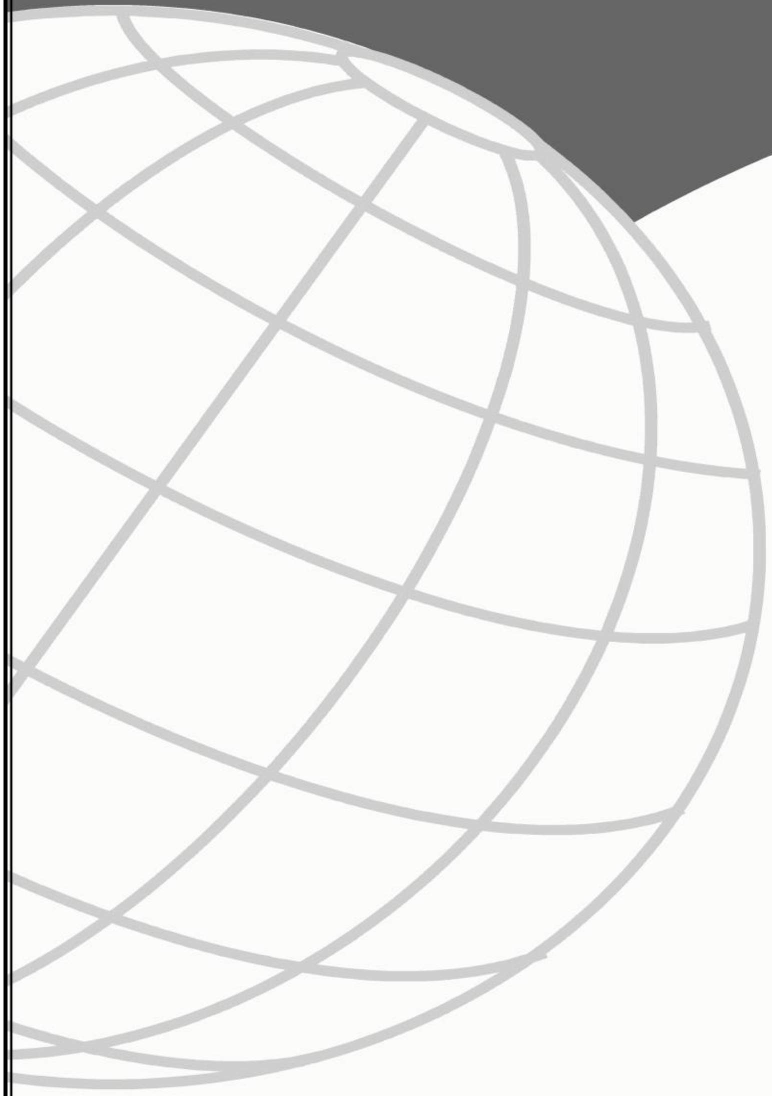

Enabling Service Excellence

Monitoring WatchGuard Firewall

eG Enterprise v6

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Monitoring the WatchGuard Firewall

Uninterrupted firewall operations are imperative to keep hackers and harmful viruses at bay. Any issue in the configuration, state, or resource usage of the firewall can bring its operations to a halt, leaving your network and all mission-critical applications operating within defenceless against malicious viruses and unscrupulous users! It is hence important that the performance of the firewall is monitored 24x7.

eG Enterprise provides a specialized *WatchGuard Firewall* monitoring model (see Figure 1), which periodically polls the SNMP MIBs of the firewall to measure the connections, responsiveness, resource usage, and VPN tunnel traffic of the firewall, and notifies administrators of potential resource crunches or configuration issues with the firewall.

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

- What is the current CPU utilization of the firewall?
- How many connections are active on the firewall? Are the connection dropped frequently? If so, how many connections are dropped?
- How well the data and packets are transmitted through the firewall?
- How well the data and packets are transmitted for each firewall policy? How many different error prone packets are discarded for each firewall policy?
- How well the data is transmitted through each VPN pair and VPN tunnel? How many different error prone packets were discarded?
- How well data is transmitted through each protocol for a security association and how many different error prone packets were discarded?

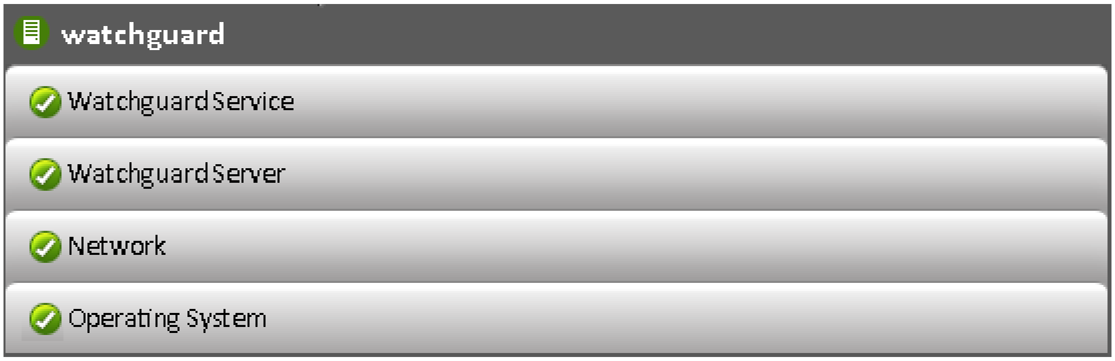
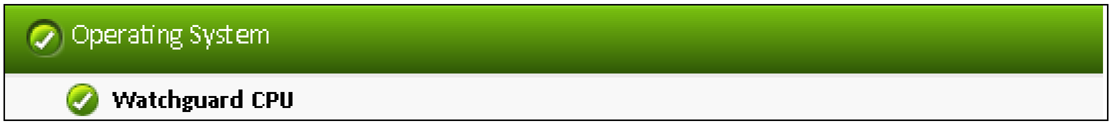


Figure 1: The layer model of the WatchGuard Firewall

The **Network** layer of the *WatchGuard Firewall* model is similar to that of a *Windows Generic* server model. Since these tests have been dealt with in the *Monitoring Unix and Windows Servers* document, this document focuses on all the other layers.

1.1 The Operating System Layer

This layer tracks the current CPU utilization of the firewall and reports administrators of any abnormalities detected in the utilization of the CPU.



Operating System

Watchguard CPU

Figure 2: The tests mapped to the Operating System layer

1.1.1 Watchguard CPU Test

This test monitors the current CPU utilization of the firewall. If the device is found to consume CPU resources excessively, then, this test will also help administrators determine when exactly during the last 5 minutes did CPU utilization peak; this revelation will help them troubleshoot CPU spikes better.

Purpose	Monitors the current CPU utilization of the firewall
Target of the test	A WatchGuard Firewall Server
Agent deploying the test	An external agent

Configurable parameters for the test	1. **TEST PERIOD** - How often should the test be executed 2. **HOST** – The IP address of the WatchGuard Firewall 3. **PORT** – The port at which the specified host listens 4. **SNMPPORT** – The SNMP Port number of the WatchGuard Firewall (161 typically) 5. **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. 6. **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. 7. **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 the **USERNAME** parameter. 8. **AUTHPASS** – Specify the password that corresponds to the above-mentioned **USERNAME**. This parameter once again appears only if the snmpversion selected is **v3**. 9. **CONFIRM PASSWORD** – Confirm the **AUTHPASS** by retyping it here. 10. **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 11. **ENCRYPTFLAG** – This flag appears only when **v3** is selected as the **SNMPVERSION**. By default, the eG agent does not encrypt SNMP requests. Accordingly, the **ENCRYPTFLAG** is set to **NO** by default. To ensure that SNMP requests sent by the eG agent are encrypted, select the **YES** option. 12. **ENCRYPTTYPE** – If the **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

	13. **ENCRYPTPASSWORD** – Specify the encryption password here. 14. **CONFIRM PASSWORD** – Confirm the encryption password by retyping it here. 15. **TIMEOUT -** Specify the duration (in seconds) within which the SNMP query executed by this test should time out in the **TIMEOUT** text box. The default is 10 seconds. 16. **ISPASSIVE** – If the value chosen is **Yes**, then the WatchGuard Firewall under consideration is a passive device in a firewall cluster. No alerts will be generated if the firewall is not running. Measures will be reported as "Not applicable" by the agent if the firewall is not up. 17. **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 WatchGuard Firewall over TCP (and not UDP). For this, set the **DATA OVER TCP** flag to **Yes**. By default, this flag is set to **No**.		
Outputs of the test	One set of results for the WatchGuard Firewall device that is to be monitored		
Measurements made by the test	**Measurement**	**Measurement Unit**	**Interpretation**
	CPU utilization - 1 min: Indicates the percentage of CPU utilized by this firewall during the last 1 minute.	Percent	A value close to 100% is a cause of concern which requires further investigation. Comparing the value of this measure with that of *CPU utilization – 5 mins* measure will help you identify the abnormalities in the CPU utilization, if any.
	CPU utilization - 5mins Indicates the percentage of CPU utilized by this firewall during the last 5 minutes.	Percent	A value close to 100% is a cause of concern.

1.2 The Watchguard Server Layer

This layer tracks the simulataneous connections of the firewall and the amount of data/packets transmitted through the firewall. Figure 3 lists the tests that are currently mapped to the WatchguardServer layer.

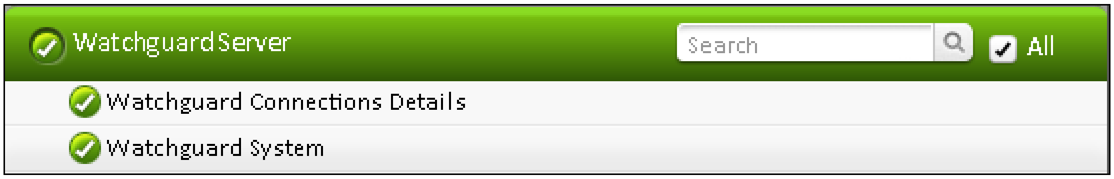


Figure 3: The tests mapped to the WatchGuard Server layer

1.2.1 Watchguard Connections Details Test

In computing, a stateful firewall (any firewall that performs stateful packet inspection (SPI) or stateful inspection) keeps track of the state of network connections (such as TCP streams, UDP communication) travelling across it. The firewall is programmed to distinguish legitimate packets for different types of connections. The firewall will allow packets matching a known active connection only and all other connections will either be dropped or rejected. Connections may also be dropped when the firewall is not able to handle a huge volume of traffic. This is where the **Watchguard Connections Details** test helps!

This test not only reports the total connections requested to the firewall, but also continuously tracks the connections that are currently active and enumerates the number of dropped connections, so that administrators can rapidly detect an abnormal increase in the number of dropped connections and determine what is causing it. This way, administrators can be proactively alerted to probable virus attacks/spams and initiate measures to protect their network from harm!

Purpose	Not only reports the total connections requested to the firewall, but also continuously tracks the connections that are currently active and enumerates the number of dropped connections
Target of the test	A WatchGuard Firewall server
Agent deploying the test	An external agent

Configurable parameters for the test	1. **TEST PERIOD** - How often should the test be executed 2. **HOST** – The IP address of the WatchGuard Firewall 3. **PORT** – The port at which the specified host listens 4. **SNMPPORT** – The SNMP Port number of the WatchGuard Firewall (161 typically) 5. **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. 6. **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. 7. **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 the **USERNAME** parameter. 8. **AUTHPASS** – Specify the password that corresponds to the above-mentioned **USERNAME**. This parameter once again appears only if the snmpversion selected is **v3**. 9. **CONFIRM PASSWORD** – Confirm the **AUTHPASS** by retyping it here. 10. **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 **ENCRYPTFLAG** is set to **NO** by default. To ensure that SNMP requests sent by the eG agent are encrypted, select the **YES** option.

	12. **ENCRYPTTYPE** – If the **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 13. **ENCRYPTPASSWORD** – Specify the encryption password here. 14. **CONFIRM PASSWORD** – Confirm the encryption password by retyping it here. 15. **TIMEOUT -** Specify the duration (in seconds) within which the SNMP query executed by this test should time out in the **TIMEOUT** text box. The default is 10 seconds. 16. **ISPASSIVE** – If the value chosen is **Yes**, then the WatchGuard Firewall under consideration is a passive device in a firewall cluster. No alerts will be generated if the firewall is not running. Measures will be reported as “Not applicable” by the agent if the firewall is not up. 17. **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 WatchGuard Firewall over TCP (and not UDP). For this, set the **DATA OVER TCP** flag to **Yes**. By default, this flag is set to **No**.		
Outputs of the test	One set of results for the WatchGuard Firewall server that is to be monitored		
Measurements made by the test	**Measurement**	**Measurement Unit**	**Interpretation**
	Total connections: Indicates the total number of connections that were requested to this firewall since startup.	Number	This measure is a good indicator of the load on the firewall.
	Active connections: Indicates the number of connections that were active or open on this firewall.	Number	An abnormally high value for this measure could indicate a probable virus attack or spam to a mail server in the network.
	Connections dropped: Indicates the number of connections that were dropped by this firewall.	Number	Ideally, the value of this measure should be zero. If there is a consistent increase in the value of this measure, then it clearly indicates that the firewall is either processing a lot of malicious traffic or is under attack.

1.2.2 Watchguard System Test

In environments where traffic flow is consistently on a higher side, it is always necessary to monitor the flow of traffic through the firewall so that malicious attacks may be identified and removed immediately. This test helps you in analyzing the amont of data that is transmitted/received through the firewall and the packets that are transmitted/received by the firewall. Using this test, administrators may figure out the amount of data and packets that are transmitted/received through the firewall and analyze the efficiency of the firewall constantly.

Purpose	Helps you in analyzing the amont of data that is transmitted/received through the firewall and the packets that are transmitted/received by the firewall
Target of the test	A WatchGuard Firewall server
Agent deploying the test	An external agent
Configurable parameters for the test	1. **TEST PERIOD** - How often should the test be executed 2. **HOST** – The IP address of the WatchGuard Firewall 3. **PORT** – The port at which the specified host listens 4. **SNMPPORT** – The SNMP Port number of the WatchGuard Firewall (161 typically) 5. **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. 6. **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. 7. **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 the **USERNAME** parameter. 8. **AUTHPASS** – Specify the password that corresponds to the above-mentioned **USERNAME.** This parameter once again appears only if the snmpversion selected is **v3.** 9. **CONFIRM PASSWORD** – Confirm the **AUTHPASS** by retyping it here. 10. **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

11. **ENCRYPTFLAG** – This flag appears only when **v3** is selected as the **SNMPVERSION**. By default, the eG agent does not encrypt SNMP requests. Accordingly, the **ENCRYPTFLAG** is set to **NO** by default. To ensure that SNMP requests sent by the eG agent are encrypted, select the **YES** option.
12. encrypttype – If the 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
13. **ENCRYPTPASSWORD** – Specify the encryption password here.
14. **CONFIRM PASSWORD** – Confirm the encryption password by retyping it here.
15. **TIMEOUT -** Specify the duration (in seconds) within which the SNMP query executed by this test should time out in the **TIMEOUT** text box. The default is 10 seconds.
16. **ISPASSIVE** – If the value chosen is **Yes**, then the WatchGuard Firewall under consideration is a passive device in a firewall cluster. No alerts will be generated if the firewall is not running. Measures will be reported as "Not applicable" by the agent if the firewall is not up.
17. **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 WatchGuard Firewall over TCP (and not UDP). For this, set the **DATA OVER TCP** flag to **Yes**. By default, this flag is set to **No**.

<table>
<tr><td><b>Outputs of the test</b></td><td colspan="3">One set of results for the WatchGuard Firewall server that is to be monitored</td></tr>
<tr><td rowspan="2"><b>Measurements made by the test</b></td><td><b>Measurement</b></td><td><b>Measurement Unit</b></td><td><b>Interpretation</b></td></tr>
<tr><td><b>Data transmitted:</b>
Indicates the amount of data transmitted through this firewall.</td><td>KB</td><td>An abnormal increase in the value of this measure indicates a problem condition that needs to be investigated immediately.</td></tr>
<tr><td></td><td><b>Data Received:</b>
Indicates the amount of data received through this firewall.</td><td>KB</td><td></td></tr>
</table>

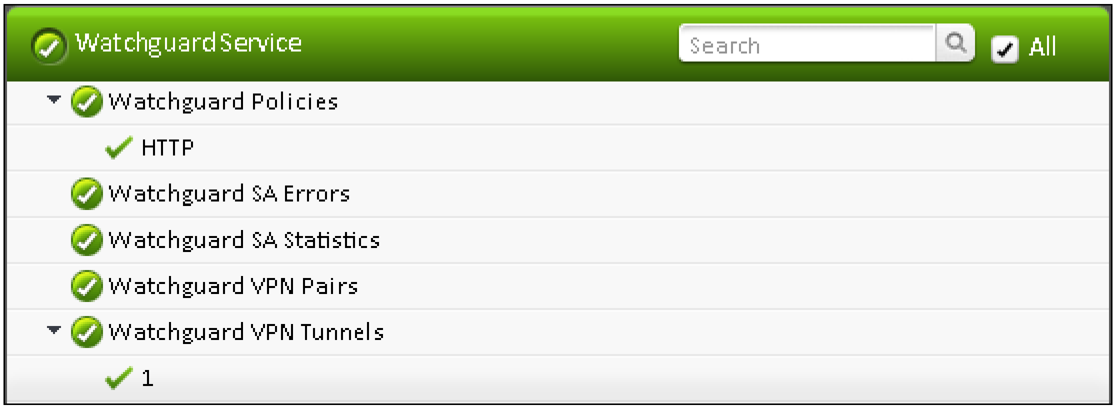
	Packets transmitted: Indicates the number of packets that were transmitted through this firewall.	Number	A continuously steady value for these measures clearly indicates that the firewall is performing efficiently without any abnormalities.
	Packets received: Indicates the number of packets that were received by this firewall.	Number	

1.3 The Watchguard Service Layer

This layer helps the administrator in understanding the following capabilities of the firewall such as:

- Packet traffic through each firewall policy
- Numerical statistics relating to the packets discarded due to various errors for each firewall policy
- For each VPN pair and VPN tunnel, you can identify the traffic flow, packets sent/received statistics, error packets discarded etc.
- Inbound and Outbound data transmission through each protocol of the security association and error packets discared for the security association

Figure 4 lists the tests that are currently mapped to the Watchguard Service layer.



Watchguard Service

Search ☑ All

- Watchguard Policies
  - HTTP
- Watchguard SA Errors
- Watchguard SA Statistics
- Watchguard VPN Pairs
- Watchguard VPN Tunnels
  - 1

Figure 4: The tests mapped to the Watchguard Service layer

1.3.1 Watchguard Policies Test

The *security policy* of your organization is a set of definitions to protect your computer network and the information that goes through it. The XTM device denies all packets that are not specifically allowed. When you add a *policy* to your XTM device configuration file, you add a set of rules that tell the XTM device to allow or deny traffic based upon factors such as source and destination of the packet or the TCP/IP port or protocol used for the packet.

A policy can also give the XTM device more instructions on how to handle the packet. For example, you can define logging and notification settings that apply to the traffic, or use NAT (Network Address Translation) to change the source IP address and port of network traffic.

For each firewall policy that is configured, this test monitors the number of active connections and the amount of data/packet traffic through the firewall. In addition, this test helps the administrators in identifying the firewall policy through which the maximum number of packets were discarded due to various errors such as replay, authentication etc.

Purpose	For each firewall policy that is configured, this test monitors the number of active connections and the amount of data/packet traffic through the firewall. In addition, this test helps the administrators in identifying the firewall policy through which the maximum number of packets were discarded due to various errors such as replay, authentication etc
Target of the test	A WatchGuard Firewall server
Agent deploying the test	An external agent
Configurable parameters for the test	1. **TEST PERIOD** - How often should the test be executed 2. **HOST** – The IP address of the WatchGuard Firewall 3. **PORT** – The port at which the specified host listens 4. **SNMPPORT** – The SNMP Port number of the WatchGuard Firewall (161 typically) 5. **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. 6. **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.

	7. **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 the **USERNAME** parameter. 8. **AUTHPASS** – Specify the password that corresponds to the above-mentioned **USERNAME**. This parameter once again appears only if the snmpversion selected is **v3.** 9. **CONFIRM PASSWORD** – Confirm the **AUTHPASS** by retyping it here. 10. **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 11. **ENCRYPTFLAG** – This flag appears only when **v3** is selected as the **SNMPVERSION**. By default, the eG agent does not encrypt SNMP requests. Accordingly, the **ENCRYPTFLAG** is set to **NO** by default. To ensure that SNMP requests sent by the eG agent are encrypted, select the **YES** option. 12. **ENCRYPTTYPE** – If the **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 13. **ENCRYPTPASSWORD** – Specify the encryption password here. 14. **CONFIRM PASSWORD** – Confirm the encryption password by retyping it here. 15. **TIMEOUT -** Specify the duration (in seconds) within which the SNMP query executed by this test should time out in the **TIMEOUT** text box. The default is 10 seconds. 16. **ISPASSIVE** – If the value chosen is **Yes**, then the WatchGuard Firewall under consideration is a passive device in a firewall cluster. No alerts will be generated if the firewall is not running. Measures will be reported as "Not applicable" by the agent if the firewall is not up. 17. **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 WatchGuard Firewall over TCP (and not UDP). For this, set the **DATA OVER TCP** flag to **Yes**. By default, this flag is set to **No**.
Outputs of the test	One set of results for each firewall policy of the WatchGuard Firewall server that is to be monitored

Measurements made by the test	Measurement	Measurement Unit	Interpretation
	Data traffic : Indicates the amount of data that was transmitted and received for this firewall policy.	KB	Comparing the values of these measures across the policies helps you in identifying the policy through which the data traffic was the maximum at any point of time.
	Packet traffic : Indicates the number of packets that are transmitted and received for this firewall policy.	Number	
	Packets discarded by decrypt errors : Indicates the number of packets that were discarded due to decrypt errors for this firewall policy.	Number	Ideally, the value of this measure should be zero.
	Packets discarded by authenticate errors : Indicates the number of packets that were discarded due to authentication errors for this firewall policy.	Number	Ideally, the value of this measure should be zero.
	Packets discarded by replay errors: Indicates the number of packets that were discarded due to replay errors for this firewall policy.	Number	Ideally, the value of this measure should be zero.
	Total active connections: Indicates the total number of connections that are active for this firewall policy.	Number	
	Current active connections: Indicates the total number of connections that are currently active for this firewall policy.	Number	

1.3.2 Watchguard VPN Pairs Test

This test auto discovers the VPN pairs configured using the WatchGuard Firewall and closely monitors the IPSEc traffic and the amount of packets sent and received via every VPN pair. In the process, the test accurately points to that VPN pair that is handling an abnormally high volume of traffic and is hence hogging the bandwidth resources available to the network! Also, this test reports the number of packets thatwere discarded due to various errors such as authentication, decrpt etc. This way, the test enables administrators to understand whether/not their firewall configurations are effective, and if not, initiate measures to fine-tune them.

Purpose	Auto discovers the VPN pairs configured using the WatchGuard Firewall and closely monitors the IPSEc traffic and the amount of packets sent and received via every VPN pair
Target of the test	A WatchGuard Firewall server
Agent deploying the test	An external agent
Configurable parameters for the test	1. **TEST PERIOD** - How often should the test be executed 2. **HOST** – The IP address of the WatchGuard Firewall 3. **PORT** – The port at which the specified host listens 4. **SNMPPORT** – The SNMP Port number of the WatchGuard Firewall (161 typically) 5. **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. 6. **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. 7. **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 the **USERNAME** parameter. 8. **AUTHPASS** – Specify the password that corresponds to the above-mentioned **USERNAME**. This parameter once again appears only if the snmpversion selected is **v3**.

	9. **CONFIRM PASSWORD** – Confirm the **AUTHPASS** by retyping it here. 10. **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 11. **ENCRYPTFLAG** – This flag appears only when **v3** is selected as the **SNMPVERSION**. By default, the eG agent does not encrypt SNMP requests. Accordingly, the **ENCRYPTFLAG** is set to **NO** by default. To ensure that SNMP requests sent by the eG agent are encrypted, select the **YES** option. 12. **ENCRYPTTYPE** – If the **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 13. **ENCRYPTPASSWORD** – Specify the encryption password here. 14. **CONFIRM PASSWORD** – Confirm the encryption password by retyping it here. 15. **TIMEOUT -** Specify the duration (in seconds) within which the SNMP query executed by this test should time out in the **TIMEOUT** text box. The default is 10 seconds. 16. **ISPASSIVE** – If the value chosen is **Yes**, then the WatchGuard Firewall under consideration is a passive device in a firewall cluster. No alerts will be generated if the firewall is not running. Measures will be reported as "Not applicable" by the agent if the firewall is not up. 17. **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 WatchGuard Firewall over TCP (and not UDP). For this, set the **DATA OVER TCP** flag to **Yes**. By default, this flag is set to **No**.		
Outputs of the test	One set of results for each VPN pair of the WatchGuard Firewall server that is to be monitored		
Measurements made by the test	**Measurement**	**Measurement Unit**	**Interpretation**
	Inbound IPSEC traffic : Indicates the amount of IPSec protocol traffic that was received through this VPN pair since the connection was established.	KB	Comparing the value of this measure across the VPN pairs will help you in identifying the VPN pair through which most of the IPSec traffic is flowing!

	Outbound IPSEC traffic : Indicates the amount of IPSec protocol traffic that was transmitted through this VPN pair since the connection was established.	KB	
	Inbound packets : Indicates the number of packets that were received through this VPN pair during the last measurement period.	Number	
	Outbound packets: Indicates the number of packets that were transmitted through this VPN pair during the last measurement period.	Number	
	Packets discarded due to decrypt errors: Indicates the number of packets that were discarded due to decrypt errors by this VPN pair during the last measurement period.	Number	Ideally, the value of these measures should be zero. Comparing the value of these measures across the VPN Pairs will help you in identifying the VPN pair that is more error prone during packet transmission.
	Packets discarded due to authentication errors: Indicates the number of packets flowing through this VPN pair that were discarded due to authentication errors during the last measurement period.	Number	
	Packets discarded due to replay errors: Indicates the number of packets that were discarded due to replay errors by this VPN pair during the last measurement period.	Number	

1.3.3 Watchguard VPN Tunnels Test

A *VPN (Virtual Private Network)* creates secure connections between computers or networks in different locations. Each connection is known as a *tunnel*. When a VPN tunnel is created, the two tunnel endpoints authenticate with each other. Data in the tunnel is encrypted. Only the sender and the recipient of the traffic can read it.

Using the WatchGuard Firewall, administrators can configure multiple VPN tunnels based on the volume of data traffic handled by their network and the security/privacy requirements of the network. Often bandwidth management can be enabled on the firewall configurations to prevent unauthorized access to the network and to optimize the usage of network resources. Improper firewall configurations can therefore result in a few VPN tunnels hogging the bandwidth resources and choking the network! To avoid this, administrators should periodically check the efficacy of the firewall configuration, identify the issues in the firewall settings and rectify the same! This is where the **Watchguard VPN Tunnels** test helps! This test auto discovers the VPN tunnels configured using the WatchGuard Firewall and closely monitors the amount of data traffic and packets sent and received via every tunnel. In addition, this test clearly indicates the number of various error – prone packets that were sent and received through each VPN tunnel. In the process, the test accurately points to that tunnel that is handling an abnormally high volume of traffic and is hence hogging the bandwidth resources available to the network! This way, the test enables administrators to understand whether/not their firewall configurations are effective, and if not, initiate measures to fine-tune them.

Purpose	Auto discovers the VPN tunnels configured using the WatchGuard Firewall and closely monitors the amount of data traffic and packets sent and received via every tunnel. In addition, this test clearly indicates the number of various error – prone packets that were sent and received through each VPN tunnel
Target of the test	A WatchGuard Firewall server
Agent deploying the test	An external agent
Configurable parameters for the test	1. **TEST PERIOD** - How often should the test be executed 2. **HOST** – The IP address of the WatchGuard Firewall 3. **PORT** – The port at which the specified host listens 4. **SNMPPORT** – The SNMP Port number of the WatchGuard Firewall (161 typically) 5. **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. 6. **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.

	7. **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 the **USERNAME** parameter. 8. **AUTHPASS** – Specify the password that corresponds to the above-mentioned **USERNAME**. This parameter once again appears only if the snmpversion selected is **v3.** 9. **CONFIRM PASSWORD** – Confirm the **AUTHPASS** by retyping it here. 10. **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 11. **ENCRYPTFLAG** – This flag appears only when **v3** is selected as the **SNMPVERSION**. By default, the eG agent does not encrypt SNMP requests. Accordingly, the **ENCRYPTFLAG** is set to **NO** by default. To ensure that SNMP requests sent by the eG agent are encrypted, select the **YES** option. 12. **ENCRYPTTYPE** – If the **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 13. **ENCRYPTPASSWORD** – Specify the encryption password here. 14. **CONFIRM PASSWORD** – Confirm the encryption password by retyping it here. 15. **TIMEOUT -** Specify the duration (in seconds) within which the SNMP query executed by this test should time out in the **TIMEOUT** text box. The default is 10 seconds. 16. **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 WatchGuard Firewall over TCP (and not UDP). For this, set the **DATA OVER TCP** flag to **Yes**. By default, this flag is set to **No.** 17. **ISPASSIVE** – If the value chosen is **Yes**, then the WatchGuard Firewall under consideration is a passive device in a firewall cluster. No alerts will be generated if the firewall is not running. Measures will be reported as "Not applicable" by the agent if the firewall is not up.
Outputs of the test	One set of results for each VPN tunnel that is to be monitored

Measurements made by the test	Measurement	Measurement Unit	Interpretation
	Inbound traffic over VPN tunnel: Indicates the amount of traffic that was received through this VPN tunnel since the connection was established.	KB	Comparing the value of these measures across the VPN tunnels helps you in identifying the VPN tunnel that is receiving/transmitting the highest amount of traffic.
	Outbound traffic over VPN tunnel: Indicates the amount of traffic that was transmitted through this VPN tunnel since the connection was established.	KB	
	Inbound packets over VPN tunnel : Indicates the number of packets that were received through this VPN tunnel during the last measurement period.	Number	Comparing the values of these measures across the VPN tunnels helps you in identifying the VPN tunnel that has received/transmitted the maximum number of packets.
	Outbound packets over VPN tunnel: Indicates the number of packets that were transmitted through this VPN tunnel during the last measurement period.	Number	
	Inbound packets discarded by decrypt errors: Indicates the number of packets that were discarded due to decrypt errors when received by this VPN tunnel during the last measurement period.	Number	Ideally, the value of this measure should be zero.

	Outbound packets discarded by decrypt error: Indicates the number of packets that were discarded due to decrypt errors when transmitted through this VPN tunnel during the last measurement period.	Number	Ideally, the value of this measure should be zero.
	Inbound packets discarded by auth errors: Indicates the number of packets that were discarded due to authentication errors during the last measurement period while being received by this VPN tunnel.	Number	Ideally, the value of this measure should be zero.
	Outbound packets discarded by auth errors: Indicates the number of packets that were discarded due to authentication errors during the last measurement period while being transmitted through this VPN tunnel.	Number	Ideally, the value of this measure should be zero.
	Inbound packets discarded by replay errors: Indicates the number of packets that were discarded due to replay errors during the last measaurement period wile being received by this VPN tunnel.	Number	Ideally, the value of this measure should be zero.
	Outbound packets discarded by replay errors: Indicates the number of packets that were discarded due to replay errors during the last measurement period while being transmitted through this VPN tunnel.	Number	Ideally, the value of this measure should be zero.

1.3.4 Watchguard SA Statistics Test

In Internet Protocol Security (IPSec), settings that establish policy and encryption keys used to protect communication between two end points in a Virtual Private Network (VPN). Security associations are negotiated between two computers during the first phase of establishing an Internet key Exchange (IKE) connection. These security associations establish shared session secrets from which keys are derived for encryption of tunneled data.

This test monitors the security association of the firewall and provides you with the exact numerical statistics of the data packets that were transmitted/received through protocols such as ESP, Authentication Header and IPComp that are part of the IPSec. This way, administrators could identify the protocol that is transmitting/receiving the maximum number of data packets and channelize the packet traffic accordingly!

Purpose	Monitors the security association of the firewall and provides you with the exact numerical statistics of the data packets that were transmitted/received through protocols such as ESP, Authentication Header and IPComp that are part of the IPSec
Target of the test	A WatchGuard Firewall server
Agent deploying the test	An external agent
Configurable parameters for the test	1. **TEST PERIOD** - How often should the test be executed 2. **HOST** – The IP address of the WatchGuard Firewall 3. **PORT** – The port at which the specified host listens 4. **SNMPPORT** – The SNMP Port number of the WatchGuard Firewall (161 typically) 5. **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. 6. **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. 7. **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 the **USERNAME** parameter. 8. **AUTHPASS** – Specify the password that corresponds to the above-mentioned **USERNAME**. This parameter once again appears only if the snmpversion selected is **v3.** 9. **CONFIRM PASSWORD** – Confirm the **AUTHPASS** by retyping it here. 10. **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 11. **ENCRYPTFLAG** – This flag appears only when **v3** is selected as the **SNMPVERSION**. By default, the eG agent does not encrypt SNMP requests. Accordingly, the **ENCRYPTFLAG** is set to **NO** by default. To ensure that SNMP requests sent by the eG agent are encrypted, select the **YES** option.

	12. **ENCRYPTTYPE** – If the **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 13. **ENCRYPTPASSWORD** – Specify the encryption password here. 14. **CONFIRM PASSWORD** – Confirm the encryption password by retyping it here. 15. **TIMEOUT -** Specify the duration (in seconds) within which the SNMP query executed by this test should time out in the **TIMEOUT** text box. The default is 10 seconds. 16. **ISPASSIVE** – If the value chosen is **Yes**, then the WatchGuard Firewall under consideration is a passive device in a firewall cluster. No alerts will be generated if the firewall is not running. Measures will be reported as "Not applicable" by the agent if the firewall is not up. 17. **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 WatchGuard Firewall over TCP (and not UDP). For this, set the **DATA OVER TCP** flag to **Yes**. By default, this flag is set to **No**.		
Outputs of the test	One set of results for the WatchGuard Firewall server that is to be monitored		
Measurements made by the test	**Measurement**	**Measurement Unit**	**Interpretation**
	Inbound data via ESP: Indicates the amount of data that was received through the ESP protocol.	Number	ESP (Encapsulating Security Payload) provides authentication and encryption of data. ESP takes the original payload of a data packet and replaces it with encrypted data. It adds integrity checks to make sure that the data is not altered in transit, and that the data came from the proper source.
	Outbound data via ESP: Indicates the amount of data that was transmitted through the ESP protocol.	Number	
	Inbound data via AH: Indicates the amount of data that was received through the AH protocol.	Number	AH (Authentication Header) is a protocol that you can use in manual VPN negotiations. To provide security, AH adds authentication information to the IP datagram. Most VPN tunnels do not use AH because it does not provide encryption.

	Outbound data via AH: Indicates the amount of data that was transmitted through the AH protocol.	Number	
	Inbound data via Ipcomp: Indicates the amount of data that was received through the IPComp protocol.	Number	In networking IP Payload Compression Protocol, or IPComp, is a low level compression protocol for IP datagrams. The intent is to reduce the size of data transmitted over congested or slow network connections, thereby increasing the speed of such networks without losing data. According to the RFC requirements, compression must be done before fragmenting or encrypting the packet. It further states that each datagram must be compressed independently so it can be decompressed even if received out of order. This is important because it allows IPComp to work with both TCP and UDP network communications.
	Outbound data via Ipcomp: Indicates the amount of data that was transmitted through the IpComp protocol.	Number	

1.3.5 Watchguard SA Errors Test

Security associations are negotiated between two computers during the first phase of establishing an Internet key Exchange (IKE) connection. These security associations establish shared session secrets from which keys are derived for encryption of tunneled data. For an optimal encryption process to happen, the packets that are sent thorugh the security associations should be error free. If too many errors are spotted in the data packets, administrators may need to figure out the exact cause of the errors – whether is it due to a fault security association connection or due to a malicious attack? The Watchguard SA errors test helps you in identifying the errors in the data packets!

This test monitors the security association of the firewall and identifies the data packets that were received with errors such as decrypt errors, authenticate errors, replay errors etc. This way, administrators would be alerted if there are too may errors that need to be manipulated for the security association to encrypt tunneled data smoothly.

Purpose	Monitors the security association of the firewall and identifies the data packets that were received with errors such as decrypt errors, authenticate errors, replay errors etc
Target of the test	A WatchGuard Firewall server
Agent deploying the test	An external agent
Configurable parameters for the test	1. **TEST PERIOD** - How often should the test be executed 2. **HOST** – The IP address of the WatchGuard Firewall 3. **PORT** – The port at which the specified host listens 4. **SNMPPORT** – The SNMP Port number of the WatchGuard Firewall (161 typically) 5. **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. 6. **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. 7. **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 the **USERNAME** parameter. 8. **AUTHPASS** – Specify the password that corresponds to the above-mentioned **USERNAME**. This parameter once again appears only if the snmpversion selected is **v3**. 9. **CONFIRM PASSWORD** – Confirm the **AUTHPASS** by retyping it here. 10. **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 11. **ENCRYPTFLAG** – This flag appears only when **v3** is selected as the **SNMPVERSION**. By default, the eG agent does not encrypt SNMP requests. Accordingly, the **ENCRYPTFLAG** is set to **NO** by default. To ensure that SNMP requests sent by the eG agent are encrypted, select the **YES** option. 12. **ENCRYPTTYPE** – If the **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 13. **ENCRYPTPASSWORD** – Specify the encryption password here. 14. **CONFIRM PASSWORD** – Confirm the encryption password by retyping it here. 15. **TIMEOUT -** Specify the duration (in seconds) within which the SNMP query executed by this test should time out in the **TIMEOUT** text box. The default is 10 seconds. 16. **ISPASSIVE** – If the value chosen is **Yes**, then the WatchGuard Firewall under consideration is a passive device in a firewall cluster. No alerts will be generated if the firewall is not running. Measures will be reported as "Not applicable" by the agent if the firewall is not up. 17. **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 WatchGuard Firewall over TCP (and not UDP). For this, set the **DATA OVER TCP** flag to **Yes**. By default, this flag is set to **No**.		
Outputs of the test	One set of results for the WatchGuard Firewall server that is to be monitored		
Measurements made by the test	**Measurement**	**Measurement Unit**	**Interpretation**
	Packets received with decrypt errors: Indicates the number of packets that were received with decrypt errors.	Number	Ideally, the value of this measure should be zero. A high value for this measure is a cause of concern which requires the administrator to identify the errors and rectify them quickly.
	Packets received with authenticate errors : Indicates the number of packets that were received with authentication errors.	Number	
	Packets received with replay errors : Indicates the number of packets that were received with replay errors.	Number	
	Packets received with policy errors : Indicates the number of packets that were received with errors relating to the security policy.	Number	

	Packets received with other errors: Indicates the number of packets that were received with other type of errors i.e.,.packets received with miscellaneous errors.	Number	

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Conclusion

This document has described in detail the monitoring paradigm used and the measurement capabilities of the eG Enterprise suite of products with respect to the **WatchGuard Firewall**. For details of how to administer and use the eG Enterprise suite of products, refer to the user manuals.

We will be adding new measurement capabilities into the future versions of the eG Enterprise suite. If you can identify new capabilities that you would like us to incorporate in the eG Enterprise suite of products, please contact support@eginnovations.com. We look forward to your support and cooperation. Any feedback regarding this manual or any other aspects of the eG Enterprise suite can be forwarded to feedback@eginnovations.com.