Redpaper

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Power Enterprise Pools on IBM Power Systems

This IBM® Redpaper™ publication describes IBM Power Enterprise Pools, a technology for dynamically sharing processor and memory activations among a group (or pool) of IBM Power Systems™ enterprise class servers. Using mobile Capacity on Demand (CoD) activation codes, your systems administrator can perform tasks without contacting IBM. To use the Power Enterprise Pools feature, you need only to upgrade to Hardware Management Console (HMC) V7.8.

Power Enterprise Pools can support your business goals in the following ways:

- Using Power Enterprise Pools can provide your organization with a dynamic infrastructure, reduced cost of performance management, improved service levels, and controlled risk management.
- The Power Enterprise Pools technology is ideal for further improving the flexibility, load balancing, and disaster recovery planning and operations of your Power Systems.
- The reliability, availability, and serviceability (RAS) of your Power Systems environment can be increased by using Power Enterprise Pools.

This paper is directed at experienced IBM Power Systems users and to decision-makers who want to know how Power Enterprise Pools can improve the IT efficiencies in their organization.

Technical benefits of implementing Power Enterprise Pools

Here are some of the technical benefits of implementing Power Enterprise Pools:

- Redundant HMCs that ensure the reliability that your organizational needs. (Although not required, redundant HMCs are highly suggested in most environments.)
- Improved flexibility and load balancing of Power Systems.
- HMC V7.7.8 provides new functions:
  - Support for Power Enterprise Pool management.
  - IBM Power Virtualization Center (PowerVC) Standard Edition enablement.
  - User-defined thresholds that enable the monitoring and alerting of workloads. These thresholds can benefit from Dynamic Platform Optimization (DPO) and an optional automation for starting DPO when a threshold is exceeded. This function also indicates whether a virtual machine can benefit from DPO.
  - Additional tracking of dynamic logical partition activity in the current profile enables reactivation of a virtual machine with all configuration changes intact since the last shutdown.
  - Improved group-based access control for Lightweight Directory Access Protocol (LDAP) users, which limits your users to a subset of HMCs.
- The master HMC (see “Master and non-master HMCs” on page 6) can be used to perform the following functions:
  - Mobile CoD processor and memory resources can be assigned to systems with inactive resources. Mobile CoD resources remain on the system to which they are assigned until they are removed from the system.
  - New systems can be added to the pool, and existing systems can be removed from the pool.
  - New resources can be added to the pool, and existing resources can be removed from the pool.
  - Pool information can be viewed, including pool resource assignments, compliance, and history logs. This function can also be performed from the non-master HMC.

How Power Enterprise Pools work

This section describes how Power Enterprise Pools work and some of the benefits that can be realized with Power Enterprise Pools that are implemented in your organization.

Types of Power Enterprise Pools

Two types of Power Enterprise Pools are available:

- One pool type enables Power 770 (9117-MMD) class systems and is restricted to valid configurations of 9117-MMD systems. This is designated as a *770 pool* and can support systems with different clock speeds.
- Another pool type enables Power 780 (9179-MHD) and Power 795 (9119-FHB) class systems and is designated as a *high-end pool*. This pool can support different clock speeds and different machine types.

Note: Power Enterprise Pools are not available on the IBM Flex System® Manager®.

Mobile and static activations

All of the previously announced processor and memory activation features are static and do not move from one server to another. However, mobile activation features are introduced to reference a CoD activation that can be moved between systems that belong to a Power Enterprise Pool.

The remaining processor core activations, aside from the required static activations, can optionally be mobile activations, static activations, or a mixture of both. Static and mobile core activations can co-reside in the same system and in the same partition.

Of the static and mobile active processor activations, a minimum of four must be static processor activations on a Power 770 and Power 780.

A minimum of 25% of the processors on a Power 795 must be static processor activation.

A maximum of 75% of active installed memory can have mobile activations. Capacity granularity when adding memory activations to a Power Enterprise Pool is 100 GB.

Note: At the time of writing, IBM intends to support the conversion of existing static activation features into mobile activations at a charge.

Table 1 shows the new mobile activation features and their sales manual descriptions. For links to full sales manual, see “Related information” on page 22.

Table 1 Mobile and static activation features per system type model

System type model	Feature number	Description
9117-MMD	EPMC	**1-core mobile activation** ► Attributes provided: Activation Code Number ► Attributes required: None ► For 9117-MMD: – Minimum required: 0 – Maximum allowed: 60 (Initial maximum order: 0) – OS level that is required: None – Initial Order/MES/Both/Supported: MES – CSU: Yes – Return parts MES: No
9179-MHD 9119-FHB	EPMD	**1-core mobile activation** ► Attributes provided: Activation Code Number ► For 9179-MHD: – Minimum required: 0 – Maximum allowed: 120 (Initial maximum order: 0) – OS level that is required: None – Initial Order/MES/Both/Supported: MES – CSU: Yes – Return parts MES: No ► For 9119-FHB: – Minimum required: 0 – Maximum allowed: 192 (Initial maximum order: 0) – OS level that is required: None – Initial Order/MES/Both/Supported: MES – CSU: Yes – Return parts MES: No
9117-MMD 9179-MHD 9119-FHB	EMA4	**100 GB mobile memory activation** ► Attributes provided: 100 GB Activation Code Number ► Attributes required: Memory feature codes ► For 9117-MMD: (#EMA4): – Minimum required: 0 – Maximum allowed: 30 (Initial maximum order: 0) – OS level that is required: None – Initial Order/MES/Both/Supported: MES – CSU: Yes – Return parts MES: No ► For 9179-MHD: (#EMA4): – Minimum required: 0 – Maximum allowed: 30 (Initial maximum order: 0) – OS level that is required: None – Initial Order/MES/Both/Supported: MES – CSU: Yes – Return parts MES: No ► For 9119-FHB: (#EMA4): – Minimum required: 0 – Maximum allowed: 120 (Initial maximum order: 0) – OS level that is required: None – Initial Order/MES/Both/Supported: MES – CSU: Yes – Return parts MES: No

System type model	Feature number	Description
9117-MMD	EP22	**1-core mobile activation** ► Attributes provided: None ► Activation Code Number: None ► Attributes required: None ► For 9117-MMD: (#EP22): – Minimum required: 0 – Maximum allowed: 60 (Initial order maximum: 0) – OS level that is required: None – Initial Order/MES/Both/Supported: MES – CSU: Yes – Return parts MES: No
9179-MHD 9119-FHB	EP23	**1-core mobile activation** ► Attributes provided: None ► Activation Code Number: None ► For 9179-MHD: (#EP23): – Minimum required: 0 – Maximum allowed: 120 (Initial order maximum: 0) – OS level that is required: None – Initial Order/MES/Both/Supported: MES – CSU: Yes – Return parts MES: No ► For 9119-FHB: (#EP23): – Minimum required: 0 – Maximum allowed: 192 (Initial order maximum: 0) – OS level that is required: None – Initial Order/MES/Both/Supported: MES – CSU: Yes – Return parts MES: No
9117-MMD 9179-MHD 9119-FHB	EB35	**Mobile enablement (Power Enterprise Pool enablement)** ► Attributes provided: None ► Attributes required: None ► For 9117-MMD: (#EB35) – Minimum required: 0 – Maximum allowed: 1 (Initial order maximum: 0) – OS level that is required: None – Initial Order/MES/Both/Supported: MES – CSU: Yes – Return parts MES: No ► For 9179-MHD: (#EB35) – Minimum required: 0 – Maximum allowed: 1 (Initial order maximum: 0) – OS level that is required: None – Initial Order/MES/Both/Supported: MES – CSU: Yes – Return parts MES: No ► For 9119-FHB: (#EB35) – Minimum required: 0 – Maximum allowed: 1(Initial order maximum: 0) – OS level that is required: None – Initial Order/MES/Both/Supported: MES – CSU: Yes – Return parts MES: No

For information about ordering mobile and static activations, including a scenario for doing so, see the IBM Redbooks® Solution Guide *Sharing Processor and Memory Activations Dynamically Among IBM Power Systems Enterprise Class Servers*, TIPS1169.

Master and non-master HMCs

Each Power Enterprise Pool has a single master HMC. There can be only one master HMC and one non-master HMC managing a pool. All of the servers in the pool must be connected to both HMCs.

The HMC that is used to create a Power Enterprise Pool is set as the master HMC of that pool. After the Power Enterprise Pool is created, configure a redundant HMC as a non-master HMC for the pool. Redundant HMCs are not required, but are highly preferable.

Each time a pool configuration change is made, the master HMC pushes the pool data to the non-master HMC. This action allows the non-master HMC to take over the master function for the pool seamlessly, if needed, because the pool data on the non-master HMC is always up-to-date.

All Power Enterprise Pool resource assignments must be performed by the master HMC. When powering on or restarting a server, ensure that the server is connected to the master HMC. This action ensures that the required Mobile CoD resources are assigned to the server.

When both the server and the master HMC are powered off, restart the master HMC first, then restart the server. This action ensures that the server can connect to the HMC to obtain its Mobile CoD resource assignments.

Note: If a restarted server cannot contact the master HMC, it restarts with no Mobile CoD resources. However, when the master HMC connects to the server, the Mobile CoD resources automatically are assigned to the server.

On occasion, you might need to redefine the master HMC, as described in “Resetting your master HMC” on page 12.

Requirements and specifications

This section describes the primary requirements and specifications for implementing Power Enterprise Pools.

In the first release of Power Enterprise Pools, all of the servers in a pool must be managed by the same HMC or pair of redundant HMCs. Redundant HMCs are highly preferable for Power Enterprise Pools.

Table 2 shows the requirements and specifications for Power Enterprise Pools.

Table 2 Requirements and specifications for HMC and Power Enterprise Pools

System	Requirements and specifications
HMC	► The HMCs must be at HMC V7R7.8 or later. ► The HMCs require at least 2 GB of memory. ► A Power Enterprise Pool can be managed by at most two HMCs. ► If a pair of redundant HMCs is used to manage a Power Enterprise Pool, they must be able to communicate with each other using a network connection. ► The HMC can manage multiple Power Enterprise Pools but is limited to 1000 total partitions and 32 high-end servers.
Power Systems	► All systems in a pool must be owned by the same customer enterprise number. ► All participating systems must either be serviced by IBM under warranty or an IBM maintenance service agreement, or not be serviced by IBM. ► Systems can belong to only one Power Enterprise Pool at one time. ► Systems on the pool must be one of the following models: – IBM Power 795 with POWER7® processors (9119-FHB) – IBM Power 780 with POWER7+™ processors (9179-MHD) – IBM Power 770 with POWER7+ processors (9117-MMD) ► The systems in the pool must be at firmware level FW780 or also called AH780. ► Power 770 and Power 780 must have at least 4 static core activations. ► The Power 795 must have at least 24 static core activations or 25% of the installed cores, whichever is higher, activated in static capability. ► A minimum of 25% of all memory activations on a server must have static activations. ► There are no partition or operating system impacts.
IBM Power Systems Software™	► Eligible programs can temporarily transfer entitlements from a Power Systems server that is participating in the pool to another Power Systems server that is also participating in the pool. ► The maximum number of software licenses within the pool for any specific software agreement cannot be exceeded. ► Any licenses for IBM AIX®, IBM i, and other Power Systems Software that exist on any system in a pool must also be licensed for at least one core on each of the additional systems in the pool. ► Each Eligible Program that is entitled for IBM Software Maintenance (SWMA) on an Authorized Machine in an Power Enterprise Pool must also have a valid IBM Software Maintenance agreement on every Authorized Machine in the same Power Enterprise Pool.
Power Enterprise Pools	► The maximum number of systems in a Power Enterprise Pool is 32 high-end or 48 mid-range systems. ► Integrated Facility for Linux activations is not supported as mobile activations within Power Enterprise Pools, but they can reside separately on systems within a pool. ► AIX, IBM i, and Linux operating systems and their workloads are all supported by Power Enterprise Pools. ► There must be inactive processors and memory on the member systems of a Power Enterprise Pool. ► Activations cannot be transferred, moved, or otherwise reassigned across country boundaries. ► Memory activations within a Power Enterprise Pool are independent of physical memory DIMM sizes and are supported in blocks of 100 GB.

Considerations and prerequisites for HMC

Here are the minimum requirements and prerequisites to update the HMC and use the new enhancements in HMC V7.7.8:

- Power Enterprise Pools and DPO enhancements for HMC require HMC V7.7.8 or later.
- To manage Power Enterprise Pools, or to use them with IBM PowerVC, the HMC requires at least 2 GB of physical memory. Here are the HMC models that cannot be upgraded to support this function, where HMC V7.7.8 is the last supported firmware level:
  - 7042-CR4
  - 7310-CR4
  - 7310-C05
  - 7310-C06
  - 7042-C06
  - 7042-C07
  - 7315-CR3
  - 7310-CR3

For these HMC models, the new GUI function is automatically disabled. HMC operation then continues in the pre-existing mode for HMC models with less than 2 GB of memory.

Eligible Power Systems Software

The Power Systems Software in Table 3 is eligible for use with Power Enterprise Pools.

Table 3 Power Systems Software that can be used with Power Enterprise Pools

IBM product identifier	Description
5765-G62	AIX V6.1 Standard Edition
5765-AEZ	AIX V6.1 Enterprise Edition
5765-G98	AIX V7.1 Standard Edition
5765-G99	AIX V7.1 Enterprise Edition
5761-SS1	IBM i V6.1
5770-SS1	IBM i V7.1
5765-SEP	Systems Director Standard Edition
5765-EMP	VMControl Enterprise Edition
5765-SKC	SmartCloud Entry
5765-PSE	IBM PowerSC™ Standard
5765-PVS	IBM PowerVM® V2 Standard
5765-PVE	IBM PowerVM V2 Enterprise
5761-HAS	IBM PowerHA® for i V6.1
5770-HAS	PowerHA IBM SystemMirror® for i V7.1
5765-H23	PowerHA for AIX V6 Standard
5765-H24	PowerHA for AIX V6 Enterprise
5765-H39	PowerHA for AIX V7 Standard
5765-SLE	IBM PowerVP™ Standard Edition
5765-VCX	PowerVC Express Edition
5765-VCS	PowerVC Standard Edition

Working with Power Enterprise Pool HMCs

Setting a new master HMC for a Power Enterprise Pool can occur in the following scenarios:

- The master HMC for a Power Enterprise Pool is up and running, and there is a backup master HMC that is defined for the pool. To perform the operation, at least one server in the pool must be in standby or operating state and connected to both the master HMC and the backup master HMC. The current master HMC must be able to communicate with the backup master HMC.

  To begin the process, click **Set as Master** from the master HMC. During the process, the master HMC transfers the current HMC CoD history log for the pool to the backup master HMC.

- The master HMC for a Power Enterprise Pool is not up and running, and there is a backup master HMC that is defined for the pool. The user is allowed to set a new master HMC from the backup master HMC. To perform the operation, at least one server in the pool must be in standby or operating state and connected to the backup master HMC. If the backup master HMC maintained an active network connection to the master HMC, the pool data is up-to-date, and the backup master HMC can be set as the master HMC. Otherwise, the backup master HMC can be set only as the master HMC if the user enters the latest pool configuration file. This is the only way that the backup master HMC is ensured to re-create the latest pool configuration.

  The master HMC CoD history log cannot be transferred, and a new HMC CoD history log is started for the pool on the backup master HMC after it becomes the master HMC.

- When no backup master HMC is defined for the pool and the master HMC is not available, you must use the latest configuration file for the pool to set a new master HMC. To do this, click **Create Pool** to import the configuration file.

Creating a Power Enterprise Pool

Before you begin this exercise, see “Requirements and specifications” on page 6, and see Table 2 on page 7 for the field descriptions that are necessary for completing this procedure. To begin creating a Power Enterprise Pool, complete the following steps:

1. Open a session on the HMC that manages your hosts.
2. Expand the Systems Management section and click **Power Enterprise Pools**. The Power Enterprise Pools GUI opens.

3. Click **Create Pool**, and the main Power Enterprise Pools window opens, as shown in Figure 1.

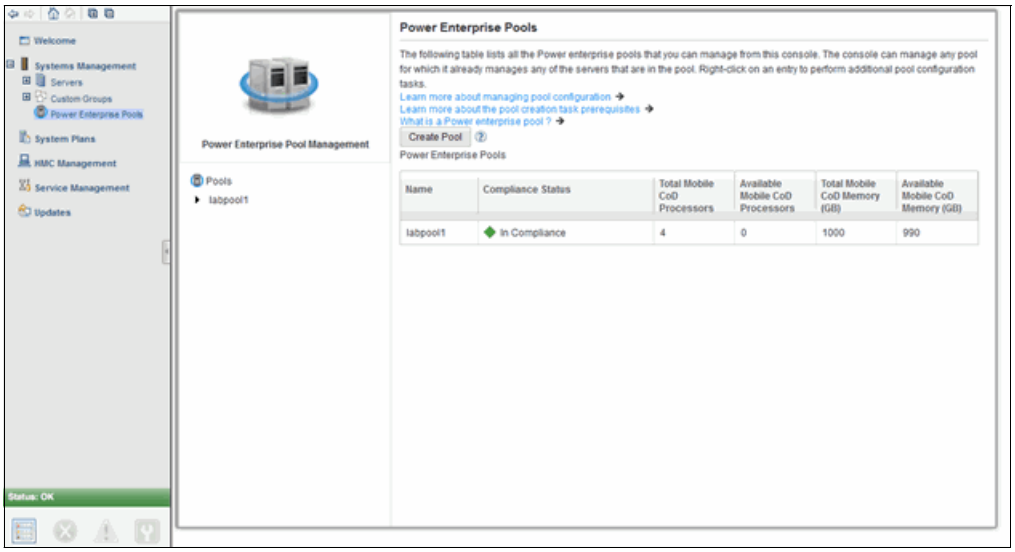

Figure 1 Power Enterprise Pools main window

4. Click **Create Pool**, and the Create Power Enterprise Pool wizard starts.
5. Enter a name for the storage pool, as shown in Figure 2.

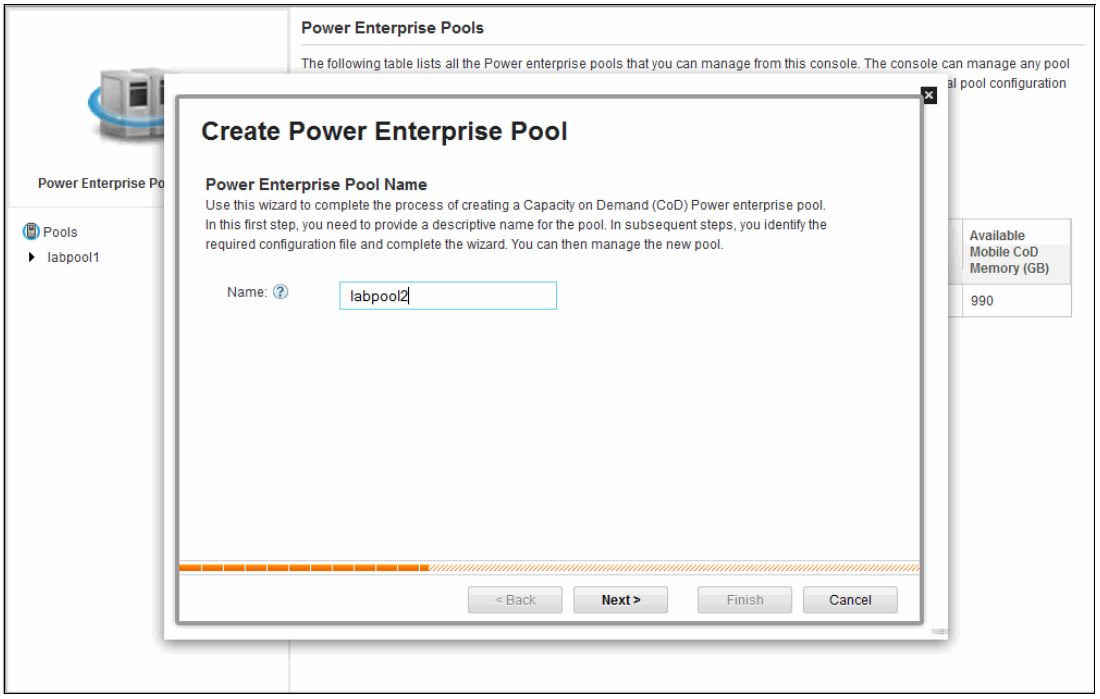

Figure 2 Create Power Enterprise Pool wizard

6. Click **Next**.
7. Click **Browse** to find the configuration file, and then click **Upload**, as shown in Figure 3 on page 11.

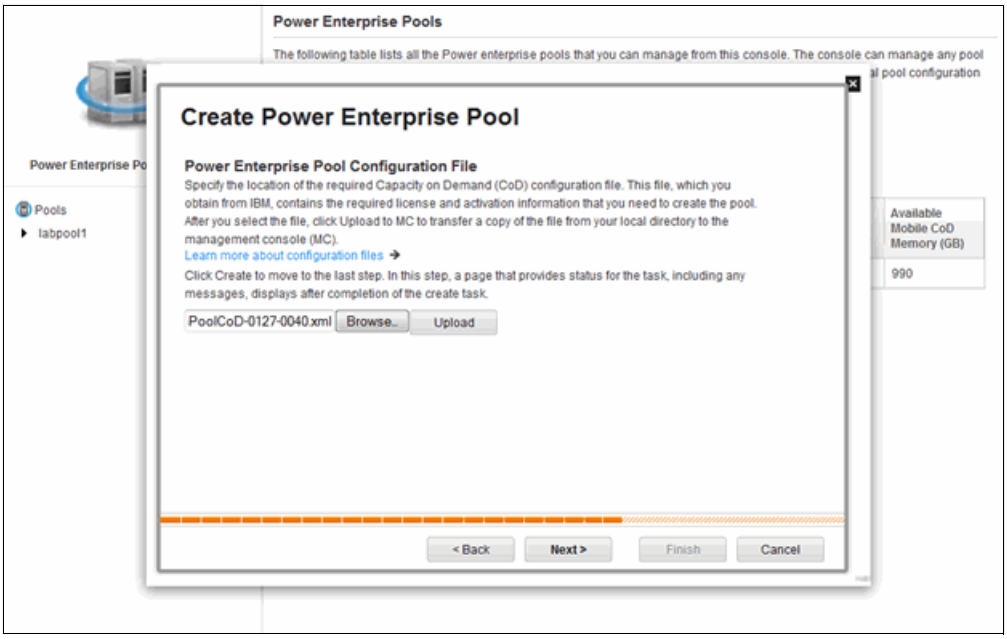

Figure 3 Upload the configuration file

For more information about the configuration file, see *IBM PowerVM Enhancements What is New in 2013*, SG24-8198.

8. When the upload completes, click **Next**, and the HMC creates the pool.

   After the pool is created, the HMC shows information about the memory and activation codes for the new pool, as shown in Figure 4.

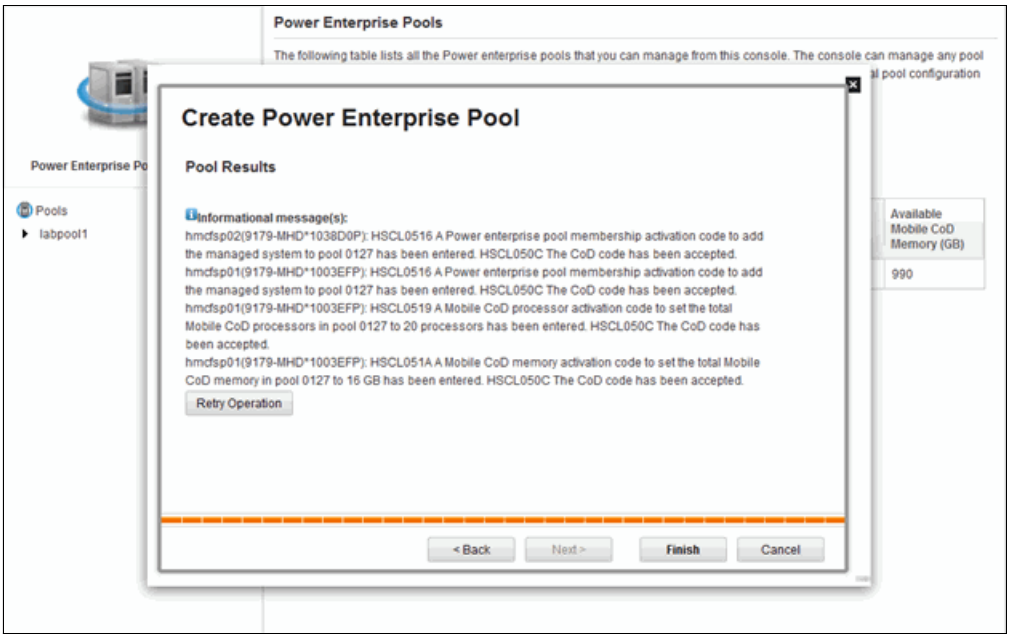

Figure 4 Confirmation of memory and activation codes

9. Click **Finish**, and then refresh the Power Enterprise Pool view. The new pool appears in the list of existing pools, as shown in Figure 5.

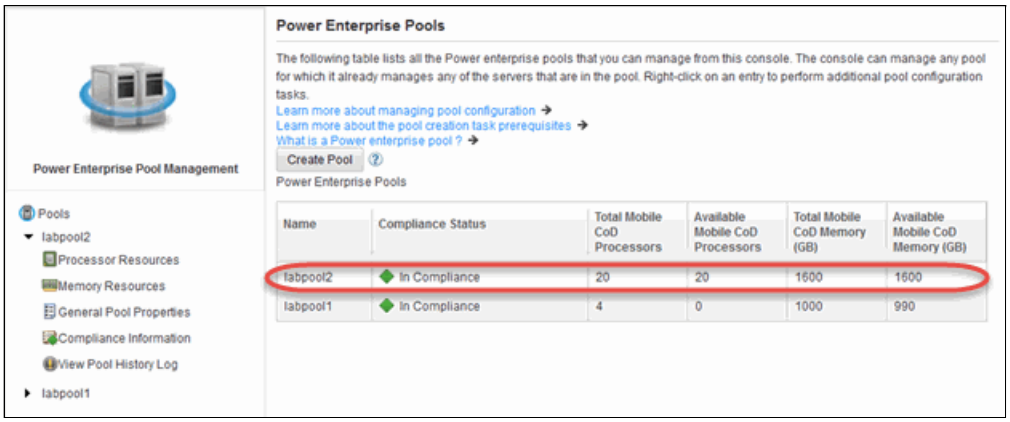

Figure 5 A new Power Enterprise Pool is created

Table 4 describes the fields that are shown in Figure 1 on page 10 through Figure 5.

Table 4 Power Enterprise Pool fields

Field	Description
Name	Name for the Power Enterprise Pool
Compliance Status	Describes the compliance status for the pool. Here are the possible values are: ► In compliance ► Approaching out of compliance (within server grace period) ► Out of compliance (within pool grace period) ► Out of compliance ► Not available (NA)
Total Mobile CoD Processor	Number of Mobile CoD Processors that are assigned to the Power Enterprise Pool.
Available Mobile CoD Processors	Number of Mobile CoD Processors that are available for the Power Enterprise Pool.
Total Mobile CoD Memory (GB)	Amount of Mobile CoD Memory that is assigned to the Power Enterprise Pool.
Available Mobile CoD Memory (GB)	Amount of Mobile CoD Memory that is available for the Power Enterprise Pool.

Resetting your master HMC

All operations that are related to controlling Power Enterprise Pool HMCs are carried out from the Power Enterprise Pools management window, as shown in Figure 6 on page 13, including resetting your master HMC

To reset your master HMC, complete the following steps:

1. From a master HMC for a pool, click **Systems Management** → **Power Enterprise Pools**.

   Figure 6 on page 13 shows the HMC interface where the Power Enterprise Pools selection is shown in the navigation pane on the left and the main Power Enterprise Pools management window is shown in the navigation pane on the right.

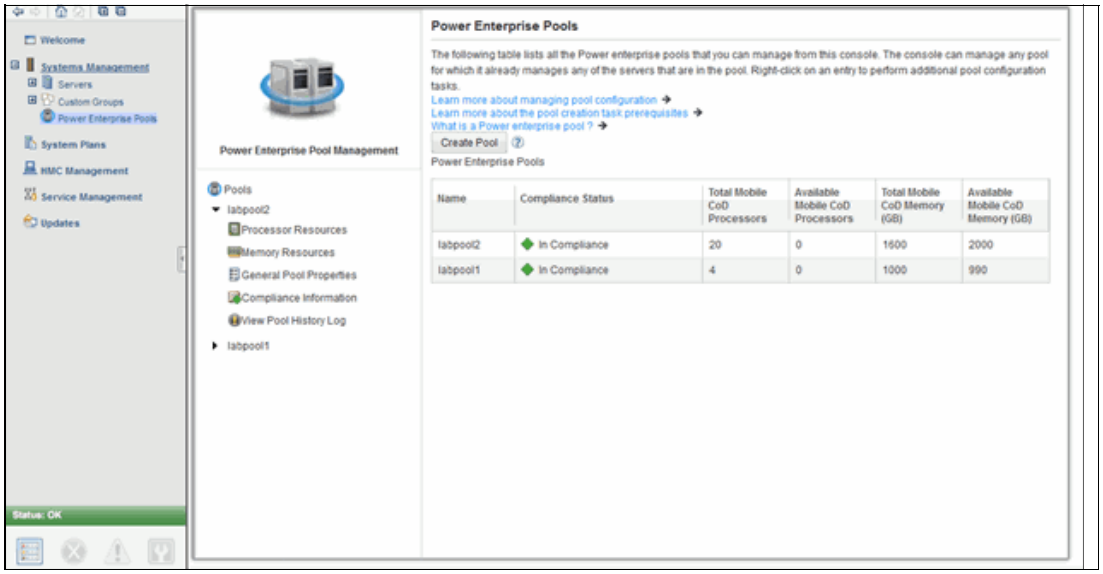

Figure 6 HMC Power Enterprise Pools main window

2. In the left navigation pane in the window that is shown in Figure 6, select the name of the pool that you want to manage to expand the management options for that pool.

   Figure 7 shows the management options and General Pool Properties for the pool named labpool2.

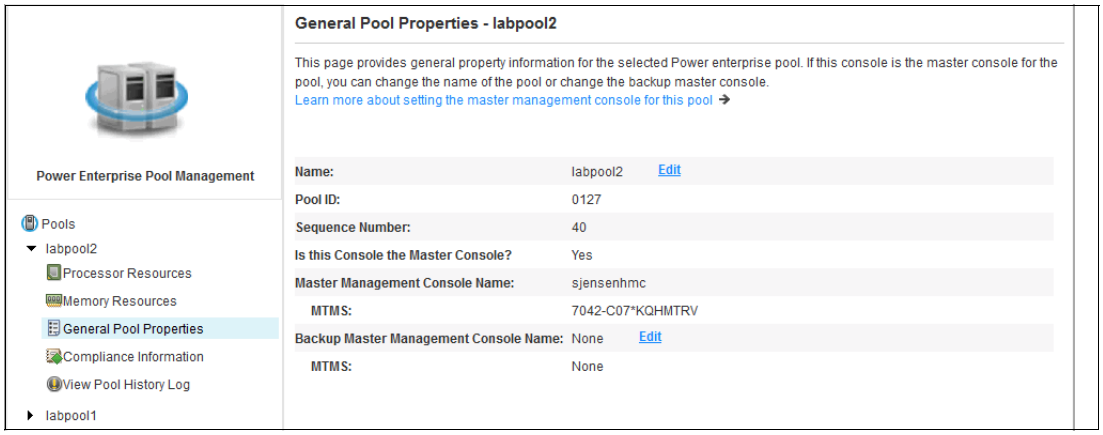

Figure 7 Pool labpoo2 General Pool Properties management option

3. To set a new master HMC for a pool, use the GUI to complete the applicable scenario that is described in “Working with Power Enterprise Pool HMCs” on page 9.

Processor resource management

This section guides you through the Processor Resources management tasks. Table 5 defines the primary fields that are needed to complete this procedure. To begin, expand the menu tree under the Power Enterprise Pool name and click **Processor Resources**, as shown in Figure 8.

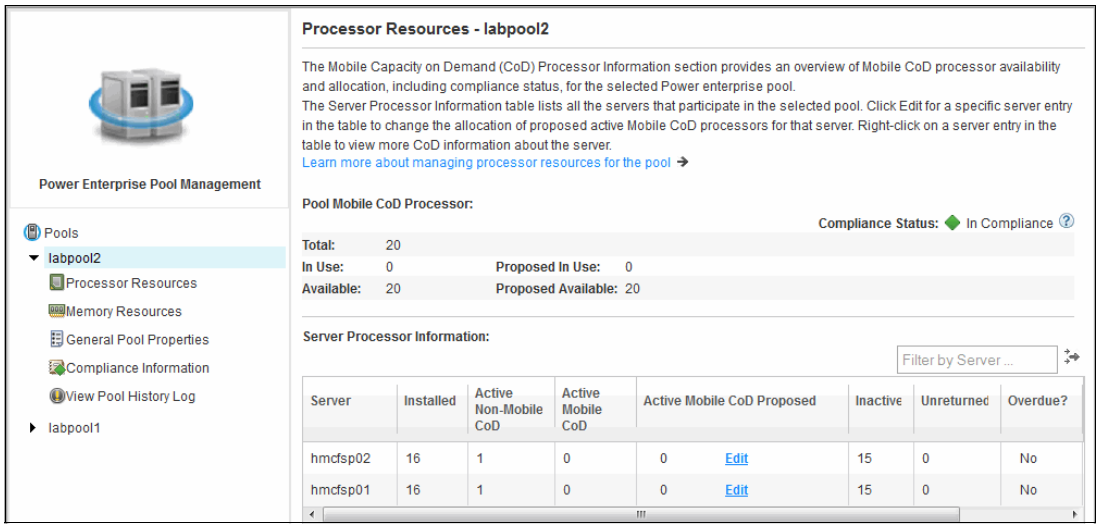

Figure 8 View of processor resources

The Pool Mobile CoD Processor section shows information about the pool and its resources. Table 5 defines the compliance status fields.

Table 5 Compliance status fields

Values	Description
In compliance	None of the servers in the pool have any unreturned Mobile CoD resources.
Approaching out of compliance (within server grace period)	At least one server in the pool has Mobile CoD resources that are unreturned, and the server grace period for those resources is not expired. None of the servers in the pool have Mobile CoD resources that are unreturned and overdue.
Out of compliance (within pool grace period)	At least one server in the pool has overdue, unreturned Mobile CoD resources, and the pool grace period is unexpired.
Out of compliance	At least one server in the pool has overdue, unreturned Mobile CoD resources, and the pool grace period is expired.
Not available (NA)	Compliance status is not available (NA) because no connection exists between the HMC (from where the Processor Resource section is being accessed) and the master HMC for the pool. Because of the lack of connection between the HMCs, other pool information is not available either. Unavailable information has a value of *NA*.

Table 6 on page 15 provides explanations about the rest of the components of the Pool Mobile CoD Processor section.

Table 6 Pool mobile CoD processor fields

Field name	Description
Total	The total number of Mobile CoD processors that are entitled to the pool.
In Use	The number of Mobile CoD processors that are assigned to servers in the pool. The number of unreturned Mobile CoD processors is not included in this count.
Available	The number of Mobile CoD processors that are available to be assigned to servers in the pool.
Proposed in Use	The number of Mobile CoD processors that are assigned to servers in the pool. This dynamic value changes immediately based on any change you make to an Active Mobile CoD Proposed value for a server.
Proposed Available	This value is the number of Mobile CoD processors that are available to be assigned to servers in the pool. This dynamic value changes immediately based on changes in the Proposed in Use value.

Table 7 provides information about each field in the Server Processor Information section.

Table 7 Server processor fields

Field name	Description
Active Non-Mobile CoD	The number of licensed processors that are on the server, not including Mobile CoD processors.
Active Mobile CoD	The number of Mobile CoD processors that are currently allocated to the server. The number of unreturned Mobile CoD processors are not included in this number.
Active Mobile CoD Proposed	The number of Mobile CoD processors that are currently allocated to the server.
Inactive	The number of unlicensed processors that are on the server. These processors are available to be licensed as Mobile CoD processors.
Unreturned	The number of unreturned Mobile CoD processors that are on the server.
Overdue	The overdue status of any unreturned Mobile CoD processors that are on the server. Unreturned Mobile CoD processors become overdue after the grace period timer expires for unreturned Mobile CoD processors on the server. If unreturned Mobile CoD processors are overdue, the pool is out of compliance.

Sharing the allocation of CoD processors within a pool

To change the allocation of CoD processors for a server, change the *Active Mobile CoD Proposed* value for the server. Changing this value affects the *Proposed in Use value* and the *Proposed Available* value. These values update immediately to reflect changes that are made to the *Active Mobile CoD Proposed* value.

Processor allocation guidelines

Here are the processor allocation guidelines:

- You can add Mobile CoD processors only to servers with unlicensed processors.
- When you add a Mobile CoD processor to a server, it is used first to satisfy any unreturned Mobile CoD processors on that server.

- If the pool is out of compliance and the grace period timer for the pool has expired, you can add Mobile CoD processors only to servers that have unreturned processors. Also, you cannot add more processors than the number of unreturned Mobile CoD processors on that server.
- If you remove Mobile CoD processors from a server that the server cannot reclaim because the processors are still in use, these processors become unreturned processors. A grace period timer then starts for the unreturned Mobile CoD processors on that server. If you do not free the unreturned Mobile CoD processors so that the server can reclaim them before the grace period expires, the pool becomes out of compliance.

Here are additional processor allocation guidelines for a server that has a state of *No Connection, Pending Authentication,* or *Failed Authentication*:

- You must confirm any add processors and remove processor operations.
- You can add Mobile CoD processors only to a server with unreturned Mobile CoD processors. The number of processors that you add cannot exceed the number of unreturned Mobile CoD processors on that server.
- You can remove Mobile CoD processors from a server. The Mobile CoD processors that you remove from the server become unreturned, and a grace period timer starts for these processors. If you do not reconnect the server to the master HMC before the grace period expires, the pool becomes out of compliance.

Here are additional processor allocation guidelines for a server that has a state of *Power Off, Power Off In Progress, Error,* or *Initializing*:

- You cannot add Mobile CoD processors to the server.
- You can remove Mobile CoD processors from a server and the processors are reclaimed immediately.

Here are additional processor allocation guidelines for a server that has a state of *Incomplete* or *Recovery* and the server is powered on:

- You can add Mobile CoD processors only to a server with unreturned Mobile CoD processors. The number of processors that you add cannot exceed the number of unreturned Mobile CoD processors on that server.
- You can remove Mobile CoD processors from the server.

How to share a Mobile CoD processor

To share a Mobile CoD processor, complete the following steps:

1. Select the destination server for the CoD and click **Edit**. A dialog box opens.
2. Enter a value (or select a preferred value) and click **Save**, as shown in Figure 9 on page 17.

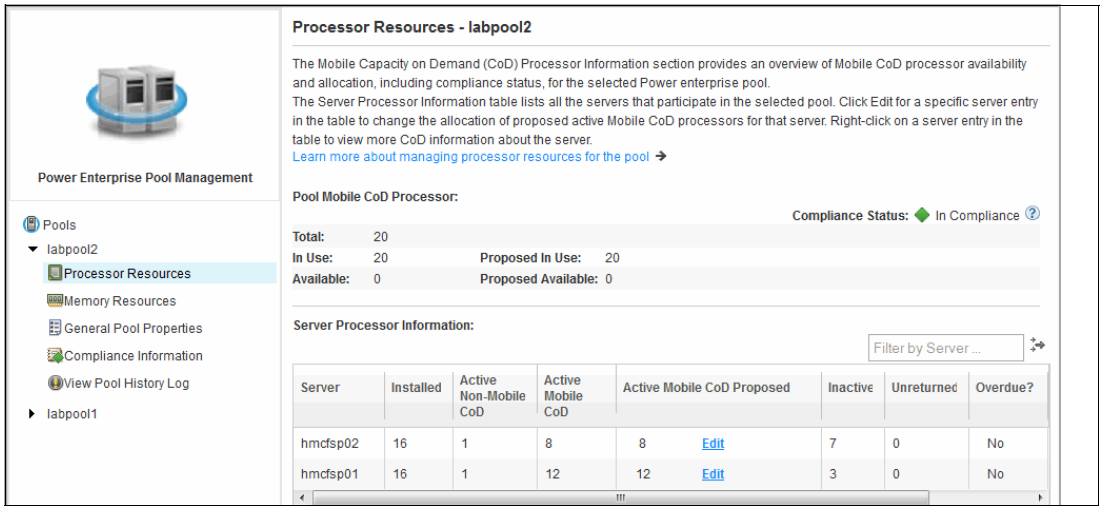

Figure 9 Sharing Mobile CoD processors

Memory resource management

This section guides you through the Memory Resources management tasks. To begin, expand the Power Enterprise Pool and click **Memory Resources** to open the window that is shown in Figure 10. Table 8 on page 18 and Table 9 on page 18 define the primary fields that are needed to complete this procedure.

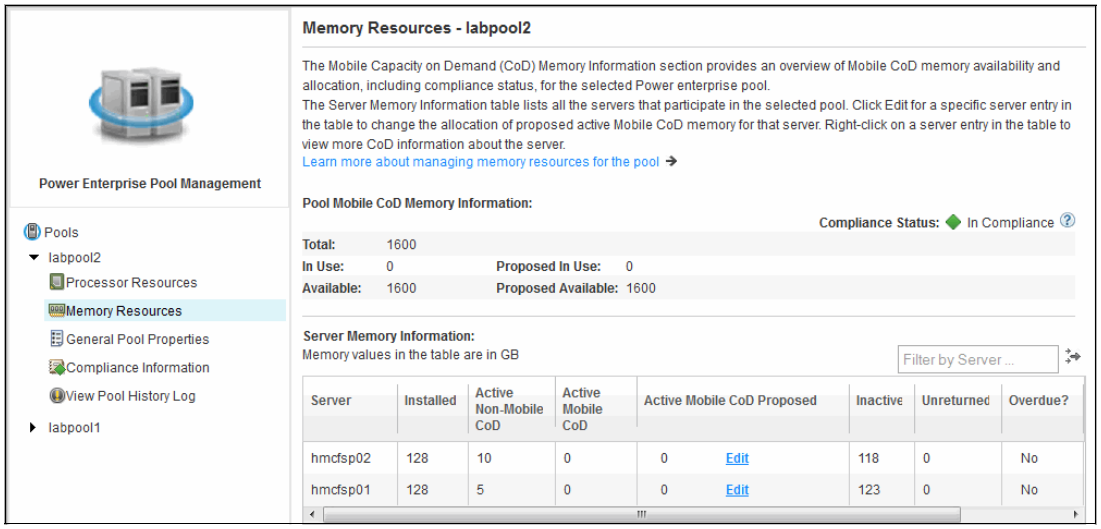

Figure 10 Memory resource view

The Pool Mobile CoD Memory section shows the information about the pool and its resources. Table 5 on page 14 provides explanations about the compliance status values.

Table 8 defines the remaining components of the Pool Mobile CoD Memory section.

Table 8 Pool mobile CoD memory fields

Field Name	Description
Total	The total Mobile CoD memory that is entitled to the pool.
In Use	The amount of Mobile CoD memory that is assigned to servers in the pool. The amount of unreturned Mobile CoD memory is not included in this count.
Available	The amount of Mobile CoD memory that is available to be assigned to servers in the pool.
Proposed in Use	The amount of Mobile CoD memory that is assigned to servers in the pool. This dynamic value changes immediately based on any change that you make to an Active Mobile CoD Proposed value for a server.
Proposed Available	The amount of Mobile CoD memory that is available to be assigned to servers in the pool. This dynamic value changes immediately based on changes in the Proposed in Use value.

Table 9 provides information about the fields in the Server Memory Information table.

Table 9 Server memory information

Field Name	Description
Active Non-Mobile CoD	The amount of licensed memory that is on the server, not including Mobile CoD memory.
Active Mobile CoD	The amount of Mobile CoD memory that currently is allocated to the server. The amount of unreturned Mobile CoD memory is not included in this number.
Active Mobile CoD Proposed	The amount of Mobile CoD memory that currently is allocated to the server.
Inactive	The amount of unlicensed memory that is on the server. This memory is available to be licensed as Mobile CoD processors.
Unreturned	The amount of unreturned Mobile CoD memory that is on the server.
Overdue	The overdue status of any unreturned Mobile CoD memory that is on the server. Unreturned Mobile CoD memory becomes overdue after the grace period timer expires for unreturned Mobile CoD memory on the server. If unreturned Mobile CoD memory is overdue, the pool is out of compliance.

Sharing memory CoD within a pool

To change the allocation of CoD memory for a server, change the Active Mobile CoD Proposed value for the server. Changing this value affects the Proposed in Use value and the Proposed Available value. These values update immediately to reflect the change that you made to the Active Mobile CoD Proposed value.

Memory allocation guidelines

Here are the memory allocation guidelines:

- You can add Mobile CoD memory only to servers with unlicensed memory.
- When you add Mobile CoD memory to a server, it is used first to satisfy any unreturned Mobile CoD memory on that server.

- If the pool is out of compliance and the grace period timer for the pool is expired, you can add Mobile CoD memory only to servers that have unreturned memory. Also, you cannot add more memory than the amount of unreturned Mobile CoD memory on that server.
- If you remove Mobile CoD memory from a server that the server cannot reclaim because the memory is still in use, this memory becomes unreturned memory. A grace period timer then starts for the unreturned Mobile CoD memory on that server. If you do not free the unreturned Mobile CoD memory so that the server can reclaim the memory before the grace period expires, the pool becomes out of compliance.

Here are additional memory allocation guidelines for a server that has a state of No Connection, Pending Authentication, or Failed Authentication:

- You must confirm any add and remove memory operations.
- You can add Mobile CoD memory only to a server with unreturned Mobile CoD memory. The amount of memory that you add cannot exceed the amount of unreturned Mobile CoD memory on that server.
- You can remove Mobile CoD memory from a server. The Mobile CoD memory that you remove from the server becomes unreturned and a grace period timer starts for this memory. If you do not reconnect the server to the master HMC before the grace period expires, the pool becomes out of compliance.

Here are additional memory allocation guidelines for a server that has a state of Power Off, Power Off In Progress, Error, or Initializing:

- You cannot add Mobile CoD memory to the server.
- You can remove Mobile CoD memory from a server and the memory is reclaimed immediately.

Here are additional memory allocation guidelines for a server that has a state of Incomplete or Recovery and the server is powered on:

- You can add Mobile CoD memory only to a server with unreturned Mobile CoD memory. The amount of memory that you add cannot exceed the amount of unreturned Mobile CoD memory on that server.
- You can remove Mobile CoD memory from the server.

How to share Mobile CoD memory

To share Mobile CoD memory, complete the following steps:

1. Select the destination server for the CoD and click **Edit**. A dialog box opens.
2. Select the preferred value and click **Save**, as shown in Figure 11.

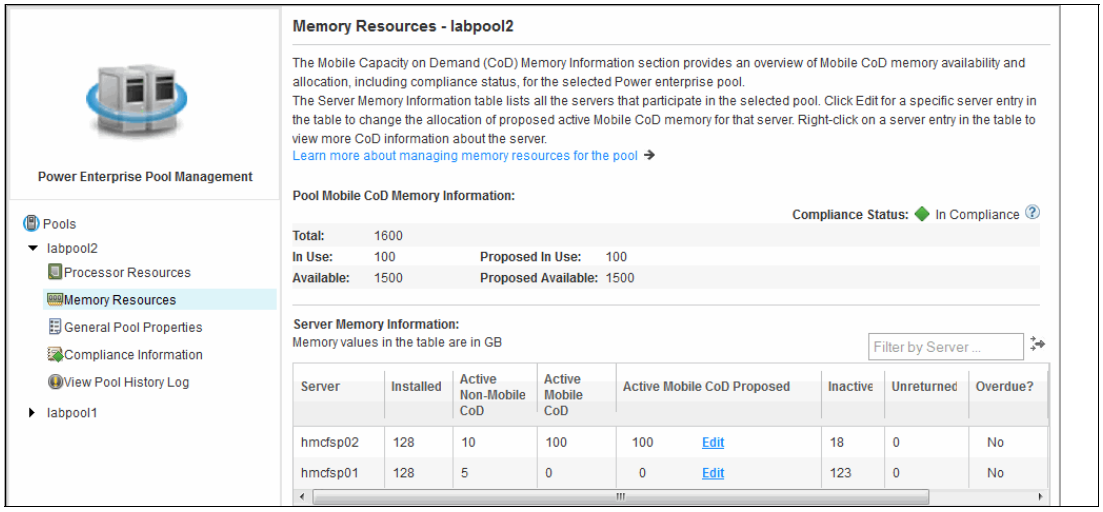

Figure 11 Sharing Mobile CoD memory

Power Enterprise Pool properties

Power Enterprise Pool properties show information about the pool, as shown in Figure 12.

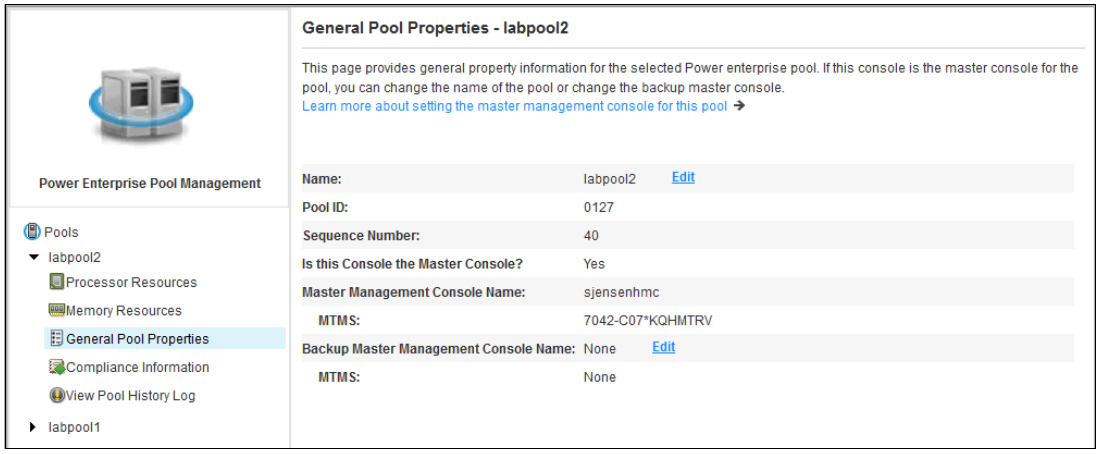

Figure 12 General Pool Properties

From this view, it is possible to change the pool name by clicking the **Edit** link beside the pool name. In addition, you can change the Backup Master Management Console by clicking the **Edit** link. You can type the name of the Backup Master Management Console or select it from the drop-down list, as shown in Figure 13 on page 21.

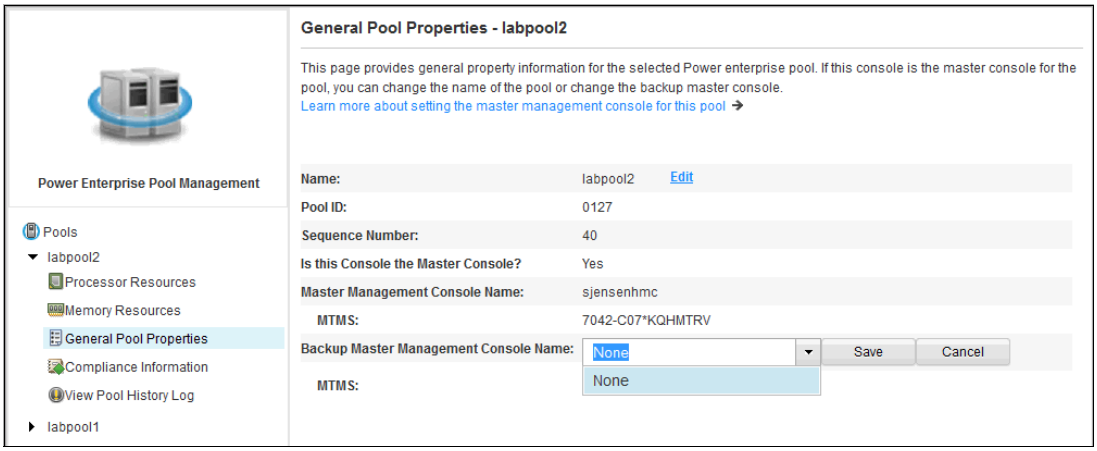

Figure 13 Set a backup master management console

Power Enterprise Pool compliance information

This view shows information about the compliance status of the pool. For more information about compliance status, see Table 5 on page 14.

Figure 14 shows the Compliance Information view for a selected pool.

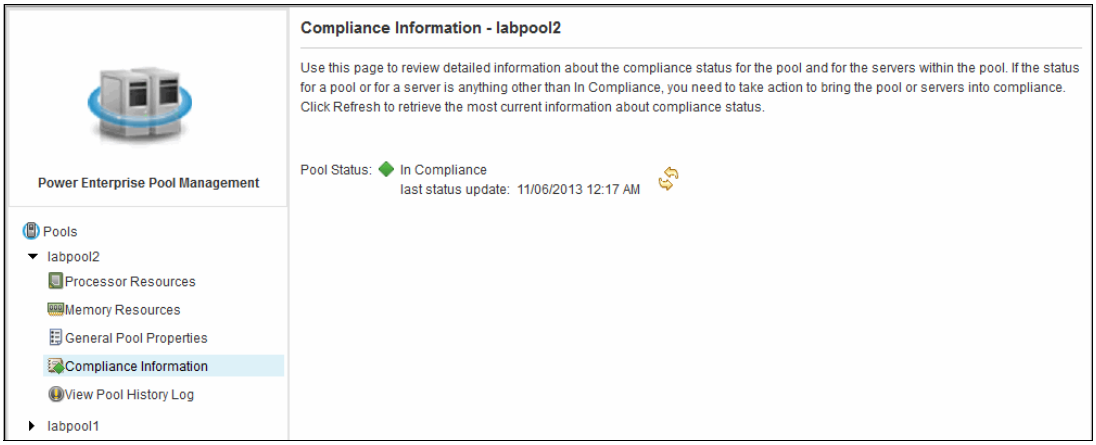

Figure 14 Compliance Information view

Product integration

Power Enterprise Pools can be configured on the following products:

- IBM Power Virtualization Center (PowerVC)
- IBM Power Virtualization Performance (PowerVP)
- Power Integrated Facility for Linux (Power IFL)
- Virtual I/O Server (VIOS) 2.2.3
- Virtual I/O Server Performance Advisor
- PowerVM Live Partition Mobility

Note: The server evacuation and live partition mobility features are included in the HMC V7.8.8 upgrade.

For more information about the integration of Power Enterprise Pools with these products, see the following website:

http://www.redbooks.ibm.com/abstracts/tips1169.html

Related information

For more information, see the following resources:

- *5765-PVS IBM PowerVM Standard Edition and PowerVM Enterprise Edition V2.2* (sales manual):

  http://www.ibm.com/common/ssi/ShowDoc.wss?docURL=/common/ssi/rep_sm/s/897/ENUS5765-PVS/index.html&lang=en&request_locale=en

- *5765-SLE IBM PowerVP Standard Edition V1.1* (sales manual):

  http://www.ibm.com/common/ssi/ShowDoc.wss?docURL=/common/ssi/rep_sm/e/897/ENUS5765-SLE/index.html&lang=en&request_locale=en

- *5765-VCS IBM PowerVC Standard Edition V1.2* (sales manual; also includes descriptions of IBM PowerVC Express Edition):

  http://www.ibm.com/common/ssi/ShowDoc.wss?docURL=/common/ssi/rep_sm/s/897/ENUS5765-VCS/index.html&lang=en&request_locale=en

- IBM Offering Information (announcement letters and sales manuals)

  http://www.ibm.com/common/ssi/index.wss?request_locale=en

  On this page, enter the product, select the information type, and then click **Search**. On the next page, narrow your search results by geography and language.

- *IBM Power Systems feature new enterprise and HMC enhancements*, found at:

  http://www.ibm.com/common/ssi/ShowDoc.wss?docURL=/common/ssi/rep_ca/2/877/ENUSZG13-0302/index.html&lang=en&request_locale=en

- IBM Power System Pools:

  http://www.ibm.com/systems/power/hardware/systempools/

- IBM Power Systems (product page):

  http://www.ibm.com/systems/power/

- *IBM PowerVC Version 1.2 Introduction and Configuration*, SG24-8199:

  http://www.redbooks.ibm.com/abstracts/sg248199.html?Open

- *IBM PowerVM Enhancements What is New in 2013*, SG24-8198:

  http://www.redbooks.ibm.com/abstracts/sg248198.html?Open

- *IBM PowerVM for Growing Businesses: Managing and Monitoring a Virtual Environment*, TIPS1091:

  http://www.redbooks.ibm.com/abstracts/tips1091.html

- *IBM PowerVM for Growing Businesses: Reduce Total Cost of Computing, and More, in a Virtual Environment*, TIPS1099:

  http://www.redbooks.ibm.com/abstracts/tips1099.html

- *IBM PowerVM Virtualization Introduction and Configuration*, SG24-7940:

  http://www.redbooks.ibm.com/abstracts/sg247940.html
- *IBM PowerVM Virtualization Managing and Monitoring*, SG24-7590:

  http://www.redbooks.ibm.com/abstracts/sg247590.html
- *Implementing IBM Power Virtualization Center in Your Data Center*, TIPS1136:

  http://www.redbooks.ibm.com/abstracts/tips1136.html
- *New Power Enterprise Pools Add Mobility to Core and Memory Activations,* found at:

  http://www.ibmsystemsmag.com/aix/administrator/systemsmanagement/power_enterprise_pools/
- Power Enterprise Pools:

  http://www-01.ibm.com/support/knowledgecenter/api/redirect/powersys/v3r1m5/index.jsp?topic=%2Fp7ha2%2Fsystempool_cod.htm

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