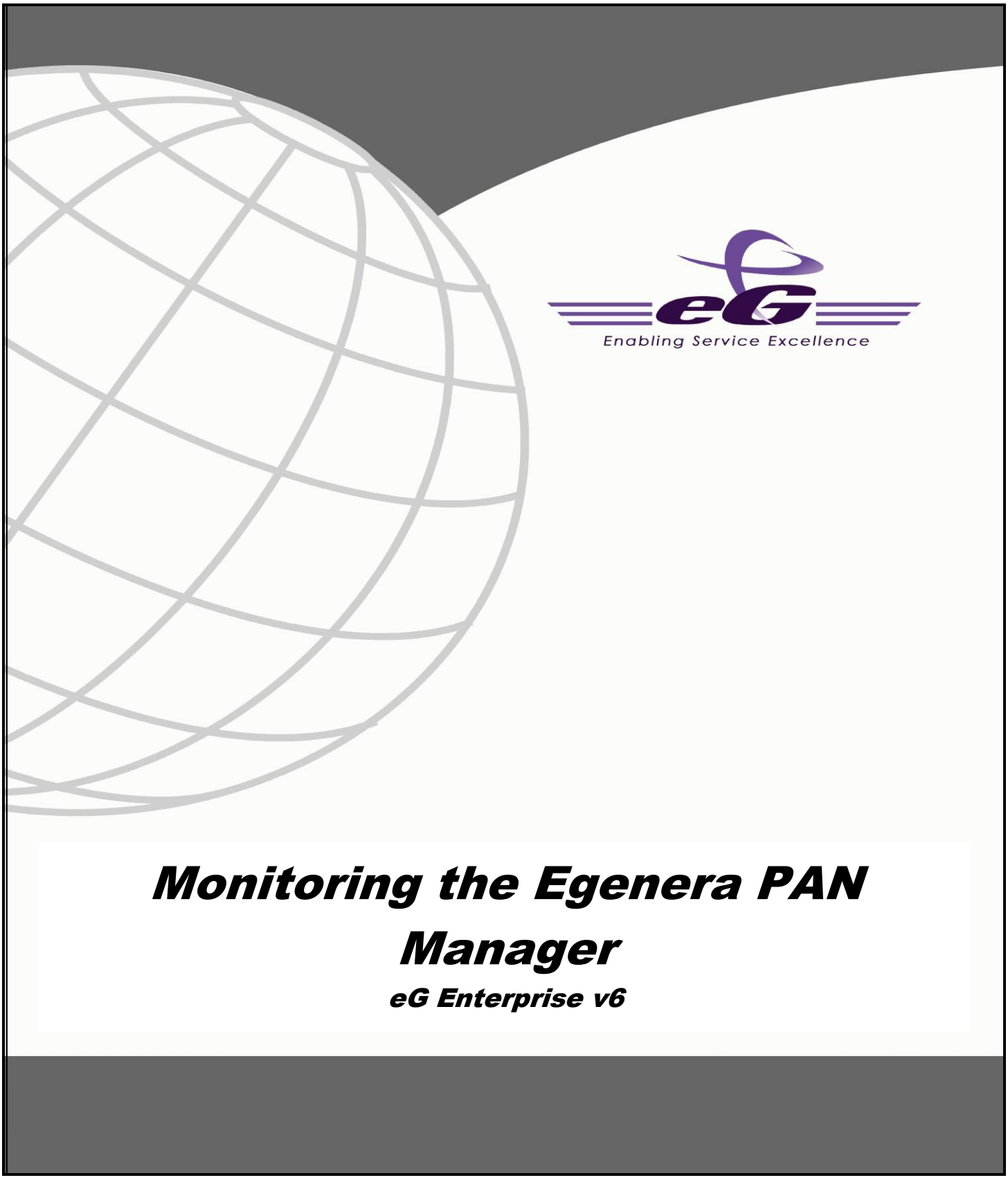

Monitoring the Egenera PAN Manager

eG Enterprise v6

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Chapter 1

Monitoring the Egenera PAN Manager

A Processing Area Network or "PAN" is a distributed set of physical and virtual resources, including processors, and network and storage connections. These resources are both internal and external to the platform's domain, and are bound into servers (pServers) through software.

PAN Manager software transforms all the management aspects of a modern datacenter, from processing resources and hardware switches to software images and event monitoring for physical components, into virtual objects that are unified under a single point of control. PAN Manager helps you convert your object groupings into deployable configurations. This allows you to group your hardware processing resources, network resources, and storage resources to respond to the datacenter's needs, and to extend the standard infrastructure of the underlying hardware/software platform.

The domain's computing infrastructure allows your site's SAN and LAN infrastructure to remain outside of the domain and the PAN, giving you significant flexibility in tailoring the datacenter environment to your needs.

Figure 1 illustrates the logical model for PAN architecture: the physical and logical components of the domain, as well as LPAN resources that do not have an equivalent hardware component.

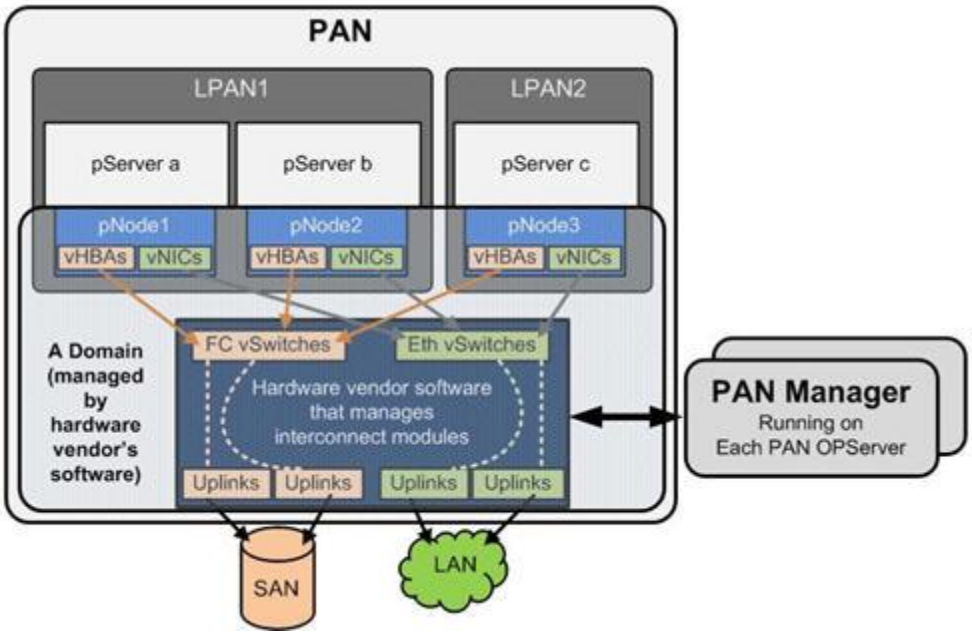


Figure 1: Logical PAN architecture

Customers use the Egenera PAN Manager to transform their static IT environments and deliver scalable and reliable IT services. Real/potential failures (if any) in the operations of the PAN Manager, will hence affect the delivery of these mission-critical IT services. To avoid such an outcome, health checks should be periodically performed on the core components of the Egenera PAN manager, so that issues are proactively detected and intimated to the administrators.

eG Enterprise offers a specialized *Egenera PAN Manager* monitoring model that monitors the current state and operations of each of the core components of the PAN manager, and reports anomalies instantly.

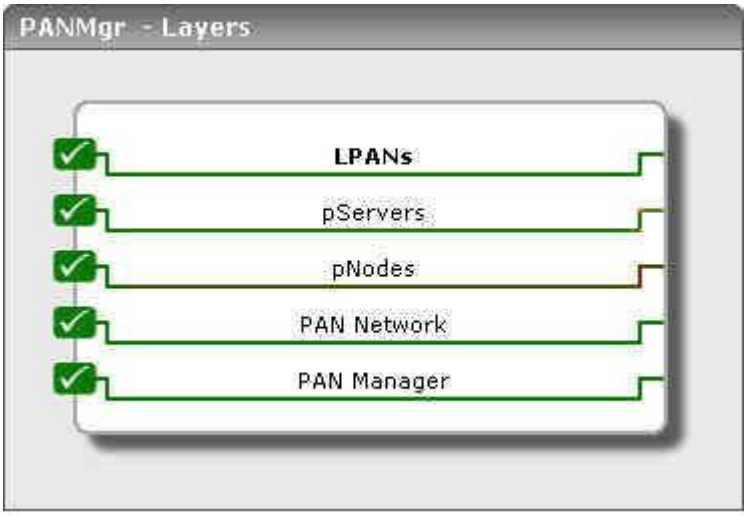


Figure 2: The layer model of the Egenera PAN Manager

Using *agentless* mechanisms,.the eG data collector executes the *PAN Manager Web Server API* commands on the PAN manager and collects a wide variety of performance statistics from the PAN manager. With the help of these statistics, administrators can find quick and accurate answers for the following queries:

- Is the PAN domain available currently?
- Are the pNodes in the PAN domain over-utilized?
- How many pNodes are available in the PAN manager? What are the names of the pNodes?
- How many global pools and uplinks are available in this PAN manager, and what are they?
- Have any media images, MACs, and WWNs been allocated to the PAN manager?
- Is the PAN OPServer currently available?
- How is license usage on the PAN Manager? Is any type of license nearing exhaustion? If so, which is it?
- Is any switch in the PAN domain powered off currently? If so, in which chassis is the switch available?
- Which switch in which chassis is attached to the maximum number of uplink ports? What are these uplink ports?
- How many vSwitches are there in the PAN Network, and what are they?
- On which vSwitch is link dependency not enabled?
- Is any pNode in the powered off state currently?
- Is any zone/hardware component of any pNode experiencing abnormal spikes in temperature? If so, which zone/hardware is it is it - is it the CPU, memory, DIMM, blade, hard drive, the Mezz zone, the CNA zone, the system zone, or the NIC zone - and which pNode are they associated with?
- Is any pServer in the shutdown mode currently?
- Is the PAN agent not available on any pServer?
- Is any pServer in the unmanaged or unavailable mode currently?
- Which pServer is currently experiencing high levels of disk I/O?
- Which pServer is consuming CPU excessively, and what is causing it - user-level processing or system-level processing?
- Is any pServer highly memory-intensive?
- Which pServer is consuming the maximum network bandwidth?
- Is any disk partition of a pServer running out of space? If so, which disk partition is it and which pServer is it associated with?
- Are there any inactive LPANs in the PAN manager?
- Is any LPAN CPU-hungry?

The sections that follow will discuss each layer of Figure 1 elaborately.

1.1 The PAN Manager Layer

Using the tests mapped to this layer, the health of the chassis, the PAN domains, and the PAN OPServer can be ascertained. In addition, the layer helps track the usage of PAN licenses and sheds light on the PAN resources configured for the PAN manager.

Figure 3: The tests mapped to the PAN Manager layer

1.1.1 PAN Domains Test

A Domain is a physical hardware platform that resides in a Processing Area Network. Once the domain is added to the PAN, the PAN Manager controls the domain's resources and profiles. A domain is a collection of one or more chassis that share a common (stacked) fabric and have access to the same network and Input/Output resources.

This test reports the status of the PAN Domain and helps the administrator figure out the following:

- How many chassis and pNodes are present in this domain?
- How many pNodes are currently active among the available pNodes and how well the pNodes are currently utilized in this domain?

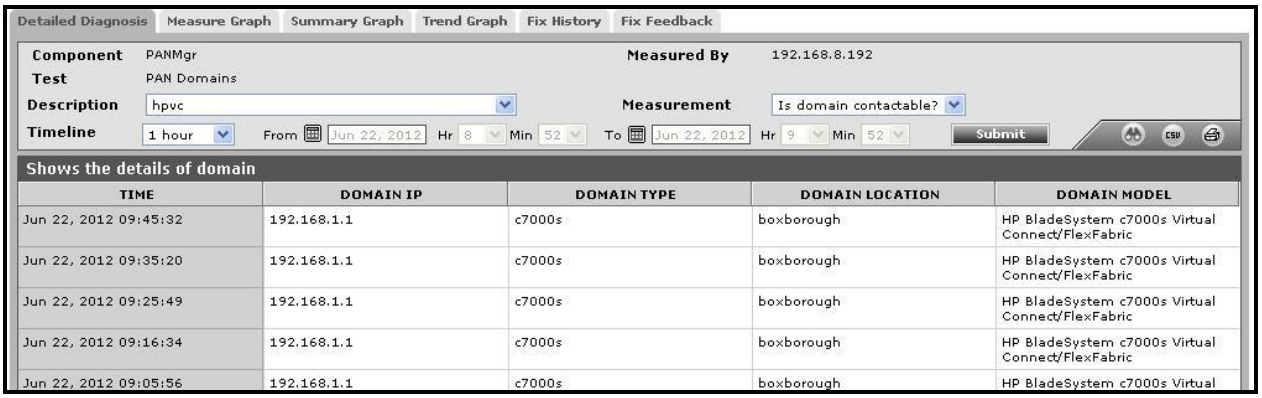
Purpose	Reports the status of the PAN Domain and helps the admonistrator figure out the following: ➢ How many chassis and pNodes are present in this domain? ➢ How many pNodes are currently active among the available pNodes and how well the pNodes are currently utilized in this domain?
Target of the test	An Egenera PAN Manager
Agent deploying the test	Remote agent

Configurable parameters for the test	1. **TEST PERIOD** - How often should the test be executed 2. **Host** – The IP address of the Egenera PAN Manager. 3. **pan manager user**, **pan manager password**, and **confirm password** - To monitor the Egenera PAN Manager, the eG agent has to be configured with *administrator* privileges. This is why, you need to specify the credentials of an *administrator* against the **pan manager user** and **pan manager password** parameters of this test. Confirm the **pan manager password** by retyping it in the **confirm password** text box. 4. **ssl** - By default, the Egenera PAN Manager is not **SSL**-enabled. Accordingly, the **SSL** flag is set to **No** by default. 5. **webport** - By default, in most environments, the Egenera PAN Manager listens on port 80 (if not SSL-enabled) or on port 443 (if SSL-enabled) only. This implies that while monitoring the Egenera PAN Manager, the eG agent, by default, connects to port 80 or 443, depending upon the SSL-enabled status of Egenera PAN Manager - i.e., if Egenera PAN Manager is not SSL-enabled (i.e., if the **SSL** flag above is set to **No**), then the eG agent connects to Egenera PAN Manager using port 80 by default, and if Egenera PAN Manager is SSL-enabled (i.e., if the **SSL** flag is set to **Yes**), then the agent-Egenera PAN Manager communication occurs via port 443 by default. Accordingly, the **WEBPORT** parameter is set to *default* by default. In some environments however, the default ports 80 or 443 might not apply. In such a case, against the **WEBPORT** parameter, you can specify the exact port at which the Egenera PAN Manager in your environment listens, so that the eG agent communicates with that port for collecting metrics from the Egenera PAN Manager. 6. **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 enabled/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.		
Outputs of the test	One set of results for the PAN domain being monitored		
Measurements made by the	**Measurement**	**Measurement Unit**	**Interpretation**

<table>
<tr><td>test</td><td>Is domain contactable?:
Indicates the current status of this PAN Domain.</td><td></td><td>This measure reports a value Yes if this PAN Domain is currently available and a value No if this PAN Domain is powered off.
The numeric values that correspond to the above-mentioned measure values are as follows:<table><tr><th>Measure Value</th><th>Numeric Value</th></tr><tr><td>Not Available</td><td>0</td></tr><tr><td>Available</td><td>1</td></tr></table>Note:
By default, this measure reports the above-mentioned Measure Values while indicating the status of this PAN domain. However, in the graph of this measure, the status will be represented using the corresponding numeric equivalents of the Measure Values.</td></tr>
<tr><td></td><td>Total pNodes:
Indicates the total number of pNodes available in this PAN Domain.</td><td>Number</td><td>A pNode is a physical blade server that provides the CPU processing and memory capabilities for a pServer.</td></tr>
<tr><td></td><td>Active pNodes:
Indicates the number of pNodes that are currently active in this PAN Domain.</td><td>Number</td><td>Use the detailed diagnosis of this measure to know the names of the active pNodes.</td></tr>
<tr><td></td><td>pNode utilization:
Indicates the percentage of pNodes that were utilized in this PAN Domain.</td><td>Percent</td><td>This measure is a good indicator to check the availabilty of the pNodes in this PAN Domain. A low value of this measure indicates that additional resources such as pServer can be added to this domain. A high value however indicates that additional resources cannot be added further to this domain.</td></tr>
<tr><td></td><td>Chassis:
Indicates the number of chassis present in this PAN Domain.</td><td>Number</td><td>The detailed diagnosis capability of this measure if enabled, provides you with the details of the chassis such as the name of the chassis, the current status of the chassis, the number of pNodes in this chassis and the number of switches present in the chassis.</td></tr>
</table>

	Powered off pNodes: Indicates the number of pNodes that are currently powered off in this PAN domain.	Number	Use the detailed diagnosis of this measure to know which pNodes are powered off.
	pNodes in other states: Indicates the number of pNodes that are currently in a state other than the powered on or the powered off state.	Number	Use the detailed diagnosis of this measure to know which pNodes are neither in the powered off state nor in the powered on state.

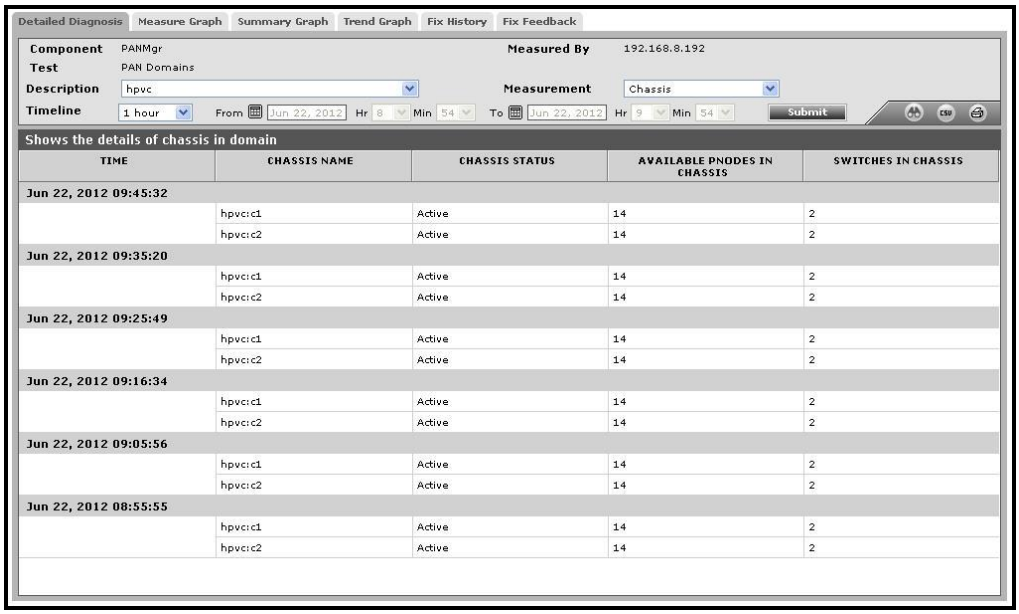
The detailed diagnosis of the *Is domain contactable?* measure reports the details of the domain such as the Domain IP, Domain Type, Domain Location and the Domain Model.



TIME	DOMAIN IP	DOMAIN TYPE	DOMAIN LOCATION	DOMAIN MODEL
Jun 22, 2012 09:45:32	192.168.1.1	c7000s	boxborough	HP BladeSystem c7000s Virtual Connect/FlexFabric
Jun 22, 2012 09:35:20	192.168.1.1	c7000s	boxborough	HP BladeSystem c7000s Virtual Connect/FlexFabric
Jun 22, 2012 09:25:49	192.168.1.1	c7000s	boxborough	HP BladeSystem c7000s Virtual Connect/FlexFabric
Jun 22, 2012 09:16:34	192.168.1.1	c7000s	boxborough	HP BladeSystem c7000s Virtual Connect/FlexFabric
Jun 22, 2012 09:05:56	192.168.1.1	c7000s	boxborough	HP BladeSystem c7000s Virtual

Figure 4: The detailed diagnosis of the Is domain contactable? measure

The detailed diagnosis capability of the *Chassis* measure if enabled, provides you with the details of the chassis such as the name of the chassis, the current status of the chassis, the number of pNodes in this chassis and the number of switches present in the chassis.



TIME	CHASSIS NAME	CHASSIS STATUS	AVAILABLE PNODES IN CHASSIS	SWITCHES IN CHASSIS
Jun 22, 2012 09:45:32				
	hpvc:c1	Active	14	2
	hpvc:c2	Active	14	2
Jun 22, 2012 09:35:20				
	hpvc:c1	Active	14	2
	hpvc:c2	Active	14	2
Jun 22, 2012 09:25:49				
	hpvc:c1	Active	14	2
	hpvc:c2	Active	14	2
Jun 22, 2012 09:16:34				
	hpvc:c1	Active	14	2
	hpvc:c2	Active	14	2
Jun 22, 2012 09:05:56				
	hpvc:c1	Active	14	2
	hpvc:c2	Active	14	2
Jun 22, 2012 08:55:55				
	hpvc:c1	Active	14	2
	hpvc:c2	Active	14	2

Figure 5: The detailed diagnosis of the Chassis measure

1.1.2 PAN Resources Test

This test provides useful insights into the type of resources available to the PAN manager and the amount of resources of each type that has been configured for the PAN manager.

Purpose	Provides useful insights into the type of resources available to the PAN manager and the amount of resources of each type that has been configured for the PAN manager
Target of the test	An Egenera PAN Manager
Agent deploying the test	Remote agent

Configurable parameters for the test	1. **TEST PERIOD** - How often should the test be executed 2. **Host** – The IP address of the Egenera PAN Manager. 3. **pan manager user**, **pan manager password**, and **confirm password** - To monitor the Egenera PAN Manager, the eG agent has to be configured with *administrator* privileges. This is why, you need to specify the credentials of an *administrator* against the **pan manager user** and **pan manager password** parameters of this test. Confirm the **pan manager password** by retyping it in the **confirm password** text box. 4. **ssl** - By default, the Egenera PAN Manager is not **SSL**-enabled. Accordingly, the **SSL** flag is set to **No** by default. 5. **webport** - By default, in most environments, the Egenera PAN Manager listens on port 80 (if not SSL-enabled) or on port 443 (if SSL-enabled) only. This implies that while monitoring the Egenera PAN Manager, the eG agent, by default, connects to port 80 or 443, depending upon the SSL-enabled status of Egenera PAN Manager - i.e., if Egenera PAN Manager is not SSL-enabled (i.e., if the **SSL** flag above is set to **No**), then the eG agent connects to Egenera PAN Manager using port 80 by default, and if Egenera PAN Manager is SSL-enabled (i.e., if the **SSL** flag is set to **Yes**), then the agent-Egenera PAN Manager communication occurs via port 443 by default. Accordingly, the **WEBPORT** parameter is set to *default* by default. In some environments however, the default ports 80 or 443 might not apply. In such a case, against the **WEBPORT** parameter, you can specify the exact port at which the Egenera PAN Manager in your environment listens, so that the eG agent communicates with that port for collecting metrics from the Egenera PAN Manager. 6. **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 enabled/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.		
Outputs of the test	One set of results for the PAN manager being monitored		
Measurements made by the	**Measurement**	**Measurement Unit**	**Interpretation**

test	**Processing nodes:** Indicates the total number of pNodes in this PAN Manager.	Number	The PAN architecture was designed around simplifying pServer management and monitoring. A pServer is a logical server that possesses all the resources of a conventional server, but which is not tied to a specific processing resource. In PAN Manager, these processing resources are called Processing Nodes, or simply pNodes.
	Pools: Indicates the total number of global pools available in this PAN Manager.	Number	A pool consists of one or more pNodes that can be used as primary pNodes or failover pNodes for pServers. The detailed diagnosis of this measure lists out the name of the pools and the number of pNodes available in each pool.
	Uplinks: Indicates the total number of uplinks allocated in this PAN Manager.	Number	An uplink is a PAN Manager resource that is the logical grouping of physical ports on the uplink module. The detailed diagnosis capability of this measure if enabled, lists out the name of the uplinks and the type of each uplink available in this PAN Manager.
	Virtual switches: Indicates the total number of vSwitches currently available in this PAN Manager.	Number	A vSwitch (Virtual Switch) is a logical representation of a physical switch - this network resource connects an uplink to a pServer.
	Media image: Indicates the total number of media images that are currently available in this PAN Manager.	Number	A media image is an ISO Image that you register with PAN Manager for use in the VCD of a pServer. The detailed diagnosis capability of this measure if enabled, lists out the name of the media images available in this PAN Manager.
	MACs: Indicates the total number of MAC addresses that are allocated to this PAN Manager.	Number	The Media Access Control (MAC) Address is a hardware address that uniquely identifies a component in an Ethernet network. In PAN Manager, each pServer vNIC has a unique MAC address.
	WWNs: Indicates the total number of WWNs (World Wide Names) that are currently allocated to this PAN Manager.	Number	A WWN (World Wide Number) is a hardware address that uniquely identifies a target in a Storage Area Network. In PAN Manager, you assign WWNs to LPANs after which you use a vHBA to assign WWNs to a pServer.

	vLans: Indicates the total number of VLANs that are currently allocated to this PAN Manager.	Number	A vLAN refers to a Virtual LAN. It is a standard, trunk-forwarding network protocol. In the PAN manager, VLANs are used on different levels by different PAN entities: ➢ Private Management Network — uses VLANs on each of its network vSwitches. ➢ LPANs — Each LPAN uses VLANs for pServer-to-pServer network traffic. ➢ pServers — For pServer network traffic external to the PAN, a pServer can have one or more VLAN-enabled vSwitches attached to it through a vNIC.

The detailed diagnosis capability of the *Uplinks* measure if enabled, lists out the name of the uplinks and the type of each uplink available in this PAN Manager.

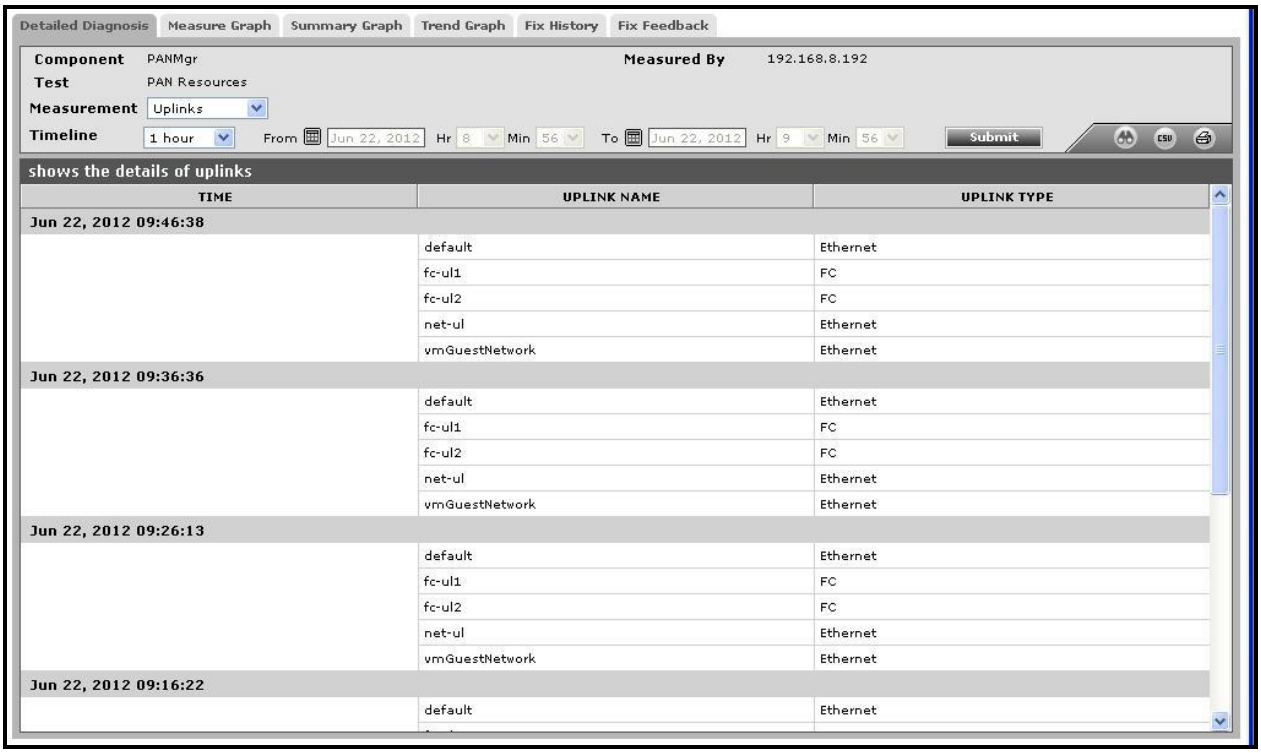


Figure 6: The detailed diagnosis of the Uplinks measure

The detailed diagnosis capability of the *Media image* measure if enabled, lists out the name of the media images available in this PAN Manager.

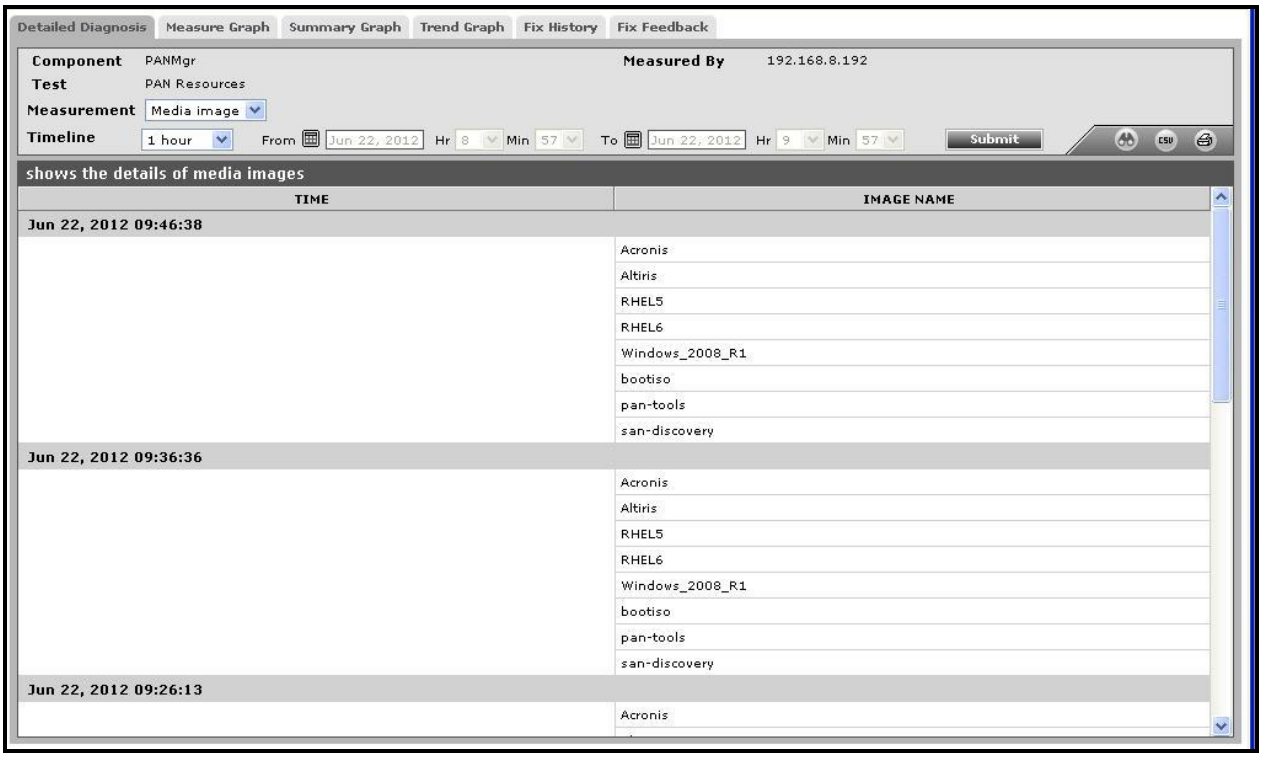


Figure 7: The detailed diagnosis of the Media image measure

1.1.3 PAN OPServer Details

The Egenera PAN Manager application runs on a PAN OPServer that is running on a 64-bit Red Hat. The PAN Manager application running on the PAN OPServers manages the physical and virtual resources of the domain(s) in the PAN. The Egenera PAN Manager is designed to run redundantly on two PAN OPServers, in a master/slave role. The master PAN OPServer performs all management functions while the slave has the ability to assume the master responsibilities in case of failure in the master PAN OPServer.

In a non-redundant setup therefore, sudden or intermittent breaks in the availability of the PAN OPServer can bring the PAN Manager application to a standstill, taking down all the mission-critical servers and applications that operate on it. By periodically checking the availability of the PAN OPServer and promptly reporting the non-availability of that server, administrators can take timely measures to restore the PAN OPServer to normalcy and thus greatly minimize PAN Manager downtime.

This test helps administrators achieve this end. The test reports whether the PAN OPServer is currently available or not and also indicates whether the server being monitored is the master/slave in a redundant setup.

Purpose	Reports whether the PAN OPServer is currently available or not and also indicates

	whether the server being monitored is the master/slave in a redundant setup		
Target of the test	Double-take server		
Agent deploying the test	Remote agent		
Configurable parameters for the test	1. **TEST PERIOD** - How often should the test be executed 2. **Host** – The IP address of the Egenera PAN Manager. 3. **pan manager user**, **pan manager password**, and **confirm password** - To monitor the Egenera PAN Manager, the eG agent has to be configured with *administrator* privileges. This is why, you need to specify the credentials of an *administrator* against the **pan manager user** and **pan manager password** parameters of this test. Confirm the **pan manager password** by retyping it in the **confirm password** text box. 4. **ssl** - By default, the Egenera PAN Manager is not **SSL**-enabled. Accordingly, the **SSL** flag is set to **No** by default. 5. **webport** - By default, in most environments, the Egenera PAN Manager listens on port 80 (if not SSL-enabled) or on port 443 (if SSL-enabled) only. This implies that while monitoring the Egenera PAN Manager, the eG agent, by default, connects to port 80 or 443, depending upon the SSL-enabled status of Egenera PAN Manager - i.e., if Egenera PAN Manager is not SSL-enabled (i.e., if the **SSL** flag above is set to **No**), then the eG agent connects to Egenera PAN Manager using port 80 by default, and if Egenera PAN Manager is SSL-enabled (i.e., if the **SSL** flag is set to **Yes**), then the agent-Egenera PAN Manager communication occurs via port 443 by default. Accordingly, the **WEBPORT** parameter is set to *default* by default. In some environments however, the default ports 80 or 443 might not apply. In such a case, against the **WEBPORT** parameter, you can specify the exact port at which the Egenera PAN Manager in your environment listens, so that the eG agent communicates with that port for collecting metrics from the Egenera PAN Manager. 6. **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 enabled/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.		
Outputs of the test	One set of results for each PAN OPServer being monitored.		
Measurements made by the	**Measurement**	**Measurement Unit**	**Interpretation**

<table>
<tr>
<td>test</td>
<td>Status:
Indicates the current status of this PAN OPServer.</td>
<td></td>
<td>This measure reports the value Available if the PAN OPServer is currently available and the value Not Available if otherwise.

The numeric values that correspond to the above-mentioned measure values are as follows:

<table>
<tr><th>Measure Value</th><th>Numeric Value</th></tr>
<tr><td>Not Available</td><td>0</td></tr>
<tr><td>Available</td><td>1</td></tr>
</table>

Note:

By default, this measure reports the above-mentioned Measure Values while indicating the status of this PAN OPServer. However, in the graph of this measure, the status will be represented using the corresponding numeric equivalents of the Measure Values.

The detailed diagnosis capability of this measure, if enabled, lists out the global IP address, the name of the Network Interface through which the global IP is assigned, the IP address of the master PAN OPServer, the name of the master PAN OPServer, the IP adress of the slave PAN OPServer, the name of the slave PAN OPServer, the version of the PAN OPServer and the role of this PAN OPServer in this Egenera PAN Manager.</td>
</tr>
</table>

	Is master role? Indicates whether this PAN OPServer is the master server in a redundant setup.		This measure reports a value *Yes* if this PAN OPServer is the master in a redundant setup and the value *No* if this PAN OPServer is not the master. The numeric values that correspond to the above-mentioned measure values are as follows: **Measure Value** / **Numeric Value** No / 0 Yes / 1 **Note:** By default, this measure reports the above-mentioned **Measure Value**s while indicating whether/not this PAN OPServer is the master. However, in the graph of this measure the master/slave status of the server will be represented using the corresponding numeric equivalents of the **Measure Value**s.

The detailed diagnosis capability of the *Status* measure, if enabled, lists out the global IP address, the name of the Network Interface through which the global IP is assigned, the IP address of the master PAN OPServer, the name of the master PAN OPServer, the IP adress of the slave PAN OPServer, the name of the slave PAN OPServer, the version of the PAN OPServer and the role of this PAN OPServer in this Egenera PAN Manager.

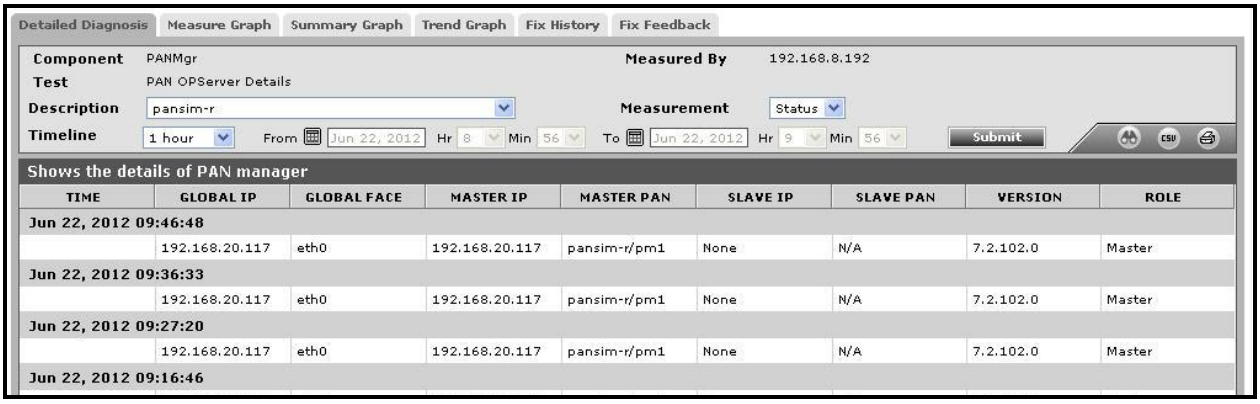


Figure 8: The detailed diagnosis of the Status measure

1.1.4 PAN Licenses Test

Egenera PAN Manager requires licenses for use and offers several levels of licensing:

- **PAN Builder** — Provides core PAN Manager features to configure, control, and monitor PAN resources. Enables a pNode to boot.
- **PAN Server Portability** — Enables a pServer to failover its pNode to another pNode. PAN Manager licenses for pNodes are based on the number of CPU sockets in the pNode. Two license types are available for a pNode: one that supports one to three sockets, and one that supports four or more sockets.
- **PAN Portability** — enables Disaster Recovery functionality for a pNode in the PAN.

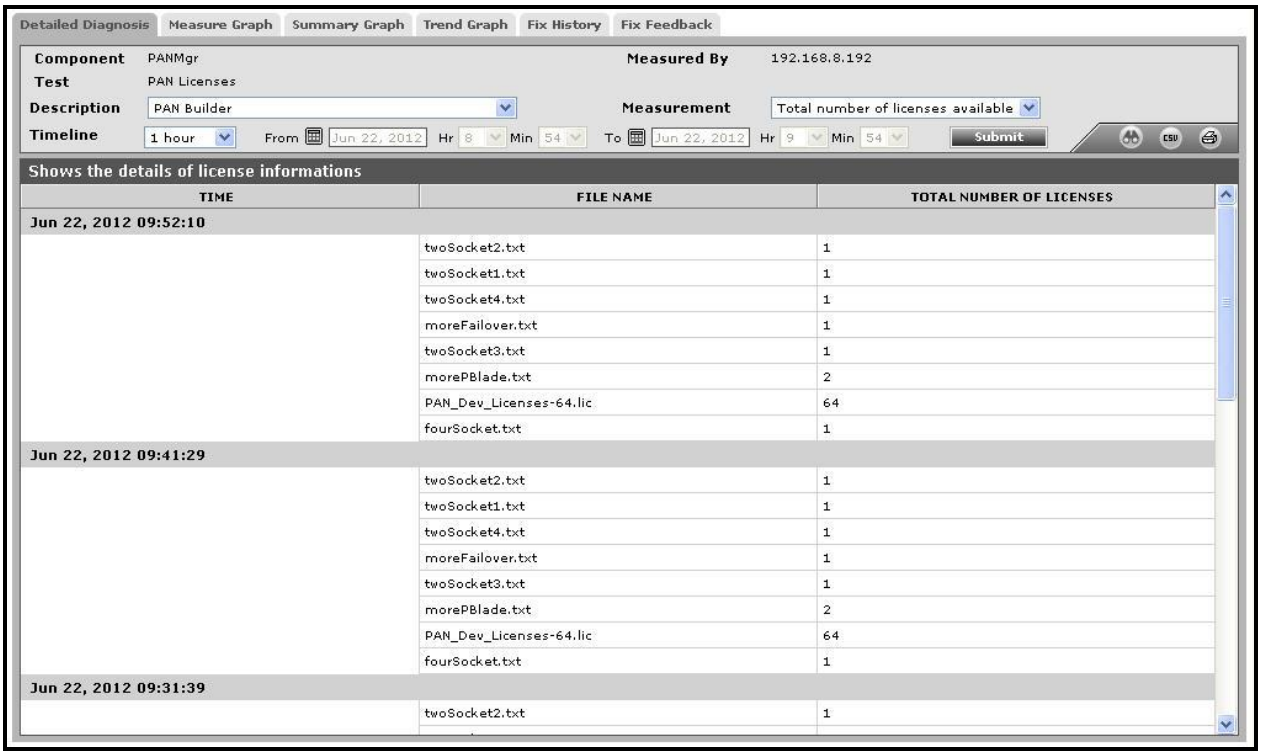
To ensure that PAN users are allowed uninterrupted access to the core PAN manager features, administrators need to continuously track the usage of all the above-mentioned license types and make sure that adequate licenses are available at all times. The PAN licenses test assists administrators in this exercise. The test periodically checks how each of the aforesaid license types are being utilized by a PAN installation and proactively alerts administrators to the probable exhaustion of the licenses of a type, so that plans can be made for the purchase of additional licenses (if required) of that type.

Purpose	Periodically checks how each of the aforesaid license types are being utilized by a PAN installation and proactively alerts administrators to the probable exhaustion of a license, so that plans can be made for the purchase of additional licenses (if required) of that type
Target of the test	An Egenera PAN Manager
Agent deploying the test	Remote agent

<table>
<tr><td>Configurable parameters for the test</td><td colspan="3">1. TEST PERIOD - How often should the test be executed
2. Host – The IP address of the Egenera PAN Manager.
3. pan manager user, pan manager password, and confirm password - To monitor the Egenera PAN Manager, the eG agent has to be configured with administrator privileges. This is why, you need to specify the credentials of an administrator against the pan manager user and pan manager password parameters of this test. Confirm the pan manager password by retyping it in the confirm password text box.
4. ssl - By default, the Egenera PAN Manager is not SSL-enabled. Accordingly, the SSL flag is set to No by default.
5. webport - By default, in most environments, the Egenera PAN Manager listens on port 80 (if not SSL-enabled) or on port 443 (if SSL-enabled) only. This implies that while monitoring the Egenera PAN Manager, the eG agent, by default, connects to port 80 or 443, depending upon the SSL-enabled status of Egenera PAN Manager - i.e., if Egenera PAN Manager is not SSL-enabled (i.e., if the SSL flag above is set to No), then the eG agent connects to Egenera PAN Manager using port 80 by default, and if Egenera PAN Manager is SSL-enabled (i.e., if the SSL flag is set to Yes), then the agent-Egenera PAN Manager communication occurs via port 443 by default. Accordingly, the WEBPORT parameter is set to default by default.
In some environments however, the default ports 80 or 443 might not apply. In such a case, against the WEBPORT parameter, you can specify the exact port at which the Egenera PAN Manager in your environment listens, so that the eG agent communicates with that port for collecting metrics from the Egenera PAN Manager.
6. 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 enabled/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.</td></tr>
<tr><td>Outputs of the test</td><td colspan="3">One set of results for each type of license utilized by the PAN Manager being monitored</td></tr>
<tr><td rowspan="2">Measurements made by the test</td><td>Measurement</td><td>Measurement Unit</td><td>Interpretation</td></tr>
<tr><td>Total number of licenses available:
Indicates the number of licences of this type currently available in this PAN Manager.</td><td>Number</td><td>The detailed diagnosis capability, if enabled for this measure, lists out the total number of licenses that are allocated for each file name.</td></tr>
</table>

	Number of licenses currently utilized: Indicates the number of licenses of this type that are currently utilized in this PAN Manager.	Number	The detailed diagnosis capability if enabled, lists out the name of the pNode, the number of licenses used by this pNode and the Socket count.
	License utilization: Indicates the percentage of licences of this type that were utilized in this PAN Domain.	Percent	If the value of this measure grows cose to 100%, it indicates that licenses of this type are being over-utilized and are about to be exhausted.

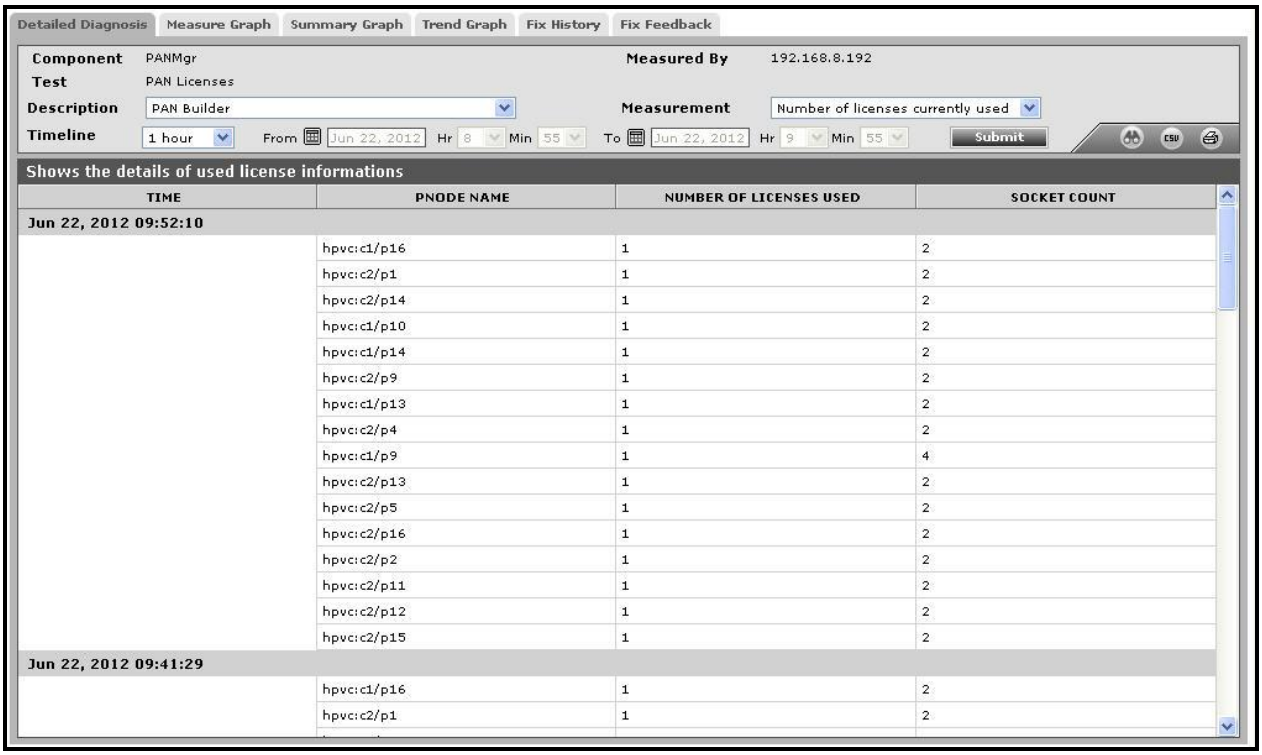
The detailed diagnosis capability, if enabled for the *Total number of licenses available* measure, lists out the total number of licenses that are allocated for each file name.



TIME	FILE NAME	TOTAL NUMBER OF LICENSES
Jun 22, 2012 09:52:10		
	twoSocket2.txt	1
	twoSocket1.txt	1
	twoSocket4.txt	1
	moreFailover.txt	1
	twoSocket3.txt	1
	morePBlade.txt	2
	PAN_Dev_Licenses-64.lic	64
	fourSocket.txt	1
Jun 22, 2012 09:41:29		
	twoSocket2.txt	1
	twoSocket1.txt	1
	twoSocket4.txt	1
	moreFailover.txt	1
	twoSocket3.txt	1
	morePBlade.txt	2
	PAN_Dev_Licenses-64.lic	64
	fourSocket.txt	1
Jun 22, 2012 09:31:39		
	twoSocket2.txt	1

Figure 9: The detailed diagnosis of the Total number of licenses available measure

The detailed diagnosis capability, if enabled for the *Number of licenses currently utilized* measure, lists out the name of the pNode, the number of licenses used by this pNode and the Socket count. This way, you can accurately identify the pNodes that are consuming licenses excessively.



TIME	PNODE NAME	NUMBER OF LICENSES USED	SOCKET COUNT
Jun 22, 2012 09:52:10			
	hpvc:c1/p16	1	2
	hpvc:c2/p1	1	2
	hpvc:c2/p14	1	2
	hpvc:c1/p10	1	2
	hpvc:c1/p14	1	2
	hpvc:c2/p9	1	2
	hpvc:c1/p13	1	2
	hpvc:c2/p4	1	2
	hpvc:c1/p9	1	4
	hpvc:c2/p13	1	2
	hpvc:c2/p5	1	2
	hpvc:c2/p16	1	2
	hpvc:c2/p2	1	2
	hpvc:c2/p11	1	2
	hpvc:c2/p12	1	2
	hpvc:c2/p15	1	2
Jun 22, 2012 09:41:29			
	hpvc:c1/p16	1	2
	hpvc:c2/p1	1	2

Figure 10: The detailed diagnosis of the Number of licenses currently used measure

1.1.5 Chassis Information Test

Each PAN domain of the Egenera PAN Manager consists of several chassis that mounts different types of switches within them. Using this test, the administrators can figure out the current operating status of the chassis and identify the type of the switches present in each chassis. Apart from this, the number of uplink and downlink ports in each swtich can be determined so that the administrator can easily identify whethere there are any uplink/downlink ports available for pServer connectivity.

Purpose	Using this test, the administrators can figure out the current operating status of the chassis and identify the type of the switches present in each chassis. Apart from this, the number of uplink and downlink ports in each swtich can be determined so that the administrator can easily identify whethere there are any uplink/downlink ports available for pServer connectivity
Target of the test	An Egenera PAN Manager
Agent deploying the test	Remote agent

Configurable parameters for the test	1. **TEST PERIOD** - How often should the test be executed 2. **Host** – The IP address of the Egenera PAN Manager. 3. **pan manager user**, **pan manager password**, and **confirm password** - To monitor the Egenera PAN Manager, the eG agent has to be configured with *administrator* privileges. This is why, you need to specify the credentials of an *administrator* against the **pan manager user** and **pan manager password** parameters of this test. Confirm the **pan manager password** by retyping it in the **confirm password** text box. 4. **ssl** - By default, the Egenera PAN Manager is not **SSL**-enabled. Accordingly, the **SSL** flag is set to **No** by default. 5. **webport** - By default, in most environments, the Egenera PAN Manager listens on port 80 (if not SSL-enabled) or on port 443 (if SSL-enabled) only. This implies that while monitoring the Egenera PAN Manager, the eG agent, by default, connects to port 80 or 443, depending upon the SSL-enabled status of Egenera PAN Manager - i.e., if Egenera PAN Manager is not SSL-enabled (i.e., if the **SSL** flag above is set to **No**), then the eG agent connects to Egenera PAN Manager using port 80 by default, and if Egenera PAN Manager is SSL-enabled (i.e., if the **SSL** flag is set to **Yes**), then the agent-Egenera PAN Manager communication occurs via port 443 by default. Accordingly, the **WEBPORT** parameter is set to *default* by default. In some environments however, the default ports 80 or 443 might not apply. In such a case, against the **WEBPORT** parameter, you can specify the exact port at which the Egenera PAN Manager in your environment listens, so that the eG agent communicates with that port for collecting metrics from the Egenera PAN Manager. 6. **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 enabled/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.		
Outputs of the test	One set of results for each switch in each chassis in a PAN domain		
Measurements made by the	**Measurement**	**Measurement Unit**	**Interpretation**

<table>
<tr>
<td>test</td>
<td>Power status:
Indicates the current operating status of this chassis in this PAN Domain.</td>
<td></td>
<td>This measure reports the value On if this chassis is currently powered on and the value Off if this chassis is powered off.

The numeric values that correspond to the above-mentioned measure values are as follows:

<table>
<tr><th>Measure Value</th><th>Numeric Value</th></tr>
<tr><td>Off</td><td>0</td></tr>
<tr><td>On</td><td>1</td></tr>
</table>

Note:

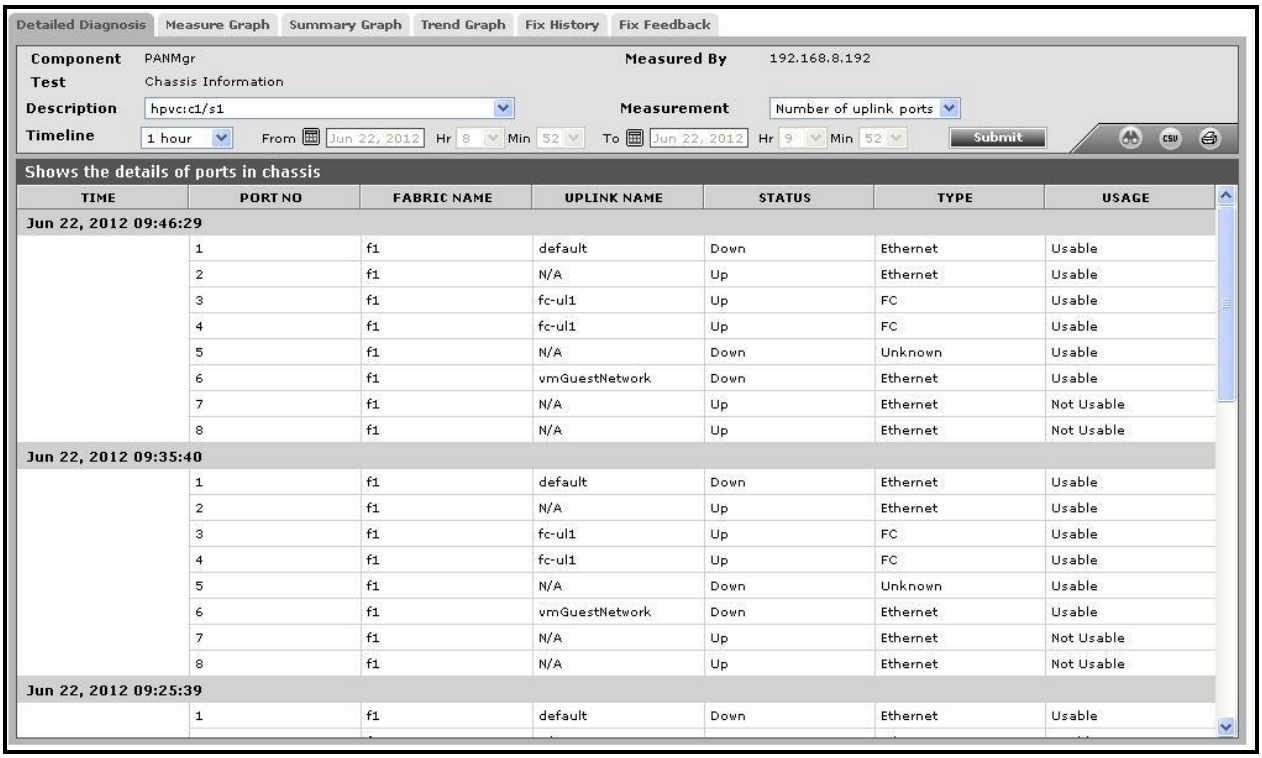
By default, this measure reports the above-mentioned Measure Values while indicating the current operating status of this chassis in this PAN Domain. However, in the graph of this measure, status will be represented using the corresponding numeric equivalents i.e., 0 or 1.</td>
</tr>
</table>

<table>
<tr>
<td></td>
<td>Type:
Indicates the type of this switch available in this chassis.</td>
<td></td>
<td>This measure reports the type of this switch as follows:
➢ Ethernet
➢ Fibre Channel(FC) and
➢ Converged
The numeric values that correspond to the above-mentioned types are as follows:
<table>
<tr><th>Type</th><th>Numeric Value</th><th>Description</th></tr>
<tr><td>Ethernet</td><td>1</td><td>the switch supports only Ethernet ports and external connectivity to Ethernet networks.</td></tr>
<tr><td>Fibre Channel(FC)</td><td>2</td><td>the switch supports only Fibre Channel ports and external connectivity to Fibre Channel storage arrays.</td></tr>
<tr><td>Converged</td><td>3</td><td>the switch supports both Ethernet and Fibre Channel ports, and therefore external connectivity to Ethernet networks and Fibre Channel storage arrays</td></tr>
</table>
Note:

By default, this measure reports the above-mentioned Types while indicating the type of this switch in this chassis. However, in the graph of this measure, the type will be represented using the corresponding numeric equivalents i.e., 1 to 3.</td>
</tr>
</table>

	Number of uplink ports: Indicates the number of uplink ports in this switch of this chassis.	Number	An uplink is a collection of one or more ports bound together into a single entity that connects to external switches for either Ethernet (network) or Fibre Channel (storage) connectivity. Uplinks provide pServer network redundancy. ➢ Uplinks are defined as either Fibre Channel (for storage connectivity) or Ethernet (for network connectivity). ➢ All of the ports in a uplink must be the same type (Fibre Channel or Ethernet) ➢ A port may be included in only one uplink. ➢ Ports are combined into uplinks to provide connectivity for network or storage traffic from the pServers to the data center network or storage array. ➢ Ports can be added or removed from the uplink after creation, as long as the ports are of the same type (Fibre Channel or Ethernet). If you change ports on the uplink, you must first shutdown the pServers using that uplink for network traffic. When you reboot the pServers, they will resume network traffic on the newly modified uplink. The detailed diagnosis capability of this measure if enabled, provides a detailed information of each port such as the PORT NO, the FABRIC NAME, UPLINK NAME, STATUS, TYPE and the USAGE i.e., the availability of this port for further use.
	Number of downlink ports: Indicates the number of downlink ports in this switch of this chassis.	Number	

The detailed diagnosis capability of the *Number of uplinks* ports measure, if enabled, provides a detailed information of each port such as the PORT NO, the FABRIC NAME, UPLINK NAME, STATUS, TYPE and the USAGE i.e., the availability of this port for further use.



TIME	PORT NO	FABRIC NAME	UPLINK NAME	STATUS	TYPE	USAGE
Jun 22, 2012 09:46:29						
	1	f1	default	Down	Ethernet	Usable
	2	f1	N/A	Up	Ethernet	Usable
	3	f1	fc-ul1	Up	FC	Usable
	4	f1	fc-ul1	Up	FC	Usable
	5	f1	N/A	Down	Unknown	Usable
	6	f1	vmGuestNetwork	Down	Ethernet	Usable
	7	f1	N/A	Up	Ethernet	Not Usable
	8	f1	N/A	Up	Ethernet	Not Usable
Jun 22, 2012 09:35:40						
	1	f1	default	Down	Ethernet	Usable
	2	f1	N/A	Up	Ethernet	Usable
	3	f1	fc-ul1	Up	FC	Usable
	4	f1	fc-ul1	Up	FC	Usable
	5	f1	N/A	Down	Unknown	Usable
	6	f1	vmGuestNetwork	Down	Ethernet	Usable
	7	f1	N/A	Up	Ethernet	Not Usable
	8	f1	N/A	Up	Ethernet	Not Usable
Jun 22, 2012 09:25:39						
	1	f1	default	Down	Ethernet	Usable

Figure 11: The detailed diagnosis of the Number of uplink ports measure

1.2 The PAN Network Layer

To check the network availability and responsiveness of the PAN Manager from time-to-time, and to determine the overall health of each of the vSwitches created on the PAN manager, use the tests mapped to this layer.

Figure 12: The tests mapped to the PAN Network layer

1.2.1 PAN Virtual Switch Details Test

The virtual switch created by PAN Manager functions just like a physical switch. A vSwitch is designated for either network (Ethernet) or storage traffic (Fibre Channel), but cannot be used for both. PAN Manager supports two types of Ethernet vSwitches:

- Uplinked vSwitch: The Ethernet vSwitch associated with a network uplink, which provides external connectivity. An uplinked Ethernet vSwitch must have a VLAN ID configured on the premises network and can be enabled for link dependency.
- Non-uplinked vSwitch: The Ethernet vSwitch that provides internal connectivity between pServers. A non-uplinked Ethernet vSwitch should use a VLAN ID already added to PAN Manager.

Normally, pServers are connected to the pNodes using vSwitches. This test auto-discovers the vSwitches in a PAN network and reports the following:

- The type of each vSwitch;
- What is the uplink status of every vSwitch? Is link dependancy capability is enabled for this vSwitch?
- How many LPANS are allocated to each vSwitch?
- How many pServers are connected through every vSwitch and what is the VLAN ID of each connection?

Purpose	Auto-discovers the vSwitches in a PAN network and reports the following: ➢ The type of each vSwitch; ➢ What is the uplink status of every vSwitch? Is link dependancy capability is enabled for this vSwitch? ➢ How many LPANS are allocated to each vSwitch? ➢ How many pServers are connected through every vSwitch and what is the VLAN ID of each connection?
Target of the test	An Egenera PAN Manager
Agent deploying the test	Remote agent

<table>
<tr><td>Configurable parameters for the test</td><td colspan="3">1. TEST PERIOD - How often should the test be executed
2. Host – The IP address of the Egenera PAN Manager.
3. pan manager user, pan manager password, and confirm password - To monitor the Egenera PAN Manager, the eG agent has to be configured with administrator privileges. This is why, you need to specify the credentials of an administrator against the pan manager user and pan manager password parameters of this test. Confirm the pan manager password by retyping it in the confirm password text box.
4. ssl - By default, the Egenera PAN Manager is not SSL-enabled. Accordingly, the SSL flag is set to No by default.
5. webport - By default, in most environments, the Egenera PAN Manager listens on port 80 (if not SSL-enabled) or on port 443 (if SSL-enabled) only. This implies that while monitoring the Egenera PAN Manager, the eG agent, by default, connects to port 80 or 443, depending upon the SSL-enabled status of Egenera PAN Manager - i.e., if Egenera PAN Manager is not SSL-enabled (i.e., if the SSL flag above is set to No), then the eG agent connects to Egenera PAN Manager using port 80 by default, and if Egenera PAN Manager is SSL-enabled (i.e., if the SSL flag is set to Yes), then the agent-Egenera PAN Manager communication occurs via port 443 by default. Accordingly, the WEBPORT parameter is set to default by default.
In some environments however, the default ports 80 or 443 might not apply. In such a case, against the WEBPORT parameter, you can specify the exact port at which the Egenera PAN Manager in your environment listens, so that the eG agent communicates with that port for collecting metrics from the Egenera PAN Manager.
6. 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 enabled/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.</td></tr>
<tr><td>Outputs of the test</td><td colspan="3">One set of results for each vSwitch in a PAN domain</td></tr>
<tr><td>Measurements made by the</td><td>Measurement</td><td>Measurement Unit</td><td>Interpretation</td></tr>
</table>

<table>
<tr>
<td>test</td>
<td>Type:
Indicates the type of this switch.</td>
<td></td>
<td>This measure reports Ethernet or Fibre Channel based on the type of the vSwitch.

The numeric values that correspond to the above-mentioned types are as follows:

<table>
<tr><th>Type</th><th>Numeric Value</th></tr>
<tr><td>Ethernet</td><td>1</td></tr>
<tr><td>Fibre Channel</td><td>2</td></tr>
</table>

Note:

By default, this measure reports the above-mentioned Types while indicating the type of the vSwitch. However, in the graph of this measure, the switch type will be represented using the corresponding numeric equivalents i.e., 1 or 2.</td>
</tr>
<tr>
<td></td>
<td>Is uplink attached?:
Indicates whether/not this vSwitch is uplinked.</td>
<td></td>
<td>An uplink is a collection of one or more ports bound together into a single entity that connects to external switches for either Ethernet (network) or Fibre Channel (storage) connectivity.

This measure reports a value Uplinked if this vSwitch is uplinked and a value Not uplinked if otherwise.

The numeric values that correspond to the above-mentioned values are as follows:

<table>
<tr><th>Measure Value</th><th>Numeric Value</th></tr>
<tr><td>Uplinked</td><td>1</td></tr>
<tr><td>Not uplinked</td><td>0</td></tr>
</table>

Note:

By default, this measure reports the above-mentioned Measure Values while indicating whether/not this vSwitch is uplinked. However, in the graph of this measure, the same will be represented using the corresponding numeric equivalents i.e., 0 or 1.

The detailed diagnosis capability of this measure, if enabled, lists out the NAME OF THE UPLINK to which this vSwitch is uplinked.</td>
</tr>
</table>

<table>
<tr>
<td></td>
<td>Link dependency:
Indicates whether/not the link dependancy is enabled on this vSwitch.</td>
<td></td>
<td>PAN Manager supports link dependency, a feature of a physical switch (usually an edge switch) that reflects the state of the switch's uplink port(s) to the downlink ports. In PAN Manager, you enable/disable link dependency on a vSwitch. If a disruption in network connectivity that is external to the PAN occurs, the bonding/teaming software in the pServer's operating system redirects network traffic over the pServer's other available path to the external network.

This measure reports a value On if link dependancy is enabled on this vSwitch and a value Off if the link dependancy is disabled.

The numeric values that correspond to the above-mentioned measure values are as follows:

<table>
<tr><th>Measure Value</th><th>Numeric Value</th></tr>
<tr><td>On</td><td>1</td></tr>
<tr><td>Off</td><td>0</td></tr>
</table>

Note:

By default, this measure reports the above-mentioned Measure Values while indicating whether/not the link dependancy is enabled on this vSwitch. However, in the graph of this measure, the same will be represented using the corresponding numeric equivalents i.e., 0 or 1.</td>
</tr>
<tr>
<td></td>
<td>Vlan ID:
Indicates the VLAN ID through which this vSwitch is connected to the pServer.</td>
<td>Number</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LPANS allocated:
Indicates the total number of LPANS to allocated to this vSwitch.</td>
<td>Number</td>
<td>LPANs consist of isolated groups of PAN and external hardware resources. They include resources and pServers that remain logically separate from the other resources of the PAN.

The detailed diagnosis capability of this measure, if enabled lists out the NAME OF THE LPANs to which this vSwitch is allocated.</td>
</tr>
</table>

	Number of pServers attached: Indicates the total number of pServers that are connected through this vSwitch.	Number	The detailed diagnosis capability of this measure, if enabled lists out the NAME OF THE LPAN, the PSERVER NAME and the VSWITCH TYPE.

The detailed diagnosis capability of the *LPANS Allocated* measure, if enabled, lists out the NAME OF THE LPANs to which this vSwitch is allocated.

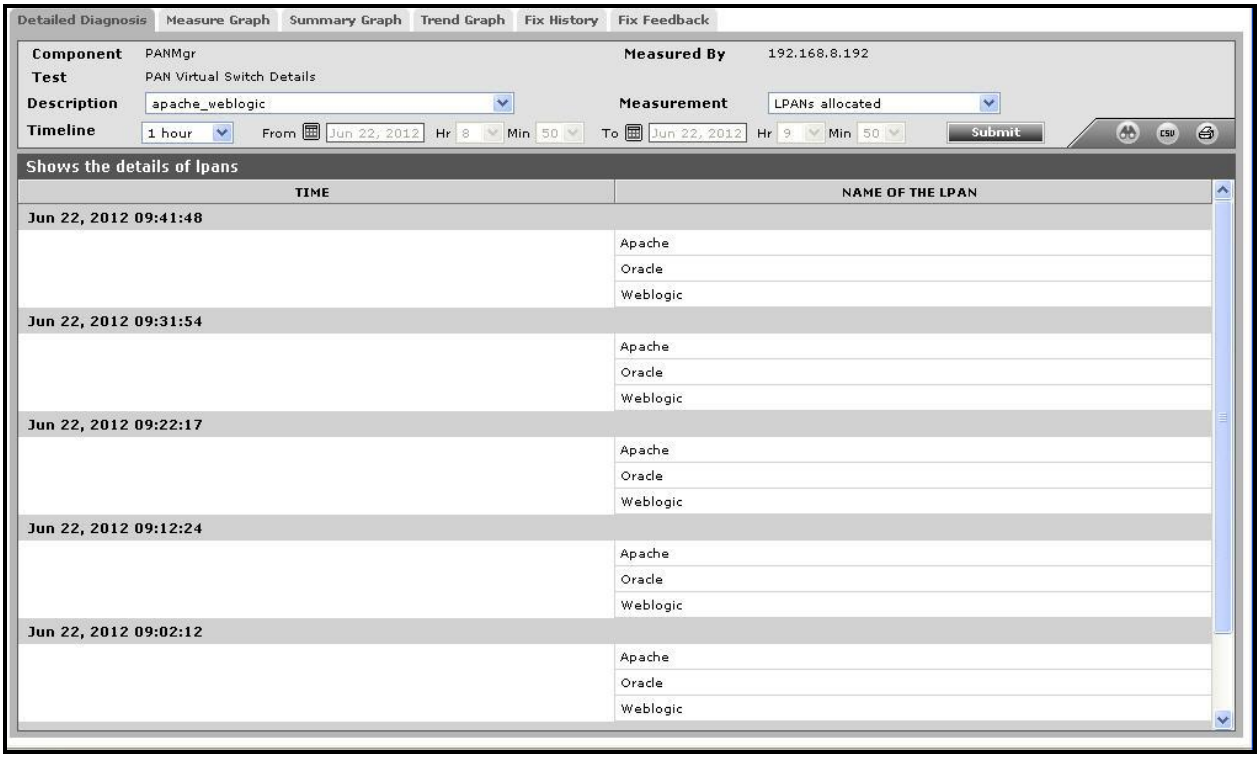


Figure 13: The detailed diagnosis of the LPANS allocated measure

The detailed diagnosis capability of the *Number of pServers attached* measure, if enabled lists out the NAME OF THE LPAN, the PSERVER NAME and the VSWITCH TYPE.

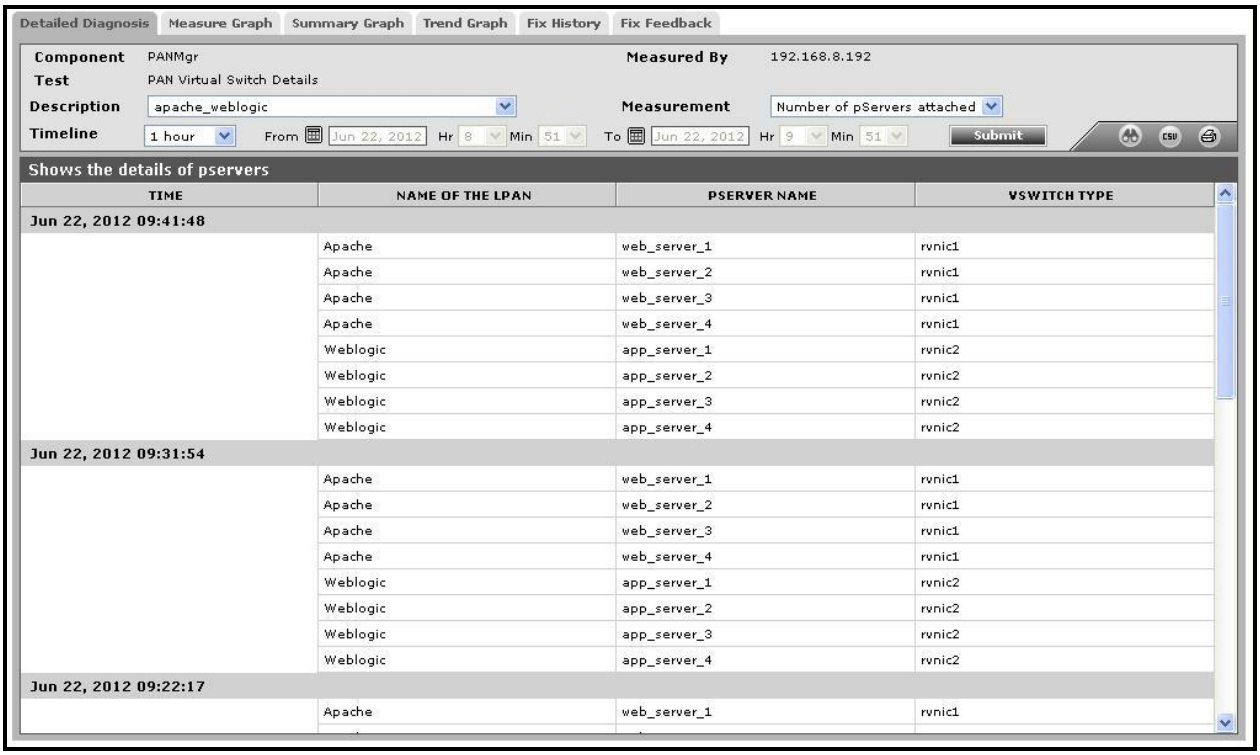


Figure 14: THe detailed diagnosis of the Number of pServers attached measure

1.3 The pNodes Layer

In PAN Manager, processing resources are called Processing Nodes, or simply pNodes. Using this layer, you can identify the pNodes managed by the PAN manager being monitored, and determine the current state, configuration, and temperature of each pNode.

Figure 15: The tests mapped to the pNodes layer

1.3.1 PAN pNode Performance Test

The PAN architecture was designed around simplifying pServer management and monitoring. A pServer is a logical server that possesses all the resources of a conventional server, but which is not

tied to a specific processing resource. In PAN Manager, these processing resources are called Processing Nodes, or simply pNodes.

This test reports the current status of each pNode in this PAN Domain and also helps the administrator to determine the following:

- the speed of the CPU in the pNode;
- the number of sockets, CPU cores, vNICs and vHBAs available in this pNode;
- the size of the RAM in each CPU;
- Which type of pool i.e., global or local does the pNode belong to?
- The temperature of the pNode and its core components such as CPU, memory, hard drive, system board, etc.

Purpose	This test reports the current status of each pNode in this PAN Domain and also helps the administrator to determine the following: ➢ the speed of the CPU in the pNode; ➢ the number of sockets, CPU cores, vNICs and vHBAs available in this pNode; ➢ the size of the RAM in each CPU; ➢ Which type of pool i.e., global or local does the pNode belong to? ➢ The temperature of the pNode and its core components such as CPU, memory, hard drive, system board, etc.
Target of the test	An Egenera PAN Manager
Agent deploying the test	Remote agent

Configurable parameters for the test	1. **TEST PERIOD** - How often should the test be executed 2. **Host** – The IP address of the Egenera PAN Manager. 3. **pan manager user**, **pan manager password**, and **confirm password** - To monitor the Egenera PAN Manager, the eG agent has to be configured with *administrator* privileges. This is why, you need to specify the credentials of an *administrator* against the **pan manager user** and **pan manager password** parameters of this test. Confirm the **pan manager password** by retyping it in the **confirm password** text box. 4. **ssl** - By default, the Egenera PAN Manager is not **SSL**-enabled. Accordingly, the **SSL** flag is set to **No** by default. 5. **webport** - By default, in most environments, the Egenera PAN Manager listens on port 80 (if not SSL-enabled) or on port 443 (if SSL-enabled) only. This implies that while monitoring the Egenera PAN Manager, the eG agent, by default, connects to port 80 or 443, depending upon the SSL-enabled status of Egenera PAN Manager - i.e., if Egenera PAN Manager is not SSL-enabled (i.e., if the **SSL** flag above is set to **No**), then the eG agent connects to Egenera PAN Manager using port 80 by default, and if Egenera PAN Manager is SSL-enabled (i.e., if the **SSL** flag is set to **Yes**), then the agent-Egenera PAN Manager communication occurs via port 443 by default. Accordingly, the **WEBPORT** parameter is set to *default* by default. In some environments however, the default ports 80 or 443 might not apply. In such a case, against the **WEBPORT** parameter, you can specify the exact port at which the Egenera PAN Manager in your environment listens, so that the eG agent communicates with that port for collecting metrics from the Egenera PAN Manager.		
Outputs of the test	One set of results for each pNode in the PAN manager being monitored		
Measurements made by the	**Measurement**	**Measurement Unit**	**Interpretation**

<table>
<tr><td>test</td><td>Status:
Indicates the current state of this pNode in this PAN Domain.</td><td></td><td>If the pNode is powered on in this PAN Domain, then the value of this measure will be reported as Powered on. If the pNode is powered off, then the value of this measure will be reported as Powered off.

The numeric values that correspond to the above-mentioned measure values are as follows:
<table><tr><th>Measure Value</th><th>Numeric Value</th></tr><tr><td>Powered on</td><td>1</td></tr><tr><td>Powered off</td><td>0</td></tr></table>
Note:
By default, this measure reports the above-mentioned Measure Values while indicating the current state of a pNode. However, in the graph of this measure, the state will be represented using the corresponding numeric equivalents i.e., 0 or 1.</td></tr>
<tr><td></td><td>Clock speed of CPU:
Indicates the clock speed of the CPU in this pNode.</td><td>GHz</td><td></td></tr>
<tr><td></td><td>Sockets:
Indicates the number of sockets available in this pNode.</td><td>Number</td><td></td></tr>
<tr><td></td><td>Cores:
Indicates the number of CPU cores available in this pNode.</td><td>Number</td><td></td></tr>
<tr><td></td><td>RAM:
Indicates the size of RAM available in this pNode.</td><td>GB</td><td></td></tr>
<tr><td></td><td>Cache memory:
Indicates the amount of memory that is allocated for cache in this pNode.</td><td>MB</td><td></td></tr>
</table>

	NICs: Indicates the number of virtual Network Interface Cards (NIC) available in this pNode.	Number	vNIC is the Virtual Network Interface Card i.e., in this case, a PAN Manager Ethernet interface you create on a pServer. A vNIC interface functions just like a physical NIC, and is the means by which a pServer connects to an Ethernet network.
	HBAs: Indicates the number of virtual Host Bus Adapters (HBA) that are currently available in this pNode.	Number	The Virtual Host Bus Adapter (vHBA) is a PAN Manager SAN interface you create on a pServer. A vHBA interface functions like a physical HBA, and is the means by which a pServer connects to a SAN environment.
	HW event log utilization: Indicates the percentage of eventlog that is currently utilized in this pNode.	Percent	

<table>
<tr>
<td></td>
<td>Is pNode in local pool?:
Indicates whether/not this pNode is in the local pool.</td>
<td></td>
<td>A local pool is a set of processing resources used by a specific LPAN and from which pNodes can be assigned to pServers running in that LPAN.

The pNode in a local pool cannot be assigned to pServers running in other LPANs. Administrators can link a local pool to a Global Pool, so the PAN Manager will attempt to allocate a pNode from the global pool if it cannot obtain one from the local pool.

This measure reports the value Yes, if this pNode is in the local pool and the value No if this pNode is not in the local pool.

The numeric values that correspond to the above-mentioned 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:

By default, this measure reports the above-mentioned Measure Values while indicating the pool to which a pNode belongs. However, in the graph of this measure, the same will be represented using the corresponding numeric equivalents i.e., 0 or 1.</td>
</tr>
<tr>
<td></td>
<td>Is pNode in global pool?:
Indicates whether/not this pNode is in the global pool.</td>
<td>Blocks/Sec</td>
<td>A global pool is a pNode Pool that is used by the whole PAN, from which pNodes are made available to pServers running in the PAN. A global pool spans LPANs i.e., the pNodes in a global pool can be made available to pServers running in any LPAN.

This measure reports a value Yes, if this pNode is in the global pool and a value No if this pNode is not in the global pool.

The numeric values that correspond to the above-mentioned measure values are as follows:</td>
</tr>
</table>

<table>
<tr><td></td><td></td><td></td><td>
<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:
By default, this measure reports the above-mentioned Measure Values while indicating the pool to which a pNode belongs. However, in the graph of this measure, the same will be represented using the corresponding numeric equivalents i.e., 0 or 1.
</td></tr>
<tr><td></td><td>Average CPU temperature:
Indicates the average CPU temperature of this pNode.</td><td>Celcius</td><td>Ideally, this temperature should be well within the specified limits.</td></tr>
<tr><td></td><td>Average memory temperature:
Indicates the average memory temperature of this pNode.</td><td>Celcius</td><td>Ideally, this temperature should be well within the specified limits.</td></tr>
<tr><td></td><td>Average memory DIMMs temperature:
Indicates the average Dual in-line memory module temperature of this pNode.</td><td>Celcius</td><td>Ideally, this temperature should be well within the specified limits.</td></tr>
<tr><td></td><td>Blade temperature:
Indicates the blade temperature of this pNode.</td><td>Celcius</td><td>Ideally, this temperature should be well within the specified limits.</td></tr>
<tr><td></td><td>Virtual fan speed:
Indicates the speed of the virtual fan in this pNode</td><td>Rpm</td><td>An abnormal speed may cause damage to the fans. So the speed of the fans must be well within normal limits.</td></tr>
<tr><td></td><td>Mezz zone temperature:
Indicates the zone temperature of this pNode.</td><td>Celcius</td><td>Ideally, the temperature of all zones and hardware components of the pNode should be low. Any abnormal spike in temperature is a cause for concern, and should be investigated immediately.</td></tr>
</table>

	CNA zone temperature: Indicates the CNA zone temperature of this pNode.	Celcius	Ideally, the temperature of all zones and hardware components of the pNode should be low. Any abnormal spike in temperature is a cause for concern, and should be investigated immediately.
	Hard drive temperature: Indicates the hard drive temperature of this pNode.	Celcius	
	System zone temperature: Indicates the temperature of the system board in this pNode.	Celcius	
	NIC zone temperature: Indicates the NIC zone temperature of this pNode.	Celcius	

1.4 The pServers Layer

A pServer is a logical server that possesses all the resources of a conventional server, but which is not tied to a specific processing resource.

With the help of the tests mapped to this layer, you can determine the current state, configuration, and resource usage f each of the pServers created in the PAN manager.

Figure 16: The tests mapped to the pServers layer

1.4.1 Pserver Performance Test

A pServer is a logical server that possesses all the resources of a conventional server, but which is not tied to a specific processing resource.

The components of a pServer resemble those of standard servers:

- pNodes — processing power
- vNICs — network access
- vHBAs — storage access
- VCD — CD-ROM drive

A conventional server contains these hardware equivalents in a single box. By contrast, a pServer consists of distributed virtual components that provide the same features. pServers remain flexible and reconfigurable after they are implemented.

This test auto discovers the pServers in the Egenera PAN Manager and help the administrators determine the following:

- The current status of each pServer and the PAN Agent availability on the pServer;
- The management mode of each pServer;
- The number of primary and failover pNodes in every pServer;
- the number of virtual components such as vHBAs and vNICs available in each pServer;
- The CPU and memory usage of each pServer and the level of disk activity and network traffic handled by every pServer; this points you to the resource-hungry pServers in your PAN manager.

Purpose	Auto discovers the pServers in the Egenera PAN Manager and help the administrators determine the following: ➢ The current status of each pServer and the PAN Agent availability on the pServer; ➢ The management mode of each pServer; ➢ The number of primary and failover pNodes in every pServer; ➢ the number of virtual components such as vHBAs and vNICs available in each pServer; ➢ The CPU and memory usage of each pServer and the level of disk activity and network traffic handled by every pServer; this points you to the resource-hungry pServers in your PAN manager.
Target of the test	An Egenera PAN Manager
Agent deploying the test	Remote agent

<table>
<tr><td>Configurable parameters for the test</td><td colspan="3">1. TEST PERIOD - How often should the test be executed
2. Host – The IP address of the Egenera PAN Manager.
3. pan manager user, pan manager password, and confirm password - To monitor the Egenera PAN Manager, the eG agent has to be configured with administrator privileges. This is why, you need to specify the credentials of an administrator against the pan manager user and pan manager password parameters of this test. Confirm the pan manager password by retyping it in the confirm password text box.
4. ssl - By default, the Egenera PAN Manager is not SSL-enabled. Accordingly, the SSL flag is set to No by default.
5. webport - By default, in most environments, the Egenera PAN Manager listens on port 80 (if not SSL-enabled) or on port 443 (if SSL-enabled) only. This implies that while monitoring the Egenera PAN Manager, the eG agent, by default, connects to port 80 or 443, depending upon the SSL-enabled status of Egenera PAN Manager - i.e., if Egenera PAN Manager is not SSL-enabled (i.e., if the SSL flag above is set to No), then the eG agent connects to Egenera PAN Manager using port 80 by default, and if Egenera PAN Manager is SSL-enabled (i.e., if the SSL flag is set to Yes), then the agent-Egenera PAN Manager communication occurs via port 443 by default. Accordingly, the WEBPORT parameter is set to default by default.
In some environments however, the default ports 80 or 443 might not apply. In such a case, against the WEBPORT parameter, you can specify the exact port at which the Egenera PAN Manager in your environment listens, so that the eG agent communicates with that port for collecting metrics from the Egenera PAN Manager.
6. 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 enabled/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.</td></tr>
<tr><td>Outputs of the test</td><td colspan="3">One set of results for each pServer in each LPAN in a PAN manager being monitored</td></tr>
<tr><td>Measurements made by the</td><td>Measurement</td><td>Measurement Unit</td><td>Interpretation</td></tr>
</table>

<table>
<tr>
<td>test</td>
<td>Boot status:
Indicates the current operating state of this pServer.</td>
<td></td>
<td>If the pServer is booted in this LPAN, then the value of this measure will be reported as Booted. If the pServer is shutdown, then the value of this measure will be reported as Shutdown.

The numeric values that correspond to the above-mentioned measure values are as follows:

<table>
<tr><th>Measure Value</th><th>Numeric Value</th></tr>
<tr><td>Booted</td><td>1</td></tr>
<tr><td>Shutdown</td><td>0</td></tr>
</table>

Note:

By default, this measure reports the above-mentioned Measure Values while indicating the current operating state of this pServer. However, in the graph of this measure the state will be represented using the corresponding numeric equivalents i.e., 0 or 1.</td>
</tr>
</table>

	Is PAN agent available?: Indicates whether/not the PAN Agent is available on this pServer.		A PAN Agent is an application running on the pServer that interprets PAN Manager network configuration changes to the pServer and subsequently invokes the network device configuration utility to update network interfaces on the pServer. The PAN Agent provides graceful shutdowns and basic monitoring of pServer and displays version information for the installed operating system. This measure reports the value *Yes* if the PAN Agent is running on the pServer or the value *No* if the PAN Agent is not running. The numeric values that correspond to the above-mentioned values are as follows: **Measure Value** / **Numeric Value** Yes / 1 No / 0 **Note:** By default, this measure reports the above-mentioned **Measure Values** while indicating whether/not the PAN Agent is running on this pServer. However, in the graph of this measure, the PAN agent's availability will be represented using the corresponding numeric equivalents of the **Measure Value**s as mentioned in the table above.

	Mode: Indicates the management mode of this pServer.		PAN Manager features the ability to monitor and control a pServer through the use of a management mode setting. With managed pServers, PAN Manager automatically detects the level of monitoring it can establish with the pServer. PAN Manager offers the following managed modes for pServer administration: ➢ **Managed** — PAN Manager monitors and controls pServer health over the private management network. There are three possible levels of monitoring and status reporting: ○ **Enhanced** — PAN Manager provides the optimal level of health monitoring for your pServers. In this level, PAN Manager uses the Heartbeat Client service to monitor pServer health. If PAN Manager does not receive a response from the pServer, and has not received any reboot or shutdown events, it initiates the restart scenario by attempting to restart on its primary pNode. (A **Managed/Enhanced** pServer can initiate its restart scenario approximately one minute after loss of heartbeat.) If the boot timeout interval is exceeded, the pServer fails over to its configured failover pNode. ○ **Basic** — PAN Manager provides basic restart protection for a pServer. If PAN Manager does not receive a response from a ping to the pServer, it waits for the boot timeout interval. If the boot timeout interval is exceeded, the pServer fails over to its configured failover pNode. pServer.

			Note: If you choose not to install PAN Tools on a pServer, in order for PAN Manager to provide a Managed/Basic level of support, you must configure one (or two for redundancy) pingable IP addresses on the ○ **Unknown** — PAN Manager cannot monitor pServer health over the private management network. ➢ **Unmanaged** — PAN Manager provides no health monitoring of any kind: neither pServer failover nor pServer recovery. Placing a pServer into Unmanaged mode temporarily can be useful when a user performs: ○ multiple reboots on a pServer that does not require the use of a failover pNode ○ operations that can adversely affect the network connectivity of the pServer ➢ **Unavailable** - A temporary status reflecting either a Recovery or Failover is currently in-progress in the pServer. This measure reports one of the above-mentioned values to indicate the current mode of this pServer.

<table>
<tr><td></td><td></td><td></td><td>The numeric values that correspond to the above-mentioned modes are as follows:
<table><tr><th>Mode</th><th>Numeric Value</th></tr><tr><td>Unknown</td><td>0</td></tr><tr><td>Enhanced</td><td>1</td></tr><tr><td>Basic mode</td><td>2</td></tr><tr><td>Unavailable</td><td>3</td></tr><tr><td>Unmanaged</td><td>4</td></tr></table>
Note:

By default, this measure reports the above-mentioned Modes while indicating the current mode of this pServer. However, in the graph of this measure, the mode will be represented using the corresponding numeric equivalents i.e., 0 to 4.</td></tr>
<tr><td></td><td>Primary pNode:
Indicates the total number of primary pNodes currently available in this pServer.</td><td>Number</td><td>From the pNodes previously allocated to the LPAN, the LPAN Administrator assigns a primary pNode to a pServer. The primary pNode can either be a specific pNode, or a pool of pNodes within the LPAN. If the LPAN is authorized to access a global pool, the pServer can obtain a primary pNode from the global pool if the local pool becomes depleted.</td></tr>
<tr><td></td><td>Failover pNode:
Indicates the total number of failover pNodes currently available in this pServer.</td><td>Number</td><td>Failover is the act of restarting a pServer on a different pNode. (Failover requires having a PAN Server Portability license). The failover pNode can either be a specific pNode, or a pool of pNodes within the LPAN. If the LPAN is authorized to access a global pool, the pServer can obtain a failover pNode from the global pool if the local pool becomes depleted.</td></tr>
<tr><td></td><td>Virtual network interface card (vNIC):
Indicates the number of virtual Network Interface Cards (vNICs) that are currently created on this pServer.</td><td>Number</td><td>vNIC is the Virtual Network Interface Card i.e., in this case, a PAN Manager Ethernet interface you create on a pServer. A vNIC interface functions just like a physical NIC, and is the means by which a pServer connects to an Ethernet network.

The detailed diagnosis capability of this measure lists out the names of the vNICs that are created on the pServer.</td></tr>
</table>

	Virtual host bus adapter: Indicates the number of virtual Host Bus Adapters (vHBAs) that are currently created on this pServer.	Number	The Virtual Host Bus Adapter (vHBA) is a PAN Manager SAN interface you create on a pServer. A vHBA interface functions like a physical HBA, and is the means by which a pServer connects to a SAN environment. The detailed diagnosis capability of this measure lists out the names of the vHBAs that are created on the pServer.
	Disk block read rate: Indicates the rate at which the disk blocks are read from this pServer.	Blocks/Sec	
	Disk block write rate: Indicates the rate at which the disk blocks are written to this pServer.	Blocks/Sec	
	Disk read rate: Indicates the rate at which the disk is read from this pServer.	Ops/Sec	Compare the values of these measures across pServers to identify the I/O-intensive pServers.
	Disk write rate: Indicates the rate at which the disk is written to this pServer.	Ops/Sec	
	User CPU utilization: Indicates the percent of CPU by this pServer for user-level processing.	Percent	
	System CPU utilization: Indicates the percentage of CPU utilized by this pServer for system-level processing.	Percent	
	Idle CPU: Indicates the percentage of CPU in this pServer that is idle.	Percent	

	CPU utilization: Indicates the overall CPU usage of this pServer.	Percent	Ideally, the value of this measure should be low. A high value is indicative of excessive CPU usage by the pServer. Compare the value of this measure across pServers to determine which pServer is utilizing the maximum CPU resources. You can then compare the value of the *User CPU utilization* and *System CPU utilization* measures for that pServer to know where the pServer is spending more CPU - in running user processes or in performing system-level processing.
	User nice CPU utilization:		
	Total memory: Indicates the total memory available in this pServer.	MB	
	Free memory: Indicates the amount of memory that is available for use in this pServer.	MB	A high value is desired for this measure.
	Used memory: Indicates the amount of memory that is currently in use on this pServer.	MB	A low value is desired for this measure.
	Memory utilization: Indicates the percentage of memory utilized by this pServer.	Percent	A high value is indicative of excessive memory usage by a pServer. Compare the value of this measure across pServers to identify the memory-intensive pServers.
	Total swap memory: Indicates the amount of memory that is available for swap in this pServer.	MB	
	Free swap memory: Indicates the amount of swap memory that is available for use in this pServer.	MB	A high value is desired for this measure, as a consistent decrease in this value is a sign of excessive swap usage, which in turn signals a memory bottleneck.

	Used swap memory: Indicates the amount of swap memory that is currently utilized by this pServer.	MB	Significant or consistent memory swapping indicates that the pServer is severely overcommitted and that performance degradation is imminent or actively occurring.
	Swap memory utilization: Indicates the percentage of swap memory that is utilized by this pServer.	Percent	A high value is indicative of a contention for memory resources on the pServer. By comparing the value of this measure across pServers, you can accurately identify the pServer that is using swap memory excessively.
	Packets receive rate: Indicates the rate at which the packets are received by this pServer.	Packets/Sec	A high value for these measures is indicative of high bandwidth usage by the pServer.
	Packets send rate: Indicates the rate at which the packets are sent from this pServer.	Packets/Sec	
	Carrier detect failures: Indicates the rate at which the packets failed in this pServer.	Failures/Sec	Ideally, the value of this measure should be 0.
	Packets received: Indicates the number of packets received by this pServer.	Packets	
	Packets sent: Indicates the number of packets sent by this pServer.	Packets	
	Data received: Indicates the number of bytes received by this pServer	Bytes	
	Data sent: Indicates the number of bytes sent by this pServer.	Bytes	

	Compressed packets received: Indicates the amount of compressed packets received by this pServer.	Packets	
	Compressed packets sent: Indicates the number of compressed packets sent by this pServer.	Packets	
	Data receive drops: Indicates the number of data packets that were dropped while data is being received in this pServer.	Packets	Ideally, the value of this measure should be zero.
	Data receive errors: Indicates the number of error packets present in the data that was received by this pServer.	Packets	Ideally, the value of this measure should be zero.
	Data receive overruns: Indicates the number of overrun packets present in the data that was received by this pServer.	Packets	
	Data send drops: Indicates the number of data packets that were dropped while data is sent from this pServer.	Packets	Ideally, the value of this measure should be zero.
	Data send errors: Indicates the number of error packets present in the data that was sent by this pServer.	Packets	Ideally, the value of this measure should be 0.
	Data send overruns: Indicates the number of overrun packets present in the data that was sent by this pServer.	Packets	

The detailed diagnosis capability of the *Virtual host bus adapter* measure lists out the names of the vHBAs that are created on the pServer.

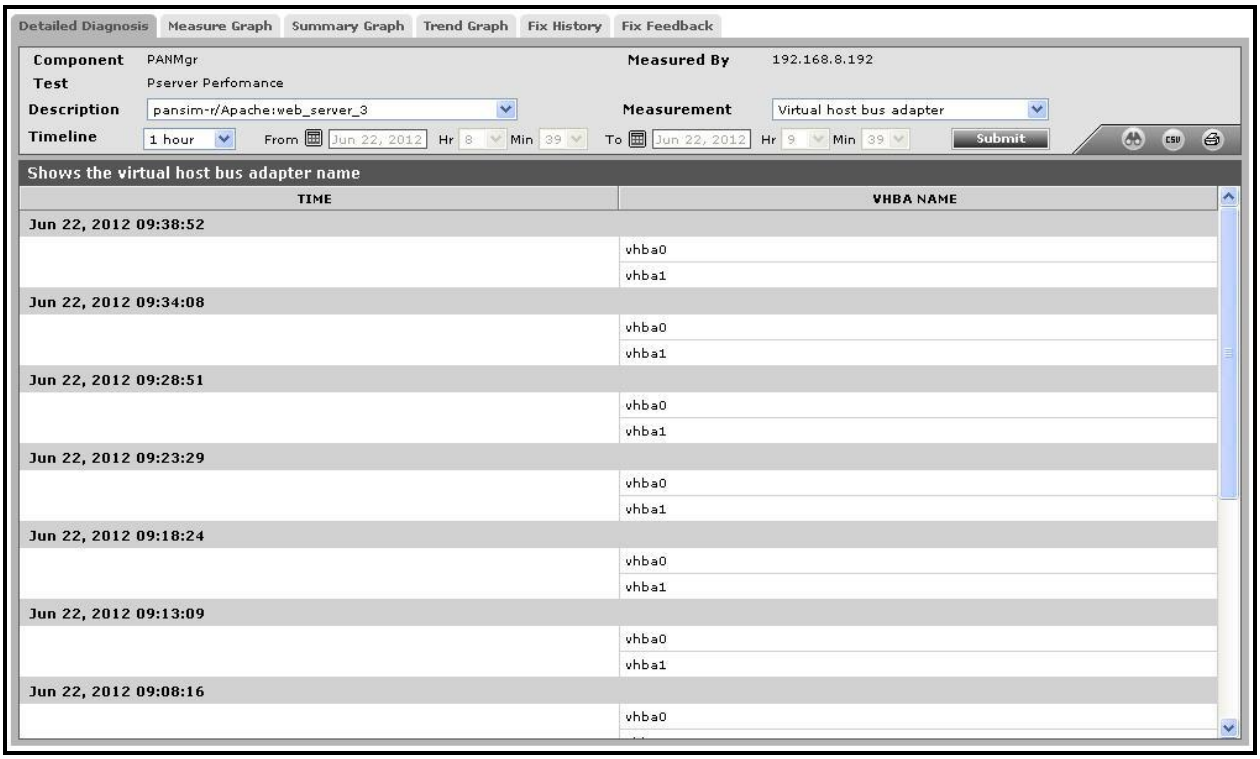


Figure 17: The detailed diagnosis of the Virtual host bus adapter measure

1.4.2 Pserver Disk Space Test

This test reports the space usage of every disk partition in every pServer in the PAN domain, and accurately points you to those pServers and disk partitions that are experiencing a space crunch.

Purpose	Reports the space usage of every disk partition in every pServer in the PAN domain, and accurately points you to those pServers and disk partitions that are experiencing a space crunch
Target of the test	An Egenera PAN Manager
Agent deploying the test	Remote agent

<table>
<tr><td>Configurable parameters for the test</td><td colspan="3">1. TEST PERIOD - How often should the test be executed
2. Host – The IP address of the Egenera PAN Manager.
3. pan manager user, pan manager password, and confirm password - To monitor the Egenera PAN Manager, the eG agent has to be configured with administrator privileges. This is why, you need to specify the credentials of an administrator against the pan manager user and pan manager password parameters of this test. Confirm the pan manager password by retyping it in the confirm password text box.
4. ssl - By default, the Egenera PAN Manager is not SSL-enabled. Accordingly, the SSL flag is set to No by default.
5. webport - By default, in most environments, the Egenera PAN Manager listens on port 80 (if not SSL-enabled) or on port 443 (if SSL-enabled) only. This implies that while monitoring the Egenera PAN Manager, the eG agent, by default, connects to port 80 or 443, depending upon the SSL-enabled status of Egenera PAN Manager - i.e., if Egenera PAN Manager is not SSL-enabled (i.e., if the SSL flag above is set to No), then the eG agent connects to Egenera PAN Manager using port 80 by default, and if Egenera PAN Manager is SSL-enabled (i.e., if the SSL flag is set to Yes), then the agent-Egenera PAN Manager communication occurs via port 443 by default. Accordingly, the WEBPORT parameter is set to default by default.
In some environments however, the default ports 80 or 443 might not apply. In such a case, against the WEBPORT parameter, you can specify the exact port at which the Egenera PAN Manager in your environment listens, so that the eG agent communicates with that port for collecting metrics from the Egenera PAN Manager.
6. 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 enabled/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.</td></tr>
<tr><td>Outputs of the test</td><td colspan="3">One set of results for each disk partition attached to each pServer in the PAN manager being monitored</td></tr>
<tr><td rowspan="2">Measurements made by the test</td><td>Measurement</td><td>Measurement Unit</td><td>Interpretation</td></tr>
<tr><td>Total space:
Indicates the total capacity of this disk partition in this pServer.</td><td>MB</td><td></td></tr>
</table>

	Free space : Indicates the amount of space that is currently available for use in this disk partition of this pServer.	MB	A high value is desired for this measure.
	Used space: Indicates the amount of space that is already used in this disk partition of this pServer.	MB	
	Space utilization: Indicates the percentage of space usage on each disk partition of this pServer.	Percent	A value close to 100% can indicate a potential problem situation where applications executing on the pServer may not be able to write data to the disk partition(s) with very high usage.

1.5 The LPANs Layer

A Logical Processing Area Network (LPAN) is a collection of PAN resources — pNodes, virtual storage and network resources — that are allocated as a group. Use the test mapped to this layer determine the health of each LPAN configured on the PAN manager.

Figure 18: The tests mapped to the LPANs layer

1.5.1 LPAN Details Test

A Logical Processing Area Network (LPAN) is a collection of PAN resources — pNodes, virtual storage and network resources — that are allocated as a group. You use PAN Manager software to configure

these resources into one or more pServers. Typically, an LPAN represents the computing resources that are devoted to a single purpose or organization.

This test auto-discovers the LPANs in the Egenera PAN Manager and reports the current status of this LPAN. This test helps the administrators to analyze the following:

- the average CPU Utilization of this LPAN;
- How many pServers and pNodes are available in this LPAN and how many pServers are currently booting, shutting down etc.?
- What are the global pools and the local pools that are linked to the LPAN?
- How many network resources like MAC address, WWNs and physical resources like vSwitch are attached to this LPAN?

Purpose	Auto-discovers the LPANs in the Egenera PAN Manager and reports the current status of this LPAN. This test helps the administrators to analyze the following: ➢ the average CPU Utilization of this LPAN; ➢ How many pServers and pNodes are available in this LPAN and how many pServers are currently booting, shutting down etc.? ➢ What are the global pools and the local pools that are linked to the LPAN? ➢ How many network resources like MAC address, WWNs and physical resources like vSwitch are attached to this LPAN?
Target of the test	An Egenera PAN Manager
Agent deploying the test	Remote agent

<table>
<tr><td>Configurable parameters for the test</td><td colspan="3">1. TEST PERIOD - How often should the test be executed
2. Host – The IP address of the Egenera PAN Manager.
3. pan manager user, pan manager password, and confirm password - To monitor the Egenera PAN Manager, the eG agent has to be configured with administrator privileges. This is why, you need to specify the credentials of an administrator against the pan manager user and pan manager password parameters of this test. Confirm the pan manager password by retyping it in the confirm password text box.
4. ssl - By default, the Egenera PAN Manager is not SSL-enabled. Accordingly, the SSL flag is set to No by default.
5. webport - By default, in most environments, the Egenera PAN Manager listens on port 80 (if not SSL-enabled) or on port 443 (if SSL-enabled) only. This implies that while monitoring the Egenera PAN Manager, the eG agent, by default, connects to port 80 or 443, depending upon the SSL-enabled status of Egenera PAN Manager - i.e., if Egenera PAN Manager is not SSL-enabled (i.e., if the SSL flag above is set to No), then the eG agent connects to Egenera PAN Manager using port 80 by default, and if Egenera PAN Manager is SSL-enabled (i.e., if the SSL flag is set to Yes), then the agent-Egenera PAN Manager communication occurs via port 443 by default. Accordingly, the WEBPORT parameter is set to default by default.
In some environments however, the default ports 80 or 443 might not apply. In such a case, against the WEBPORT parameter, you can specify the exact port at which the Egenera PAN Manager in your environment listens, so that the eG agent communicates with that port for collecting metrics from the Egenera PAN Manager.
6. 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 enabled/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.</td></tr>
<tr><td>Outputs of the test</td><td colspan="3">One set of results for each LPAN in a PAN domain</td></tr>
<tr><td>Measurements made by the</td><td>Measurement</td><td>Measurement Unit</td><td>Interpretation</td></tr>
</table>

<table>
<tr><td>test</td><td>Is Lpan active?
Indicates the current status of this LPAN in the PAN Manager.</td><td></td><td>This measure reports the value Yes if this LPAN is active in the PAN MAnager and the value No if this LPAN is not active.
The numeric values that correspond to the above-mentioned 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:
By default, this measure reports the above-mentioned Measure Values while indicating the status of this LPAN. However, in the graph of this measure, the LPAN status will be represented using the corresponding numeric equivalents i.e., 0 or 1.</td></tr>
<tr><td></td><td>Average CPU utilization:
Indicates the percentage of CPU utilized by this LPAN on an average</td><td>Percent</td><td>A low value is desired for this measure. A high value of this measure may indicate a performance bottleneck.</td></tr>
<tr><td></td><td>Total pServers:
Indicates the number of pServers available in this LPAN.</td><td>Number</td><td>A pServer is a combination of a single pNode, an optional failover pNode, storage and network connections, that provides the capabilities of a conventional server.
The detailed diagnosis of this measure lists out the all the pServers available in this LPAN.</td></tr>
<tr><td></td><td>Booting pServers:
Indicates the number of pServers that are currently booting in this LPAN.</td><td>Number</td><td></td></tr>
<tr><td></td><td>Booted pServers:
Indicates the number of pServers that were already booted in this LPAN.</td><td>Number</td><td></td></tr>
</table>

	Shutting pServers: Indicates the number of pServers that are currently shutting down in this LPAN.	Number	
	Shutdown pServers: Indicates the number of pServers that were already shut down in this LPAN.	Number	
	Failing pServers: Indicates the number of pServers that are currently failing in this LPAN.	Number	
	pNodes: Indicates the number of pNodes that are currently available in this LPAN.	Number	A pNode is nothing but a physical blade server that provides the CPU processing and memory capabilities for a pServer. The detailed diagnosis of this measure lists out the name of the pNodes available in this LPAN.
	Linked global pools: Indicates the number of global pools that are currently attached to this LPAN.	Number	A global pool is a pNode Pool that is used by the whole PAN, from which pNodes are made available to pServers running in the PAN. A global pool spans LPANs i.e., the pNodes in a global pool can be made available to pServers running in any LPAN. The detailed diagnosis of this measure lists out the names of the global pools in this LPAN, the available number of pNodes in each global pool, indicates whether the pServer is capable of booting from this global pool and the name of the local pool that is linked to this global pool.

	Local pools: Indicates the number of local pools that are currently attached to this LPAN.	Number	A local pool is a set of processing resources used by a specific LPAN and from which pNodes can be assigned to pServers running in that LPAN. The pNode in a local pool cannot be assigned to pServers running in other LPANs. Administrators can link a local pool to a Global Pool, so the PAN Manager will attempt to allocate a pNode from the global pool if it cannot obtain one from the local pool. The detailed diagnosis of this measure lists out the names of the local pool, the number of pNodes that are currently available in each local pool and the name of the global pool that this local pool is linked to.
	vSwitches: Indicates the number of vSwitches that are currently attached to this LPAN.	Number	The detailed diagnosis capability of this measure if enabled, lists out the names of the vSwitches and the type of each vSwitch.
	Media images: Indicates the number of media images that are currently attached to this LPAN.	Number	Media images can be used for a variety of purposes such as installing pServer PAN Tools, installing pServer operating systems, and providing software to the pServers in an LPAN.
	WWNs: Indicates the number of WWNs (WORLD WIDE NAMEs) that are curently assigned to this LPAN.	Number	THE WORLD WIDE NAME (WWN) is a hardware address that uniquely identifies a target in a Storage Area Network (SAN). In PAN Manager, you assign WWNs to LPANs after which you use a vHBA to assign WWNs to a pServer.
	MACs: Indicates the number of MAC (MEDIA ACCESS CONTROL) addresses that are curently assigned to this LPAN.	Number	The Media Access Control (MAC) Address is a hardware address that uniquely identifies a component in an Ethernet network. In PAN Manager, each pServer vNIC has a unique MAC address.

The detailed diagnosis of the *Local pools* measure lists out the names of the local pool, the number of pNodes that are currently available in each local pool and the name of the global pool that this local pool is linked to.

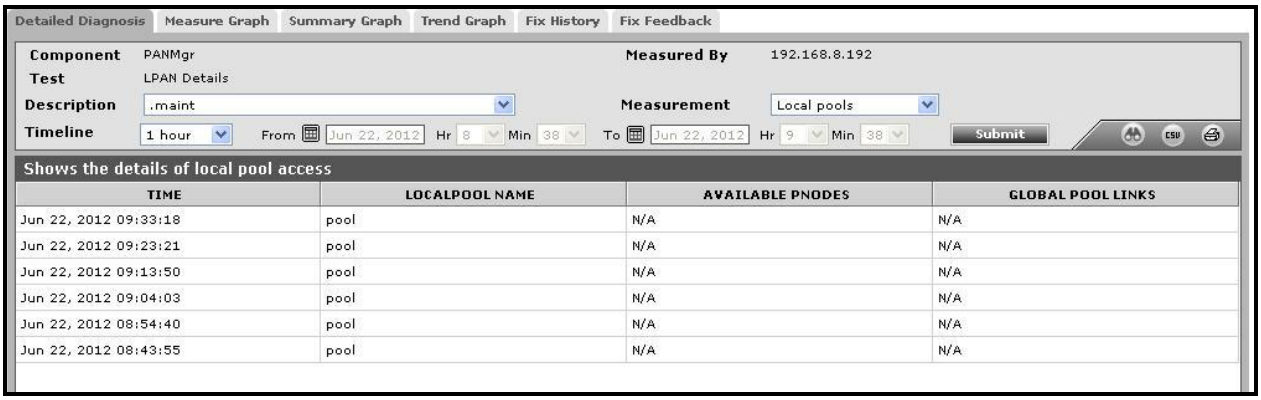


Figure 19: The detailed diagnosis of the Local pools measure

The detailed diagnosis capability of the *vSwitches* measure if enabled, lists out the names of the vSwitches and the type of each vSwitch.

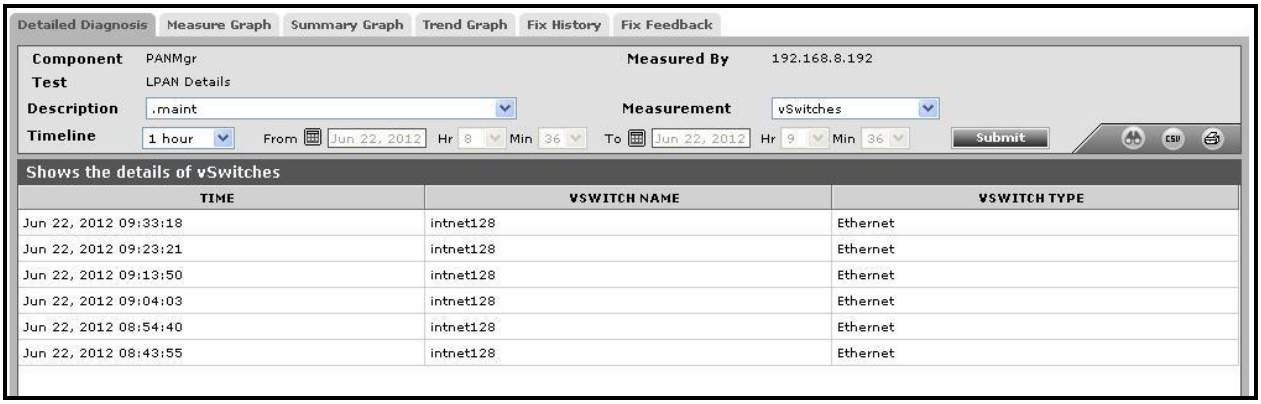


Figure 20: The detailed diagnosis of the vSwitches measure

Chapter 2

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 **Egenera PAN Manager**. 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.