operating system usage.

This test is disabled by default. To enable the test, go to the **ENABLE / DISABLE TESTS** page using the menu sequence : Agents -> Tests -> Enable/Disable, pick *SAP ABAP* as the desired **Component type**, set *Performance* as the **Test type**, choose the test from the **DISABLED TESTS** list, and click on the **<** button to move the test to the **ENABLED TESTS** list. Finally, click the **Update** button.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every SAP ABAP instance being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.

Parameter	Description
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Heap memory total allocation	The total size of heap memory (private memory).	MB	
Heap memory peak use	A high watermark of heap memory usage.	Percent	
Heap memory recent peak use	The peak usage of heap memory in recent times.	Percent	
Heap memory actual usage	The percentage of heap memory actually used.	Percent	
Extended memory allocated	Indicates the total size of the extended memory.	MB	
Extended memory peak use	The high watermark of the stack memory usage since startup.	Percent	
Extended memory rec peak use	Indicates the peak usage achieved in the recent period for extended memory.	Percent	
High extended memory usage	The actual usage of extended memory.	Percent	
High extended	The percentage of	Percent	

Measurement	Description	Measurement Unit	Interpretation
memory attached	extended memory in user contexts that is active in WPs now.		
Number of extended memory slots	The number of extended memory slots.	Number	
Extended memory slot peak use	Indicates the peak usage of the extended memory slots.	Percent	
Extended memory slot rec peak use	The peak usage of the extended memory slots in recent times.	Percent	
Usage of extended memory slots	The percentage of extended memory slots actually used.	Percent	
Private work processes	The number of restarted private work processes.	Number	
Dialog work processes restarted	The number of restarted dialog processes.	Number	
Non-dialog work process restarts	The number of non-dialog processes restarted.	Number	

3.2.6 Roll Page Test

Roll area and Paging area are two very important concepts of memory management. Roll area is a memory area with a set size that belongs to a work process. It is located in the heap of the virtual address space of the work process. Disk area (swap space) is used as an extension of the physical memory for temporary storage. When SAP tries to keep track of processes requiring more physical memory than available, then data is moved to and from the swap space. If only segments of the processes are so copied, it is called paging.

Figure 3.5 depicts the elements of the SAP memory.
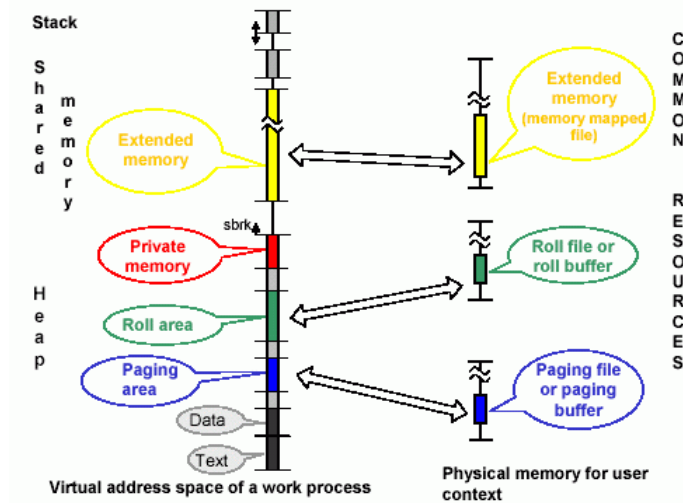
Figure 3.5: Elements of the SAP memory

This test extracts statistics specific to these two memory concepts.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every SAP ABAP instance being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the

Parameter	Description
	name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Paging area used	The percentage utilization of the swap space (paging area).	Percent	Paging utilizes CPU resources, performs disk reads / writes, and hence is considered an expensive operation. However, paging itself occurs only when the memory is low. Therefore, if more paging area is used, it means one has to kill some processes or increase physical memory size.
Roll area used	The percentage of roll area that has been used.	Percent	When the context of a work process changes, the data is copied from the roll area to a common resource called the roll file. First the process tries to occupy the roll area of the memory. When roll area is full, extended memory is used up by the process. The default value is specified in transaction RZ11, and is determined dynamically. Roll area should not be changed manually. If one has to still to make changes on one's platform, keep in mind the following dependencies: • rdisp/ROLL_SHM should be adjusted if ztta/roll_area is changed. • rdisp/ROLL_MAXFS must be adjusted if ztta/roll_area is changed. • ztta/roll_area must be larger than, or the same size as ztta/roll_first.

3.2.7 Table Space Test

This test monitors the database tablespaces.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every tablespace on the database.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a

Parameter	Description
	case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Space free	The amount of free space in the database tablespaces.	MB	
Space used	The percentage of used up area of the various tablespaces in the database.	Percent	

3.3 The SAP Work Processes Layer

Numerous services execute on the SAP ABAP Instance, each of which is crucial to its smooth functioning. The tests associated with the **SAP Work Processes** layer (see Figure 3.6) monitor these critical services and report performance issues in their operations (if any).
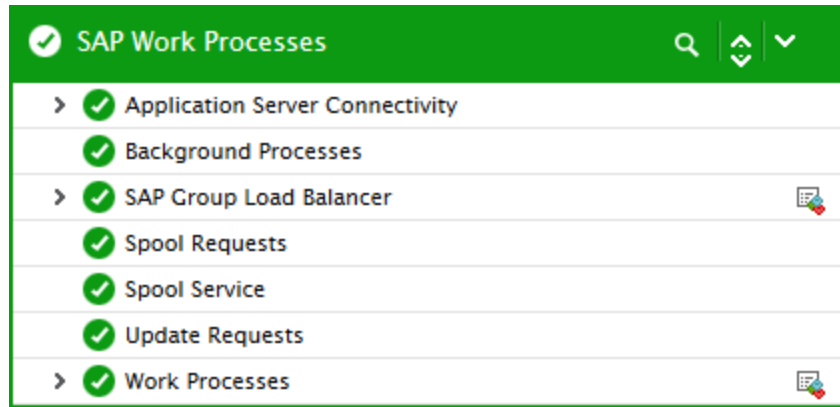
Figure 3.6: The tests associated with the SAP Work Processes layer

3.3.1 Spool Service Test

The Spool Service monitoring object contains the most important attributes about the spool system. This test monitors the functioning of the spool system, and reports the extent of its utilization, the length of the wait queues, etc.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every SAP ABAP instance being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been

Parameter	Description
	provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses SAPJCO to collect measures.** An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses SAPJCO to collect measures.** If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses SAPJCO to collect measures.** This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Utilization of the spool work processes	The percentage utilization of the spool work processes.	Percent	
Spool work processes	The number of spool work processes.	Percent	Output requests are buffered in the dispatcher queue on the spool server until a free work process accepts them. A high value for this measure therefore, indicates the non-availability of idle work processes for servicing the output requests in the dispatcher queue. This, in turn, could be due to a heavy workload on the spool server.
Requests in the spool service queue	The percentage of space in the spool requests queue that has been utilized.	Percent	The spool requests queue takes output requests from the dispatcher queue when a free work process in the spool server accepts the output request. A high value here, once again indicates a heavy workload on the server, due to which very few work processes are free to accept the enqueued output requests.
Requests in process-specific request queues	The percentage of space being utilized in the special spool request queues for processing requests in sequence.	Percent	If a spool server has several spool work processes, output requests can overtake each other. To maintain the sequence of requests, there are special work process-specific request queues, each with requests for one particular output device.
Pages in spool requests queue	The number of pages in the spool requests queue.	Number	
Device cache used	The percentage of the device cache in use.	Percent	The device cache contains device definitions and sever assignments for all work processes. Entries are taken into the cache as required, and can be removed again if the cache becomes full.

Measurement	Description	Measurement Unit	Interpretation
Fixed device cache area used	The percentage of space in the fixed device cache that is currently in use.	Percent	The fixed device cache contains information about the output devices for which there are requests in the host spool system that have not yet been reported as finished. The cache must therefore contain at least as many entries as the number of devices that can be concurrently used.
Host spool requests list used	The percentage of space in the host spool requests list in use.	Percent	The host spool requests limit the number of requests in the host spool which can be managed with the spool service. To minimize database accesses, the list must be stored in shared memory. It deals with status queries for the current requests.

3.3.2 Background Processes Test

This test measures the extent of usage of the background processes.

This test is disabled by default. To enable the test, go to the **ENABLE / DISABLE TESTS** page using the menu sequence : Agents -> Tests -> Enable/Disable, pick *SAP ABAP* the desired **Component type**, set *Performance* as the **Test type**, choose the test from the **DISABLED TESTS** list, and click on the **<** button to move the test to the **ENABLED TESTS** list. Finally, click the **Update** button.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every background server of the SAP ABAP instance being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.

Parameter	Description
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for

Parameter	Description
	SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Utilization of background work processes	The percentage of the background processing capacity currently utilized. The value is averaged over the background work processes and by default, averaged over the last hour.	Percent	This measure and the System wide queue length measure (of the BackgroundService test) show if there is a serious bottleneck in the background processing capacity. The optimal situation is to maintain a high level of utilization of the work processes and a short wait queue.
Running background processes	The number of background work processes running on an application server.	Number	It does not make sense to have more than 2-3 work processes per CPU on a background server, as these work processes will already be fully utilizing the CPU. Set the number of these processes using the system parameter rdisp/wp_no_btc.
Server queue length	The number of released jobs that are explicitly to be executed on this application server, but for which there are no free background work processes.	Jobs	An alert for this measure when there is a short System wide queue length suggests that the distribution of jobs is not optimal. Only specify a target server if it is absolutely necessary.

3.3.3 Background Services Test

This test monitors the background services that are key to the smooth functioning of background processes.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every SAP ABAP instance being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.

Parameter	Description
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
System wide queue length	The number of jobs that are waiting for free background processes for their execution.	Number	Background jobs are usually defined without a target server specification. This ensures optimal distribution of the workload from the jobs. This attribute is the best for showing capacity problems in background processing. A short wait queue is the optimal situation.
System wide free background processes	The number of free background work processes in the entire system.	Number	
System wide class A processes	The number of class A background processes in the entire system.	Number	

3.3.4 Dialog Activity Test

The Dialog service is the one which responds to the user requests to an SAP ABAP server. This test reports performance statistics pertaining to the Dialog service of the SAP ABAP server.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for the SAP ABAP instance being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses SAPJCO to collect measures**. An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.

Parameter	Description
Router	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses SAPJCO to collect measures**. If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses SAPJCO to collect measures**. This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Utilization of the dialog processes	The percentage utilization of the dialog work processes of an application server.	Percent	
Dialog work processes	The number of dialog work processes.	Number	
Dispatcher wait queue length	The percentage utilization of the dispatcher wait	Percent	With normal workload, this value is around 0%. A long wait queue is a sign

Measurement	Description	Measurement Unit	Interpretation
	queue.		that the application server has too few work processes or too high a CPU workload.
Long runners	Indicates how long the long-running dialog processes have been running.	Secs	Long-running tasks can block other users' dialog steps and can produce a general degradation of dialog response time for interactive users. Resolving this problem requires analysis of long-running dialog steps. Corrective measures include moving users to another application server, asking users to schedule long-running reports or other actions as background jobs in off-peak time periods, etc.
Dialog steps	The number of dialog steps per minute.	Steps/min	A high value combined with a high Dialog process time points to a general overload; a very low value, indicates an error.
Users logged in	The number of users logged in.	Number	

3.3.5 Database Buffer Test

This test reports statistics pertaining to the buffer cache for database operations.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every SAP ABAP instance being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.

Parameter	Description
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then

Parameter	Description
	the JCO Version configuration should be 3.x.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Buffer cache hit ratio	The percentage of time the database server is able to satisfy a request directly from the cache.	Percent	Physical I/O takes significant amount of time and also increases CPU resources required. The database configuration should be tuned to ensure that a required block will be most likely in memory. The extent to which this is achieved is measured using this measure. Ratio should be 80% or higher. A lower value indicates insufficient memory allocation to the database buffer cache.
Library cache hit ratio	Library cache is a buffer that contains the shared SQL and PL/SQL areas. The library cache hit ratio indicates the percentage of shared SQL statements being reparsed.	Percent	For a well-tuned database, this ratio is 90%. A lower hit ratio may indicate that the memory allocation to the library cache is insufficient. A low value can degrade the database performance.
Redo log buffer entries	The number of entries in the redo log buffer describing changes made to the database.	Number	The changes made to the database are first written to the redo log buffer. The database then periodically writes batches of the redo entries to the online redo log files. The lesser the number of entries in the Redo Buffer, the lesser the database changes are reflected in the buffer. Therefore, there will be higher disk reads and system performance will decrease.

3.3.6 SAP Group Load Balancer Test

This test automatically discovers the logon groups on a SAP message server, and monitors the status of load balancing on each of the SAP ABAP application server(s) associated with a logon group.

Target of the test : The SAP Messaging server

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every logon group discovered.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
MessagePort	Specify the port number of the SAP Message server.
LibraryPath	This test uses an **lgtst** command to extract critical statistics from the SAP Message server. Specify the full path to the library files used in the execution of the **lgtst** command.
CommandPath	Specify the full path to the **lgtst** executable in the Command Path text box.
	Note:
	The MessagePort, LibraryPath and CommandPath parameters are applicable only to **non-windows platforms**.
Count	Specify the number of SAP ABAP instances to be polled by the **lgtst** command, so as to determine whether load balancing has been enabled on the SAP ABAP server or not.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Number of unique servers	Indicates the number of distinct application servers that are currently communicating under the same group through the Message Server.	Number	
Load balanced	Indicates whether the SAP logon group is load-balanced or not.	Percent	If the value of this measure is 0, it means that load-balancing is not enabled for the logon group. The client's request will be served by the dialog server which has first taken up the request. The value 100 indicates that the logon group is load-balanced.

Note:

- This test uses an lgtst command to extract critical statistics from the SAP Message server. With this command, you can check the active instances of your SAP System and check existing logon groups directly at the operating system level. To ensure that this test functions smoothly, the **lgtst** command needs to be copied to the /opt/egurkha/bin directory (on Unix, or the <EG_INSTALL_DIR>\bin on Windows).

- Another pre-requisite for the smooth execution of this test is that, in the transaction SMLG, the External RFC Permitted attribute will have to be defined for any one of the logon groups on the SAP Message server.

3.3.7 Application Server Connectivity Test

This test reveals whether the connection between the SAP ABAP Instance and the SAP Messaging server is available or not.

Target of the test : The SAP Messaging server

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for the SAP ABAP instance being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
MessagePort	Specify the port number of the SAP Message server.
LibraryPath	This test uses an **lgtst** command to extract critical statistics from the SAP Message server. Specify the full path to the library files used in the execution of the **lgtst** command.
CommandPath	Specify the full path to the **lgtst** executable in the Command Path text box. **Note:** The MessagePort, LibraryPath and CommandPath parameters are applicable only to **non-windows platforms**.
Count	Specify the number of SAP ABAP instances to be polled by the **lgtst** command, so as to determine whether load balancing has been enabled on the SAP ABAP server or not.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Availability	Indicates whether a SAP ABAP Instance is currently available for communicating with a SAP Message server.	Percent	If the value of this measure is 0, it means that the SAP ABAP Instance server can no longer communicate with other SAP ABAP Instances (especially if central instance and dialog instance are installed in separate systems). The value 100 indicates the availability of the SAP ABAP Instance server.

Note:

- This test uses an **lgtst** command to extract critical statistics from the SAP Message server. With this command, you can check the active instances of your SAP System and check existing logon groups directly at the operating system level. To ensure that this test functions smoothly, the **lgtst** command needs to be copied to the /opt/egurkha/bin directory (on Unix, or the <EG_INSTALL_DIR>\bin on Windows).

- Another pre-requisite for the smooth execution of this test is that, in the transaction SMLG, the External RFC Permitted attribute will have to be defined for any one of the logon groups on the SAP Message server.

3.3.8 SAP Messages Test

This test reports the number of SAP ABAP instances that are communicating with the SAP Messaging server.

Target of the test : The SAP Messaging server

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for the SAP ABAP instance being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
MessagePort	Specify the port number of the SAP Message server.
LibraryPath	This test uses an **lgtst** command to extract critical statistics from the SAP Message server. Specify the full path to the library files used in the execution of the **lgtst** command.
CommandPath	Specify the full path to the **lgtst** executable in the Command Path text box. **Note:** The MessagePort, LibraryPath and CommandPath parameters are applicable only to **non-windows platforms**.
Count	Specify the number of SAP ABAP instances to be polled by the **lgtst** command, so as to determine whether load balancing has been enabled on the SAP ABAP server or not.

Parameter	Description
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.

The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:

- The eG manager license should allow the detailed diagnosis capability

- Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Reachable application servers	Indicates the number of application servers that are currently communicating with the SAP Message server.	Number	

Note:

- This test uses an **lgtst** command to extract critical statistics from the SAP Message server. With this command, you can check the active instances of your SAP System and check existing logon groups directly at the operating system level. To ensure that this test functions smoothly, the **lgtst** command needs to be copied to the /opt/egurkha/bin directory (on Unix, or the <EG_INSTALL_DIR>\bin on Windows).

- Another pre-requisite for the smooth execution of this test is that, in the transaction SMLG, the External RFC Permitted attribute will have to be defined for any one of the logon groups on the SAP Message server.

3.3.9 Spool Processes Test

This test reports measures pertaining to the different request processing groups. For classification of the output requests, we recommend that you assign both the spool servers and the output devices to different classes. By having different spool servers that process different types (and priorities) of requests you can avoid, or at least control, mutual obstruction of output requests. The Processing Groups MTE contains the possible processing groups:

MTE	Description	Notes
ProcessingGroup Adm	Spool administration tasks	Examples: • Activation of delayed requests • Deletion of obsolete requests • Rerouting of requests in the case of server failure
ProcessingGroup Reg	Normal requests	Normal requests are requests to devices that are assigned to a spool server
ProcessingGroup Fro	Requests for front end output devices	Front end output devices are defined by the user at operating system level. In the SAP ABAP system, there must be only one output device with the access method F (front end) which sends output requests to the user's standard printer.
ProcessingGroup Vol	Requests classified as mass printing	Mass printing means very large requests. Assign these requests to a separate spool server, to avoid the obstruction of other output requests.
ProcessingGroup Pro	Requests classified as production printing	Assign the output requests that are required for trouble free productive operation to the production printing processing group.
ProcessingGroup Dsk	Requests classified as desktop printing	Assign printers at one's workspace to the desktop printing processing group. As they are often not available, they could obstruct other tasks. Do not use this group for routine operations.
ProcessingGroup Tst	Requests classified as test printing	Assign output devices which are a new device type or for which configuration is being tested to the test printing processing group.

In the table above, the term MTE stands for a Monitoring Tree Element. According to the SAP monitoring architecture, every SAP component/sub-system requiring monitoring, such as the buffer system, the dialog system, background processing etc., is termed as a Monitor. Each of these Monitors and their respective attributes are organized in the form of a tree-structure known as the

monitoring tree, where the Monitor itself will be the pivotal node, and its key attributes the sub-nodes. Each of these attributes is otherwise referred to as a monitoring tree element (MTE).

Figure 3.7 depicts the tree-structure of the *Spool System Monitor*. From this figure it can be inferred that the monitor, **Spool System**, is the primary node of the monitoring tree. One of the sub-nodes of this monitor is *Processing Groups*. This sub-node and each of the nodes within (i.e., the individual processing groups and their attributes) will therefore become individual MTEs of the **Spool System Monitor**. The eG agent executing the *SpoolProcessTest* extracts the values of the key attributes of each of the processing groups.
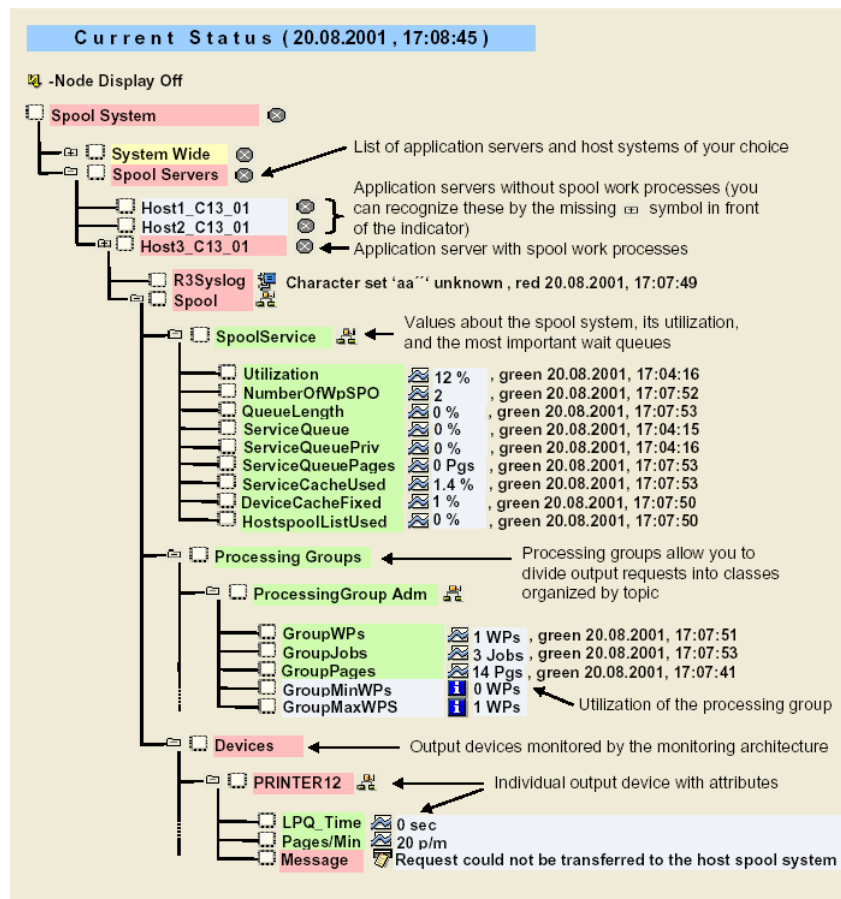
Figure 3.7: The Spool System Monitor

This test is disabled by default. To enable the test, go to the **ENABLE / DISABLE TESTS** page using the menu sequence : Agents -> Tests -> Enable/Disable, pick *SAP ABAP* as the desired **Component type**, set *Performance* as the **Test type**, choose the test from the **DISABLED TESTS** list, and click on the **<** button to move the test to the **ENABLED TESTS** list. Finally, click the **Update** button.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every processing group on a SAP ABAP instance.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed.
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.

Parameter	Description
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Group work processes	The number of group spool work processes.	Number	
Group jobs	The number of group spool requests.	Number	
Group pages	Peak usage achieved in the recent period for stack memory.	Number	

3.3.10 Spool Requests Test

The SAP System differentiates between two types of request when printing:

- **Spool request:** A spool request is a document for which a print function has been selected. However, it has not yet been output to a printer or another device. The output data for the print document is stored partly formatted in a data store until an output request is created, that is, until it is sent to a particular output device.

The spool system uses a spool request to store the print data temporarily and to access it. The data is stored in a temporary format. You can also display the print document.

The system automatically assigns a 10-digit ID number to a spool request.

- **Output request:** From the point of view of the SAP spool system, an output request outputs the print data of a spool request to a particular output device.

  Multiple output requests may exist for a single spool request. Each represents an instance of the output of the same spool request. Each of these output requests may have different attributes, such as the target printer or number of copies.

By differentiating between spool request and output requests, the spool system provides a means of storing the data temporarily.

This test monitors the spool requests of the target SAP ABAP instance and reports how many spool requests were created? Using this test, administrators may figure out how many spool requests were error prone. Apart from this, you can figure out the number of output problems and output errors encountered by the output requests for a corresponding spool request. This way, administrators may figure out what exactly caused the errors while processing the spool requests and when exactly were the errors at their peak!

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every processing group on a SAP ABAP instance.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects:

Parameter	Description
	S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.

Parameter	Description
DD Frequency	Refers to the frequency with which detailed diagnosis measures are to be generated for this test. The default is *1:1*. This indicates that, by default, detailed measures will be generated every time this test runs, and also every time the test detects a problem. You can modify this frequency, if you so desire. Also, if you intend to disable the detailed diagnosis capability for this test, you can do so by specifying *none* against DD Frequency.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option. The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled: • The eG manager license should allow the detailed diagnosis capability • Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Spool requests	Indicates the number of spool requests created during the last measurement period.	Requests	These measures are a good indicator of the load on the spool system.
Spool request rate	Indicates the rate at which spool requests were created during the last measurement period.	Requests/sec	
Total number of spool errors	Indicates the total number of outstanding spool requests with errors.	Requests	Ideally, the value of this measure should be zero.
Spool error rate	Indicates the rate of spool requests with errors during the last measurement period.	Requests/sec	A sudden/gradual increase in the value of this measure indicates that the overall spool system is error prone.

Measurement	Description	Measurement Unit	Interpretation
Total number of output problems	Indicates the number of output problems encountered by the output requests for a corresponding spool request.	Requests	These output problems are encountered while executing the output requests corresponding a spool request. However, you can infer that there was an output for the request but problems were encountered during printing.
Rate of output problems	Indicates the rate at which output problems were encountered by the output requests.	Requests/sec	A sudden/gradual increase in the value of this measure indicates issues with output device connectivity or printing issues.
Total number of output errors	Indicates the number of output errors encountered by the output requests for a corresponding spool request.	Requests	The output errors occur when there is no output for a particular output request.
Rate of output errors	Indicates the rate at which the output errors were encountered by the output requests during the last measurement period.	Requests/sec	A sudden/gradual increase in the value of this measure indicates issues with output device connectivity or printing issues.
New spool errors	Indicates the number of spool requests with errors during the last measurement period.	Requests	Ideally, the value of this measure should be zero. The detailed diagnosis of this measure if enabled, lists the request number, corresponding output request status, title, output device, timestamp etc.,
New output problems	Indicates the number of output problems encountered by the output requests during the last measurement period.	Requests	The detailed diagnosis of this measure if enabled, lists the spool request number, output device, total output requests processed, number of output problems, number of requests with no printout, timestamp etc.
New output errors	Indicates the number of output errors encountered	Requests	Ideally, the value of this measure should be zero.

Measurement	Description	Measurement Unit	Interpretation
	by the output requests during the last measurement period.		The detailed diagnosis of this measure if enabled, lists the spool request number, output device, total output requests processed, number of output problems, number of requests with no printout, timestamp etc.,

3.3.11 Work Processes Test

Work processes execute the individual dialog steps in SAP ABAP applications. For each type of work process, this test reports the numerical statistics of the work processes in various states. In addition, this test helps administrators in analyzing the CPU utilization of the work processes so that resource intensive work processes can be identified. This way, administrators may figure out how well the work processes are utilized in the target environment and what is really causing the slowdown of the environment – is it due to the unavailability of free work processes? or are too many work processes on hold or in PRIV mode?

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every processing group on a SAP ABAP instance.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed.
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
Use SAPControl	Set this flag to **Yes** if you want the test to use the SAPControl web service for collecting metrics. Set this flag to **No** if you want the test to use the SAPJCO to report metrics. By default, this flag is set to **Yes**.
WSDL Port	**This parameter appears only if the Use SAPControl flag is set to Yes – i.e., if the test uses the SAPControl web service for collecting measures**. In this text box, specify the port number of the SAPControl web service. To determine the exact port number of the SAPControl web service, you can look up the etc/services file on

Parameter	Description
	the SAP ABAP system being monitored. If the port number is not declared in the etc/services file, you can specify the default port number of the web service against WSDL Port. If the web service is not SSL-enabled, then the default port number of the web service will be: 5<NR>13. Similarly, if the web service is SSL-enabled, then the default port number of the web service will be: 5<NR>14. <NR> in the port number refers to the system number of the SAP server being monitored. The system number is an indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the system number will be '00'. Similarly, if the SAP server port is 3201, the system number will have to be specified as '01'. Accordingly, the default port number of an SSL-enabled SAPControl web service will be 50014 , if the system number is 00, or 50114, if the system number is 01.
OS Username and OS Password	**This parameter appears only if the Use SAPControl flag is set to Yes – i.e., if the test uses the SAPControl web service for collecting measures**. To enable the test to access the SAPControl web service, you need to configure the OS Username and OS Password parameters of the test with the credentials (i.e., name and password) of an OS user, who fulfills one of the following conditions: - The name of the OS user should be declared using the service\admin_users profile parameter; (OR) - The name of the user group to which the OS user belongs should be declared using the service\admin_groups profile parameter; (OR) - The OS user should have the permission to execute the **sapstartsrv** executable
Confirm Password	**This parameter appears only if the Use SAPControl flag is set to Yes – i.e., if the test uses the SAPControl web service for collecting measures**. Confirm the OS Password by retyping it here.
SSL	**This parameter appears only if the Use SAPControl flag is set to Yes – i.e., if the test uses the SAPControl web service for collecting measures**. Set this flag to **Yes**, if the SAPControl web service is SSL-enabled. Set this flag to **No**, if the SAPControl web service is not SSL-enabled.
SAPUser	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses the SAPJCO to collect measures**. Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_TABU_DIS, S_XMI_ PROD, S_TOOLS_EX, S_RZL_ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user.

Parameter	Description
	The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses the SAPJCO to collect measures**. The password of the specified SAPUser.
Confirm Password	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses the SAPJCO to collect measures**. Confirm the password by retyping it here.
ClientName	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses the SAPJCO to collect measures**. Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SysNo	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses the SAPJCO to collect measures**. An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses the SAPJCO to collect measures**. If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses the SAPJCO to collect measures**. This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses the SAPJCO to collect measures**. Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.

Parameter	Description
JCO Version	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses the SAPJCO to collect measures**. The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
Long Running DIA Step (Mins)	Specify the time duration in minutes beyond which a dialog work process is classified as a long running work process in the Long Running DIA Step (Mins) text box. By default, this value is 10 minutes. If the dialog work process is running beyond the specified cutoff duration, the details about the long running dialog work process will be displayed in detailed diagnosis of the *Long running work processes* measure.
Long Running BGD Step (Hrs)	Specify the time duration in hours beyond which a background work process is classified as a long running work process in the Long Running BGD Step (Hrs) text box. By default, this value is 24 hours. If the background work process is running for a duration longer than the specified cutoff time, the details about the long running background work process will be displayed in detailed diagnosis of the *Long running work processes* measure.
Long Running ENQ Step (Mins)	Specify the time duration in minutes beyond which a enqeue work process is identified as a long running work process in the Long Running ENQ Step (Mins) text box. By default, this value is 60 minutes. If the enqueue work process is running for a duration longer than the specified cutoff time, the details about the long running enqueue work process will be displayed in detailed diagnosis of the *Long running work processes* measure.
Long Running SPO Step (Mins)	Specify the time duration in minutes beyond which a spool work process is classified as a long running work process in the Long Running SPO Step (Mins) text box. By default, this value is 5 minutes. If the spool work process is running for a duration longer than the specified cutoff time, the details about the long running spool work process will be displayed in detailed diagnosis of the *Long running work processes* measure.
Long Running UPD Step (Mins)	Specify the time duration in minutes beyond which a update work process is classified as a long running work process in the Long Running UPD Step (Mins) text box. By default, this value is 5 minutes. If the update work process is running for a duration longer than the specified cutoff time, the details about the long running update work process will be displayed in detailed diagnosis of the *Long running work processes*

Parameter	Description
	measure.
Long Running UP2 Step (Mins)	Specify the time duration in minutes beyond which a update type 2 work process is classified as a long running work process in the Long Running UP2 Step (Mins) text box. By default, this value is 5 minutes. If the update type 2 work process is running for a duration longer than the specified cutoff time, the details about the long running update type 2 work process will be displayed in detailed diagnosis of the Long running work processes measure.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.
DD Frequency	Refers to the frequency with which detailed diagnosis measures are to be generated for this test. The default is *1:1*. This indicates that, by default, detailed measures will be generated every time this test runs, and also every time the test detects a problem. You can modify this frequency, if you so desire. Also, if you intend to disable the detailed diagnosis capability for this test, you can do so by specifying *none* against DD Frequency.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.
	The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:
	• The eG manager license should allow the detailed diagnosis capability
	• Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Free work processes	Indicates the number of work processes of this type that are currently free.	Number	A high value is desired for these measures. Sufficient number of free work processes are needed to handle sudden spikes in activity. It is

Measurement	Description	Measurement Unit	Interpretation
			important that free dialog work processes are available so that administrators will be able to login and troubleshoot other issues.
Percentage of free work processes	Indicates the percentage of work processes of this type that are currently free.	Percent	
Work processes on hold	Indicates the number of work processes of this type that are currently on hold.	Number	Work processes are held when a particular user holds the work proceses while waiting for some message. These processes cannot be released to the free pool until the message is received. Work processes on PRIV mode are also counted as on hold. Some issues can cause work processes to be held indefinitely thereby severely limiting/exhausting the number of free work processes.

The detailed diagnosis of this measure if enabled, lists the process ID, CPU utilization, user, report being run, table being accessed, elapsed time etc., |
| Percentage of work processes on hold | Indicates the percentage of work processes of this type that are currently on hold. | Percent | A low value is desired for this measure. If there is a sudden surge in the value of this measure, then it would adversely affect the performance of the server by exhausting the number of free work processes. Using the Work processes on hold measure administrators may figure out the work processes that are held for a longer duration and examine the real cause. |
| Work processes in PRIV mode | Indicates the number of work processes of this type that are currently in PRIV mode. | Number | A work process enters PRIV mode when either extended memory is exhausted or the process has used the amount of memory specified in ztta/roll_extension. The work process then starts utilizing the heap area which is not appreciated. If the memory utilized is greater than the one set against the abap/heaplimit profile |

Measurement	Description	Measurement Unit	Interpretation
			parameter, then the work process has to be restarted after terminating the user (i.e., after user sign out process). This will help administrators to restore the work processes from the PRIV mode.
			A low value is desired for this measure. An increasing trend in the value of this measure indicates severe performance bottleneck.
			The detailed diagnosis of this measure if enabled, lists the process ID, user, report being run, table being accessed, elapsed time etc.,
Percentage of work processes in PRIV mode	Indicates the percentage of work processes of this type that are currently in PRIV mode.	Percent	A low value is desired for this measure. The system will automatically terminate the executing transactions if more than a certain percentage of work processes are in PRIV mode and the user is inactive for a certain period of time.
Running work processes	Indicates the number of work processes of this type that are currently running.	Number	Comparing the value of this measure across the types helps you in identifying the work processes type that is highly utilized. This data can be very useful for capacity planning and fine tuning.

The detailed diagnosis of this measure lists the work process details thereby providing a snapshot view of the work processes that are currently executing. |
| Stopped work processes | Indicates the work processes of this type that are currently in Stopped state. | Number | The work processes would be in Stopped state when the work processes have been aborted and are not to be restarted. This usually happens because of a serious startup issue for the work process which |

Measurement	Description	Measurement Unit	Interpretation
			needs to be fixed before the work process can be started again.
			The detailed diagnosis of this measure lists the details about these work processes such as the process ID, user, report being run, table being accessed, elapsed time etc.,
Total number of work processes	Indicates the total number of work processes of this type that are configured to run.	Number	Comparing the value of this measure helps administrators in planning the capacity of each work processes type and fine tune it accordingly.
Dumps	Indicates the total number of created by the work processes of this type during the last measurement period.	Number	The detailed diagnosis of this measure if enabled, lists the name of the work processes that had errors / dumps, the CPU utilization, number of dumps thrown, user, report running, table accessed etc., Using these details administrators can deduce the reason behind the creation of dumps.
Request queue utilization	Indicates the percent of request queue for the work processes of this type that is currently utilized.	Percent	A high value for this measure indicates a sudden surge in the user activity which helps administrators to validate the distribution of work processes.
CPU utilization	Indicates the overall CPU utilization of the work processes of this type.	Percent	This measure indicates service level CPU utilization of the various services (work process types) such as Dialog service, Update service, Spool service etc., This measure helps administrators to identify the resource intensive work processes and figure out the real reason that is hogging the resources.

The detailed diagnosis of this measure if enabled, provides a sorted list of work processes by CPU utilization. |
| Waiting requests | Indicates the number of | Number | A higher number of waiting requests |

Measurement	Description	Measurement Unit	Interpretation
	requests for this work process type that are waiting to be processed.		results in high dispatcher wait time and response time. This helps to provision and distribute work processes appropriately.
Long running work processes	Indicates the number of work processes that have been running for a duration longer than the specified cutoff time.	Number	Generally, the work processes may be classified as a long running work process when the work process runs for longer duration than cutoff time. A high value for this measure is a cause of concern as long running work processes consume too much of resources thus leading to the performance degradation of the SAP instance. Use the detailed diagnosis of this measure to know more about the work process that is identified as a long running work process.,

3.3.12 Update Performance Test

The update system is designed to reduce the workload of the SAP transactions when significant changes are made to the database. The changes are carried out asynchronously - usually with short delays in between - by special update work processes. This is why the update system is widely used in SAP transactions (by almost every transaction that changes business data), although transactions also can change the data directly in the database.

This test tracks the performance of the update system on a SAP ABAP instance.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for the SAP ABAP instance being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull

Parameter	Description
	out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Response time for updates	The time taken for the update.	Secs	
Wait time of the update process	The wait time of the update processes in the dispatcher queue.	Secs	
Utilization of the update processes	The percentage utilization of the update work processes.	Percent	
Update work processes	The number of work processes of type Update 1 (high priority) and Update 2 (low priority).	Number	There must be atleast one Update 1 type work process in the system.

3.3.13 SAP ABAP Database Log Test

The test monitors database logs for specific error patterns. This test is disabled by default. To enable the test, go to the **ENABLE / DISABLE TESTS** page using the menu sequence : Agents -> Tests -> Enable/Disable, pick *SAP ABAP* the desired **Component type**, set *Performance* as the **Test type**, choose the test from the **DISABLED TESTS** list, and click on the **<** button to move the test to the **ENABLED TESTS** list. Finally, click the **Update** button.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every SearchPattern.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
AlertFile	Specify the path to the database log file to be monitored. For eg., */usr/john/cejkxihy.sta*. Multiple log file paths can be provided as a comma-separated list - eg., */user/john/cejkxihy.sta,/tmp/log/sejkxsig.tse*.
	Also, instead of a specific log file path, the path to the directory containing log files can be provided - eg., */user/logs*. This ensures that eG monitors the most recent log files in the specified directory. Specific log file name patterns can also be specified. For example, to monitor the latest log files with names containing the string 'dblogs', the parameter specification can be, */tmp/usr/*dblogs**. Here, '*' indicates leading/trailing spaces (as the case may be). In this case, the eG agent first enumerates all the log files in the specified path that match the given pattern, and then picks only the latest log file from the result set for monitoring.
	You can also configure the path in the following format: Name@logfilepath. Here, Name represents the display name of the path being configured. Accordingly, the parameter specification for the 'dblogs' example discussed above can be: *dblogs@/tmp/db/*dblogs**. In this case, the display name 'slogs' will alone be displayed as descriptors of the test.
	Every time this test is executed, the eG agent verifies the following:
	• Whether any changes have occurred in the size and/or timestamp of the log files that were monitoring during the last measurement period;
	• Whether any new log files (that match the AlertFile specification) have been newly added since the last measurement period;
	If a few lines have been added to a log file that was monitored previously, then the eG agent monitors the additions to that log file, and then proceeds to monitor newer log files (if any). If an older log file has been overwritten, then, the eG agent monitors this log file completely, and then proceeds to monitor the newer log files (if any).
SearchPattern	Enter the specific patterns of alerts to be monitored. The pattern should be in the

Parameter	Description
	following format: *<PatternName>:<Pattern>, where <PatternName>* is the pattern name that will be displayed in the monitor interface and <Pattern> is an expression of the form - expr or expr or expr or expr, etc. A leading '*' signifies any number of leading characters, while a trailing '*' signifies any number of trailing characters.
	For example, say you specify **BRSPACE:BR100*** in the SearchPattern text box. This indicates that "**BRSPACE**"is the pattern name to be displayed in the monitor interface. "**BR100***" indicates that the test will monitor only those lines in the database log which start with the term "**BR100**". A single pattern may also be of the form e1+e2, where + signifies an OR condition. That is, the PatternName is matched if either e1 is true or e2 is true.
	Multiple search patterns can be specified as a comma-separated list. For example: **BRSPACE:BR100*,BRCONNECT:BR02***.
	If the AlertFile specification is of the format Name@logfilepath, then the descriptor for this test in the eG monitor interface will be of the format: Name:PatternName. On the other hand, if the alertfile specification consists only of a comma-separated list of log file paths, then the descriptors will be of the format: *LogFilePath:PatternName*.
	If you want all the messages in a log file to be monitored, then your specification would be: <PatternName>:*.
Lines	Specify two numbers in the format x:y. This means that when a line in the alert file matches a particular pattern, then x lines before the matched line and y lines after the matched line will be reported in the detail diagnosis output (in addition to the matched line). The default value here is 0:0. Multiple entries can be provided as a comma-separated list.
	If you give *0:0,1:1* as the value for Lines and if the corresponding value in the SearchPattern filed is like *BRSPACE:BR100*,BRCONNECT:BR02** then:
	• 0:0 will be applied to BRSPACE:BR100* pattern
	• 1:1 will be applied to BRCONNECT:BR02* pattern
ExcludePattern	Provide a comma-separated list of patterns to be excluded from monitoring in the *EXCLUDEPATTERN* text box. For example critical ,*exception* . By default, this parameter is set to 'none'.
UniqueMatch	By default, the UniqueMatch parameter is set to **False**, indicating that, by default, the test checks every line in the log file for the existence of each of the configured SearchPatterns. By setting this parameter to **True**, you can instruct the test to ignore a line and move to the next as soon as a match for one of the configured patterns is found

Parameter	Description
	in that line. For example, assume that *Pattern1:*fatal*,Pattern2:*error** is the SearchPattern that has been configured. If UniqueMatch is set to **False**, then the test will read every line in the log file completely to check for the existence of messages embedding the strings 'fatal' and 'error'. If both the patterns are detected in the same line, then the number of matches will be incremented by 2. On the other hand, if UniqueMatch is set to **True**, then the test will read a line only until a match for one of the configured patterns is found and not both. This means that even if the strings 'fatal' and 'error' follow one another in the same line, the test will consider only the first match and not the next. The match count in this case will therefore be incremented by only 1.
RotatingFile	This flag governs the display of descriptors for this test in the eG monitoring console.
	If this flag is set to true and the AlertFile text box contains the full path to a specific (log/text) file, then, the descriptors of this test will be displayed in the following format: *Directory_containing_monitored_file:<SearchPattern>*. For instance, if the AlertFile parameter is set to *c:\eGurkha\logs\syslog.txt*, and RotatingFile is set to **True**, then, your descriptor will be of the following format: *c:\eGurkha\logs:<SearchPattern>*. On the other hand, if the RotatingFile flag had been set to **False**, then the descriptors will be of the following format: *<FileName>:<SearchPattern> - i.e., syslog.txt:<SearchPattern>* in the case of the example above.
	If this flag is set to **True** and the AlertFile parameter is set to the directory containing log files, then, the descriptors of this test will be displayed in the format: *Configured_ directory_path:<SearchPattern>.* For instance, if the AlertFile parameter is set to *c:\eGurkha\logs*, and RotatingFile is set to **True**, then, your descriptor will be: *c:\eGurkha\logs:<SearchPattern>*. On the other hand, if the RotatingFile parameter had been set to **False**, then the descriptors will be of the following format: *Configured_directory:<SearchPattern> - i.e., logs:<SearchPattern>* in the case of the example above.
	If this flag is set to **True** and the alertfile parameter is set to a specific file pattern, then, the descriptors of this test will be of the following format: *<FilePattern>:<SearchPattern>*. For instance, if the AlertFile parameter is set to *c:\eGurkha\logs*sys**, and RotatingFile is set to **True**, then, your descriptor will be: sys:<SearchPattern>. In this case, the descriptor format will not change even if the RotatingFile flag status is changed.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.
DD Frequency	Refers to the frequency with which detailed diagnosis measures are to be generated for

Parameter	Description
	this test. The default is *1:1*. This indicates that, by default, detailed measures will be generated every time this test runs, and also every time the test detects a problem. You can modify this frequency, if you so desire. Also, if you intend to disable the detailed diagnosis capability for this test, you can do so by specifying *none* against DD frequency.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.
	The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:
	• The eG manager license should allow the detailed diagnosis capability.
	• Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Messages	Indicates the number of messages of the configured patterns that were added to the database log when the test was last executed.	Number	The value of this measure is a clear indicator of the number of "new" alerts that have come into the monitored database logs.

3.3.14 Idoc Wait Monitor Test

A database consistency check performs a thorough check of the entire database. It examines all tables in the database to find out whether index and data pages are correctly linked and indexes are in proper-sorted order. It also checks that all pointers are consistent and that the data information on each page, and page offsets are reasonable. It enables the early recognition of problems and thus prevents problem escalation and possible loss of data.

Using this test, administrators can figure out how many primary and secondary indices were affected i.e., inconsistent while each type of database consistency check is performed. In addition, you can also figure out the number of tables and views that were affected when the database consistency check is performed.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every SAP ABAP instance being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a

Parameter	Description
	case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Primary indexes	Indicates the number of primary indices that were affected while performing this type of database consistency check.	Number	A low value is desired for this measure.
Secondary indexes	Indicates the number of secondary indices that were affected while performing this type of database consistency check.	Number	A low value is desired for this measure.
Tables	Indicates the number of tables that were affected	Number	A high value indicates that the tables in the database are inconsistent. Early

Measurement	Description	Measurement Unit	Interpretation
	while performing this type of database consistency check.		detection of such tables will help administrators prevent possible loss of data.
Views	Indicates the number of views that were affected while performing this type of database consistency check.	Number	

3.3.15 Update Requests Test

An update request, or update record, describes the data changes determined in an SAP LUW. These changes should be made completely, or not all (this means, in a database LUW). This refers only to V1 updates. V2 updates are triggered once the V1 update is complete, and are processed in a separate database LUW.

An update request is identified by its update key.

When the dialog transaction ends (COMMIT WORK), and the update process is called, an update header is created. Then the update record is created. The update data is contained in the update modules that was created using the ABAP command CALL FUNCTION '…' IN UPDATE TASK. The function module type is defined in the transaction for maintaining function modules (transaction SE37). Whenever there are too many data changes in the target environment, then it indicates that so many update requests will be created to effect those changes. With an increase in the volume of data changes, administrators may need to check the volume of the update requests too. The time taken for an update request to complete processing depends on the changes that were made to the target environment. Therefore, when too many update requests are created in the environment, administrators need to identify the update requests that are taking too long to process, update requests that are stopped and are stuck for a longer duration. This is exactly where the **Update requests** test helps! Using this test, you can figure out how many update requests were created and how many were actually stopped/stuck in the target environment. In addition, administrators can figure out the update requests that encountered errors.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every SAP ABAP instance being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull

Parameter	Description
	out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.
StuckUpdateCutoff	Specify the time duration (in minutes) beyond which the update requests in the following states are classified as stuck: • VB_RUN_V1, • VB_RUN_V2, • VB_RESTART_V1, • VB_RESTART_V2, • initial, • auto(sys) and • auto(dia)
DD Frequency	Refers to the frequency with which detailed diagnosis measures are to be generated for this test. The default is *1:1*. This indicates that, by default, detailed measures will be generated every time this test runs, and also every time the test detects a problem. You can modify this frequency, if you so desire. Also, if you intend to disable the detailed diagnosis capability for this test, you can do so by specifying *none* against DD Frequency.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option. The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:

Parameter	Description
	• The eG manager license should allow the detailed diagnosis capability
	• Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Number of update requests created	Indicates the number of update requests that were created during the last measurement period.	Requests	
Rate of update requests created	Indicates the rate at which update requests were created during the last measurement period.	Requests/sec	This measure is a good indicator of the load on the system.
Total number of stopped updates	Indicates the total number of update requests that were stopped since the start of the server.	Requests	The update requests may be stopped due to various reasons such as database issues, longer wait period to connect to the server, the update server being inactive for a longer time etc.
Rate of stopped update requests	Indicates the rate at which update requests were stopped during the last measurement period.	Percent	
Total number of error updates	Indicates the total number of errors encountered in the update request since the start of the server.	Number	Ideally, the value of this measure should be zero.
Rate of update requests with errors	Indicates the rate at which errors were encountered in the update requests during the last measurement period.	Requests/sec	An increasing trend for this measure indicates an error with the update system. If so, update system can be deactivated to prevent issues relating to the abnormally terminated updates and reactivated once the issue has been resolved.

Measurement	Description	Measurement Unit	Interpretation
Total number of updates stuck	Indicates the total number of update requests that were stuck while processing since the start of the server.	Requests	Stuck updates are hanging updates that have not been marked as error updates. Stuck updates may need to be manually processed depending upon their actual status.
Rate of update requests stuck	Indicates the rate at which update requests were stuck while processing during the last measurement period.	Requests/sec	
New updates stopped	Indicates the number of update requests that were stopped during the last measurement period.	Number	
New updates with errors	Indicates the number of errors encountered in the update requests during the last measurement period.	Number	Ideally, the value of this measure should be zero.
New updates stuck	Indicates the number of updates that were stuck while processing during the last measurement period.	Number	

3.3.16 Idoc wait monitor Test

Idocs are structured ASCII files (or a virtual equivalent). They are the file format used by SAP ABAP to exchange data with foreign systems. Idocs is the acronym for Interchange Document. This indicates a set of (electronic) information which builds a logical entity. An IDoc is e.g. all the data of a single customer in your customer master data file, or the IDoc is all the data of a single invoice.

An SAP ABAP application creates data and updates the database appropriately. An application can be a transaction, a stand-alone ABAP Report or any tool that can update a database within SAP ABAP. If the application thinks that data needs to be distributed to a foreign system, it triggers the IDoc outbound routine, usually by leaving a descriptive message record in the message table NAST. The application then either directly calls the IDoc engine or a collector job eventually picks up all due IDoc messages and determines what to do with them. If the engine believes that data is ready to be sent to a partner system, then it determines the function module which can collect and wrap the

required IDoc data into an IDoc. In IDoc customising, you specify the name of the function module to use. This can either be one which is predefined by ABAP standard or a user-written one. When the IDoc is created it is stored in an SAP ABAP table and from there it is sent to the foreign system.

IDoc inbound routines, on the other hand, are function modules with a standard interface, which will interpret the received IDoc data and prepare it for processing. The received IDoc data is processed record by record and interpreted according to the segment information provided with each record. The prepared data can then be processed by an application, a function module, or a self-written program.

Any slowdown noticed in electronic data exchange between the SAP ABAP system and foreign systems therefore, can be attributed to bottlenecks or errors in the transmission/reception of Idocs. Administrators should hence closely monitor inbound and outbound IDoc traffic to proactively detect probable slowdowns in inter-system communications, and accurately tell where the slowdown occurred and why, so that the communication bottlenecks can be promptly cleared. This is where the **IDoc wait monitor** test helps.

This test monitors the inbound and outbound Idocs generated during the past hour and reports the rate at which these Idocs were processed at various stages of transmission/reception, thus accurately pointing to processing slowdowns and where exactly the processing was bottlenecked. In addition, the test also reports the number of Idocs that were found to be erroneous every second and the exact stage of transmission/reception at which the rate of errors peaked!

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every SAP ABAP instance being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the

Parameter	Description
	permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses SAPJCO to collect measures**. An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses SAPJCO to collect measures**. If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses SAPJCO to collect measures**. This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Open change pointers	Indicates the number of Idocs generated for the change pointers that are still in the Waiting state for the last 1 hour.	Number	Change Pointers are log entries to remember all modified records relevant for ALE. Change pointers are log entries to table BDCP, which are written every time a transaction modifies certain fields.
Outbound ready for dispatch	Indicates the number of outbound Idocs that were ready for dispatch during the last 1 hour.	Number	
Outbound in external system	Indicates the number of outbound Idocs that were waiting in the external system during the last 1 hour.	Number	
Outbound errors in Idoc interface	Indicates the number of outbound Idocs that encountered errors in the interface during the last 1 hour.	Number	Ideally, the value of this measure should be zero.
Outbound errors in external system	Indicates the number of outbound Idocs that were error prone in the external system during the last 1 hour.	Number	Ideally, the value of this measure should be zero.
Inbound generated	Indicates the number of Idocs that were in the Waiting state during the last 1 hour.	Number	
Inbound errors in Idoc interface	Indicates the number of inbound Idocs that encountered errors in the interface during the last 1 hour.	Number	
Inbound errors in	Indicates the number of	Number	

Measurement	Description	Measurement Unit	Interpretation
application	inbound Idocs with application errors during the last 1 hour.		

3.4 The SAP Workload Layer

The tests mapped to this layer monitor the jobs, task types, and transactions that execute on the SAP ABAP instance, report on the load generated by these entities, and reveal how well the SAP ABAP instance handles the load.
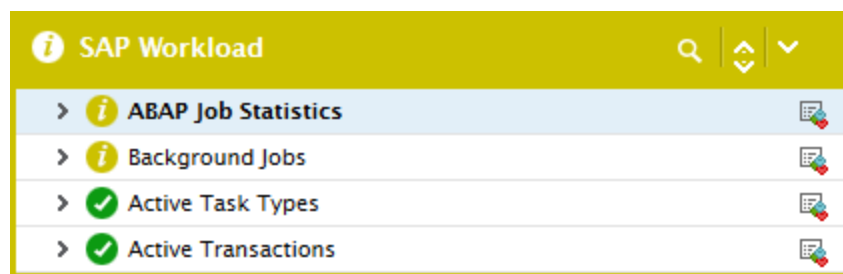
Figure 3.8: The tests mapped to the SAP Workload Layer

3.4.1 Background Jobs Test

SAP background processing automates routine tasks and helps you optimize your organization's SAP computing resources. Using background processing, you tell the SAP System to run programs for you. Background processing lets you move long-running or resource-intensive program runs to times when the system load is low. It also lets you delegate to the system the task of running reports or programs. Your dialog sessions are not tied up, and reports that run in the background are not subject to the dialog-step run-time limit that applies to interactive sessions.

The SAP System offers sophisticated support for background processing. You can choose from a variety of methods for scheduling and managing jobs. You can run both SAP-internal and external programs. And, for easier scheduling and management, you can run related programs as " job steps" within a single background processing job, allowing a single background job to accomplish a complex task that consists of multiple processing steps.

Often job execution takes too long when the job consists of too many complex tasks. This prolonged execution of a job may consume a considerable amount of resources and therefore hamper the execution of other background jobs. In order to figure out the background jobs that are executing for a longer time and the status of the job, administrators may use the **Background jobs** test! This test

monitors the current status and the previous status of each background job that is executing, the time taken for job execution and the time delay encountered by the jobs during execution. This way, administrators can figure out the background job that is executing for a longer duration and blocking valuable resources.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every SAP ABAP instance being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a

Parameter	Description
	case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
MaxLogLines	In order to troubleshoot the jobs that were aborted, the eG agent facilitates collecting the last n lines of the jobs that were aborted. To achieve this, specify the number of lines of an aborted job that needs to be retrieved for troubleshooting in the MaxLogLines parameter. By default, the value of this parameter is 3.
UserJobs	Sometimes, administrators may wish to periodically monitor certain background jobs. To monitor such jobs, specify a comma-separated list of jobs in the format: *Job:Time period (in hours)* in the UserJobs text box. Say for example, you wish to monitor a job named *Print* with a time period of 2 hours, then specify *Print:2* in the UserJobs text box. By default, *none* is specified against this text box.
StandardJobMonitor	If you wish to monitor the standard jobs in the target SAP ABAP instance, then set the StandardJobMonitor flag to **Yes**. If you set this flag to **No**, then standard jobs will not be monitored. By default, the value of this flag is **Yes**.
DD Frequency	Refers to the frequency with which detailed diagnosis measures are to be generated for this test. The default is *1:1*. This indicates that, by default, detailed measures will be generated every time this test runs, and also every time the test detects a problem. You can modify this frequency, if you so desire. Also, if you intend to disable the detailed diagnosis capability for this test, you can do so by specifying *none* against DD Frequency.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be

Parameter	Description
	configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.
	The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:
	• The eG manager license should allow the detailed diagnosis capability
	• Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Current status	Indicates the current status of this job execution.		The values that this measure reports and their numeric equivalents are provided in the table below: | Measure value	Numeric value
---	---
N/A	0
Planned or Scheduled	1
Released	2
Ready	3
Active	4
Finished	5
Cancelled or Aborted	6	 **Note:** By default, this measure reports one of the values listed under **Measure Value**s to indicate the current status of this job execution. In the graph of this measure however, the same is represented using the numeric equivalents i.e., 0 to 6 only.

Measurement	Description	Measurement Unit	Interpretation
Previous status	Indicates the status of this job that was executed before the last known execution of this job.		The values that this measure reports and their numeric equivalents are provided in the table below: | Measure value	Numeric value | |---|---| | N/A | 0 | | Planned or Scheduled | 1 | | Released | 2 | | Ready | 3 | | Active | 4 | | Finished | 5 | | Cancelled or Aborted | 6 | **Note:** By default, this measure reports one of the values listed under **Measure Value**s to indicate the status of the job execution before the last known execution. In the graph of this measure however, the same is represented using the numeric equivalents i.e., 0 to 6 only.
Duration	Indicates the total time taken to execute this job.	Minutes	Compare the value of this measure across the jobs to figure out the job that took too long to execute.
Delay	Indicates the time delay encountered by this job during execution.	Minutes	A low value is desired for this measure. If there is an alarming increase in the value of this measure, it indicates that adequate background processes are not available for executing this job. The background processes may not be available when there are too many job executions and when a job is executing endlessly. In such cases,

Measurement	Description	Measurement Unit	Interpretation
			administrators need to overlook the issue and rectify the same before any serious performance degradation of the server occurs. Comparing the value of this measure across the jobs will help you identify the job that encountered the maximum time delay.

3.4.2 ABAP Job Statistics Test

This test monitors the distribution of background jobs according to the job status. Apart from monitoring the overall job execution, this test helps to debug issues that occurred due to long running jobs, aborted jobs and jobs with high start delays.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every SAP ABAP instance being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been

Parameter	Description
	provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
MaxLogLines	In order to troubleshoot the jobs that were aborted, the eG agent facilitates collecting the last n lines of the jobs that were aborted. To achieve this, specify the number of lines of an aborted job that needs to be retrieved for troubleshooting in the MaxLogLines parameter. By default, the value of this parameter is 3.
LongRunningCutoff	Specify the time duration in hours beyond which a job is classified as a long running job in the LongRunningCutoff text box. The default value specified in this text box is *0.8* hours.

Parameter	Description
HighDelayCutoff	Generally, there may be a permissible time delay while a job is started. Specify the duration of such time delay in seconds beyond which the job is classified as a job with a higher start delay in the HighDelayCutoff text box. The default value specified in this text box is *60*.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.

The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:

- The eG manager license should allow the detailed diagnosis capability

- Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Active jobs	Indicates the number of jobs of this priority class that are currently active.	Number	
Ready jobs	Indicates the number of jobs of this priority class that are waiting for execution by the background work processes.	Number	A low value is desired for this measure. If there is a sudden/gradual increase in the value of this measure, then it indicates that the background work processes are insufficient to execute the jobs. Therefore, administrators may need to check the number of background work processes and provision them accordingly.
Long running jobs	Indicates the number of jobs of this priority class that have been running for a duration longer than the	Number	Generally, the jobs may be classified as a long running job when the job is stuck during execution and loops the execution several times without

Measurement	Description	Measurement Unit	Interpretation
	cutoff time specified in the LongRunningCutoff parameter.		completion. A high value for this measure is a cause of concern as long running jobs consume too much of resources thus leading to the performance degradation of the SAP instance. The detailed diagnosis of this measure if enabled, lists the name of the job, job count, report name, user details, timestamps, duration etc.,
New jobs	Indicates the number of jobs of this priority class that were started during the last measurement period.	Number	A gradual decrease in the value of this measure is a cause of concern. Administrators may need to check the number of background processes that are free and provision them according so that the background processes can execute the jobs continuously.
New jobs with start delays	Indicates the number of jobs of this priority class that started with a delay time greater than the time specified against the HighDelayCutoff parameter while configuring the test.	Number	A low value is desired for this measure. The jobs may be started with a delay due to various reasons such as unavailable background work processes, scheduling issues between the originating server and target server, other dependencies etc., This measure helps detect such issues by providing the details of these jobs including the exact start delay in milliseconds.
Aborted or cancelled jobs	Indicates the number of jobs of this priority class that were cancelled/aborted during the last measurement period.	Number	Jobs may be abruptly terminated either manually or due to underlying program errors. Program errors could in turn be due to various issues such as authentication, file access, dead locks, updates, tablespace, memory, programming errors, dependencies etc., Therefore, a sudden/gradual

Measurement	Description	Measurement Unit	Interpretation
			increase in the value is a cause of concern which indicates severe performance degradation of the target server.
			The detailed diagnosis of this measure if enabled, provides details and logs for the aborted/cancelled jobs in order to facilitate troubleshooting.
Average job start delay	Indicates the average time delay experienced in starting the jobs of this priority class.	Milliseconds	Comparing the value of this measure across the priority classes helps you identify the class in which the jobs experienced the maximum start delay.
Finished jobs	Indicates the number of jobs of this priority class that completed execution during the last measurement period.	Number	A high value is desired for this measure. This measure is a good indicator of the performance of the background processing system. The higher the value of this measure the greater is the performance of the target server.

3.4.3 Active Task Types Test

Typically, every work process in the SAP AS ABAP system specializes in a particular task type. These task types are as follows:

Task Type	Explanation
B.INPUT	Transaction step in batch input mode; it is processed by the dialog work process (update dialogs generated in batch input are always processed synchronously, they belong to the UPDATE task type).
BACKGROUND	Transaction step that was started by a background processing work process.
DIALOG	Usually a transaction step started online by a user (for example, editor dialogs or manual postings).
SPOOL	Transaction step of a spool work process
UPDATE	Transaction step of the SAP update task; it is automatically started by the dispatcher on a host with an active update process (update processes are usually

Task Type	Explanation
	installed on the database host)
UPDATE2	V2 update
LCOM	The Fast RFC (fRFC or LCOM-RFC) is a very fast form of data transfer that uses a shared memory pipeline. It is only used in internal communication between ABAP and Java in the SAP Web AS.
HTTP, HTTPS, NNTP, SMTP, FTP	Requests from the ICM that are based on the corresponding Internet protocols
ENQUEUE	Enqueue handler
DIALOG(-)GUI	Dialog without GUI
EXT.PLUGIN AUTOTH (Auto task handler) RPCTH (Task handler remote procedure call) RFCVMC (RFC inside VMC) DDLOG CLEANUP DEL. THCALL (Delayed task handler call) AUTOJAVA HTTP/JSP, HTTPS/JSP	The statistical evaluations of these task types are only relevant for internal SAP purposes.

In addition to the above, there are some task types that do not correspond to any work process; these tasks represent specific applications in the dialog work process. Such task types are as follows:

Task Type	Explanation
AUTOABAP	Automatically-processed report (for example, for monitoring tools)
BUFFERSYNC	A synchronization of the local table buffers regularly requested by the SAP system (the time interval is controlled by the profile parameter rdisp/bufreftime).
RFC	Remote Function Call in the ABAP system; it is processed by the dialog work process
CPIC	Other communication using the CPIC interface; it is processed by the dialog work process
ALE	iDoc processing; it is processed by the dialog work process

Tasks, regardless of their type, add to the workload of a SAP AS ABAP system. In the event of a slowdown therefore, administrators should check the workload generated by each task type, analyze whether/not the ABAP system has the processing power to handle the load, isolate the task

types where processing is bottlenecked, and understand where the bottleneck occurred – at the dispatcher? When rolling in user contexts? When loading objects? When waiting for RFC calls? When interacting with the database? when performing enqueue operations? The **Task Types Load** test provides administrators with answers to these questions!

This test auto-discovers the task types handled by the SAP ABAP system, and for each task type, reports the resource usage of the transactions of that type, measures the processing time of the transactions at various stages, and accurately pinpoints the following:

- The task type(s) that is consuming more resources than normal;

- The task type(s) that is taking too long to be processed and why;

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every task type handled by the SAP AS ABAP instance being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.

Parameter	Description
SysNo	An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.
Maximum Steps	To report workload metrics, the eG agent will have to typically analyze numerous dialog steps of activity on the SAP ABAP system. To reduce the stress on the eG agent, you can limit the number of dialog steps the eG agent needs to process in order to make a fair assessment of the workload and the processing ability of the ABAP system. This limit can be specified against maximum steps. By default, this limit is set to 5000.
Include eG SAP User	By default, this flag is set to **No**. This means that, by default, this test will disregard all user sessions launched by the eG agent as the configured sapuser. If you want the test to report metrics for the SAPUser sessions too, set this flag to **Yes**.
DD Frequency	Refers to the frequency with which detailed diagnosis measures are to be generated for

Parameter	Description
	this test. The default is *1:1*. This indicates that, by default, detailed measures will be generated every time this test runs, and also every time the test detects a problem. You can modify this frequency, if you so desire. Also, if you intend to disable the detailed diagnosis capability for this test, you can do so by specifying *none* against DD Frequency.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.
	The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:
	• The eG manager license should allow the detailed diagnosis capability
	• Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Activity	Indicates the rate of steps executed for transactions of this task type in the last measurement period.	Steps/Sec	This is a good indicator of the workload imposed by a task type on the SAP ABAP instance. You can compare the value of this measure across task types to know which task type is generating the maximum load.
CPU utilization	Indicates the percentage of CPU resources utilized by the transactions of this task type.	Percent	Compare the value of this measure across task types to know which task type is using the maximum CPU and is probably causing a CPU contention on the system. You may then want to observe how this task type has been using CPU over time and figure out whether the CPU usage of that task type remains consistently high; if so, it

Measurement	Description	Measurement Unit	Interpretation
			could mean that that task type requires more processing power to execute. You may then want to consider resizing the SAP ABAP system with more CPU resources.
Total memory	Indicates the total memory used by the transactions of this task type during the last measurement period.	MB	This measure is the sum total of the roll memory, extended memory, and heap memory used by a process.

By comparing the value of this measure across task types, you can accurately identify that task type which is consuming the maximum memory. If the memory usage of this task type has been abnormally high consistently, it could indicate that the task type is basically memory-intensive and requires more memory resources for proper execution. You should then figure out how much memory and of what type should be allocated to the task. For this, you may want to determine which memory type was being used the highest over time – is it heap memory? Roll memory? Or extended memory. The values of the PRIV mode heap memory and the Extended memory metrics will help administrators figure this out.

You can also use the detailed diagnosis of this measure to identify the top 3 memory-consuming transactions of a particular task type. |
| PRIV mode heap memory | Indicates the maximum PRIV mode heap memory consumed by | MB | SAP's memory management system assigns memory to a work process. The order in which a work |

Measurement	Description	Measurement Unit	Interpretation
	transactions of this task type in the last measure period.		process is assigned the memory type depends on the work process type, either dialog or non-dialog), and the underlying operating system. Some of the memory types are as follows: • **Roll area**: The roll area memory is used for the initial memory assigned to a user context, and (if available) for additional memory if the expanded memory is full. The roll area consists of 2 segments. The first segment is assigned to the work process first as memory. If this is used up, the work process has more memory assigned to it. • **Extended memory**: Each ABAP work process has a part reserved in its virtual address space for extended memory. The majority of the user context is stored in the extended memory. You can map the extended memory from the common resource onto any work process, and after onto another process on the same address in the virtual address space. This is important if you work with pointers in the ABAP program. The value of the Extended memory measure

Measurement	Description	Measurement Unit	Interpretation
			indicates how each task type is using this memory type.
			• Private memory: If a dialog work process has used up the roll area assigned to it and the extended memory, private memory is assigned to the work process. The work process goes into PRIV mode (private). Other processes cannot use private (heap) memory. After releasing the assigned memory, the operating system still considers the (virtual) memory as being occupied by the allocating process.
			A consistent increase in the value of the PRIV mode heap memory measure for a task type therefore indicates that transactions of that type are continuously using up all the roll area and extended memory, and are being forced to reach out to the private memory. This could mean that the task type is memory-intensive. If too many task types are found to be using PRIV heap memory, it could mean that the work processes are sized with insufficient roll area and extended memory. You may want hence want to allocate more roll area and extended memory to make sure that private memory usage is minimal.

Measurement	Description	Measurement Unit	Interpretation
Extended memory	Indicates the maximum extended memory used by transactions of this task type in the last measure period.	MB	
Work process restarts	Indicates the number of work process restarts caused by transactions of this task type in the last measure period.	Number	One of the common reasons for work process restarts is excessive usage of private memory. The work process, if it has used a lot of private memory, is restarted when the user context is terminated and the local memory is returned. The restart makes the local memory available again for other processes.

Regardless of what caused it, work process restarts are performance-impacting and need to be kept at a minimum. |
| Maximum response time of a step | Indicates the maximum response time of the transaction steps of this task type in the last measurement period. | Secs | An SAP transaction normally extends over several transaction steps. During these steps, data such as variables, internal tables, and screen lists are built up and stored in the main memory of the application server.

This measure compares the response time of all the transaction steps executed by a task type in the last measurement period and reports the highest response time.

Use the detailed diagnosis of this measure to identify the top 3 steps executed for this task type with highest response times. This leads you to the probable cause for delay in the execution of this task type in the last five minutes. Apart from the response time break up, the report |

Measurement	Description	Measurement Unit	Interpretation
			and CUA programs that were running are also shown as part of detailed diagnosis.
Average step response time	Indicates the average response time of the transaction step of this task type in the last measurement period.	Seconds/Step	This measure is used by the BASIS administrators for comparing the response time across all the transaction steps executed by a transaction to determine which step is taking longer duration for execution.
Total response time	Indicates the total response time per transaction of this task type within the last measure period.	Seconds/transaction	This measure includes the response time taken at the server and the round trip times. Ideally, the value of this measure should be low. High values are indicative of poor responsiveness.
			Compare the value of this measure across task types to identify the task type that is least responsive. To know the reason for the delay, you can compare the value of the GUI time, GUI Net time, Server response time, Processing time, Dispatcher wait time, Load and generation time, Roll time, Database request time, Lock time, and RFC time measures for that task type. This will accurately pinpoint where the task spent maximum time – in the dispatcher queue? at the server end? in processing? when loading objects? when rolling in user contexts? when performing database operations? when performing enqueue operations? Or in waiting for RFC calls?
			You can also use the detailed

Measurement	Description	Measurement Unit	Interpretation
			diagnosis of this measure to view the details of the top 3 transaction invocations that were least responsive.
GUI time	Indicates the average time taken for round trip communication steps between client and server in between a transaction of this task type.	Seconds/transaction	If the values of these measures are excessive, check that the hardware requirements for the presentation server are met and that the network between the application servers and the presentation servers is not experiencing shortages or slow traffic.
GUI Net time	Indicates the average front end net time taken for the first and last steps of transactions of this task type.	Seconds/transaction	
Server response time	Indicates the average response time of a transaction of this task type at the server end.	Seconds/transaction	In the event of a processing slowdown, you can compare the value of this measure with other response time measures reported by this test to understand where the processing bottleneck lies.
Processing time	Indicates the average time taken to process a transaction of this task type.	Seconds/transaction	A high value for this measure may indicate that ABAP programs are very complex and the work processes spend a large amount of time interpreting what is to be done. The processing time of the DIALOG task type for instance should be below twice the CPU time. The same for the UPDATE task type should be about 50% higher than that of the DIALOG task type.
Dispatcher wait time	Indicates the average time that the transactions of this task type spent waiting for a	Seconds/transaction	When the dispatcher receives a processing request, it looks for a free SAP work process of the required type and then sends the

Measurement	Description	Measurement Unit	Interpretation
	free work process at the dispatcher.		request to this work process, which begins the work. If all SAP work processes of the required type are busy when the request initially reaches the dispatcher, the request is placed in the dispatcher queue. In the dispatcher queue, the request waits until a work process of the required type is free. As soon as a work process is free, the dispatcher sends the request to it. This time the request spends in the dispatcher queue is indicated as the dispatcher wait time. For the DIALOG task type for instance, the value of this measure should be less than 10% of the value of the Total response time measure. Higher values are indicative of performance problems. One common cause of such performance problems may be insufficient work processes.
Load and generation time	Indicates the average time spent for a transaction of this task type for loading and generation.	Seconds/transaction	All ABAP programs and screens that are required but not yet available in the application server buffers must be loaded or generated. The time it takes to do this is indicated as load and generation time. Loading a program also entails accessing database tables that store the ABAP programs. Typically, for a DIALOG task type, the load time per step should not be greater than 50 ms. High values could indicate problems with memory

Measurement	Description	Measurement Unit	Interpretation
			configuration, small buffer sizes, wrong parameter settings or a CPU bottleneck.
Roll time	Indicates the average time spent by a transaction of this task type for rolling in user contexts or when waiting for roll out.	Secs	AN SAP transaction normally extends over several transaction steps. During these steps, data such as variables, internal tables, and screen lists are built up and stored in the main memory of the application server. This data is known as user context. Different transaction steps are normally processed by different dialog work processes. At the beginning of a transaction step, the user context is made available to the appropriate work process. This procedure is called roll-in. Roll-out on the other hand saves the current user-context data to virtual memory at the conclusion of a transaction step. The time a transaction step waited in the roll-area is called roll wait time. The value of this measure is the sum total of roll-in time and roll wait time. A high value for this measure indicates that a particular task type is either taking too long to roll in user contexts or is waiting too long in the roll-area for a roll-out to occur. Since a user context is moved out of the local memory of a work process and moved into the roll buffer during the roll-in process, improperly sized roll buffers can cause slowdowns in this process.

Measurement	Description	Measurement Unit	Interpretation
			Lack of adequate space in the extended memory can also contribute to a slowdown when rolling in user contexts. Possible causes for high roll wait times may be due to having all work processes in the target system occupied. It is very important to configure the instances properly, especially when they are designed to handle RFC communication.
Database request time	Indicates the average time spent by transactions of this task type for performing database operations such as selects, inserts, updates, deletes and commits.	Seconds/transaction	When data is read or changed in the database, the time required is known as Database request time. This time is measured from the moment the database request is sent to the database server and runs until the moment the data is returned to the application server. Ideally, for the DIALOG task type, the value of this measure should be 40% of the total response time. Many factors can cause worrysome spikes in this value. This could be problems in the database such as expensive SQL statement or wrong parameter settings in the database level. In addition, issues in network connectivity between the application server and the database can also adversely impact this value. This is because, the Database request time not only includes the time required by the database to produce the requested data, but also the time required for network transfer of that data. In addition, I/O contention

Measurement	Description	Measurement Unit	Interpretation
			experienced by the physical disks can also affect this time.
Lock time	Indicates the average time spent performing enqueue operations for a transaction of this task type.	Seconds/Transaction	The enqueue service allows SAP ABAP applications to lock data so that only they can use it. Locking the data prevents parallel changes to the same data, which would lead to data inconsistency.

The Lock time measure reports the time from sending an enqueue request to the SAP enqueue server to the receipt of the results.

For a DIALOG task type typically, the Lock time should be less than 5 ms. Any value higher than that would represent a problem that might affect system stability. Network problems can also increase the value of this measure. |
| RFC time | Indicates the average time spent waiting for RFC calls to get executed in a transaction of this task type. | Seconds/Transaction | The value of this measure includes CPIC (Common Programming Interface Communication) time as well. CPIC is typically used by the SAP system for program-to-program communication.

An increase in RFC time can increase roll wait time considerably. When synchronous RFCs are called, the work process executes a roll out and may have to wait for the end of the RFC in the roll area, even if the dialog step is not yet completed. In the roll area, RFC server programs can also wait for other RFCs sent to them. The time a transaction step waited in the roll-area is called roll wait time. |

Measurement	Description	Measurement Unit	Interpretation
			The absence of adequate work processes can cause the RFC time and consequently, the roll wait time to increase. Besides ensuring that the SAP ABAP system is sized with sufficient work processes, you can also set the following parameters properly to better balance RFC load: • rdisp/rfc_max_comm_entries: This specifies the maximum number of communications in an instance. No more dialog work processes will be given to the program calling the target system after this number is reached. • rdisp/rfc_min_wait_dia_wp: This specifies the number of work processes to be always available for online users.
Invocations	Indicates the number of active transaction invocations for this task type in the last measurement period.	Number	Ideally, the value of this measure is preferred to be low. A high value indicates high load on the transaction level.
New invocations	Indicates the number of new transaction invocations for this task type in the last measurement period.	Number	Use detailed diagnosis of this measure to find out the exact invocation timestamp, program, terminal and other details for each new invocation.

3.4.4 Active Task Types Test

Typically, every work process in the SAP AS ABAP system specializes in a particular task type. These task types are as follows:

Task Type	Explanation
B.INPUT	Transaction step in batch input mode; it is processed by the dialog work process (update dialogs generated in batch input are always processed synchronously, they belong to the UPDATE task type).
BACKGROUND	Transaction step that was started by a background processing work process.
DIALOG	Usually a transaction step started online by a user (for example, editor dialogs or manual postings).
SPOOL	Transaction step of a spool work process
UPDATE	Transaction step of the SAP update task; it is automatically started by the dispatcher on a host with an active update process (update processes are usually installed on the database host)
UPDATE2	V2 update
LCOM	The Fast RFC (fRFC or LCOM-RFC) is a very fast form of data transfer that uses a shared memory pipeline. It is only used in internal communication between ABAP and Java in the SAP Web AS.
HTTP, HTTPS, NNTP, SMTP, FTP	Requests from the ICM that are based on the corresponding Internet protocols
ENQUEUE	Enqueue handler
DIALOG(-)GUI	Dialog without GUI
EXT.PLUGIN AUTOTH (Auto task handler) RPCTH (Task handler remote procedure call) RFCVMC (RFC inside VMC) DDLOG CLEANUP DEL. THCALL (Delayed task handler call) AUTOJAVA HTTP/JSP, HTTPS/JSP	The statistical evaluations of these task types are only relevant for internal SAP purposes.

In addition to the above, there are some task types that do not correspond to any work process; these tasks represent specific applications in the dialog work process. Such task types are as follows:

Task Type	Explanation
AUTOABAP	Automatically-processed report (for example, for monitoring tools)
BUFFERSYNC	A synchronization of the local table buffers regularly requested by the SAP system (the time interval is controlled by the profile parameter rdisp/bufreftime).
RFC	Remote Function Call in the ABAP system; it is processed by the dialog work process
CPIC	Other communication using the CPIC interface; it is processed by the dialog work process
ALE	iDoc processing; it is processed by the dialog work process

Tasks, regardless of their type, add to the workload of a SAP AS ABAP system. In the event of a slowdown therefore, administrators should check the workload generated by each task type, analyze whether/not the ABAP system has the processing power to handle the load, isolate the task types where processing is bottlenecked, and understand where the bottleneck occurred – at the dispatcher? When rolling in user contexts? When loading objects? When waiting for RFC calls? When interacting with the database? when performing enqueue operations? The **Task Types Load** test provides administrators with answers to these questions!

This test auto-discovers the task types handled by the SAP ABAP system, and for each task type, reports the resource usage of the transactions of that type, measures the processing time of the transactions at various stages, and accurately pinpoints the following:

- The task type(s) that is consuming more resources than normal;

- The task type(s) that is taking too long to be processed and why;

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every task type handled by the SAP AS ABAP instance being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.

Parameter	Description
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for

Parameter	Description
	SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.
Maximum Steps	To report workload metrics, the eG agent will have to typically analyze numerous dialog steps of activity on the SAP ABAP system. To reduce the stress on the eG agent, you can limit the number of dialog steps the eG agent needs to process in order to make a fair assessment of the workload and the processing ability of the ABAP system. This limit can be specified against maximum steps. By default, this limit is set to 5000.
Include eG SAP User	By default, this flag is set to **No**. This means that, by default, this test will disregard all user sessions launched by the eG agent as the configured sapuser. If you want the test to report metrics for the SAPUser sessions too, set this flag to **Yes**.
DD Frequency	Refers to the frequency with which detailed diagnosis measures are to be generated for this test. The default is *1:1*. This indicates that, by default, detailed measures will be generated every time this test runs, and also every time the test detects a problem. You can modify this frequency, if you so desire. Also, if you intend to disable the detailed diagnosis capability for this test, you can do so by specifying *none* against DD Frequency.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option. The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled: • The eG manager license should allow the detailed diagnosis capability • Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Activity	Indicates the rate of	Steps/Sec	This is a good indicator of the

Measurement	Description	Measurement Unit	Interpretation
	steps executed for transactions of this task type in the last measurement period.		workload imposed by a task type on the SAP ABAP instance. You can compare the value of this measure across task types to know which task type is generating the maximum load.
CPU utilization	Indicates the percentage of CPU resources utilized by the transactions of this task type.	Percent	Compare the value of this measure across task types to know which task type is using the maximum CPU and is probably causing a CPU contention on the system. You may then want to observe how this task type has been using CPU over time and figure out whether the CPU usage of that task type remains consistently high; if so, it could mean that that task type requires more processing power to execute. You may then want to consider resizing the SAP ABAP system with more CPU resources.
Total memory	Indicates the total memory used by the transactions of this task type during the last measurement period.	MB	This measure is the sum total of the roll memory, extended memory, and heap memory used by a process. By comparing the value of this measure across task types, you can accurately identify that task type which is consuming the maximum memory. If the memory usage of this task type has been abnormally high consistently, it could indicate that the task type is basically memory-intensive and requires more memory resources for proper execution. You should then figure out how much memory and of what type should be allocated to the task. For this, you

Measurement	Description	Measurement Unit	Interpretation
			may want to determine which memory type was being used the highest over time – is it heap memory? Roll memory? Or extended memory. The values of the PRIV mode heap memory and the Extended memory metrics will help administrators figure this out.
			You can also use the detailed diagnosis of this measure to identify the top 3 memory-consuming transactions of a particular task type.
PRIV mode heap memory	Indicates the maximum PRIV mode heap memory consumed by transactions of this task type in the last measure period.	MB	SAP's memory management system assigns memory to a work process. The order in which a work process is assigned the memory type depends on the work process type, either dialog or non-dialog), and the underlying operating system. Some of the memory types are as follows:
			• **Roll area**: The roll area memory is used for the initial memory assigned to a user context, and (if available) for additional memory if the expanded memory is full. The roll area consists of 2 segments. The first segment is assigned to the work process first as memory. If this is used up, the work process has more memory assigned to it.
			• **Extended memory**: Each ABAP

Measurement	Description	Measurement Unit	Interpretation
			work process has a part reserved in its virtual address space for extended memory. The majority of the user context is stored in the extended memory. You can map the extended memory from the common resource onto any work process, and after onto another process on the same address in the virtual address space. This is important if you work with pointers in the ABAP program. The value of the Extended memory measure indicates how each task type is using this memory type.
			• Private memory: If a dialog work process has used up the roll area assigned to it and the extended memory, private memory is assigned to the work process. The work process goes into PRIV mode (private). Other processes cannot use private (heap) memory. After releasing the assigned memory, the operating system still considers the (virtual) memory as being occupied by the allocating process.

Measurement	Description	Measurement Unit	Interpretation
			A consistent increase in the value of the PRIV mode heap memory measure for a task type therefore indicates that transactions of that type are continuously using up all the roll area and extended memory, and are being forced to reach out to the private memory. This could mean that the task type is memory-intensive. If too many task types are found to be using PRIV heap memory, it could mean that the work processes are sized with insufficient roll area and extended memory. You may want hence want to allocate more roll area and extended memory to make sure that private memory usage is minimal.
Extended memory	Indicates the maximum extended memory used by transactions of this task type in the last measure period.	MB	
Work process restarts	Indicates the number of work process restarts caused by transactions of this task type in the last measure period.	Number	One of the common reasons for work process restarts is excessive usage of private memory. The work process, if it has used a lot of private memory, is restarted when the user context is terminated and the local memory is returned. The restart makes the local memory available again for other processes. Regardless of what caused it, work process restarts are performance-impacting and need to be kept at a minimum.
Maximum response time of a step	Indicates the maximum response time of the	Secs	An SAP transaction normally extends over several transaction

Measurement	Description	Measurement Unit	Interpretation
	transaction steps of this task type in the last measurement period.		steps. During these steps, data such as variables, internal tables, and screen lists are built up and stored in the main memory of the application server. This measure compares the response time of all the transaction steps executed by a task type in the last measurement period and reports the highest response time. Use the detailed diagnosis of this measure to identify the top 3 steps executed for this task type with highest response times. This leads you to the probable cause for delay in the execution of this task type in the last five minutes. Apart from the response time break up, the report and CUA programs that were running are also shown as part of detailed diagnosis.
Average step response time	Indicates the average response time of the transaction step of this task type in the last measurement period.	Seconds/Step	This measure is used by the BASIS administrators for comparing the response time across all the transaction steps executed by a transaction to determine which step is taking longer duration for execution.
Total response time	Indicates the total response time per transaction of this task type within the last measure period.	Seconds/transaction	This measure includes the response time taken at the server and the round trip times. Ideally, the value of this measure should be low. High values are indicative of poor responsiveness. Compare the value of this measure across task types to identify the task type that is least responsive.

Measurement	Description	Measurement Unit	Interpretation
			To know the reason for the delay, you can compare the value of the GUI time, GUI Net time, Server response time, Processing time, Dispatcher wait time, Load and generation time, Roll time, Database request time, Lock time, and RFC time measures for that task type. This will accurately pinpoint where the task spent maximum time – in the dispatcher queue? at the server end? in processing? when loading objects? when rolling in user contexts? when performing database operations? when performing enqueue operations? Or in waiting for RFC calls? You can also use the detailed diagnosis of this measure to view the details of the top 3 transaction invocations that were least responsive.
GUI time	Indicates the average time taken for round trip communication steps between client and server in between a transaction of this task type.	Seconds/transaction	If the values of these measures are excessive, check that the hardware requirements for the presentation server are met and that the network between the application servers and the presentation servers is not experiencing shortages or slow traffic.
GUI Net time	Indicates the average front end net time taken for the first and last steps of transactions of this task type.	Seconds/transaction	
Server response time	Indicates the average response time of a transaction of this task	Seconds/transaction	In the event of a processing slowdown, you can compare the value of this measure with other

Measurement	Description	Measurement Unit	Interpretation
	type at the server end.		response time measures reported by this test to understand where the processing bottleneck lies.
Processing time	Indicates the average time taken to process a transaction of this task type.	Seconds/transaction	A high value for this measure may indicate that ABAP programs are very complex and the work processes spend a large amount of time interpreting what is to be done. The processing time of the DIALOG task type for instance should be below twice the CPU time. The same for the UPDATE task type should be about 50% higher than that of the DIALOG task type.
Dispatcher wait time	Indicates the average time that the transactions of this task type spent waiting for a free work process at the dispatcher.	Seconds/transaction	When the dispatcher receives a processing request, it looks for a free SAP work process of the required type and then sends the request to this work process, which begins the work. If all SAP work processes of the required type are busy when the request initially reaches the dispatcher, the request is placed in the dispatcher queue. In the dispatcher queue, the request waits until a work process of the required type is free. As soon as a work process is free, the dispatcher sends the request to it. This time the request spends in the dispatcher queue is indicated as the dispatcher wait time. For the DIALOG task type for instance, the value of this measure should be less than 10% of the value of the Total response time measure. Higher values are indicative of performance problems.

Measurement	Description	Measurement Unit	Interpretation
			One common cause of such performance problems may be insufficient work processes.
Load and generation time	Indicates the average time spent for a transaction of this task type for loading and generation.	Seconds/transaction	All ABAP programs and screens that are required but not yet available in the application server buffers must be loaded or generated. The time it takes to do this is indicated as load and generation time. Loading a program also entails accessing database tables that store the ABAP programs.

Typically, for a DIALOG task type, the load time per step should not be greater than 50 ms.

High values could indicate problems with memory configuration, small buffer sizes, wrong parameter settings or a CPU bottleneck. |
| Roll time | Indicates the average time spent by a transaction of this task type for rolling in user contexts or when waiting for roll out. | Secs | AN SAP transaction normally extends over several transaction steps. During these steps, data such as variables, internal tables, and screen lists are built up and stored in the main memory of the application server. This data is known as user context. Different transaction steps are normally processed by different dialog work processes. At the beginning of a transaction step, the user context is made available to the appropriate work process. This procedure is called roll-in. Roll-out on the other hand saves the current user-context data to virtual memory at the |

Measurement	Description	Measurement Unit	Interpretation
			conclusion of a transaction step. The time a transaction step waited in the roll-area is called roll wait time.
			The value of this measure is the sum total of roll-in time and roll wait time.
			A high value for this measure indicates that a particular task type is either taking too long to roll in user contexts or is waiting too long in the roll-area for a roll-out to occur. Since a user context is moved out of the local memory of a work process and moved into the roll buffer during the roll-in process, improperly sized roll buffers can cause slowdowns in this process. Lack of adequate space in the extended memory can also contribute to a slowdown when rolling in user contexts.
			Possible causes for high roll wait times may be due to having all work processes in the target system occupied. It is very important to configure the instances properly, especially when they are designed to handle RFC communication.
Database request time	Indicates the average time spent by transactions of this task type for performing database operations such as selects, inserts, updates, deletes and commits.	Seconds/transaction	When data is read or changed in the database, the time required is known as Database request time. This time is measured from the moment the database request is sent to the database server and runs until the moment the data is returned to the application server.

Measurement	Description	Measurement Unit	Interpretation
			Ideally, for the DIALOG task type, the value of this measure should be 40% of the total response time. Many factors can cause worrysome spikes in this value. This could be problems in the database such as expensive SQL statement or wrong parameter settings in the database level. In addition, issues in network connectivity between the application server and the database can also adversely impact this value. This is because, the Database request time not only includes the time required by the database to produce the requested data, but also the time required for network transfer of that data. In addition, I/O contention experienced by the physical disks can also affect this time.
Lock time	Indicates the average time spent performing enqueue operations for a transaction of this task type.	Seconds/Transaction	The enqueue service allows SAP ABAP applications to lock data so that only they can use it. Locking the data prevents parallel changes to the same data, which would lead to data inconsistency.
			The Lock time measure reports the time from sending an enqueue request to the SAP enqueue server to the receipt of the results.
			For a DIALOG task type typically, the Lock time should be less than 5 ms. Any value higher than that would represent a problem that might affect system stability. Network problems can also increase the value of this measure.

Measurement	Description	Measurement Unit	Interpretation
RFC time	Indicates the average time spent waiting for RFC calls to get executed in a transaction of this task type.	Seconds/Transaction	The value of this measure includes CPIC (Common Programming Interface Communication) time as well. CPIC is typically used by the SAP system for program-to-program communication. An increase in RFC time can increase roll wait time considerably. When synchronous RFCs are called, the work process executes a roll out and may have to wait for the end of the RFC in the roll area, even if the dialog step is not yet completed. In the roll area, RFC server programs can also wait for other RFCs sent to them. The time a transaction step waited in the roll-area is called roll wait time. The absence of adequate work processes can cause the RFC time and consequently, the roll wait time to increase. Besides ensuring that the SAP ABAP system is sized with sufficient work processes, you can also set the following parameters properly to better balance RFC load: • rdisp/rfc_max_comm_entries: This specifies the maximum number of communications in an instance. No more dialog work processes will be given to the program calling the target system after this number is reached.

Measurement	Description	Measurement Unit	Interpretation
			• rdisp/rfc_min_wait_dia_wp: This specifies the number of work processes to be always available for online users.
Invocations	Indicates the number of active transaction invocations for this task type in the last measurement period.	Number	Ideally, the value of this measure is preferred to be low. A high value indicates high load on the transaction level.
New invocations	Indicates the number of new transaction invocations for this task type in the last measurement period.	Number	Use detailed diagnosis of this measure to find out the exact invocation timestamp, program, terminal and other details for each new invocation.

3.4.5 Active Transactions Test

SAP transactions are units of work that define the workload of a SAP ABAP system. When users to a SAP ABAP program complain of a slowdown, administrators should be able to instantly locate the exact transaction at which the slowdown occurred and what is causing the delay – is it because the transaction is resource-intensive? Is it because the transaction spent too much time in the dispatcher queue? is it owing to the time spent loading objects? Is it because database operations consumed too much time? Is it due to complex enqueue operations? or did waiting for RFC calls to complete contribute to the transaction slowdown? The **Active Transactions** test helps answer these questions!

For every transaction invocation, this test reports the resource usage of and load imposed by that transaction on the SAP ABAP system, indicates how well the system is processing the load, proactively detects overload conditions and processing bottlenecks (if any), and accurately points administrators to the source of the bottleneck – i.e., it precisely pinpoints which transaction is being processed slowly, which exact transaction step caused the delay, and why.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every transaction handled by the SAP AS ABAP instance being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses SAPJCO to collect measures**. An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses SAPJCO to collect measures**. If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses SAPJCO to collect measures**. This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.

Parameter	Description
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.
Maximum Steps	To report workload metrics, the eG agent will have to typically analyze numerous dialog steps of activity on the SAP ABAP system. To reduce the stress on the eG agent, you can limit the number of dialog steps the eG agent needs to process in order to make a fair assessment of the workload and the processing ability of the ABAP system. This limit can be specified against Maximum Steps. By default, this limit is set to 5000.
Include TCodes	By default, this test monitors only those transactions that were invoked in the last measurement period. However, if you want a few critical transactions to be monitored all the time – i.e., regardless of their status (whether they were invoked or not) in the last measurement period – then, you can provide a comma-separated list of the transaction codes of such transactions against include tcodes.
DD Frequency	Refers to the frequency with which detailed diagnosis measures are to be generated for this test. The default is *1:1*. This indicates that, by default, detailed measures will be generated every time this test runs, and also every time the test detects a problem. You can modify this frequency, if you so desire. Also, if you intend to disable the detailed diagnosis capability for this test, you can do so by specifying *none* against DD Frequency.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option. The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:

Parameter	Description
	• The eG manager license should allow the detailed diagnosis capability
	• Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Activity	Indicates the rate of steps executed for this transaction in the last measurement period.	Steps/Sec	This is a good indicator of the workload imposed by a transaction on the SAP ABAP instance. You can compare the value of this measure across transactions to know which transaction is generating the maximum load.
CPU utilization	Indicates the percentage of CPU resources utilized by this transaction.	Percent	Compare the value of this measure across transactions to know which transaction is using the maximum CPU and is probably causing a CPU contention on the system. You may then want to observe how this transaction has been using CPU over time and figure out whether the CPU usage of that transaction remains consistently high; if so, it could mean that that transaction requires more processing power to execute. You may then want to consider resizing the SAP ABAP system with more CPU resources.
Total memory	Indicates the total memory used by this transaction during the last measurement period.	MB	This measure is the sum total of the roll memory, extended memory, and heap memory used by a process. By comparing the value of this measure across transactions, you can accurately identify that

Measurement	Description	Measurement Unit	Interpretation
			transaction which is consuming the maximum memory. If the memory usage of this transaction has been abnormally high consistently, it could indicate that the transaction is basically memory-intensive and requires more memory resources for proper execution. You should then figure out how much memory and of what type should be allocated to the task. For this, you may want to determine which memory type was being used the highest over time – is it heap memory? Roll memory? Or extended memory. The values of the PRIV mode heap memory and the Extended memory metrics will help administrators figure this out.

You can also use the detailed diagnosis of this measure to identify the top 3 memory-consuming steps of a particular transaction. |
| PRIV mode heap memory | Indicates the maximum PRIV mode heap memory consumed by this transaction in the last measure period. | MB | SAP's memory management system assigns memory to a work process. The order in which a work process is assigned the memory type depends on the work process type, either dialog or non-dialog), and the underlying operating system. Some of the memory types are as follows:

- **Roll area**: The roll area memory is used for the initial memory assigned to a user context, and (if available) for additional memory if the expanded memory |

Measurement	Description	Measurement Unit	Interpretation
			is full. The roll area consists of 2 segments. The first segment is assigned to the work process first as memory. If this is used up, the work process has more memory assigned to it. • **Extended memory**: Each ABAP work process has a part reserved in its virtual address space for extended memory. The majority of the user context is stored in the extended memory. You can map the extended memory from the common resource onto any work process, and after onto another process on the same address in the virtual address space. This is important if you work with pointers in the ABAP program. The value of the Extended memory measure indicates how each transaction is using this memory type. • **Private memory**: If a dialog work process has used up the roll area assigned to it and the extended memory, private memory is assigned to the work process. The work process goes into PRIV mode (private). Other processes cannot use private

Measurement	Description	Measurement Unit	Interpretation
			(heap) memory. After releasing the assigned memory, the operating system still considers the (virtual) memory as being occupied by the allocating process.

A consistent increase in the value of the PRIV mode heap memory measure for a transaction therefore indicates that transactions of that type are continuously using up all the roll area and extended memory, and are being forced to reach out to the private memory. This could mean that the transaction is memory-intensive. If too many transactions are found to be using PRIV heap memory, it could mean that the work processes are sized with insufficient roll area and extended memory. You may hence want to allocate more roll area and extended memory to make sure that private memory usage is minimal. |
| Extended memory | Indicates the maximum extended memory used by this transaction in the last measure period. | MB | |
| Work process restarts | Indicates the number of work process restarts caused by this transaction in the last measure period. | Number | One of the common reasons for work process restarts is excessive usage of private memory. The work process, if it has used a lot of private memory, is restarted when the user context is terminated and the local memory is returned. The restart makes the local memory available again for other processes. |

Measurement	Description	Measurement Unit	Interpretation
			Regardless of what caused it, work process restarts are performance-impacting and need to be kept at a minimum.
Maximum response time of a step	Indicates the maximum response time of the transaction steps of this transaction in the last measurement period.	Secs	An SAP transaction normally extends over several transaction steps. During these steps, data such as variables, internal tables, and screen lists are built up and stored in the main memory of the application server. This measure compares the response time of all the transaction steps executed by a transaction in the last measurement period and reports the highest response time. Use the detailed diagnosis of this measure to identify the top 3 steps executed by this transaction with highest response times. This leads you to the probable cause for delay in the execution of a transaction in the last five minutes. Apart from the response time break up, the report and CUA programs that were running are also shown as part of detailed diagnosis.
Total response time	Indicates the total response time per invocation of this transaction within the last measure period.	Seconds/transaction	This measure includes the response time taken at the server and the round trip times. Ideally, the value of this measure should be low. High values are indicative of poor responsiveness. Compare the value of this measure across transactions to identify which transaction is least responsive. To know the reason for

Measurement	Description	Measurement Unit	Interpretation
			the delay, you can compare the value of the GUI time, GUI Net time, Server response time, Processing time, Dispatcher wait time, Load and generation time, Roll time, Database request time, Lock time, and RFC time measures for that transaction. This will accurately pinpoint where a transaction spent maximum time – in the dispatcher queue? at the server end? in processing? when loading objects? when rolling in user contexts? when performing database operations? when performing enqueue operations? Or in waiting for RFC calls?
			You can also use the detailed diagnosis of this measure to view the details of the top 3 transaction invocations that were least responsive.
Average step response time	Indicates the average response time of a step executed for this transaction in the last measurement period.	Seconds/Step	This measure is used by the BASIS administrators for comparing the response time across all the transaction steps executed by this transaction to determine which step is taking longer duration for execution.
GUI time	Indicates the average time taken for round trip communication steps between client and server in between an invocation of this transaction.	Seconds/transaction	If the values of these measures are excessive, check that the hardware requirements for the presentation server are met and that the network between the application servers and the presentation servers is not experiencing shortages or slow traffic.
GUI Net time	Indicates the average front end net time taken	Seconds/transaction	

Measurement	Description	Measurement Unit	Interpretation
	for the first and last steps of this transaction.		
Server response time	Indicates the average response time of an invocation of this transaction at the server end.	Seconds/transaction	In the event of a processing slowdown, you can compare the value of this measure with other response time measures reported by this test to understand where the processing bottleneck lies.
Processing time	Indicates the average time taken to process an invocation of this transaction.	Seconds/transaction	A high value for this measure may indicate that ABAP programs are very complex and the work processes spend a large amount of time interpreting what is to be done. The processing time of transactions executed by the dialog work process for instance should be below twice the CPU time.
Dispatcher wait time	Indicates the average time that an invocation of this transaction spent waiting for a free work process at the dispatcher.	Seconds/transaction	When the dispatcher receives a processing request, it looks for a free SAP work process of the required type and then sends the request to this work process, which begins the work. If all SAP work processes of the required type are busy when the request initially reaches the dispatcher, the request is placed in the dispatcher queue. In the dispatcher queue, the request waits until a work process of the required type is free. As soon as a work process is free, the dispatcher sends the request to it. This time the request spends in the dispatcher queue is indicated as the dispatcher wait time. For the transactions of the dialog work process for instance, the

Measurement	Description	Measurement Unit	Interpretation
			value of this measure should be less than 10% of the value of the Total response time measure. Higher values are indicative of performance problems. One common cause of such performance problems may be insufficient work processes.
Load and generation time	Indicates the average time spent by an invocation of this transaction for loading and generation.	Seconds/transaction	All ABAP programs and screens that are required but not yet available in the application server buffers must be loaded or generated. The time it takes to do this is indicated as load and generation time. Loading a program also entails accessing database tables that store the ABAP programs. Typically, for the transactions of the dialog work process, the load time per step should not be greater than 50 ms. High values could indicate problems with memory configuration, small buffer sizes, wrong parameter settings or a CPU bottleneck.
Roll time	Indicates the average time spent by an invocation of this transaction for rolling in user contexts and when waiting for roll out.	Secs	An SAP transaction normally extends over several transaction steps. During these steps, data such as variables, internal tables, and screen lists are built up and stored in the main memory of the application server. This data is known as user context. Different transaction steps are normally processed by different dialog work processes. At the beginning of a

Measurement	Description	Measurement Unit	Interpretation
			transaction step, the user context is made available to the appropriate work process. This procedure is called roll-in. Roll-out on the other hand saves the current user-context data to virtual memory at the conclusion of a transaction step. The time a transaction step waited in the roll-area is called roll wait time.
			The value of this measure is the sum total of roll-in time and roll wait time.
			A high value for this measure indicates that this transaction is either taking too long to roll in user contexts or is waiting too long in the roll-area for a roll-out to occur. Since a user context is moved out of the local memory of a work process and moved into the roll buffer during the roll-in process, improperly sized roll buffers can cause slowdowns in this process. Lack of adequate space in the extended memory can also contribute to a slowdown when rolling in user contexts.
			Possible causes for high roll wait times may be due to having all work processes in the target system occupied. It is very important to configure the instances properly, especially when they are designed to handle RFC communication.
Database request time	Indicates the average time spent by an invocation this transaction for	Seconds/transaction	When data is read or changed in the database, the time required is known as Database request time. This time is measured from the

Measurement	Description	Measurement Unit	Interpretation
	performing database operations such as selects, inserts, updates, deletes and commits.		moment the database request is sent to the database server and runs until the moment the data is returned to the application server.
			Ideally, for the transactions of the dialog work process, the value of this measure should be 40% of the total response time. Many factors can cause worrysome spikes in this value. This could be problems in the database such as expensive SQL statement or wrong parameter settings in the database level. In addition, issues in network connectivity between the application server and the database can also adversely impact this value. This is because, the Database request time not only includes the time required by the database to produce the requested data, but also the time required for network transfer of that data. In addition, I/O contention experienced by the physical disks can also affect this time.
Lock time	Indicates the average time that an invocation of this transaction spent performing enqueue operations.	Seconds/Transaction	The enqueue service allows SAP ABAP applications to lock data so that only they can use it. Locking the data prevents parallel changes to the same data, which would lead to data inconsistency.
			The Lock time measure reports the time from sending an enqueue request to the SAP enqueue server to the receipt of the results.
			For the transactions of the dialog work process for example, the Lock

Measurement	Description	Measurement Unit	Interpretation
			time should be less than 5 ms. Any value higher than that would represent a problem that might affect system stability. Network problems can also increase the value of this measure.
RFC time	Indicates the average time an invocation of this transaction spent waiting for RFC calls to get executed.	Seconds/Transaction	The value of this measure includes CPIC (Common Programming Interface Communication) time as well. CPIC is typically used by the SAP system for program-to-program communication. An increase in RFC time can increase roll wait time considerably. When synchronous RFCs are called, the work process executes a roll out and may have to wait for the end of the RFC in the roll area, even if the dialog step is not yet completed. In the roll area, RFC server programs can also wait for other RFCs sent to them. The time a transaction step waited in the roll-area is called roll wait time. The absence of adequate work processes can cause the RFC time and consequently, the roll wait time to increase. Besides ensuring that the SAP ABAP system is sized with sufficient work processes, you can also set the following parameters properly to better balance RFC load: • rdisp/rfc_max_comm_entries: This specifies the maximum number of communications in an

Measurement	Description	Measurement Unit	Interpretation
			instance. No more dialog work processes will be given to the program calling the target system after this number is reached. • rdisp/rfc_min_wait_dia_wp: This specifies the number of work processes to be always available for online users.
Invocations	Indicates the number of active transaction invocations for this transaction in the last measurement period.	Number	Ideally, the value of this measure is preferred to be low. A high value indicates high load on the transaction level.
New invocations	Indicates the number of new invocations for this transaction in the last measurement period.	Number	This measure is useful for calculating number of transaction invocations that are newly made by a particular user in a specified time duration. Use detailed diagnosis of this measure to find out the exact invocation timestamp, program, terminal and other details for first transaction step of each new invocation.

3.5 The SAP Gateway Layer

Using the tests associated with the SAP ABAP Gateway layer (see Figure 3.9), administrators can determine the health of communications between the SAP systems and external programs.

Figure 3.9: The tests associated with the SAP Gateway layer

3.5.1 IDoc Statistics Test

Idocs are structured ASCII files (or a virtual equivalent). They are the file format used by SAP ABAP to exchange data with foreign systems. Idocs is the acronym for Interchange Document. This indicates a set of (electronic) information which builds a logical entity. An IDoc is e.g. all the data of a single customer in your customer master data file, or the IDoc is all the data of a single invoice.

An SAP ABAP application creates data and updates the database appropriately. An application can be a transaction, a stand-alone ABAP Report or any tool that can update a database within SAP ABAP. If the application thinks that data needs to be distributed to a foreign system, it triggers the IDoc outbound routine, usually by leaving a descriptive message record in the message table NAST. The application then either directly calls the IDoc engine or a collector job eventually picks up all due IDoc messages and determines what to do with them. If the engine believes that data is ready to be sent to a partner system, then it determines the function module which can collect and wrap the required IDoc data into an IDoc. In IDoc customising, you specify the name of the function module to use. This can either be one which is predefined by ABAP standard or a user-written one. When the IDoc is created it is stored in an SAP ABAP table and from there it is sent to the foreign system.

IDoc inbound routines, on the other hand, are function modules with a standard interface, which will interpret the received IDoc data and prepare it for processing. The received IDoc data is processed record by record and interpreted according to the segment information provided with each record. The prepared data can then be processed by an application, a function module, or a self-written program.

Any slowdown noticed in electronic data exchange between the SAP ABAP system and foreign systems therefore, can be attributed to bottlenecks or errors in the transmission/reception of Idocs. Administrators should hence closely monitor inbound and outbound IDoc traffic to proactively detect probable slowdowns in inter-system communications, and accurately tell where the slowdown

occurred and why, so that the communication bottlenecks can be promptly cleared. This is where the **IDoc Statistics** test helps.

This test monitors the Idocs generated and reports the rate at which these Idocs were processed at various stages of transmission/reception, thus accurately pointing to processing slowdowns and where exactly the processing was bottlenecked. In addition, the test also reports the number of Idocs that were found to be erroneous every second and the exact stage of transmission/reception at which the rate of errors peaked! This way, the test leads administrators to errors in electronic data exchange that may have delayed communication significantly, and where such delays were frequent!

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every SAP ABAP instance being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port

Parameter	Description
	is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
DD Frequency	Refers to the frequency with which detailed diagnosis measures are to be generated for this test. The default is *1:1*. This indicates that, by default, detailed measures will be generated every time this test runs, and also every time the test detects a problem. You can modify this frequency, if you so desire. Also, if you intend to disable the detailed diagnosis capability for this test, you can do so by specifying *none* against DD Frequency.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option. The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled: • The eG manager license should allow the detailed diagnosis capability

Parameter	Description
	• Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Number of new Idocs	Indicates the number of Idocs of this type that were created during the last measurement period.	Idocs	A high value is desired for this measure.
Rate of new Idocs	Indicates the rate at which the Idocs of this type were generated during the last measurement period.	Idocs/sec	This measure gives an overview of outbound/inbound data transfer rate using the Idocs.
Idocs with recent unprocessed interface errors	Indicates the number of Idocs of this type with unprocessed interface errors during the last measurement period.	Number	Ideally, the value of this measure should be zero. The detailed diagnosis of this measure if enabled, lists the details of these Idocs such as the Idoc number, type, error message, recipient and sender details, creation and modified timestamps and number of data records.
Idocs with recent unprocessed external system or application errors	Indicates the number of Idocs of this type with external system errors or application errors during the last measurement period.	Number	Ideally, the value of this measure should be zero. The detailed diagnosis of this measure if enabled, lists the details of these Idocs such as the Idoc number, type, error message, recipient and sender details, creation and modified timestamps and number of data records.

3.5.2 QRFC Queues Test

All types of applications are instructed to communicate with other applications. This communication may take place within an SAP system, with another SAP system, or with an application from a remote external system. An interface that can be used for dealing with this task is the *Remote*Function *C*all (RFC). RFCs can be used to start applications in remote systems, and to execute particular functions.

Whereas the first version of the RFC, the synchronous RFC, (sRFC) required both systems involved to be active in order to produce a synchronous communication, the subsequent generations of RFC had a greater range of features at their disposal (such as serialization, guarantee for one-time-only execution, and that the receiver system does not have to be available). These features were further enhanced through the *q*ueued RFC with inbound/outbound queue.

qRFC performs a serialization of tRFC (Transactional RFC) using wait queues. While the actual sending process is done by the tRFC, inbound and outbound queues are added to the tRFC, thus resulting in a qRFC (queued Remote Function Call). The sender system is called the client system, while the target system corresponds to the server system.

In qRFC, the following communication scenarios are possible:

- qRFC with outbound queue

- qRFC with inbound queue (and outbound queue)

Figure 2.21 depicts both these communication scenarios:

As you can see, in a *qRFC with an outbound queue,* the sender system uses an outbound queue to serialize the data that is being sent. This means that function modules which depend on each other (such as update and then change) are put into the outbound queue of the sender system, and are guaranteed to be sent to the target system one after each other and one time only. The called system (server) has no knowledge of the outbound queue in the sender system (client), meaning that in this scenario, every SAP system can also communicate with a non-SAP system. (Note: the programming code of the server system must not be changed. However, it must be tRFC-capable.)

In the *qRFC with inbound queue* scenario on the other hand, for an outbound queue in the sender system (client), there is also an inbound queue in the target system (server). In other words, if a qRFC with inbound queue exists, it means that an outbound queue also exists in the sender system. This guarantees the sequence and efficiently controls the resources in the client system and server system. The inbound queue only processes as many function modules as the system resources in the target system (server) at that time allow. This prevents a server from being blocked by a client.

Two systems can engage in smooth, uninterrupted communication using qRFC only if the outbound and inbound queues operate in an error-free manner. To be able to promptly capture deficiencies in queue execution and rapidly isolate the reasons for the same, administrators should closely monitor the inbound and outbound qRFC queues. This can be achieved using the **QRFC Queues** test. For each type (inbound and outbound) of queue, this test reports the number of queues that are experiencing errors currently and the count of queues that took too long to complete. In the process, the test turns the spotlight on those queues that may be responsible for unexpected breaks or prolonged delays (if any) in inter-system communication, and also reveals what could be causing such queues to perform poorly.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every qRFC queue type on the server being monitored; an additional *All* descriptor is also supported, which aggregates metrics across queue types.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if**

Parameter	Description
	the test uses SAPJCO to collect measures. An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses SAPJCO to collect measures.** If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses SAPJCO to collect measures.** This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
LongReadyCutoff (HRS)	This test reports the *Long ready state queues* measure, which is the number of queues stuck in the *Ready* state for a long time. To report this measure, this test counts all queues that have been in the *Ready* state in excess of the duration (in hours) specified against LongReadyCutoff (HRS).
LongRunningcCutoff (HRS)	This test reports the Long running queues measure, which is the number of queues that have been running for a long time. To report this measure this test counts all queues that have been running for over a period of time (in hours) specified against LongRunningcCutoff (HRS).

Parameter	Description
DD Frequency	Refers to the frequency with which detailed diagnosis measures are to be generated for this test. The default is *1:1*. This indicates that, by default, detailed measures will be generated every time this test runs, and also every time the test detects a problem. You can modify this frequency, if you so desire. Also, if you intend to disable the detailed diagnosis capability for this test, you can do so by specifying *none* against DD Frequency.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.

The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:

- The eG manager license should allow the detailed diagnosis capability

- Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Number of queue entries	Indicates the number of queue entries for this queue type.	Number	Queue entries refer to the function modules that are sequentially arranged and placed in an inbound/outbound queue (as the case may be), for consumption by a target system. A high value or a consistently increasing value for this measure therefore indicates that the inbound/outbound queue is long or is growing. This could imply an overload or a processing bottleneck at the sender/receiver system (as the case may be). You can compare the value of this measure between inbound and outbound queues to understand where the bottleneck is – at the sender system

Measurement	Description	Measurement Unit	Interpretation
			or the target system? .
Number of queues	Indicates the current number of queues of this queue type.	Number	The inbound queue scheduler and the outbound queue scheduler ensure that the corresponding queues (inbound and outbound) are processed in parallel. An increase in the number of queues impairs the performance of the scheduler, as it can no longer process the queues in parallel. Its hence best to limit the number of inbound/outbound queues.
Blocked queues	Indicates the current number of queues in blocked state.	Number	Ideally, the value of this measure should be 0. A non-zero value indicates that one/more inbound/outbound queues are blocked. qRFC queues can be blocked due to various reasons such as no free work processes (SYSLOAD), target system error (SYSFAIL), transmission error(CPICERR), explicit lock, dependent lock, debugging, waiting for update, LUW execution error, LUW data modification.
SYSFAIL queues	Indicates the current number of queues of this type in the SYSFAIL error status.	Number	Ideally, the value of this measure should be 0. If this measure reports a non-zero value instead, it indicates that a serious error occurred when the first logical unit of work (LUW) of one/more queues was being executed. SYSFAIL errors interrupt execution of the LUW and generates short dumps on the target system. To know which queues encountered SYSFAIL errors, use the detailed diagnosis of this measure.
SYSLOAD queues	Indicates the current number of queues of this type in the SYSLOAD	Number	Ideally, the value of this measure should be 0. If this measure reports a non-zero value instead, it indicates that

Measurement	Description	Measurement Unit	Interpretation
	error state.		at the time of the qRFC call, no DIALOG work processes were free in the sending system. If these errors persist, the number of dialog work processes can be increased accordingly. To know which queues encountered SYSLOAD errors, use the detailed diagnosis of this measure.
CPICERR queues	Indicates the current number of queues of this type in the CPICERR error state.	Number	Ideally, the value of this measure should be 0. If this measure reports a non-zero value instead, it indicates that during transmission or processing of the first LUW of one/more queues, a network or communication error occurred. Status CPICERR may also exist in the following cases although no communication error occurred: A qRFC application finds out that a LUW cannot be processed any further due to a temporary error in the application and therefore calls the RESTART_OF_ BACKGROUNDTASK function module to prompt the qRFC Manager to cancel the execution of this LUW and to repeat this LUW later. In this case, qRFC simulates a communication error with the text "Command to tRFC/qRFC: Execute LUW once again." If this error occurs very often, you must contact the corresponding application. To know which queues encountered the CPICERR errors, use the detailed diagnosis of this measure.
Waiting queues	Indicates the current number of queues of this type in the WAITING state.	Number	Ideally, the value of this measure should be 0. If this measure reports a non-zero value instead, it indicates that

Measurement	Description	Measurement Unit	Interpretation
			the first LUW of some queues has dependencies to other queues, and at least one of these queues currently still contains other LUWs with higher priorities. Queues can also go into waiting, if there are updates in the transaction and the queues have to wait until the update ends.
			To know which queues are in the WAITING state currently, use the detailed diagnosis of this measure.
NoSend queues	Indicates the current number of queues of this type in the NOSEND state.	Number	If this measure reports a non-zero value, it indicates that the LUWs of some queues were never sent but retrieved by a special application. These queues are only used internally at SAP. Even if a LUW has been read by the corresponding application (BW, CRM), this status does not change. This LUW is only deleted from the queue if this application confirms collection (collective confirmation possible). Under no circumstances should this status be reset and the queue activated.
			Use the detailed diagnosis of this measure to know which queues are NOSEND queues.
Long ready state queues	Indicates the number of queues that have been in the READY state for a long time.	Number	This measure reports the count of all queues that have been in the READY state for a period of time greater than the longreadycutoff (HRS) specification.
			Typically, the READY state is a temporary state. If this state becomes permanent for a queue or is prolonged, it could be because that queue has been

Measurement	Description	Measurement Unit	Interpretation
			locked manually via a transaction/program and then unlocked without being activated at the same time. Under such circumstances, the queue must be activated explicitly.
Long running queues	Indicates the number of queues that have been running for a long time.	Number	This measure reports the count of all queues that have been in the RUNNING state for a period of time greater than the longrunningcutoff (HRS) specification.

If a queue hangs in the RUNNING state for more than 30 minutes, this may mean that the work process responsible for sending this LUW has been terminated. In this case, you can activate this queue again.

Note that activating a queue in status RUNNING may cause a LUW to be executed several times if this LUW is still being processed in the target system at that time. SAP therefore recommends a waiting time of at least 30 minutes before you reactivate the queue. |

3.5.3 Gateways Test

The SAP Gateway carries out CPI-C services within the SAP world, which are based on TCP/IP. These services enable SAP systems and external programs to communicate with one another. As RFC is based on CPI-C, all RFC connections also pass through the SAP Gateway. This test reports statistics pertaining to this SAP gateway.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for the SAP ABAP instance being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull

Parameter	Description
	out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Gateway clients	The number of gateway clients who are currently connected to the SAP server, expressed as a percentage of the maximum number of gateway clients allowed.	Percent	For example, if the gateway can administrate 300 clients, and there are currently 30 clients logged on to the gateway, the value is 10%.

If the value is near 100%, the maximum number of clients can be changed using the profile parameter gw/max_sys. |
| Gateway connections utilized | The number of gateway connections currently utilized, expressed as a percentage of the maximum number of gateway connections allowed. | Percent | |
| Remote gateways | Of the total number of gateways, what percentage is consumed by remote gateways. | Percent | If the value is near 100%, the maximum number of gateways can be changed using the profile parameter rdisp/max_gateways.

To administrate gateway connections, call transaction SMGW on the server in question. |

Measurement	Description	Measurement Unit	Interpretation
Gateway admin entries	Of the maximum number of gateway admin entries that are allowed, what percentage is being currently utilized.	Percent	If the value is near 100%, the maximum number of entries can be changed using the profile parameter rdisp/max_comm_entries.
Gateway work processes	Of the maximum number of gateway work processes allowed, what percentage is being used currently.	Percent	If a value is near 100%, the maximum number of work processes can be changed using the profile parameter gw/max_wp.
Gateway overflow usage	Of the total gateway size, what percentage of gateway overflow has been used.	Percent	If a value is near 100%, the maximum overflow size can be changed using the profile parameter gw/max_ overflow_size.

3.5.4 RFC Calls Test

This test monitors the RFC connections that pass through the SAP gateway.

This test is disabled by default. To enable the test, go to the **ENABLE / DISABLE TESTS** page using the menu sequence : Agents -> Tests -> Enable/Disable, pick *SAP ABAP* as the desired **Component type**, set *Performance* as the **Test type**, choose the test from the **DISABLED TESTS** list, and click on the **<** button to move the test to the **ENABLED TESTS** list. Finally, click the **Update** button.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for the SAP ABAP instance being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.

Parameter	Description
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then

Parameter	Description
	the JCO Version configuration should be 3.x.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Communication errors in outbound RFC calls	The number of communication errors in outbound RFC calls.	Number	
Execution errors in outbound RFC calls	The number of execution errors in outbound RFC calls.	Number	
Outbound calls without RFC resources	The number of errors with no server resources for outbound calls.	Number	
Inbound RFC calls	The number of inbound RFC calls.	Number	

3.5.5 RFC Destinations Test

Remote Function Call (RFC) is an SAP procedure for calling function modules in remote systems. The information about the target system of an RFC call is stored in the RFC destination. If an RFC destination is not reachable or is not available, then the information of the RFC call stored in the RFC destination cannot be accessed. Therefore, it is necessary to monitor each RFC destination regularly and ensure that the RFC destinations are available round the clock. The **RFC destinations** test helps administrators in this regard!

By closely monitoring RFC destinations in the target environment, administrators can figure out the RFC destinations that are not reachable for a long duration. The detailed diagnosis helps administrators figure out the reason for why the RFC destination is not reachable.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for each *Connection Type:RFC destination* configured on the target SAP ABAP instance

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
Port	Enter the port to which the specified host listens.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses SAPJCO to collect measures.** An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
Router	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses SAPJCO to collect measures.** If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network,

Parameter	Description
	then specify 'none' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
InstanceName	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses SAPJCO to collect measures.** This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Include Destination Patterns	Specify a comma-separated list of destination patterns that need to be included for monitoring, by default, in this text box. **Pattern search is not supported.**
Exclude Destination Patterns	Specify a comma-separated list of destination patterns that need to be excluded from the scope of monitoring, in this text box. **Pattern search is not supported.**
Monitor ABAP Connections	By default, while administrators configure an RFC destination, they indicate the system connection type in the Connection Type field. When Type 3 is specified as the connection type, it indicates RFC connections to ABAP systems. By default, these Type 3 connection types are monitored by eG Enterprise and therefore, this flag is set to **Yes**, by default. If administrators do not wish to monitor Type 3 connection types, then, they can set this flag to **No**.
Monitor Internal Connections	When Type I is specified as the connection type, it indicates an RFC connection between the ABAP systems connected to the same database as the current system. By default, these Type I connection types are monitored by eG Enterprise and therefore, this flag is set to **Yes**, by default. If administrators do not wish to monitor Type I connection types, then, they can set this flag to **No**.
Monitor Logical Connections	When Type L is specified as the connection type, it indicates an RFC connection to a physical destination. By default, these Type L connection types are monitored by eG Enterprise and therefore, this flag is set to **Yes**, by default. If administrators do not wish to monitor Type L connection types, then, they can set this flag to **No**.
Monitor SNA/CPI-C Connections	When Type S is specified as the connection type, it indicates an RFC connection that uses IBM's System Network Architecture (SNA) as its destination. By default, these

Parameter	Description
	Type L connection types are monitored by eG Enterprise and therefore, this flag is set to **Yes**, by default. If administrators do not wish to monitor Type S connection types, then, they can set this flag to **No**.
Monitor TCPIP Connections	Type T destinations are connections to external programs that use the RFC library to receive RFCs. By default, these Type T connection types are monitored by eG Enterprise and therefore, this flag is set to **Yes**, by default. If administrators do not wish to monitor Type T connection types, then, they can set this flag to **No**.
Monitor ABAP Driver Connections	Type X entries indicate systems where device drivers in ABAP have been specially installed. By default, these Type X connection types are monitored by eG Enterprise and therefore, this flag is set to **Yes**, by default. If administrators do not wish to monitor Type X connection types, then, they can set this flag to **No**.
DD Frequency	Refers to the frequency with which detailed diagnosis measures are to be generated for this test. The default is *1:1*. This indicates that, by default, detailed measures will be generated every time this test runs, and also every time the test detects a problem. You can modify this frequency, if you so desire. Also, if you intend to disable the detailed diagnosis capability for this test, you can do so by specifying *none* against DD Frequency.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option. The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled: • The eG manager license should allow the detailed diagnosis capability • Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Is reachable?	Indicates whether/not this RFC destination is reachable.		The values reported by this measure and its numeric equivalents are mentioned in the table below:

Measurement	Description	Measurement Unit	Interpretation
			Measure value / **Numeric Value** below: | Measure value	Numeric Value
---	---
Yes	0
No	1	 **Note:** By default, this measure reports the **Measure Value**s listed in the table above to indicate whether/not this RFC destination is reachable. The graph of this measure however is represented using the numeric equivalents only - 0 and 1.

3.5.6 TRFC calls Test

Transactional RFC (tRFC) and qRFC are variants of the Remote Function Call that make the data transfer between different systems more reliable and more secure. For each type of tRFC call, this test reports the number of calls that were recorded, the number of calls that were executed. Using this test, administrators may figure out how many calls were in states such as CPICERR, SYSFAIL, other states etc.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every SAP ABAP instance being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.

Parameter	Description
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running.

Parameter	Description
	Measures will be reported as "Not applicable" by the agent if the server is not up.
LongWaitingCutoff	Specify the time duration in hours beyond which the tRFC calls are classified as stuck in the LongWaitingCutoff text box.
StuckStates	By default, tRFC calls are prone to get stuck when in MAILED or RECORDED states. In order to monitor those tRFC call that are stuck in these states, specify these states as a comma-separated list in the StuckStates text box. The default is MAILED,RECORDED. If you wish to monitor the tRFC calls that are stuck in HOLD state, then you can specify MAILED,RECORDED,HOLD in this text box.
Need DD For Other States	If you wish to disable the detailed diagnosis capability for the *Calls in other states* measure of this test, then set the Need DD For Other States parameter to **No**. By default, this is set to **Yes**.
DD Frequency	Refers to the frequency with which detailed diagnosis measures are to be generated for this test. The default is *1:1*. This indicates that, by default, detailed measures will be generated every time this test runs, and also every time the test detects a problem. You can modify this frequency, if you so desire. Also, if you intend to disable the detailed diagnosis capability for this test, you can do so by specifying *none* against DD Frequency.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.

The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:

- The eG manager license should allow the detailed diagnosis capability

- Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Calls recorded	Indicates the number of tRFC calls of this type that were recorded during the	Number	A sudden/gradual increase in the value of this measure could indicate issues such as insufficient

Measurement	Description	Measurement Unit	Interpretation
	last measurement period.		configuration of connection resources for transactions.
Calls executed	Indicates the number of tRFC calls of this type that were executed during the last measurement period.	Number	
CPICERR calls	Indicates the number of tRFC calls of this type with communication errors i.e., the number of tRFC calls in CPICERR state during the last measurement period.	Number	CPICERR error arises due to connection of communication issues with the target system or external component. CPICERR calls may be retried. The detailed diagnosis of this measure if enabled, lists the details about these calls such as the host, process ID, timestamp, destination, function, user, retries, Tcode and error message.
SYSFAIL calls	Indicates the number of tRFC calls of this type that were in SYSFAIL state during the last measurement period.	Number	SYSFAIL error arises due to error in execution of tRFC call in target system or external component. The detailed diagnosis of this measure if enabled lists the details about these calls such as the host, process ID, timestamp, destination, function, user, retries, Tcode and error message.
Number of calls mailed	Indicates the number of tRFC calls of this type for which CMC (protocol X400) connection was initiated during the last measurement period.	Number	
Calls executed in target	Indicates the total number of tRFC calls of this type that were executed in the target SAP system during the last measurement	Number	

Measurement	Description	Measurement Unit	Interpretation
	period.		
Calls in other states	Indicates the number of tRFC calls of this type that were in intermediary states such as HOLD, WCONFIRM, SYSLOAD etc during the last measurement period.	Number	Tracking these calls become important when typical tRFC issues are encountered. The detailed diagnosis of this emasure if enabled lists the details for these calls using which you can figure out any abnormal/error states.
Long waiting calls	Indicates the number of tRFC calls of this type that were stuck in any state beyond the time specified against the longwaitingCutOff parameter while configuring this test.	Number	tRFC calls can get stuck in certain states due to various reasons such as insufficient errors or intermediate errors, communication issues etc. Such calls need to be either manually processed or an appropriate report can be configured to process any known issues. Use the detailed diagnosis of this measure for further analysis of such calls.

3.5.7 Internet Communication Manager Test

The Internet Communication Manager (ICM) facilitates communication between SAP system(s) and the internet using the HTTP, HTTPS, and SMTP protocols. Requests received from the internet are forwarded to SAP system for processing via the ICM. Likewise, the ICM also sends SAP requests to the internet, gets the feedback and transfers it to the SAP system.

The ICM is implemented as an independent process and is started and monitored by the dispatcher. The ICM process uses a pool of worker threads to parallel process the load. This is why, if a sudden/consistent slow down is noticed in a SAP system's interactions with the internet, the first place administrators need to check for inconsistencies is this thread pool. The absence of adequate threads in the pool can significantly impair the ICM's ability to uniformly distribute the request load across threads, thereby causing one/more threads be over-utilized; ultimately, this will result in a slowdown! Besides erratic thread pool usage, the sudden unavailability of the ICM and over-utilization of ICM connections can also cause disturbances in a SAP system's internet communications. To ensure that such anomalies are promptly captured and corrected,

administrators should keep an eye on the accessibility of the ICM, its thread pool usage, and availability of ICM connections. This is where the **Internet Communication Manager** test helps! This test periodically checks the availability, thread pool usage, and connection utilization of the ICM, and promptly reports the non-availability of the ICM, abnormal usage of worker threads by the ICM, and the over-utilization of ICM connections. This way, the test leads administrators to the probable causes for the breaks / slowness in the communication between the SAP system and the internet.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for the SAP ABAP instance being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.

Parameter	Description
Router	If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.
DD Frequency	Refers to the frequency with which detailed diagnosis measures are to be generated for this test. The default is *1:1*. This indicates that, by default, detailed measures will be generated every time this test runs, and also every time the test detects a problem. You can modify this frequency, if you so desire. Also, if you intend to disable the detailed diagnosis capability for this test, you can do so by specifying *none* against DD Frequency.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option. The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled: • The eG manager license should allow the detailed diagnosis capability

Parameter	Description
	• Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Is available ?	Indicates whether/not the ICM is running.		This measure reports the value Yes if the ICM is running, and No if the ICM is not running. The numeric values that correspond to the above-mentioned measure values are as follows: 	Measure Value	Numeric Value	 |---|---| | Yes	100	 | No	0	 **Note:** By default, the test reports the above-mentioned **Measure Value**s to indicate whether/not the ICM is available. However, in the graph of this measure, the same is represented using the numeric equivalents only. If the value of this measure is No, then it indicates that the HTTP/HTTPS/SMTP communication to the SAP ABAP instance is disrupted.
Current threads	Indicates the number of threads that were currently created from the pool for processing requests.	Number	A high value denotes a high level of activity on the ICM.
Free threads	Indicates the number of threads that can be created from the pool for	Number	

Measurement	Description	Measurement Unit	Interpretation
	processing requests.		
Thread utilization	Indicates the percentage of maximum threads (in pool) that have been created currently for processing requests.	Percent	A value close to 100% denotes over-usage of threads. You may then have to increase the maximum threads in pool configuration to allow more threads to be created for processing requests, so that processing bottlenecks can be eliminated.
Percentage waiting threads	Indicates the percentage of maximum threads (in pool) to that are currently waiting for data to be processed.	Percent	Threads waiting for data from network or application server / server response / client response are classified as waiting threads. Threads waiting for a long time result in sustained increase in waiting threads and are indicative of a generic network / application server issue.
Number of requests in queue	Indicates the number of requests waiting for free ICM threads.	Number	A consistent rise in this value could indicate a potential overload condition, typically caused by insufficient threads in pool. You may hence have to resize the pool to prevent requests from queuing up.
Request queue utilization	Indicates the percentage of total requests that are in queue currently.	Percent	A value close to 100% is a cause for concern, as it indicates that almost all requests are being queued. This again points to a load-balancing irregularity, probably caused by the lack of adequate threads in the pool.
Connections used	Indicates the number of currently open connections.	Number	The number of simultaneously open connections and their sockets can be deduced from this measure.
Connection utilization	Indicates the percentage of currently open connections.	Percent	Each request can create multiple connections. This measure therefore helps to gauge the level activity at the ICM (web dispatcher), so that the system load can be observed and the relevant profile parameters can be tuned

Measurement	Description	Measurement Unit	Interpretation
			accordingly. For instance, a value close to 100% for this measure, may mandate that the icm/max_conn parameter be increased, so that enough connections are always available.
Inactive services	Indicates the number of inactive ICM services.	Number	A service may be inactive due to various reasons such as a port conflict, unauthorized deactivation etc. If the service is deactivated, then, administrators should be alerted towards such deactivation so that necessary steps can be taken to re-activate the service(s) appropriately.
			If the ICM services are inactive for a longer period, then incoming requests (HTTP/HTTPS/SMTP) to the SAP ABAP instance cannot be processed. This would have a direct impact on the accessibility of the SAP Applications. The longer the services are inactive, the SAP Applications would be inaccessible till then.
			The detailed diagnosis of this measure provides details of the inactive services. These details include the service name, keep alive connection status, backend processing timeout, port, hostname and whether/not external bindings are used.

3.6 The SAP Service Layer

The tests depicted by Figure 3.10 help administrators to find quick and accurate answers to the following questions:

- Are all SAP ABAP sub-systems functioning smoothly, or has any sub-system reported errors? If so, how many errors were reported?

- Is the Dialog service taking too long a time to respond to requests? If so, where does the maximum delay take place - during network transfer or in the queue or during GUI call-back or at the database end?

- Is the SAP ABAP instance available? What is the connection time?

- Are too many users logged on to the SAP ABAP system? If so, who are they and what are the client activities they are logged into?
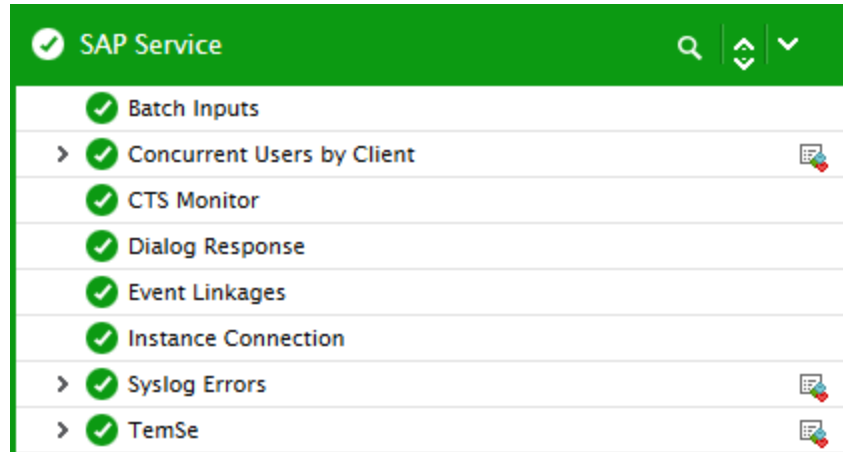

Figure 3.10: The tests associated with the SAP Service layer

3.6.1 Batch Inputs Test

Batch input is one of the primary ways in which data can be transferred into the SAP ABAP System. Batch input is used for bulk data transfers and not for near real-time data transfers.

Typical uses of batch input include the one-time import of data from a legacy system into a newly installed SAP ABAP System. Another typical use is for periodic (hourly, daily...) transfers of data from external systems or legacy systems that are still in use into SAP ABAP, where all enterprise data is consolidated.

A batch input session is a set of one or more calls to transactions along with the data to be processed by the transactions. The system normally executes the transactions in a session non-interactively, allowing rapid entry of bulk data into an SAP ABAP System.

Administrators should periodically check whether/not the batch input sessions have completed successfully. If bulk transfers into the SAP ABAP system via these sessions is interrupted, then administrators should be able to promptly capture the errors in sessions, instantly initiate error analysis, and rapidly correct the problem. The **Batch Inputs** test enables administrators to perform all this and more! This test monitors the batch input sessions, promptly detects errors in sessions,

and accurately points administrators to those sessions where errors have occurred. In addition, the test periodically measures the load on the SAP ABAP system by reporting the number of created and running sessions, and in the process, warns administrators of probable overload conditions.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for the SAP ABAP instance being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses SAPJCO to collect measures**. An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the**

Parameter	Description
	test uses SAPJCO to collect measures. If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses SAPJCO to collect measures**. This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
DD Frequency	Refers to the frequency with which detailed diagnosis measures are to be generated for this test. The default is *1:1*. This indicates that, by default, detailed measures will be generated every time this test runs, and also every time the test detects a problem. You can modify this frequency, if you so desire. Also, if you intend to disable the detailed diagnosis capability for this test, you can do so by specifying *none* against DD Frequency.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option. The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled: • The eG manager license should allow the detailed diagnosis capability • Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Error sessions	Indicates the current number of batch input sessions with errors.	Number	Ideally, the value of this measure should be 0. A non-zero value indicates that transactions in one/more sessions ended in errors. A transaction contains an error if it issues a message of type E (error) or type A (abnormal termination). In such situations, the system administrator must analyze the error. Most errors fall into one of two categories: • Required data is missing from the batch-input session or invalid data has been included in the session. Possible external causes of this type of problem include errors in the data conversion program or the presence of unexpected types of data or incorrect data in the legacy database. Causes for this type of problem within SAP ABAP include incorrect or incomplete customizing in an application. For example, a legacy data type may not have been foreseen in the check table entries made in application customizing. • Technical/programming problems. A batch input session enters data by running SAP ABAP transactions non-interactively. A typical technical or programming problem is therefore incorrect identification of one of the

Measurement	Description	Measurement Unit	Interpretation
			data fields in a transaction. Or the conversion program may not fill a required data field or may have provided invalid values. You can use the detailed diagnosis of this measure to know which batch input sessions encountered what type of errors. To correct transactions with errors, the system administrator or the responsible department can interactively correct and reprocess the transactions.
Background sessions	Indicates the current number of batch input sessions running in the background.	Number	The data in a batch input session can be processed in one of the three modes: • **Process/foreground**: Runs the session in the foreground, displaying every screen and field. If you change a screen in this option, the process halts. • **Display errors only**: Runs the session in the foreground, displaying only errors. • **Background**: Runs the session in the background. The *Background sessions* measure reports the number of sessions currently running in the background mode. Since sessions are typically run in this mode to execute the data transfer or test its performance, you can use the Background sessions measure as an indicator of the number of data transfer

Measurement	Description	Measurement Unit	Interpretation
			sessions the SAP ABAP system can handle at a given point in time.
Inprocess sessions	Indicates the number of batch input sessions that are currently running.	Number	This is a good indicator of the current batch input session load on the SAP ABAP system.
Sessions being created	Indicates the number of batch input sessions being created.	Number	

3.6.2 Event linkages Test

The type linkage describes the assignment of a receiver function module and a receiver type to a particular combination of object type and event.

A type linkage must be created if the system is always to react to an event of a particular object type. The type linkages are evaluated at runtime by the event manager.

The event receiver should define a type linkage using a function module provided.

Type linkages are client-dependent and are written automatically into a Customizing transport request if the client is configured (in table T000) for changes to be recorded automatically. All entries are then transported including activation indicators.

In the case of client copy, you should ensure that the type linkages are copied into the target client, but are always deactivated in the target client. The activation indicator of each individual type linkage is only copied with client copy if explicitly requested (parameter option for copying tables of class A).

The event manager begins the evaluation of the active type linkages when it is notified of the ID of a created event. For event handling to take place, either the event created and its triggering object type or the event created and a supertype of the triggering object type must be entered for the type linkage.

An appropriate workflow is always started as a reaction to an event of a particular object type. Whenever workflow start is delayed or there is a sudden decrease in the number of workflows that are started, then the administrators may need to analyze the real cause behind such delays! Usually such delays are caused when the event linkages are inactive and when errors are detected in the event linkages. Therefore it becomes essential to monitor the event linkages and keep a constant

vigil on the number of inactive linkages and the number of linkages with errors. The **Event linkages** test helps you in this regard.

This test monitors the event linkages and helps you figure out how many linkages are available on the server and how many are currently active/inactive on the server. In addition, this test helps the administrators identify the number of event linkages with errors and figure out the real reason behind such errors.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every SAP ABAP instance being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored,

Parameter	Description
	follow the procedure detailed in Section **2.1.2**.
Router	If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
DD Frequency	Refers to the frequency with which detailed diagnosis measures are to be generated for this test. The default is *1:1*. This indicates that, by default, detailed measures will be generated every time this test runs, and also every time the test detects a problem. You can modify this frequency, if you so desire. Also, if you intend to disable the detailed diagnosis capability for this test, you can do so by specifying *none* against DD Frequency.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.
	The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:
	• The eG manager license should allow the detailed diagnosis capability
	• Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Total linkages	Indicates the number of type linkages defined on the server.	Number	
Active linkages	Indicates the type linkages that are currently activated on the server.	Number	
Inactive linkages	Indicates the number of type linkages that are currently inactive on the server.	Number	The event receivers will respond to events only when the type linkages are active. The detailed diagnosis of this measure if enabled, lists the linkage details such as the Client, Business object, event description, receiver type, receiver function modules, error linkage etc.
Percentage of linkages that are inactive	Indicates the percentage of type linkages that were inactive.	Percent	A low value is desired for this measure.
Error linkages	Indicates the number of type linkages with errors.	Number	Receivers will immediately respond to events only if the event linkage is active is without any errors. Active linkages with errors result in the event being queued with error status and these linkages have to be reprocessed manually, if needed. Ideally, the value of this measure should be zero. If the value of this measure is abnormally high, then it indicates that there are too many errors in the linkages which eventually results in the delay in processing and lead to a delayed response to the events by the receivers. The detailed diagnosis of this measure if enabled, lists the corresponding type

Measurement	Description	Measurement Unit	Interpretation
			linkage details such as Client, Business object type, event description, receiver type, receiver function modules, error linkage etc.
Percentage of linkages with errors	Indicates the percentage of type linkages with errors.	Number	A high value for this measure is a cause of concern.

3.6.3 Instance Dumps Test

If an unhandled exception occurs while an ABAP program is executed, the ABAP runtime environment triggers an ABAP runtime error. The execution of the program is terminated and a detailed error log (short dump) is created and saved in the affected ABAP system. This test reports the occurrence of ABAP short dumps.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for the SAP ABAP instance being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been

Parameter	Description
	provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server,

Parameter	Description
	choose the **On** option. To disable the capability, click on the **Off** option.
	The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:
	• The eG manager license should allow the detailed diagnosis capability
	• Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Total short dumps	The total number of ABAP short dumps that have occurred.	Number	
New short dumps	The number of ABAP short dumps that have occurred during the last measurement period.	Number	

3.6.4 Instance Status Messages Test

The different SAP ABAP sub-systems report the status of different activities carried out. This test indicates whether each sub-system's activities are successfully carried out or not.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every SAP ABAP sub-system being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.

Parameter	Description
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for

Parameter	Description
	SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.

The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:

- The eG manager license should allow the detailed diagnosis capability

- Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0. |

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Total messages	The total number of error messages present in SAP ABAP's sub-system.	Number	
New messages	The number of error messages that were newly generated in the SAP ABAP's sub-systems.	Number	

3.6.5 Dialog Response Test

This test monitors the responses sent by the Dialog service, and returns key performance metrics pertaining to the responses.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every SAP ABAP instance being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.

Parameter	Description
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Total response time for a dialog step	The average time that the user waits at the front end for his or her request to be processed. It is the sum of the Dialog process time, Network transfer time, Queue time and GUI Callback time.	Secs	If the user response time increases, while the standard response time remains stable, it means that the problem must be at the front end or in the connection to the application server.
Network transfer time for a dialog step	The time taken by the network for the first data transfer between the front end and the application server and during the last data transfer from the application server to the front end.	Secs	The value of this measure does not include round trips.
Queue time for dialog process	The average wait time in the dispatcher wait queue.	Secs	With a normal workload, there should always be free dialog work processes available. In such a case, the wait time will only be a few milliseconds.
GUI callback time	The average length of time that a work process waits	Secs	

Measurement	Description	Measurement Unit	Interpretation
	for the front end during the communication between the application server and the front end.		
Dialog process time	The total time that is required for processing a SAP ABAP dialog step, including the database processing time.	Secs	Check the CPU performance, system paging, dialog work processes, and database performance for any performance lag in the dialog process time.
Load generation time	The average load generation time for source texts, graphical user interfaces and screen information from the database.	Secs	
Database response time for the dialog step	The average time for processing logical database requests.	Secs	Read requests can either be sent to the database buffers or to the fast local SAP buffers. The efficiency of the buffers, the required number of requests as well as a large number of database change requests affect the total access time. The database access time also takes into account the db server, CPU performance as well as network transfer times.
Dialog std response time	The time taken for a standard transaction that simulates the normal workload of a transaction by accessing data on the database and executing a series of ABAP function modules.	Secs	If the dialog response time is deteriorating consistently, while the standard response time remains stable, check the number of users logged on. If there are only a small number of users, the use of very resource-intensive transactions by one user can, in extreme cases, significantly increase the response time. If this is the case, there is often no serious performance problem.

3.6.6 Instance Connection Test

This test emulates a client access to the SAP ABAP instance, and reports the server availability and connect time.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every SAP ABAP instance being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	If the SAP client with the specified ClientName exists in a network external to the SAP

Parameter	Description
	server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
SAP ABAP instance availability	Whether the SAP server is available or not.	Percent	The value 0 for this measure indicates that the server is not available. The value 100 indicates server availability.
Connect time	Time taken for the SAP client to connect to the SAP server.	Secs	
Command execution time	Time taken by the server to execute a command.	Secs	

3.6.7 Concurrent Users By Client Test

This test displays the number of users logged on to various client activities of the SAP ABAP server.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every SAP ABAP sub-system being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.

Parameter	Description
InstanceName	This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.

The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:

- The eG manager license should allow the detailed diagnosis capability

- Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0. |

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Current users	The number of users logged on to various client activities of the SAP ABAP server.	Number	The detailed diagnosis of this measure, if enabled, provides the details of the currently logged in users.

3.6.8 Instance Log Test

The Instance Log test monitors the SAP ABAP instance's log files for specific error patterns.

This test is disabled by default. To enable the test, go to the **ENABLE / DISABLE TESTS** page using the menu sequence : Agents -> Tests -> Enable/Disable, pick *SAP ABAP* as the desired **Component type**, set *Performance* as the **Test type**, choose the test from the **DISABLED TESTS** list, and click on the **<** button to move the test to the **ENABLED TESTS** list. Finally, click the **Update** button.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every SearchPattern.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
AlertFile	Specify the path to the SAP ABAP instance log file to be monitored. For eg., */usr/saplog/slog.log*. Multiple log file paths can be provided as a comma-separated list - eg., */user/john/sapalerts.log,/tmp/log/slog01.log*.

Also, instead of a specific log file path, the path to the directory containing log files can be provided - eg., */user/logs*. This ensures that eG monitors the most recent log files in the specified directory. Specific log file name patterns can also be specified. For example, to monitor the latest log files with names containing the string 'slogs', the parameter specification can be, */tmp/usr/*slogs**. Here, '*' indicates leading/trailing spaces (as the case may be). In this case, the eG agent first enumerates all the log files in the specified path that match the given pattern, and then picks only the latest log file from the result set for monitoring.

The eG monitor interface will report one set of measurements for every configured path. You can also configure the path in the following format: *Name@logfilepath*. Here, *Name* represents the display name of the path being configured. Accordingly, the parameter specification for the 'slogs' example discussed above can be: *slogs@/tmp/usr/*slogs**. In this case, the display name 'slogs' will alone be displayed as descriptors of the test. |

Parameter	Description
	Every time this test is executed, the eG agent verifies the following:
	• Whether any changes have occurred in the size and/or timestamp of the log files that were monitoring during the last measurement period;
	• Whether any new log files (that match the AlertFile specification) have been newly added since the last measurement period;
	If a few lines have been added to a log file that was monitored previously, then the eG agent monitors the additions to that log file, and then proceeds to monitor newer log files (if any). If an older log file has been overwritten, then, the eG agent monitors this log file completely, and then proceeds to monitor the newer log files (if any).
SearchPattern	Enter the specific patterns of alerts to be monitored. The pattern should be in the following format: *<PatternName>:<Pattern>*, where *<PatternName>* is the pattern name that will be displayed in the monitor interface and *<Pattern>* is an expression of the form - *expr* or *expr* or *expr* or *expr*, etc. A leading '*' signifies any number of leading characters, while a trailing '*' signifies any number of trailing characters.
	For example, say you specify **SAP:*SAPSYS*** in the SearchPattern text box. This indicates that "**SAP**"is the pattern name to be displayed in the monitor interface. "***SAPSYS***" indicates that the test will monitor only those lines in the SAP ABAP server log which embed the term "**SAPSYS**". A single pattern may also be of the form e1+e2, where + signifies an OR condition. That is, the PatternName is matched if either e1 is true or e2 is true.
	Multiple search patterns can be specified as a comma-separated list. For example: **SAP:*SAPSYS*,SAPAL:*DDIC***.
	If the AlertFile specification is of the format *Name@logfilepath*, then the descriptor for this test in the eG monitor interface will be of the format: *Name:PatternName*. On the other hand, if the AlertFile specification consists only of a comma-separated list of log file paths, then the descriptors will be of the format: *LogFilePath:PatternName*.
	If you want all the messages in a log file to be monitored, then your specification would be: *<PatternName>:**.
Lines	Specify two numbers in the format x:y. This means that when a line in the alert file matches a particular pattern, then x lines before the matched line and y lines after the matched line will be reported in the detail diagnosis output (in addition to the matched line). The default value here is 0:0. Multiple entries can be provided as a comma-separated list.
	If you give 1:1 as the value for Lines, then this value will be applied to all the patterns

Parameter	Description
	specified in the SearchPattern field. If you give *0:0,1:1* as the value for Lines and if the corresponding value in the SearchPattern filed is like **SAP:*SAPSYS*,SAPAL:*DDIC*** then:
	• **0:0** will be applied to **SAP:*SAPSYS*** pattern
	• **1:1** will be applied to **SAPAL:*DDIC*** pattern
ExcludePattern	Provide a comma-separated list of patterns to be excluded from monitoring in the ExcludePattern text box. For example *critical,*exception**. By default, this parameter is set to '*none*'.
UniqueMatch	By default, the UniqueMatch parameter is set to **False**, indicating that, by default, the test checks every line in the log file for the existence of each of the configured SearchPatterns. By setting this parameter to **True**, you can instruct the test to ignore a line and move to the next as soon as a match for one of the configured patterns is found in that line. For example, assume that *Pattern1:*fatal*,Pattern2:*error** is the SearchPattern that has been configured. If UniqueMatch is set to **False**, then the test will read every line in the log file completely to check for the existence of messages embedding the strings 'fatal' and 'error'. If both the patterns are detected in the same line, then the number of matches will be incremented by 2. On the other hand, if UniqueMatch is set to **True**, then the test will read a line only until a match for one of the configured patterns is found and not both. This means that even if the strings 'fatal' and 'error' follow one another in the same line, the test will consider only the first match and not the next. The match count in this case will therefore be incremented by only 1.
RotatingFile	This flag governs the display of descriptors for this test in the eG monitoring console.
	If this flag is set to true and the AlertFile text box contains the full path to a specific (log/text) file, then, the descriptors of this test will be displayed in the following format: *Directory_containing_monitored_file:<SearchPattern>*. For instance, if the AlertFile parameter is set to *c:\eGurkha\logs\syslog.txt*, and RotatingFile is set to **True**, then, your descriptor will be of the following format: *c:\eGurkha\logs:<SearchPattern>*. On the other hand, if the RotatingFile flag had been set to **False**, then the descriptors will be of the following format: *<FileName>:<SearchPattern> - i.e., syslog.txt:<SearchPattern>* in the case of the example above.
	If this flag is set to **True** and the AlertFile parameter is set to the directory containing log files, then, the descriptors of this test will be displayed in the format: *Configured_ directory_path:<SearchPattern>.* For instance, if the AlertFile parameter is set to *c:\eGurkha\logs*, and RotatingFile is set to **True**, then, your descriptor will be: *c:\eGurkha\logs:<SearchPattern>*. On the other hand, if the RotatingFile parameter

Parameter	Description
	had been set to **False**, then the descriptors will be of the following format: *Configured_directory:<SearchPattern>* - i.e., *logs:<SearchPattern>* in the case of the example above.
	If this flag is set to **True** and the alertfile parameter is set to a specific file pattern, then, the descriptors of this test will be of the following format: *<FilePattern>:<SearchPattern>*. For instance, if the AlertFile parameter is set to *c:\eGurkha\logs*sys**, and RotatingFile is set to **True**, then, your descriptor will be: sys:<SearchPattern>. In this case, the descriptor format will not change even if the RotatingFile flag status is changed.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.
DD Frequency	Refers to the frequency with which detailed diagnosis measures are to be generated for this test. The default is *1:1*. This indicates that, by default, detailed measures will be generated every time this test runs, and also every time the test detects a problem. You can modify this frequency, if you so desire. Also, if you intend to disable the detailed diagnosis capability for this test, you can do so by specifying *none* against DD frequency.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.
	The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:
	• The eG manager license should allow the detailed diagnosis capability
	• Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Number of messages	Indicates the number of messages of the	Number	The value of this measure is a clear indicator of the number of "new" alerts

Measurement	Description	Measurement Unit	Interpretation
	configured patterns that were added to the SAP ABAP instance logs when the test was last executed.		that have come into the monitored logs.

3.6.9 Syslog errors Test

The SysLog aka "System Logging" is a text file where selected events and problems within a SAP ABAP instance are generally logged.

This test monitors the syslog file and for each event type logged into the file, this test reports the numerical statistics of the total number of messages logged, the messages that were entered due to transaction problems, application server and memory related issues. In addition, this test reports the error messages and the warnings that were entered. This way, administrators may identify the event type that is more error prone and take remedial measures to rectify the same before any severe issue crops up!.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every SAP ABAP instance being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and

Parameter	Description
	assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.
CustomPatterns	Specify a comma separated list of custom patterns for which this test should report metrics for. You can specify the patterns in the *PatternName:Patternstring* format. However, the PatternName is optional. If the PatternName is specified, then this

Parameter	Description
	PatternName is displayed as the descriptor of this test in the eG monitor interface. If the PatternName is not specified, then the PatternString alone is specified as the descriptor of this test. By default, *none* will be displayed against this parameter.
ShowAlertsOnly	By default, this test monitors all the syslog messages logged in the syslog file. If you wish to monitor only those syslog messages for which alerts were generated in the SAP ABAP server instance, then set this flag to **Yes**.
SeverityCutoff	By default, each syslog message is mapped to a severity value. Specify a severity value against this text box beyond which all syslog messages are included in the scope of monitoring. By default, the value of this parameter is 49.
DD Frequency	Refers to the frequency with which detailed diagnosis measures are to be generated for this test. The default is *1:1*. This indicates that, by default, detailed measures will be generated every time this test runs, and also every time the test detects a problem. You can modify this frequency, if you so desire. Also, if you intend to disable the detailed diagnosis capability for this test, you can do so by specifying *none* against DD Frequency.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.
	The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:
	• The eG manager license should allow the detailed diagnosis capability
	• Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Transaction problems	Indicates the number of messages of this type entered in the syslog file with transaction problems during the last	Number	Transaction problems indicate problems while invoking transaction codes. The detailed diagnosis of this measure if enabled, lists the details such as the

Measurement	Description	Measurement Unit	Interpretation
	measurement period.		user executing the Tcode, the client, the terminal logged in by the user, program that is currently executing, timestamp of the problem message, severity and alert message and the actual problem message.
Warnings	Indicates the number of warning messages of this type that were entered in the syslog file during the last measurement period.	Number	The detailed diagnosis of this measure if enabled, lists the details such as the user executing the Tcode, the client, the terminal logged in by the user, program that is currently executing, timestamp of the problem message, severity and alert message and the actual problem message.
Dumps messages	Indicates the number of dump messages of this type that were entered in the syslog file during the last measurement period.	Number	The detailed diagnosis of this measure if enabled, lists the details such as the user executing the Tcode, the client, the terminal logged in by the user, program that is currently executing, timestamp of the problem message, severity and alert message and the actual problem message.
AS problems	Indicates the number of application server problem messages of this type that were entered in the syslog file during the last measurement period.	Number	Use these messages to trace problems that occurred when the application server was operated. The detailed diagnosis of this measure if enabled, lists the details such as the user executing the Tcode, the client, the terminal logged in by the user, program that is currently executing, timestamp of the problem message, severity and alert message and the actual problem message.
Memory messages	Indicates the total number of memory related messages of this type that were entered in the syslog	Number	Use these messages to identify memory related issues with the SAP ABAP instance. The detailed diagnosis of this measure

Measurement	Description	Measurement Unit	Interpretation
	file during the last measurement period.		if enabled, lists the details such as the user executing the Tcode, the client, the terminal logged in by the user, program that is currently executing, timestamp of the problem message, severity and alert message and the actual problem message.
Error messages	Indicates the error messages of this type that were entered in the syslog file during the last measurement period.	Number	The detailed diagnosis of this measure if enabled, lists the name of the user executing the Tcode, the client, the terminal logged in by the user, Program that is currently executing, Timestamp, severity and alert message and the actual problem message.
Total issues	Indicates the total number of messages of this type available in the syslog file during the last measurement period.	Number	This measure is a good indicator of the issues occurring on the SAP instance. The value of this measure is cumulative of the Transaction problems, Warnings, Dumps messages, AS problems, Memory messages and Error messages measures.

3.6.10 TemSe Test

TemSe is the SAP store location for temporary sequential data. When the Temse area grows rapidly, it becomes tedious for the administrators to locate what exactly caused the growth of the Temse area and which Temse object contributed to this abnormal growth? Use the **Temse** test to figure out the answers to such questions.

This test reports the rate at which each Temse object was created due to spool requests, background jobs and activity in the HR module. In addition, this test reports how well the data is copied to the Temse object. This way, administrators may figure out the Temse object that occupied more space and the Temse object that was created the most.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for each Temse object of the SAP ABAP instance being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	This is set to *none* by default. This implies that the eG agent automatically discovers

Parameter	Description
	the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Total TemSe creation rate	Indicates the rate at which this Temse object was created during the last measurement period.	Parts/sec	This measure is a good indicator of the rate at which the Temse data has grown. If the value of this measure is high, administrators can consider reorganizing/provisioning the TemSe data accordingly.
TemSe creation rate for spool requests	Indicates the rate at which this Temse object was created due to spool requests during the last measurement period.	Parts/sec	This measure is a good indicator of the growth in the Temse area due to spool/printing requests.
TemSe creation rate for jobs	Indicates the rate at which this Temse object was created due to background jobs during the last measurement period.	Parts/sec	
HR TemSe creation	Indicates the rate at	Parts/sec	

Measurement	Description	Measurement Unit	Interpretation
rate	which this Temse object was created during the last measurement period due to the activity in the HR module of the SAP ABAP instance.		
TemSe data rate	Indicates the rate at which data was copied to the Temse area of this Temse object during the last measurement period.	MB/sec	This measure can also be used for provisioning/reorganization of the TemSe space and also helps in detecting TemSe issues created due to causes like huge spool requests, overutilization by background jobs etc.,

3.6.11 CTS Monitor Test

Change and Transport System (CTS) is the tool provided by SAP for the creation, documentation and distribution of changes within a system landscape.

Using this test, administrators may figure out the number of requests that were created, how many of those requests were successful and how many succeeded with errors. In addition, you may figure out how many transport requests were partially successful and how many requests encountered critical errors. This way, administrators may figure out how well the transport requests were processed and the exact cause behind the error prone requests.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every SAP ABAP instance being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP

Parameter	Description
	ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses SAPJCO to collect measures**. An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses SAPJCO to collect measures**. If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses SAPJCO to collect measures**. This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify

Parameter	Description
	the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
DD Frequency	Refers to the frequency with which detailed diagnosis measures are to be generated for this test. The default is *1:1*. This indicates that, by default, detailed measures will be generated every time this test runs, and also every time the test detects a problem. You can modify this frequency, if you so desire. Also, if you intend to disable the detailed diagnosis capability for this test, you can do so by specifying *none* against DD Frequency.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option. The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled: • The eG manager license should allow the detailed diagnosis capability • Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Total exports	Indicates the total number of requests that were created during the last measurement period.	Number	
Successful exports	Indicates the number of transport requests that were successful during the last measurement period.	Number	The TPALOG return code for these requests is 0000.
Succeeded with warnings	Indicates the number of transport requests that succeeded with warnings	Number	The TPALOG return code for these requests is 0004. Warnings could be innocuous as in regular warnings

Measurement	Description	Measurement Unit	Interpretation
	during the last measurement period.		issued when the transport request involves object deletion. Nevertheless, these warnings need to be checked.
Partial successes	Indicates the number of transport requests that were partially successful during the last measurement period.	Parts/sec	The TPALOG return code for these requests is 0008. These errors need to be analyzed and corrected. Examples of such errors include original/repaired objects not being overwritten. Detailed diagnosis for this measure provides details of these requests such as : Request timestamp, Request number, target system, source client, transport step, project number, transport user and transport admin.
Percentage of partial successes	Indicates the percentage of transport requests that were partially successful during the last measurement period.	Percent	The TPALOG return code for these requests is 0008. Typically these errors arise due to transport request configuration as opposed to a transport system error.
Critical errors	Indicates the number of transport requests with critical errors during the last measurement period.	Number	The TPALOG return code for these requests is 0012 or higher. These errors usually arise due to some serious error in the transport system and hence tend to impact a majority of the transport requests. The detailed diagnosis of this measure if enabled lists the details of these requests such as Request timestamp, Request number, target system, source client, transport step, project number, transport user and transport admin.
Percentage of critical errors	Indicates the percentage of transport requests with critical errors during the last measurement period.	Percent	The TPALOG return code for these requests is 0012 or higher. These errors tend to correspond to the overall availability of the transport system.

3.6.12 New SAP Alerts Test

Every SAP solution is bundled with a monitoring architecture, and alerts form a central element of this architecture. They quickly and reliably report errors – such as values exceeding or falling below a particular threshold value or that a SAP component has been inactive for a defined period of time. These alerts are displayed in the **Alert Monitor** - this is a central tool that facilitates efficient administration and monitoring of distributed SAP solutions.

An alert is uniquely assigned to one monitoring tree element (MTE) in the **Alert Monitor**. A set of monitoring tree elements (MTEs) that are arranged in a hierarchical structure becomes a **Monitor**. These **Monitors** can be grouped to form a **Monitor Set**.

The alerts contain a status indicator with a color and a numerical value. Yellow means a warning, red means a problem, green means normal, and the numerical value shows the severity of the reported error.

Using APIs provided by SAP, this test pulls out useful statistics related to SAP ABAP alerts from the **AlertMonitor**. Besides reporting the total number of alerts generated on every **Monitor** that is configured, the test also reveals the number of alerts in various states (red, yellow, green, etc.). You can even optionally generate detailed measures to view additional alert information such as the alert description and its severity. This way, the eG monitoring console serves as a single, central platform that displays the details of the open and completed alerts related to a monitored SAP ABAP instance.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every configured Monitor.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.

Parameter	Description
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses SAPJCO to collect measures.** An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses SAPJCO to collect measures.** If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses SAPJCO to collect measures.** This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example,

Parameter	Description
	this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
Sets	Provide a comma-separated list of monitor sets for which performance attributes are to be monitored. For example: *SAP CCMS Monitor Templates,Monitor Collection for Certification*
Monitors	Provide a comma-separated list of monitors under the configured monitor Sets for which performance attributes are to be monitored. While specifying the list of Monitors, make sure that you specify them in the same order as that of your monitor sets specification. For instance, the first monitor in your Monitors list should belong to the first monitor set in your Sets specification, and so on. This implies that if your Sets specification reads as follows - SAP CCMS Monitor Templates,Monitor Collection for Certification- then the first monitor in your Monitors specification should belong to the SAP CCMS Monitor Templates set and the second monitor should belong to the Monitor Collection for Certification set. In this case, your Monitors specification may read as follows: *Dialog Overview,Test Monitor Syslog*.
	If you want to include more than one monitor from a particular monitor set in your Monitors specification, then make sure that you repeat that monitor set's name as many times in your sets specification.
	While configuring the Sets and Monitors, you may want to know the exact names of the monitors and monitor sets that form part of your specification. To determine this, follow the procedure discussed in Page Section .
XMI Audit Level	The XMI interface is a general framework for the CCMS external system management interfaces. This interface contains essential function modules and structures that coordinate connections between external system management tools and individual CCMS interfaces, and writes messages in the SAP ABAP XMI log on behalf of the external tool. The XMI log is a table containing English message texts. The messages can have various degrees of detail. The audit level determines the degree of detail to which messages in the XMI log are written - i.e., whether the message should always be logged, or is simply a message which supplies further detail (higher detail degree). The XMI log contains messages from external tools and also messages which arise in SMAPI functions. To indicate to the test the degree of detail to which messages from the eG agent are to be written in the XMI log, you need to specify the XMI Audit Level. By default, this parameter is set to *0*, which indicates that all calls that modify the database are to be logged. The other values this parameter can take and their implications are discussed below:

- 1: Logs all calls that modify the database and error messages

Parameter	Description
	• 2: Logs all calls that read from the database, modify the database, and error messages
	• 3: Logs all calls and all messages (full trace)
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.
	The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:
	• The eG manager license should allow the detailed diagnosis capability
	• Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Total number of alerts	Indicates the total number of alerts that have occurred for this monitor since the last measurement period.	Number	The detailed diagnosis of this measure, if enabled, provides the complete details of all the alerts associated with the corresponding monitor. The details include: Date, Time, System, Context, Object Name, Short Name, Status, Importance and Alert Text. Alternatively, you can navigate to the Components -> SAP -> Alerts to selectively view the alerts related to specific monitor sets or monitors, alerts of a specific status, or alerts generated during a given period.
Number of red alerts	Indicates the number of errors or critical status messages that have	Number	To view the alerts and rectify them instantly, you can navigate to the Components -> SAP -> Alerts page in

Measurement	Description	Measurement Unit	Interpretation
	occurred for this monitor since the last measurement period.		the eG monitoring console.
Number of yellow alerts	Indicates the number of warning alerts that have occurred for this monitor since the last measurement period.	Number	To view the alerts and rectify them instantly, you can navigate to the Components -> SAP -> Alerts page in the eG monitoring console.
Number of green alerts	Indicates the number of events or components that were running normally since the last measurement period.	Number	It is also possible to generate messages for green "alerts" and react to them correspondingly. Green alerts of this type do not indicate error situations, but are intended as all-clears or explicit messages that an action was successful. You can activate green alerts in the Alert Monitor for performance attributes and status attributes. Behavior in the case of performance attributes is as follows: • A green alert is generated if the current status is yellow or red and the next report sets the current status to green. • No green alert is generated if the current status is already green.
Number of active alerts	Indicates the number of alerts that are active since the last measurement period.	Number	An abnormally high value could indicate that the SAP ABAP component is problem-prone. You may want to navigate to the Components -> SAP -> Alerts page in the eG monitoring console to take a closer look at the active alerts, and decide on a course of action.
Number of completed	Indicates the number of	Number	To zoom into the completed alerts, you

Measurement	Description	Measurement Unit	Interpretation
alerts	alerts that were rectified manually since the last measurement period.		can navigate to the Components -> SAP -> Alerts page in the eG monitoring console.
Number of autocompleted alerts	Indicates the number of alerts that were rectified automatically by this SAP ABAP system since the last measurement period.	Number	To zoom into the auto-completed alerts, you can navigate to the Components -> SAP -> Alerts page in the eG monitoring console.

The detailed diagnosis of the *Total number of alerts* measure provides the complete details of the alerts generated on a configured monitor. The details include: Date, Time, System, Context, Object Name, Short Name, Status, Importance and Alert Text.

Figure 3.11: The detailed diagnosis of the Total number of alerts measure

3.6.13 Performance Attributes for Monitors Test

A monitoring object represents a component of the IT environment that is to be monitored, such as the CPU of a server, the dialog system, or background processing. Monitoring attributes are values, statuses, or texts that are reported to this object, such as the CPU utilization, or the average response time in the dialog system. A monitoring attribute can be assigned an alert. The selection of

the monitoring objects is performed using the data suppliers that exist for all areas of system management.

Monitoring objects and their attributes are displayed in the alert monitoring tree as individual nodes in a hierarchical tree. If the data reported to the monitoring architecture exceeds or falls below the defined alert threshold values, an alert is triggered in the corresponding monitoring tree element.

There are five different types of monitoring attributes:

- Performance attribute

- Status attribute

- Heartbeat attribute

- Log attribute

- Text attribute

The Performance attribute collects and averages performance values that have been reported to the monitoring architecture. If these values violate the set threshold values, an alert is generated.

To know the count of performance attributes associated with specific monitors, and to instantly isolate attributes on which alerts were generated, use the **Performance Attributes in Monitors** test.

This test is disabled by default. To enable the test, go to the **ENABLE / DISABLE TESTS** page using the menu sequence : Agents -> Tests -> Enable/Disable, pick *SAP ABAP* the desired **Component type**, set *Performance* as the **Test type**, choose the test from the **DISABLED TESTS** list, and click on the **<** button to move the test to the **ENABLED TESTS** list. Finally, click the **Update** button.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every configured Monitor.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed.
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.

Parameter	Description
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses SAPJCO to collect measures.** An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses SAPJCO to collect measures.** If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses SAPJCO to collect measures.** This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics,

Parameter	Description
	you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
Sets	Provide a comma-separated list of monitor sets for which performance attributes are to be monitored. For example: *SAP CCMS Monitor Templates,Monitor Collection for Certification*
Monitors	Provide a comma-separated list of monitors under the configured monitor Sets for which performance attributes are to be monitored. While specifying the list of Monitors, make sure that you specify them in the same order as that of your monitor sets specification. For instance, the first monitor in your Monitors list should belong to the first monitor set in your Sets specification, and so on. This implies that if your Sets specification reads as follows - SAP CCMS Monitor Templates,Monitor Collection for Certification- then the first monitor in your Monitors specification should belong to the SAP CCMS Monitor Templates set and the second monitor should belong to the Monitor Collection for Certification set. In this case, your Monitors specification may read as follows: *Dialog Overview,Test Monitor Syslog*.

If you want to include more than one monitor from a particular monitor set in your Monitors specification, then make sure that you repeat that monitor set's name as many times in your sets specification.

While configuring the Sets and Monitors, you may want to know the exact names of the monitors and monitor sets that form part of your specification. To determine this, follow the procedure discussed in Page Section . |
| XMI Audit Level | The XMI interface is a general framework for the CCMS external system management interfaces. This interface contains essential function modules and structures that coordinate connections between external system management tools and individual CCMS interfaces, and writes messages in the SAP ABAP XMI log on behalf of the external tool. The XMI log is a table containing English message texts. The messages can have various degrees of detail. The audit level determines the degree of detail to which messages in the XMI log are written - i.e., whether the message should always be logged, or is simply a message which supplies further detail (higher detail degree). The XMI log contains messages from external tools and also messages which arise in SMAPI functions. To indicate to the test the degree of detail to which messages from the eG agent are to be written in the XMI log, you need to specify the XMI Audit Level. By default, this parameter is set to *0*, which indicates that all calls that modify the database are to be logged. The other values this parameter can take and their |

Parameter	Description
	implications are discussed below:
	• 1: Logs all calls that modify the database and error messages
	• 2: Logs all calls that read from the database, modify the database, and error messages
	• 3: Logs all calls and all messages (full trace)
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.
	The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:
	• The eG manager license should allow the detailed diagnosis capability
	• Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Total number of performance attributes	Indicates the total number of Performance attributes available for this monitor.	Number	A monitoring tree depicts the hierarchy of monitoring objects within a monitor and the various attributes exposed by the monitoring objects. The monitoring tree depicted by the detailed diagnosis page of this measure shows only the Performance attributes within the monitoring objects. Within the tree, the Performance attributes are indicated in a tabular format. The table contains an entry for each Performance attribute exposed by the monitoring object with details such as the Attribute Name, Current Value of the attribute (with

Measurement	Description	Measurement Unit	Interpretation
			units), Importance and the actual Timestamp of the Current Value shown. The Importance value is a combination of the status and severity of the most significant active alert associated with this Performance attribute. The Status of this performance attribute is represented using the unique color code as mentioned above. The severity of a given status is indicated by a number between 0 and 255, with higher severity values being more important than the lower ones.

The monitoring tree is identical to the alert monitoring tree in SAP CCMS Alert Monitor and its individual nodes can be expanded and contracted. |
Number of red performance attributes	Indicates the number of errors or critical status messages that have been issued for this monitor.	Number	A high value for this measure indicates that too many performance attributes of a given monitor have encountered critical errors. To view these performance attributes, use the Alerts page that appears when the Components -> SAP -> Alerts menu sequence is followed in the eG monitoring console.
Number of yellow performance attributes	Indicates the number of warning messages that have been issued for this monitor.	Number	A high value for this measure indicates that too many performance attributes of a given monitor have encountered warnings. To view these performance attributes, use the Alerts page that appears when the Components -> SAP -> Alerts menu sequence is followed in the eG monitoring console.
Number of green performance attributes	Indicates the number of successful events for this monitor.	Number	

Measurement	Description	Measurement Unit	Interpretation
Number of inactive performance attributes	Indicates the number of Performance attributes for this monitor that currently do not have any data.	Number	

The monitoring tree depicted by the detailed diagnosis page of the *Total number of performance attributes* measure shows only the Performance attributes within the monitoring objects. Within the tree, the Performance attributes are indicated in a tabular format. The table contains an entry for each Performance attribute exposed by the monitoring object with details such as the Attribute Name, Current Value of the attribute (with units), Importance and the actual Timestamp of the Current Value shown. The Importance value is a combination of the status and severity of the most significant active alert associated with this Performance attribute. The Status of this performance attribute is represented using the unique color code as mentioned above. The severity of a given status is indicated by a number between 0 and 255, with higher severity values being more important than the lower ones.

Figure 3.12: The detailed diagnosis of the Total number of performance attributes measure

While configuring the **MONITOR DETAILS**, you may want to know the exact names of the monitors and monitor sets that form part of your specification. To determine this, do the following:

1. Open the **SAP Logon** tool using the Start -> Programs -> SAP Front End -> SAP Logon menu sequence.

2. Pick a system from Figure 3.13 that appears, and click on the **Logon** button therein to connect to the chosen system.
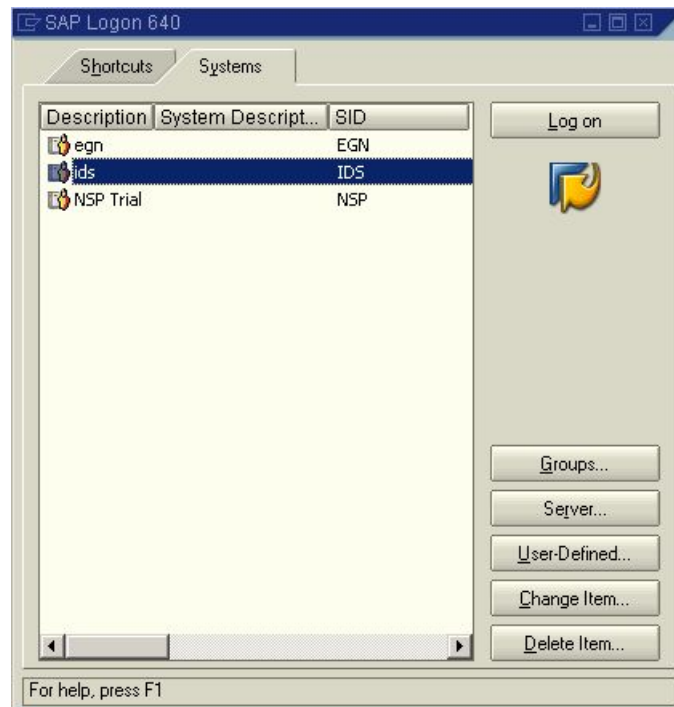
Figure 3.13: Selecting a system to login to

3. Then, login to the chosen system by providing the required **Client**, **User**, and **Password** credentials. Once the **Password** is provided, press the **Enter** key on your keyboard to login (see Figure 3.14).
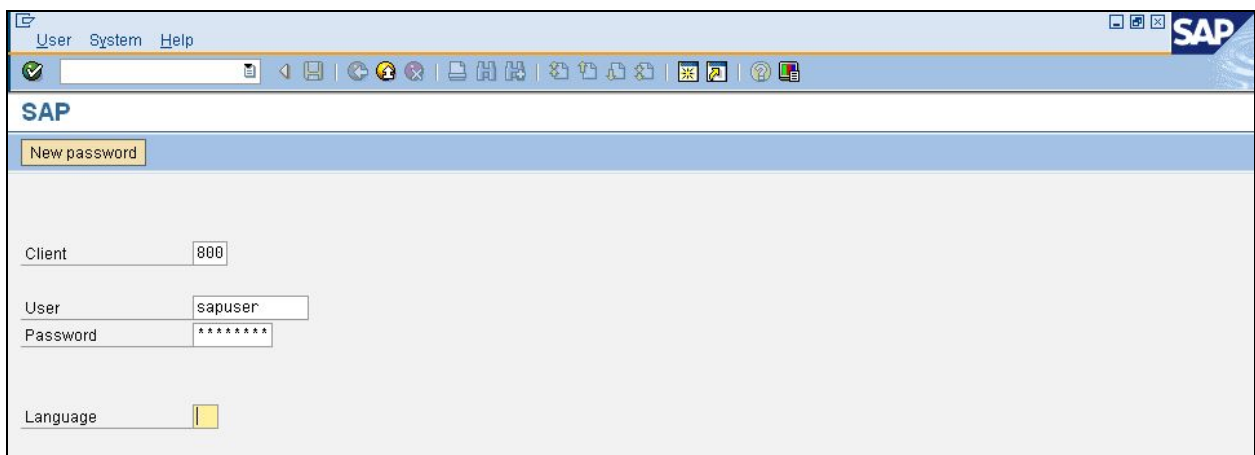
Figure 3.14: Logging into the chosen system

4. Upon logging in successfully, the **SAP Easy Access** interface will appear (see Figure 3.15). In the tree-structure in the left panel of the interface, follow the node sequence, SAP Menu -> Tools -> CCMS -> Control/Monitoring. Then, double-click on the **RZ20-CCMS Monitor Sets** sub-node under the Control/Monitoring node.
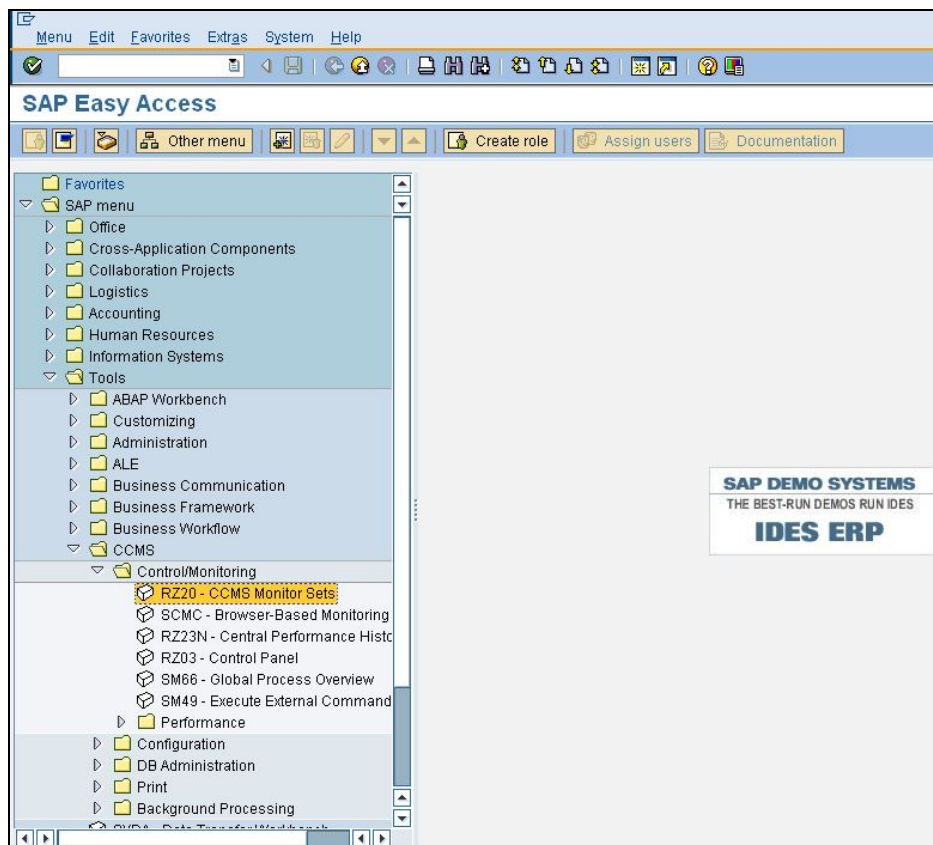
Figure 3.15: Double-clicking on the CCMS Monitor Sets sub-node

5. This will invoke Figure 3.16, where the complete list of monitor sets will be displayed. Expand a monitor set to view the monitors within. Use these details to configure the *monitor set:monitors* in the **MONITOR DETAILS** text box.
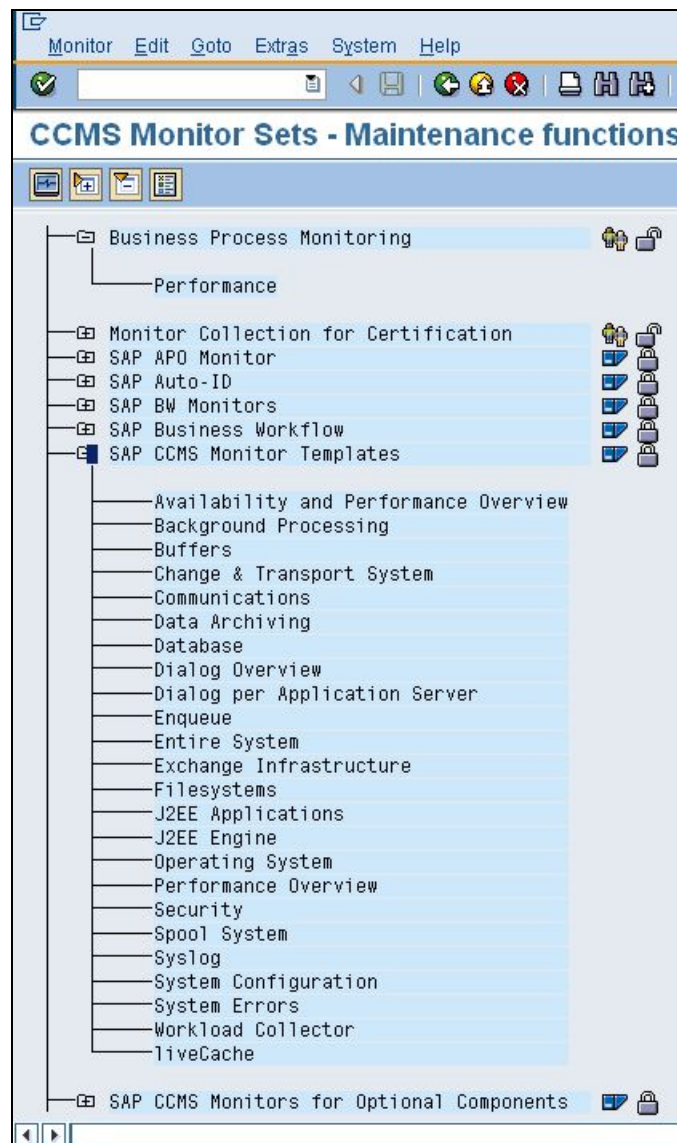
Figure 3.16: Viewing the monitor sets and monitors

3.7 The SAP Users Layer

The tests mapped to this layer monitor the user activity on the SAP ABAP system, pinpoint users whose logon experience with the system is poor, and lead administrators to the probable cause of the slow login.
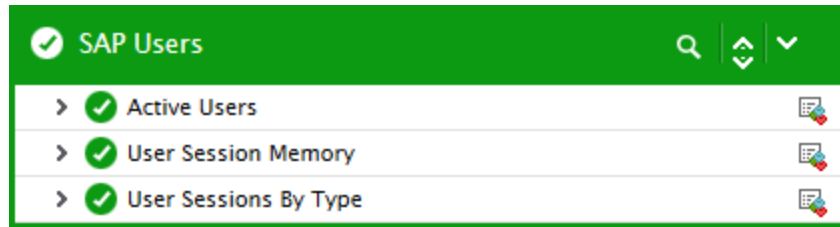
Figure 3.17: The tests mapped to the SAP Users layer

3.7.1 Active UsersTest

When a user complains that the SAP ABAP system is taking too long to process his/her requests, administrators may want to closely observe the interactions between that user and the SAP system, identify processing bottlenecks (if any), and accurately determine where the bottleneck has occurred. The **Active Users** test enables administrators effectively and efficiently perform this user experience analysis! This test monitors the transactions of every user to the SAP ABAP system and reports the following:

- Which user is executing resource-intensive transactions on the ABAP system?

- Which user is overloading the system?

- Which user is experiencing slowness when running transactions on the system? Where did this delay occur? – in the dispatcher queue? when loading/generating objects? when rolling-in/rolling out user contexts? in the database? when performing enqueue operations? or when waiting for RFC calls to complete?

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every user who is currently logged into the SAP ABAP system.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP

Parameter	Description
	ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.

Parameter	Description
Maximum Steps	To report workload metrics, the eG agent will have to typically analyze numerous dialog steps of activity on the SAP ABAP system. To reduce the stress on the eG agent, you can limit the number of dialog steps the eG agent needs to process in order to make a fair assessment of the workload and the processing ability of the ABAP system. This limit can be specified against maximum steps. By default, this limit is set to 5000.
Include Users	By default, this test monitors only those users who are currently logged into the SAP ABAP system. This is why, this parameter is set to *none* by default. If you want a few specific users to be monitored regardless of whether they are logged in or not, specify the names of those users as a comma-separated list against this parameter. If this is done, then such users alone will be monitored irrespective of their login status, while all other users will be monitored only if they are currently logged in.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.
	The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:
	• The eG manager license should allow the detailed diagnosis capability
	• Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Activity	Indicates the rate of steps executed for this user's transactions in the last measurement period.	Steps/Sec	This is a good indicator of the workload imposed by a user on the SAP ABAP instance. You can compare the value of this measure across users to know which transaction is generating the maximum load.

Measurement	Description	Measurement Unit	Interpretation
CPU utilization	Indicates the percentage of CPU resources utilized by this user's transactions.	Percent	Compare the value of this measure across users to know which user is using the maximum CPU and is probably causing a CPU contention on the system. You may then want to observe how this user has been using CPU over time and figure out whether the CPU usage of that user remains consistently high; if so, it could mean that that transactions executed by that user require more processing power to execute. You may then want to consider resizing the SAP ABAP system with more CPU resources.
Total memory	Indicates the total memory used by the transactions of this user during the last measurement period.	MB	This measure is the sum total of the roll memory, extended memory, and heap memory used by a process. By comparing the value of this measure across users, you can accurately identify that user who is consuming the maximum memory. If the memory usage of this user has been abnormally high consistently, it could indicate that the user is typically running memory-intensive transactions and requires more memory resources for proper execution. You should then figure out how much memory and of what type should be allocated to the task. For this, you may want to determine which memory type was being used the highest over time – is it heap memory? Roll memory? Or extended memory. The values of the PRIV mode heap memory and the Extended memory metrics will

Measurement	Description	Measurement Unit	Interpretation
			help administrators figure this out. You can also use the detailed diagnosis of this measure to identify the top 3 memory-consuming steps of a particular transaction.
PRIV mode heap memory	Indicates the maximum PRIV mode heap memory consumed by transactions of this user in the last measure period.	MB	SAP's memory management system assigns memory to a work process. The order in which a work process is assigned the memory type depends on the work process type, either dialog or non-dialog), and the underlying operating system. Some of the memory types are as follows: • **Roll area**: The roll area memory is used for the initial memory assigned to a user context, and (if available) for additional memory if the expanded memory is full. The roll area consists of 2 segments. The first segment is assigned to the work process first as memory. If this is used up, the work process has more memory assigned to it. • **Extended memory**: Each ABAP work process has a part reserved in its virtual address space for extended memory. The majority of the user context is stored in the extended memory. You can map the extended memory from the common resource onto any

Measurement	Description	Measurement Unit	Interpretation
			work process, and after onto another process on the same address in the virtual address space. This is important if you work with pointers in the ABAP program. The value of the *Extended memory* measure indicates how each user is using this memory type. • **Private memory**: If a dialog work process has used up the roll area assigned to it and the extended memory, private memory is assigned to the work process. The work process goes into PRIV mode (private). Other processes cannot use private (heap) memory. After releasing the assigned memory, the operating system still considers the (virtual) memory as being occupied by the allocating process. A consistent increase in the value of the PRIV mode heap memory measure for a user therefore indicates that transactions of that user are continuously using up all the roll area and extended memory, and are being forced to reach out to the private memory. This could mean that the user transactions are memory-intensive. If too many

Measurement	Description	Measurement Unit	Interpretation
			transactions are found to be using PRIV heap memory, it could mean that the work processes are sized with insufficient roll area and extended memory. You may hence want to allocate more roll area and extended memory to make sure that private memory usage is minimal.
Extended memory	Indicates the maximum extended memory used by transactions of this user in the last measure period.	MB	
Work process restarts	Indicates the number of work process restarts caused by transactions of this user in the last measure period.	Number	One of the common reasons for work process restarts is excessive usage of private memory. The work process, if it has used a lot of private memory, is restarted when the user context is terminated and the local memory is returned. The restart makes the local memory available again for other processes. Regardless of what caused it, work process restarts are performance-impacting and need to be kept at a minimum.
Maximum response time of a step	Indicates the maximum response time of the transaction steps of this user in the last measurement period.	Secs	An SAP transaction normally extends over several transaction steps. During these steps, data such as variables, internal tables, and screen lists are built up and stored in the main memory of the application server. This measure compares the response time of all the transactions executed by a user in the last measurement period and reports the highest response time.

Measurement	Description	Measurement Unit	Interpretation
			Use the detailed diagnosis of this measure to identify the top 3 transactions executed by this user with highest response times. This leads you to the probable cause for delay in the execution of this transaction in the last five minutes. Apart from the response time break up, the report and CUA programs that were running are also shown as part of detailed diagnosis.
Total response time	Indicates the total response time per transaction of this user within the last measure period.	Seconds/transaction	This measure includes the response time taken at the server and the round trip times. Ideally, the value of this measure should be low. High values are indicative of poor responsiveness. Compare the value of this measure across users to identify the user who is experiencing the maximum slowness. To know the reason for the delay, you can compare the value of the GUI time, GUI Net time, Server response time, Processing time, Dispatcher wait time, Load and generation time, Roll time, Database request time, Lock time, and RFC time measures for that transaction. This will accurately pinpoint where the user transactions spent maximum time – in the dispatcher queue? at the server end? in processing? when loading objects? when rolling in user contexts? when performing database operations? when performing enqueue operations? Or in waiting for RFC calls?

Measurement	Description	Measurement Unit	Interpretation
			You can also use the detailed diagnosis of this measure to view the details of the top 3 transaction invocations that were least responsive.
Average step response time	Indicates the average response time of a transaction step executed by this user in the last measurement period.	Seconds/Step	This measure is used by the BASIS administrators for comparing the response time across all the transaction steps executed by this user to determine which step is taking longer duration for execution.
GUI time	Indicates the average time taken for round trip communication steps between client and server in between a transaction of this user.	Seconds/transaction	If the values of these measures are excessive, check that the hardware requirements for the presentation server are met and that the network between the application servers and the presentation servers is not experiencing shortages or slow traffic.
GUI Net time	Indicates the average front end net time taken for the first and last steps of transactions of this user.	Seconds/transaction	
Server response time	Indicates the average response time of a transaction of this user at the server end.	Seconds/transaction	In the event of a processing slowdown, you can compare the value of this measure with other response time measures reported by this test to understand where the processing bottleneck lies.
Processing time	Indicates the average time taken to process a transaction of this user.	Seconds/transaction	A high value for this measure may indicate that ABAP programs are very complex and the work processes spend a large amount of time interpreting what is to be done. The processing time of transactions executed by the dialog work process for instance should be below twice the CPU time.

Measurement	Description	Measurement Unit	Interpretation
Dispatcher wait time	Indicates the average time that the transactions of this user spent waiting for a free work process at the dispatcher.	Seconds/transaction	When the dispatcher receives a processing request, it looks for a free SAP work process of the required type and then sends the request to this work process, which begins the work. If all SAP work processes of the required type are busy when the request initially reaches the dispatcher, the request is placed in the dispatcher queue. In the dispatcher queue, the request waits until a work process of the required type is free. As soon as a work process is free, the dispatcher sends the request to it. This time the request spends in the dispatcher queue is indicated as the dispatcher wait time.

For the transactions of the dialog work process for instance, the value of this measure should be less than 10% of the value of the Total response time measure. Higher values are indicative of performance problems. One common cause of such performance problems may be insufficient work processes. |
| Load and generation time | Indicates the average time spent for a transaction of this user for loading and generation. | Seconds/transaction | All ABAP programs and screens that are required but not yet available in the application server buffers must be loaded or generated. The time it takes to do this is indicated as load and generation time. Loading a program also entails accessing database tables that store the ABAP programs. |

Measurement	Description	Measurement Unit	Interpretation
			Typically, for the transactions of the dialog work process, the load time per step should not be greater than 50 ms.
			High values could indicate problems with memory configuration, small buffer sizes, wrong parameter settings or a CPU bottleneck.
Roll time	Indicates the average time spent by a transaction of this user for rolling in user contexts and when waiting for roll out.	Secs	AN SAP transaction normally extends over several transaction steps. During these steps, data such as variables, internal tables, and screen lists are built up and stored in the main memory of the application server. This data is known as user context. Different transaction steps are normally processed by different dialog work processes. At the beginning of a transaction step, the user context is made available to the appropriate work process. This procedure is called roll-in. Roll-out on the other hand saves the current user-context data to virtual memory at the conclusion of a transaction step. The time a transaction step waited in the roll-area is called roll wait time.
			The value of this measure is the sum total of roll-in time and roll wait time.
			A high value for this measure indicates that the user transaction is either taking too long to roll in user contexts or is waiting too long in the roll-area for a roll-out to occur.

Measurement	Description	Measurement Unit	Interpretation
			Since a user context is moved out of the local memory of a work process and moved into the roll buffer during the roll-in process, improperly sized roll buffers can cause slowdowns in this process. Lack of adequate space in the extended memory can also contribute to a slowdown when rolling in user contexts.
			Possible causes for high roll wait times may be due to having all work processes in the target system occupied. It is very important to configure the instances properly, especially when they are designed to handle RFC communication.
Database request time	Indicates the average time spent by transactions of this user for performing database operations such as selects, inserts, updates, deletes and commits.	Seconds/transaction	When data is read or changed in the database, the time required is known as Database request time. This time is measured from the moment the database request is sent to the database server and runs until the moment the data is returned to the application server.
			Ideally, for the transactions of the dialog work process, the value of this measure should be 40% of the total response time. Many factors can cause worrysome spikes in this value. This could be problems in the database such as expensive SQL statement or wrong parameter settings in the database level. In addition, issues in network connectivity between the application server and the database can also adversely impact this

Measurement	Description	Measurement Unit	Interpretation
			value. This is because, the Database request time not only includes the time required by the database to produce the requested data, but also the time required for network transfer of that data. In addition, I/O contentions experienced by the physical disks can also affect this time.
Lock time	Indicates the average time spent performing enqueue operations for a transaction of this user.	Seconds/Transaction	The enqueue service allows SAP ABAP applications to lock data so that only they can use it. Locking the data prevents parallel changes to the same data, which would lead to data inconsistency. The Lock time measure reports the time from sending an enqueue request to the SAP enqueue server to the receipt of the results. For the transactions of the dialog work process for example, the Lock time should be less than 5 ms. Any value higher than that would represent a problem that might affect system stability. Network problems can also increase the value of this measure.
RFC time	Indicates the average time spent waiting for RFC calls to get executed in a transaction of this user.	Seconds/Transaction	The value of this measure includes CPIC (Common Programming Interface Communication) time as well. CPIC is typically used by the SAP system for program-to-program communication. An increase in RFC time can increase roll wait time considerably. When synchronous RFCs are called, the work process

Measurement	Description	Measurement Unit	Interpretation
			executes a roll out and may have to wait for the end of the RFC in the roll area, even if the dialog step is not yet completed. In the roll area, RFC server programs can also wait for other RFCs sent to them. The time a transaction step waited in the roll-area is called roll wait time.
			The absence of adequate work processes can cause the RFC time and consequently, the roll wait time to increase. Besides ensuring that the SAP ABAP system is sized with sufficient work processes, you can also set the following parameters properly to better balance RFC load:
			• **rdisp/rfc_max_comm_entries**: This specifies the maximum number of communications in an instance. No more dialog work processes will be given to the program calling the target system after this number is reached.
			• **rdisp/rfc_min_wait_dia_wp**: This specifies the number of work processes to be always available for online users.
Invocations	Indicates the number of active transaction invocations that have been performed by this user in the last	Number	Using this measure, the load created by this user at the transaction invocation level can be determined.

Measurement	Description	Measurement Unit	Interpretation
	measurement period.		
New invocations	Indicates the number of new invocations that are made by this user in the last measurement period.	Number	This measure is useful for calculating number of transaction invocations that are newly made by a particular user in a specified time duration. Use detailed diagnosis of this measure to find out the exact invocation timestamp, program, terminal and other details for first transaction step of each new invocation.

3.7.2 User Sessions By Type Test

By tracking the user logins to the SAP ABAP system, administrators can understand how actively the system is being used and accordingly plan the capacity of the system. In addition, failed login attempts can also be isolated, thus turning the spotlight on unauthorized accesses and malicious attacks. This is why, eG Enterprise periodically executes the **User Sessions By Type** test. For every type of login, this test reports the number of users who are logged in, measures the activity levels of the users, and reports login failures. This way, the test indicates how well the ABAP system is being utilized, proactively reveals a consistent rise in user activity on the system, and pre-emptively points to dubious login attempts.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for every user login type - GUI, PLUGIN, SYSTEM and various RFC subtypes such as RFC client, RFC Internal, RFC Server, RFC to App Server, RFC to R/2. One set of summary measures for all types.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.

Parameter	Description
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses SAPJCO to collect measures**. An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses SAPJCO to collect measures**. This parameter appears only if the use sapcontrol flag is set to No – i.e., if the test uses SAPJCO to collect measures.If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull

Parameter	Description
	out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
CutoffMins	Specify the duration of inactivity of a user, beyond which that user will be considered as inactive. Such users will be automatically excluded from the Active users count and the value of the Percentage active users measure.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.
Include eG SAP User	By default, this flag is set to **No**. This means that the measures reported by this test will not, by default, consider the sessions launched by the eG agent on the SAP ABAP instance, as the configured SAPUser. If you want the test to consider these sessions too when reporting metrics, set this flag to **Yes**.
Show Logged in User DD	By default, this test collects detailed metrics for the Logged in users measure, where the complete details of all the currently logged in users will be provided. In SAP ABAP installations where numerous users are logged in most of the time, collecting detailed diagnostics for the Logged in users measure may strain the eG database. To avoid this, you may want to set this flag to **No** and turn off the detailed diagnosis capability of this measure.
DD Frequency	Refers to the frequency with which detailed diagnosis measures are to be generated for this test. The default is *1:1*. This indicates that, by default, detailed measures will be generated every time this test runs, and also every time the test detects a problem. You can modify this frequency, if you so desire. Also, if you intend to disable the detailed diagnosis capability for this test, you can do so by specifying *none* against DD Frequency.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.
	The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:

Parameter	Description
	• The eG manager license should allow the detailed diagnosis capability
	• Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Logged in users	Indicates the number of users of this type who are currently logged in.	Number	This is a good indicator of the current workload imposed on the SAP ABAP instance. You can compare the value of this measure across login types to know which type of login contributed to the maximum load. Use the detailed diagnosis of this measure to know which users of this type are currently logged in, when he/she logged in, the login duration, the status of each user, when last this user session was active, where he/she logged in from (i.e., the client terminal), and whether/not the user is active.
Active users	Indicates the number of users of this login type who created some activity in the instance during the last measure period.	Number	A high value of this measure is indicative of high level of user activity on the ABAP instance. In the event of an overload, you cn compare the value of this measure across login types to know which type of login is generating the maximum activity on the instance.
Percentage active users	Indicates the percentage of logged in users of this type who are currently active.	Percent	
New users	Indicates the number of users of this login type who logged in during the last measurement period.	Number	

Measurement	Description	Measurement Unit	Interpretation
Logouts	Indicates the number of users of this login type who have successfully logged out in the last measure period.	Number	The detailed diagnosis of this measure shows the activity summary of the logged out user such as name, hostname, login time, duration in minutes etc.
External sessions	Indicates the total number of external sessions created for this login type.	Number	When user logs on to SAP ABAP system, the system creates a new terminal session called external session. In general, each user can open up to six windows in a single SAP GUI session. Each of these windows corresponds to an external session on the application server with its own area of shared memory.
Internal sessions	Indicates the total number of internal sessions created for this login type.	Number	Internal sessions are automatically created by the ABAP system when navigating through transactions. Internal sessions are like navigation levels when performing system functions.. A maximum of 9 internal sessions can be created.

The internal session has a memory area that contains the ABAP program and its associated data. Internal sessions proportionately increase the memory consumption of its parent external session. High average number of internal sessions results in higher memory consumption for the same number of external sessions. |

3.7.3 Multiple User Logons Test

Whenever a user attempts to log on more than once to the SAP system (dialog logon attempt only), the system informs the user with a dialog box that he or she is already logged on. The user then has the following choices:

- He or she can continue with the current logon and end all other user sessions.

- If multiple logons are allowed, he or she can continue with the current logon and keep the other user sessions. (If multiple logons are not allowed, this option is not offered.)

- He or she can cancel the current logon attempt.

The user is informed of the consequences of his or her decision. If the user ends existing user sessions, data that has not been saved is lost. If the user continues with his or her current logon attempt without ending existing user sessions, then the system records his or her decision.

If the multiple dialog logon capability is not used wisely, it can adversely impact the performance of the SAP system. For instance, if a user logs in multiple times to the same SAP system at around the same time window for no palpable reason, you could have a situation where many sessions on the SAP system are idle, thereby unnecessarily increasing the load on the SAP system and wasting resources. Moreover, the risk of corruption and instability is also high in such cases, as SAP administrators cannot control nor track the changes effected during the simultaneous logins. If such adversities are to be averted, administrators need to be instantly alerted when an unusually large number of multiple dialog logon sessions are noticed on the SAP Netweaver application server. This is exactly what the **Multiple User Logons** test does!

The test promptly captures the count of users who are logged on multiple times to the target SAP system (dialog logon attempts only), reports the total session load that is imposed by these users on the SAP system, and notifies administrators if these counts are more than normal. Additionally, the test also reveals the count of sessions that are active on the SAP system, thus indicating how many sessions are inactive/idle. Detailed diagnostics provided by the test also help administrators accurately isolate the idle sessions and the users who launched those sessions. Administrators can then pull up those user sessions for scrutiny during an audit.

Target of the test : A SAP ABAP instance

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for the SAP ABAP instance being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed
Host	Host name of the server for which the test is to be configured.

Parameter	Description
PortNo	Enter the port to which the specified host listens.
ClientName	Specify the ID of the client system as what the eG agent will be connecting to the SAP ABAP instance. To know how to determine the client ID to use, follow the instructions provided in Section **2.1.3**.
SAPUser	Typically, to connect to a SAP ABAP instance and run tests, the eG agent requires the permissions of a SAP user who has been assigned the following authorization objects: *S_RFC, S_RFC_ADM, S_TABU_DIS, S_XMI_PROD, S_TOOLS_EX, S_RZL_ ADM*. Ideally, you will have to create a new user role on the SAP ABAP instance for this purpose, associate the above-mentioned authorization objects with that role, and assign the new role to an existing SAP user. The procedure for the same has been provided in Section **2.1.4**. Once the new role is assigned to a SAP user, specify the name of this user against SAPUser.
Password	The password of the specified SAPUser.
Confirm Password	Confirm the password by retyping it here.
SysNo	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses SAPJCO to collect measures**. An indicator of the TCP/IP port at which the SAP server listens. For example, for a server that listens at port 3200, the SysNo will be '00'. Similarly, if the SAP server port is 3201, the SysNo will have to be specified as '01'. Therefore, in the SysNo text box specify the system number of the SAP server with which the specified client communicates. To know the system number for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
Router	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses SAPJCO to collect measures**. If the SAP client with the specified ClientName exists in a network external to the SAP server, then a router will be used to enable the server-client communication. In such a case, specify the router string of the router in the Router text box. If both the client and the server exist in the same network, then specify '*none*' against the Router text box. To know what is the SAP Router string for the ABAP server being monitored, follow the procedure detailed in Section **2.1.2**.
InstanceName	**This parameter appears only if the Use SAPControl flag is set to No – i.e., if the test uses SAPJCO to collect measure**. This is set to *none* by default. This implies that the eG agent automatically discovers the instance name at run time.
Timeout	Indicate the duration (in seconds) for which this test should wait for a response from the SAP ABAP instance. By default, this is set to 120 seconds.
JCO Version	The eG agent uses the SAP JCO library to connect to the SAP ABAP system and pull

Parameter	Description
	out metrics. To enable the eG agent to make this connection and query the metrics, you need to specify the version of the SAP JCO library that the agent needs to use. For instance, to instruct the eG agent to use JCO v2.1.19, it would suffice if you specify the 'major version number' alone against JCO Version – in the case of this example, this will be 2.x. Note that if you have downloaded the SAP JCO CONNECTOR files for SAP JCO version 3 from the SAP market place (as instructed by Section **2.1.1**), then the JCO Version configuration should be 3.x.
IsPassive	If the value chosen is **Yes**, then the server under consideration is a passive server in a SAP ABAP INSTANCE cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable" by the agent if the server is not up.
CutoffMins	Specify the duration of inactivity of a user, beyond which that user will be considered as inactive. Such users will be automatically excluded from the Active users count and the value of the Percentage active users measure.
DD Frequency	Refers to the frequency with which detailed diagnosis measures are to be generated for this test. The default is *1:1*. This indicates that, by default, detailed measures will be generated every time this test runs, and also every time the test detects a problem. You can modify this frequency, if you so desire. Also, if you intend to disable the detailed diagnosis capability for this test, you can do so by specifying *none* against DD Frequency.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.
	The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:
	• The eG manager license should allow the detailed diagnosis capability
	• Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Multiple logon users	Indicates the number of users who are currently logged in to SAP ABAP multiple times.	Number	A high value could be a cause for concern. Under such circumstances, use the detailed diagnosis of this measure to figure out which users have multiple sessions open on the SAP ABAP instance currently, which client each user is connecting from, the total number of multiple dialog logon sessions launched by each user, and the number of such sessions that are currently active for each user. By comparing the active and total session counts for a user, you can understand whether/not too many sessions of that user are idle. Since idle/inactive sessions are a serious resource-drain, you may have to closely scrutinize such sessions.
Multiple logon sessions	Indicates the total number of sessions of all users who are currently logged into the SAP system multiple times.	Number	This is a good indicator of the total session load imposed by the multiple dialog logons on the SAP ABAP instance. In the event of an overload on the monitored instance, you can use the detailed diagnosis of this measure to know which users have logged into the instance the maximum number of times and has hence contributed the most to the load, where these users are connecting from, and the nature of the sessions launched by these users – i.e., whether active or inactive. If most of the sessions launched by these users are found to be inactive, you can conclude that such users are responsible for unnecessarily increasing the server load and for

Measurement	Description	Measurement Unit	Interpretation
			draining the server resources. During a SAP audit, these idle sessions should be subjected to close scrutiny.
Multiple active sessions	Indicates the number of sessions actively used by all users who have logged into the SAP ABAP server multiple times.	Number	By comparing the value of this measure with that of the Multiple logon sessions measure, you can accurately compute the number of inactive/idle sessions on the SAP ABAP instance. Idle sessions unnecessarily increase the load on the instance and lock resources. To know which sessions are idle, use the detailed diagnosis of the Multiple logon sessions measure. To avoid such sessions, you can disable multiple dialog logons.

3.8 Viewing the Performance Attribute Tree

The **Performance Attribute** tree (see Figure 3.12) discussed earlier in this chapter allowed you to view all the performance attributes that are associated with a specific monitor only. However, if you are looking for a more flexible interface, which allows you to choose from all monitor sets configured for a SAP ABAP instance, pick one/more monitors of interest to you, and view all the attributes associated with all chosen monitors, then, you will have to use the **METRICS** page (see Figure 3.18) offered by the eG monitoring console. To access this page, follow the *Components -> SAP -> Metrics* menu sequence.
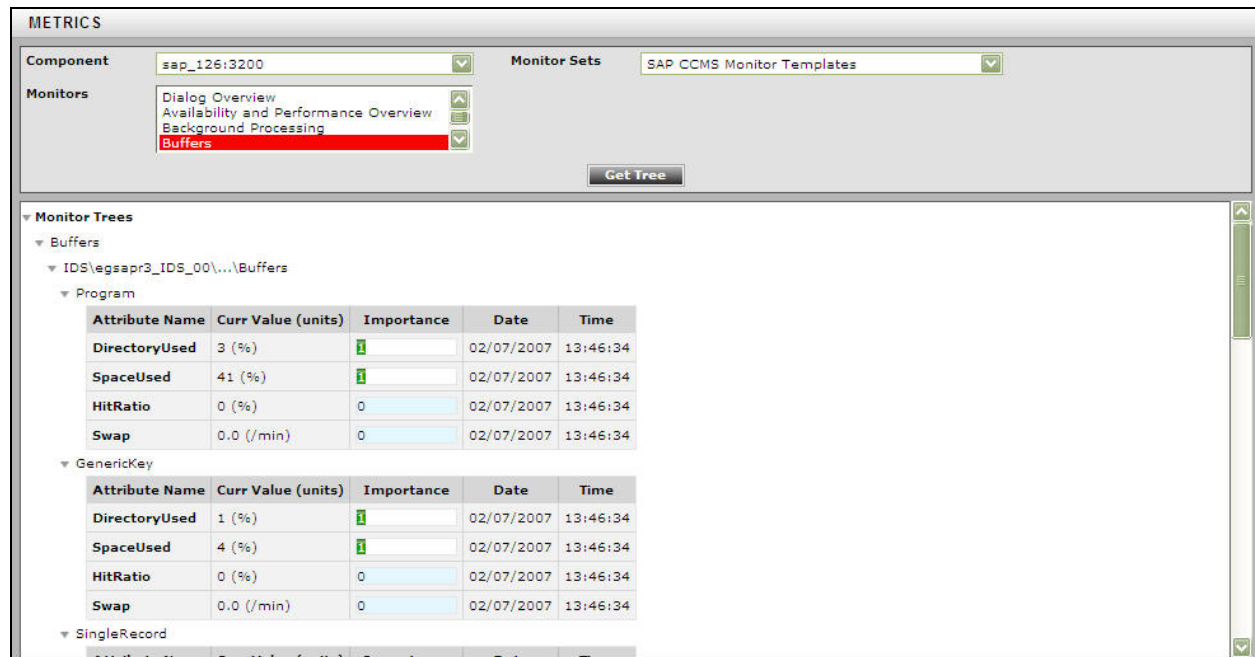
Figure 3.18: The Metrics page

To use this page, do the following:

- Select the SAP ABAP **Component** of interest to you.

- All the **Monitor Sets** configured for the chosen server will then populate the **Monitor Sets** list. Pick a monitor set from this list.

- The **Monitors** list will then display all the monitors associated with the chosen **Monitor Set**. Select one/more monitors from this list, and click the **Get Tree** button.

An attribute tree providing the details of all the attributes of the chosen monitors will then appear, as depicted by Figure 3.18 above. Within the tree, the Performance attributes will be displayed in a tabular format. The table contains an entry for each Performance attribute exposed by the monitoring object with details such as the Attribute Name, Current Value of the attribute (with units), Importance and the actual Timestamp of the Current Value shown. The Importance value is a combination of the status and severity of the most significant active alert associated with this Performance attribute. The Status of this performance attribute is represented using a unique color code. The severity of a given status is indicated by a number between 0 and 255, with higher severity values being more important than the lower ones.

3.9 Viewing the SAP Alerts

The eG monitoring console provides a dedicated interface for selectively viewing the history of alerts related to managed SAP ABAP components. With the help of this interface, administrators can at-a-glance infer the number, nature, status, and severity of issues encountered by the SAP ABAP environment, currently and in the past. This information will enable administrators to understand how problem-prone their SAP environment has been over time, study problem patterns, isolate recurring problems (if any), and arrive at effective solutions.

Moreover, active alerts awaiting manual completion can be effortlessly identified using this interface, and such alerts can also be closed by employing a simple sequence of mouse-clicks on this interface.

To access this interface, follow the menu sequence, *Components -> SAP -> Alerts* in the eG monitoring console. Figure 3.19 will then appear.

Figure 3.19: The SAP Alerts page with the filter criteria

In this page, do the following:

1. To view the SAP alerts related to a particular SAP ABAP component, select a **Component**.

2. Once a **Component** is selected, the **Monitor Sets** list will be populated with the monitor sets that currently exist for the selected component. To view the alerts for specific monitor sets, pick them from the **Monitor Sets** list.

3. The monitors that are available within the chosen monitor sets will be populated automatically in the **Monitors** list. Select the monitors of your choice from this list.

4. Use the **Filter By** list to filter your alerts based on their current status. The options available here are as follows:

    - **Active:** Pick this criterion to view the currently active alerts pertaining to the selected monitor sets and the monitors.

- **Done:** This criterion is selected to view the list of alerts that were completed by the administrator.

- **Auto Completed:** You can select this option to view the list of alerts that were completed automatically by the SAP system.

- **All:** Select this option to view all alerts related to the chosen monitors, regardless of their status.

5. Then, from the **Timeline** list box, select the time period for which you wish to view the alerts. The timeline options available are as follows:

- To view all the alerts that were generated by the SAP ABAP system since startup, select the **All** option from the **Timeline** list box.

- If you wish to view the alerts that were prevalent for a short period during the last 24 hours, pick the **Last X Minutes** option. This will invoke the **Hr** and **Min** list boxes using which you can specify a particular time period for which you wish to view the alerts.

- By picking the **Any** option, you will be allowed to select the date/time range from the list boxes that appear next to the **Timeline** option.

Note:

The date/time range provided as part of the **Any Timeline** specification will pertain to the time zone of the **SAP USER** configured for the **New alerts in the last measurement period** test.

6. Finally, click the **Submit** button to view the list of alerts that fulfill the selected criteria.

7. If the **Filter by** option was set to **All**, then all alerts related to chosen monitor sets and monitors will appear, regardless of status (see Figure 3.20).

Figure 3.20: The SAP Alerts page displaying all alerts, regardless of status

8. On the other hand, if you had chosen the **Active** alerts from the **Filter by** list, then only the currently active alerts will appear.

Figure 3.21: The SAP Alerts page displaying only the active alerts

9. Regardless of the **Filter by** option chosen, the details displayed for each alert include the **Date**, **Time**, **System** (the name of the SAP ABAP system), **Context** (the instance on which this alert has occurred), **Object Name** and **Short Name** (the name of the monitoring object and its corresponding attribute that is responsible for this alert). Also, in the **Status** column, the status of

each alert will be indicated using symbols. In other words, the ⟳ symbol will be displayed to represent an Active alert. Likewise, the ✔ symbol represents the alerts that were Auto Completed by the SAP ABAP system and the 🖑 symbol represents that the alerts were completed i.e., Done by the administrator. Besides status, an alert is also accompanied by 'importance' indicators. The importance of an alert is represented by a color coding and a severity value ranging from 0 to 255, encrypted on the color. A red color in the **Importance** column indicates that the alert is critical and a yellow color in the **Importance** column indicates that this is a warning alert. An elaborate description of alert will be available in the **Alert text** column. The alerts displayed in this page are sorted in the order and sequence specified below:

- ascending order of the monitors chosen from the **Monitors** list box in Figure 3.21

- ascending order of status code (active/done/auto-completed),

- descending order of severity values (most severe alerts appear first)

- ascending order of alert time stamps

- ascending order of the ID of the alert (note that the alarm ID will not be displayed in the Figure 3.21, and is maintained internally by the eG Enterprise system; this will be however used for the sorting purposes).

Note:

The **DATE** and **TIME** displayed for every alert in this page will pertain to the time zone of the **SAP USER** configured for the **New alerts in the last measure period** test.

10. Active alerts can also be completed on-the-fly, using this page. For this purpose, simply select the check box corresponding to an active alert, and click the **Complete** button below (see Figure 3.21)

About eG Innovations

eG Innovations provides intelligent performance management solutions that automate and dramatically accelerate the discovery, diagnosis, and resolution of IT performance issues in on-premises, cloud and hybrid environments. Where traditional monitoring tools often fail to provide insight into the performance drivers of business services and user experience, eG Innovations provides total performance visibility across every layer and every tier of the IT infrastructure that supports the business service chain. From desktops to applications, from servers to network and storage, from virtualization to cloud, eG Innovations helps companies proactively discover, instantly diagnose, and rapidly resolve even the most challenging performance and user experience issues.

eG Innovations is dedicated to helping businesses across the globe transform IT service delivery into a competitive advantage and a center for productivity, growth and profit. Many of the world's largest businesses use eG Enterprise to enhance IT service performance, increase operational efficiency, ensure IT effectiveness and deliver on the ROI promise of transformational IT investments across physical, virtual and cloud environments.

To learn more visit www.eginnovations.com.

Contact Us

For support queries, email support@eginnovations.com.

To contact eG Innovations sales team, email sales@eginnovations.com.