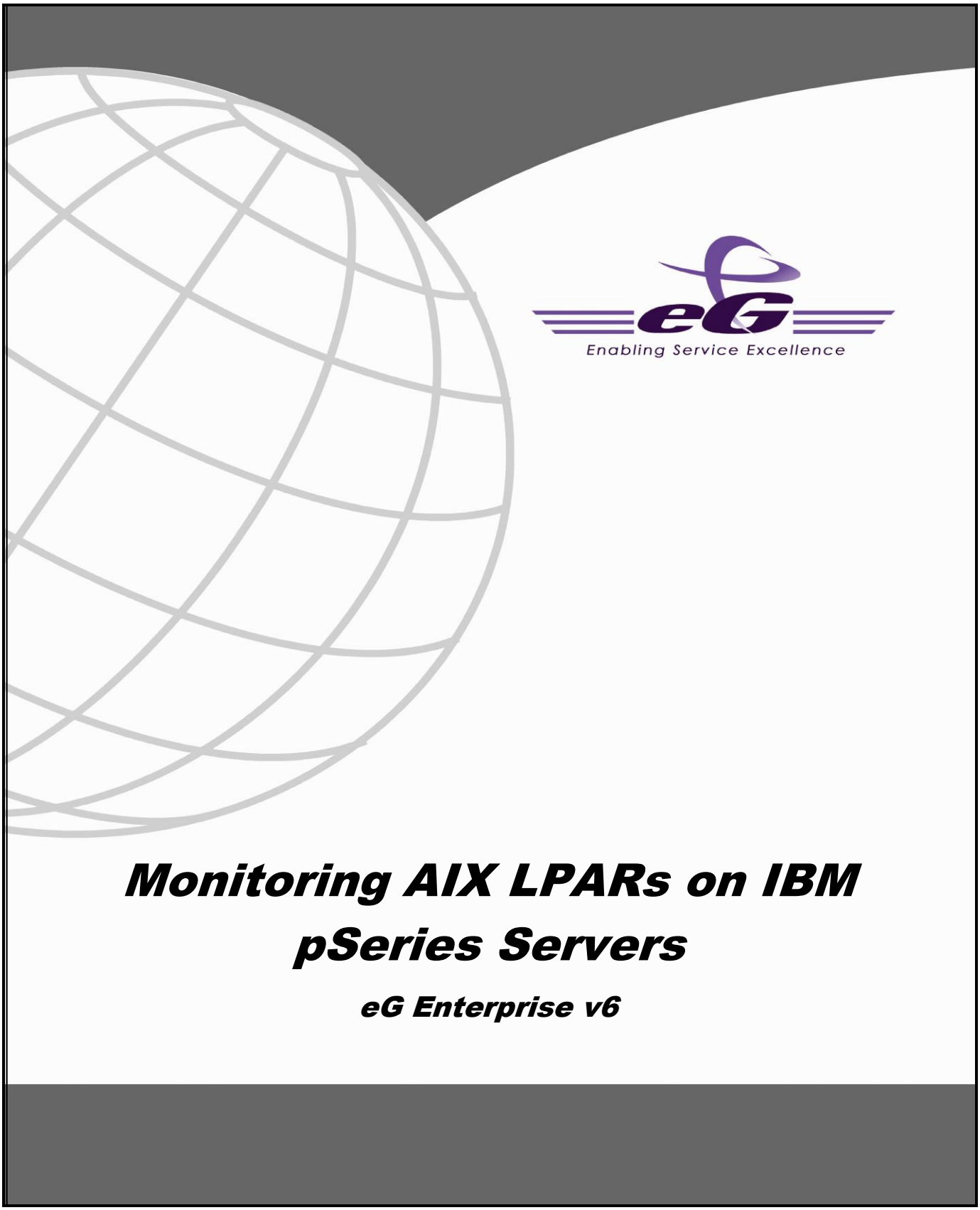

Monitoring AIX LPARs on IBM pSeries Servers

eG Enterprise v6

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Monitoring AIX LPARs on IBM pSeries Servers

In computing, a **Logical Partition**, commonly called an **LPAR**, is a subset of computer's hardware resources, virtualized as a separate computer. In effect, a physical machine can be partitioned into multiple LPARs, each housing a separate operating system. LPAR designates the logical partitioning function and mode of operation in which hardware resources are shared between partitions.

Logical partitioning (LPAR) on IBM servers, which began (on IBM mainframes) with a predominantly physical partitioning scheme based on hardware boundaries, has now evolved into one that allows for virtual and shared resources with dynamic load balancing (i.e., the IBM pSeries Server).

The latest IBM p5 and OpenPower extends the capabilities of the IBM pSeries server by introducing flexibility in partition usage. There are now two types of partitions in the IBM p5 and OpenPower. Partitions can have dedicated processors, or they can have virtualized processors from a single pool of shared physical processors. Both types of partitions can coexist at the same time in the same system.

Sharing a pool of virtualized processors is known as *Micro-Partitioning technology*. In the IBM pSeries servers, this technology is implemented via the Virtual I/O Server - this is a special-purpose partition that provides virtual I/O resources to client partitions. The Virtual I/O Server owns the real resources that are shared with other clients. With Virtual I/O technology, you can assign a physical adapter to a partition to be shared by one or more partitions, enabling clients to minimize their number of physical adapters. Ethernet and SCSI I/O devices also have been virtualized enabling these resources to be shared by multiple partitions.

To configure and operate these partitions, IBM provides the Hardware Management Console (HMC). Using an HMC, the following tasks can be performed:

- Configure and manage logical partitions and partition profiles
- Non-disruptively move memory, CPU capacity, and I/O interfaces between LPARs within the same server - i.e., perform **DLPAR** functions.
- Activate and manage dormant processor and memory resources within your system, without taking your system or application down - i.e., activate and manage **Capacity on Demand** resources.

While on one hand, this mix of partitioning technologies (dedicated and shared) facilitates more efficient resource usage, on the other hand, it serves as a catalyst for the creation of a large number of partitions with smaller resource allocations, thereby increasing the size and complexity of the virtualized environment, and consequently, compounding the monitoring and management troubles of administrators. Administrators therefore need a single, central solution that can look across the multitude of LPARs configured on a pSeries server, accurately identify the LPAR that is experiencing a slowdown, and automatically lead you to the root-cause of such slowdowns.

1.1 How eG Enterprise Monitors the IBM pSeries Server and its AIX LPARs?

To address the monitoring concerns of LPAR administrators and to quickly lead them to the root-cause of performance slowdowns experienced by LPARs, eG Enterprise provides an "agentless" *IBM pSeries* monitoring model. This model adopts an 'In-N-Out' approach to monitoring an IBM pSeries server and its AIX LPARs alone. This approach involves a single eG agent operating on a remote Windows/Solaris/Linux host in the environment, which performs the following tasks (see Figure 1):

a. Connects to the HMC server in the environment via HTTP/HTTPS;

b. Automatically discovers the IBM pSeries servers managed by the HMC, and the AIX LPARs configured on each server;

c. Uses HMC to pull out the percentage of the server's physical resources that the AIX LPARs on the server are using - i.e., the relative loading of the AIX LPARs. This represents the view of how an LPAR and its applications are doing from the "outside" - i.e., from outside the AIX LPAR.

d. Connects to each AIX LPAR on the target pSeries server via SSH to report on the resource usage of the AIX LPARs and the applications running inside the AIX LPARs (as seen from within the guest LPAR). This represents the view from within the AIX LPAR - i.e., the "inside" view.

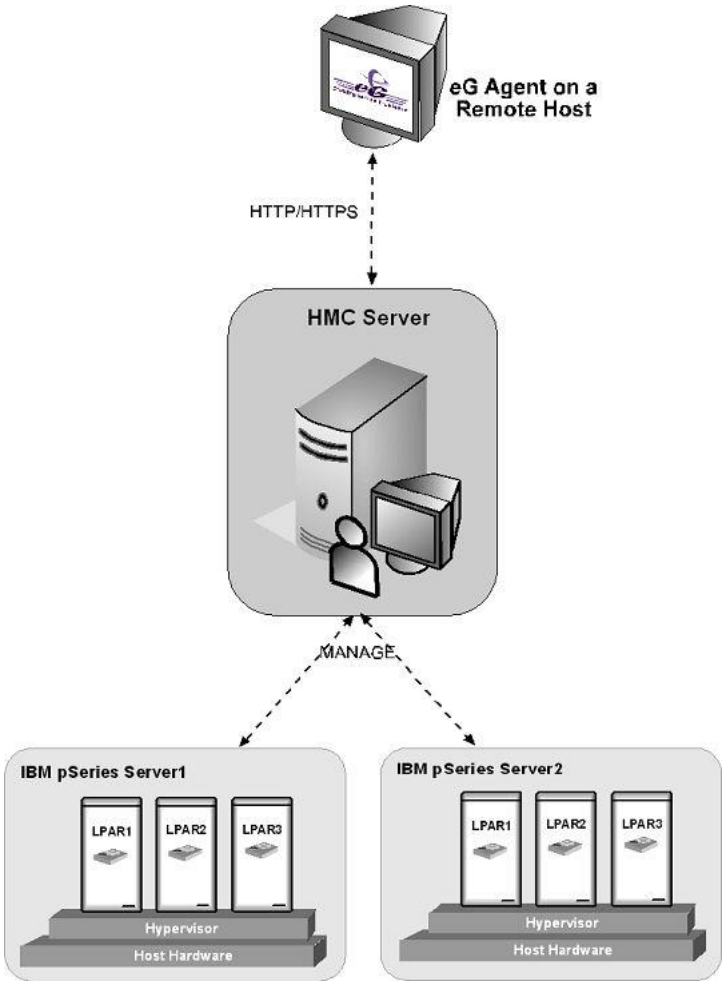


Figure 1: How the eG single agent monitors an IBM pSeries Server

1.2 Pre-requisites for AIX LPAR Monitoring

The following pre-requisites need to be fulfilled before attempting AIX LPAR monitoring:

- SSH will have to be enabled on the HMC server and on each of the LPARs on the target pSeries server;
- All tests executed by the eG agent should be configured with the IP of the HMC server and the credentials of a user to the HMC server who is assigned the **hmcviewer** role;
- Al tests should be configured with the credentials of a valid user to each of the LPARs configured on the pSeries server.

The "inside" and "outside" view statistics that the agent reports to the eG manager are then presented in the eG monitoring console vide the *IBM pSeries* layer model depicted by Figure 1 below.

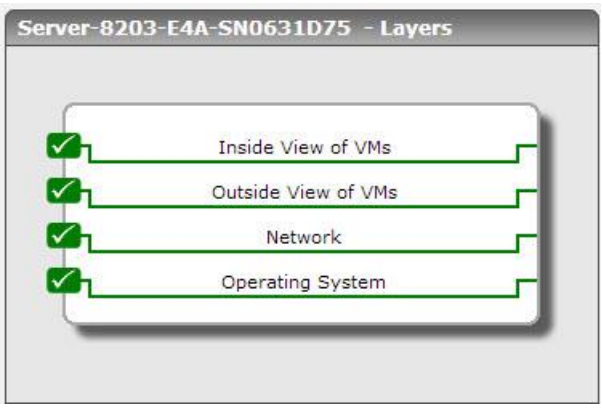


Figure 2: The layer model of the IBM pSeries server

Each layer of Figure 2 above reports a wide variety of metrics that enable administrators to find answers for the following performance queries:

- Is the pSeries server available over the network? If so, how quickly is it responding to requests?
- How are the LPARs on the server utilizing the physical CPU resources? Is any LPAR utilizing the physical processors excessively? If so, which one is it?
- How many dedicated processors are used by the LPARs?
- How many shared processors are used by the LPARs?
- How many dedicated and shared partitions have been configured on the server? What are the names and IDs of the partitions?
- Does the system firmware (i.e., hypervisor) have adequate memory to support LPAR operations?
- Are the LPARs rightly sized in terms of memory? Are there any over-sized or under-sized LPARs?
- Is load balanced across all the physical adapters supported by the Virtual I/O server? Is any adapter experiencing excessive activity? If so, which one is it? Which physical disk in the volume group is responsible for this activity?
- Is any volume group currently inactive?

- Are there any stale physical volumes and physical partitions?
- Do the storage pools on the Virtual I/O server have sufficient space? Which pool is currently running out of space?
- Is any LPAR currently powered off?
- How many LPARs are currently not running? Which ones are they?
- Were any LPARs migrated from or to the server recently? If so, which ones are they?
- Which LPAR is utilizing the virtual CPU and memory resources excessively? Where does this LPAR spend the most of its entitled CPU resoures - doing user-level proessing, kernel level processing, being idle, in waiting, or making hypervisor calls?
- Which LPAR is utilizing the allocated CPU, memory, and disk resources excessively? Which process executing on this LPAR is causing the resource drain?
- Has any LPAR been down for too long a time?
- Are too many TCP connections being currently established with any LPAR?
- Is any LPAR dropping too many TCP connections?

The sections that will follow discuss each layer in great detail.

1.3 The Operating System Layer

Using the tests mapped to this layer, you can:

- Determine the total physical resources available with the pSeries host;
- Understand how all the LPARs have collectively utilized the physical resources;
- Detect resource contentions, if any, at the host-level, and what is causing them;
- Monitor the VIO server so that, you can isolate the logical volume storage pools of the VIO server that are running short of space, determine the current state of the volume groups on the VIO server, and analyze the I/O activity on the storage adapters and attached disks on the VIO server;

Figure 3: The tests mapped to the Operating System layer

1.3.1 pSeries Processors Test

This test reports the quantity of allocated and unallocated physical CPU resources of the pSeries server, and the percentage of allocated CPU that has been utilized by the LPARs on that server. In the process, the test helps assess the impact of the guest CPU usage on the physical CPU resources of the pSeries server. If the server experiences a CPU contention, then this test will enable you to figure out whether the resource-crunch is owing to improper CPU allocation to the LPARs, or the existence of one/more CPU-intensive processes on the LPARs.

Purpose	Reports the quantity of allocated and unallocated physical CPU resources of the pSeries server, and the percentage of allocated CPU that has been utilized by the LPARs on that server.
Target of the test	An IBM pSeries server
Agent deploying the test	A remote agent

Configurable parameters for the test	1. **TEST PERIOD** - How often should the test be executed 2. **HOST -** The host for which the test is to be configured. 3. **PORT** - Indicate the **PORT** at which the specified **HOST** listens. By default, this is NULL. 4. **REAL SERVERNAME** - Specify the name of the pSeries server in the **REAL SERVERNAME** text box. If the target pSeries server has been auto-discovered using HMC, the server name will be set automatically in the **REAL SERVERNAME** text box. However, while configuring this test for a pSeries server that has been manually added, you have to explicitly provide the server name in the **REAL SERVERNAME** text box.  To obtain the real server name, a user can login to the target pSeries server as a valid pSeries user, go to the shell prompt of the server, and execute the following command: *lssyscfg - r sys -F name* 5. **IS MANAGED BY** - By selecting an option from the **IS MANAGED BY** list, indicate whether the target pSeries server is managed using an HMC server or an IVM (Integrated Virtual Manager) server. If the target server has been auto-discovered via an HMC server, the **HMC** option will be automatically chosen from this list. 6. **MANAGEMENT SERVER**, **MANAGEMENT USER**, **MANAGEMENT PASSWORD** - This test connects to an HMC/IVM server to perform LPAR discovery and to collect host-level and "outside view" metrics from the pSeries server. To enable this communication, first, provide the IP address/host name of the HMC/IVM server in the **MANAGEMENT SERVER** text box. If the eG manager had automatically discovered the target pSeries server by connecting to an HMC server in the environment, then, the IP address/host name and user credentials pertaining to that HMC server will be automatically displayed in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. However, if the pSeries server being monitored was manually added to the eG Enterprise system (and not auto-discovered via the HMC server), then, you will have to explicitly indicate whether the target pSeries server is managed by an HMC server or an IVM server by selecting an option from the **IS MANAGED BY** list. If the **HMC** option is chosen, then, you will have to provide the IP address of the HMC server that manages the target pSeries server in the **MANAGEMENT SERVER** text box. In such a case, in the **MANAGEMENT USER** and **MANAGEMENT PASSWORD** text boxes, you will have to provide the credentials of an HMC user who is assigned the **hmcviewer** role. On the other hand, if the **IVM** option is chosen from the **IS MANAGED BY** list, it implies that the IP address/host name and user credentials pertaining to that IVM server has to be explicitly provided in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. 7. **CONFIRM PASSWORD** - Confirm the **HMC PASSWORD** by retyping it here. 8. **DOMAIN** - Set the **DOMAIN** parameter to *none*.

9. **ADMIN USER**, **ADMIN PASSWORD**, **CONFIRM PASSWORD** - The eG agent remotely communicates with each discovered LPAR on the pSeries server to obtain their "inside view". For this, the eG agent will have to be configured with the credentials of a valid user with access rights to each LPAR. If a single user is authorized to access all the LPARs on the pSeries server, provide the name and password of the user in the **ADMIN USER** and **ADMIN PASSWORD** text boxes, and confirm the password by retyping it in the **CONFIRM PASSWORD** text box. On the other hand, if the test needs to communicate with different LPARs using different user accounts, then, multiple user names and passwords will have to be provided. To help administrators provide these multiple user details quickly and easily, the eG administrative interface embeds a special configuration page. To know how to use this page, refer to Section 1.3.1.1 of this document.

10. **SSL** - By default, the HMC/IVM server (as the case may e) is not SSL-enabled. This indicates that by default, the eG agent communicates with the HMC/IVM server using HTTP. Accordingly, the **SSL** flag is set to **No** by default. If you configure the HMC/IVM server to use SSL, then make sure that the **SSL** flag is set to **Yes**, so that the eG agent communicates with the HMC/IVM server using HTTPS.

11. **IGNORE VMS INSIDE VIEW** - Administrators of some high security LPAR environments might not have permissions to internally monitor one/more LPARs. The eG agent can be configured to **not obtain the 'inside view' of such 'inaccessible' VMs** using the **IGNORE VMS INSIDE VIEW** parameter. Against this parameter, you can provide a comma-separated list of LPAR names, or LPAR name patterns, for which the inside view need not be obtained. For instance, your **IGNORE VMS INSIDE VIEW** specification can be: **lp,aix\lp*,lin**. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to *none* indicating that the eG agent obtains the inside view of all LPARs on a pSeries server by default.

While performing LPAR discovery, the eG agent will not discover the operating system of the LPARs configured in the **IGNORE VMS INSIDE VIEW** text box.

12. **EXCLUDE VMS** - Administrators of some virtualized environments may not want to monitor some of their less-critical LPARs both from 'outside' and from 'inside'. The eG agent in this case can be configured to completely exclude such LPARs from its monitoring purview. To achieve this, provide a comma-separated list of LPARs to be excluded from monitoring in the **EXCLUDE VMS** text box. Instead of LPARs, LPAR name patterns can also be provided here in a comma-separated list. For example, your **EXCLUDE VMS** specification can be: **lp,aix\lp*,lin**. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to *none* indicating that the eG agent obtains the inside and outside views of all AIX LPARs on a virtual host by default. By providing a comma-separated list of LPARs/LPAR name patterns in the **EXCLUDE VMS** text box, you can make sure the eG agent stops collecting 'inside' and 'outside' view metrics for a configured set of LPARs.

13. **DD FREQUENCY** - The **DD FREQUENCY** parameter refers to the frequency with which detailed diagnosis measures are to be generated for this test. For example, if this is set to *1:1*, it indicates that detailed measures will be generated every time this test runs, and also every time the test detects a problem.

<table>
<tr><td></td><td colspan="3">14. DETAILED DIAGNOSIS - To make diagnosis more efficient and accurate, the eG system 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 against DETAILED DIAGNOSIS. To disable the capability, click on the Off option.

The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:
• The eG manager license should allow the detailed diagnosis capability
• Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.</td></tr>
<tr><td>Outputs of the test</td><td colspan="3">One set of results for the IBM pSeries server being monitored</td></tr>
<tr><td rowspan="3">Measurements made by the test</td><td>Measurement</td><td>Measurement Unit</td><td>Interpretation</td></tr>
<tr><td>Installed processing units:
Indicates the number of processing units installed on the pSeries server.</td><td>Number</td><td></td></tr>
<tr><td>Available processing units:
Indicates the number of free processing units on the pSeries server.</td><td>Number</td><td>Typically, a large number of free processing units implies that more logical partitions can be configured on the server. If the value of this measure is very low, it could mean that almost all the CPU resources have been allocated to the LPAR guests. You can use the detailed diagnosis of the Used processing units measure to accurately identify the LPAR that has been allocated the maximum CPU.</td></tr>
<tr><td></td><td>Used processing units:
Indicates the total number of processing units allocated to the LPAR guests on the pSeries server.</td><td>Number</td><td>If the value of this measure is very high or is close to the value of the Installed processing units measure, it could mean that almost all the CPU resources of the host have been allocated to the LPAR guests. In this case, you can use the detailed diagnosis of this measure to understand how many processing units have been allocated to each LPAR, and thus accurately identify the LPAR that has been allocated the maximum CPU.</td></tr>
</table>

	Processing units utilization: Indicates the percentage of physical CPU resources allocated to the LPAR guests.	Percent	If the value of this measure is very high or is close to 100%, it could mean that almost all the CPU resources of the host have been allocated to the LPAR guests. In this case, you can use the detailed diagnosis of this measure to understand how many processing units have been allocated to each LPAR, and thus accurately identify the LPAR that has been allocated the maximum CPU.
	Total physical processors consumed: Indicates the total number of allocated processing units used by LPAR guests.	Number	The detailed diagnosis of this measure reports the number of physical processors consumed by each LPAR guest on the pSeries server. In the event of a CPU contention, you can use this information to accurately identify the LPAR which is consuming the maximum CPU.
	Physical processors consumed out of allocation: Indicates the percentage of allocated CPU utilized by the LPAR guests.	Percent	A high value for this measure could indicate that one/more LPARs have resource-intensive processes executing on them.
	Physical processors utilization: Indicates the percentage of physical CPU resources utilized by the LPAR guests.	Percent	A high value for this measure could indicate that one/more LPARs are over-utilizing the physical CPU resources.
	Total physical processors: Indicates the total number of physical processors installed on the pSeries server.	Number	
	Dedicated processors: Indicates the total number of dedicated processors used by the LPAR guests.	Number	A dedicated processor partition has an entire processor that is assigned to a partition. These processors are owned by the partition where they are running and are not shared with other partitions. Also, the amount of processing capacity on the partition is limited by the total processing capacity of the number of processors configured in that partition, and it cannot go over this capacity (unless you add or move more processors from another partition to the partition that is using a dynamic LPAR operation).

	Shared processors: Indicates the total number of shared processing units used by the LPAR guests.	Number	A partition that has its processors virtualized from a pool of shared physical processors is a shared processor partition. When the processors are in the shared processing pool, an uncapped partition that needs more processing power can use the idle processing resources in the pool.

You can use the detailed diagnosis of the *Used processing units* measure to accurately identify the LPAR that has been allocated the maximum CPU.

Details of CPU utilized by an Lpar Server

Time	LparName	LparID	Lpar minimum processing units(Number)	Lpar current processing units(Number)	Lpar maximum processing units(Number)
27.05.10 16:57:04					
	aixtest	4	0.2	0.2	0.2
	aix2	3	0.2	0.2	0.2
	aix1	2	1	1	1
	VIO Server	1	0.6	0.6	0.6

Figure 4: The detailed diagnosis of the Used Processing Units measure

The detailed diagnosis of the *Total physical processors consumed* measure reports the number of physical processors consumed by each LPAR guest on the pSeries server. In the event of a CPU contention, you can use this information to accurately identify the LPAR which is consuming the maximum CPU.

Details of a CPU utilized by an Lpar

Time	LparName	Physical processors consumed(Number)
27.05.10 16:57:04		
	aix2	0
	aix1	1
	aixtest	0.01

Figure 5: The detailed diagnosis of the Total physical processors consumed measure

1.3.1.1 Configuring Users for LPAR Monitoring

In order to enable the eG agent to connect to multiple LPARs and pull out metrics from them, the eG administrative interface provides a special page using which the different **ADMIN USER** names and **ADMIN PASSWORDS** can be specified. To access this page, just click on the **Click here** hyperlink in any of the test configuration pages.

Figure 6: Configuring a test

Upon clicking, Figure 7 will appear, using which the user details can be configured.

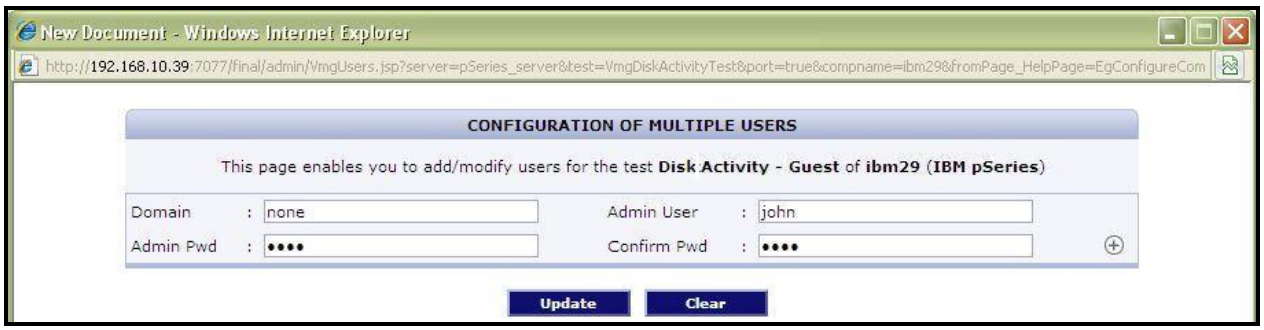


Figure 7: The LPAR user configuration page

To add a user specification, do the following:

1. By default, the **Domain** will be set to *none* (see Figure 7).
2. Next, provide the credentials of a valid user to one of the LPARs in the **Admin User** text box.
3. The password of the specified **Admin User** should be mentioned in the **Admin Pwd** text box.
4. Confirm the password by retyping it in the **Confirm Pwd** text box.
5. To add more users, click on the ⊕ button in Figure 7. This will allow you to add one more user specification as depicted by Figure 8.

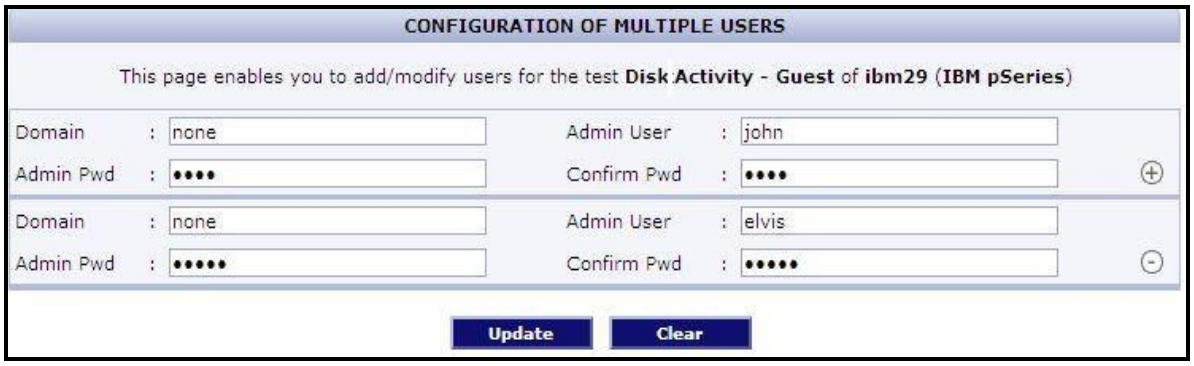


Figure 8: Adding another user

6. When this is done, then, while attempting to connect to an LPAR, the eG agent will begin by using the first **Admin User** name of the specification. If, for some reason, the agent is unable to login using the first **Admin User** name, then it will try to login again, but this time using the second **Admin User** name of the specification. If the first login attempt itself is successful, then the agent will ignore the second **Admin User** name.
7. To clear all the user specifications, simply click the **Clear** button in Figure 8.
8. To remove the details of a particular user alone, just click the ⊖ button in Figure 8.
9. To save the specification, just click on the **Update** button in Figure 8. This will lead you back to the test configuration page, where you will find user names, and passwords listed against the respective fields (see Figure 9).

Figure 9: The test configuration page displaying multiple user names, and passwords

1.3.2 Partition Information Test

Micro-Partitioning technology allows for multiple partitions to share one physical processor. Partitions using Micro-Partitioning technology are referred to as shared processor partitions. A partition may be defined with a processor capacity as small as 10 processor units. This represents 1/10 of a physical processor. Each processor can be shared by up to 10 shared processor partitions. The shared processor partitions are dispatched and time-sliced on the physical processors that are under control of the hypervisor.

A dedicated processor partition, such as the partitions that are used on POWER4 processor based servers, have an entire processor that is assigned to a partition. These processors are owned by the partition where they are running and are not shared with other partitions. Also, the amount of processing capacity on the partition is limited by the total processing capacity of the number of processors configured in that partition, and it cannot go over this capacity (unless you add or move more processors from another partition to the partition that is using a dynamic LPAR operation).

This test reports the number of shared partitions and dedicated partitions that have been configured on a pSeries server.

Purpose	Reports the number of shared partitions and dedicated partitions that have been configured on a pSeries server
Target of the test	An IBM pSeries server
Agent deploying the test	A remote agent

Configurable parameters for the test	1. **TESTPERIOD** - How often should the test be executed 2. **HOST -** The host for which the test is to be configured. 3. **PORT** - Indicate the **PORT** at which the specified **HOST** listens. By default, this is NULL. 4. **REAL SERVERNAME** - Specify the name of the pSeries server in the **REAL SERVERNAME** text box. If the target pSeries server has been auto-discovered using HMC, the server name will be set automatically in the **REAL SERVERNAME** text box. However, while configuring this test for a pSeries server that has been manually added, you have to explicitly provide the server name in the **REAL SERVERNAME** text box.  To obtain the real server name, a user can login to the target pSeries server as a valid pSeries user, go to the shell prompt of the server, and execute the following command: *lssyscfg - r sys -F name* 5. **IS MANAGED BY** - By selecting an option from the **IS MANAGED BY** list, indicate whether the target pSeries server is managed using an HMC server or an IVM (Integrated Virtual Manager) server. If the target server has been auto-discovered via an HMC server, the **HMC** option will be automatically chosen from this list. 6. **MANAGEMENT SERVER**, **MANAGEMENT USER**, **MANAGEMENT PASSWORD** - This test connects to an HMC/IVM server to perform LPAR discovery and to collect host-level and "outside view" metrics from the pSeries server. To enable this communication, first, provide the IP address/host name of the HMC/IVM server in the **MANAGEMENT SERVER** text box. If the eG manager had automatically discovered the target pSeries server by connecting to an HMC server in the environment, then, the IP address/host name and user credentials pertaining to that HMC server will be automatically displayed in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. However, if the pSeries server being monitored was manually added to the eG Enterprise system (and not auto-discovered via the HMC server), then, you will have to explicitly indicate whether the target pSeries server is managed by an HMC server or an IVM server by selecting an option from the **IS MANAGED BY** list. If the **HMC** option is chosen, then, you will have to provide the IP address of the HMC server that manages the target pSeries server in the **MANAGEMENT SERVER** text box. In such a case, in the **MANAGEMENT USER** and **MANAGEMENT PASSWORD** text boxes, you will have to provide the credentials of an HMC user who is assigned the **hmcviewer** role. On the other hand, if the **IVM** option is chosen from the **IS MANAGED BY** list, it implies that the IP address/host name and user credentials pertaining to that IVM server has to be explicitly provided in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. 7. **CONFIRM PASSWORD** - Confirm the **HMC PASSWORD** by retyping it here. 8. **DOMAIN** - Set the **DOMAIN** parameter to *none*.

9. **ADMIN USER**, **ADMIN PASSWORD**, **CONFIRM PASSWORD** - The eG agent remotely communicates with each discovered LPAR on the pSeries server to obtain their "inside view". For this, the eG agent will have to be configured with the credentials of a valid user with access rights to each LPAR. If a single user is authorized to access all the LPARs on the pSeries server, provide the name and password of the user in the **ADMIN USER** and **ADMIN PASSWORD** text boxes, and confirm the password by retyping it in the **CONFIRM PASSWORD** text box. On the other hand, if the test needs to communicate with different LPARs using different user accounts, then, multiple user names and passwords will have to be provided. To help administrators provide these multiple user details quickly and easily, the eG administrative interface embeds a special configuration page. To know how to use this page, refer to Section 1.3.1.1 of this document.

10. **SSL** - By default, the HMC/IVM server (as the case may be) is not SSL-enabled. This indicates that by default, the eG agent communicates with the HMC/IVM server using HTTP. Accordingly, the **SSL** flag is set to **No** by default. If you configure the HMC/IVM server to use SSL, then make sure that the **SSL** flag is set to **Yes**, so that the eG agent communicates with the HMC/IVM server using HTTPS.

11. **IGNORE VMS INSIDE VIEW** - Administrators of some high security LPAR environments might not have permissions to internally monitor one/more LPARs. The eG agent can be configured to **not obtain the 'inside view' of such 'inaccessible' VMs** using the **IGNORE VMS INSIDE VIEW** parameter. Against this parameter, you can provide a comma-separated list of LPAR names, or LPAR name patterns, for which the inside view need not be obtained. For instance, your **IGNORE VMS INSIDE VIEW** specification can be: **lp,aixlp*,lin**. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to *none* indicating that the eG agent obtains the inside view of all LPARs on a pSeries server by default.

While performing LPAR discovery, the eG agent will not discover the operating system of the LPARs configured in the **IGNORE VMS INSIDE VIEW** text box.

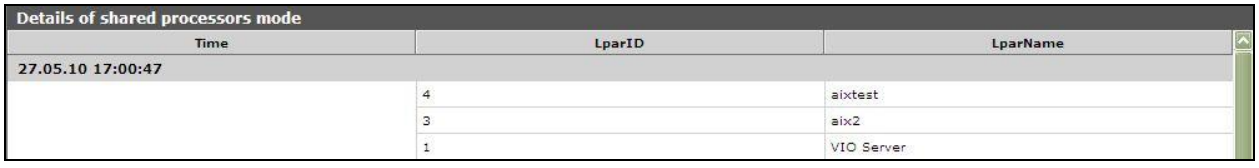
12. **EXCLUDE VMS** - Administrators of some virtualized environments may not want to monitor some of their less-critical LPARs both from 'outside' and from 'inside'. The eG agent in this case can be configured to completely exclude such LPARs from its monitoring purview. To achieve this, provide a comma-separated list of LPARs to be excluded from monitoring in the **EXCLUDE VMS** text box. Instead of LPARs, LPAR name patterns can also be provided here in a comma-separated list. For example, your **EXCLUDE VMS** specification can be: **lp,aixlp*,lin**. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to *none* indicating that the eG agent obtains the inside and outside views of all AIX LPARs on a virtual host by default. By providing a comma-separated list of LPARs/LPAR name patterns in the **EXCLUDE VMS** text box, you can make sure the eG agent stops collecting 'inside' and 'outside' view metrics for a configured set of LPARs.

<table>
<tr><td></td><td colspan="3">13. DD FREQUENCY - The DD FREQUENCY parameter refers to the frequency with which detailed diagnosis measures are to be generated for this test. For example, if this is set to 1:1, it indicates that detailed measures will be generated every time this test runs, and also every time the test detects a problem.

14. DETAILED DIAGNOSIS - To make diagnosis more efficient and accurate, the eG system 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 against DETAILED DIAGNOSIS. To disable the capability, click on the Off option.

The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:
• The eG manager license should allow the detailed diagnosis capability
• Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.</td></tr>
<tr><td>Outputs of the test</td><td colspan="3">One set of results for the IBM pSeries server being monitored</td></tr>
<tr><td rowspan="3">Measurements made by the test</td><td>Measurement</td><td>Measurement Unit</td><td>Interpretation</td></tr>
<tr><td>Shared partitions:
Indicates the number of shared partitions currently available in the pSeries server.</td><td>Number</td><td>Each processor can be shared by up to 10 shared processor partitions. To know the names and IDs of the shared partitions on the server, use the detailed diagnosis of this measure.</td></tr>
<tr><td>Dedicated partitions:
Indicates the number of dedicated partitions currently available in the pSeries server.</td><td>Number</td><td>To know the names and IDs of the dedicated partitions on the server, use the detailed diagnosis of this measure.</td></tr>
</table>

To know the names and IDs of the shared partitions on the server, use the detailed diagnosis of the *Shared partitions* measure.



Details of shared processors mode

Time	LparID	LparName
27.05.10 17:00:47		
	4	aixtest
	3	aix2
	1	VIO Server

Figure 10: The detailed diagnosis of the Shared partitions measure

To know the names and IDs of the dedicated partitions on the server, use the detailed diagnosis of the *Dedicated partitions* measure.

Details of dedicated processors mode

Time	LparID	LparName
27.05.10 17:00:47	2	aix1

Figure 11: The detailed diagnosis of the Dedicated partitions measure

1.3.3 pSeries Memory Test

The physical memory resources installed on a pSeries server are allocated to each LPAR on the server based on partition configuration, I/O resources assigned, and applications used. In addition to this, the system firmware will have to be configured with adequate memory resources for initialization and configuration of the server and for supporting the LPARs. Firmware is "software" stored in a memory chip that holds its content without electrical power, such as, for example, read-only memory (ROM), programmable ROM (PROM), erasable programmable ROM (EPROM), electrically erasable programmable ROM (EEPROM), and non-volatile random access memory (non-volatile RAM).

This test captures the memory usage of the system firmware and the physical memory allocations to the LPARs so that, in the event of a memory contention, administrators are enabled to determine what could be causing the contention - is it because the system firmware has not been configured with adequate memory resources, or is it because sufficient memory has not been allocated to the partitions.

Purpose	Captures the memory usage of the system firmware and the physical memory allocations to the LPARs
Target of the test	An IBM pSeries server
Agent deploying the test	A remote agent

Configurable parameters for the test	1. **TESTPERIOD** - How often should the test be executed 2. **HOST -** The host for which the test is to be configured. 3. **PORT** - Indicate the **PORT** at which the specified **HOST** listens. By default, this is NULL. 4. **REAL SERVERNAME** - Specify the name of the pSeries server in the **REAL SERVERNAME** text box. If the target pSeries server has been auto-discovered using HMC, the server name will be set automatically in the **REAL SERVERNAME** text box. However, while configuring this test for a pSeries server that has been manually added, you have to explicitly provide the server name in the **REAL SERVERNAME** text box.  To obtain the real server name, a user can login to the target pSeries server as a valid pSeries user, go to the shell prompt of the server, and execute the following command: *lssyscfg - r sys -F name* 5. **IS MANAGED BY** - By selecting an option from the **IS MANAGED BY** list, indicate whether the target pSeries server is managed using an HMC server or an IVM (Integrated Virtual Manager) server. If the target server has been auto-discovered via an HMC server, the **HMC** option will be automatically chosen from this list. 6. **MANAGEMENT SERVER**, **MANAGEMENT USER**, **MANAGEMENT PASSWORD** - This test connects to an HMC/IVM server to perform LPAR discovery and to collect host-level and "outside view" metrics from the pSeries server. To enable this communication, first, provide the IP address/host name of the HMC/IVM server in the **MANAGEMENT SERVER** text box. If the eG manager had automatically discovered the target pSeries server by connecting to an HMC server in the environment, then, the IP address/host name and user credentials pertaining to that HMC server will be automatically displayed in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. However, if the pSeries server being monitored was manually added to the eG Enterprise system (and not auto-discovered via the HMC server), then, you will have to explicitly indicate whether the target pSeries server is managed by an HMC server or an IVM server by selecting an option from the **IS MANAGED BY** list. If the **HMC** option is chosen, then, you will have to provide the IP address of the HMC server that manages the target pSeries server in the **MANAGEMENT SERVER** text box. In such a case, in the **MANAGEMENT USER** and **MANAGEMENT PASSWORD** text boxes, you will have to provide the credentials of an HMC user who is assigned the **hmcviewer** role. On the other hand, if the **IVM** option is chosen from the **IS MANAGED BY** list, it implies that the IP address/host name and user credentials pertaining to that IVM server has to be explicitly provided in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. 7. **CONFIRM PASSWORD** - Confirm the **HMC PASSWORD** by retyping it here. 8. **DOMAIN** - Set the **DOMAIN** parameter to *none*.

9. **ADMIN USER**, **ADMIN PASSWORD**, **CONFIRM PASSWORD** - The eG agent remotely communicates with each discovered LPAR on the pSeries server to obtain their "inside view". For this, the eG agent will have to be configured with the credentials of a valid user with access rights to each LPAR. If a single user is authorized to access all the LPARs on the pSeries server, provide the name and password of the user in the **ADMIN USER** and **ADMIN PASSWORD** text boxes, and confirm the password by retyping it in the **CONFIRM PASSWORD** text box. On the other hand, if the test needs to communicate with different LPARs using different user accounts, then, multiple user names and passwords will have to be provided. To help administrators provide these multiple user details quickly and easily, the eG administrative interface embeds a special configuration page. To know how to use this page, refer to Section 1.3.1.1 of this document.

10. **SSL** - By default, the HMC/IVM server (as the case may be) is not SSL-enabled. This indicates that by default, the eG agent communicates with the HMC/IVM server using HTTP. Accordingly, the **SSL** flag is set to **No** by default. If you configure the HMC/IVM server to use SSL, then make sure that the **SSL** flag is set to **Yes**, so that the eG agent communicates with the HMC/IVM server using HTTPS.

11. **DETAILED DIAGNOSIS** - To make diagnosis more efficient and accurate, the eG system 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 against **DETAILED DIAGNOSIS**. To disable the capability, click on the **Off** option.

    The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:

    - The eG manager license should allow the detailed diagnosis capability
    - Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

12. **IGNORE VMS INSIDE VIEW** - Administrators of some high security LPAR environments might not have permissions to internally monitor one/more LPARs. The eG agent can be configured to **not obtain the 'inside view' of such 'inaccessible' VMs** using the **IGNORE VMS INSIDE VIEW** parameter. Against this parameter, you can provide a comma-separated list of LPAR names, or LPAR name patterns, for which the inside view need not be obtained. For instance, your **IGNORE VMS INSIDE VIEW** specification can be: **lp,aixlp*,lin**. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to *none* indicating that the eG agent obtains the inside view of all LPARs on a pSeries server by default.

While performing LPAR discovery, the eG agent will not discover the operating system of the LPARs configured in the **IGNORE VMS INSIDE VIEW** text box.

<table>
<tr><td></td><td colspan="3">13. EXCLUDE VMS - Administrators of some virtualized environments may not want to monitor some of their less-critical LPARs both from 'outside' and from 'inside'. The eG agent in this case can be configured to completely exclude such LPARs from its monitoring purview. To achieve this, provide a comma-separated list of LPARs to be excluded from monitoring in the EXCLUDE VMS text box. Instead of LPARs, LPAR name patterns can also be provided here in a comma-separated list. For example, your EXCLUDE VMS specification can be: *lp,aixlp*,lin*. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to none indicating that the eG agent obtains the inside and outside views of all AIX LPARs on a virtual host by default. By providing a comma-separated list of LPARs/LPAR name patterns in the EXCLUDE VMS text box, you can make sure the eG agent stops collecting 'inside' and 'outside' view metrics for a configured set of LPARs.</td></tr>
<tr><td>Outputs of the test</td><td colspan="3">One set of results for the IBM pSeries server 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>Installed system memory:
Indicates the total amount of memory (in MB) installed on the managed system.</td><td>MB</td><td></td></tr>
</table>

	System firmware memory: Indicates the amount of memory configured for the system firmware (i.e., the hypervisor).	MB	The amount of memory that is required by the server firmware varies according to several factors. Factors influencing server firmware memory requirements include: • Number of logical partitions; • Partition environments of the logical partitions; • Number of physical and virtual I/O devices used by the logical partitions; • Maximum memory values given to the logical partitions; Generally, you can estimate the amount of memory that is required by server firmware to be approximately eight percent of the system installed memory. The actual amount that is required will generally be less than eight percent. However, there are some server models that require an absolute minimum amount of memory for server firmware, regardless of the previously mentioned considerations. In the absence of adequate memory, the firmware may not be able to support LPAR operations, and may even bring the server down.
	Unallocated system memory: Indicates the amount of physical memory that is yet to be allocated to the LPARs.		
	System memory used by LPAR: Indicates the amount of physical memory that has been allocated to the LPARs.	MB	Memory requirements for partitions depend on partition configuration, I/O resources assigned, and applications used. Memory can be assigned in increments of 16 MB, 32 MB, 64 MB, 128 MB, and 256 MB. The default memory block size varies according to the amount of configurable memory in the system. The detailed diagnosis of this measure reveals the minimum and maximum memory configurations of each LPAR on the server, and also the amount of memory that each LPAR is entitled to receive (i.e., current memory). With the help of this information, you can quickly isolate those LPARs that may have been under-sized or over-sized in terms of memory resource allocations.

	Utilized system memory: Indicates the percentage of physical memory that has been allocated to the LPARs.	Percent	Memory requirements for partitions depend on partition configuration, I/O resources assigned, and applications used. Memory can be assigned in increments of 16 MB, 32 MB, 64 MB, 128 MB, and 256 MB. The default memory block size varies according to the amount of configurable memory in the system.

Used the detailed diagnosis of the *System memory used by LPAR* measure to figure out to which LPAR memory has been improperly allocated.

Details of memory utilized by an Lpar Server

Time	LparName	LparID	Lpar Minimum Memory(MB)	Lpar Current Memory(MB)	Lpar Maximum Memory (MB)
27.05.10 17:03:05					
	aixtest	4	1152	2176	2176
	aix2	3	1152	2176	2176
	aix1	2	1152	4224	4224
	VIO Server	1	1024	2048	2048

Figure 12: The detailed diagnosis of the System memory used by LPAR measure

1.3.4 Storage Adapters Test

The Virtual I/O Server provides virtual storage and shared Ethernet capability to client logical partitions on the system. It is installed in its own logical partition, and allows physical adapters with attached disks on the Virtual I/O Server to be shared by one or more client partitions.

Using this test, you can periodically monitor the I/O activity on each of the physical adapters and attached disks supported by the Virtual I/O server.

Purpose	Monitors the I/O activity on each of the physical adapters and attached disks supported by the Virtual I/O server
Target of the test	An IBM pSeries server
Agent deploying the test	A remote agent

Configurable parameters for the test	1. **TESTPERIOD** - How often should the test be executed 2. **HOST -** The host for which the test is to be configured. 3. **PORT** - Indicate the **PORT** at which the specified **HOST** listens. By default, this is NULL. 4. **REAL SERVERNAME** - Specify the name of the pSeries server in the **REAL SERVERNAME** text box. If the target pSeries server has been auto-discovered using HMC, the server name will be set automatically in the **REAL SERVERNAME** text box. However, while configuring this test for a pSeries server that has been manually added, you have to explicitly provide the server name in the **REAL SERVERNAME** text box.  To obtain the real server name, a user can login to the target pSeries server as a valid pSeries user, go to the shell prompt of the server, and execute the following command: *lssyscfg - r sys -F name* 5. **IS MANAGED BY** - By selecting an option from the **IS MANAGED BY** list, indicate whether the target pSeries server is managed using an HMC server or an IVM (Integrated Virtual Manager) server. If the target server has been auto-discovered via an HMC server, the **HMC** option will be automatically chosen from this list. 6. **MANAGEMENT SERVER**, **MANAGEMENT USER**, **MANAGEMENT PASSWORD** - This test connects to an HMC/IVM server to perform LPAR discovery and to collect host-level and "outside view" metrics from the pSeries server. To enable this communication, first, provide the IP address/host name of the HMC/IVM server in the **MANAGEMENT SERVER** text box. If the eG manager had automatically discovered the target pSeries server by connecting to an HMC server in the environment, then, the IP address/host name and user credentials pertaining to that HMC server will be automatically displayed in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. However, if the pSeries server being monitored was manually added to the eG Enterprise system (and not auto-discovered via the HMC server), then, you will have to explicitly indicate whether the target pSeries server is managed by an HMC server or an IVM server by selecting an option from the **IS MANAGED BY** list. If the **HMC** option is chosen, then, you will have to provide the IP address of the HMC server that manages the target pSeries server in the **MANAGEMENT SERVER** text box. In such a case, in the **MANAGEMENT USER** and **MANAGEMENT PASSWORD** text boxes, you will have to provide the credentials of an HMC user who is assigned the **hmcviewer** role. On the other hand, if the **IVM** option is chosen from the **IS MANAGED BY** list, it implies that the IP address/host name and user credentials pertaining to that IVM server has to be explicitly provided in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. 7. **CONFIRM PASSWORD** - Confirm the **HMC PASSWORD** by retyping it here. 8. **DOMAIN** - Set the **DOMAIN** parameter to *none*.

9. **ADMIN USER**, **ADMIN PASSWORD**, **CONFIRM PASSWORD** - The eG agent remotely communicates with each discovered LPAR on the pSeries server to obtain their "inside view". For this, the eG agent will have to be configured with the credentials of a valid user with access rights to each LPAR. If a single user is authorized to access all the LPARs on the pSeries server, provide the name and password of the user in the **ADMIN USER** and **ADMIN PASSWORD** text boxes, and confirm the password by retyping it in the **CONFIRM PASSWORD** text box. On the other hand, if the test needs to communicate with different LPARs using different user accounts, then, multiple user names and passwords will have to be provided. To help administrators provide these multiple user details quickly and easily, the eG administrative interface embeds a special configuration page. To know how to use this page, refer to Section 1.3.1.1 of this document.

10. **SSL** - By default, the HMC/IVM server (as the case may be) is not SSL-enabled. This indicates that by default, the eG agent communicates with the HMC/IVM server using HTTP. Accordingly, the **SSL** flag is set to **No** by default. If you configure the HMC/IVM server to use SSL, then make sure that the **SSL** flag is set to **Yes**, so that the eG agent communicates with the HMC using HTTPS.

11. **DETAILED DIAGNOSIS** - To make diagnosis more efficient and accurate, the eG system 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 against **DETAILED DIAGNOSIS**. To disable the capability, click on the **Off** option.

    The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:

    - The eG manager license should allow the detailed diagnosis capability
    - Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

12. **IGNORE VMS INSIDE VIEW** - Administrators of some high security LPAR environments might not have permissions to internally monitor one/more LPARs. The eG agent can be configured to **not obtain the 'inside view' of such 'inaccessible' VMs** using the **IGNORE VMS INSIDE VIEW** parameter. Against this parameter, you can provide a comma-separated list of LPAR names, or LPAR name patterns, for which the inside view need not be obtained. For instance, your **IGNORE VMS INSIDE VIEW** specification can be: **lp,aixlp*,lin**. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to *none* indicating that the eG agent obtains the inside view of all LPARs on a pSeries server by default.

While performing LPAR discovery, the eG agent will not discover the operating system of the LPARs configured in the **IGNORE VMS INSIDE VIEW** text box.

	13. **EXCLUDE VMS** - Administrators of some virtualized environments may not want to monitor some of their less-critical LPARs both from 'outside' and from 'inside'. The eG agent in this case can be configured to completely exclude such LPARs from its monitoring purview. To achieve this, provide a comma-separated list of LPARs to be excluded from monitoring in the **EXCLUDE VMS** text box. Instead of LPARs, LPAR name patterns can also be provided here in a comma-separated list. For example, your **EXCLUDE VMS** specification can be: **lp,aix*lp*,lin**. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to *none* indicating that the eG agent obtains the inside and outside views of all AIX LPARs on a virtual host by default. By providing a comma-separated list of LPARs/LPAR name patterns in the **EXCLUDE VMS** text box, you can make sure the eG agent stops collecting 'inside' and 'outside' view metrics for a configured set of LPARs.		
Outputs of the test	One set of results for each physical adapter supported by the VIO server on the IBM pSeries server being monitored		
Measurements made by the test	**Measurement**	**Measurement Unit**	**Interpretation**
	Data transferred: Indicates the amount of data transferred (read or written) in this adapter.	MB	The detailed diagnosis of this measure lists the physical disks in the volume group. For each physical disk, the detailed diagnosis page displays the amount of data transferred, read, and written to that physical disk, and the rate of data transfers handled by that physical disk. In the event of a high level of I/O activity on the volume group, you can use this information to identify which physical disk in the volume group is experiencing excessive activity.
	Number of data transfers: Indicates the number of transfers per second issued to this adapter.	Number/Sec	
	Data reads from adapter: Indicates the amount of data read from this adapter.	MB	
	Data writes to adapter: Indicates the amount of data written to this adapter.	MB	

The detailed diagnosis of the *Data transferred* measure lists the physical disks in the volume group. For each physical disk, the detailed diagnosis page displays the amount of data transferred, read, and written to that physical disk, and the rate of data transfers handled by that physical disk. In the event of a high level of I/O activity on the volume group, you can use this information to identify which physical disk in the volume group is experiencing excessive activity.

Disk Utilization Report

Time	Disks	Physical disk active (%)	Data transferred(MB)	Number of data transfers (Number/sec)	Data reads(MB)	Data writes(MB)
03.06.10 18:24:25						
	hdisk0	0	0	0	0	0
	hdisk1	7	0.0586	15	0	0.0586
	hdisk2	0	0	0	0	0
	hdisk3	0	0	0	0	0

Figure 13: The detailed diagnosis of the Data transferred measure

1.3.5 VIO Volume Groups Test

A physical volume is a collection of regions on one or more disks. Data is stored in physical volumes and administrative operations are performed on physical volumes. A volume group is a collection of one or more physical volumes of varying sizes and types. A physical volume can belong to only one volume group per system; there can be up to 4096 active volume groups on a Virtual I/O Server.

To know the state, composition, and usage of each volume group configured on a Virtual I/O server, use this test.

Purpose	Reports the state, composition, and usage of each volume group configured on a Virtual I/O server
Target of the test	An IBM pSeries server
Agent deploying the test	A remote agent

Configurable parameters for the test	1. **TESTPERIOD** - How often should the test be executed 2. **HOST -** The host for which the test is to be configured. 3. **PORT** - Indicate the **PORT** at which the specified **HOST** listens. By default, this is NULL. 4. **REAL SERVERNAME** - Specify the name of the pSeries server in the **REAL SERVERNAME** text box. If the target pSeries server has been auto-discovered using HMC, the server name will be set automatically in the **REAL SERVERNAME** text box. However, while configuring this test for a pSeries server that has been manually added, you have to explicitly provide the server name in the **REAL SERVERNAME** text box.  To obtain the real server name, a user can login to the target pSeries server as a valid pSeries user, go to the shell prompt of the server, and execute the following command: *lssyscfg - r sys -F name* 5. **IS MANAGED BY** - By selecting an option from the **IS MANAGED BY** list, indicate whether the target pSeries server is managed using an HMC server or an IVM (Integrated Virtual Manager) server. If the target server has been auto-discovered via an HMC server, the **HMC** option will be automatically chosen from this list. 6. **MANAGEMENT SERVER**, **MANAGEMENT USER**, **MANAGEMENT PASSWORD** - This test connects to an HMC/IVM server to perform LPAR discovery and to collect host-level and "outside view" metrics from the pSeries server. To enable this communication, first, provide the IP address/host name of the HMC/IVM server in the **MANAGEMENT SERVER** text box. If the eG manager had automatically discovered the target pSeries server by connecting to an HMC server in the environment, then, the IP address/host name and user credentials pertaining to that HMC server will be automatically displayed in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. However, if the pSeries server being monitored was manually added to the eG Enterprise system (and not auto-discovered via the HMC server), then, you will have to explicitly indicate whether the target pSeries server is managed by an HMC server or an IVM server by selecting an option from the **IS MANAGED BY** list. If the **HMC** option is chosen, then, you will have to provide the IP address of the HMC server that manages the target pSeries server in the **MANAGEMENT SERVER** text box. In such a case, in the **MANAGEMENT USER** and **MANAGEMENT PASSWORD** text boxes, you will have to provide the credentials of an HMC user who is assigned the **hmcviewer** role. On the other hand, if the **IVM** option is chosen from the **IS MANAGED BY** list, it implies that the IP address/host name and user credentials pertaining to that IVM server has to be explicitly provided in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. 7. **CONFIRM PASSWORD** - Confirm the **HMC PASSWORD** by retyping it here. 8. **DOMAIN** - Set the **DOMAIN** parameter to *none*.

9. **ADMIN USER**, **ADMIN PASSWORD**, **CONFIRM PASSWORD** - The eG agent remotely communicates with each discovered LPAR on the pSeries server to obtain their "inside view". For this, the eG agent will have to be configured with the credentials of a valid user with access rights to each LPAR. If a single user is authorized to access all the LPARs on the pSeries server, provide the name and password of the user in the **ADMIN USER** and **ADMIN PASSWORD** text boxes, and confirm the password by retyping it in the **CONFIRM PASSWORD** text box. On the other hand, if the test needs to communicate with different LPARs using different user accounts, then, multiple user names and passwords will have to be provided. To help administrators provide these multiple user details quickly and easily, the eG administrative interface embeds a special configuration page. To know how to use this page, refer to Section 1.3.1.1 of this document.

10. **SSL** - By default, the HMC/IVM server (as the case may be) is not SSL-enabled. This indicates that by default, the eG agent communicates with the HMC/IVM server using HTTP. Accordingly, the **SSL** flag is set to **No** by default. If you configure the HMC/IVM server to use SSL, then make sure that the **SSL** flag is set to **Yes**, so that the eG agent communicates with the HMC/IVM server using HTTPS.

11. **DETAILED DIAGNOSIS** - To make diagnosis more efficient and accurate, the eG system 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 against **DETAILED DIAGNOSIS**. To disable the capability, click on the **Off** option.

    The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:

    - The eG manager license should allow the detailed diagnosis capability
    - Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

12. **IGNORE VMS INSIDE VIEW** - Administrators of some high security LPAR environments might not have permissions to internally monitor one/more LPARs. The eG agent can be configured to **not obtain the 'inside view' of such 'inaccessible' VMs** using the **IGNORE VMS INSIDE VIEW** parameter. Against this parameter, you can provide a comma-separated list of LPAR names, or LPAR name patterns, for which the inside view need not be obtained. For instance, your **IGNORE VMS INSIDE VIEW** specification can be: **lp,aixlp*,lin**. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to *none* indicating that the eG agent obtains the inside view of all LPARs on a pSeries server by default.

While performing LPAR discovery, the eG agent will not discover the operating system of the LPARs configured in the **IGNORE VMS INSIDE VIEW** text box.

	13. **EXCLUDE VMS** - Administrators of some virtualized environments may not want to monitor some of their less-critical LPARs both from 'outside' and from 'inside'. The eG agent in this case can be configured to completely exclude such LPARs from its monitoring purview. To achieve this, provide a comma-separated list of LPARs to be excluded from monitoring in the **EXCLUDE VMS** text box. Instead of LPARs, LPAR name patterns can also be provided here in a comma-separated list. For example, your **EXCLUDE VMS** specification can be: **lp,aix\lp*,lin**. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to *none* indicating that the eG agent obtains the inside and outside views of all AIX LPARs on a virtual host by default. By providing a comma-separated list of LPARs/LPAR name patterns in the **EXCLUDE VMS** text box, you can make sure the eG agent stops collecting 'inside' and 'outside' view metrics for a configured set of LPARs.		
Outputs of the test	One set of results for each volume group configured on the VIO server on the IBM pSeries server being monitored		
Measurements made by the test	**Measurement**	**Measurement Unit**	**Interpretation**
	Volume group status: Indicates the current state of this volume group.	Percent	If this measure reports the value 100, it indicates that this volume group is active/complete. Such a state implies that all physical volumes within the group are currently active. On the other hand, if this measure reports the value 0, it indicates that this volume group is active/partial. This state implies that some physical volumes in the group are currently inactive.
	Maximum logical volumes: Indicates the maximum number of logical volumes allowed in this volume group.	Number	A logical volume presents the user with a contiguous address space of pages (0 .. N-1 pages in a volume with N pages) on secondary storage. Page I/O, mounting, and dismounting volumes is performed by applications on logical volumes. A logical volume is mapped to one or more physical volumes. All user I/O occurs through a logical volume.
	Currently available logical volumes: Indicates the number of logical volumes currently in this volume group.	Number	The detailed diagnosis of this measure lists the logical volumes within the group, the current state of the volume, and the number of logical partitions, physical partitions, and physical volumes attached to this volume group.
	Currently opened logical volumes: Indicates the number of logical volumes within this volume group that are currently open.	Number	

	Total physical volumes: Indicates the total number of physical volumes within this volume group.	Number	To know which physical volumes are within this group, use the detailed diagnosis of this measure. The detailed diagnosis will list the physical volumes in the group, the state of each volume, the number of physical partitions within every volume, and the number of free partitions per volume.
	Stale physical volumes: Indicates the total number of stale physical volumes within this volume group.	Number	A physical volume is stale if its contents reflect a version of the logical volume that is earlier than the current version. Typically, if a user mounts a logical volume while one of two physical volumes backing it is unavailable, but immediately dismounts it, the unavailable physical volume is declared as stale.
	Currently active physical volumes: Indicates the number of physical volumes that are currently active in this volume group.	Number	
	Maximum physical partitions per volume group: Indicates the maximum number of physical partitions allowed for this volume group.	Number	
	Maximum physical partitions per physical volume: Indicates the maximum number of physical partitions per physical volume allowed for this volume group.	Number	
	Size of each physical partition: Indicates the size of each physical partition supported by each physical volume in this volume group.	MB	When you add a physical volume to a volume group, the physical volume is partitioned into contiguous, equal-sized units of space called physical partitions. A physical partition is the smallest unit of storage space allocation and is a contiguous space on a physical volume. Physical volumes inherit the volume group's physical partitions size.
	Total physical partitions: Indicates the total number of physical partitions within this volume group.	Number	

	Not allocated physical partitions: Indicates the number of physical partitions in this volume group that are not allocated to logical volumes.	Number	
	Allocated physical partitions: Indicates the number of physical partitions in this volume group that are currently allocated to logical volumes.	Number	
	Stale physical partitions: Indicates the number of stale physical partitions currently available in the logical volumes supported by this volume group.	Number	A STALE physical partition is a physical partition that contains data you cannot use. Physical partitions marked as STALE must be updated to contain the same information as valid physical partitions. This process, called resynchronization, can be done at vary-on time, or can be started anytime the system is running. Until the STALE partitions have been rewritten with valid data, they are not used to satisfy read requests, nor are they written to on write requests.
	Maximum physical volumes: Indicates the maximum number of physical volumes allowed in this volume group.	Number	

The detailed diagnosis of the *Currently available logical volumes* measure lists the logical volumes within the group, the current state of the volume, and the number of logical partitions, physical partitions, and physical volumes attached to this volume group.

Details of volume groups in a VIO Server

Time	Logical Volume Name	Type	Logical Partitions (Number)	Physical Partitions (Number)	Physical Volumes (Number)	Logical volume State	Mount Point
03.06.10 18:22:30							
	hdd5	jfs	120	120	1	closed/syncd	N/A
	vdisk1	jfs	120	120	1	open/syncd	N/A
	vdisk2	jfs	40	40	1	open/syncd	N/A
	vdisk0	jfs	120	120	1	open/syncd	N/A

Figure 14: The detailed diagnosis of the Currently available logical volumes measure

The detailed diagnosis of the *Total physical volumes* measure will list the volumes in the group, the state of each volume, the number of physical partitions within every volume, and the number of free partitions per volume.

Details of physical volumes in a VIO Server

Time	Physical Volume Name	Physical Volume State	Total Physical partitions(Number)	Free Physical partitions(Number)
03.06.10 18:32:56	hdisk1	active	546	146

Figure 15: The detailed diagnosis of the Total physical volumes measure

1.3.6 VIO Storage Pools Test

You can create a logical volume storage pool on a Virtual I/O Server using the Hardware Management Console or the mksp and mkbdsp commands.

Logical volume storage pools are volume groups, which are collections of one or more physical volumes. The physical volumes that comprise a logical volume storage pool can be of varying sizes and types.

Since critical data is stored and key administrative operations are performed on the physical volumes, it is imperative that the storage pools have sufficient space to handle the current and anticipated data and operational load. This test monitors how each storage pool utilizes the space allocated to it, and proactively alerts you to potential space crunches.

Purpose	Reports the state, composition, and usage of each volume group configured on a Virtual I/O server
Target of the test	An IBM pSeries server
Agent deploying the test	A remote agent

Configurable parameters for the test	1. **TESTPERIOD** - How often should the test be executed 2. **HOST -** The host for which the test is to be configured. 3. **PORT** - Indicate the **PORT** at which the specified **HOST** listens. By default, this is NULL. 4. **REAL SERVERNAME** - Specify the name of the pSeries server in the **REAL SERVERNAME** text box. If the target pSeries server has been auto-discovered using HMC, the server name will be set automatically in the **REAL SERVERNAME** text box. However, while configuring this test for a pSeries server that has been manually added, you have to explicitly provide the server name in the **REAL SERVERNAME** text box.  Note To obtain the real server name, a user can login to the target pSeries server as a valid pSeries user, go to the shell prompt of the server, and execute the following command: *lssyscfg - r sys -F name* 5. **IS MANAGED BY** - By selecting an option from the **IS MANAGED BY** list, indicate whether the target pSeries server is managed using an HMC server or an IVM (Integrated Virtual Manager) server. If the target server has been auto-discovered via an HMC server, the **HMC** option will be automatically chosen from this list. 6. **MANAGEMENT SERVER**, **MANAGEMENT USER**, **MANAGEMENT PASSWORD** - This test connects to an HMC/IVM server to perform LPAR discovery and to collect host-level and "outside view" metrics from the pSeries server. To enable this communication, first, provide the IP address/host name of the HMC/IVM server in the **MANAGEMENT SERVER** text box. If the eG manager had automatically discovered the target pSeries server by connecting to an HMC server in the environment, then, the IP address/host name and user credentials pertaining to that HMC server will be automatically displayed in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. However, if the pSeries server being monitored was manually added to the eG Enterprise system (and not auto-discovered via the HMC server), then, you will have to explicitly indicate whether the target pSeries server is managed by an HMC server or an IVM server by selecting an option from the **IS MANAGED BY** list. If the **HMC** option is chosen, then, you will have to provide the IP address of the HMC server that manages the target pSeries server in the **MANAGEMENT SERVER** text box. In such a case, in the **MANAGEMENT USER** and **MANAGEMENT PASSWORD** text boxes, you will have to provide the credentials of an HMC user who is assigned the **hmcviewer** role. On the other hand, if the **IVM** option is chosen from the **IS MANAGED BY** list, it implies that the IP address/host name and user credentials pertaining to that IVM server has to be explicitly provided in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. 7. **CONFIRM PASSWORD** - Confirm the **HMC PASSWORD** by retyping it here. 8. **DOMAIN** - Set the **DOMAIN** parameter to *none*.

	9. **ADMIN USER**, **ADMIN PASSWORD**, **CONFIRM PASSWORD** - The eG agent remotely communicates with each discovered LPAR on the pSeries server to obtain their "inside view". For this, the eG agent will have to be configured with the credentials of a valid user with access rights to each LPAR. If a single user is authorized to access all the LPARs on the pSeries server, provide the name and password of the user in the **ADMIN USER** and **ADMIN PASSWORD** text boxes, and confirm the password by retyping it in the **CONFIRM PASSWORD** text box. On the other hand, if the test needs to communicate with different LPARs using different user accounts, then, multiple user names and passwords will have to be provided. To help administrators provide these multiple user details quickly and easily, the eG administrative interface embeds a special configuration page. To know how to use this page, refer to Section 1.3.1.1 of this document. 10. **SSL** - By default, the HMC/IVM server (as the case may be) is not SSL-enabled. This indicates that by default, the eG agent communicates with the HMC/IVM server using HTTP. Accordingly, the **SSL** flag is set to **No** by default. If you configure the HMC/IVM server to use SSL, then make sure that the **SSL** flag is set to **Yes**, so that the eG agent communicates with the HMC/IVM server using HTTPS. 11. **IGNORE VMS INSIDE VIEW** - Administrators of some high security LPAR environments might not have permissions to internally monitor one/more LPARs. The eG agent can be configured to **not obtain the 'inside view' of such 'inaccessible' VMs** using the **IGNORE VMS INSIDE VIEW** parameter. Against this parameter, you can provide a comma-separated list of LPAR names, or LPAR name patterns, for which the inside view need not be obtained. For instance, your **IGNORE VMS INSIDE VIEW** specification can be: **lp,aixlp*,lin**. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to *none* indicating that the eG agent obtains the inside view of all LPARs on a pSeries server by default.  Note While performing LPAR discovery, the eG agent will not discover the operating system of the LPARs configured in the **IGNORE VMS INSIDE VIEW** text box. 12. **EXCLUDE VMS** - Administrators of some virtualized environments may not want to monitor some of their less-critical LPARs both from 'outside' and from 'inside'. The eG agent in this case can be configured to completely exclude such LPARs from its monitoring purview. To achieve this, provide a comma-separated list of LPARs to be excluded from monitoring in the **EXCLUDE VMS** text box. Instead of LPARs, LPAR name patterns can also be provided here in a comma-separated list. For example, your **EXCLUDE VMS** specification can be: **lp,aixlp*,lin**. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to *none* indicating that the eG agent obtains the inside and outside views of all AIX LPARs on a virtual host by default. By providing a comma-separated list of LPARs/LPAR name patterns in the **EXCLUDE VMS** text box, you can make sure the eG agent stops collecting 'inside' and 'outside' view metrics for a configured set of LPARs.
Outputs of the test	One set of results for each storage pool configured on the VIO server on the IBM pSeries server being monitored

Measurements made by the test	Measurement	Measurement Unit	Interpretation
	Total storage pool size: Indicates the total size of this storage pool.	MB	
	Allocated storage pool size: Indicates the minimum allocation size of this storage pool.	MB	
	Used storage pool size: Indicates the amount of space in this pool that is currently being utilized.	MB	Ideally, this value should be low.
	Free storage pool size: Indicates the currently available space in this pool.	MB	
	Used storage pool: Indicates the percentage of space in this pool that is currently in use.	Percent	A very high value or a value close to 100% indicates that the pool is rapidly running out of space. You may want to allocate more space to the pool by say, adding more physical volumes to it.
	Free storage pool: Indicates the percentage of space in this pool that is currently free.	Percent	A very low value of this measure or a value close to 100% indicates that the pool is rapidly running out of space. You may want to allocate more space to the pool by say, adding more physical volumes to it.

1.4 The Network Layer

Using the **Network** test mapped to the **Network** layer, you can promptly detect a sudden non-availability of the pSeries server over the network, and also periodically monitor the health of network transmissions to and from the server.

Figure 16: The tests mapped to the Network layer

Since the **Network** test has already been discussed in the *Monitoring Unix and Windows Servers* document, let us skip the discussion and instead, proceed to the next layer.

1.5 Outside View of VMs

This layer represents the pSeries server's view of the resource allocation and usage levels of each of the LPARs hosted on it. Using the information reported by this test, administrators can:

- Know the quantity of resources each LPAR is configured with;
- Determine which of LPARs are taking up more resources (CPU, memory, network, or disk) than the others. This information can help with load balancing or capacity planning. For example, if one of the VMs is receiving a very high rate of requests compared to the others, this VM may be a candidate for migration to another pSeries server, so as to minimize the impact it has on the other guests on the current pSeries server.
- Track the overall status of the LPARs - how many are registered, which ones are powered on, and at what times, etc.

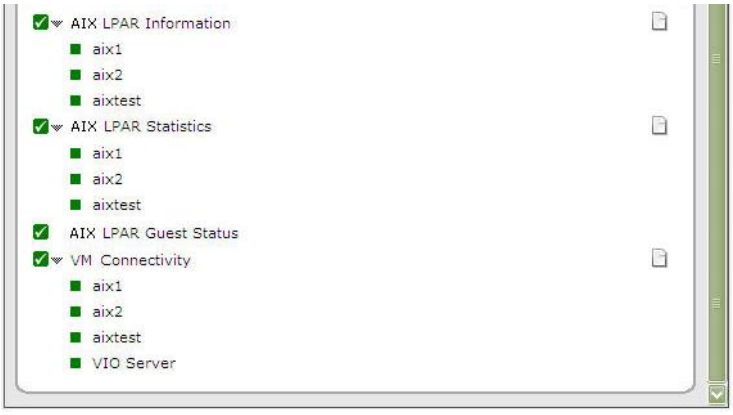


Figure 17: The tests mapped to the LPAR Guests layer

1.5.1 AIX LPAR Information Test

This test auto-discovers the LPARs on a pSeries server, reports the amount of CPU and memory resources that each LPAR is configured with, reveals the extent of usage of the allocated resources by every LPAR, and also updates you

with the powered-on status of these LPARs. Using the measures reported by this test, the following can be quickly ascertained:

- Which LPAR is currently powered-off?
- Which LPAR is utilizing virtual CPU and virtual memory optimally? Are there any resource-hungry LPARs? If so, which ones are they?
- Is any LPAR under-sized/over-sized in terms of the CPU and memory allocated to it? If so, which one is it?
- What is the maximum limit to which the processing capacity of an LPAR can be allowed to grow?
- What is the processing capacity configuration of every LPAR's shared resource pool?

Purpose	Auto-discovers the LPARs on a pSeries server, reports the amount of CPU and memory resources that each LPAR is configured with, reveals the extent of usage of the allocated resources by every LPAR, and also updates you with the powered-on status of these LPARs
Target of the test	An IBM pSeries server
Agent deploying the test	A remote agent

Configurable parameters for the test	1. **TESTPERIOD** - How often should the test be executed 2. **HOST -** The host for which the test is to be configured. 3. **PORT** - Indicate the **PORT** at which the specified **HOST** listens. By default, this is NULL. 4. **REAL SERVERNAME** - Specify the name of the pSeries server in the **REAL SERVERNAME** text box. If the target pSeries server has been auto-discovered using HMC, the server name will be set automatically in the **REAL SERVERNAME** text box. However, while configuring this test for a pSeries server that has been manually added, you have to explicitly provide the server name in the **REAL SERVERNAME** text box.  To obtain the real server name, a user can login to the target pSeries server as a valid pSeries user, go to the shell prompt of the server, and execute the following command: *lssyscfg - r sys -F name* 5. **IS MANAGED BY** - By selecting an option from the **IS MANAGED BY** list, indicate whether the target pSeries server is managed using an HMC server or an IVM (Integrated Virtual Manager) server. If the target server has been auto-discovered via an HMC server, the **HMC** option will be automatically chosen from this list. 6. **MANAGEMENT SERVER**, **MANAGEMENT USER**, **MANAGEMENT PASSWORD** - This test connects to an HMC/IVM server to perform LPAR discovery and to collect host-level and "outside view" metrics from the pSeries server. To enable this communication, first, provide the IP address/host name of the HMC/IVM server in the **MANAGEMENT SERVER** text box. If the eG manager had automatically discovered the target pSeries server by connecting to an HMC server in the environment, then, the IP address/host name and user credentials pertaining to that HMC server will be automatically displayed in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. However, if the pSeries server being monitored was manually added to the eG Enterprise system (and not auto-discovered via the HMC server), then, you will have to explicitly indicate whether the target pSeries server is managed by an HMC server or an IVM server by selecting an option from the **IS MANAGED BY** list. If the **HMC** option is chosen, then, you will have to provide the IP address of the HMC server that manages the target pSeries server in the **MANAGEMENT SERVER** text box. In such a case, in the **MANAGEMENT USER** and **MANAGEMENT PASSWORD** text boxes, you will have to provide the credentials of an HMC user who is assigned the **hmcviewer** role. On the other hand, if the **IVM** option is chosen from the **IS MANAGED BY** list, it implies that the IP address/host name and user credentials pertaining to that IVM server has to be explicitly provided in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. 7. **CONFIRM PASSWORD** - Confirm the **HMC PASSWORD** by retyping it here. 8. **DOMAIN** - Set the **DOMAIN** parameter to *none*.

9. **ADMIN USER**, **ADMIN PASSWORD**, **CONFIRM PASSWORD** - The eG agent remotely communicates with each discovered LPAR on the pSeries server to obtain their "inside view". For this, the eG agent will have to be configured with the credentials of a valid user with access rights to each LPAR. If a single user is authorized to access all the LPARs on the pSeries server, provide the name and password of the user in the **ADMIN USER** and **ADMIN PASSWORD** text boxes, and confirm the password by retyping it in the **CONFIRM PASSWORD** text box. On the other hand, if the test needs to communicate with different LPARs using different user accounts, then, multiple user names and passwords will have to be provided. To help administrators provide these multiple user details quickly and easily, the eG administrative interface embeds a special configuration page. To know how to use this page, refer to Section 1.3.1.1 of this document.

10. **SSL** - By default, the HMC/IVM server (as the case may be) is not SSL-enabled. This indicates that by default, the eG agent communicates with the HMC/IVM server using HTTP. Accordingly, the **SSL** flag is set to **No** by default. If you configure the HMC/IVM server to use SSL, then make sure that the **SSL** flag is set to **Yes**, so that the eG agent communicates with the HMC/IVM server using HTTPS.

11. **IGNORE VMS INSIDE VIEW** - Administrators of some high security LPAR environments might not have permissions to internally monitor one/more LPARs. The eG agent can be configured to **not obtain the 'inside view' of such 'inaccessible' VMs** using the **IGNORE VMS INSIDE VIEW** parameter. Against this parameter, you can provide a comma-separated list of LPAR names, or LPAR name patterns, for which the inside view need not be obtained. For instance, your **IGNORE VMS INSIDE VIEW** specification can be: **lp,aixlp*,lin**. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to *none* indicating that the eG agent obtains the inside view of all LPARs on a pSeries server by default.

While performing LPAR discovery, the eG agent will not discover the operating system of the LPARs configured in the **IGNORE VMS INSIDE VIEW** text box.

12. **EXCLUDE VMS** - Administrators of some virtualized environments may not want to monitor some of their less-critical LPARs both from 'outside' and from 'inside'. The eG agent in this case can be configured to completely exclude such LPARs from its monitoring purview. To achieve this, provide a comma-separated list of LPARs to be excluded from monitoring in the **EXCLUDE VMS** text box. Instead of LPARs, LPAR name patterns can also be provided here in a comma-separated list. For example, your **EXCLUDE VMS** specification can be: **lp,aixlp*,lin**. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to *none* indicating that the eG agent obtains the inside and outside views of all AIX LPARs on a virtual host by default. By providing a comma-separated list of LPARs/LPAR name patterns in the **EXCLUDE VMS** text box, you can make sure the eG agent stops collecting 'inside' and 'outside' view metrics for a configured set of LPARs.

<table>
<tr><td></td><td colspan="3">13. DD FREQUENCY - The DD FREQUENCY parameter refers to the frequency with which detailed diagnosis measures are to be generated for this test. For example, if this is set to 1:1, it indicates that detailed measures will be generated every time this test runs, and also every time the test detects a problem.

14. DETAILED DIAGNOSIS - To make diagnosis more efficient and accurate, the eG system 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 against DETAILED DIAGNOSIS. To disable the capability, click on the Off option.

The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:
• The eG manager license should allow the detailed diagnosis capability
• Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.</td></tr>
<tr><td>Outputs of the test</td><td colspan="3">One set of results for each LPAR configured on the IBM pSeries server being monitored</td></tr>
<tr><td>Measurements made by the test</td><td>Measurement</td><td>Measurement Unit</td><td>Interpretation</td></tr>
<tr><td></td><td>Is LPAR powered on?:
Whether this LPAR is powered on or not.</td><td></td><td>If this measure returns the value 'Yes', it indicates that the LPAR is powered-on. The value 'No' on the other hand indicates that the LPAR is powered off. The table below displays the values that can be reported by this measure, and their numeric equivalents:
<table><tr><th>Measure Value</th><th>Numeric Equivalent</th></tr><tr><td>Yes</td><td>0</td></tr><tr><td>No</td><td>1</td></tr></table>
Note:

By default, this measure reports one of the Measure Values listed in the table above. The graph of this measure however will represent the VM status using the numeric equivalents - 0 or 1.</td></tr>
</table>

	Online virtual CPUs: Indicates the number of virtual CPUs currently being used by this LPAR.	Number	A high value of this measure indicates excessive CPU usage by an LPAR. Comparing the value of this measure across LPARs will enable you to quickly and accurately point to that LPAR that is consuming too much CPU. To know whether the CPU resources of this LPAR are capped or uncapped, use the detailed diagnosis of this measure. This will additionally reveal the partition ID and type (whether dedicated or shared) as well.
	Maximum virtual CPUs: Indicates the maximum number of virtual CPUs that can be utilized by this LPAR.	Number	
	Minimum virtual CPUs: Indicates the minimum number of virtual CPUs configured for this LPAR.	Number	
	Online memory: Indicates the amount of allocated memory resources currently utilized by this LPAR.	MB	A high value of this measure indicates excessive memory usage by an LPAR. Comparing the value of this measure across LPARs will enable you to quickly and accurately point to that LPAR that is consuming too much memory.
	Maximum memory: Indicates the maximum amount of memory that this LPAR can use.	MB	
	Minimum memory: Indicates the minimum amount of memory allocated to this LPAR.	MB	
	Capacity increment: Indicates the minimum capacity (in units of 1/100 of a physical processor) that can be added to or removed from this partition's processor capacity.	Number	This measure indicates the granule at which changes to Entitled Capacity can be made. A value in whole multiples indicates a Dedicated LPAR.

	Maximum capacity: Indicates the maximum number of processing units that this LPAR can use.	Number	The entitled capacity of the LPAR can go up to the value of this measure.
	Minimum capacity: Indicates the minimum number of processing units required by this LPAR for its functioning.	Number	The entitled capacity of the LPAR cannot go down beyond the value of this measure.
	Active physical CPUs in system: Indicates the current number of active physical CPUs in the system containing this LPAR.	Number	
	Maximum physical CPUs in system: Indicates the maximum number of physical CPUs that can be used by this LPAR.	Number	
	Active CPUs in pool: Indicates the maximum number of CPUs available to this LPAR's shared processor pool.	Number	
	Shared physical CPUs in system: Indicates the number of physical CPUs available for use by shared processor LPARs.	Number	
	Entitled capacity of pool: Indicates the number of processing units that this LPAR's shared processor pool is entitled to receive.	Number	
	Maximum capacity of pool: Indicates the maximum number of processing units available to this LPAR's shared processor pool.	Processing units	

	Unallocated capacity: Indicates the sum of the number of processor units unallocated from shared LPARs in an LPAR group.	Processing units	This sum does not include the processor units unallocated from a dedicated LPAR, which can also belong to the group. The unallocated processor units can be allocated to any dedicated LPAR (if it is greater than or equal to 1.0) or shared LPAR of the group.
	Unallocated weight: Indicates the number of variable processor capacity weight units currently unallocated within the LPAR group.	Processing units	

To know whether the CPU resources of an LPAR are capped or uncapped, use the detailed diagnosis of this *Online virtual CPUs* measure.

Details of lpar guests

Time	Partition Number	Partition type	Cpu model(Mode)
27.05.10 17:26:24	2	Dedicated-SMT	Capped

Figure 18: The detailed diagnosis of the Online virtual CPUs measure

1.5.2 AIX LPAR Guests Test

Using the measures reported by this test, you can promptly identify guests that are powered-off and those that have been newly added/removed from the pSeries server.

Purpose	Reports the count of LPARs in varying states of activity
Target of the test	An IBM pSeries server
sgent deploying the test	A remote agent

Configurable parameters for the test	1. **TESTPERIOD** - How often should the test be executed 2. **HOST -** The host for which the test is to be configured. 3. **PORT** - Indicate the **PORT** at which the specified **HOST** listens. By default, this is NULL. 4. **REAL SERVERNAME** - Specify the name of the pSeries server in the **REAL SERVERNAME** text box. If the target pSeries server has been auto-discovered using HMC, the server name will be set automatically in the **REAL SERVERNAME** text box. However, while configuring this test for a pSeries server that has been manually added, you have to explicitly provide the server name in the **REAL SERVERNAME** text box.  To obtain the real server name, a user can login to the target pSeries server as a valid pSeries user, go to the shell prompt of the server, and execute the following command: *lssyscfg - r sys -F name* 5. **IS MANAGED BY** - By selecting an option from the **IS MANAGED BY** list, indicate whether the target pSeries server is managed using an HMC server or an IVM (Integrated Virtual Manager) server. If the target server has been auto-discovered via an HMC server, the **HMC** option will be automatically chosen from this list. 6. **MANAGEMENT SERVER**, **MANAGEMENT USER**, **MANAGEMENT PASSWORD** - This test connects to an HMC/IVM server to perform LPAR discovery and to collect host-level and "outside view" metrics from the pSeries server. To enable this communication, first, provide the IP address/host name of the HMC/IVM server in the **MANAGEMENT SERVER** text box. If the eG manager had automatically discovered the target pSeries server by connecting to an HMC server in the environment, then, the IP address/host name and user credentials pertaining to that HMC server will be automatically displayed in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. However, if the pSeries server being monitored was manually added to the eG Enterprise system (and not auto-discovered via the HMC server), then, you will have to explicitly indicate whether the target pSeries server is managed by an HMC server or an IVM server by selecting an option from the **IS MANAGED BY** list. If the **HMC** option is chosen, then, you will have to provide the IP address of the HMC server that manages the target pSeries server in the **MANAGEMENT SERVER** text box. In such a case, in the **MANAGEMENT USER** and **MANAGEMENT PASSWORD** text boxes, you will have to provide the credentials of an HMC user who is assigned the **hmcviewer** role. On the other hand, if the **IVM** option is chosen from the **IS MANAGED BY** list, it implies that the IP address/host name and user credentials pertaining to that IVM server has to be explicitly provided in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. 7. **CONFIRM PASSWORD** - Confirm the **HMC PASSWORD** by retyping it here. 8. **DOMAIN** - Set the **DOMAIN** parameter to *none*.

9. **ADMIN USER**, **ADMIN PASSWORD**, **CONFIRM PASSWORD** - The eG agent remotely communicates with each discovered LPAR on the pSeries server to obtain their "inside view". For this, the eG agent will have to be configured with the credentials of a valid user with access rights to each LPAR. If a single user is authorized to access all the LPARs on the pSeries server, provide the name and password of the user in the **ADMIN USER** and **ADMIN PASSWORD** text boxes, and confirm the password by retyping it in the **CONFIRM PASSWORD** text box. On the other hand, if the test needs to communicate with different LPARs using different user accounts, then, multiple user names and passwords will have to be provided. To help administrators provide these multiple user details quickly and easily, the eG administrative interface embeds a special configuration page. To know how to use this page, refer to Section 1.3.1.1 of this document.

10. **SSL** - By default, the HMC/IVM server (as the case may be) is not SSL-enabled. This indicates that by default, the eG agent communicates with the HMC/IVM server using HTTP. Accordingly, the **SSL** flag is set to **No** by default. If you configure the HMC/IVM server to use SSL, then make sure that the **SSL** flag is set to **Yes**, so that the eG agent communicates with the HMC/IVM server using HTTPS.

11. **IGNORE VMS INSIDE VIEW** - Administrators of some high security LPAR environments might not have permissions to internally monitor one/more LPARs. The eG agent can be configured to **not obtain the 'inside view' of such 'inaccessible' VMs** using the **IGNORE VMS INSIDE VIEW** parameter. Against this parameter, you can provide a comma-separated list of LPAR names, or LPAR name patterns, for which the inside view need not be obtained. For instance, your **IGNORE VMS INSIDE VIEW** specification can be: **lp,aixlp*,lin**. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to *none* indicating that the eG agent obtains the inside view of all LPARs on a pSeries server by default.

While performing LPAR discovery, the eG agent will not discover the operating system of the LPARs configured in the **IGNORE VMS INSIDE VIEW** text box.

12. **EXCLUDE VMS** - Administrators of some virtualized environments may not want to monitor some of their less-critical LPARs both from 'outside' and from 'inside'. The eG agent in this case can be configured to completely exclude such LPARs from its monitoring purview. To achieve this, provide a comma-separated list of LPARs to be excluded from monitoring in the **EXCLUDE VMS** text box. Instead of LPARs, LPAR name patterns can also be provided here in a comma-separated list. For example, your **EXCLUDE VMS** specification can be: **lp,aixlp*,lin**. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to *none* indicating that the eG agent obtains the inside and outside views of all AIX LPARs on a virtual host by default. By providing a comma-separated list of LPARs/LPAR name patterns in the **EXCLUDE VMS** text box, you can make sure the eG agent stops collecting 'inside' and 'outside' view metrics for a configured set of LPARs.

<table>
<tr><td></td><td colspan="3">13. DD FREQUENCY - The DD FREQUENCY parameter refers to the frequency with which detailed diagnosis measures are to be generated for this test. For example, if this is set to 1:1, it indicates that detailed measures will be generated every time this test runs, and also every time the test detects a problem.

14. DETAILED DIAGNOSIS - To make diagnosis more efficient and accurate, the eG system 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 against DETAILED DIAGNOSIS. To disable the capability, click on the Off option.

The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:
• The eG manager license should allow the detailed diagnosis capability
• Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.</td></tr>
<tr><td>Outputs of the test</td><td colspan="3">One set of results for the IBM pSeries server being monitored</td></tr>
<tr><td rowspan="6">Measurements made by the test</td><td>Measurement</td><td>Measurement Unit</td><td>Interpretation</td></tr>
<tr><td>Registered LPARs:
Indicates the number of guests registered with the pSeries server.</td><td>Number</td><td>Use the detailed diagnosis of this measure to know which guests are registered with the server.</td></tr>
<tr><td>Running LPARs:
Indicates the number of guests that are currently running.</td><td>Number</td><td>Use the detailed diagnosis of this measure to know which guests are currently running.</td></tr>
<tr><td>Not Running LPARs:
Indicates the number of guests that are not running currently.</td><td>Number</td><td>Use the detailed diagnosis of this measure to know which guests are not running currently.</td></tr>
<tr><td>Added LPARs:
Indicates the number of guests that have been newly added to the pSeries server since the last measurement period.</td><td>Number</td><td>Use the detailed diagnosis of this measure to know which guests were recently added.</td></tr>
<tr><td>Removed LPARs:
Indicates the number of guests that have been removed from the pSeries server since the last measurement period.</td><td>Number</td><td>Use the detailed diagnosis of this measure to know which guests have been removed.</td></tr>
</table>

Use the detailed diagnosis of the *Registered LPARs* to know which guests are registered with the server and the operating system on which they are functioning.

Details of pSeries server LPARs

Time	GuestName	IP Address	OS
27.05.10 17:26:26			
	VIO Server	192.168.10.17	N/A
	aix2	192.168.10.44	AIX
	aix1	192.168.10.19	AIX
	aixtest	192.168.10.26	AIX

Figure 19: The detailed diagnosis of the Registered LPARs measure

Use the detailed diagnosis of the *Running LPARs* measure to know which guests are currently running.

Details of running pSeries server LPARs

Time	GuestName	IP Address	OS
27.05.10 17:26:26			
	VIO Server	192.168.10.17	N/A
	aix2	192.168.10.44	AIX
	aix1	192.168.10.19	AIX
	aixtest	192.168.10.26	AIX

Figure 20: The detailed diagnosis of the Running LPARs measure

1.5.3 AIX LPAR Statistics Test

When applications executing on one/more LPARs experience sudden or sporadic slowdowns, administrators need to know how each of these LPARs is utilizing the processing capacity (i.e., CPU resources) assigned to it so that, they can accurately isolate that LPAR that is responsible for the processing bottleneck. By periodically reporting the CPU consumption of each LPAR on a pSeries server, this test facilitates such an analysis. Besides turning the spot light on resource-hungry LPARs, the test also reveals where such LPARs spend maximum time - whether on user-level processing, system-level processing, by being idle, or by being in waiting. In addition, you can optionally configure this test to report the number of hypervisor calls and the time spent by the LPAR's processor on these calls so that, the CPU-efficiency of such calls can also be determined.

Purpose	Reveals resource-hungry LPARs, and points to where resources are spent
Target of the test	An IBM pSeries server
Agent deploying the test	A remote agent

Configurable parameters for the test	1. **TESTPERIOD** - How often should the test be executed 2. **HOST -** The host for which the test is to be configured. 3. **PORT** - Indicate the **PORT** at which the specified **HOST** listens. By default, this is NULL. 4. **REAL SERVERNAME** - Specify the name of the pSeries server in the **REAL SERVERNAME** text box. If the target pSeries server has been auto-discovered using HMC, the server name will be set automatically in the **REAL SERVERNAME** text box. However, while configuring this test for a pSeries server that has been manually added, you have to explicitly provide the server name in the **REAL SERVERNAME** text box.  To obtain the real server name, a user can login to the target pSeries server as a valid pSeries user, go to the shell prompt of the server, and execute the following command: *lssyscfg - r sys -F name* 5. **IS MANAGED BY** - By selecting an option from the **IS MANAGED BY** list, indicate whether the target pSeries server is managed using an HMC server or an IVM (Integrated Virtual Manager) server. If the target server has been auto-discovered via an HMC server, the **HMC** option will be automatically chosen from this list. 6. **MANAGEMENT SERVER**, **MANAGEMENT USER**, **MANAGEMENT PASSWORD** - This test connects to an HMC/IVM server to perform LPAR discovery and to collect host-level and "outside view" metrics from the pSeries server. To enable this communication, first, provide the IP address/host name of the HMC/IVM server in the **MANAGEMENT SERVER** text box. If the eG manager had automatically discovered the target pSeries server by connecting to an HMC server in the environment, then, the IP address/host name and user credentials pertaining to that HMC server will be automatically displayed in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. However, if the pSeries server being monitored was manually added to the eG Enterprise system (and not auto-discovered via the HMC server), then, you will have to explicitly indicate whether the target pSeries server is managed by an HMC server or an IVM server by selecting an option from the **IS MANAGED BY** list. If the **HMC** option is chosen, then, you will have to provide the IP address of the HMC server that manages the target pSeries server in the **MANAGEMENT SERVER** text box. In such a case, in the **MANAGEMENT USER** and **MANAGEMENT PASSWORD** text boxes, you will have to provide the credentials of an HMC user who is assigned the **hmcviewer** role. On the other hand, if the **IVM** option is chosen from the **IS MANAGED BY** list, it implies that the IP address/host name and user credentials pertaining to that IVM server has to be explicitly provided in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. 7. **CONFIRM PASSWORD** - Confirm the **HMC PASSWORD** by retyping it here. 8. **DOMAIN** - Set the **DOMAIN** parameter to *none*.

9. **ADMIN USER**, **ADMIN PASSWORD**, **CONFIRM PASSWORD** - The eG agent remotely communicates with each discovered LPAR on the pSeries server to obtain their "inside view". For this, the eG agent will have to be configured with the credentials of a valid user with access rights to each LPAR. If a single user is authorized to access all the LPARs on the pSeries server, provide the name and password of the user in the **ADMIN USER** and **ADMIN PASSWORD** text boxes, and confirm the password by retyping it in the **CONFIRM PASSWORD** text box. On the other hand, if the test needs to communicate with different LPARs using different user accounts, then, multiple user names and passwords will have to be provided. To help administrators provide these multiple user details quickly and easily, the eG administrative interface embeds a special configuration page. To know how to use this page, refer to Section 1.3.1.1 of this document.

10. **SSL** - By default, the HMC/IVM server (as the case may be) is not SSL-enabled. This indicates that by default, the eG agent communicates with the HMC/IVM server using HTTP. Accordingly, the **SSL** flag is set to **No** by default. If you configure the HMC/IVM server to use SSL, then make sure that the **SSL** flag is set to **Yes**, so that the eG agent communicates with the HMC/IVM server using HTTPS.

11. **DETAILED DIAGNOSIS** - To make diagnosis more efficient and accurate, the eG system 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 against **DETAILED DIAGNOSIS**. To disable the capability, click on the **Off** option.

    The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:

    - The eG manager license should allow the detailed diagnosis capability
    - Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

12. **IGNORE VMS INSIDE VIEW** - Administrators of some high security LPAR environments might not have permissions to internally monitor one/more LPARs. The eG agent can be configured to **not obtain the 'inside view' of such 'inaccessible' VMs** using the **IGNORE VMS INSIDE VIEW** parameter. Against this parameter, you can provide a comma-separated list of LPAR names, or LPAR name patterns, for which the inside view need not be obtained. For instance, your **IGNORE VMS INSIDE VIEW** specification can be: **lp,aixlp*,lin**. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to *none* indicating that the eG agent obtains the inside view of all LPARs on a pSeries server by default.

While performing LPAR discovery, the eG agent will not discover the operating system of the LPARs configured in the **IGNORE VMS INSIDE VIEW** text box.

<table>
<tr><td></td><td colspan="3">13. EXCLUDE VMS - Administrators of some virtualized environments may not want to monitor some of their less-critical LPARs both from 'outside' and from 'inside'. The eG agent in this case can be configured to completely exclude such LPARs from its monitoring purview. To achieve this, provide a comma-separated list of LPARs to be excluded from monitoring in the EXCLUDE VMS text box. Instead of LPARs, LPAR name patterns can also be provided here in a comma-separated list. For example, your EXCLUDE VMS specification can be: *lp,aixlp*,lin*. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to none indicating that the eG agent obtains the inside and outside views of all AIX LPARs on a virtual host by default. By providing a comma-separated list of LPARs/LPAR name patterns in the EXCLUDE VMS text box, you can make sure the eG agent stops collecting 'inside' and 'outside' view metrics for a configured set of LPARs.

14. USESUDO and SUDOCMD - By default, the USESUDO flag is set to No, indicating that the test does not collect hypervisor-related metrics by default. If the flag is set to Yes instead, the test uses the sudo command (by default) to collect the hypervisor metrics. This is why, the SUDOCMD parameter is set to sudo by default. To use a command other than the sudo command, specify the command in the SUDOCMD text box.

15. INTERVALS and COUNT - By default, the INTERVALS parameter is set to 1 and the COUNT parameter is set to 2. This implies that every time this test executes, it will collect metrics twice (because, the default COUNT is 2), and each set of metrics will be collected at the end of every second (because the default INTERVAL is 1). Also, note that the agent will report only the last set of metrics to the eG manager.</td></tr>
<tr><td>Outputs of the test</td><td colspan="3">One set of results for each LPAR configured on an IBM pSeries server being monitored</td></tr>
<tr><td rowspan="3">Measurements made by the test</td><td>Measurement</td><td>Measurement Unit</td><td>Interpretation</td></tr>
<tr><td>Entitled processing capacity:
Indicates the number of processing units this LPAR is entitled to receive - i.e., the number of processing units reseved for usage by this LPAR.</td><td>Number</td><td>For dedicated partitions, the entitled processing capacity is the number of physical processors.</td></tr>
<tr><td>User level entitled processing capacity used:
Indicates the percentage of the entitled processing capacity used by this LPAR while executing at the user level.</td><td>Percent</td><td>A high value for this measure indicates that the user is executing CPU-intensive processes/applications on the LPAR. Comparing the value of this measure with the Kernel level entitled processing capacity used, Idle entitled processing capacity, and Waiting entitled processing capacity measures will reveal where the LPAR spent the maximum time.</td></tr>
</table>

	Kernel level entitled processing capacity used: Indicates the percentage of the entitled processing capacity used by this LPAR while executing system-level processes.	Percent	A high value for this measure indicates that system-level processing is CPU-intensive. Comparing the value of this measure with the *User level entitled processing capacity used*, *Idle entitled processing capacity*, and *Waiting entitled processing capacity* measures will reveal where the LPAR spent the maximum time.
	Idle entitled processing capacity idle: Indicates the percentage of the entitled processing capacity unused while this partition was idle and did not have any outstanding disk I/O request(s).	Percent	Idle processing capacity in the shared resources pool can be used by any shared LPAR that requires additional processing power. While capped partitions can utilize as much processing capacity from the pool as allowed by their maximum processing capacity configuration, the uncapped partitions can draw beyond this maximum threshold, but not beyond the total idle processing capacity in the pool. Comparing the value of this measure with the *User level entitled processing capacity used*, *Kernel level entitled processing capacity*, and *Waiting entitled processing capacity* measures will reveal where the LPAR spent the maximum time.
	Waiting entitled processing capacity: Indicates the percentage of the entitled processing capacity unused while this partition was idle and had outstanding disk I/O request(s).	Percent	A high value for this measure could indicate a processing bottleneck. Comparing the value of this measure with the *User level entitled processing capacity used*, *Kernel level entitled processing capacity*, and *Idle entitled processing capacity* measures will reveal where the LPAR spent the maximum time.
	Physical processors consumed: Indicates the number of physical processing units, of the total entitled processing capacity, that were consumed by this LPAR.	Number	CPU usage measured in absolute terms (i.e., processing units) helps administrators to effectively assess the resource impact of migrating an LPAR to another server. **Note that this measure is displayed only when the partition type is "shared" or "dedicated-donating".**
	Entitled processors consumed: Indicates the percentage of the entitled capacity consumed.	Percent	Because the time base over which this data is computed can vary, the entitled capacity percentage can sometimes exceed 100%. This excess is noticeable only with small sampling intervals. **Note that this measure is displayed only when the partition type is "shared".**

	Logical processors utilization: Indicates the percentage of logical processor(s) that was utilized by this LPAR while executing at the user and system level.	Percent	A very high value is indicative of excessive logical processor utilization by the LPAR. **Note that this measure is displayed only when the partition type is "shared".**
	Available physical processors in the shared pool: Indicates the number of physical processors available in the shared resource pool that is used by this LPAR.	Number	**Note that this measure is displayed only when the partition type is "shared".**
	Virtual context cpu switches: Indicates the number of virtual context switches that are virtual-processor hardware preemptions.	Number	**Note that this measure is displayed only when the partition type is "shared" or "dedicated-donating".**
	Phantom interruptions received: Indicates the number of phantom (targeted to another shared partition in this pool) interruptions received.	MB	A phantom interrupt is an interrupt targeted to another partition that shares the same physical processor. For example, one partition starts an I/O operation. While the partition is waiting for the I/O to complete, it cedes the physical processor to another partition. The I/O operation completes and the controller sends an interrupt to the requesting processor, but as the interrupted partition running is not the intended destination, the partition says "not for me" and the interrupt is queued by the Power hypervisor. They do not have a a big impact on performance.
	Time spent in hypervisor: Indicates the percentage of physical processor capacity spent making hypervisor calls.	Percent	A high value for this measure is indicative of too much time and CPU resources spent on hypervisor calls. **Note that this measure will be available only if the HYPER CALLS flag is set to Yes for this test, and the ADMIN USER configured for this test is either a 'root user' or a 'root equivalent user'.**
	Hypervisor calls executed: Indicates the average number of hypervisor calls that were started.	Number	**Note that this measure will be available only if the HYPER CALLS flag is set to Yes for this test, and the ADMIN USER configured for this test is either a 'root user' or a 'root equivalent user'.**

1.5.4 VM Connectivity Test

Sometimes, an LPAR could be in a powered-on state, but the failure of the LPAR operating system or any fatal error in LPAR operations could have rendered the LPAR inaccessible to users. In order to enable administrators to promptly detect such 'hidden' anomalies, the eG agent periodically runs a connectivity check on each VM using the VM Connectivity test, and reports whether the VM is accessible over the network or not.

Purpose	Runs a connectivity check on each LPAR and reports whether the LPAR is accessible over the network or not
Target of the test	An IBM pSeries server
Agent deploying the test	A remote agent

Configurable parameters for the test	1. **TESTPERIOD** - How often should the test be executed 2. **HOST -** The host for which the test is to be configured. 3. **PORT** - Indicate the **PORT** at which the specified **HOST** listens. By default, this is NULL. 4. **REAL SERVERNAME** - Specify the name of the pSeries server in the **REAL SERVERNAME** text box. If the target pSeries server has been auto-discovered using HMC, the server name will be set automatically in the **REAL SERVERNAME** text box. However, while configuring this test for a pSeries server that has been manually added, you have to explicitly provide the server name in the **REAL SERVERNAME** text box.  To obtain the real server name, a user can login to the target pSeries server as a valid pSeries user, go to the shell prompt of the server, and execute the following command: *lssyscfg - r sys -F name* 5. **IS MANAGED BY** - By selecting an option from the **IS MANAGED BY** list, indicate whether the target pSeries server is managed using an HMC server or an IVM (Integrated Virtual Manager) server. If the target server has been auto-discovered via an HMC server, the **HMC** option will be automatically chosen from this list. 6. **MANAGEMENT SERVER**, **MANAGEMENT USER**, **MANAGEMENT PASSWORD** - This test connects to an HMC/IVM server to perform LPAR discovery and to collect host-level and "outside view" metrics from the pSeries server. To enable this communication, first, provide the IP address/host name of the HMC/IVM server in the **MANAGEMENT SERVER** text box. If the eG manager had automatically discovered the target pSeries server by connecting to an HMC server in the environment, then, the IP address/host name and user credentials pertaining to that HMC server will be automatically displayed in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. However, if the pSeries server being monitored was manually added to the eG Enterprise system (and not auto-discovered via the HMC server), then, you will have to explicitly indicate whether the target pSeries server is managed by an HMC server or an IVM server by selecting an option from the **IS MANAGED BY** list. If the **HMC** option is chosen, then, you will have to provide the IP address of the HMC server that manages the target pSeries server in the **MANAGEMENT SERVER** text box. In such a case, in the **MANAGEMENT USER** and **MANAGEMENT PASSWORD** text boxes, you will have to provide the credentials of an HMC user who is assigned the **hmcviewer** role. On the other hand, if the **IVM** option is chosen from the **IS MANAGED BY** list, it implies that the IP address/host name and user credentials pertaining to that IVM server has to be explicitly provided in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. 7. **CONFIRM PASSWORD** - Confirm the **HMC PASSWORD** by retyping it here. 8. **DOMAIN** - Set the **DOMAIN** parameter to *none*.

9. **ADMIN USER**, **ADMIN PASSWORD**, **CONFIRM PASSWORD** - The eG agent remotely communicates with each discovered LPAR on the pSeries server to obtain their "inside view". For this, the eG agent will have to be configured with the credentials of a valid user with access rights to each LPAR. If a single user is authorized to access all the LPARs on the pSeries server, provide the name and password of the user in the **ADMIN USER** and **ADMIN PASSWORD** text boxes, and confirm the password by retyping it in the **CONFIRM PASSWORD** text box. On the other hand, if the test needs to communicate with different LPARs using different user accounts, then, multiple user names and passwords will have to be provided. To help administrators provide these multiple user details quickly and easily, the eG administrative interface embeds a special configuration page. To know how to use this page, refer to Section 1.3.1.1 of this document.

10. **SSL** - By default, the HMC/IVM server (as the case may be) is not SSL-enabled. This indicates that by default, the eG agent communicates with the HMC/IVM server using HTTP. Accordingly, the **SSL** flag is set to **No** by default. If you configure the HMC/IVM server to use SSL, then make sure that the **SSL** flag is set to **Yes**, so that the eG agent communicates with the HMC/IVM server using HTTPS.

11. **IGNORE VMS INSIDE VIEW** - Administrators of some high security LPAR environments might not have permissions to internally monitor one/more LPARs. The eG agent can be configured to **not obtain the 'inside view' of such 'inaccessible' VMs** using the **IGNORE VMS INSIDE VIEW** parameter. Against this parameter, you can provide a comma-separated list of LPAR names, or LPAR name patterns, for which the inside view need not be obtained. For instance, your **IGNORE VMS INSIDE VIEW** specification can be: **lp,aixlp*,lin**. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to *none* indicating that the eG agent obtains the inside view of all LPARs on a pSeries server by default.

While performing LPAR discovery, the eG agent will not discover the operating system of the LPARs configured in the **IGNORE VMS INSIDE VIEW** text box.

12. **EXCLUDE VMS** - Administrators of some virtualized environments may not want to monitor some of their less-critical LPARs both from 'outside' and from 'inside'. The eG agent in this case can be configured to completely exclude such LPARs from its monitoring purview. To achieve this, provide a comma-separated list of LPARs to be excluded from monitoring in the **EXCLUDE VMS** text box. Instead of LPARs, LPAR name patterns can also be provided here in a comma-separated list. For example, your **EXCLUDE VMS** specification can be: **lp,aixlp*,lin**. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to *none* indicating that the eG agent obtains the inside and outside views of all AIX LPARs on a virtual host by default. By providing a comma-separated list of LPARs/LPAR name patterns in the **EXCLUDE VMS** text box, you can make sure the eG agent stops collecting 'inside' and 'outside' view metrics for a configured set of LPARs.

	13. **PACKETSIZE** - The size of packets used for the test (in bytes) 14. **PACKETCOUNT** - The number of packets to be transmitted during the test 15. **TIMEOUT** - How long after transmission should a packet be deemed lost (in seconds) 16. **PACKETINTERVAL** - Represents the interval (in milliseconds) between successive packet transmissions during the execution of the network test for a specific target. 17. **REPORTUNAVAILABILITY** – By default, this flag is set to **No**. This implies that, by default, the test will not report the unavailability of network connection to any LPAR. In other words, if the *Network availability of VM* measure of this test registers the value *0* for any LPAR, then, by default, this test will not report any measure for that LPAR; under such circumstances, the corresponding LPAR name will not appear as a descriptor of this test. You can set this flag to **Yes**, if you want the test to report and alert you to the unavailability of the network connection to an LPAR.		
Outputs of the test	One set of results for each LPAR configured on the pSeries server being monitored		
Measurements made by the test	**Measurement**	**Measurement Unit**	**Interpretation**
	Avg network delay: Indicates the average delay between transmission of packet to a VM and receipt of the response to the packet at the source.	Secs	An increase in network latency could result from misconfiguration of the router(s) along the path, network congestion, retransmissions at the network, etc.
	Min network delay: The minimum time between transmission of a packet and receipt of the response back.	Secs	A significant increase in the minimum round-trip time is often a sure sign of network congestion.
	Packet loss: Indicates the percentage of packets lost during transmission from source to target and back.	Percent	Packet loss is often caused by network buffer overflows at a network router or by packet corruptions over the network. The detailed diagnosis for this measure provides a listing of routers that are on the path from the external agent to target server, and the delays on each hop. This information can be used to diagnose the hop(s) that could be causing excessive packet loss/delays.
	Network availability of VM: Indicates whether the network connection is available or not.	Percent	A value of 100 indicates that the VM is connected. The value 0 indicates that the VM is not connected. Typically, the value 100 corresponds to a *Packet loss* of 0.

1.6 The Inside View of VMs Layer

The tests mapped to the **Inside View of VMs** layer provide an "internal" view of the workings of each of the LPARs - these tests execute on an IBM pSeries server host, but send probes into each of the LPAR operating systems to analyze how well each guest utilizes the resources that are allocated to it, and how well it handles network traffic and loading.

By default however, clicking on the **Inside View of VMs** layer, does not display the list of tests associated with that layer. Instead, Figure 21 appears, which provides you with an overview of individual LPAR performance.

Figure 21: A list of LPARs on an IBM pSeries server, and their current state

To return to the layer model and view the tests associated with the **Virtual Servers** layer, click on the **COMPONENT LAYERS** link in Figure 21. You can now view the list of tests mapped to the **Virtual Servers** layer, as depicted by Figure 22 below.

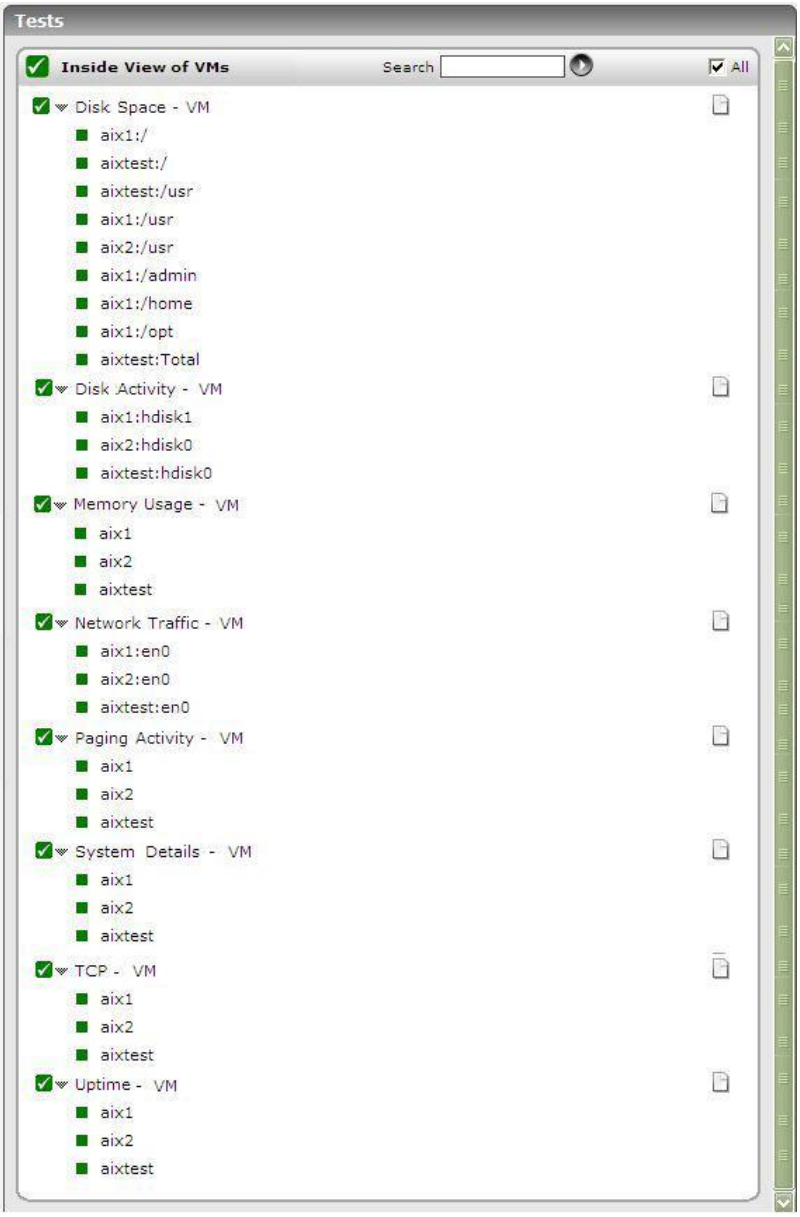


Figure 22: The tests associated with the Inside View of VMs layer

As indicated in Figure 22, the tests associated with this layer monitor different aspects of each virtual guest. Disk space utilization, disk activity levels, CPU utilization, memory usage levels, TCP traffic, etc. are all monitored and reported for each LPAR hosted on the IBM pSeries. Detailed diagnosis for these tests provide details of individual processes and their utilization levels.

The tests associated with this layer are described in detail below.

1.6.1 Disk Activity - VM Test

This test reports statistics pertaining to the input/output utilization of each physical disk on an LPAR.

Purpose	To measure the input/output utilization of each physical disk on each LPAR
Target of the test	An IBM pSeries Server

Agent deploying the test	A remote agent
Configurable parameters for the test	1. **TESTPERIOD** - How often should the test be executed 2. **HOST -** The host for which the test is to be configured. 3. **PORT** - Indicate the **PORT** at which the specified **HOST** listens. By default, this is NULL. 4. **REAL SERVERNAME** - Specify the name of the pSeries server in the **REAL SERVERNAME** text box. If the target pSeries server has been auto-discovered using HMC, the server name will be set automatically in the **REAL SERVERNAME** text box. However, while configuring this test for a pSeries server that has been manually added, you have to explicitly provide the server name in the **REAL SERVERNAME** text box.  **Note** To obtain the real server name, a user can login to the target pSeries server as a valid pSeries user, go to the shell prompt of the server, and execute the following command: *lssyscfg - r sys -F name* 5. **IS MANAGED BY** - By selecting an option from the **IS MANAGED BY** list, indicate whether the target pSeries server is managed using an HMC server or an IVM (Integrated Virtual Manager) server. If the target server has been auto-discovered via an HMC server, the **HMC** option will be automatically chosen from this list. 6. **MANAGEMENT SERVER**, **MANAGEMENT USER**, **MANAGEMENT PASSWORD** - This test connects to an HMC/IVM server to perform LPAR discovery and to collect host-level and "outside view" metrics from the pSeries server. To enable this communication, first, provide the IP address/host name of the HMC/IVM server in the **MANAGEMENT SERVER** text box. If the eG manager had automatically discovered the target pSeries server by connecting to an HMC server in the environment, then, the IP address/host name and user credentials pertaining to that HMC server will be automatically displayed in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. However, if the pSeries server being monitored was manually added to the eG Enterprise system (and not auto-discovered via the HMC server), then, you will have to explicitly indicate whether the target pSeries server is managed by an HMC server or an IVM server by selecting an option from the **IS MANAGED BY** list. If the **HMC** option is chosen, then, you will have to provide the IP address of the HMC server that manages the target pSeries server in the **MANAGEMENT SERVER** text box. In such a case, in the **MANAGEMENT USER** and **MANAGEMENT PASSWORD** text boxes, you will have to provide the credentials of an HMC user who is assigned the **hmcviewer** role. On the other hand, if the **IVM** option is chosen from the **IS MANAGED BY** list, it implies that the IP address/host name and user credentials pertaining to that IVM server has to be explicitly provided in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. 7. **CONFIRM PASSWORD** - Confirm the **HMC PASSWORD** by retyping it here. 8. **DOMAIN** - Set the **DOMAIN** parameter to *none*.

9. **ADMIN USER**, **ADMIN PASSWORD**, **CONFIRM PASSWORD** - The eG agent remotely communicates with each discovered LPAR on the pSeries server to obtain their "inside view". For this, the eG agent will have to be configured with the credentials of a valid user with access rights to each LPAR. If a single user is authorized to access all the LPARs on the pSeries server, provide the name and password of the user in the **ADMIN USER** and **ADMIN PASSWORD** text boxes, and confirm the password by retyping it in the **CONFIRM PASSWORD** text box. On the other hand, if the test needs to communicate with different LPARs using different user accounts, then, multiple user names and passwords will have to be provided. To help administrators provide these multiple user details quickly and easily, the eG administrative interface embeds a special configuration page. To know how to use this page, refer to Section 1.3.1.1 of this document.

10. **SSL** - By default, the HMC/IVM server (as the case may be) is not SSL-enabled. This indicates that by default, the eG agent communicates with the HMC/IVM server using HTTP. Accordingly, the **SSL** flag is set to **No** by default. If you configure the HMC/IVM server to use SSL, then make sure that the **SSL** flag is set to **Yes**, so that the eG agent communicates with the HMC/IVM server using HTTPS.

11. **DETAILED DIAGNOSIS** - To make diagnosis more efficient and accurate, the eG system 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 against **DETAILED DIAGNOSIS**. To disable the capability, click on the **Off** option.

    The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:

    - The eG manager license should allow the detailed diagnosis capability
    - Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

12. **IGNORE VMS INSIDE VIEW** - Administrators of some high security LPAR environments might not have permissions to internally monitor one/more LPARs. The eG agent can be configured to **not obtain the 'inside view' of such 'inaccessible' VMs** using the **IGNORE VMS INSIDE VIEW** parameter. Against this parameter, you can provide a comma-separated list of LPAR names, or LPAR name patterns, for which the inside view need not be obtained. For instance, your **IGNORE VMS INSIDE VIEW** specification can be: **lp,aix*lp*,lin**. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to *none* indicating that the eG agent obtains the inside view of all LPARs on a pSeries server by default.

While performing LPAR discovery, the eG agent will not discover the operating system of the LPARs configured in the **IGNORE VMS INSIDE VIEW** text box.

<table>
<tr><td></td><td colspan="3">13. EXCLUDE VMS - Administrators of some virtualized environments may not want to monitor some of their less-critical LPARs both from 'outside' and from 'inside'. The eG agent in this case can be configured to completely exclude such LPARs from its monitoring purview. To achieve this, provide a comma-separated list of LPARs to be excluded from monitoring in the EXCLUDE VMS text box. Instead of LPARs, LPAR name patterns can also be provided here in a comma-separated list. For example, your EXCLUDE VMS specification can be: *lp,aixlp*,lin*. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to none indicating that the eG agent obtains the inside and outside views of all AIX LPARs on a virtual host by default. By providing a comma-separated list of LPARs/LPAR name patterns in the EXCLUDE VMS text box, you can make sure the eG agent stops collecting 'inside' and 'outside' view metrics for a configured set of LPARs.</td></tr>
<tr><td>Outputs of the test</td><td colspan="3">One set of results for every combination of LPAR:disk_partition</td></tr>
<tr><td rowspan="6">Measurements made by the test</td><td>Measurement</td><td>Measurement Unit</td><td>Interpretation</td></tr>
<tr><td>Percent virtual disk busy:
Indicates the percentage of elapsed time during which the disk is busy processing requests (i.e., reads or writes).</td><td>Percent</td><td>Comparing the percentage of time that the different disks are busy, an administrator can determine whether load is properly balanced across the different disks.</td></tr>
<tr><td>Percent reads from virtual disk:
Indicates the percentage of elapsed time that the selected disk drive is busy servicing read requests.</td><td>Percent</td><td></td></tr>
<tr><td>Percent writes to virtual disk:
Indicates the percentage of elapsed time that the selected disk drive is busy servicing write requests.</td><td>Percent</td><td></td></tr>
<tr><td>Virtual disk read time:
Indicates the average time in seconds of a read of data from the disk.</td><td>Secs</td><td></td></tr>
<tr><td>Virtual disk write time:
Indicates the average time in seconds of a write of data from the disk.</td><td>Secs</td><td></td></tr>
</table>

	Avg. queue for virtual disk: Indicates the average number of both read and write requests that were queued for the selected disk during the sample interval.	Number	
	Current queue for virtual disk: The number of requests outstanding on the disk at the time the performance data is collected.	Number	This measure includes requests in service at the time of the snapshot. This is an instantaneous length, not an average over the time interval. Multi-spindle disk devices can have multiple requests active at one time, but other concurrent requests are awaiting service. This counter might reflect a transitory high or low queue length, but if there is a sustained load on the disk drive, it is likely that this will be consistently high. Requests experience delays proportional to the length of this queue minus the number of spindles on the disks. This difference should average less than two for good performance.
	Reads from virtual disk: Indicates the number of reads happening on a logical disk per second.	Reads/Sec	A dramatic increase in this value may be indicative of an I/O bottleneck on the guest.
	Data reads from virtual disk: Indicates the rate at which bytes are transferred from the disk during read operations.	KB/Sec	A very high value indicates an I/O bottleneck on the guest.
	Writes to virtual disk: Indicates the number of writes happening on a local disk per second.	Writes/Sec	A dramatic increase in this value may be indicative of an I/O bottleneck on the guest.
	Data writes to virtual disk: Indicates the rate at which bytes are transferred from the disk during write operations.	KB/Sec	A very high value indicates an I/O bottleneck on the guest.
	Disk service time: Indicates the average time that this disk took to service each transfer request (i.e., the average I/O operation time)	Secs	A sudden rise in the value of this measure can be attributed to a large amount of information being input or output. A consistent increase however, could indicate an I/O processing bottleneck.

	Disk queue time: Indicates the average time that transfer requests waited idly on queue for this disk.	Secs	Ideally, the value of this measure should be low.
	Disk I/O time: Indicates the avarage time taken for read and write operations of this disk.	Secs	The value of this measure is the sum of the values of the Disk service time and Disk queue time measures. A consistent increase in the value of this measure could indicate a latency in I/O processing.

1.6.2 Disk Space - VM Test

This test monitors the space usage of every disk partition on an LPAR guest.

Purpose	To measure the space usage of every disk partition on each LPAR on an IBM pSeries server
Target of the test	An IBM pSeries server
Agent deploying the test	A remote agent

Configurable parameters for the test	1. **TESTPERIOD** - How often should the test be executed 2. **HOST -** The host for which the test is to be configured. 3. **PORT** - Indicate the **PORT** at which the specified **HOST** listens. By default, this is NULL. 4. **REAL SERVERNAME** - Specify the name of the pSeries server in the **REAL SERVERNAME** text box. If the target pSeries server has been auto-discovered using HMC, the server name will be set automatically in the **REAL SERVERNAME** text box. However, while configuring this test for a pSeries server that has been manually added, you have to explicitly provide the server name in the **REAL SERVERNAME** text box.  To obtain the real server name, a user can login to the target pSeries server as a valid pSeries user, go to the shell prompt of the server, and execute the following command: *lssyscfg - r sys -F name* 5. **IS MANAGED BY** - By selecting an option from the **IS MANAGED BY** list, indicate whether the target pSeries server is managed using an HMC server or an IVM (Integrated Virtual Manager) server. If the target server has been auto-discovered via an HMC server, the **HMC** option will be automatically chosen from this list. 6. **MANAGEMENT SERVER**, **MANAGEMENT USER**, **MANAGEMENT PASSWORD** - This test connects to an HMC/IVM server to perform LPAR discovery and to collect host-level and "outside view" metrics from the pSeries server. To enable this communication, first, provide the IP address/host name of the HMC/IVM server in the **MANAGEMENT SERVER** text box. If the eG manager had automatically discovered the target pSeries server by connecting to an HMC server in the environment, then, the IP address/host name and user credentials pertaining to that HMC server will be automatically displayed in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. However, if the pSeries server being monitored was manually added to the eG Enterprise system (and not auto-discovered via the HMC server), then, you will have to explicitly indicate whether the target pSeries server is managed by an HMC server or an IVM server by selecting an option from the **IS MANAGED BY** list. If the **HMC** option is chosen, then, you will have to provide the IP address of the HMC server that manages the target pSeries server in the **MANAGEMENT SERVER** text box. In such a case, in the **MANAGEMENT USER** and **MANAGEMENT PASSWORD** text boxes, you will have to provide the credentials of an HMC user who is assigned the **hmcviewer** role. On the other hand, if the **IVM** option is chosen from the **IS MANAGED BY** list, it implies that the IP address/host name and user credentials pertaining to that IVM server has to be explicitly provided in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. 7. **CONFIRM PASSWORD** - Confirm the **HMC PASSWORD** by retyping it here. 8. **DOMAIN** - Set the **DOMAIN** parameter to *none*.

	9. **ADMIN USER**, **ADMIN PASSWORD**, **CONFIRM PASSWORD** - The eG agent remotely communicates with each discovered LPAR on the pSeries server to obtain their "inside view". For this, the eG agent will have to be configured with the credentials of a valid user with access rights to each LPAR. If a single user is authorized to access all the LPARs on the pSeries server, provide the name and password of the user in the **ADMIN USER** and **ADMIN PASSWORD** text boxes, and confirm the password by retyping it in the **CONFIRM PASSWORD** text box. On the other hand, if the test needs to communicate with different LPARs using different user accounts, then, multiple user names and passwords will have to be provided. To help administrators provide these multiple user details quickly and easily, the eG administrative interface embeds a special configuration page. To know how to use this page, refer to Section 1.3.1.1 of this document. 10. **SSL** - By default, the HMC/IVM server (as the case may be) is not SSL-enabled. This indicates that by default, the eG agent communicates with the HMC/IVM server using HTTP. Accordingly, the **SSL** flag is set to **No** by default. If you configure the HMC/IVM server to use SSL, then make sure that the **SSL** flag is set to **Yes**, so that the eG agent communicates with the HMC/IVM server using HTTPS. 11. **IGNORE VMS INSIDE VIEW** - Administrators of some high security LPAR environments might not have permissions to internally monitor one/more LPARs. The eG agent can be configured to **not obtain the 'inside view' of such 'inaccessible' VMs** using the **IGNORE VMS INSIDE VIEW** parameter. Against this parameter, you can provide a comma-separated list of LPAR names, or LPAR name patterns, for which the inside view need not be obtained. For instance, your **IGNORE VMS INSIDE VIEW** specification can be: **lp,aixlp*,lin**. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to *none* indicating that the eG agent obtains the inside view of all LPARs on a pSeries server by default.  Note While performing LPAR discovery, the eG agent will not discover the operating system of the LPARs configured in the **IGNORE VMS INSIDE VIEW** text box. 12. **EXCLUDE VMS** - Administrators of some virtualized environments may not want to monitor some of their less-critical LPARs both from 'outside' and from 'inside'. The eG agent in this case can be configured to completely exclude such LPARs from its monitoring purview. To achieve this, provide a comma-separated list of LPARs to be excluded from monitoring in the **EXCLUDE VMS** text box. Instead of LPARs, LPAR name patterns can also be provided here in a comma-separated list. For example, your **EXCLUDE VMS** specification can be: **lp,aixlp*,lin**. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to *none* indicating that the eG agent obtains the inside and outside views of all AIX LPARs on a virtual host by default. By providing a comma-separated list of LPARs/LPAR name patterns in the **EXCLUDE VMS** text box, you can make sure the eG agent stops collecting 'inside' and 'outside' view metrics for a configured set of LPARs.
Outputs of the test	One set of results for every combination of *LPAR:disk_partition*

Measurements made by the test	Measurement	Measurement Unit	Interpretation
	Total capacity: Indicates the total capacity of a disk partition.	MB	
	Used space: Indicates the amount of space used in a disk partition.	MB	
	Free space: Indicates the current free space available for each disk partition of a system.	MB	
	Percent usage: Indicates the percentage of space usage on each disk partition of a system.	Percent	A value close to 100% can indicate a potential problem situation where applications executing on the guest may not be able to write data to the disk partition(s) with very high usage.

1.6.3 Memory Usage - VM Test

This test reports statistics related to the usage of physical memory of the LPARs.

Purpose	Reports statistics related to the usage of physical memory of the LPARs
Target of the test	An IBM pSeries server
Agent deploying the test	A remote agent

Configurable parameters for the test	1. **TESTPERIOD** - How often should the test be executed 2. **HOST -** The host for which the test is to be configured. 3. **PORT** - Indicate the **PORT** at which the specified **HOST** listens. By default, this is NULL. 4. **MANAGEMENT SERVER**, **MANAGEMENT USER**, **MANAGEMENT PASSWORD** - This test connects to an HMC/IVM server to perform LPAR discovery and to collect host-level and "outside view" metrics from the pSeries server. To enable this communication, first, provide the IP address/host name of the HMC/IVM server in the **MANAGEMENT SERVER** text box. If the eG manager had automatically discovered the target pSeries server by connecting to an HMC server in the environment, then, the IP address/host name and user credentials pertaining to that HMC server will be automatically displayed in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. However, if the pSeries server being monitored was manually added to the eG Enterprise system (and not auto-discovered via the HMC server), then, you will have to explicitly indicate whether the target pSeries server is managed by an HMC server or an IVM server by selecting an option from the **IS MANAGED BY** list. If the **HMC** option is chosen, then, you will have to provide the IP address of the HMC server that manages the target pSeries server in the **MANAGEMENT SERVER** text box. In such a case, in the **MANAGEMENT USER** and **MANAGEMENT PASSWORD** text boxes, you will have to provide the credentials of an HMC user who is assigned the **hmcviewer** role. On the other hand, if the **IVM** option is chosen from the **IS MANAGED BY** list, it implies that the IP address/host name and user credentials pertaining to that IVM server has to be explicitly provided in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. 5. **CONFIRM PASSWORD** - Confirm the **HMC PASSWORD** by retyping it here. 6. **DOMAIN** - Set the **DOMAIN** parameter to *none*. 7. **ADMIN USER**, **ADMIN PASSWORD**, **CONFIRM PASSWORD** - The eG agent remotely communicates with each discovered LPAR on the pSeries server to obtain their "inside view". For this, the eG agent will have to be configured with the credentials of a valid user with access rights to each LPAR. If a single user is authorized to access all the LPARs on the pSeries server, provide the name and password of the user in the **ADMIN USER** and **ADMIN PASSWORD** text boxes, and confirm the password by retyping it in the **CONFIRM PASSWORD** text box. On the other hand, if the test needs to communicate with different LPARs using different user accounts, then, multiple user names and passwords will have to be provided. To help administrators provide these multiple user details quickly and easily, the eG administrative interface embeds a special configuration page. To know how to use this page, refer to Section 1.3.1.1 of this document. 8. **SSL** - By default, the HMC Server is not SSL-enabled. This indicates that by default, the eG agent communicates with the HMC server using HTTP. Accordingly, the **SSL** flag is set to **No** by default. If you configure the HMC server to use SSL, then make sure that the **SSL** flag is set to **Yes**, so that the eG agent communicates with the HMC server using HTTPS.

<table>
<tr><td></td><td colspan="3">9. IGNORE VMS INSIDE VIEW - Administrators of some high security LPAR environments might not have permissions to internally monitor one/more LPARs. The eG agent can be configured to not obtain the 'inside view' of such 'inaccessible' VMs using the IGNORE VMS INSIDE VIEW parameter. Against this parameter, you can provide a comma-separated list of LPAR names, or LPAR name patterns, for which the inside view need not be obtained. For instance, your IGNORE VMS INSIDE VIEW specification can be: *lp,aixlp*,lin*. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to none indicating that the eG agent obtains the inside view of all LPARs on a pSeries server by default.

 
To obtain the real server name, a user can login to the target pSeries server as a valid pSeries user, go to the shell prompt of the server, and execute the following command: lssyscfg - r sys -F name

10. EXCLUDE VMS - Administrators of some virtualized environments may not want to monitor some of their less-critical LPARs both from 'outside' and from 'inside'. The eG agent in this case can be configured to completely exclude such LPARs from its monitoring purview. To achieve this, provide a comma-separated list of LPARs to be excluded from monitoring in the EXCLUDE VMS text box. Instead of LPARs, LPAR name patterns can also be provided here in a comma-separated list. For example, your EXCLUDE VMS specification can be: *lp,aixlp*,lin*. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to none indicating that the eG agent obtains the inside and outside views of all AIX LPARs on a virtual host by default. By providing a comma-separated list of LPARs/LPAR name patterns in the EXCLUDE VMS text box, you can make sure the eG agent stops collecting 'inside' and 'outside' view metrics for a configured set of LPARs.

11. DETAILED DIAGNOSIS - To make diagnosis more efficient and accurate, the eG suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the On option. To disable the capability, click on the Off option. The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:
• The eG manager license should allow the detailed diagnosis capability.
• Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.</td></tr>
<tr><td>Outputs of the test</td><td colspan="3">One set of results for every AIX LPAR on the target IBM pSeries server</td></tr>
<tr><td>Measurements made by the test</td><td>Measurement</td><td>Measurement Unit</td><td>Interpretation</td></tr>
</table>

	Total physical memory: Indicates the total physical memory of this LPAR.	MB	
	Used physical memory: Indicates the used physical memory of this LPAR.	MB	
	Free physical memory: Indicates the free physical memory of the LPAR.	MB	This measure typically indicates the amount of memory available for use by applications running on the target VM. On Unix operating systems (AIX and Linux), the operating system tends to use parts of the available memory for caching files, objects, etc. When applications require additional memory, this is released from the operating system cache. Hence, to understand the true free memory that is available to applications, the eG agent reports the sum of the free physical memory and the operating system cache memory size as the value of the *Free physical memory* measure while monitoring AIX LPARs.
	Physical memory utilized: Indicates the percent usage of physical memory by this LPAR.	Percent	Ideally, the value of this measure should be low. While sporadic spikes in memory usage could be caused by one/more rogue processes on the LPAR, a consistent increase in this value could be a cause for some serious concern, as it indicates a gradual, but steady erosion of valuable memory resources. If this unhealthy trend is not repaired soon, it could severely hamper VM performance, causing anything from a slowdown to a complete system meltdown. You can use the detailed diagnosis of this measure to figure out which processes on the VM are consuming memory excessively.

	Available physical memory: Indicates the amount of physical memory, immediately available for allocation to a process or for system use.	MB	Not all of the *Available physical memory* is *Free physical memory*. Typically, *Available physical memory* is made up of the Standby List, Free List, and Zeroed List. When Windows wants to trim a process' working set, the trimmed pages are moved (usually) to the Standby List. From here, they can be brought back to life in the working set with only a soft page fault (much faster than a hard fault, which would have to talk to the disk). If a page stays in the standby List for a long time, it gets freed and moved to the Free List. In the background, there is a low priority thread (actually, the only thread with priority 0) which takes pages from the Free List and zeros them out. Because of this, there is usually very little in the Free List. All new allocations always come from the Zeroed List, which is memory pages that have been overwritten with zeros. This is a standard part of the OS' cross-process security, to prevent any process ever seeing data from another. If the Zeroed List is empty, Free List memory is zeroed and used or, if that is empty too, Standby List memory is freed, zeroed, and used. It is because all three can be used with so little effort that they are all counted as "available". A high value is typically desired for this measure. **This measure will be available for Windows 2008 VMs only.**

	Modified memory: Indicates the amount of memory that is allocated to the modified page list.	MB	This memory contains cached data and code that is not actively in use by processes, the system and the system cache. This memory needs to be written out before it will be available for allocation to a process or for system use. Cache pages on the modified list have been altered in memory. No process has specifically asked for this data to be in memory, it is merely there as a consequence of caching. Therefore it can be written to disk at any time (not to the page file, but to its original file location) and reused. However, since this involves I/O, it is not considered to be Available physical memory. **This measure will be available for Windows 2008 VMs only.**
	Standby memory: Indicates the amount of memory assigned to the standby list.	MB	This memory contains cached data and code that is not actively in use by processes, the system and the system cache. It is immediately available for allocation to a process or for system use. If the system runs out of available free and zero memory, memory on lower priority standby cache page lists will be repurposed before memory on higher priority standby cache page lists. Typically, Standby memory is the aggregate of Standby Cache Core Bytes,Standby Cache Normal Priority Bytes, and Standby Cache Reserve Bytes. Standby Cache Core Bytes is the amount of physical memory, that is assigned to the core standby cache page lists. Standby Cache Normal Priority Bytes is the amount of physical memory, that is assigned to the normal priority standby cache page lists. Standby Cache Reserve Bytes is the amount of physical memory, that is assigned to the reserve standby cache page lists. **This measure will be available for Windows 2008 VMs only.**
	Cached memory: This measure is an aggregate of *Standby memory* and *Modified memory*.	MB	**This measure will be available for Windows 2008 VMs only.**

While monitoring AIX LPARs, you may observe discrepancies between the value of the *Physical memory utilized* measure and the memory usage percentages reported per process by the detailed diagnosis of the same measure. This is because, while the *Physical memory utilized* measure takes into account the memory in the OS cache of the AIX LPAR, the memory usage percent that the detailed diagnosis reports per process does not consider the OS cache memory.

1.6.4 System Details - VM Test

This test collects various metrics pertaining to the CPU and memory usage of every processor supported by an LPAR guest.

Purpose	To measure the CPU and memory usage of each LPAR guest
Target of the test	An IBM pSeries server
Agent deploying the test	A remote agent

Configurable parameters for the test	1. **TESTPERIOD** - How often should the test be executed 2. **HOST -** The host for which the test is to be configured. 3. **PORT** - Indicate the **PORT** at which the specified **HOST** listens. By default, this is NULL. 4. **MANAGEMENT SERVER**, **MANAGEMENT USER**, **MANAGEMENT PASSWORD** - This test connects to an HMC/IVM server to perform LPAR discovery and to collect host-level and "outside view" metrics from the pSeries server. To enable this communication, first, provide the IP address/host name of the HMC/IVM server in the **MANAGEMENT SERVER** text box. If the eG manager had automatically discovered the target pSeries server by connecting to an HMC server in the environment, then, the IP address/host name and user credentials pertaining to that HMC server will be automatically displayed in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. However, if the pSeries server being monitored was manually added to the eG Enterprise system (and not auto-discovered via the HMC server), then, you will have to explicitly indicate whether the target pSeries server is managed by an HMC server or an IVM server by selecting an option from the **IS MANAGED BY** list. If the **HMC** option is chosen, then, you will have to provide the IP address of the HMC server that manages the target pSeries server in the **MANAGEMENT SERVER** text box. In such a case, in the **MANAGEMENT USER** and **MANAGEMENT PASSWORD** text boxes, you will have to provide the credentials of an HMC user who is assigned the **hmcviewer** role. On the other hand, if the **IVM** option is chosen from the **IS MANAGED BY** list, it implies that the IP address/host name and user credentials pertaining to that IVM server has to be explicitly provided in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. 5. **CONFIRM PASSWORD** - Confirm the **HMC PASSWORD** by retyping it here. 6. **DOMAIN** - Set the **DOMAIN** parameter to *none*. 7. **ADMIN USER**, **ADMIN PASSWORD**, **CONFIRM PASSWORD** - The eG agent remotely communicates with each discovered LPAR on the pSeries server to obtain their "inside view". For this, the eG agent will have to be configured with the credentials of a valid user with access rights to each LPAR. If a single user is authorized to access all the LPARs on the pSeries server, provide the name and password of the user in the **ADMIN USER** and **ADMIN PASSWORD** text boxes, and confirm the password by retyping it in the **CONFIRM PASSWORD** text box. On the other hand, if the test needs to communicate with different LPARs using different user accounts, then, multiple user names and passwords will have to be provided. To help administrators provide these multiple user details quickly and easily, the eG administrative interface embeds a special configuration page. To know how to use this page, refer to Section 1.3.1.1 of this document. 8. **SSL** - By default, the HMC Server is not SSL-enabled. This indicates that by default, the eG agent communicates with the HMC server using HTTP. Accordingly, the **SSL** flag is set to **No** by default. If you configure the HMC server to use SSL, then make sure that the **SSL** flag is set to **Yes**, so that the eG agent communicates with the HMC server using HTTPS. 9. **DETAILED DIAGNOSIS** - To make diagnosis more efficient and accurate, the eG system 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 against **DETAILED DIAGNOSIS**. To disable the capability, click on the **Off** option.

The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:

- The eG manager license should allow the detailed diagnosis capability
- Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

10. **ENABLE MEMORY DIAGNOSIS** - By default, the **ENABLE MEMORY DIAGNOSIS** flag is set to **NO**, indicating that detailed diagnosis will not be available for the *Free memory in VM* measure reported by this test by default. If you want to view the detailed diagnosis of the *Free memory in VM* measure - i.e., to view the top 10 processes on the target VM that are utilizing memory excessively - you can change this flag to **YES**.

11. **INTERVALS** and **COUNT** - By default, the **INTERVALS** parameter is set to **1** and the **COUNT** parameter is set to **2**. This implies that every time this test executes, it will collect metrics twice (because, the default **COUNT** is 2), and each set of metrics will be collected at the end of every second (because the default **INTERVAL** is 1). Also, note that the agent will report only the last set of metrics to the eG manager.

12. **IGNORE VMS INSIDE VIEW** - Administrators of some high security LPAR environments might not have permissions to internally monitor one/more LPARs. The eG agent can be configured to **not obtain the 'inside view' of such 'inaccessible' VMs** using the **IGNORE VMS INSIDE VIEW** parameter. Against this parameter, you can provide a comma-separated list of LPAR names, or LPAR name patterns, for which the inside view need not be obtained. For instance, your **IGNORE VMS INSIDE VIEW** specification can be: **lp,aix\lp*,lin**. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to *none* indicating that the eG agent obtains the inside view of all LPARs on a pSeries server by default.

While performing LPAR discovery, the eG agent will not discover the operating system of the LPARs configured in the **IGNORE VMS INSIDE VIEW** text box.

13. **EXCLUDE VMS** - Administrators of some virtualized environments may not want to monitor some of their less-critical LPARs both from 'outside' and from 'inside'. The eG agent in this case can be configured to completely exclude such LPARs from its monitoring purview. To achieve this, provide a comma-separated list of LPARs to be excluded from monitoring in the **EXCLUDE VMS** text box. Instead of LPARs, LPAR name patterns can also be provided here in a comma-separated list. For example, your **EXCLUDE VMS** specification can be: **lp,aix\lp*,lin**. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to *none* indicating that the eG agent obtains the inside and outside views of all AIX LPARs on a virtual host by default. By providing a comma-separated list of LPARs/LPAR name patterns in the **EXCLUDE VMS** text box, you can make sure the eG agent stops collecting 'inside' and 'outside' view metrics for a configured set of LPARs.

Outputs of the test	One set of results for every combination of *LPAR:processor*		
Measurements made by the	**Measurement**	**Measurement Unit**	**Interpretation**

test	**Virtual CPU utilization:** This measurement indicates the percentage of CPU utilized by the processor.	Percent	A high value could signify a CPU bottleneck. The CPU utilization may be high because a few processes are consuming a lot of CPU, or because there are too many processes contending for a limited resource. The detailed diagnosis of this test reveals the top-10 CPU-intensive processes on the guest.
	System usage of virtual CPU: Indicates the percentage of CPU time spent for system-level processing.	Percent	An unusually high value indicates a problem and may be due to too many system-level tasks executing simultaneously.
	Run queue in VM: Indicates the instantaneous length of the queue in which threads are waiting for the processor cycle. This length does not include the threads that are currently being executed.	Number	A value consistently greater than 2 indicates that many processes could be simultaneously contending for the processor.
	Blocked processes in VM: Indicates the number of processes blocked for I/O, paging, etc.	Number	A high value could indicate an I/O problem on the guest (e.g., a slow disk).
	Swap memory in VM: Denotes the committed amount of virtual memory. This corresponds to the space reserved for virtual memory on disk paging file(s).	MB	An unusually high value for the swap usage can indicate a memory bottleneck. Check the memory utilization of individual processes to figure out the process(es) that has (have) maximum memory consumption and look to tune their memory usages and allocations accordingly.

	Free memory in VM: Indicates the free memory available.	MB	This measure typically indicates the amount of memory available for use by applications running on the target VM. On Unix operating systems (AIX and Linux), the operating system tends to use parts of the available memory for caching files, objects, etc. When applications require additional memory, this is released from the operating system cache. Hence, to understand the true free memory that is available to applications, the eG agent reports the sum of the free physical memory and the operating system cache memory size as the value of the *Free memory in VM* measure while monitoring AIX LPARs. The detailed diagnosis of this measure, if enabled, lists the top 10 processes responsible for maximum memory consumption on the AIX LPAR.
	Scan rate in VM: Indicates the memory scan rate.	Pages/Sec	A high value is indicative of memory thrashing. Excessive thrashing can be detrimental to guest performance.

While instantaneous spikes in CPU utilization are captured by the eG agents and displayed in the Measures page, the detailed diagnosis will not capture/display such instantaneous spikes. Instead, detailed diagnosis will display only a consistent increase in CPU utilization observed over a period of time.

1.6.5 Uptime - VM Test

In most virtualized environments, it is essential to monitor the uptime of VMs hosting critical server applications in the infrastructure. By tracking the uptime of each of the VMs, administrators can determine what percentage of time a VM has been up. Comparing this value with service level targets, administrators can determine the most trouble-prone areas of the virtualized infrastructure.

In some environments, administrators may schedule periodic reboots of their LPARs.a By knowing that a specific VM has been up for an unusually long time, an administrator may come to know that the scheduled reboot task is not working on an LPAR.

The Uptime - Guest test included in the eG agent monitors the uptime of each LPAR.

Purpose	To monitor the uptime of each LPAR guest
Target of the test	An IBM pSeries server
Agent deploying the test	A remote agent

Configurable parameters for the test	1. **TESTPERIOD** - How often should the test be executed 2. **HOST -** The host for which the test is to be configured. 3. **PORT** - Indicate the **PORT** at which the specified **HOST** listens. By default, this is NULL. 4. **REAL SERVERNAME** - Specify the name of the pSeries server in the **REAL SERVERNAME** text box. If the target pSeries server has been auto-discovered using HMC, the server name will be set automatically in the **REAL SERVERNAME** text box. However, while configuring this test for a pSeries server that has been manually added, you have to explicitly provide the server name in the **REAL SERVERNAME** text box.  To obtain the real server name, a user can login to the target pSeries server as a valid pSeries user, go to the shell prompt of the server, and execute the following command: *lssyscfg - r sys -F name* 5. **IS MANAGED BY** - By selecting an option from the IS MANAGED BY list, indicate whether the target pSeries server is managed using an HMC server or an IVM (Integrated Virtual Manager) server. If the target server has been auto-discovered via an HMC server, the HMC option will be automatically chosen from this list. 6. **MANAGEMENT SERVER**, **MANAGEMENT USER**, **MANAGEMENT PASSWORD** - This test connects to an HMC/IVM server to perform LPAR discovery and to collect host-level and "outside view" metrics from the pSeries server. To enable this communication, first, provide the IP address/host name of the HMC/IVM server in the **MANAGEMENT SERVER** text box. If the eG manager had automatically discovered the target pSeries server by connecting to an HMC server in the environment, then, the IP address/host name and user credentials pertaining to that HMC server will be automatically displayed in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. However, if the pSeries server being monitored was manually added to the eG Enterprise system (and not auto-discovered via the HMC server), then, you will have to explicitly indicate whether the target pSeries server is managed by an HMC server or an IVM server by selecting an option from the **IS MANAGED BY** list. If the **HMC** option is chosen, then, you will have to provide the IP address of the HMC server that manages the target pSeries server in the **MANAGEMENT SERVER** text box. In such a case, in the **MANAGEMENT USER** and **MANAGEMENT PASSWORD** text boxes, you will have to provide the credentials of an HMC user who is assigned the **hmcviewer** role. On the other hand, if the **IVM** option is chosen from the **IS MANAGED BY** list, it implies that the IP address/host name and user credentials pertaining to that IVM server has to be explicitly provided in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. 7. **CONFIRM PASSWORD** - Confirm the **HMC PASSWORD** by retyping it here. 8. **DOMAIN** - Set the **DOMAIN** parameter to *none*.

9. **ADMIN USER**, **ADMIN PASSWORD**, **CONFIRM PASSWORD** - The eG agent remotely communicates with each discovered LPAR on the pSeries server to obtain their "inside view". For this, the eG agent will have to be configured with the credentials of a valid user with access rights to each LPAR. If a single user is authorized to access all the LPARs on the pSeries server, provide the name and password of the user in the **ADMIN USER** and **ADMIN PASSWORD** text boxes, and confirm the password by retyping it in the **CONFIRM PASSWORD** text box. On the other hand, if the test needs to communicate with different LPARs using different user accounts, then, multiple user names and passwords will have to be provided. To help administrators provide these multiple user details quickly and easily, the eG administrative interface embeds a special configuration page. To access this page, simply click on the **Click here** hyperlink that appears just above the parameters of this test in the test configuration page.

10. **SSL** - By default, the HMC/IVM server (as the case may be) is not SSL-enabled. This indicates that by default, the eG agent communicates with the HMC/IVM server using HTTP. Accordingly, the **SSL** flag is set to **No** by default. If you configure the HMC/IVM server to use SSL, then make sure that the **SSL** flag is set to **Yes**, so that the eG agent communicates with the IBM pSeries server using HTTPS.

11. **IGNORE VMS INSIDE VIEW** - Administrators of some high security LPAR environments might not have permissions to internally monitor one/more LPARs. The eG agent can be configured to **not obtain the 'inside view' of such 'inaccessible' VMs** using the **IGNORE VMS INSIDE VIEW** parameter. Against this parameter, you can provide a comma-separated list of LPAR names, or LPAR name patterns, for which the inside view need not be obtained. For instance, your **IGNORE VMS INSIDE VIEW** specification can be: **lp,aixlp*,lin**. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to *none* indicating that the eG agent obtains the inside view of all LPARs on a pSeries server by default.

While performing LPAR discovery, the eG agent will not discover the operating system of the LPARs configured in the **IGNORE VMS INSIDE VIEW** text box.

<table>
<tr><td></td><td colspan="3">12. EXCLUDE VMS - Administrators of some virtualized environments may not want to monitor some of their less-critical LPARs both from 'outside' and from 'inside'. The eG agent in this case can be configured to completely exclude such LPARs from its monitoring purview. To achieve this, provide a comma-separated list of LPARs to be excluded from monitoring in the EXCLUDE VMS text box. Instead of LPARs, LPAR name patterns can also be provided here in a comma-separated list. For example, your EXCLUDE VMS specification can be: *lp,aixlp*,lin*. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to none indicating that the eG agent obtains the inside and outside views of all AIX LPARs on a virtual host by default. By providing a comma-separated list of LPARs/LPAR name patterns in the EXCLUDE VMS text box, you can make sure the eG agent stops collecting 'inside' and 'outside' view metrics for a configured set of LPARs.

13. REPORTMANAGERTIME - By default, this flag is set to Yes, indicating that, by default, the detailed diagnosis of this test, if enabled, will report the shutdown and reboot times of the AIX LPARs in the manager's time zone. If this flag is set to No, then the shutdown and reboot times are shown in the time zone of the system where the agent is running.

14. DETAILED DIAGNOSIS - To make diagnosis more efficient and accurate, the eG suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the On option. To disable the capability, click on the Off option.

The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:
• The eG manager license should allow the detailed diagnosis capability
• Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.</td></tr>
<tr><td>Outputs of the test</td><td colspan="3">One set of results for every LPAR guest on an IBM pSeries server</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>Has the VM been rebooted?:
Indicates whether the VM has been rebooted during the last measurement period or not.</td><td>Boolean</td><td>If this measure shows 1, it means that the guest was rebooted during the last measurement period. By checking the time periods when this metric changes from 0 to 1, an administrator can determine the times when this guest was rebooted.</td></tr>
</table>

	Uptime of VM during the last measure period: Indicates the time period that the VM has been up since the last time this test ran.	Secs	If the guest has not been rebooted during the last measurement period and the agent has been running continuously, this value will be equal to the measurement period. If the guest was rebooted during the last measurement period, this value will be less than the measurement period of the test. For example, if the measurement period is 300 secs, and if the guest was rebooted 120 secs back, this metric will report a value of 120 seconds. The accuracy of this metric is dependent on the measurement period - the smaller the measurement period, greater the accuracy.
	Total uptime of the VM: Indicates the total time that the VM has been up since its last reboot.	Mins	Administrators may wish to be alerted if a guest has been running without a reboot for a very long period. Setting a threshold for this metric allows administrators to determine such conditions.

If a value less than a minute is configured as the **TEST PERIOD** of the Uptime - Guest test, then, the **Uptime during the last measure period** measure will report the value 0 for AIX LPARs until the minute boundary is crossed. For instance, if you configure the Uptime - Guest test to run every 10 seconds, then, for the first 5 test execution cyles (i.e., 10 x 5 = 50 seconds), the **Uptime during the last measure period** measure will report the value 0 for the AIX LPARs; however, the sixth time the test executes (i.e, when test execution touches the 1 minute boundary), this measure will report the value 60 seconds for the same LPARs. Thereafter, every sixth measurement period will report 60 seconds as the uptime of the AIX LPARs. This is because, Unix-based operating systems report uptime only in minutes and not in seconds.

1.6.6 Network Traffic - VM Test

This is an internal test that monitors the incoming and outgoing traffic through each guest on an IBM pSeries server.

Purpose	To measure the incoming and outgoing traffic through each guest on an IBM pSeries server
Target of the test	An IBM pSeries server
Agent deploying the test	A remote agent

Configurable parameters for the test	1. **TESTPERIOD** - How often should the test be executed 2. **HOST -** The host for which the test is to be configured. 3. **PORT** - Indicate the **PORT** at which the specified **HOST** listens. By default, this is NULL. 4. **REAL SERVERNAME** - Specify the name of the pSeries server in the **REAL SERVERNAME** text box. If the target pSeries server has been auto-discovered using HMC, the server name will be set automatically in the **REAL SERVERNAME** text box. However, while configuring this test for a pSeries server that has been manually added, you have to explicitly provide the server name in the **REAL SERVERNAME** text box.  To obtain the real server name, a user can login to the target pSeries server as a valid pSeries user, go to the shell prompt of the server, and execute the following command: *lssyscfg - r sys -F name* 5. **IS MANAGED BY** - By selecting an option from the **IS MANAGED BY** list, indicate whether the target pSeries server is managed using an HMC server or an IVM (Integrated Virtual Manager) server. If the target server has been auto-discovered via an HMC server, the **HMC** option will be automatically chosen from this list. 6. **MANAGEMENT SERVER**, **MANAGEMENT USER**, **MANAGEMENT PASSWORD** - This test connects to an HMC/IVM server to perform LPAR discovery and to collect host-level and "outside view" metrics from the pSeries server. To enable this communication, first, provide the IP address/host name of the HMC/IVM server in the **MANAGEMENT SERVER** text box. If the eG manager had automatically discovered the target pSeries server by connecting to an HMC server in the environment, then, the IP address/host name and user credentials pertaining to that HMC server will be automatically displayed in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. However, if the pSeries server being monitored was manually added to the eG Enterprise system (and not auto-discovered via the HMC server), then, you will have to explicitly indicate whether the target pSeries server is managed by an HMC server or an IVM server by selecting an option from the **IS MANAGED BY** list. If the **HMC** option is chosen, then, you will have to provide the IP address of the HMC server that manages the target pSeries server in the **MANAGEMENT SERVER** text box. In such a case, in the **MANAGEMENT USER** and **MANAGEMENT PASSWORD** text boxes, you will have to provide the credentials of an HMC user who is assigned the **hmcviewer** role. On the other hand, if the **IVM** option is chosen from the **IS MANAGED BY** list, it implies that the IP address/host name and user credentials pertaining to that IVM server has to be explicitly provided in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. 7. **CONFIRM PASSWORD** - Confirm the **HMC PASSWORD** by retyping it here. 8. **DOMAIN** - Set the **DOMAIN** parameter to *none*.

	9. **ADMIN USER**, **ADMIN PASSWORD**, **CONFIRM PASSWORD** - The eG agent remotely communicates with each discovered LPAR on the pSeries server to obtain their "inside view". For this, the eG agent will have to be configured with the credentials of a valid user with access rights to each LPAR. If a single user is authorized to access all the LPARs on the pSeries server, provide the name and password of the user in the **ADMIN USER** and **ADMIN PASSWORD** text boxes, and confirm the password by retyping it in the **CONFIRM PASSWORD** text box. On the other hand, if the test needs to communicate with different LPARs using different user accounts, then, multiple user names and passwords will have to be provided. To help administrators provide these multiple user details quickly and easily, the eG administrative interface embeds a special configuration page. To know how to use this page, refer to Section 1.3.1.1 of this document. 10. **SSL** - By default, the HMC/IVM server (as the case may be) is not SSL-enabled. This indicates that by default, the eG agent communicates with the HMC/IVM server using HTTP. Accordingly, the **SSL** flag is set to **No** by default. If you configure the HMC/IVM server to use SSL, then make sure that the **SSL** flag is set to **Yes**, so that the eG agent communicates with the HMC/IVM server using HTTPS. 11. **IGNORE VMS INSIDE VIEW** - Administrators of some high security LPAR environments might not have permissions to internally monitor one/more LPARs. The eG agent can be configured to **not obtain the 'inside view' of such 'inaccessible' VMs** using the **IGNORE VMS INSIDE VIEW** parameter. Against this parameter, you can provide a comma-separated list of LPAR names, or LPAR name patterns, for which the inside view need not be obtained. For instance, your **IGNORE VMS INSIDE VIEW** specification can be: **lp,aixlp*,lin**. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to *none* indicating that the eG agent obtains the inside view of all LPARs on a pSeries server by default.  Note While performing LPAR discovery, the eG agent will not discover the operating system of the LPARs configured in the **IGNORE VMS INSIDE VIEW** text box. 12. **EXCLUDE VMS** - Administrators of some virtualized environments may not want to monitor some of their less-critical LPARs both from 'outside' and from 'inside'. The eG agent in this case can be configured to completely exclude such LPARs from its monitoring purview. To achieve this, provide a comma-separated list of LPARs to be excluded from monitoring in the **EXCLUDE VMS** text box. Instead of LPARs, LPAR name patterns can also be provided here in a comma-separated list. For example, your **EXCLUDE VMS** specification can be: **lp,aixlp*,lin**. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to *none* indicating that the eG agent obtains the inside and outside views of all AIX LPARs on a virtual host by default. By providing a comma-separated list of LPARs/LPAR name patterns in the **EXCLUDE VMS** text box, you can make sure the eG agent stops collecting 'inside' and 'outside' view metrics for a configured set of LPARs.
Outputs of the test	One set of results for every *LPAR:network_interface* combination

Measurements made by the test	Measurement	Measurement Unit	Interpretation
	Incoming network traffic: Indicates the rate of incoming traffic.	Pkts/Sec	An increase in traffic to the guest can indicate an increase in accesses to the guest (from users or from other applications) or that the guest is under an attack of some form.
	Outgoing network traffic: Represents the rate of outgoing traffic.	Pkts/Sec	An increase in traffic from the guest can indicate an increase in accesses to the guest (from users or from other applications).

1.6.7 Tcp - VM Test

This test tracks various statistics pertaining to TCP connections to and from each LPAR guest. The details of the test are provided below:

Purpose	To measure statistics pertaining to the TCP layer of an LPAR guest
Target of the test	An IBM pSeries server
Agent deploying the test	A remote agent

Configurable parameters for the test	1. **TESTPERIOD** - How often should the test be executed 2. **HOST -** The host for which the test is to be configured. 3. **PORT** - Indicate the **PORT** at which the specified **HOST** listens. By default, this is NULL. 4. **REAL SERVERNAME** - Specify the name of the pSeries server in the **REAL SERVERNAME** text box. If the target pSeries server has been auto-discovered using HMC, the server name will be set automatically in the **REAL SERVERNAME** text box. However, while configuring this test for a pSeries server that has been manually added, you have to explicitly provide the server name in the **REAL SERVERNAME** text box.  Note To obtain the real server name, a user can login to the target pSeries server as a valid pSeries user, go to the shell prompt of the server, and execute the following command: *lssyscfg - r sys -F name* 5. **IS MANAGED BY** - By selecting an option from the **IS MANAGED BY** list, indicate whether the target pSeries server is managed using an HMC server or an IVM (Integrated Virtual Manager) server. If the target server has been auto-discovered via an HMC server, the **HMC** option will be automatically chosen from this list. 6. **MANAGEMENT SERVER**, **MANAGEMENT USER**, **MANAGEMENT PASSWORD** - This test connects to an HMC/IVM server to perform LPAR discovery and to collect host-level and "outside view" metrics from the pSeries server. To enable this communication, first, provide the IP address/host name of the HMC/IVM server in the **MANAGEMENT SERVER** text box. If the eG manager had automatically discovered the target pSeries server by connecting to an HMC server in the environment, then, the IP address/host name and user credentials pertaining to that HMC server will be automatically displayed in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. However, if the pSeries server being monitored was manually added to the eG Enterprise system (and not auto-discovered via the HMC server), then, you will have to explicitly indicate whether the target pSeries server is managed by an HMC server or an IVM server by selecting an option from the **IS MANAGED BY** list. If the **HMC** option is chosen, then, you will have to provide the IP address of the HMC server that manages the target pSeries server in the **MANAGEMENT SERVER** text box. In such a case, in the **MANAGEMENT USER** and **MANAGEMENT PASSWORD** text boxes, you will have to provide the credentials of an HMC user who is assigned the **hmcviewer** role. On the other hand, if the **IVM** option is chosen from the **IS MANAGED BY** list, it implies that the IP address/host name and user credentials pertaining to that IVM server has to be explicitly provided in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. 7. **CONFIRM PASSWORD** - Confirm the **HMC PASSWORD** by retyping it here. 8. **DOMAIN** - Set the **DOMAIN** parameter to *none*.

	9. **ADMIN USER**, **ADMIN PASSWORD**, **CONFIRM PASSWORD** - The eG agent remotely communicates with each discovered LPAR on the pSeries server to obtain their "inside view". For this, the eG agent will have to be configured with the credentials of a valid user with access rights to each LPAR. If a single user is authorized to access all the LPARs on the pSeries server, provide the name and password of the user in the **ADMIN USER** and **ADMIN PASSWORD** text boxes, and confirm the password by retyping it in the **CONFIRM PASSWORD** text box. On the other hand, if the test needs to communicate with different LPARs using different user accounts, then, multiple user names and passwords will have to be provided. To help administrators provide these multiple user details quickly and easily, the eG administrative interface embeds a special configuration page. To know how to use this page, refer to Section 1.3.1.1 of this document. 10. **SSL** - By default, the HMC Server is not SSL-enabled. This indicates that by default, the eG agent communicates with the HMC server using HTTP. Accordingly, the **SSL** flag is set to **No** by default. If you configure the HMC server to use SSL, then make sure that the **SSL** flag is set to **Yes**, so that the eG agent communicates with the HMC server using HTTPS. 11. **IGNORE VMS INSIDE VIEW** - Administrators of some high security LPAR environments might not have permissions to internally monitor one/more LPARs. The eG agent can be configured to **not obtain the 'inside view' of such 'inaccessible' VMs** using the **IGNORE VMS INSIDE VIEW** parameter. Against this parameter, you can provide a comma-separated list of LPAR names, or LPAR name patterns, for which the inside view need not be obtained. For instance, your **IGNORE VMS INSIDE VIEW** specification can be: **lp,aixlp*,lin**. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to *none* indicating that the eG agent obtains the inside view of all LPARs on a pSeries server by default.  Note While performing LPAR discovery, the eG agent will not discover the operating system of the LPARs configured in the **IGNORE VMS INSIDE VIEW** text box. 12. **EXCLUDE VMS** - Administrators of some virtualized environments may not want to monitor some of their less-critical LPARs both from 'outside' and from 'inside'. The eG agent in this case can be configured to completely exclude such LPARs from its monitoring purview. To achieve this, provide a comma-separated list of LPARs to be excluded from monitoring in the **EXCLUDE VMS** text box. Instead of LPARs, LPAR name patterns can also be provided here in a comma-separated list. For example, your **EXCLUDE VMS** specification can be: **lp,aixlp*,lin**. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to *none* indicating that the eG agent obtains the inside and outside views of all AIX LPARs on a virtual host by default. By providing a comma-separated list of LPARs/LPAR name patterns in the **EXCLUDE VMS** text box, you can make sure the eG agent stops collecting 'inside' and 'outside' view metrics for a configured set of LPARs.
Outputs of the test	One set of results for each powered-on guest on the IBM pSeries server being monitored

Measurements made by the	Measurement	Measurement Unit	Interpretation

test	**Incoming connections to VM:** Indicates the connections per second received by the guest.	Conns/Sec	A high value can indicate an increase in input load.
	Outgoing connections to VM: Indicates the connections per second initiated by the guest.	Conns/Sec	A high value can indicate that one or more of the applications executing on the guest have started using a number of TCP connections to some other guest or host.
	Current connections to VM: Indicates the currently established connections.	Number	A sudden increase in the number of connections established on a guest can indicate either an increase in load to one or more of the applications executing on the guest, or that one or more of the applications are experiencing a problem (e.g., a slow down). On Microsoft Windows, the current connections metrics is the total number of TCP connections that are currently in the ESTABLISHED or CLOSE_WAIT states.
	Connection drops on VM: Indicates the rate of established TCP connections dropped from the TCP listen queue.	Conns/Sec	This value should be 0 for most of the time. Any non-zero value implies that one or more applications on the guest are under overload.
	Connection failures on VM: Indicates the rate of half open TCP connections dropped from the listen queue.	Conns/Sec	This value should be 0 for most of the time. A prolonged non-zero value can indicate either that the server is under SYN attack or that there is a problem with the network link to the server that is resulting in connections being dropped without completion.

1.6.8 Paging - VMs Test

For each LPAR executing on a pSeries server, this test reports statistics pertaining to the paging activity on the LPAR.

Purpose	To measure statistics pertaining to the paging activity on the LPAR
Target of the test	An IBM pSeries server
Agent deploying the test	A remote agent

Configurable parameters for the test	1. **TESTPERIOD** - How often should the test be executed 2. **HOST -** The host for which the test is to be configured. 3. **PORT** - Indicate the **PORT** at which the specified **HOST** listens. By default, this is NULL. 4. **REAL SERVERNAME** - Specify the name of the pSeries server in the **REAL SERVERNAME** text box. If the target pSeries server has been auto-discovered using HMC, the server name will be set automatically in the **REAL SERVERNAME** text box. However, while configuring this test for a pSeries server that has been manually added, you have to explicitly provide the server name in the **REAL SERVERNAME** text box.  To obtain the real server name, a user can login to the target pSeries server as a valid pSeries user, go to the shell prompt of the server, and execute the following command: *lssyscfg - r sys -F name* 5. **IS MANAGED BY** - By selecting an option from the **IS MANAGED BY** list, indicate whether the target pSeries server is managed using an HMC server or an IVM (Integrated Virtual Manager) server. If the target server has been auto-discovered via an HMC server, the **HMC** option will be automatically chosen from this list. 6. **MANAGEMENT SERVER**, **MANAGEMENT USER**, **MANAGEMENT PASSWORD** - This test connects to an HMC/IVM server to perform LPAR discovery and to collect host-level and "outside view" metrics from the pSeries server. To enable this communication, first, provide the IP address/host name of the HMC/IVM server in the **MANAGEMENT SERVER** text box. If the eG manager had automatically discovered the target pSeries server by connecting to an HMC server in the environment, then, the IP address/host name and user credentials pertaining to that HMC server will be automatically displayed in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. However, if the pSeries server being monitored was manually added to the eG Enterprise system (and not auto-discovered via the HMC server), then, you will have to explicitly indicate whether the target pSeries server is managed by an HMC server or an IVM server by selecting an option from the **IS MANAGED BY** list. If the **HMC** option is chosen, then, you will have to provide the IP address of the HMC server that manages the target pSeries server in the **MANAGEMENT SERVER** text box. In such a case, in the **MANAGEMENT USER** and **MANAGEMENT PASSWORD** text boxes, you will have to provide the credentials of an HMC user who is assigned the **hmcviewer** role. On the other hand, if the **IVM** option is chosen from the **IS MANAGED BY** list, it implies that the IP address/host name and user credentials pertaining to that IVM server has to be explicitly provided in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. 7. **CONFIRM PASSWORD** - Confirm the **HMC PASSWORD** by retyping it here. 8. **DOMAIN** - Set the **DOMAIN** parameter to *none*.

9. **ADMIN USER**, **ADMIN PASSWORD**, **CONFIRM PASSWORD** - The eG agent remotely communicates with each discovered LPAR on the pSeries server to obtain their "inside view". For this, the eG agent will have to be configured with the credentials of a valid user with access rights to each LPAR. If a single user is authorized to access all the LPARs on the pSeries server, provide the name and password of the user in the **ADMIN USER** and **ADMIN PASSWORD** text boxes, and confirm the password by retyping it in the **CONFIRM PASSWORD** text box. On the other hand, if the test needs to communicate with different LPARs using different user accounts, then, multiple user names and passwords will have to be provided. To help administrators provide these multiple user details quickly and easily, the eG administrative interface embeds a special configuration page. To know how to use this page, refer to Section 1.3.1.1 of this document.

10. **SSL** - By default, the HMC/IVM server (as the case may be) is not SSL-enabled. This indicates that by default, the eG agent communicates with the HMC/IVM server using HTTP. Accordingly, the **SSL** flag is set to **No** by default. If you configure the HMC/IVM server to use SSL, then make sure that the **SSL** flag is set to **Yes**, so that the eG agent communicates with the HMC/IVM server using HTTPS.

11. **IGNORE VMS INSIDE VIEW** - Administrators of some high security LPAR environments might not have permissions to internally monitor one/more LPARs. The eG agent can be configured to **not obtain the 'inside view' of such 'inaccessible' VMs** using the **IGNORE VMS INSIDE VIEW** parameter. Against this parameter, you can provide a comma-separated list of LPAR names, or LPAR name patterns, for which the inside view need not be obtained. For instance, your **IGNORE VMS INSIDE VIEW** specification can be: **lp,aixlp*,lin**. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to *none* indicating that the eG agent obtains the inside view of all LPARs on a pSeries server by default.

While performing LPAR discovery, the eG agent will not discover the operating system of the LPARs configured in the **IGNORE VMS INSIDE VIEW** text box.

12. **INTERVALS** and **COUNT** - By default, the **INTERVALS** parameter is set to **1** and the **COUNT** parameter is set to **2**. This implies that every time this test executes, it will collect metrics twice (because, the default **COUNT** is 2), and each set of metrics will be collected at the end of every second (because the default **INTERVAL** is 1). Also, note that the agent will report only the last set of metrics to the eG manager.

	13. **EXCLUDE VMS** - Administrators of some virtualized environments may not want to monitor some of their less-critical LPARs both from 'outside' and from 'inside'. The eG agent in this case can be configured to completely exclude such LPARs from its monitoring purview. To achieve this, provide a comma-separated list of LPARs to be excluded from monitoring in the **EXCLUDE VMS** text box. Instead of LPARs, LPAR name patterns can also be provided here in a comma-separated list. For example, your **EXCLUDE VMS** specification can be: **lp,aix\lp*,lin**. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to *none* indicating that the eG agent obtains the inside and outside views of all AIX LPARs on a virtual host by default. By providing a comma-separated list of LPARs/LPAR name patterns in the **EXCLUDE VMS** text box, you can make sure the eG agent stops collecting 'inside' and 'outside' view metrics for a configured set of LPARs.
Outputs of the test	One set of results for each powered-on guest on the IBM pSeries server being monitored

Measurements made by the test	**Measurement**	**Measurement Unit**	**Interpretation**
	Paging space pages in: Indicates the rate at which the pages were paged in from the paging space.	Pages/Sec	
	Paging space pages out: Indicates the rate at which the pages were paged out to the paging space.	Pages/Sec	
	File pages freed: Indicates the rate at which pages were freed.	Pages/Sec	
	File pages scanned: Indicates the rate at which pages were scanned by the page-replacement algorithm.	Pages/Sec	

1.6.9 Tunable Parameters Test

For each LPAR executing on a pSeries server, this test reports how well the LPAR is utilizing the virtual memory. By default, this test is disabled. To enable the test, go to the **ENABLE / DISABLE TESTS** page using the menu sequence : Agents -> Tests -> Enable/Disable, pick *IBM pSeries Server* as the **Component type**, *Performance* as the **Test type**, choose the test from the **DISABLED TESTS** list, and click on the **>>** button to move the test to the **ENABLED TESTS** list. Finally, click the **Update** button.

Purpose	Reports how well the LPAR is utilizing the virtual memory
Target of the	An IBM pSeries server

test	
Agent deploying the test	A remote agent
Configurable parameters for the test	1. **TESTPERIOD** - How often should the test be executed 2. **HOST -** The host for which the test is to be configured. 3. **PORT** - Indicate the **PORT** at which the specified **HOST** listens. By default, this is NULL. 4. **REAL SERVERNAME** - Specify the name of the pSeries server in the **REAL SERVERNAME** text box. If the target pSeries server has been auto-discovered using HMC, the server name will be set automatically in the **REAL SERVERNAME** text box. However, while configuring this test for a pSeries server that has been manually added, you have to explicitly provide the server name in the **REAL SERVERNAME** text box.  **Note** To obtain the real server name, a user can login to the target pSeries server as a valid pSeries user, go to the shell prompt of the server, and execute the following command: *lssyscfg - r sys -F name* 5. **IS MANAGED BY** - By selecting an option from the IS MANAGED BY list, indicate whether the target pSeries server is managed using an HMC server or an IVM (Integrated Virtual Manager) server. If the target server has been auto-discovered via an HMC server, the HMC option will be automatically chosen from this list. 6. **MANAGEMENT SERVER**, **MANAGEMENT USER**, **MANAGEMENT PASSWORD** - This test connects to an HMC/IVM server to perform LPAR discovery and to collect host-level and "outside view" metrics from the pSeries server. To enable this communication, first, provide the IP address/host name of the HMC/IVM server in the **MANAGEMENT SERVER** text box. If the eG manager had automatically discovered the target pSeries server by connecting to an HMC server in the environment, then, the IP address/host name and user credentials pertaining to that HMC server will be automatically displayed in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. However, if the pSeries server being monitored was manually added to the eG Enterprise system (and not auto-discovered via the HMC server), then, you will have to explicitly indicate whether the target pSeries server is managed by an HMC server or an IVM server by selecting an option from the **IS MANAGED BY** list. If the **HMC** option is chosen, then, you will have to provide the IP address of the HMC server that manages the target pSeries server in the **MANAGEMENT SERVER** text box. In such a case, in the **MANAGEMENT USER** and **MANAGEMENT PASSWORD** text boxes, you will have to provide the credentials of an HMC user who is assigned the **hmcviewer** role. On the other hand, if the **IVM** option is chosen from the **IS MANAGED BY** list, it implies that the IP address/host name and user credentials pertaining to that IVM server has to be explicitly provided in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. 7. **CONFIRM PASSWORD** - Confirm the **HMC PASSWORD** by retyping it here. 8. **DOMAIN** - Set the **DOMAIN** parameter to *none*.

	9. **ADMIN USER**, **ADMIN PASSWORD**, **CONFIRM PASSWORD** - The eG agent remotely communicates with each discovered LPAR on the pSeries server to obtain their "inside view". For this, the eG agent will have to be configured with the credentials of a valid user with access rights to each LPAR. If a single user is authorized to access all the LPARs on the pSeries server, provide the name and password of the user in the **ADMIN USER** and **ADMIN PASSWORD** text boxes, and confirm the password by retyping it in the **CONFIRM PASSWORD** text box. On the other hand, if the test needs to communicate with different LPARs using different user accounts, then, multiple user names and passwords will have to be provided. To help administrators provide these multiple user details quickly and easily, the eG administrative interface embeds a special configuration page. To know how to use this page, refer to Section 1.3.1.1 of this document. 10. **SSL** - By default, the HMC/IVM server (as the case may be) is not SSL-enabled. This indicates that by default, the eG agent communicates with the HMC/IVM server using HTTP. Accordingly, the **SSL** flag is set to **No** by default. If you configure the HMC/IVM server to use SSL, then make sure that the **SSL** flag is set to **Yes**, so that the eG agent communicates with the HMC/IVM server using HTTPS. 11. **IGNORE VMS INSIDE VIEW** - Administrators of some high security LPAR environments might not have permissions to internally monitor one/more LPARs. The eG agent can be configured to **not obtain the 'inside view' of such 'inaccessible' VMs** using the **IGNORE VMS INSIDE VIEW** parameter. Against this parameter, you can provide a comma-separated list of LPAR names, or LPAR name patterns, for which the inside view need not be obtained. For instance, your **IGNORE VMS INSIDE VIEW** specification can be: **lp,aixlp*,lin**. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to *none* indicating that the eG agent obtains the inside view of all LPARs on a pSeries server by default.  Note While performing LPAR discovery, the eG agent will not discover the operating system of the LPARs configured in the **IGNORE VMS INSIDE VIEW** text box. 12. **EXCLUDE VMS** - Administrators of some virtualized environments may not want to monitor some of their less-critical LPARs both from 'outside' and from 'inside'. The eG agent in this case can be configured to completely exclude such LPARs from its monitoring purview. To achieve this, provide a comma-separated list of LPARs to be excluded from monitoring in the **EXCLUDE VMS** text box. Instead of LPARs, LPAR name patterns can also be provided here in a comma-separated list. For example, your **EXCLUDE VMS** specification can be: **lp,aixlp*,lin**. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to *none* indicating that the eG agent obtains the inside and outside views of all AIX LPARs on a virtual host by default. By providing a comma-separated list of LPARs/LPAR name patterns in the **EXCLUDE VMS** text box, you can make sure the eG agent stops collecting 'inside' and 'outside' view metrics for a configured set of LPARs.
Outputs of the test	One set of results for each powered-on guest on the IBM pSeries server being monitored

Measurements made by the test	Measurement	Measurement Unit	Interpretation
	Real memory pages: Indicates the size of the real memory in KBytes.	Kbytes	4 Kb equals to 1 page.
	Lruable pages: Indicates the number of 4 KB pages considered for replacement.	Number	This number excludes the pages used for VMM(Virtual memeory manager) internal pages, and the pages used for the pinned part of the kernel text.
	Free pages: Indicates the number of 4 KB pages currently used by the file cache.	Number	
	Memory pools: Indicates the number of memory pools.	Number	
	Pinned pages: Indicates the number of pinned 4KB pages.	Number	
	Maximum pinnable memory: Indicates the tuning parameter (managed using vmo) specifying the percentage of real memory which can be pinned.	Percent	
	Minimum persistent memory: This measure indicates the tuning parameter (managed using vmo) in percentage of real memory.	Percent	This specifies the point below which file pages are protected from the re-page algorithm.
	Maximum persistent memory: Indicates the Tuning parameter (managed using vmo) in percentage of real memory.	Percent	This specifies the point above which the page stealing algorithm steals only file pages.
	Persistent file cache: Indicates the percentage of memory currently used by the file cache.	Percent	

	Currently used file cache memory: Indicates the number of pages that are currently used by the file cache.	Number	
	Memory used by compressed pages: Indicates the percentage of memory that are relatively compressed.	Number	
	Compressed memory pages: Indicates the number of unused pages that are relatively compressed and stored in memory.	Number	
	Memory occupied by client pages: Indicates the number of unused pages that are relatively compressed and stored in memory.	Number	
	Maximum memory for client pages: Indicates a limit on the maximum amount of memory that should be used to cache non-computational client pages; It is the maximum percentage of memory which can be used for client pages.	Number	Because all non-computational client pages are a subset of the total number of non-computational permanent storage pages, the maxclient limit must always be less than or equal to the maxperm limit.
	Client pages: Indicates the number of client pages.	Number	
	Pageouts scheduled for client filesystems: Indicates the number of pageouts scheduled for client file systems.	Number	
	Pending disk I/O requests blocked: Indicates the number of pending disk I/O requests that have been blocked since the pbuf are not available.	Number	Pbufs are pinned memory buffers used to hold I/O requests at the logical volume manager layer.

	Paging space I/O requests blocked: Indicates the number of paging space I/O requests that have been blocked since the psbufs are not available.	Number	Psbufs are pinned memory buffers used to hold I/O requests at the virtual memory manager layer.
	Filesystem I/O requests blocked: Indicates the number of filesystem I/O requests blocked because no fsbuf was available.	Number	Fsbufs are pinned memory buffers used to hold I/O requests in the filesystem layer.
	Client filesystem I/O requests blocked: Indicates the number of client filesystem I/O requests blocked because no fsbuf was available.	Number	NFS (Network File System) and VxFS (Veritas) are client filesystems. Fsbufs are pinned memory buffers used to hold I/O requests in the filesystem layer.
	External pager client filesystem I/O requests blocked: Indicates the number of external pager client filesystem I/O requests blocked because no fsbuf was available.	Number	JFS2 is an external pager client filesystem. Fsbuf are pinned memory buffers used to hold I/O requests in the filesystem layer.

1.6.10 Shared Ethernet Adapter - VM Test

A Shared Ethernet Adapter (SEA) is a new service that acts as a Layer 2 network switch to route network traffic from a Virtual Ethernet to a real network adapter - in other words, it is a bridge from a physical Ethernet adapter to one or more Virtual Ethernet adapters.

The SEA must run in a Virtual I/O Server partition. The advantage of the SEA is that partitions can communicate outside the system without having a physical network adapter attached to the partition. Up to 18 VLANs can be shared on a single network interface. The amount of network traffic will limit the number of client partitions that are served through a single network interface.

This test measures the network traffic flowing to and from each SEA that serves the AIX partitions on a pSeries server, and helps administrators accurately isolate overloaded and error-prone SEAs, and also sheds light on potential network congestions.

By default, this test is disabled. To enable the test, go to the **ENABLE / DISABLE TESTS** page using the menu sequence : Agents -> Tests -> Enable/Disable, pick *IBM pSeries Server* as the **Component type**, *Performance* as the **Test type**, choose the test from the **DISABLED TESTS** list, and click on the **>>** button to move the test to the **ENABLED TESTS** list. Finally, click the **Update** button.

Purpose	Measures the network traffic flowing to and from each SEA that serves the AIX partitions on a pSeries server, and helps administrators accurately isolate overloaded and error-prone SEAs, and also sheds light on potential network congestions
Target of the test	An IBM pSeries server

Agent deploying the test	A remote agent
Configurable parameters for the test	1. **TESTPERIOD** - How often should the test be executed 2. **HOST -** The host for which the test is to be configured. 3. **PORT** - Indicate the **PORT** at which the specified **HOST** listens. By default, this is NULL. 4. **REAL SERVERNAME** - Specify the name of the pSeries server in the **REAL SERVERNAME** text box. If the target pSeries server has been auto-discovered using HMC, the server name will be set automatically in the **REAL SERVERNAME** text box. However, while configuring this test for a pSeries server that has been manually added, you have to explicitly provide the server name in the **REAL SERVERNAME** text box.  **Note** To obtain the real server name, a user can login to the target pSeries server as a valid pSeries user, go to the shell prompt of the server, and execute the following command: *lssyscfg - r sys -F name* 5. **IS MANAGED BY** - By selecting an option from the **IS MANAGED BY** list, indicate whether the target pSeries server is managed using an HMC server or an IVM (Integrated Virtual Manager) server. If the target server has been auto-discovered via an HMC server, the **HMC** option will be automatically chosen from this list. 6. **MANAGEMENT SERVER**, **MANAGEMENT USER**, **MANAGEMENT PASSWORD** - This test connects to an HMC/IVM server to perform LPAR discovery and to collect host-level and "outside view" metrics from the pSeries server. To enable this communication, first, provide the IP address/host name of the HMC/IVM server in the **MANAGEMENT SERVER** text box. If the eG manager had automatically discovered the target pSeries server by connecting to an HMC server in the environment, then, the IP address/host name and user credentials pertaining to that HMC server will be automatically displayed in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. However, if the pSeries server being monitored was manually added to the eG Enterprise system (and not auto-discovered via the HMC server), then, you will have to explicitly indicate whether the target pSeries server is managed by an HMC server or an IVM server by selecting an option from the **IS MANAGED BY** list. If the **HMC** option is chosen, then, you will have to provide the IP address of the HMC server that manages the target pSeries server in the **MANAGEMENT SERVER** text box. In such a case, in the **MANAGEMENT USER** and **MANAGEMENT PASSWORD** text boxes, you will have to provide the credentials of an HMC user who is assigned the **hmcviewer** role. On the other hand, if the **IVM** option is chosen from the **IS MANAGED BY** list, it implies that the IP address/host name and user credentials pertaining to that IVM server has to be explicitly provided in the **MANAGEMENT SERVER**, **MANAGEMENT USER**, and **MANAGEMENT PASSWORD** text boxes. 7. **CONFIRM PASSWORD** - Confirm the **HMC PASSWORD** by retyping it here. 8. **DOMAIN** - Set the **DOMAIN** parameter to *none*.

	9. **ADMIN USER**, **ADMIN PASSWORD**, **CONFIRM PASSWORD** - The eG agent remotely communicates with each discovered LPAR on the pSeries server to obtain their "inside view". For this, the eG agent will have to be configured with the credentials of a valid user with access rights to each LPAR. If a single user is authorized to access all the LPARs on the pSeries server, provide the name and password of the user in the **ADMIN USER** and **ADMIN PASSWORD** text boxes, and confirm the password by retyping it in the **CONFIRM PASSWORD** text box. On the other hand, if the test needs to communicate with different LPARs using different user accounts, then, multiple user names and passwords will have to be provided. To help administrators provide these multiple user details quickly and easily, the eG administrative interface embeds a special configuration page. To know how to use this page, refer to Section 1.3.1.1 of this document. 10. **SSL** - By default, the HMC/IVM server (as the case may be) is not SSL-enabled. This indicates that by default, the eG agent communicates with the HMC/IVM server using HTTP. Accordingly, the **SSL** flag is set to **No** by default. If you configure the HMC/IVM server to use SSL, then make sure that the **SSL** flag is set to **Yes**, so that the eG agent communicates with the HMC/IVM server using HTTPS. 11. **IGNORE VMS INSIDE VIEW** - Administrators of some high security LPAR environments might not have permissions to internally monitor one/more LPARs. The eG agent can be configured to **not obtain the 'inside view' of such 'inaccessible' VMs** using the **IGNORE VMS INSIDE VIEW** parameter. Against this parameter, you can provide a comma-separated list of LPAR names, or LPAR name patterns, for which the inside view need not be obtained. For instance, your **IGNORE VMS INSIDE VIEW** specification can be: **lp,aixlp*,lin**. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to *none* indicating that the eG agent obtains the inside view of all LPARs on a pSeries server by default.  Note While performing LPAR discovery, the eG agent will not discover the operating system of the LPARs configured in the **IGNORE VMS INSIDE VIEW** text box. 12. **EXCLUDE VMS** - Administrators of some virtualized environments may not want to monitor some of their less-critical LPARs both from 'outside' and from 'inside'. The eG agent in this case can be configured to completely exclude such LPARs from its monitoring purview. To achieve this, provide a comma-separated list of LPARs to be excluded from monitoring in the **EXCLUDE VMS** text box. Instead of LPARs, LPAR name patterns can also be provided here in a comma-separated list. For example, your **EXCLUDE VMS** specification can be: **lp,aixlp*,lin**. Here, the * (asterisk) is used to denote leading and trailing spaces (as the case may be). By default, this parameter is set to *none* indicating that the eG agent obtains the inside and outside views of all AIX LPARs on a virtual host by default. By providing a comma-separated list of LPARs/LPAR name patterns in the **EXCLUDE VMS** text box, you can make sure the eG agent stops collecting 'inside' and 'outside' view metrics for a configured set of LPARs.
Outputs of the test	One set of results for each SEA that serves every powered-on AIX LPAR on the IBM pSeries server being monitored

Measurements made by the test	Measurement	Measurement Unit	Interpretation
	Packets transmitted: Indicates the number of packets transmitted successfully by this SEA.	Number	These measures are good indicators of the level of network traffic handled by the SEA.
	Packets received: Indicates the number of packets received successfully by this SEA.	Number	
	Data transmitted: Indicates the rate at which data is transmitted by this SEA.	KB/Sec	
	Data received: Indicates the rate at which data is received by this SEA.	KB/Sec	
	Output errors: Indicates the number of output errors encountered on this SEA.	Number	This is a counter for unsuccessful transmissions due to hardware or network errors. Ideally, this value should be 0. You can compare this value across SEAs to know which SEA is experiencing the maximum number of output errors, and which AIX LPAR that SEA is associated with.
	Input errors: Indicates the number of input errors encountered on this SEA.	Number	This is a counter for unsuccessful reception due to hardware/network errors. Ideally, the value of this measure should be 0. You can compare this value across SEAs to know which SEA is experiencing the maximum number of input errors, and which AIX LPAR that SEA is associated with.
	Transmitted packets dropped: Indicates the number of packets accepted by the device driver for transmission which were not (for any reason) given to this SEA.	Number	
	Received packets dropped: Indicates the number of packets received by the device driver from this SEA which were not (for any reason) given to a network demuxer.	Percent	

As stated earlier, by default, clicking on the **Virtual Servers** layer of a managed *IBM pSeries* server, leads you to a page displaying the current status of the LPAR guests executing on that server. If you want to override this default setting - i.e., if you prefer to view the tests mapped to the **Virtual Servers** layer first, and then proceed to focus on individual guest performance, follow the steps given below:

- Edit the **eg_ui.ini** file in the **<EG_INSTALL_DIR>\manager\config** directory
- Set the **LAYERMODEL_LINK_TO_VIRTUAL** flag in the file to **false**; this is set to **true** by default.
- Save the **eg_ui.ini** file.

Doing so ensures that as soon as the **Virtual Servers** layer is clicked, the list of tests mapped to that layer appears, as depicted by Figure 23.

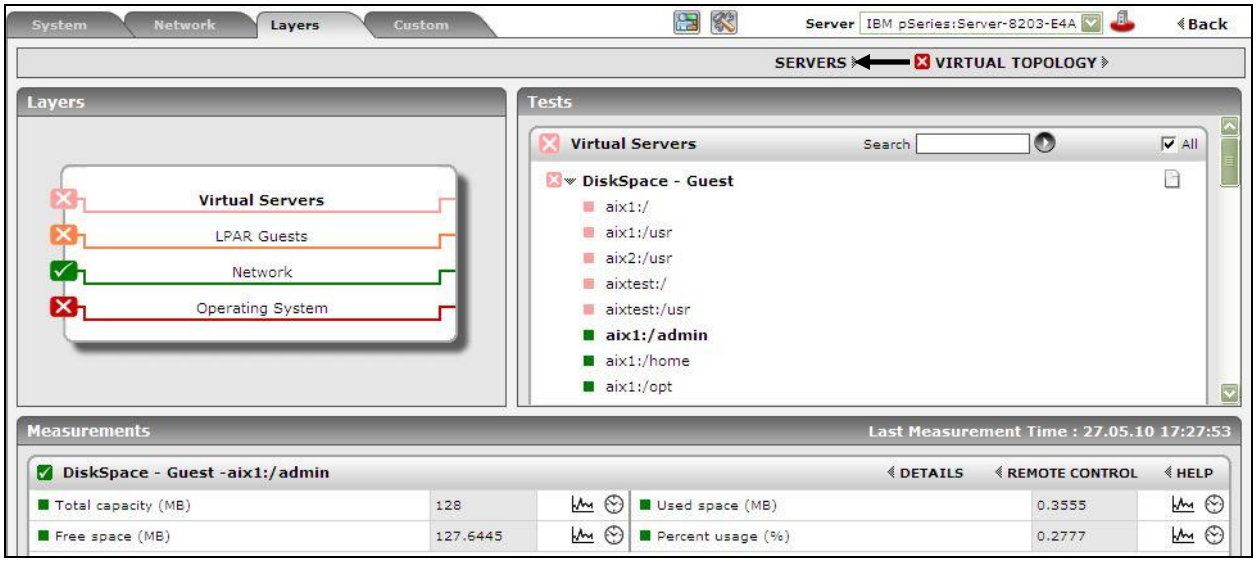


Figure 23: The tests mapped to the Virtual Servers layer

If you now want the **Server view**, simply click on the **SERVERS** link above the list of tests in Figure 23 (indicated by the arrow).

Clicking on any of the guests in the **Server view** leads you to Figure 24 that displays all the performance metrics extracted from that LPAR, in real-time. You are thus enabled to cross-correlate across the various metrics, and quickly detect the root-cause of current/probable disturbances to the internal health of an LPAR. To view the time-of-day variations in a measure, you can view its graph by clicking on that measure in Figure 24.

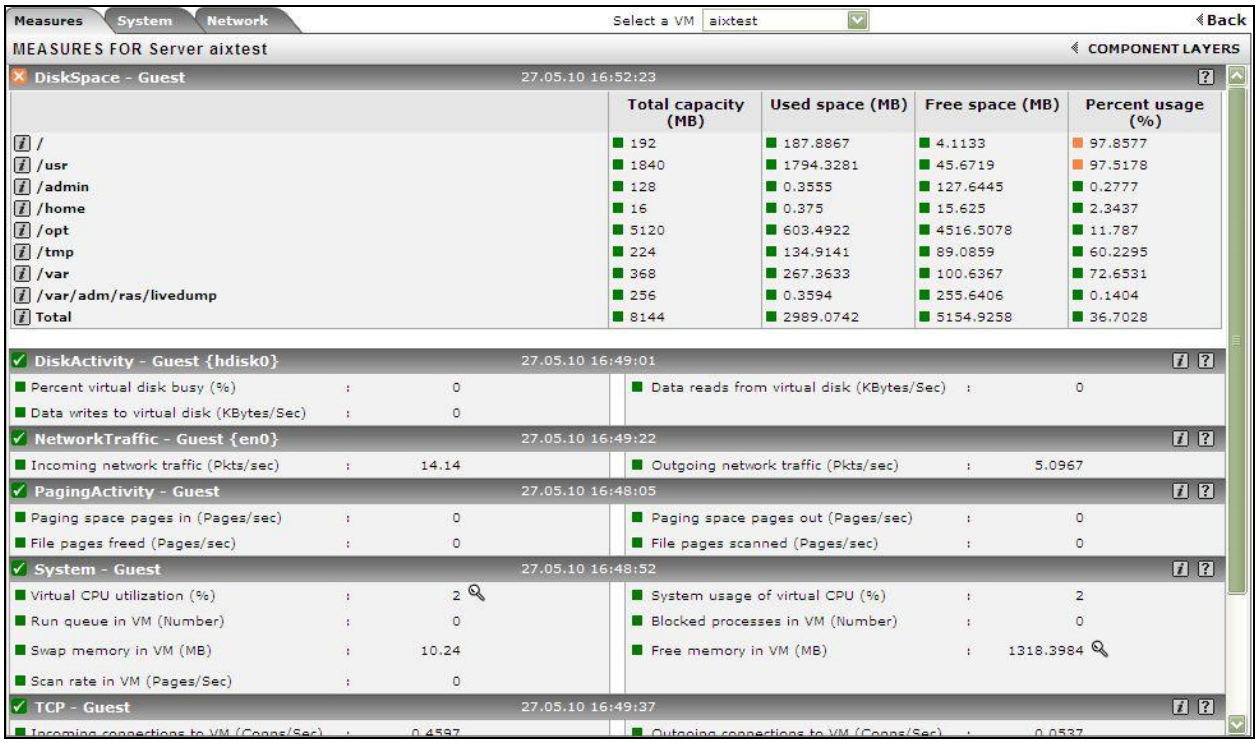


Figure 24: Measures pertaining to a chosen LPAR

To view real-time graphs of pre-configured measures (pertaining to the pSeries host and the LPARs operating on it), click on the **LIVE GRAPH** link in Figure 25. Using this graph, you can easily assess how well the CPU, memory, and disk resources are being utilized by the LPARs. On the basis of this analysis, you can proactively isolate potential performance issues, and also determine the root-cause of the issue.

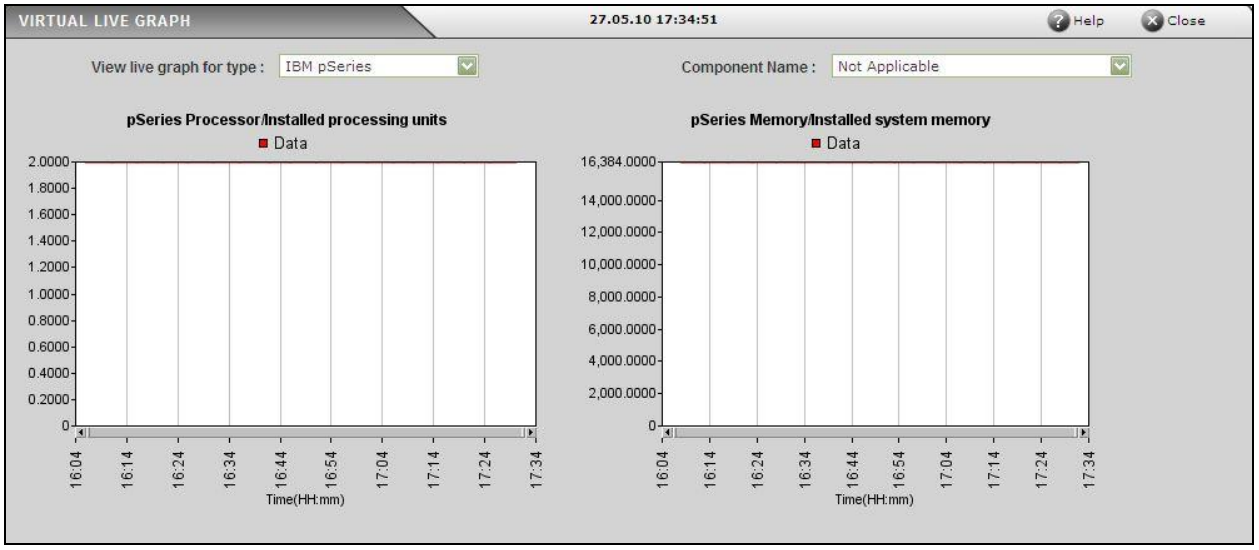


Figure 25: Live graph of the IBM pSeries server

2

Troubleshooting

By default, the eG agent uses secure shell (SSH) to connect to an IBM HMC server and pull out the 'outside view' metrics related to the AIX LPARs running on the IBM pSeries servers managed by that HMC server. Likewise, the eG agent also uses SSH to obtain the 'inside-view' of the LPARs. Password Authentication is the default method for SSH connections in eG Enterprise. If the eG agent fails to obtain the 'outside view' and/or the 'inside view' of one/more AIX LPARs, it could imply either/both of the following:

- The problematic AIX LPARs and/or the IBM HMC server managing those LPARs do not support SSH;
- Password authentication is not supported by the SSH daemon running on the AIX LPAR and/or the IBM HMC server. Under such circumstances, you can perform either of the following:
    - Enable Password Authentication in the SSH daemon on the problematic AIX LPARs and/or on the IBM HMC server via which the eG agent pulls out the 'outside view' metrics of the LPARs; or,
    - Implement Key-Based Authentication between the eG agent and the SSH daemon of the AIX LPAR and/or the IBM HMC server.

If you pick option (1), then follow the steps given below to enable password authentication:

1. Login to the AIX LPAR / IBM HMC server with which the eG agent is unable to establish an SSH connection.
2. Edit the **sshd_config** file in the **/etc/ssh** directory.
3. Check whether the **Password Authentication** flag in the **sshd_config** file is set to **no**. If so, set it to **yes**.
4. Then, save the file and restart/signal the SSH daemon (eg., using **kill -1 <sshd_config PID>**).

On the contrary, if you choose to enable key-based authentication [i.e, option (2)], then you will have to generate a public/private key pair. A public/private key pair is available in the **<EG_INSTALL_DIR>\agent\sshkeys** directory (on Windows; on Unix, this will be **/opt/egurkha/agent/sshkeys**) of the eG agent. While the private key is available in the file named **id_rsa**, the public key is contained within the file **authorized_keys**. You now have the option to proceed with the default keys or generate a different key pair. If you decide to go with the keys bundled with the eG agent, do the following:

1. To enable key-based authentication, the private key should remain in the **<EG_INSTALL_DIR>\agent\sshkeys** directory (on Windows; on Unix, this will be **/opt/egurkha/agent/sshkeys**), and the public key should be copied to each of the problematic AIX LPARs and/or the IBM HMC server. To achieve this, first login to the problem target (AIX LPAR/IBM HMC server) as the eG user.
2. Create a directory named **.ssh** in the **<USER_HOME_DIR>** on the AIX LPAR/IBM HMC server, using the command: **mkdir ~/.ssh**.
3. Next, copy the **authorized_keys** file from the **<EG_INSTALL_DIR>\agent\sshkeys** directory (on Windows; on Unix, this will be **/opt/egurkha/agent/sshkeys**) on the eG remote agent host to the **<USER_HOME_DIR>/.ssh** directory on the AIX LPAR/IBM HMC server.

Make sure that the permission of the **.ssh** directory and the **authorized_keys** file is **700**.

4. Finally, on the eG manager host, edit the **<EG_INSTALL_DIR>\manager\config\eg_tests.ini** file. Against the **EgJavaSSHKeyFile** parameter, enter: **agent/sshkeys/id_rsa.pub**, and save the file.

On the other hand, if you want to generate a new key pair, then do the following:

1. Login to any AIX/Linux host in your environment (even an AIX LPAR) as an eG user.
2. From the **<USER_HOME_DIR>**, execute the command: **ssh-keygen -t rsa**. Upon executing the command, you will be requested to specify the full path to the file to which the key is to be saved. By default, a directory named **.ssh** will be created in the **<USER_HOME_DIR>**, to which the key pair will be saved. To go with the default location, simply press **Enter**.

```
Generating public/private rsa key pair.
Enter file in which to save the key (/home/egurkha/.ssh/id_rsa):
```

3. Next, you will be prompted to provide a pass phrase. Provide any pass phrase of your choice.

```
Enter passphrase (empty for no passphrase): eginnovations
Enter same passphrase again: eginnovations
```

4. If the key pair is created successfully, then the following messages will appear:

```
Your identification has been saved in /hom
e/egurkha/.ssh/id_rsa.
Your public key has been saved in /home/egurkha/.ssh/id_rsa.pub.
The key fingerprint is:
09:f4:02:3f:7d:00:4a:b4:6d:b9:2f:c1:cb:cf:0e:e1 dclements@sde4.freshwater.com
```

5. The messages indicate that the private key has been saved to a file named **id_rsa** in the **<USER_HOME_DIR>/.ssh**, and the public key has been saved to a file named **id_rsa.pub** in the same directory. Now, to enable key-based authentication, login to the AIX LPAR and/or the IBM HMC server as the eG user.
6. Create a directory named **.ssh** in the **<USER_HOME_DIR>** on the AIX LPAR and/or the IBM HMC server, using the command: **mkdir ~/.ssh**.
7. Next, copy the **id_rsa.pub** file from the **<USER_HOME_DIR>/.ssh** directory on the AIX/Linux host to the **<USER_HOME_DIR>/.ssh** directory on the AIX LPAR and/or the IBM HMC server.
8. Ensure that the **id_rsa.pub** file on the AIX LPAR and/or the IBM HMC server is renamed as **authorized_keys**.
9. Repeat this procedure on every AIX LPAR to be monitored.
10. Then, lock the file permissions down to prevent other users from being able to read the key pair data, using the following commands:

    chmod go-w ~/
    chmod 700 ~/.ssh
    chmod go-rwx ~/.ssh/*

11. Finally, on the eG manager host, edit the **<EG_INSTALL_DIR>\manager\config\eg_tests.ini** file. Against the **EgJavaSSHKeyFile** parameter, enter: **agent/sshkeys/id_rsa.pub**, and save the file.

Instead of choosing between the authentication modes (Password or Key-based), you can also disable the usage of the Java SSH client, and use **plink** to connect to AIX LPARs and the IBM HMC server. To achieve this, follow the steps given below:

- Edit the **eg_tests.ini** file in the **/opt/egurkha/manager/config** directory (on Unix; on Windows, this will be **<EG_INSTALL_DIR>\manager\config** directory).
- Set the **JavaSSHForVm** flag in the **[AGENT_SETTINGS]** section of the file to **false**; by default, this is set to **true** indicating that the eG agent uses Java SSH by default. By setting the flag to **false**, you can ensure that the eG agent does not use Java SSH, and instead uses the **plink** command to connect to AIX LPARs and the IBM HMC server.
- The **plink** command exists in the **<EG_INSTALL_DIR>\lib\vmgfiles** directory (on Windows; on Unix, this will be **/opt/egurkha/lib/vmgfiles**) of the eG agent. To use the **plink** command, you need to explicitly configure the SSH keys, so that the eG agent is able to communicate with the AIX LPARs and the IBM HMC server using SSH. To do this, follow the steps given below:
    - Go to the command prompt and switch to the directory containing the **plink** command.
    - Then, execute the **plink** command to connect to any of the AIX LPARs on the IBM pSeries server and to the IBM HMC server. The syntax for the **plink** command is as follows:

      plink -ssh <user>@<IP_of_target_host> <command>

      For example, assume that you want to connect to the AIX LPAR, **192.168.10.7**, as user **john** with password **john**, to know its hostname. The syntax of the **plink** command in this case will be:

      plink -ssh john@192.168.10.7 hostname, where **hostname** is the command to be executed on the remote host for extracting its hostname.
    - To ensure that you do not connect to an imposter host, **SSH2.X** presents you with a unique host key fingerprint for that host, and requests your confirmation to save the displayed host key to the cache.

      ```
      The server's host key is not cached in the registry. You have no
      guarantee that the server is the computer you think it is.
      The server's rsa2 key fingerprint is:<host key>
      If you trust this host, enter "y" to add the key to PuTTY's cache and
      carry on connecting.
      If you want to carry on connecting just once, without adding the key to
      the cache, enter "n".
      If you do not trust this host, press Return to abandon the connection.
      Store key in cache? (y/n) y
      ```

      Once you confirm the host key storage and provide the user's password to connect to the AIX LPAR and/or the IBM HMC server, this message will not appear during your subsequent attempts to connect to an AIX LPAR and/or an IBM HMC server. In other words, the eG agent will be able to execute tests on all AIX LPARs and the IBM HMC server without any interruption. Therefore, press **y** to confirm key storage.

3

Conclusion

This document has clearly explained how eG Enterprise monitors IBM pSeries servers and the AIX LPARs configured on them. We can thus conclude that eG Enterprise, with its ability to provide in-depth insight into the performance of AIX LPAR infrastructures, is the ideal solution for monitoring such environments. For more information on eG Enterprise, please visit our web site at www.eginnovations.com or write to us at sales@eginnovations.com.