Monitoring Maipu Router

eG Innovations Product Documentation

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Total Performance Visibility

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Chapter 1: Introduction

A router is a device or, in some cases, software in a computer, that determines the next network point to which a packet should be forwarded toward its destination. The router is connected to at least two networks and decides which way to send each information packet based on its current understanding of the state of the networks it is connected to.

Maipu MP7500X series routers implement "multicore power" on the basis of the leading "dual-core power". Based on the ATCA structure design and meeting the users' high performance requirements, it provides the most complete dual-redundancy or multi-redundancy design for the whole system, providing users with the high reliability of core-device carrier-class. With unified MyPower-R software, Maipu MP7500X series router provides abundant routing, backup, network security services, IP multicast, QoS, network management, and other functions, supports a variety of network layer and link layer protocols, supports BGP border gateway protocol and MPLS function, and can play the PE node or P node function in the network.

As a multi-purpose universal data processing and routing platform, MP7500X series router can cooperate with a full range of Maipu routers to provide operators, government, finance, energy, transportation, education, military and other industrial users and large/medium-sized enterprise users with a full range of WAN solutions, widely applied at the core backbone layer and core aggregation layer of the above industries.

Excessive packet traffic can choke the router, thereby significantly slowing down packet transmission. Similarly, very low unused memory/CPU on the router can also affect the speed with which the router transmits data. It is therefore imperative to monitor the resource usage and the traffic to and from the router, so that any sudden increase in load or erosion of resources can be instantly detected, and remedial action immediately initiated. The eG-developed custom monitoring model helps network administrators in this regard.

This document describes the eG-developed custom monitor for the Maipu Router.

Chapter 2: How to Monitor Maipu Router Using eG Enterprise?

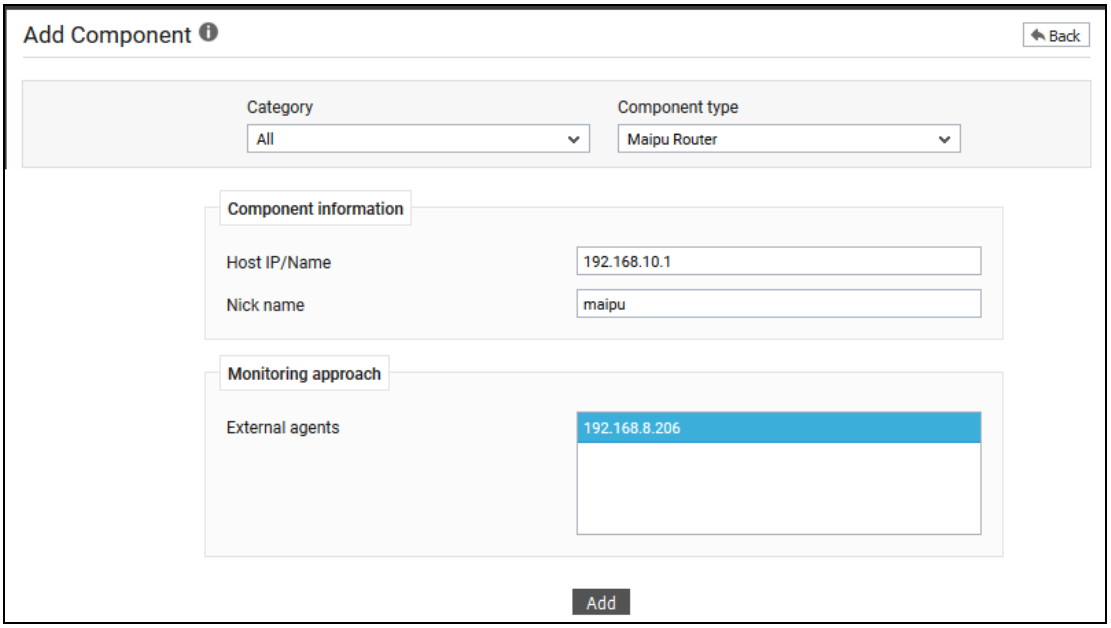
eG Enterprise adopts agentless approach to monitor the Maipu Router. A single eG external agent is all that is required to monitor a switch. This agent, when deployed on a remote host, executes tests that connect to the SNMP MIB of the switch to be monitored, and collects statistics of interest from it. The key pre-requisite for monitoring the Maipu Router is that the router should be SNMP enabled. Once this requirement is kept in place, you can start monitoring the router. There are two broad steps for monitoring the router:

- Managing the Maipu Router
- Configuring the tests

2.1 Managing the Maipu Router

The eG Enterprise can automatically discover the Maipu Router. Toconfigure a router for monitoring by eG Enterprise, do the following:

1. Log into the eG administrative interface.
2. If the router is already discovered, then directly proceed towards managing it using the **COMPONENTS - MANAGE/UNMANAGE** page (Infrastructure -> Components -> Manage/Unmanage). However, if it is yet to be discovered, then run discovery (Infrastructure -> Components -> Discovery) to get it discovered or add the router 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.
3. If you add the component manually, then, in the **COMPONENTS** page that appears, select *Maipu Router* as the **Component type**. Then, click the **Add New Component** button. This will invoke Figure 2.1.



Category: All

Component type: Maipu Router

Component information

Host IP/Name: 192.168.10.1

Nick name: maipu

Monitoring approach

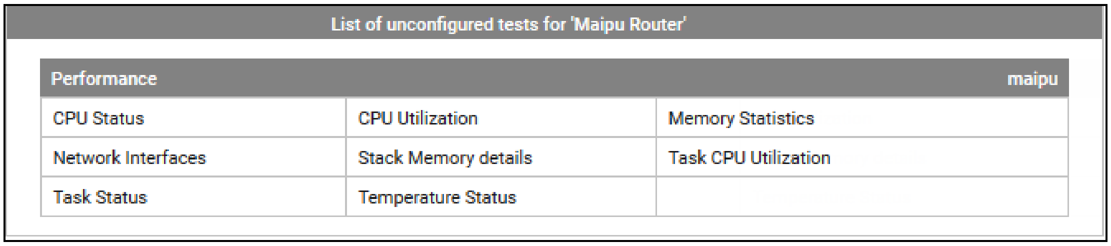
External agents: 192.168.8.206

Figure 2.1: Adding a Maipu Router

4. Specify the **Host IP** and the **Nick name** of the Maipu Router in Figure 2.1. Then click the **Add** button to register the changes.

2.2 Configuring the tests

1. When you attempt to sign out, a list of unconfigured tests will appear as shown in Figure 2.2.



List of unconfigured tests for 'Maipu Router'

Performance		maipu
CPU Status	CPU Utilization	Memory Statistics
Network Interfaces	Stack Memory details	Task CPU Utilization
Task Status	Temperature Status	

Figure 2.2: List of Unconfigured tests to be configured for the Maipu Router

2. Click on the tests to configure them. To know how to configure these tests, refer to the **Monitoring the Maipu Router** chapter.

3. To know how to configure the **Network Interfaces** test, refer to *Monitoring Cisco Routers* document.

4. Once the **Network Interfaces** test is configured, signout of the eG administrative interface.

Chapter 3: Monitoring the Maipu Router

By executing a couple of simple tests on the SNMP MIB exposed by the Maipu Router, the eG external agent performs 24 x 7 monitoring of the router, extracts critical performance data from the router, and reports the metrics so gathered to the eG manager. The eG manager in turn, maps these tests to the layers of the unique *Maipu Router* layer model (see Figure 3.1) that it prescribes for the Maipu Router, and displays the performance data in the eG monitor console.

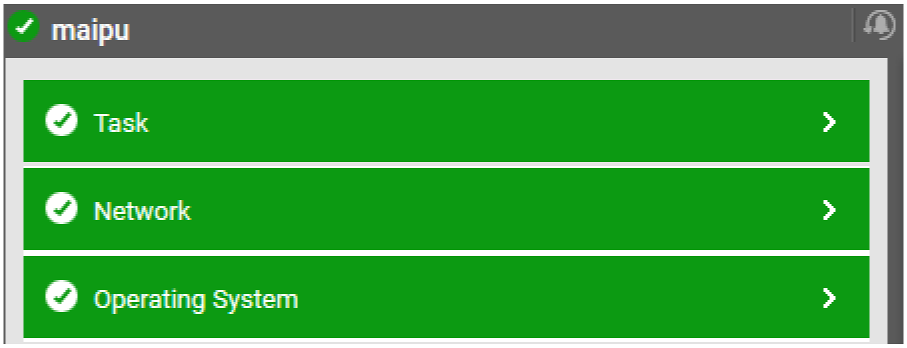


Figure 3.1: The layer model of the Maipu Router

Every layer of Figure 3.1 is mapped to a variety of tests which connect to the SNMP MIB of the target router to collect critical statistics pertaining to its performance. The metrics reported by these tests enable administrators to answer the following questions:

- What is the current status of each task?
- What is the priority of each task?
- What is the current option used by each task?
- What percentage of CPU is utilized to perform each task?
- What is the total size of stack memory utilized by each task?
- How much of stack memory is available for use by each task?
- What percentage of stack memory was utilized by each task?
- What is the current status of the CPU?
- What is the utilization percentage of CPU?
- How much memory was allocated for the router?
- What is the amount of memory utilized by the router?

- What is the amount of memory that is still available for use by the router?
- What is the temperature of the CPU?
- What is the temperature of the motherboard?

Since the **Network** layer has been dealt extensively in *Monitoring Cisco Routers* document, the this document will deal with the remaining layers of Figure 3.1 in detail.

3.1 The Operating System Layer

This layer tracks the current status of the CPU of the target router and the memory utilization of the router. In addition, if the status of the CPU is detected to be a Spy CPU, this layer also tracks the temperature of the CPU and the motherboard as well as the CPU utilized by each task performed through the router.

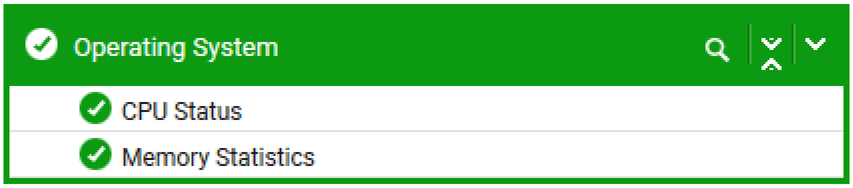


Figure 3.2: The tests mapped to the Operating System layer

3.1.1 CPU Status Test

This test reports the current status of the CPU.

Target of the test : A Maipu Router

Agent deploying the test : An external agent

Outputs of the test : One set of results for the target router being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed.
Host	The IP address of the host for which this test is to be configured.
SNMPPort	The port at which the monitored target exposes its SNMP MIB; The default value is 161.
SNMPVersion	By default, the eG agent supports SNMP version 1. Accordingly, the default selection

Parameter	Description
	in the SNMPVersion list is **v1**. However, if a different SNMP framework is in use in your environment, say SNMP **v2** or **v3**, then select the corresponding option from this list.
SNMPCommunity	The SNMP community name that the test uses to communicate with the router. This parameter is specific to SNMP **v1** and **v2** only. Therefore, if the SNMPVersion chosen is **v3**, then this parameter will not appear.
UserName	This parameter appears only when **v3** is selected as the SNMPVersion. SNMP version 3 (SNMPv3) is an extensible SNMP Framework which supplements the SNMPv2 Framework, by additionally supporting message security, access control, and remote SNMP configuration capabilities. To extract performance statistics from the MIB using the highly secure SNMP v3 protocol, the eG agent has to be configured with the required access privileges – in other words, the eG agent should connect to the MIB using the credentials of a user with access permissions to be MIB. Therefore, specify the name of such a user against this parameter.
Context	This parameter appears only when v3 is selected as the SNMPVersion. An SNMP context is a collection of management information accessible by an SNMP entity. An item of management information may exist in more than one context and an SNMP entity potentially has access to many contexts. A context is identified by the SNMPEngineID value of the entity hosting the management information (also called a contextEngineID) and a context name that identifies the specific context (also called a contextName). If the Username provided is associated with a context name, then the eG agent will be able to poll the MIB and collect metrics only if it is configured with the context name as well. In such cases therefore, specify the context name of the Username in the Context text box. By default, this parameter is set to *none*.
AuthPass	Specify the password that corresponds to the above-mentioned Username. This parameter once again appears only if the SNMPVersion selected is **v3**.
Confirm Password	Confirm the AuthPass by retyping it here.
AuthType	This parameter too appears only if **v3** is selected as the SNMPversion. From the Authtype list box, choose the authentication algorithm using which SNMP v3 converts the specified username and password into a 32-bit format to ensure security of SNMP transactions. You can choose between the following options: • **MD5** – Message Digest Algorithm • **SHA** – Secure Hash Algorithm
EncryptFlag	This flag appears only when **v3** is selected as the SNMPversion. By default, the eG agent does not encrypt SNMP requests. Accordingly, the this flag is set to **No** by

Parameter	Description
	default. To ensure that SNMP requests sent by the eG agent are encrypted, select the **Yes** option.
EncryptType	If this EncryptFlag is set to **Yes**, then you will have to mention the encryption type by selecting an option from the EncryptType list. SNMP v3 supports the following encryption types: • **DES** – Data Encryption Standard • **AES** – Advanced Encryption Standard
EncryptPassword	Specify the encryption password here.
Confirm Password	Confirm the encryption password by retyping it here.
Timeout	Specify the duration (in seconds) within which the SNMP query executed by this test should time out in this text box. The default is 10 seconds.
Data Over TCP	By default, in an IT environment, all data transmission occurs over UDP. Some environments however, may be specifically configured to offload a fraction of the data traffic – for instance, certain types of data traffic or traffic pertaining to specific components – to other protocols like TCP, so as to prevent UDP overloads. In such environments, you can instruct the eG agent to conduct the SNMP data traffic related to the monitored target over TCP (and not UDP). For this, set this flag to **Yes**. By default, this flag is set to **No**.

Measurements made by the test

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td>CPU status</td><td>Indicates the current status of the CPU.</td><td></td><td>The values reported by this measure and its numeric equivalents are mentioned in the table below:
<table>
<tr><th>Measure value</th><th>Numeric Value</th></tr>
<tr><td>No Spy CPU</td><td>1</td></tr>
<tr><td>Spy CPU</td><td>2</td></tr>
</table>
<b>Note:</b>
By default, this measure reports the Measure Values listed in the table</td></tr>
</table>

Measurement	Description	Measurement Unit	Interpretation
			above to indicate the current state of the CPU. The graph of this measure however, represents the status of the CPU using the numeric equivalents only i.e., *1* or *2*.

3.1.2 CPU Utilization Test

This test auto-discovers the CPUs in the target router and for each CPU, reports the current CPU utilization and the average CPU utilized. Using this test, administrators can determine the CPU that is being utilized frequently.

Target of the test : A Maipu Router

Agent deploying the test : An external agent

Outputs of the test : One set of results for each CPU of the target router being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed.
Host	The IP address of the host for which this test is to be configured.
SNMPPort	The port at which the monitored target exposes its SNMP MIB; The default value is 161.
SNMPVersion	By default, the eG agent supports SNMP version 1. Accordingly, the default selection in the SNMPVersion list is **v1**. However, if a different SNMP framework is in use in your environment, say SNMP **v2** or **v3**, then select the corresponding option from this list.
SNMPCommunity	The SNMP community name that the test uses to communicate with the router. This parameter is specific to SNMP **v1** and **v2** only. Therefore, if the SNMPVersion chosen is **v3**, then this parameter will not appear.
UserName	This parameter appears only when **v3** is selected as the SNMPVersion. SNMP version 3 (SNMPv3) is an extensible SNMP Framework which supplements the SNMPv2 Framework, by additionally supporting message security, access control, and remote SNMP configuration capabilities. To extract performance statistics from the MIB using

Parameter	Description
	the highly secure SNMP v3 protocol, the eG agent has to be configured with the required access privileges – in other words, the eG agent should connect to the MIB using the credentials of a user with access permissions to be MIB. Therefore, specify the name of such a user against this parameter.
Context	This parameter appears only when v3 is selected as the SNMPVersion. An SNMP context is a collection of management information accessible by an SNMP entity. An item of management information may exist in more than one context and an SNMP entity potentially has access to many contexts. A context is identified by the SNMPEngineID value of the entity hosting the management information (also called a contextEngineID) and a context name that identifies the specific context (also called a contextName). If the Username provided is associated with a context name, then the eG agent will be able to poll the MIB and collect metrics only if it is configured with the context name as well. In such cases therefore, specify the context name of the Username in the Context text box. By default, this parameter is set to *none*.
AuthPass	Specify the password that corresponds to the above-mentioned Username. This parameter once again appears only if the SNMPVersion selected is **v3**.
Confirm Password	Confirm the AuthPass by retyping it here.
AuthType	This parameter too appears only if **v3** is selected as the SNMPversion. From the Authtype list box, choose the authentication algorithm using which SNMP v3 converts the specified username and password into a 32-bit format to ensure security of SNMP transactions. You can choose between the following options: • **MD5** – Message Digest Algorithm • **SHA** – Secure Hash Algorithm
EncryptFlag	This flag appears only when **v3** is selected as the SNMPversion. By default, the eG agent does not encrypt SNMP requests. Accordingly, the this flag is set to **No** by default. To ensure that SNMP requests sent by the eG agent are encrypted, select the **Yes** option.
EncryptType	If this EncryptFlag is set to **Yes**, then you will have to mention the encryption type by selecting an option from the EncryptType list. SNMP v3 supports the following encryption types: • **DES** – Data Encryption Standard • **AES** – Advanced Encryption Standard
EncryptPassword	Specify the encryption password here.

Parameter	Description
Confirm Password	Confirm the encryption password by retyping it here.
Timeout	Specify the duration (in seconds) within which the SNMP query executed by this test should time out in this text box. The default is 10 seconds.
Data Over TCP	By default, in an IT environment, all data transmission occurs over UDP. Some environments however, may be specifically configured to offload a fraction of the data traffic – for instance, certain types of data traffic or traffic pertaining to specific components – to other protocols like TCP, so as to prevent UDP overloads. In such environments, you can instruct the eG agent to conduct the SNMP data traffic related to the monitored target over TCP (and not UDP). For this, set this flag to **Yes**. By default, this flag is set to **No**.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
CPU utilization	Indicates the utilization of this CPU, in percentage.	Percent	A very high value of this measure indicates a CPU bottleneck. Comparing the value of this measure across the CPUs will help you in identifying the CPU that is being utilized frequently.
Average CPU utilization	Indicates the average utilization of this CPU, expressed in percentage.	Percent	A very high value of this measure indicates a CPU bottleneck.

3.1.3 Memory Statistics Test

This test reports the memory utilization of the target Maipu router. Using this test, administrators can figure out if the Maipu router is running short of memory.

Target of the test : A Maipu Router

Agent deploying the test : An external agent

Outputs of the test : One set of results for the target Maipu Router being monitored

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed.
Host	The IP address of the host for which this test is to be configured.
SNMPPort	The port at which the monitored target exposes its SNMP MIB; The default value is 161.
SNMPVersion	By default, the eG agent supports SNMP version 1. Accordingly, the default selection in the SNMPVersion list is **v1**. However, if a different SNMP framework is in use in your environment, say SNMP **v2** or **v3**, then select the corresponding option from this list.
SNMPCommunity	The SNMP community name that the test uses to communicate with the router. This parameter is specific to SNMP **v1** and **v2** only. Therefore, if the SNMPVersion chosen is **v3**, then this parameter will not appear.
UserName	This parameter appears only when **v3** is selected as the SNMPVersion. SNMP version 3 (SNMPv3) is an extensible SNMP Framework which supplements the SNMPv2 Framework, by additionally supporting message security, access control, and remote SNMP configuration capabilities. To extract performance statistics from the MIB using the highly secure SNMP v3 protocol, the eG agent has to be configured with the required access privileges – in other words, the eG agent should connect to the MIB using the credentials of a user with access permissions to be MIB. Therefore, specify the name of such a user against this parameter.
Context	This parameter appears only when v3 is selected as the SNMPVersion. An SNMP context is a collection of management information accessible by an SNMP entity. An item of management information may exist in more than one context and an SNMP entity potentially has access to many contexts. A context is identified by the SNMPEngineID value of the entity hosting the management information (also called a contextEngineID) and a context name that identifies the specific context (also called a contextName). If the Username provided is associated with a context name, then the eG agent will be able to poll the MIB and collect metrics only if it is configured with the context name as well. In such cases therefore, specify the context name of the Username in the Context text box. By default, this parameter is set to *none*.
AuthPass	Specify the password that corresponds to the above-mentioned Username. This parameter once again appears only if the SNMPVersion selected is **v3**.
Confirm Password	Confirm the AuthPass by retyping it here.
AuthType	This parameter too appears only if **v3** is selected as the SNMPversion. From the

Parameter	Description
	Authtype list box, choose the authentication algorithm using which SNMP v3 converts the specified username and password into a 32-bit format to ensure security of SNMP transactions. You can choose between the following options: • **MD5** – Message Digest Algorithm • **SHA** – Secure Hash Algorithm
EncryptFlag	This flag appears only when **v3** is selected as the SNMPversion. By default, the eG agent does not encrypt SNMP requests. Accordingly, the this flag is set to **No** by default. To ensure that SNMP requests sent by the eG agent are encrypted, select the **Yes** option.
EncryptType	If this EncryptFlag is set to **Yes**, then you will have to mention the encryption type by selecting an option from the EncryptType list. SNMP v3 supports the following encryption types: • **DES** – Data Encryption Standard • **AES** – Advanced Encryption Standard
EncryptPassword	Specify the encryption password here.
Confirm Password	Confirm the encryption password by retyping it here.
Timeout	Specify the duration (in seconds) within which the SNMP query executed by this test should time out in this text box. The default is 10 seconds.
Data Over TCP	By default, in an IT environment, all data transmission occurs over UDP. Some environments however, may be specifically configured to offload a fraction of the data traffic – for instance, certain types of data traffic or traffic pertaining to specific components – to other protocols like TCP, so as to prevent UDP overloads. In such environments, you can instruct the eG agent to conduct the SNMP data traffic related to the monitored target over TCP (and not UDP). For this, set this flag to **Yes**. By default, this flag is set to **No**.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Total memory	Indicates the total amount of memory allocated for the router.	MB	

Measurement	Description	Measurement Unit	Interpretation
Used memory	Indicates the amount of memory that is utilized by the router.	MB	A low value is desired for this measure. A value close to the *Total memory* measure indicates that the memory resources are depleting rapidly.
Free memory	Indicates the amount of memory that is currently available for use in the router.	MB	
Used memory utilization	Indicates the percentage of memory utilized by the router during the last measurement period.	Percent	

3.1.4 Task CPU Utilization Test

This test auto-discovers the tasks performed by the target router and for each task, this test reports the percentage of CPU utilized. Using this test, administrators can determine the task that is consuming too much of CPU resources.

Target of the test : A Maipu Router

Agent deploying the test : An external agent

Outputs of the test : One set of results for each task on the target router being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed.
Host	The IP address of the host for which this test is to be configured.
SNMPPort	The port at which the monitored target exposes its SNMP MIB; The default value is 161.
SNMPVersion	By default, the eG agent supports SNMP version 1. Accordingly, the default selection in the SNMPVersion list is **v1**. However, if a different SNMP framework is in use in your environment, say SNMP **v2** or **v3**, then select the corresponding option from this list.

Parameter	Description
SNMPCommunity	The SNMP community name that the test uses to communicate with the router. This parameter is specific to SNMP **v1** and **v2** only. Therefore, if the SNMPVersion chosen is **v3**, then this parameter will not appear.
UserName	This parameter appears only when **v3** is selected as the SNMPVersion. SNMP version 3 (SNMPv3) is an extensible SNMP Framework which supplements the SNMPv2 Framework, by additionally supporting message security, access control, and remote SNMP configuration capabilities. To extract performance statistics from the MIB using the highly secure SNMP v3 protocol, the eG agent has to be configured with the required access privileges – in other words, the eG agent should connect to the MIB using the credentials of a user with access permissions to be MIB. Therefore, specify the name of such a user against this parameter.
Context	This parameter appears only when v3 is selected as the SNMPVersion. An SNMP context is a collection of management information accessible by an SNMP entity. An item of management information may exist in more than one context and an SNMP entity potentially has access to many contexts. A context is identified by the SNMPEngineID value of the entity hosting the management information (also called a contextEngineID) and a context name that identifies the specific context (also called a contextName). If the Username provided is associated with a context name, then the eG agent will be able to poll the MIB and collect metrics only if it is configured with the context name as well. In such cases therefore, specify the context name of the Username in the Context text box. By default, this parameter is set to *none*.
AuthPass	Specify the password that corresponds to the above-mentioned Username. This parameter once again appears only if the SNMPVersion selected is **v3**.
Confirm Password	Confirm the AuthPass by retyping it here.
AuthType	This parameter too appears only if **v3** is selected as the SNMPversion. From the Authtype list box, choose the authentication algorithm using which SNMP v3 converts the specified username and password into a 32-bit format to ensure security of SNMP transactions. You can choose between the following options: • **MD5** – Message Digest Algorithm • **SHA** – Secure Hash Algorithm
EncryptFlag	This flag appears only when **v3** is selected as the SNMPversion. By default, the eG agent does not encrypt SNMP requests. Accordingly, the this flag is set to **No** by default. To ensure that SNMP requests sent by the eG agent are encrypted, select the **Yes** option.
EncryptType	If this EncryptFlag is set to **Yes**, then you will have to mention the encryption type by

Parameter	Description
	selecting an option from the EncryptType list. SNMP v3 supports the following encryption types: • **DES** – Data Encryption Standard • **AES** – Advanced Encryption Standard
EncryptPassword	Specify the encryption password here.
Confirm Password	Confirm the encryption password by retyping it here.
Timeout	Specify the duration (in seconds) within which the SNMP query executed by this test should time out in this text box. The default is 10 seconds.
Data Over TCP	By default, in an IT environment, all data transmission occurs over UDP. Some environments however, may be specifically configured to offload a fraction of the data traffic – for instance, certain types of data traffic or traffic pertaining to specific components – to other protocols like TCP, so as to prevent UDP overloads. In such environments, you can instruct the eG agent to conduct the SNMP data traffic related to the monitored target over TCP (and not UDP). For this, set this flag to **Yes**. By default, this flag is set to **No**.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Task CPU utilization	Indicates the percentage of CPU utilized by this task.	Percent	A very high value of this measure indicates a CPU bottleneck. Comparing the value of this measure across the tasks will help you in identifying the task that is consuming too much of CPU resources.

3.1.5 Temperature Status Test

This test reports the temperature of the CPU and the motherboard. Using this test, administrators can figure out abnormalities in the temperature of the CPU and motherboard, before end user start complaining about the malfunctioning of the router!

Target of the test : A Maipu Router

Agent deploying the test : An external agent

Outputs of the test : One set of results for the target router being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed.
Host	The IP address of the host for which this test is to be configured.
SNMPPort	The port at which the monitored target exposes its SNMP MIB; The default value is 161.
SNMPVersion	By default, the eG agent supports SNMP version 1. Accordingly, the default selection in the SNMPVersion list is **v1**. However, if a different SNMP framework is in use in your environment, say SNMP **v2** or **v3**, then select the corresponding option from this list.
SNMPCommunity	The SNMP community name that the test uses to communicate with the router. This parameter is specific to SNMP **v1** and **v2** only. Therefore, if the SNMPVersion chosen is **v3**, then this parameter will not appear.
UserName	This parameter appears only when **v3** is selected as the SNMPVersion. SNMP version 3 (SNMPv3) is an extensible SNMP Framework which supplements the SNMPv2 Framework, by additionally supporting message security, access control, and remote SNMP configuration capabilities. To extract performance statistics from the MIB using the highly secure SNMP v3 protocol, the eG agent has to be configured with the required access privileges – in other words, the eG agent should connect to the MIB using the credentials of a user with access permissions to be MIB. Therefore, specify the name of such a user against this parameter.
Context	This parameter appears only when v3 is selected as the SNMPVersion. An SNMP context is a collection of management information accessible by an SNMP entity. An item of management information may exist in more than one context and an SNMP entity potentially has access to many contexts. A context is identified by the SNMPEngineID value of the entity hosting the management information (also called a contextEngineID) and a context name that identifies the specific context (also called a contextName). If the Username provided is associated with a context name, then the eG agent will be able to poll the MIB and collect metrics only if it is configured with the context name as well. In such cases therefore, specify the context name of the Username in the Context text box. By default, this parameter is set to *none*.
AuthPass	Specify the password that corresponds to the above-mentioned Username. This parameter once again appears only if the SNMPVersion selected is **v3**.
Confirm Password	Confirm the AuthPass by retyping it here.

Parameter	Description
AuthType	This parameter too appears only if **v3** is selected as the SNMPversion. From the Authtype list box, choose the authentication algorithm using which SNMP v3 converts the specified username and password into a 32-bit format to ensure security of SNMP transactions. You can choose between the following options: • **MD5** – Message Digest Algorithm • **SHA** – Secure Hash Algorithm
EncryptFlag	This flag appears only when **v3** is selected as the SNMPversion. By default, the eG agent does not encrypt SNMP requests. Accordingly, the this flag is set to **No** by default. To ensure that SNMP requests sent by the eG agent are encrypted, select the **Yes** option.
EncryptType	If this EncryptFlag is set to **Yes**, then you will have to mention the encryption type by selecting an option from the EncryptType list. SNMP v3 supports the following encryption types: • **DES** – Data Encryption Standard • **AES** – Advanced Encryption Standard
EncryptPassword	Specify the encryption password here.
Confirm Password	Confirm the encryption password by retyping it here.
Timeout	Specify the duration (in seconds) within which the SNMP query executed by this test should time out in this text box. The default is 10 seconds.
Data Over TCP	By default, in an IT environment, all data transmission occurs over UDP. Some environments however, may be specifically configured to offload a fraction of the data traffic – for instance, certain types of data traffic or traffic pertaining to specific components – to other protocols like TCP, so as to prevent UDP overloads. In such environments, you can instruct the eG agent to conduct the SNMP data traffic related to the monitored target over TCP (and not UDP). For this, set this flag to **Yes**. By default, this flag is set to **No**.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
CPU temperature	Indicates the current temperature of the CPU.	Celsius	A gradual/sudden increase in the value of this measure is a cause of concern

Measurement	Description	Measurement Unit	Interpretation
			which could eventually result in the failure of the CPU.
Motherboard temperature	Indicates the current temperature of the motherboard.	Celsius	A gradual/sudden increase in the value of this measure is a cause of concern which could eventually result in the failure of the motherboard.

3.2 The Task Layer

This layer tracks the current status of each task performed by the router and the priority of each task. This layer also tracks the stack memory utilization of each task and helps administrators in identifying the task that is consuming too much of stack memory resources.

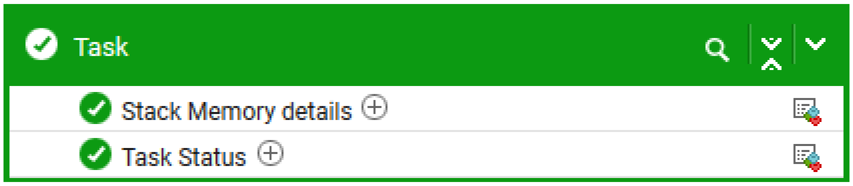


Figure 3.3: The tests mapped to the Task layer

3.2.1 Task Status Test

This test reports the current status of each task.

Target of the test : A Maipu Router

Agent deploying the test : An external agent

Outputs of the test : One set of results for each task on the target router being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed.
Host	The IP address of the host for which this test is to be configured.
SNMPPort	The port at which the monitored target exposes its SNMP MIB; The default value is 161.

Parameter	Description
SNMPVersion	By default, the eG agent supports SNMP version 1. Accordingly, the default selection in the SNMPVersion list is **v1**. However, if a different SNMP framework is in use in your environment, say SNMP **v2** or **v3**, then select the corresponding option from this list.
SNMPCommunity	The SNMP community name that the test uses to communicate with the router. This parameter is specific to SNMP **v1** and **v2** only. Therefore, if the SNMPVersion chosen is **v3**, then this parameter will not appear.
UserName	This parameter appears only when **v3** is selected as the SNMPVersion. SNMP version 3 (SNMPv3) is an extensible SNMP Framework which supplements the SNMPv2 Framework, by additionally supporting message security, access control, and remote SNMP configuration capabilities. To extract performance statistics from the MIB using the highly secure SNMP v3 protocol, the eG agent has to be configured with the required access privileges – in other words, the eG agent should connect to the MIB using the credentials of a user with access permissions to be MIB. Therefore, specify the name of such a user against this parameter.
Context	This parameter appears only when v3 is selected as the SNMPVersion. An SNMP context is a collection of management information accessible by an SNMP entity. An item of management information may exist in more than one context and an SNMP entity potentially has access to many contexts. A context is identified by the SNMPEngineID value of the entity hosting the management information (also called a contextEngineID) and a context name that identifies the specific context (also called a contextName). If the Username provided is associated with a context name, then the eG agent will be able to poll the MIB and collect metrics only if it is configured with the context name as well. In such cases therefore, specify the context name of the Username in the Context text box. By default, this parameter is set to *none*.
AuthPass	Specify the password that corresponds to the above-mentioned Username. This parameter once again appears only if the SNMPVersion selected is **v3**.
Confirm Password	Confirm the AuthPass by retyping it here.
AuthType	This parameter too appears only if **v3** is selected as the SNMPversion. From the Authtype list box, choose the authentication algorithm using which SNMP v3 converts the specified username and password into a 32-bit format to ensure security of SNMP transactions. You can choose between the following options: • **MD5** – Message Digest Algorithm • **SHA** – Secure Hash Algorithm
EncryptFlag	This flag appears only when **v3** is selected as the SNMPversion. By default, the eG

Parameter	Description
	agent does not encrypt SNMP requests. Accordingly, the this flag is set to **No** by default. To ensure that SNMP requests sent by the eG agent are encrypted, select the **Yes** option.
EncryptType	If this EncryptFlag is set to **Yes**, then you will have to mention the encryption type by selecting an option from the EncryptType list. SNMP v3 supports the following encryption types: • **DES** – Data Encryption Standard • **AES** – Advanced Encryption Standard
EncryptPassword	Specify the encryption password here.
Confirm Password	Confirm the encryption password by retyping it here.
Timeout	Specify the duration (in seconds) within which the SNMP query executed by this test should time out in this text box. The default is 10 seconds.
Data Over TCP	By default, in an IT environment, all data transmission occurs over UDP. Some environments however, may be specifically configured to offload a fraction of the data traffic – for instance, certain types of data traffic or traffic pertaining to specific components – to other protocols like TCP, so as to prevent UDP overloads. In such environments, you can instruct the eG agent to conduct the SNMP data traffic related to the monitored target over TCP (and not UDP). For this, set this flag to **Yes**. By default, this flag is set to **No**.

Measurements made by the test

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td>Status</td><td>Indicates the current status of this task.</td><td></td><td>The values reported by this measure and its numeric equivalents are mentioned in the table below:
<table>
<tr><th>Measure value</th><th>Numeric Value</th></tr>
<tr><td>Task ready</td><td>1</td></tr>
<tr><td>Task suspended</td><td>2</td></tr>
<tr><td>Task delay</td><td>3</td></tr>
<tr><td>Task deleted</td><td>4</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td><b>Note:</b>
By default, this measure reports the Measure Values listed in the table above to indicate the current state of this task. The graph of this measure however, represents the status of the task using the numeric equivalents only i.e., <i>1</i> to <i>4</i>.</td></tr>
<tr><td>Priority</td><td>Indicates the priority of this task.</td><td>Number</td><td></td></tr>
<tr><td>Option</td><td>Indicates the current option used by this task.</td><td></td><td>The values reported by this measure and its numeric equivalents are mentioned in the table below:
<table>
<tr><th>Measure value</th><th>Numeric Value</th></tr>
<tr><td>VX SUPERVISOR MODE</td><td>1</td></tr>
<tr><td>VX UNBREAKABLE</td><td>2</td></tr>
<tr><td>VX DEALLOC STACK</td><td>4</td></tr>
<tr><td>VX FP TASK</td><td>8</td></tr>
<tr><td>VX STDIO</td><td>16</td></tr>
<tr><td>VX PRIVATE ENV</td><td>128</td></tr>
<tr><td>VX NO STACK FILL</td><td>256</td></tr>
</table>
<b>Note:</b>
By default, this measure reports the Measure Values listed in the table above to indicate the current option used by this task. The graph of this measure however, represents the status of the task using the above-mentioned numeric equivalents only.</td></tr>
</table>

3.2.2 Stack Details Test

This test auto-discovers the stack memories on the target Maipu Router and for each stack memory, reports the memory utilization. Using this test, administrators can figure out the stack memory that can accommodate additional resources.

Target of the test : A Maipu Router

Agent deploying the test : An external agent

Outputs of the test : One set of results for each task ID of the target router being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed.
Host	The IP address of the host for which this test is to be configured.
SNMPPort	The port at which the monitored target exposes its SNMP MIB; The default value is 161.
SNMPVersion	By default, the eG agent supports SNMP version 1. Accordingly, the default selection in the SNMPVersion list is **v1**. However, if a different SNMP framework is in use in your environment, say SNMP **v2** or **v3**, then select the corresponding option from this list.
SNMPCommunity	The SNMP community name that the test uses to communicate with the router. This parameter is specific to SNMP **v1** and **v2** only. Therefore, if the SNMPVersion chosen is **v3**, then this parameter will not appear.
UserName	This parameter appears only when **v3** is selected as the SNMPVersion. SNMP version 3 (SNMPv3) is an extensible SNMP Framework which supplements the SNMPv2 Framework, by additionally supporting message security, access control, and remote SNMP configuration capabilities. To extract performance statistics from the MIB using the highly secure SNMP v3 protocol, the eG agent has to be configured with the required access privileges – in other words, the eG agent should connect to the MIB using the credentials of a user with access permissions to be MIB. Therefore, specify the name of such a user against this parameter.
Context	This parameter appears only when v3 is selected as the SNMPVersion. An SNMP context is a collection of management information accessible by an SNMP entity. An item of management information may exist in more than one context and an SNMP entity potentially has access to many contexts. A context is identified by the

Parameter	Description
	SNMPEngineID value of the entity hosting the management information (also called a contextEngineID) and a context name that identifies the specific context (also called a contextName). If the Username provided is associated with a context name, then the eG agent will be able to poll the MIB and collect metrics only if it is configured with the context name as well. In such cases therefore, specify the context name of the Username in the Context text box. By default, this parameter is set to *none*.
AuthPass	Specify the password that corresponds to the above-mentioned Username. This parameter once again appears only if the SNMPVersion selected is **v3**.
Confirm Password	Confirm the AuthPass by retyping it here.
AuthType	This parameter too appears only if **v3** is selected as the SNMPversion. From the Authtype list box, choose the authentication algorithm using which SNMP v3 converts the specified username and password into a 32-bit format to ensure security of SNMP transactions. You can choose between the following options: • **MD5** – Message Digest Algorithm • **SHA** – Secure Hash Algorithm
EncryptFlag	This flag appears only when **v3** is selected as the SNMPversion. By default, the eG agent does not encrypt SNMP requests. Accordingly, the this flag is set to **No** by default. To ensure that SNMP requests sent by the eG agent are encrypted, select the **Yes** option.
EncryptType	If this EncryptFlag is set to **Yes**, then you will have to mention the encryption type by selecting an option from the EncryptType list. SNMP v3 supports the following encryption types: • **DES** – Data Encryption Standard • **AES** – Advanced Encryption Standard
EncryptPassword	Specify the encryption password here.
Confirm Password	Confirm the encryption password by retyping it here.
Timeout	Specify the duration (in seconds) within which the SNMP query executed by this test should time out in this text box. The default is 10 seconds.
Data Over TCP	By default, in an IT environment, all data transmission occurs over UDP. Some environments however, may be specifically configured to offload a fraction of the data traffic – for instance, certain types of data traffic or traffic pertaining to specific components – to other protocols like TCP, so as to prevent UDP overloads. In such

Parameter	Description
	environments, you can instruct the eG agent to conduct the SNMP data traffic related to the monitored target over TCP (and not UDP). For this, set this flag to **Yes**. By default, this flag is set to **No**.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Total stack size	Indicates the total size of stack memory utilized by this task.	MB	
Used stack size	Indicates the amount of stack memory utilized by this task.	MB	A low value is desired for this measure.
Free stack size	Indicates the amount of stack memory that is available for use by this task.	MB	A high value is desired for this measure.
Used stack size utilization	Indicates the percentage of stack memory utilized by this task.	Percent	A utilization value close to 100% is indicative of a memory bottleneck at the router.

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.

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