Monitoring IBM HMC Server

eG Enterprise v6

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Chapter 1

Monitoring the IBM HMC Server

IBM provides the Hardware Management Console (HMC) to configure and manage the logical partitions (LPARs) on the IBM pSeries servers. 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.

Owing to the crucial role the HMC server plays in the management of logical partitions, issues in the performance of the HMC server can grossly affect the quality of the user experience with the partitions. It is therefore imperative that the HMC server is monitored and potential problems in its performance promptly captured and corrected.

eG Enterprise offers a dedicated *IBM HMC Server* model, which provides a top-down view of the performance of the HMC server. The tests mapped to each layer of this model are capable of alerting you to anomalies ranging from hardware failures to breaks in the availability of the HMC server to unusually high user logins to the server or sudden logouts.

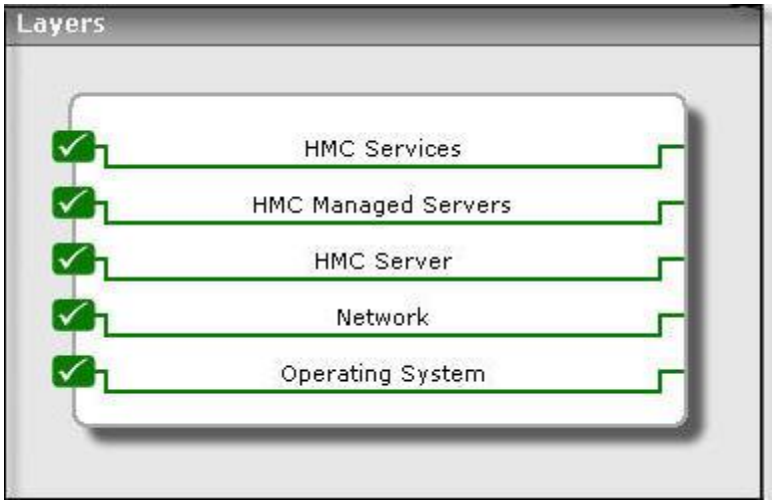

Figure 1.1: Layer model of the HCM server

Using the metrics reported by Figure 1.1, answers to persistent performance queries can be found:

- Is the HMC server available? If so, how quickly can a remote connection to the server be established?
- Do all disk partitions on the server have adequate space?
- Is any processor supported by the server over-utilized?
- Is there a contention for memory resources on the server?
- How many pSeries servers and AIX LPARs have been managed by the server?
- Is any pSeries server not operating currently?
- Is the server currently overloaded with user sessions? What type of sessions are these - sessions initiated by SSH terminals or the HMC console?
- Have too many users suddenly logged out of the server?

1.1 The Operating System Layer

Using the tests mapped to this layer you cane, do the following

- Isolate disk partitions that are experiencing a space crunch;
- Proactively detect potential CPU and memory resource contentions
- Monitor the uptime of the server

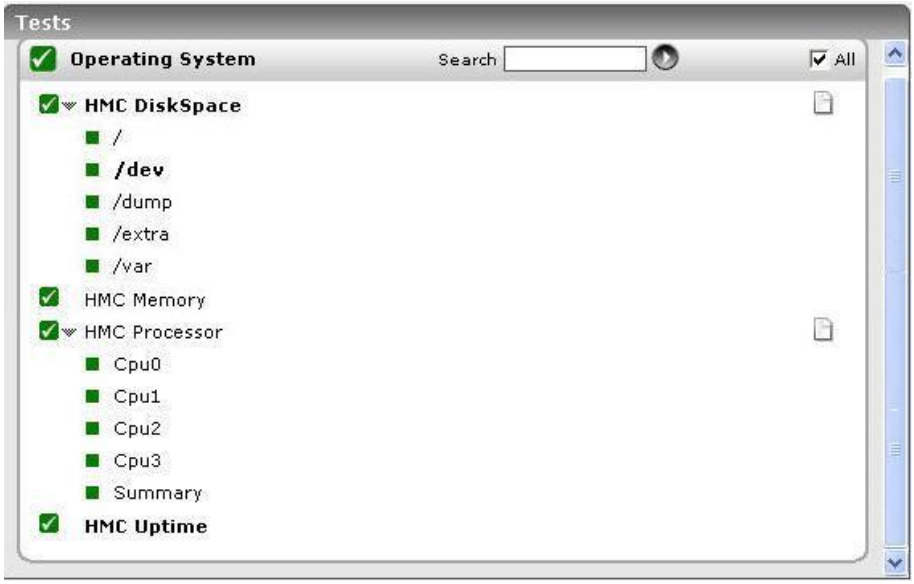

Figure 1.2: The tests mapped to the Operating System layer

1.1.1 HMC DiskSpace Test

This test monitors the space usage of each disk partitions on the HMC server, and points you to those disk partitions that are critically low on space.

Purpose	Monitors the space usage of each disk partitions on the HMC server, and points you to those disk partitions that are critically low on space		
Target of the test	An IBM HMC 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		
Outputs of the test	One set of results for each disk partition on the HMC server		
Measurements made by the test	**Measurement**	**Measurement Unit**	**Interpretation**
	Total capacity: Indicates the total capacity of this disk partition.	MB	
	Used space: Indicates the space used on this disk partition.	MB	

	Free space: Indicates the amount of unused space on this disk partition.	MB	`
	Percent usage: Indicates the percentage of space on this disk partition that is in use.	Percent	Ideally, the value of this measure should be low. A high value is indicative of excessive space usage on the disk partition. If the value is dangerously close to 100%, it indicates that the partition will soon run out of space. You may want to clear some space on the disk partition, so that you can continue working with the HMC server

1.1.2 HMC Memory Test

By periodically monitoring how the HMC server uses its memory resources, you can capture a potential memory bottleneck much before it actually begins to degrade the performance of the server. This test, at configured intervals, reports on the memory usage levels of the HMC server, and provides you with these early warning signals.

Purpose	Reports on the memory usage levels of the HMC server		
Target of the test	An IBM HMC 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		
Outputs of the test	One set of results for the HMC server		
Measurements made by the test	**Measurement**	**Measurement Unit**	**Interpretation**
	Total memory of HMC: Indicates the total memory capacity of the server.	MB	
	Used memory of HMC: Indicates the amount of memory used.	MB	

	Free memory of HMC: Indicates the amount of unused memory on HMC.	MB	`
	Swap memory of HMC: Indicates the amount of swap memory on HMC.	MB	
	Memory utilization of HMC: Indicates the percentage of memory used by the HMC server.	Percent	Ideally, the value of this measure should be low. A high value is indicative of excessive memory utilization, which if left unchecked, could cause the performance of the HMC server to suffer.

1.1.3 HMC Processor Test

Keep track of CPU usage by the HMC server and be proactively alerted to any processor contention with the help of this test.

Purpose	Keep track of CPU usage by the HMC server and be proactively alerted to any processor contention with the help of this test		
Target of the test	An IBM HMC 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		
Outputs of the test	One set of results for each processor supported by the HMC server		
Measurements made by the test	**Measurement**	**Measurement Unit**	**Interpretation**
	CPU utilization: Indicates the percentage of CPU resources utilized by the user processes executing on the HMC server.	Percent	A high value is indicative of excessive CPU usage by user processes.

	System CPU utilization: Indicates the percentage of CPU resources utilize for system-level processing.	Percent	A high value is indicative of excessive CPU usage by the core system processes.
	Idle CPU: Indicates the percentage of time for which the processor was idle	Percent	A very high value is often indicative of an under-utilized proceessor.
	IO Waits: Indicates the percentage of time the processor was idle waiting for I/O processing to complete.	Percent	Comparing the value of this measure with that of the *CPU utilization*, *System CPU utilization*, and *Idle CPU* measures, will enable you to identify exactly where the HMC server has spent the most of its CPU resources, and why.
	Swap memory: Indicates the amount of swap space currently available on the HMC server.	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.

1.1.4 HMC Uptime Test

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

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

This test reports the measures relating to the uptime of critical HMC servers.

Purpose	Reports the measures relating to the uptime of critical HMC servers
Target of the `test	An IBM HMC 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

Outputs of the test	One set of results for the HMC server		
Measurements made by the test	**Measurement**	**Measurement Unit**	**Interpretation**
	Has system been rebooted: Indicates whether the server has been rebooted during the last measurement period or not.	Boolean	If this measure shows 1, it means that the server 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 server was rebooted.
	Uptime during the last measure period: Indicates the time period that the system has been up since the last time this test ran.	Secs	If the server 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 server 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 server 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 system: Indicates the total time that the server has been up since its last reboot.	Mins	Administrators may wish to be alerted if a server has been running without a reboot for a very long period. Setting a threshold for this metric allows administrators to determine such conditions.

1.2 The Network Layer

This layer monitors the availability of the HMC server over the network, and alerts you to bad network connections (if any) to the server.

Figure 1.3: The test mape to he Network layer

Since this test has been dealt with elaborately in the *Monitoring Unix and Windows Servers* document, let us proceed to the next layer.

1.3 The HMC Server Layer

This layer monitors the availability and responsiveness of the HMC server for remote command executions.

Figure 1.4: The test mapped to the HMC Server layer

1.3.1 HMC Status Test

This test reports the availability and the responsiveness of the HMC server to remote command execution.

Purpose	Reports the availability and the responsiveness of the HMC server to remote command execution

Target of the test	An IBM HMC 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		
Outputs of the test	One set of results for the HMC server		
Measurements made by the test	**Measurement**	**Measurement Unit**	**Interpretation**
	Availability: Indicates whether the HMC server is available for remote command execution or not.	Number	The value 100 indicates that the HMC server is available and the value 0 indicates that the server is not available.
	Response time: Indicates the time taken to connect to the HMC server.	Secs	A high value could indicate a connection bottleneck.

1.4 The HMC Managed Servers Layer

To know the number of pSeries servers and AIX LPARs managed by the HMC server, and be updated with the current state of the pSeries servers, use the tests mapped to this layer.

Figure 1.5: The tests mapped to the HMC Managed Servers layer

1.4.1 ManagedServer Informations Test

This test reports the number of IBM pSeries servers and AIX LPARs that are being managed by the target HMC server.

Purpose	Reports the number of IBM pSeries servers and AIX LPARs that are being managed by the target HMC server		
Target of the test	An IBM HMC 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		
Outputs of the test	One set of results for the HMC server		
Measurements made by the test	**Measurement**	**Measurement Unit**	**Interpretation**
	IBM pSeries servers: Indicates number of Series servers being managed by the HMC server.	Number	
	Total Aix Lpars: Indicates the number of AIX LPARs being managed by the HMC server.	Number	

1.4.2 ManagedServer Details Test

This test reports the state of the pSeries servers managed by the HMC server being monitored.

Purpose	Reports the state of the pSeries servers managed by the HMC server being monitored		
Target of the test	An IBM HMC 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		
Outputs of the test	One set of results for each IBM pSeries server managed by the HMC server		
Measurements made by the test	**Measurement**	**Measurement Unit**	**Interpretation**

	State: Indicates the current state of this pSeries server.		This measure reports the value *Operating*, if the pSeries server is in an operational state currently. If not, this measure will report the value *Not Operating*. The numeric values that correspond to the states discussed above are as follows: **State** / **Numeric Value** Operating / 1 Power off / 0 Error / 2 Authentication / 3 **Note:** By default, this measure reports the values *Operating* or *Not operating* to indicate the status of a managed pSeries servers. The graph of this measure however, represents the status using the numeric equivalents - *0* to *3*.

1.5 The HMC Services Layer

Using the tests mapped to this layer, you can determine the level and nature of session activity on HMC server and also the number and type of RMC and HMC tasks executing on the server.

Figure 1. 6: The tests mapped to the HMC Services layer

1.5.1 HMC Terminal Logins Test

This test monitors the user activity on the HMC server, and reveals the number of new SSH logins and logouts from the server.

Purpose	Monitors the user activity on the HMC server, and reveals the number of new SSH logins and logouts from the server		
Target of the test	An IBM HMC 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. **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. 4. **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.`		
Outputs of the test	One set of results for the HMC server		
Measurements made by the test	**Measurement**	**Measurement Unit**	**Interpretation**
	Current terminal logins: Indicates the current number of user logins from SSH terminals.	Number	
	New terminal logins: Indicates the number of new terminal logins since the last measurement period.	Number	

	New terminal logins percentage: Indicates the percentage of new terminal logins.	Percent	A high value could indicate that the user activity on the HMC server has suddenly increased in the current measurement period.
	Terminal logouts: Indicates the number of sessions that have logged out.	Number	

1.5.2 RMC Tasks Test

This test reports key statistics pertaining to the Remote Monitoring and Control (RMC) tasks executing on the HMC server

Purpose	Reports key statistics pertaining to the Remote Monitoring and Control (RMC) tasks executing on the HMC server		
Target of the test	An IBM HMC 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. **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.`		
Outputs of the test	One set of results for the HMC server		
Measurements made by the test	**Measurement**	**Measurement Unit**	**Interpretation**
	Total tasks: Indicates the total number of RMC tasks available on the HMC server.	Number	Use the detailed diagnosis of this measure to know which tasks are available on the server.

	Running tasks: Indicates the number of RMC tasks currently running on the server.	Number	Use the detailed diagnosis of this measure to know which tasks are currently running.
	Sleeping tasks: Indicates the number of sleeping RMC tasks.	Number	Use the detailed diagnosis of this measure to know which tasks are sleeping.
	Stopped tasks: Indicates the number of RMC tasks that have stopped.	Number	
	Zombie tasks: Indicates the number of zombie tasks executing on the server.	Number	

1.5.3 HMC Web Logins Test

This test monitors the session activity on the HMC server and reports statistics related to the sessions that were established via the web-based HMC console with the server.

Purpose	Monitors the session activity on the HMC server and reports statistics related to the sessions that were established via the web-based HMC console with the server
Target of the `test	An IBM HMC 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. **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. 4. **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.`		
Outputs of the test	One set of results for the HMC server		
Measurements made by the test	**Measurement**	**Measurement Unit**	**Interpretation**
	Current sessions: Indicates the current number of sessions on the HMC server that were established via the HMC console.	Number	Use the detailed diagnosis of this measure to understand who initiated these sessions and when.
	New sessions: Indicates the number of recent web-based logins to the server.	Number	
	New sessions percentage: Indicates the percentage of new web-based logins.	Percent	A high value could indicate that the user activity on the HMC server has suddenly increased in the current measurement period.
	Logout sessions: Indicates the number of sessions that have logged out.	Number	

1.5.4 HMC Tasks Test

This test reports key statistics pertaining to HMC tasks.

Purpose	Reports key statistics pertaining to HMC tasks		
Target of the test	An IBM HMC 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. **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.`		
Outputs of the test	One set of results for the HMC server		
Measurements made by the test	**Measurement**	**Measurement Unit**	**Interpretation**
	Total tasks: Indicates the total number of tasks available on the HMC server.	Number	Use the detailed diagnosis of this measure to know which tasks are available on the server.
	Running tasks: Indicates the number of tasks currently running on the server.	Number	
	Sleeping tasks: Indicates the number of sleeping HMC tasks.	Number	Use the detailed diagnosis of this measure to know which tasks are sleeping.
	Stopped tasks: Indicates the number of HMC tasks that have stopped.	Number	

	Zombie tasks: Indicates the number of zombie tasks executing on the server.	Number	

Chapter 2

Conclusion

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