Monitoring BIG-IP F5 Traffic Manager

eG Innovations Product Documentation

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Total Performance Visibility

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Chapter 1: Introduction

The BIG-IP Local Traffic Manager (LTM) is an application delivery networking system that secures, optimizes, and delivers applications.

This system provides a suite of security services that enhance network and protocol level security, filter application attacks, and thus protect your mission-critical applications. In addition, the BIG-IP Local Traffic Manager removes single points of failure and virtualizes the network and applications using industry-leading L7 intelligence. Furthermore, it includes static and dynamic load balancing methods, which track dynamic performance levels of servers in a group and ensures that all sites are always on, more scalable, and easier to manage.

Since application delivery delays, inefficiencies, and failures can cause prolonged service outages and cost an enterprise money and reputation, the continuous operation and good health of the LTM is of paramount importance. To ensure this, eG Enterprise provides a specialized *F5 Traffic Manager* model that helps the administrator to continuously monitor the F5 Traffic Manager.

Chapter 1: How does eG Enterprise Monitor F5 Traffic Manager?

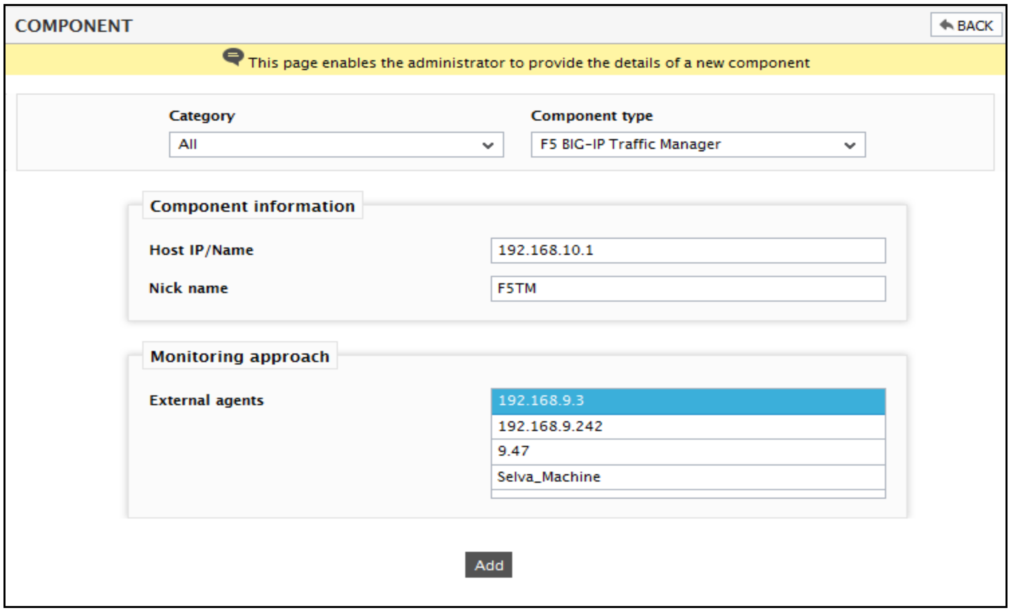
eG Enterprise is capable of monitoring the F5 Traffic Manager in an agentless manner. All that is required for this is a single eG agent be deployed on any remote Windows host in the environment. Th eG agent communicates with the F5 Traffic Manager via the SNMP-MIB interface supported by the F5 Traffic Manager. The eG agent polls the SNMP-MIB of the F5 Traffic Manager at regular basis and pulls out the critical statistics pertaining to its performance. Before attempting to monitor the F5 Traffic Manager, ensure that the F5 Traffic Manager is SNMP-enabled.

1.1 Managing the BIG-IP F5 Traffic Manager

The eG Enterprise cannot automatically discover a BIG-IP F5 Traffic Manager. This implies that you need to manually add the component for monitoring. To manage a BIG-IP F5 Traffic Manager component, do the following:

1. Log into the eG administrative interface.
2. Follow the Components -> Add/Modify menu sequence in the **Infrastructure** tile of the **Admin** menu.

3. In the **COMPONENTS** page that appears next, select BIG-IP F5 Traffic Manager as the **Component** type. Then, click the **Add New Component** button. This will invoke Figure 1.1.



COMPONENT

This page enables the administrator to provide the details of a new component

Category: All

Component type: F5 BIG-IP Traffic Manager

Component information

Host IP/Name: 192.168.10.1

Nick name: F5TM

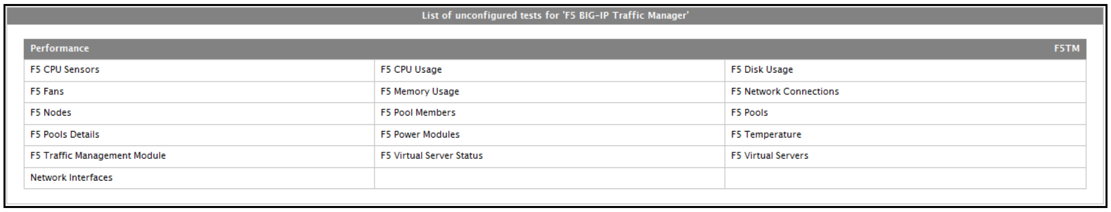
Monitoring approach

External agents: 192.168.9.3 (selected), 192.168.9.242, 9.47, Selva_Machine

Figure 1.1: Adding a BIG-IP F5 Traffic Manager component

4. Specify the **Host IP/Name** and **Nick name o**f the BIG-IP F5 Traffic Manager component to be monitored as shown in Figure 1.1. Then, click **Add** button to register the changes. Remember that eG Enterprise automatically manages the components that are added manually.

5. When you attempt to sign out, a list of unconfigured tests appears.

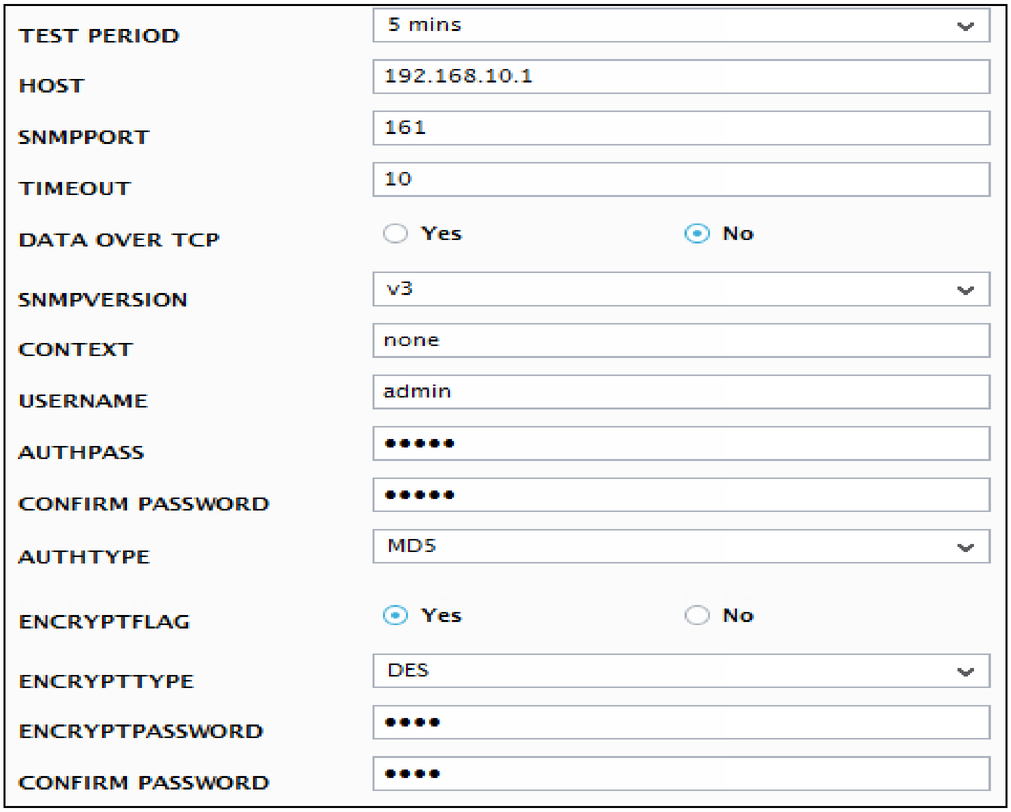


List of unconfigured tests for 'F5 BIG-IP Traffic Manager'

Performance		F5TM
F5 CPU Sensors	F5 CPU Usage	F5 Disk Usage
F5 Fans	F5 Memory Usage	F5 Network Connections
F5 Nodes	F5 Pool Members	F5 Pools
F5 Pools Details	F5 Power Modules	F5 Temperature
F5 Traffic Management Module	F5 Virtual Server Status	F5 Virtual Servers
Network Interfaces		

Figure 1.2: List of unconfigured tests to be configured for the BIG-IP F5 Traffic Manager

6. Click on any test in the list of unconfigured tests. For instance, click on the **F5 CPU Sensors** test to configure it. In the page that appears, specify the parameters as shown in Figure 1.3.



TEST PERIOD	5 mins
HOST	192.168.10.1
SNMPPORT	161
TIMEOUT	10
DATA OVER TCP	○ Yes ● No
SNMPVERSION	v3
CONTEXT	none
USERNAME	admin
AUTHPASS	●●●●●
CONFIRM PASSWORD	●●●●●
AUTHTYPE	MD5
ENCRYPTFLAG	● Yes ○ No
ENCRYPTTYPE	DES
ENCRYPTPASSWORD	●●●●
CONFIRM PASSWORD	●●●●

Figure 1.3: Configuring the F5 CPU Sensors test

To know how to configure the tests, refer to the **Monitoring the BIG-IP Local Traffic Manager (LTM)**.

7. Finally, signout of the eG administrative interface.

Chapter 2: Monitoring the BIG-IP Local Traffic Manager (LTM)

The eG Enterprise provides a specialized *F5 Traffic Manager* model. By periodically polling the SNMP MIB of the traffic manager, the eG external agent extracts useful metrics revealing the availability of the manager, the resource usage of the manager, the status of the pools managed by the manager, and more!

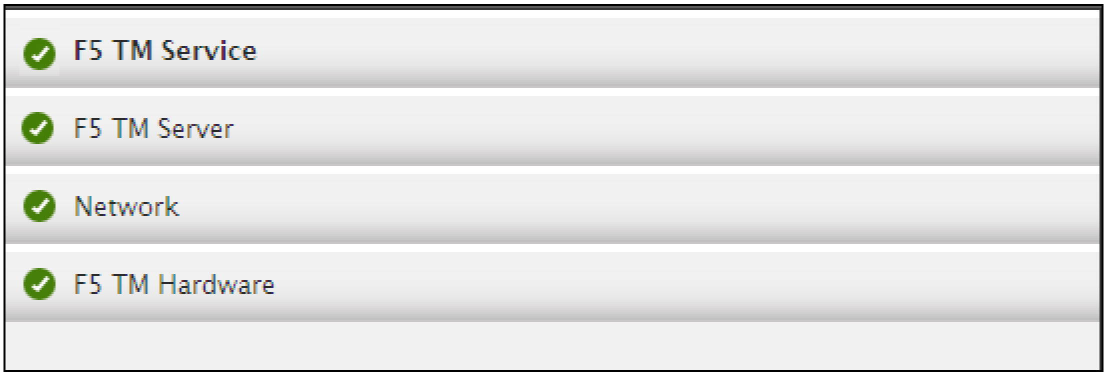


Figure 2.1: Layer model of the F5 Traffic Manager

With the help of the metrics that are extracted by the eG external agent, the following questions can be answered easily and accurately:

- Is the LTM available over the network? If so, how quickly is it responding to requests?
- Is any network interface supported by the LTM consuming bandwidth excessively?
- Which is the faster network interface supported by the LTM?
- Is the CPU temperature very high?
- Are any disk partitions on the LTM over-utilized? If so, which ones?
- Has any chassis fan on the LTM failed? If so, which one?
- Is any chassis fan functioning at abnormal speed?
- Is the temperature of any chassis temperature sensor abnormally high?
- What is the current state of each pool configured on the LTM?
- Is any virtual server disabled currently? If so, was it disabled by the parent?

The sections that will follow will discuss each of the layers depicted by Figure 2.1 above.

2.1 The F5 TM Hardware Layer

This layer monitors the critical hardware components of the traffic manager such as CPUs, disk partitions, fans, and temperature sensors, and proactively alerts administrators to hardware failures.

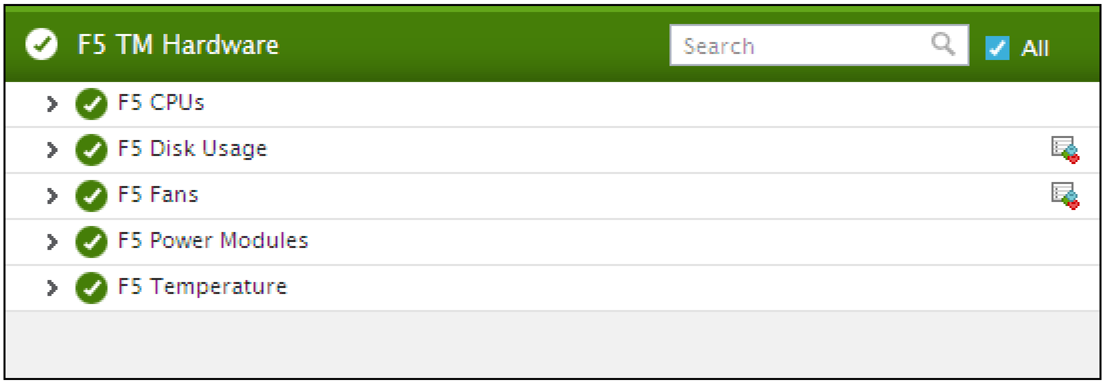


Figure 2.2: The tests mapped to the F5 TM Hardware layer

2.1.1 F5 CPU Usage Test

This test reports the current utilization of each CPU available in the Traffic Manager. Using this test, administrators can be proactively alerted to abnormal CPU utilization so that further investigation could be warranted and the real cause of resource contention be identified.

Target of the test : A Big-IP/F5 Local Traffic Manager

Agent deploying the test : An external agent

Outputs of the test : One set of results for each CPU of the traffic manager 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 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 firewall. This

Parameter	Description
	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 selecting an option from the EncryptType list. SNMP v3 supports the following

Parameter	Description
	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 utilization:	Indicates the percentage utilization of this CPU in the traffic manager.	Percent	Ideally, the value should be low. An unusually high value or a consistent increase in this value is indicative of abnormal CPU usage which requires further investigation.

2.1.2 F5 CPUs Test

This test reports the temperature and fan speed of the CPU supported by the traffic manager.

Target of the test : A Big-IP/F5 Local Traffic Manager

Agent deploying the test : An external agent

Outputs of the test : One set of results for the traffic manager 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 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 firewall. 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:

Parameter	Description
	- **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 high value of this measure is a cause for concern.
CPU fan speed	Indicates the current fan speed of the CPU.	Rpm	Ideally, the speed of the fan should be within permissible limits.

2.1.3 F5 Disk Usage Test

This test reports the space usage of each disk partition on the traffic manager, and thus indicates which disk is currently running out of space.

Target of the test : A Big-IP/F5 Local Traffic Manager

Agent deploying the test : An external agent

Outputs of the test : One set of results for each disk partition in the traffic manager 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 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 firewall. 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

Parameter	Description
	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 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 space	Indicates the total available space in this disk partition.	MB	
Free space	Indicates the free space in this disk partition.	MB	
Used space	Indicates the amount of space that has been used up on this partition.	MB	
Percent free space	Indicates the percentage of free space in this disk partition.	Percent	Ideally, the value of this measure should be high. A low value is indicative of excessive space usage on the disk partition. Compare the value of this measure across disk partition to accurately identify which partition is facing a potential space crunch.

2.1.4 F5 Fans Test

This test reports the current state and speed of each fan supported by the traffic manager.

Target of the test : A Big-IP/F5 Local Traffic Manager

Agent deploying the test : An external agent

Outputs of the test : One set of results for each chassis fan supported by the traffic manager 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 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 firewall. 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

Parameter	Description
	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**.
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

Measurements	Description	Measurement Unit	Interpretation
Chassis fan status	Indicates the current status of this fan.	Boolean	Ideally, the value for this measure should be 1, which means the Fan is in good state and it is enabled. If this measure reports the value of 0 or 2, then it implies that the fan is in bad state or the fan is not present. Use the detailed diagnosis of this measure to know exactly what state the numeric value reported by the test represents.
Chassis fan speed	Indicates the actual speed of this chassis fan.	Rpm	Ideally, the speed of the fan should be within permissible limits.

2.1.5 F5 Temperature Test

This test reports the current temperature of the chassis temperature sensor. **Note that this test is only supported on those platforms in which the sensor data is available**.

Target of the test : A Big-IP/F5 Local Traffic Manager

Agent deploying the test : An external agent

Outputs of the test : One set of results for the traffic manager 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 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 firewall. This parameter is specific to SNMP **v1** and **v2** only. Therefore, if the SNMPVersion chosen is **v3**, then this parameter will not appear.

Parameter	Description
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 selecting an option from the EncryptType list. SNMP v3 supports the following encryption types:

Parameter	Description
	• **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

Measurements	Measurement	Measurement Unit	Interpretation
Chassis temperature	Indicates the current temperature of the chassis temperature sensor.	Celsius	Ideally, the value should be low. A high value could be a cause for concern.

2.1.6 F5 Power Modules Test

This test reports the current status of the chassis power supply thus proactively alerting the administrators of abnormalities in the power supply, if any.

Target of the test : A Big-IP/F5 Local Traffic Manager

Agent deploying the test : An external agent

Outputs of the test : One set of results for each chassis power supply supported by the traffic manager 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 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 firewall. 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:

Parameter	Description
	- **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

Measurements	Measurement	Measurement Unit	Interpretation
Chassis power status	Indicates the current status of this chassis power supply.		The values that this measure can report and its numeric equivalents are mentioned in the table below:

<table>
<tr><th>Measurements</th><th>Measurement</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>Measure Value</th><th>Numeric Value</th></tr>
<tr><td>Bad</td><td>0</td></tr>
<tr><td>Good</td><td>1</td></tr>
<tr><td>Not present</td><td>2</td></tr>
</table>
<b>Note:</b>
By default, this measure can report the <b>Measure Value</b>s mentioned above while indicating the current status of the chassis power supply. However, the graph of this measure is indicated using the numeric equivalents 0 - 2 only.
</td></tr>
</table>

2.1.7 F5 Memory Usage Test

This test monitors the memory utilization of the Traffic Manager and proactively alerts administrators to potential resource contention.

Target of the test : A Big-IP/F5 Local Traffic Manager

Agent deploying the test : An external agent

Outputs of the test : One set of results for the traffic manager 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 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 firewall. This

Parameter	Description
	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 selecting an option from the EncryptType list. SNMP v3 supports the following

Parameter	Description
	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

Measurements	Description	Measurement Unit	Interpretation
Total memory	Indicates the current memory that is available in this traffic manager.	MB	
Used memory	Indicates the amount of memory that is already used by this traffic manager.	MB	A low value is desired for this measure.
Memory utilization	Indicates the percentage of memory that is utilized by this traffic manager.	Percent	A low value is desired for this measure. While sporadic spikes in memory usage could be caused by one/more rogue processes on the traffic manager, a consistent increase in this value could be a cause for some serious concern, as it indicates a gradual, but steady erosion of valuable memory resources.

Measurements	Description	Measurement Unit	Interpretation
Free memory	Indicates the amount of memory that is available for use in this traffic manager.	MB	A sudden decrease in this value could indicate an unexpected/sporadic spike in the memory utilization of the traffic manager. A consistent decrease however could indicate a gradual, yet steady erosion of memory resources, and is hence a cause for concern.

2.1.8 The Network Layer

Use the **Network** test mapped to this layer to assess the health of network connections to and from the traffic manager. Since this test has been discussed adequately in the *Monitoring Unix and Windows servers* document, let us proceed to the next layer.

Figure 2.3: The test mapped to the Network layer

2.2 The F5 TM Server Layer

With the help of the tests mapped to this layer, you can be promptly alerted to the abnormal state of one/more virtual servers in the pools configured on the traffic manager, and the irregularities in load balancing amongst the virtual servers.

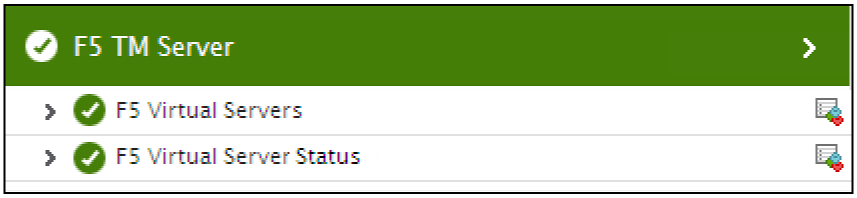


Figure 2.4: The tests mapped to the F5 TM Server Layer

The sections that follow discusses the tests pertaining to this layer in detail.

2.2.1 F5 Virtual Servers Test

A virtual server is capable of performing the following:

- Distribute client requests across multiple servers to balance server load;
- Apply various behavioral settings to a specific type of traffic;
- Enable persistence for a specific type of traffic;
- Direct traffic according to user-written iRules

In addition, virtual servers can also be used in the following ways:

- Directing traffic to a load balancing pool;
- Sharing an IP address with a VLAN node;
- Forwarding traffic to a specific destination IP address;
- Increasing the speed of processing HTTP traffic;
- Increasing the speed of processing Layer 4 traffic;
- Relaying DHCP traffic

Since the virtual servers are able to manage the traffic and divert client requests to servers that are managing fewer requests, poor performance and outages can be avoided. Irregularities in load balancing can cause significant delay in request processing thus affecting the user experience with the load balancing system.To avoid this, you can configure the periodic execution of the **F5 Virtual Servers** test. For each virtual server configured on the traffic manager, this test continuously monitors the load on the load-balancing virtual servers and reveals how well each server processes client requests. In addition, this test detects inconsistencies in load-balancing early on and warns administrators of possible deviations proactively.

Target of the test : A Big-IP/F5 Local Traffic Manager

Agent deploying the test : An external agent

Outputs of the test : One set of results for each pool configured on a traffic manager

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 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 firewall. 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:

Parameter	Description
	• **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**.
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

Measurements	Description	Measurement Unit	Interpretation
Data transmitted	Indicates the rate at which data is transmitted from this virtual server during the last measurement period.	MB/Sec	Compare the value of these measures across the virtual servers to identify the server that is experiencing the maximum traffic.
Data received	Indicates the rate at which data is received by this virtual server during the last measurement period.	MB/Sec	
Packets transmitted	Indicates the rate at which packets were transmitted from this virtual server during the last measurement period.	Packets/Sec	Compare the value of these measures across the virtual servers to identify the server that is handling maximum traffic.
Packets received	Indicates the rate at which packets were received by this virtual server during the last measurement period.	Packets/Sec	
Active connections	Indicates the number of connections that are currently active on this virtual server.	Number	This measure is a good indicator of the load on the virtual server.
Total connections	Indicates the total number of connections established on this virtual server since the restart of the traffic manager.	Number	
Connection during the last measure period	Indicates the rate at which connections were established during the last measurement period.	Conns/Sec	
Connection usage	Indicates the percentage of connections that were used by this virtual server.	Percent	A value close to 100% indicates that the virtual server is currently overloaded.

Measurements	Description	Measurement Unit	Interpretation
Maximum connections established	Indicates the maximum number of connections that were established on this virtual server since the start of the traffic manager.	Number	
Requests	Indicates the rate at which requests were processed by this virtual server.	Requests/sec	
CPU usage	Indicates the percentage of time this virtual server was busy during the past minute.	Percent	A value close to 100 is a cause of concern.
Average time for all connections	Indicates the average time required for establishing all the connections to this virtual server.	Milliseconds	A sudden/gradual increase in the value of this measure may indicate connection issues to the virtual server.

2.2.2 F5 Virtual Server Status Test

A virtual server is a traffic-management object on the BIG-IP system that is represented by an IP address and a service. Clients on an external network can send application traffic to a virtual server, which then directs the traffic according to your configuration instructions. The main purpose of a virtual server is often to balance traffic load across a pool of servers on an internal network. Virtual servers increase the availability of resources for processing client requests.

Not only do virtual servers distribute traffic across multiple servers, they also treat varying types of traffic differently, depending on your traffic-management needs. Therefore, the avalibility of the virtual servers in the system is imperative for balancing the load. The **F5 virtual Servers** test exactly helps administrators in identifying the availability status of the virtual servers.

This test reports the current availability status of each virtual server in a pool and if the virtual server is available, this tests reports the current activity status of each virtual server.

Target of the test : A Big-IP/F5 Local Traffic Manager

Agent deploying the test : An external agent

Outputs of the test : One set of results for each virtual server in the pools configured on a traffic manager

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 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 firewall. 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

Measurements	Description	Measurement Unit	Interpretation
Virtual server available status	Indicates the current status of this virtual		The values that this measure can report and its numeric equivalents are

<table>
<tr><th>Measurements</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td>server.</td><td></td><td>mentioned in the table below:
<table>
<tr><th>Measure Value</th><th>Numeric Value</th></tr>
<tr><td>None</td><td>0</td></tr>
<tr><td>Available</td><td>1</td></tr>
<tr><td>Currently not available</td><td>2</td></tr>
<tr><td>Offline</td><td>3</td></tr>
<tr><td>Unknown</td><td>4</td></tr>
<tr><td>Unlicensed</td><td>5</td></tr>
</table>
<b>Note:</b>
By default, this measure can report the <b>Measure Value</b>s mentioned above while indicating the current status of the virtual server. However, the graph of this measure is indicated using the numeric equivalents 0 - 5 only.</td></tr>
<tr><td>Virtual server activity status</td><td>Indicates the current activity status of this virtual server as specified by the user.</td><td></td><td>This measure appears only if the Virtual server available status measure reports the Measure Value Available.
The values that this measure can report and its numeric equivalents are mentioned in the table below:
<table>
<tr><th>Measure Value</th><th>Numeric Value</th></tr>
<tr><td>None</td><td>0</td></tr>
<tr><td>Enabled</td><td>1</td></tr>
<tr><td>Disabled</td><td>2</td></tr>
<tr><td>Disabled by parent</td><td>3</td></tr>
</table>
<b>Note:</b>
By default, this measure can report the</td></tr>
</table>

Measurements	Description	Measurement Unit	Interpretation
			Measure Values mentioned above while indicating the current activity status of the virtual server. However, the graph of this measure is indicated using the numeric equivalents 0 - 3 only.

2.3 The F5 TM Service Layer

Quickly detect changes in the status of the pools configured on the traffic manager using the tests mapped to this layer.

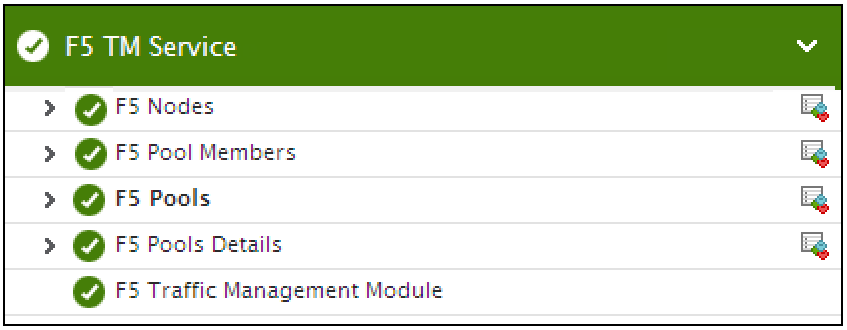


Figure 2.5: The test mapped to the F5 TM Service Layer

2.3.1 F5 Pools Test

In a typical client – server scenario, a client request is directed to the destination IP address specified in the header of the request. For sites with huge volumes of traffic, the destination server may be quickly overloaded, Therefore, it is imperative to create a load balancing pool. A load balancing pool is a logical set of devices, such as web servers, that you group together to receive and process traffic. Instead of sending client traffic to the destination IP address specified in the client request, Local Traffic Manager sends the request to any of the servers that are members of that pool. This helps to efficiently distribute the load on your server resources. In order to efficiently distribute the load across the servers, it is essential to constantly monitor the availability of the load balancing pools. This is where the **F5 Pools** test helps.

This test reports the current status of each of the pools configured on the traffic manager and if the pool is available, this test reports the activity status of each pool.

Target of the test : A Big-IP/F5 Local Traffic Manager

Agent deploying the test : An external agent

Outputs of the test : One set of results for each pool configured on a traffic manager

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 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 firewall. 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**.

Parameter	Description
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 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**.
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.

Parameter	Description
	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

<table>
<tr><th>Measurements</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td>Pool available status</td><td>Indicates the current status of this pool.</td><td></td><td>The values that this measure can report and its numeric equivalents are mentioned in the table below:
<table>
<tr><th>Measure Value</th><th>Numeric Value</th></tr>
<tr><td>None</td><td>0</td></tr>
<tr><td>Available</td><td>1</td></tr>
<tr><td>Currently not available</td><td>2</td></tr>
<tr><td>Offline</td><td>3</td></tr>
<tr><td>Unknown</td><td>4</td></tr>
<tr><td>Unlicensed</td><td>5</td></tr>
</table>
<b>Note:</b>
By default, this measure can report the <b>Measure Value</b> s mentioned above while indicating the current status of the pool. However, the graph of this measure is indicated using the numeric equivalents 0 - 5 only.</td></tr>
<tr><td>Pool activity status</td><td>Indicates the current activity status of this pool as specified by the</td><td></td><td>The values that this measure can report and its numeric equivalents are mentioned in the table below:</td></tr>
</table>

<table>
<tr><th>Measurements</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td>user.</td><td></td><td>
<table>
<tr><th>Measure Value</th><th>Numeric Value</th></tr>
<tr><td>None</td><td>0</td></tr>
<tr><td>Enabled</td><td>1</td></tr>
<tr><td>Disabled</td><td>2</td></tr>
<tr><td>Disabled by parent</td><td>3</td></tr>
</table>
<b>Note:</b>
By default, this measure can report the <b>Measure Value</b> s mentioned above while indicating the current activity status of the pool. However, the graph of this measure is indicated using the numeric equivalents 0 - 3 only.</td></tr>
</table>

2.3.2 F5 Pools Details Test

The Local Traffic Manager can be configured to perform a number of different operations for a load balancing pool such as:

- Associate health monitors with pools and pool members
- Enable or disable SNAT connections
- Rebind a connection to a different pool member if the originally- targeted pool member becomes unavailable
- Specify a load balancing algorithm for a pool
- Set the Quality of Service or Type of Service level within a packet
- Assign pool members to priority groups within a pool

With the help of the load balancing pool, client requests can be evenly distributed across the servers of the pool. Sometimes, the load balancing pools may not be able to handle the client requests owing to performance issues or lack of resources which may inturn cause irregularities in load balancing. To avoid such a situation, you need to monitor the load balancing pools at periodic intervals. The **F5**

Pools Details test exactly does the same. Using this test, administrators can determine the following:

- How well each load balancing pool is handling the data/packet traffic?;
- How many connections are handled by the pool and how many are currently active on the pool?;
- How many connections have been used and how many maximum connections are established in the pool since the start of the traffic manager?

This way, administrators can constantly keep a vigil on the load balancing pool and proactively avoid performance and load balancing issues, if any.

Target of the test : A Big-IP/F5 Local Traffic Manager

Agent deploying the test : An external agent

Outputs of the test : One set of results for each pool configured on a traffic manager

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 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 firewall. 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.

Parameter	Description
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.
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.

Parameter	Description
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

Measurements	Description	Measurement Unit	Interpretation
Data transmitted	Indicates the rate at which data is transmitted from this pool during the last measurement period.	MB/Sec	Compare the values of these measures across the pools to identify the pool that is experiencing the maximum traffic.
Data received	Indicates the rate at which data is received in this pool during the last measurement period.	MB/Sec	
Packets transmitted	Indicates the rate at which packets were transmitted from this pool during the last measurement period.	Packets/Sec	Compare the values of these measures across the pools to identify the pool that is handling maximum amount of traffic.
Packets received	Indicates the rate at which packets were received in this pool during the last measurement period.	Packets/Sec	
Active connections	Indicates the number of connections that are currently active in this pool.	Number	
Total connections	Indicates the total number of connections established on this pool since the start of the traffic manager.	Number	
Connection during	Indicates the rate at which	Conns/Sec	

Measurements	Description	Measurement Unit	Interpretation
the last measure period	connections were established during the last measurement period.		
Connection usage	Indicates the percentage of connections that were used by this pool.	Percent	
Maximum connections established	Indicates the maximum number of connections that were established on this pool since the start of the traffic manager.	Number	

2.3.3 F5 Pool Members Test

This test auto-discovers the members of each load balancing pool and reports the data /packet traffic through each member, the number of active connections and total connections. In addition, this test reports how well the conenctions are used by each member. This way, administrators can figure out how well each pool member handles the load and proactively detect load balancing irregularities, if any.

Target of the test : A Big-IP/F5 Local Traffic Manager

Agent deploying the test : An external agent

Outputs of the test : One set of results for each pool configured on a traffic manager

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 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 firewall. This

Parameter	Description
	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 selecting an option from the EncryptType list. SNMP v3 supports the following

Parameter	Description
	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**.
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

Measurements	Descriptions	Measurement Unit	Interpretation
Connection during the last measure period	Indicates the rate at which connections were established during the last measurement period.	Conns/Sec	

Measurements	Descriptions	Measurement Unit	Interpretation
Data transmitted	Indicates the rate at which data is transmitted from this member during the last measurement period.	MB/Sec	Comparing the value of these measures across the pool members will help you identify the pool member that is handling maximum traffic.
Data received	Indicates the rate at which data is received in this member during the last measurement period.	MB/Sec	
Packets transmitted	Indicates the rate at which packets were transmitted from this member during the last measurement period.	Packets/Sec	Compare the value of these measures across the pool members to identify the pool member that is experiencing the maximum traffic.
Packets received	Indicates the rate at which packets were received in this member during the last measurement period.	Packets/Sec	
Active connections	Indicates the number of connections that are currently active in this member.	Number	
Connection usage	Indicates the percentage of connections that were used by this member.	Percent	
Maximum connections established	Indicates the maximum number of connections that were established on this member since the restart of the traffic manager.	Number	

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.