Monitoring Mikrotik 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.

A large number of users can choke the traffic on 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 users and ascertain if they are genuine users and the resource utilization of the router, so that any sudden increase in load or erosion of resources can be instantly detected, and remedial action be initiated immediately. The eG- developed custom monitoring model for Mikrotik Routers helps network administrators in this regard.

This document describes the eG-developed custom monitor for Mikrotik Routers.

Chapter 2: How does eG Enterprise Monitor Mikrotik Router?

eG Enterprise monitors the Mikrotik Router in an agentless manner. For this purpose, an eG external agent is deployed on any remote host in the environment. This agent communicates with the Mikrotik router and collects the performance metrics by executing the CLI commands on the router and also from the SNMP-MIB of the router. To collect metrics from the SNMP-MIB, eG agent requires the router to be SNMP enabled.

2.1 Managing the Mikrotik Router

To configure a router for monitoring by the eG Enterprise:

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.

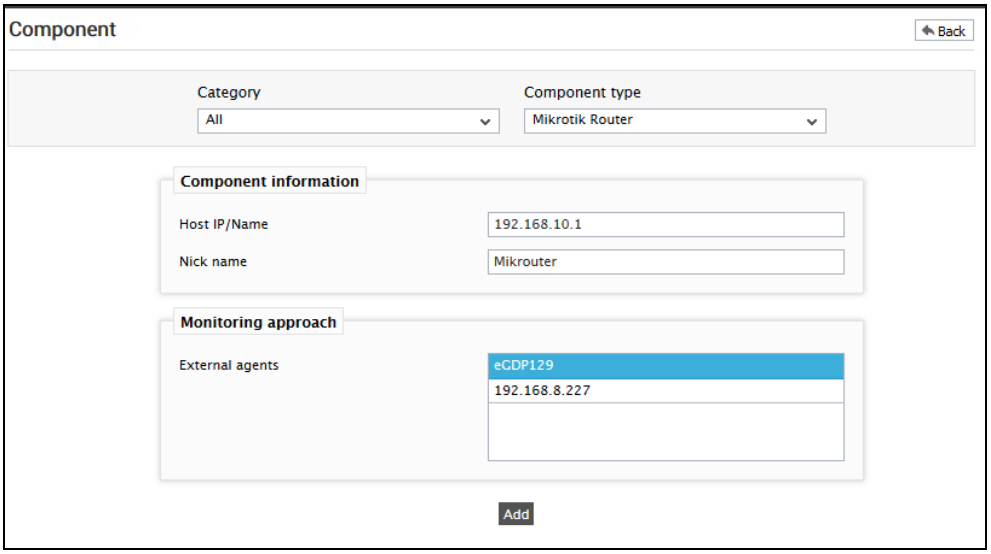

Figure 2.1: Adding a new Mikrotik Router

3. Now, attempt to sign out of the eG administrative interface. Doing so will result in the display of Figure 2.2, which lists all the unconfigured tests of the Mikrotik Router.

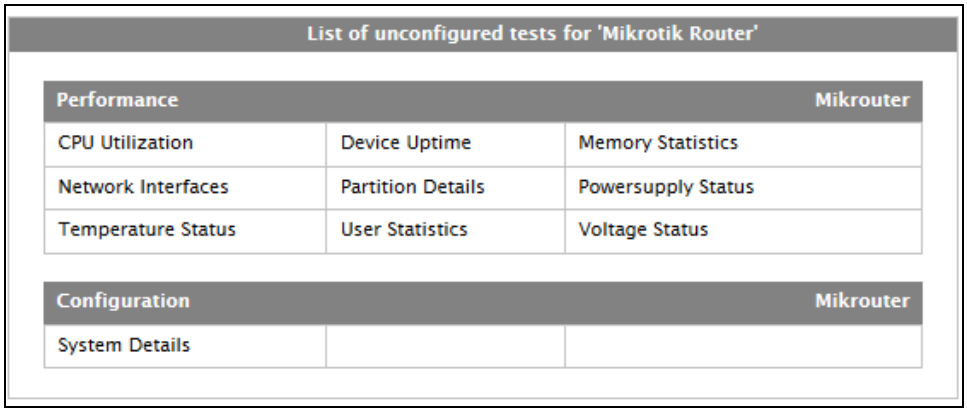

Figure 2.2: List of unconfigured tests for the Mikrotik router

4. Click the CPU Utilization Test to configure the test. Figure 2.3 then appears.

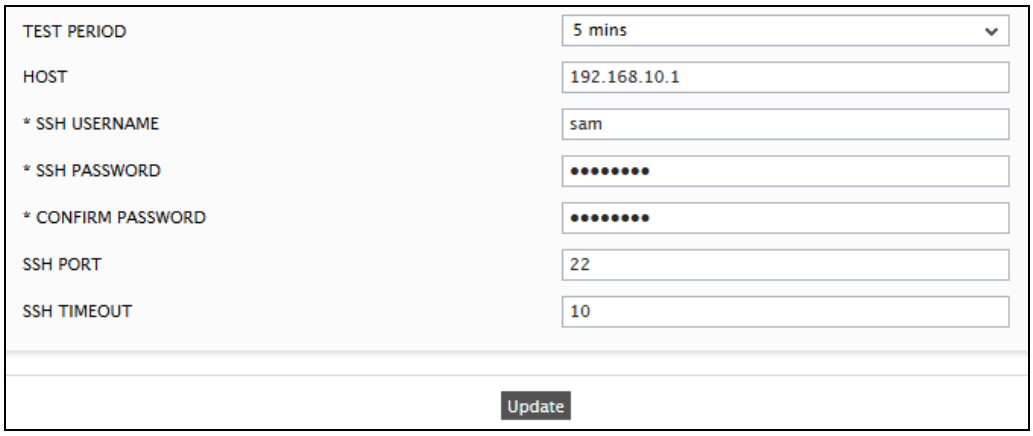

Figure 2.3: Configuring the CPU Utilization test

5. Then, signing out of the eG administrative interface will prompt you to configure a few more tests as shown in Figure 2.4.

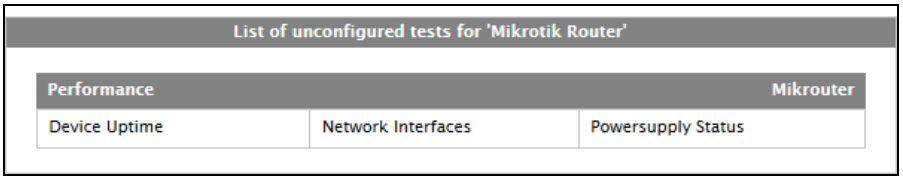

Figure 2.4: The list of unconfigured tests for the Mikrotik router

6. Click the Powersupply Status Test to configure it. Figure 2.5 then appears.

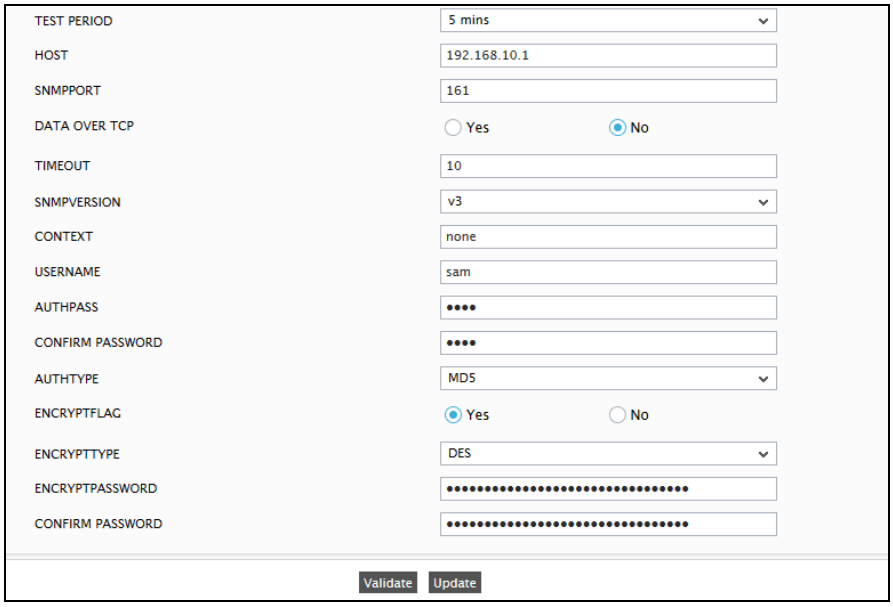

Figure 2.5: Configuring the Powersupply Status test

7. Finally, signout of the eG administrative interface.

Chapter 3: Monitoring Mikrotik Router

eG Enterprise prescribes an exclusive Mikrotik Router monitoring model (see Figure 3.1), that determines the CPU and memory utilization, the status of the power supplies, the temperature and voltage of the router at frequent intervals.

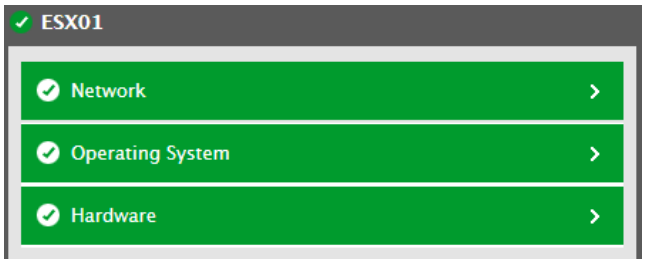

Figure 3.1: The layer model of the Fujitsu Primergy Rack server

Using the metrics reported, administrators can find quick and accurate answers for the following performance questions:

- What is the percentage of CPU utilized by the router?
- How much of memory is available for use in the router?
- What is the amount of memory utilized by the router?
- What is the current state of the power supply unit of the router?
- What is the current state of the power supply unit that acts as a backup in the router?
- What is the current temperature of the router?
- What is the voltage passing through the router?
- How many unique active users are connected to the router?
- Are the partitions active and running?
- What is the size of each partition?

The **Network** layer of the **Mikrotik Router** model is similar to that of a **Windows Generic** server model. Since these tests have been dealt with in the *Monitoring Windows and Unix Servers* document, the section to come focuses on the other layers associated with the router.

3.1 The Operating System Layer

Using the tests mapped to this layer, administrators can track the CPU and memory utilization of the router. In addition, the voltage and temperature of the router can be detected and the status and size of each partition on the target router can be determined. The various tests of interest are as depicted in Figure 3.2

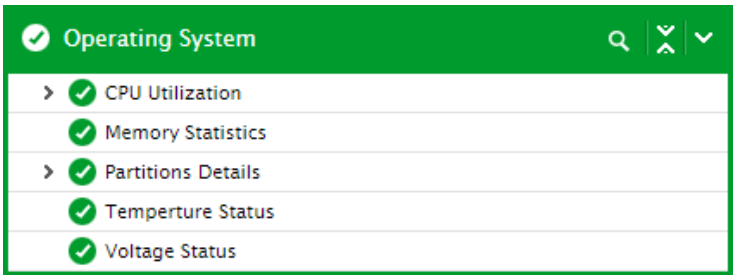

Figure 3.2: Lists of tests associated with the Operating System layer

3.1.1 CPU Utilization Test

This test monitors the current CPU utilization of the router. If the device is found to consume CPU resources excessively, then, this test will help administrators troubleshoot the CPU spikes at the earliest.

Target of the test : A Mikrotik Router

Agent deploying the test : An external agent

Outputs of the test : One set of results for the target Mikrotik 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 router for which this test is to be configured.
SSH Username and SSH Password	Specify the credentials of a user who has the right to execute CLI (command-line interface) commands on the target router and pull out metrics via SSH.
Confirm Password	Confirm the SSH Password by retyping it here.
SSH Port	Specify the SSH port of the target router here; The default value is 22.
SSH Timeout	Specify the duration (in seconds) beyond which the execution of this test should time out in this text box. The default is 10 seconds.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
CPU utilization	Indicates the percentage of CPU utilized by the router.	Percent	A value close to 100% is a cause of concern which requires further investigation.

3.1.2 Memory Statistics Test

This test monitors the current CPU utilization of the router. If the device is found to consume CPU resources excessively, then, this test will help administrators troubleshoot the CPU spikes at the earliest.

Target of the test : A Mikrotik Router

Agent deploying the test : An external agent

Outputs of the test : One set of results for the target Mikrotik 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 router for which this test is to be configured.
SSH Username and SSH Password	Specify the credentials of a user who has the right to execute CLI (command-line interface) commands on the target router and pull out metrics via SSH.
Confirm Password	Confirm the SSH Password by retyping it here.
SSH Port	Specify the SSH port of the target router here; The default value is 22.
SSH Timeout	Specify the duration (in seconds) beyond which the execution of this test should time out in this text box. The default is 10 seconds.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Total memory	Indicates the total amount of memory allotted for the	MB	

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

3.1.3 Partition Details Test

This test auto-discovers the partitions of the target router and for each partition, reports whether the partition is active and running. Besides, this test also reveals the size of each partition.

Target of the test : A Mikrotik Router

Agent deploying the test : An external agent

Outputs of the test : One set of results for each partition 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 router for which this test is to be configured.
SSH Username and SSH Password	Specify the credentials of a user who has the right to execute CLI (command-line interface) commands on the target router and pull out metrics via SSH.
Confirm Password	Confirm the SSH Password by retyping it here.
SSH Port	Specify the SSH port of the target router here; The default value is 22.
SSH Timeout	Specify the duration (in seconds) beyond which the execution of this test should time out in this text box. The default is 10 seconds.

Measurements made by the test

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td>Is partition active?</td><td>Indicates whether/not this partition is active.</td><td></td><td>This measure reports the value Yes if the partition is active and the value No if it is not.

The numeric values that correspond to the aforesaid measure values are as follows:

<table><tr><th>Measure Value</th><th>Numeric Value</th></tr><tr><td>Yes</td><td>1</td></tr><tr><td>No</td><td>0</td></tr></table>
Note:

Typically, this measure reports the Measure Values listed above to indicate whther/not this partition is active. However, in the graph of this measure, the same is indicated using the numeric equivalents only.</td></tr>
<tr><td>Is partition running?</td><td>Indicates whether/not this partition is running.</td><td></td><td>This measure reports the value Yes if the partition is running and the value No if it is not.

The numeric values that correspond to the aforesaid measure values are as follows:

<table><tr><th>Measure Value</th><th>Numeric Value</th></tr><tr><td>Yes</td><td>1</td></tr><tr><td>No</td><td>0</td></tr></table>
Note:

Typically, this measure reports the Measure Values listed above to indicate whther/not this partition is</td></tr>
</table>

Measurement	Description	Measurement Unit	Interpretation
			running. However, in the graph of this measure, the same is indicated using the numeric equivalents only.
Size	Indicates the current size of this partition.	MB	

3.1.4 Powersupply Status Test

This test monitors the status of the power supply unit of the target router. In addition, this test also reports the status of the backup power supply of the target router.

Target of the test : A Mikrotik 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 host for which the 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

Parameter	Description
	the name of such a user against the username 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.
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

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td>Status</td><td>Indicates the current state of the power supply.</td><td>Number</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>Up</td><td>1</td></tr><tr><td>Down</td><td>0</td></tr></table>
Note:
By default, this measure reports the Measure Values listed in the table above to indicate the current status of the power supply. However, the graph of this measure is represented using its corresponding numeric equivalents only - 0 or 1.</td></tr>
<tr><td>Backup powersupply status</td><td>Indicates the current status of the power supply that is available as a backup to the main power supply.</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>Up</td><td>1</td></tr><tr><td>Down</td><td>0</td></tr></table></td></tr>
</table>

Measurement	Description	Measurement Unit	Interpretation
			Note: By default, this measure reports the **Measure Value**s listed in the table above to indicate the current status of the power supply that is the backup of the main power supply. However, the graph of this measure is represented using its corresponding numeric equivalents only - *0 or 1*.

3.1.5 Temperature Status Test

This test monitors the ambient temperature of the target router.

Target of the test : A Mikrotik 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 router for which this test is to be configured.
SSH Username and SSH Password	Specify the credentials of a user who has the right to execute CLI (command-line interface) commands on the target router and pull out metrics via SSH.
Confirm Password	Confirm the SSH Password by retyping it here.
SSH Port	Specify the SSH port of the target router here; The default value is 22.
SSH Timeout	Specify the duration (in seconds) beyond which the execution of this test should time out in this text box. The default is 10 seconds.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Temperature	Indicates the current temperature of the router.	Celsius	The value of this measure should normally be within admissible range. If the value of this measure is too high, then, it indicates a damage to the router.

3.1.6 Voltage Status Test

This test monitors the voltage of the target router.

Target of the test : A Mikrotik 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 router for which this test is to be configured.
SSH Username and SSH Password	Specify the credentials of a user who has the right to execute CLI (command-line interface) commands on the target router and pull out metrics via SSH.
Confirm Password	Confirm the SSH Password by retyping it here.
SSH Port	Specify the SSH port of the target router here; The default value is 22.
SSH Timeout	Specify the duration (in seconds) beyond which the execution of this test should time out in this text box. The default is 10 seconds.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Voltage	Indicates the current voltage of the router.	Voltage	

3.2 The Switch Services Layer

Using the test mapped to this layer, administrators can figure out the number of active users on the router. The IP address through which the users are accessing the router too can be tracked.

Figure 3.3: The tests associated with the Switch Services layer

3.2.1 User Statistics Test

This test reports the number of unique users on the target router. In the process, this test reveals the name of the users and the IP address through which the users accessed the router.

Target of the test : A Mikrotik 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 router for which this test is to be configured.
SSH Username and SSH Password	Specify the credentials of a user who has the right to execute CLI (command-line interface) commands on the target router and pull out metrics via SSH.
Confirm Password	Confirm the SSH Password by retyping it here.
SSH Port	Specify the SSH port of the target router here; The default value is 22.
SSH Timeout	Specify the duration (in seconds) beyond which the execution of this test should time out in this text box. The default is 10 seconds.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Unique users	Indicates the number of unique active users connected to the router.	Number	The detailed diagnosis of this measure lists the name of the users and the IP address through which the users connected to 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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