



Power Systems  
Capacity on demand







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**Note**

Before using this information and the product it supports, read the information in “Notices,” on page 41.

This edition applies to IBM Hardware Management Console Version 7 Release 3.1.0 Maintenance Level 0 and to all subsequent releases and modifications until otherwise indicated in new editions.

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## Capacity on demand

Capacity on Demand (CoD) offerings allow you to dynamically activate one or more resources on your server as your business peaks dictate. You can activate inactive processors or memory units that are already installed on your server on a temporary and permanent basis.

This topic describes Capacity on demand capabilities for IBM® POWER6™ servers managed by the Hardware Management Console (HMC) Version 7 and later, and explains how to order and use each offering.

Capacity on demand offerings are available on select IBM servers. For ordering information, see the POWER6 machine type/model tables within each CoD offering section of this document. Some servers include a number of active and inactive resources. Active processors and active memory units are resources that are available for use on your server. Inactive processors and inactive memory units are resources that are included with your server, but are not available for use until you activate them.

This topic contains information about how to use Capacity on demand offerings with the Hardware Management Console (HMC) Version 7 Release 3.1.0 Maintenance Level 0 and later. This topic is also meant for users who are managing systems based on the POWER6 processor.

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## Capacity on Demand offerings

Learn the differences between the Capacity on Demand (CoD) offerings and learn basic information about each offering.

The following table provides a brief description of each CoD offering. Consult your IBM Business Partner or IBM sales representative to select the CoD offering most appropriate for your environment.

*Table 1. Capacity on Demand offerings*

Offering	Description
Capacity Upgrade on Demand “Capacity Upgrade on Demand” on page 5	You can permanently activate inactive processors and memory units by purchasing an activation feature and entering the provided activation code. You can do this without restarting your server or interrupting your business.
Trial Capacity on Demand “Trial Capacity on Demand” on page 10	You can evaluate the use of inactive processors, memory, or both, at no charge using Trial CoD. After it is started, the trial period is available for 30 power-on days.
On/Off Capacity on Demand “On/Off Capacity on Demand” on page 16	You can activate processors or memory units for a number of days by using the HMC to activate resources on a temporary basis.
Utility Capacity on Demand “Utility Capacity on Demand” on page 30	Utility CoD is used when you have unpredictable, short workload spikes. Utility CoD automatically provides additional processor capacity on a temporary basis within the shared processor pool. Use is measured in processor minute increments and is reported at the Utility CoD Web site.
Capacity BackUp “Capacity BackUp” on page 34	You can use Capacity BackUp to provide an off-site, disaster recovery server using On/Off CoD capabilities. The Capacity BackUp offering has a minimum set of active processors that can be used for any workload and a large number of inactive processors that can be activated using On/Off CoD in the event of a disaster. A specified number of no-charge On/Off CoD processor days is provided with Capacity BackUp.

Table 1. Capacity on Demand offerings (continued)

Offering	Description
PowerVM™ Editions (PowerVM)	PowerVM Editions (PowerVM Editions) deliver advanced virtualization functions for AIX®, Linux® and IBM i™ clients.
“PowerVM Editions” on page 35	<p>PowerVM Editions (PowerVM Editions) include the following offerings:</p> <ul style="list-style-type: none"> <li>• Micro-Partitioning™</li> <li>• Virtual I/O Server</li> <li>• Integrated Virtualization Manager</li> <li>• Live Partition Mobility</li> <li>• The ability to run x86 Linux applications on Power Systems</li> </ul> <p>PowerVM Editions (Express, Standard, and Enterprise) offer different capabilities. For more information about each each editions’ capabilities, see “PowerVM Editions” on page 35.</p>

## Preparing for Capacity on Demand

Capacity on Demand (CoD) allows you to activate processors and memory units on your server when your workload requires the additional resources. To prepare your server for CoD, consider how you would like to license your software and determine when you need to activate your resources. You also must plan for and set up your environment in preparation for CoD.

## Capacity on Demand software licensing considerations

As you select software for activating Capacity on Demand (CoD) resources, consider how you would like to license your software. Many methods are used to license software, such as per user, software tier, or per processor.

Typically a tool, such as a license manager, is used to manage the licenses. A license manager detects use of the software, compares it to the entitlement, and then takes action based on the results. A license manager can be provided by IBM or can be made available by the software provider.

This table shows Capacity on Demand software licensing considerations.

Table 2. Capacity on Demand software licensing considerations

Licensing Type *	Software type	Capacity Upgrade on Demand (permanent activations)	On/Off, Utility, and Trial CoD (temporary activations)
<b>Per user licensing</b>	<ul style="list-style-type: none"> <li>• IBM and non-IBM middleware</li> <li>• Independent software vendor (ISV) software</li> </ul>	No Charge - User entitlement does not change when inactive processors are permanently activated	No Charge - User entitlement does not change when inactive processors are temporarily activated
<b>Software tier licensing</b>	<ul style="list-style-type: none"> <li>• IBM and non-IBM middleware</li> <li>• ISV software</li> </ul>	No Charge - Tier entitlement does not change when inactive processors are permanently activated	No Charge - Tier entitlement does not change when inactive processors are temporarily activated
<b>Per processor licensing</b>	IBM i, AIX, Linux	Per activation charge - One processor entitlement must be purchased for each permanently activated processor assigned to a partition that uses the software.	No Charge - Processor entitlement does not change when inactive processors are temporarily activated. <b>Note:</b> This rule might not apply to Linux, see your Linux distributor for details.



Table 2. Capacity on Demand software licensing considerations (continued)

Licensing Type *	Software type	Capacity Upgrade on Demand (permanent activations)	On/Off, Utility, and Trial CoD (temporary activations)
Per processor licensing	IBM middleware	Per activation charge - One processor entitlement must be purchased for each permanently activated processor assigned to a partition that uses the software.	Daily user charge - One processor day of entitlement must be purchased each time that any number of inactive processors are temporarily activated.
*Note: It is possible that you use a combination of these licensing types. For details, consult the license agreement associated with your product.			

## Determining when to activate resources

Capacity on Demand provides the ability to activate processors and memory units on your server when your workload requires the additional resources. To determine when to activate additional processors or memory units and how many new resources you require, monitor your trends in CPU and memory utilization by using a performance tool. Several performance tools are available to report CPU utilization information.

To identify trends in your resource utilization, click the following links:

- Performance Management for IBM i
- Performance Management for Power Systems
- IBM Performance Management for Power Systems

When computing average usage of all available processors, the system functions that report CPU utilization do not include the inactive processors in the total amount of CPU capacity. The inactive processors are not considered active within the various system functions that report CPU utilization percentages. The percentage of used CPU capacity is a calculated metric based on the amount of time that the processor was active within an elapsed time. This capacity is typically reported as a percentage, where 100% indicates that the processor was busy for the entire elapsed time. When multiple processors are present, CPU time must be adjusted to represent the average usage of all processors, so utilization is always reported as the percentage of total available capacity.

## Processor sparing and memory sparing

Dynamic *processor sparing* is a feature that allows inactive processors to act as dynamic spares in environments with the Capacity on Demand offering. *Memory sparing* occurs when on-demand inactive memory is automatically activated by the system to temporarily replace failed memory until a service action can be performed.

Processor sparing helps minimize the impact to server performance caused by a failed processor. An inactive processor is activated if a failing processor reaches a predetermined error threshold, thus helping to maintain performance and improve system availability. Dynamic processor sparing happens dynamically and automatically when using dynamic logical partitioning (DLPAR) and the failing processor is detected prior to failure. If not detected prior to failure or when not using DLPAR, a reboot of the system or partition activates an alternate processor from the inactive spares. You can then re-establish required performance levels without waiting for parts to arrive on-site. Dynamic processor sparing does not require the purchase of an activation code; it requires only that the system have inactive CUoD processors available.

Memory sparing occurs only when inactive CoD memory is present in a system and when an entire memory feature becomes unusable. During an initial program load (IPL), failed memory parts are taken out of use and inactive CoD memory is activated in place of the failed part without operational intervention.

## Moving activations

You might want to move parts (processors or memory) between compatible systems in an attempt to rebalance your capacity.

Sometimes the movement of the resource requires both the movement of the physical component and the movement of the Capacity on Demand activation. Under these circumstances, a deactivation of the capacity on the source server is required as the processor or memory activation is being migrated.

It is not usual practice, but if the need arises to move activations, contact your appropriate Capacity on demand administrator at one of these e-mail addresses:




- IBM i: [icod@us.ibm.com](mailto:icod@us.ibm.com)
- Power Systems: [pcod@us.ibm.com](mailto:pcod@us.ibm.com)

## Planning for Capacity on Demand

Capacity planning for servers with inactive processors and memory units uses essentially the same procedures and resources that are used for sizing other servers. The set of tools, resources, and offerings available to help determine the required server capacity supports servers with inactive processors and memory units.

For information about pricing and to determine how much a particular Capacity on Demand activation costs, contact your IBM Business Partner or IBM sales representative for more information.

For help with capacity planning, refer to these resources:

- IBM Benchmark Center   
Use this Web site for help with benchmarking application environments.
- Systems solution center, Bangalore   
Systems solution center, Bangalore can help find the right solution to run your business and can link you with solution developers. Connect to IBM eServer™ solution options for your business needs across technologies and solution areas such as business intelligence, client relationship management, and enterprise software.
- IBM Systems Workload Estimator   
IBM Systems Workload Estimator to help you predict a possible server model processor, interactive feature, memory, and disk storage to purchase for a given workload.

## Setting up your environment for Capacity on Demand

Before you order any activation features, prepare your environment for integrating the additional capacity to ensure that your server is able to fully use the activated processors or memory.

To set up your environment for Capacity on Demand (CoD), you should:

- Prepare any logical partitions (LPAR)
- Perform any I/O conditioning
- Perform any disk upgrades

Newly activated processors are immediately available for use by uncapped logical partitions. You can choose to assign these processors to one or more logical partitions, except for processors that are

activated by using Utility CoD. If there are no uncapped partitions, you must assign these processors to one or more logical partitions to begin using them. You must also assign newly activated memory to one or more logical partitions to begin using the memory.

## Capacity Upgrade on Demand

Capacity Upgrade on Demand (CUoD) allows you to permanently activate one or more inactive processors or memory units without requiring you to restart your server or interrupt your business.

### Capacity Upgrade on Demand concepts

With Capacity Upgrade on Demand (CUoD), you can activate additional processors and memory units on selected servers by purchasing a permanent processor or memory unit activation feature. CUoD adds capacity for new workloads, which enables your server to adapt to unexpected performance demands.

Make sure that you have prepared your server before continuing. For more information, see “Preparing for Capacity on Demand” on page 2.

With appropriate planning, you can determine exactly when to activate CUoD based on your current and future workloads. Without appropriate planning and preparation, you might not obtain the maximum potential that is available through CUoD.

### Capacity Upgrade on Demand processors and memory units

This information lists the number of active and inactive processors and memory units available for each server model.

Your managed systems include a number of active processors and memory units. They can also include inactive processors and memory units. *Active* processors or memory units are processors or memory units that are already available for use on your server when it comes from the manufacturer. *Inactive* processors or memory units are processors or memory units that are included with your server, but not available for use until you activate them. Inactive processors and memory units can be permanently activated by purchasing an activation feature and entering the provided activation code on your server. For information about ordering, see “Ordering Capacity Upgrade on Demand activation features” on page 7.

The activation code is unique to your server and is posted at <http://www-912.ibm.com/pod/pod>.

Allow several days for order processing and activation code posting to take place.

These tables list the number of active and inactive processors and memory units that are available for each server model.

Table 3. IBM i Capacity Upgrade on Demand server features, processor features, and processor activation features

Machine type-model	Server <i>n</i> -core range active/total	Server feature	Active processors	Inactive processors	Processor feature x quantity	CUoD processor activation feature (priced/zero priced)
9406-MMA	1/4	4910	1	3	7380 x 2	5403/7783
9406-MMA	2/8	4911	2	6	7380 x 4	5403/7783
9406-MMA	4/16	4912	4	12	7380 x 8	5403/7783
9406-MMA	1/8	4923	1	7	7380 x 4	5403/7783
9406-MMA	2/16	4924	2	14	7380 x 8	5403/7783
9408-M25	1/2	4930	1	1	4986 x 1	5677/5654
9409-M50	2/4	4920	2	2	4966 x 2	4946/4986

Table 4. Power Systems Capacity Upgrade on Demand processor features and processor activation features

Machine type-model	Server n-core range	Processor feature n-core	Processor feature	CUoD processor activation feature (priced/zero priced)
9117-MMA	2/16	0/2	5620 (3.5 GHz,DDR2 12X)	5670
9117-MMA	2/16	0/2	5621 (4.2 GHz,DDR2 8x)	5671
9117-MMA	2/16	0/2	5622 (4.2 GHz,DDR2 12x)	5672
9117-MMA	2/16	0/2	7380 (4.7 GHz,DDR2 12x)	5403
9117-MMA	2/16	0/2	7388 (5.0 GHz,DDR2 12x)	7306
9117-MMA	2/16	0/2	7387 (4.4 GHz, DDR2 12x)	7719
9117-MMA	4/32	0/4	7540 (4.2GHz, DCM DDR2 12x)	7700
9119-FHA	3/64	0/8	4694 (4.2GHz, DDR2)	4754
9119-FHA	3/64	0/8	4695 (5.0GHz, DDR2)	4755
9119-FHA	3/64	0/8	4705 (5.0GHz DDR2)	4755

Table 5. Power Systems Capacity Upgrade on Demand memory activation features

Orderable memory feature code	Description	Minimum activation	Server supported
5680	Activation of 1GB DDR2 POWER6 Memory	-	9117-MMA, 9119-FHA, 9406-MMA
5681	Activation of 256 GB DDR2 POWER6 Memory	-	9117-MMA, 9119-FHA, 9406-MMA
5692	0/2GB (4x512MB), DDR2, 667MHz, DIMMs	1 GB	9117-MMA , 9406-MMA
5693	0/4GB (4x1GB), DDR2, 667MHz, DIMMs	2 GB	9117-MMA, 9119-FHA, 9406-MMA
5694	0/8GB (4x2GB), DDR2, 667MHz, DIMMs	4 GB	9117-MMA, 9119-FHA, 9406-MMA
5695	0/16GB (4x4GB), DDR2, 533MHz, DIMMs	8 GB	9117-MMA, 9119-FHA, 9406-MMA
5696	0/32GB (4x8GB), DDR2, 400MHz, DIMMs	16 GB	9117-MMA, 9119-FHA, 9406-MMA
5697	0/64GB (4x16GB), DDR2, 400MHz, DIMMs	64 GB	9117-MMA, 9119-FHA
8129	0/256 GB MEMORY BUNDLE, 8 of FC 5696	128 GB	9117-MMA
8201	0/256 GB MEMORY BUNDLE, 32 of FC 5694	256 GB	9119-FHA
8202	0/256 GB MEMORY BUNDLE, 16 of FC 5695	256 GB	9119-FHA
8203	0/512 GB MEMORY BUNDLE, 32 of FC 5695	512 GB	9119-FHA
8204	0/512 GB MEMORY BUNDLE, 16 of FC 5696	512 GB	9119-FHA
8205	0/2.048 TB MEMORY BUNDLE , 32 of FC 5697	2.048 TB	9119-FHA

## Capacity Upgrade on Demand activation codes

After you decide to permanently activate some or all of your resources, you must order and purchase one or more activation features. When you order and purchase activation features, you are provided with one or more activation codes that you use to activate resources on your server.

When the order is placed, the order record is combined with vital product data (VPD) from your server. This information generates one or more activation codes that are specific to your server.

The activation codes are posted on an IBM Web site for quick access, usually within one business day (24 hours) after the order reaches the IBM manufacturing system. After your activation codes have been generated, you can access them by using your system type and serial number at the following Capacity on Demand Web site:

<http://www-912.ibm.com/pod/pod> 

To order activation features and receive activation codes, see “Ordering Capacity Upgrade on Demand activation features.”

## Ordering Capacity Upgrade on Demand activation features

You can order activation features for a new server, a server model upgrade, or an installed server. After you place your order, you will receive a code that activates inactive processors or memory units.

For a new server or a server model upgrade, your order can contain one or more activation features for processors or memory units, which results in one or more activation codes. In this case, the activation codes are entered before the server is sent to you.

When you order Capacity Upgrade on Demand (CUoD) activation features for an installed server, you must determine whether you want to permanently activate some or all of your inactive processors or memory units. You must order one or more activation features and then use the resulting one or more activation codes to activate your inactive processors or memory units.

### Notes:

- It can take several days to process an order. You can use a one-time no-charge Trial Capacity on Demand for 30 days to satisfy workload requirements while your order for permanent activation of additional capacity is being fulfilled. For more information, see “Ordering Trial Capacity on Demand” on page 10.
- An order for activation features will process more quickly if you do not include any miscellaneous features with the order.

To order one or more CUoD activation features:

1. Determine the number of inactive processors or memory units that you want to activate. For more information, see “Capacity Upgrade on Demand processors and memory units” on page 5.
2. Contact your IBM Business Partner or IBM sales representative to place your order for one or more activation features.

After ordering, see “Activating Capacity Upgrade on Demand” on page 8 to activate inactive resources permanently.

## Related concepts

“Trial Capacity on Demand” on page 10

Trial Capacity on Demand provides no-charge temporary capacity to enable you to test new function on your server.

## Using Capacity Upgrade on Demand

You can use the Hardware Management Console (HMC) or the Advanced System Management Interface (ASMI) to manage Capacity Upgrade on Demand (CUoD).


Most Capacity on Demand (CoD) tasks on the HMC require the HMC Super Administrator user role.

If you are not using the HMC, you can use the ASMI.

## Activating Capacity Upgrade on Demand

When you purchase one or more activation features, you will receive corresponding activation codes to permanently activate your inactive processors or memory units.

To permanently activate your inactive resources by retrieving and entering your activation code:

1. Retrieve the activation code by going to <http://www-912.ibm.com/pod/pod> .
2. Enter the system type and serial number of your server.
3. Record the activation code that is displayed on the Web site.
4. Enter your activation code on your server using the HMC. To enter your code:
  - a. In the navigation area of the HMC window, expand **Systems Management**.
  - b. Select **Servers**.
  - c. In the contents area, select the server on which you want enter your activation code.
  - d. Select **Tasks > Capacity on Demand (CoD) > Enter CoD Code**.
  - e. Type your activation code in the **Code** field.
  - f. Click **OK**.

Any newly activated processors are now available for use by uncapped logical partitions. If there are no uncapped logical partitions, you must assign the processors to one or more logical partitions in order to begin using the processors. Any newly activated memory must be assigned to one or more logical partitions to begin using the newly activated memory.

If your server is in the manufacturing default configuration, the server can begin using the newly activated processors or memory immediately after restarting your server operating system. Alternatively, you can dynamically assign the newly activated processors or memory to the default partition.

You can now begin using the new resources.

## Viewing settings for Capacity on Demand resources

You can use the Hardware Management Console (HMC) to view Capacity on Demand (CoD) settings.

You can see how many processors or memory units you have, how many are active, and how many are available for activation using CoD with these settings. You can also view information about your On/Off CoD processors and memory units, Trial CoD processors and memory units, and your Utility CoD processors.

To view the capacity settings for processors or memory, do the following:

1. In the navigation area of the HMC window, expand **Systems Management**.
2. Select **Servers**.
3. In the contents area, select the server on which you want to view capacity settings.

4. Select **Capacity on Demand**.
5. Select either **Processor** or **Memory**.
6. Select the CoD offering that you want to view.
7. Select **View Capacity Settings**.

### Viewing and saving Capacity on Demand code-generation information

You can view and save Capacity on Demand (CoD) code-generation information using the Hardware Management Console (HMC). You might need to do this if the CoD code that was provided for your server does not work.

You can view CoD code-generation information and save it to a file on a remote system or to a file on removable media. The information that is used to generate your CoD codes must exactly match the information that is shown on the HMC CoD Code Information window. To collect the information that is used to generate your CoD codes, use the CoD Code Information window to save the CoD code information to a file on a remote system or to a file on removable media. Then, you can either attach the file to an e-mail, or print the file and fax it to your CoD administrator.

To view and save CoD code-generation information:

1. In the navigation area of the HMC window, expand **Systems Management**.
2. Select **Servers**.
3. In the contents area, select the server on which you want to view and save the CoD code information.
4. Select **Tasks**.
5. Select **Capacity on Demand (CoD)**.
6. Select **Processors (or Memory)**.
7. Select the CoD offering you want to view or save.
8. Select **View Code Information**.
9. In the CoD Code Information window, click **Save** to save the CoD code information to a file on a remote system or to a file on removable media.
10. In the Save CoD Code Information panel, select one of these options, and then perform the tasks associated with that option.

Option	Description
<b>Save to a file on a remote system</b>	<ol style="list-style-type: none"> <li>1. Enter the remote system name, file name, user ID, and password.</li> <li>2. Click <b>OK</b> to save the CoD code information or click <b>Cancel</b> to exit the panel without saving the CoD code information.</li> </ol>
<b>Save to media</b>	<ol style="list-style-type: none"> <li>1. Click <b>OK</b>.</li> <li>2. Select the required device. These options might be included in the list (the list includes only those removable media devices that are available for use on the HMC): <ul style="list-style-type: none"> <li>• <b>Diskette drive</b></li> <li>• <b>Flash memory</b></li> <li>• <b>USB diskette drive</b></li> </ul> </li> <li>3. Click <b>OK</b> to save the CoD code-generation information, or click <b>Cancel</b> to exit the panel without saving the CoD code information.</li> </ol>

To fax or e-mail the CoD code information to your CoD administrator, use one of these options to send your information:

- Fax-to information:
  - **Send to:** Capacity on Demand Administrator
  - **Fax number:** 507-253-4553
  - **Location:** Rochester, Minnesota, U.S.
- Fax-from information:
  - **Customer name:**
  - **Customer contact name:**
  - **Customer address:**
  - **Customer phone number:**
  - **Customer fax number:**
- If you are using e-mail, send the electronic image of the code information in an e-mail to the appropriate address:
  - IBM i models: [icod@us.ibm.com](mailto:icod@us.ibm.com)
  - Power Systems models: [pcod@us.ibm.com](mailto:pcod@us.ibm.com)

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## Trial Capacity on Demand

Trial Capacity on Demand provides no-charge temporary capacity to enable you to test new function on your server.

### Related concepts

“Ordering Capacity Upgrade on Demand activation features” on page 7

You can order activation features for a new server, a server model upgrade, or an installed server. After you place your order, you will receive a code that activates inactive processors or memory units.

## Trial Capacity on Demand concepts

You can evaluate the use of inactive processors, memory, or both, at no charge with Trial Capacity on Demand (CoD).

After you start the CoD trial, the trial period is available for 30 power-on days. The trial period only advances while the server is powered on.

When action on your part is required after you implement this CoD offering, the HMC displays messages on the HMC desktop.

You can use the Hardware Management Console to stop a current CoD trial for processors or memory units before the trial automatically expires. If you choose to stop the trial before it expires, you cannot restart it and you forfeit any remaining days.


## Ordering Trial Capacity on Demand

If you need to test new functions or evaluate inactive processors, memory, or both processors and memory, order Trial Capacity on Demand.

An HMC is required to use Trial Capacity on Demand.

To order Trial CoD, do the following:

1. Click the following Trial Capacity on Demand Web Site link:

[https://www-912.ibm.com/tcod\\_reg.nsf/TrialCod?OpenForm](https://www-912.ibm.com/tcod_reg.nsf/TrialCod?OpenForm) 

2. Select a request based on your situation.



Before using Trial CoD, you must activate Trial Capacity on Demand. See “Activating Trial Capacity on Demand” to activate your inactive processors or memory.

## Using Trial Capacity on Demand

You must use the Hardware Management Console (HMC) to manage your Trial Capacity on Demand (CoD) activations.

Most Capacity on Demand (CoD) tasks on the HMC require the HMC Super Administrator user role.

### Activating Trial Capacity on Demand

You can activate your inactive processors or memory for a trial period by obtaining and entering a trial processor code or a trial memory code.

To activate Trial CoD, do the following:

1. Retrieve the activation code by going to the following Web address:

<http://www-912.ibm.com/pod/pod>  .

2. Enter your activation code on your server using the HMC. To enter your code:
  - a. In the navigation area of the HMC window, expand **Systems Management**.
  - b. Select **Servers**.
  - c. In the contents area, select the server on which you want enter your activation code.
  - d. Select **Tasks > Capacity on Demand (CoD) > Enter CoD Code**.
  - e. Type your activation code in the **Code** field.
  - f. Click **OK**.

Any newly activated processors are now available for use by uncapped logical partitions. If there are no uncapped logical partitions, you must assign the processors to one or more logical partitions in order to begin using the processors. Any newly activated memory must be assigned to one or more logical partitions to begin using the newly activated memory.

If your server is in the manufacturing default configuration, the server can begin using the newly activated processors or memory immediately after restarting your server operating system. Alternatively, you can dynamically assign the newly activated processors or memory to the default partition.

Before the trial period expires, you must either enter a Capacity Upgrade on Demand activation code to permanently activate the Trial CoD resources, or you must return the Trial CoD resources. For more information, see “Activating Capacity Upgrade on Demand” on page 8 or “Returning Capacity on Demand resources” on page 13.

### Stopping Trial Capacity on Demand

Trial Capacity on Demand ends when the trial period is over and the resources have been reclaimed by the server. You must return the resources before the trial period has ended.

For more information about returning CoD resources, see “Returning Capacity on Demand resources” on page 13. If your server is powered off or loses power before the resources are removed from the logical partitions, you might need to perform recovery actions to successfully power on your server. For more information, see “Recovery actions” on page 12.

Trial Capacity on Demand can also end when you enter a Capacity Upgrade on Demand activation code to permanently activate the processors or memory. For more information about permanently activating resources, see “Activating Capacity Upgrade on Demand” on page 8. For more information about Capacity Upgrade on Demand, see “Capacity Upgrade on Demand” on page 5.

### Stopping a current trial

You can use the HMC to stop a current Capacity on Demand trial for processors or memory units before the trial automatically expires. If you choose to stop the trial before it expires, you cannot restart it and you forfeit any remaining days.

Additional requests for Trial Capacity on Demand might be available from your Capacity on Demand administrator.

To stop a current Trial Capacity on Demand, follow these steps:

1. Return the trial resources. See “Returning Capacity on Demand resources” on page 13 for more information.
2. In the navigation area of the HMC window, expand **Systems Management**.
3. Select **Servers**.
4. In the contents area, select the server on which you want to stop Trial Capacity on Demand.
5. Select **Tasks**.
6. Select **Capacity on Demand (CoD)**.
7. Select either **Processor** or **Memory**.
8. Select **Trial CoD**.
9. Select **Stop**.
10. In the confirmation window, click **Yes** to stop the trial. Click **No** to cancel the request to stop the trial (the trial will remain active).

Trial Capacity on Demand is now stopped and cannot be restarted.

#### **Recovery actions:**

Perform these recovery actions in the event the server is powered off or loses power when there are unreturned Trial CoD or On/Off CoD resources. Unreturned Trial CoD resources result when the trial period ends before the Trial CoD resources have been removed from your logical partition. Unreturned On/Off CoD resources result when the On/Off CoD request expires before the On/Off CoD resources have been removed from your logical partition. These recovery actions need to be used to ensure that logical partitions that were running prior to the power off or loss of power are successfully powered on.

When a server is powered off or loses power, all unreturned Trial CoD or On/Off CoD resources are reclaimed by the server. As a result, when the server is powered back on, all logical partitions that were running prior to the power off or loss of power might not be able to be restarted since only licensed resources are available for use. Furthermore, when a logical partition is powered on, if there are not enough licensed resources to satisfy the logical partition’s memory or processor requirements, the power on of that logical partition will fail. The failure might result in an HMC message of HSCL03F4 (not enough processing resources to meet the allocation setting), or a system reference code of B2xx1150 or B2xx1230.

**Note:** The server can power on to standby mode only if you have specified that option prior to powering on your server.

To successfully power on those logical partitions, perform either step 1 or 2, or a combination of the 2 steps.

1. Reduce logical partition resources so that the total of logical partition resources across all logical partitions to be powered on does not exceed the total number of activated resources.
2. Enter new Capacity on Demand activation codes to satisfy these requirements. Additionally, start an On/Off CoD request (if On/Off CoD is still enabled) or enter a new Trial CoD activation code. If the On/Off CoD enablement is exhausted, a new On/Off CoD enablement code would need to be entered before doing a new On/Off CoD request.

## Returning Capacity on Demand resources

To return Trial Capacity on Demand (CoD) processors or memory, you must remove the processors or memory from the logical partitions to which they are assigned, thus making them available to be reclaimed by the server.

You do not need to remove the processors or memory from the same logical partitions to which they were assigned when you started your On/Off CoD request or Trial CoD. You can remove the processors or memory from any of your logical partitions.

It is best to remove processors or memory from a logical partition when the logical partition is running.

Logical partitions that are not activated might still have processors and memory assigned to them. To remove processors or memory from a logical partition that is not activated, you have these options:

- Modify a partition profile for the logical partition to reduce the number of processors or memory, and then activate the logical partition by using the modified partition profile.
- Delete the logical partition.

## Entering a Capacity Upgrade on Demand activation while running Trial Capacity on Demand

To manage the permanent activation of resources while running under a Trial Capacity on Demand (CoD) activation, you select your option based on the number of resources that you would like to activate.

The following describes each option:

- When the number of resources to be permanently activated is equal to the number of resources that are activated by Trial CoD, these options are presented to convert the trial resource activations into permanent resource activations when the permanent activation code is entered on the Hardware Management Console (HMC):

Option	Description
Yes	The conversion occurs immediately (dynamic conversion from trial resources to permanent resources).
No	<ul style="list-style-type: none"><li>• If there are enough inactive resources (not trial or permanent), the permanent activation will be accomplished using the inactive resources that are currently installed on the system.</li><li>• If there are not enough inactive resources to satisfy the request, the permanent activation will not be accepted.</li></ul>

- When the number of resources to be permanently activated is greater than the number of resources activated through Trial CoD and there are enough inactive resources plus the trial resources to satisfy the permanent activation, these options are presented to convert the trial resource activations into permanent resource activations when the permanent activation code is entered on the HMC:

Option	Description
Yes	The conversion occurs immediately (dynamic conversion from trial resources to permanent resources using as many inactive resources as necessary).

Option	Description
No	<ul style="list-style-type: none"> <li>• If there are enough inactive resources (not trial or permanent), the permanent activation will be accomplished using the inactive resources that are currently installed on the system.</li> <li>• If there are not enough inactive resources to satisfy the request, then the permanent activation will not be accepted. You should stop the Trial CoD request before attempting to permanently activate resources.</li> </ul>

- When the number of resources to be permanently activated is less than the number of resources activated through Trial CoD, these are the results that occur:
  - If there are enough inactive resources (not trial or permanent), then the permanent activation will be accomplished using the inactive resources that are currently installed on the system.
  - If there are not enough inactive resources to satisfy the request, then the permanent activation code will not be accepted. Stop the Trial CoD request before attempting to permanently activate resources.

### Viewing settings for Trial Capacity on Demand resources

You can use the Hardware Management Console (HMC) to view Trial Capacity on Demand (CoD) settings.

You can see how many processors or memory units you have, how many are active, and how many are available for activation using CoD with these settings. You can also view information about your On/Off CoD processors and memory units, Trial CoD processors and memory units, and your Utility CoD processors.

To view the capacity settings for processors or memory, do the following:

1. In the navigation area of the HMC window, expand **Systems Management**.
2. Select **Servers**.
3. In the contents area, select the server on which you want to view capacity settings.
4. Select **Capacity on Demand**.
5. Select either **Processor** or **Memory**.
6. Select the CoD offering that you want to view.
7. Select **View Capacity Settings**.

### Viewing and saving Trial Capacity on Demand code-generation information

You can view and save Trial Capacity on Demand (CoD) code-generation information using the Hardware Management Console (HMC). You might need to do this if the CoD code that was provided for your server does not work.

You can view CoD code-generation information and save it to a file on a remote system or to a file on removable media. The information that is used to generate your CoD codes must exactly match the information that is shown on the HMC CoD Code Information window. To collect the information that is used to generate your CoD codes, use the CoD Code Information window to save the CoD code information to a file on a remote system or to a file on removable media. Then, you can either attach the file to an e-mail, or print the file and fax it to your CoD administrator.

To view and save CoD code-generation information:

1. In the navigation area of the HMC window, expand **Systems Management**.
2. Select **Servers**.
3. In the contents area, select the server on which you want to view and save the CoD code information.

4. Select **Tasks**.
5. Select **Capacity on Demand (CoD)**.
6. Select **Processors (or Memory)**.
7. Select the CoD offering you want to view or save.
8. Select **View Code Information**.
9. In the CoD Code Information window, click **Save** to save the CoD code information to a file on a remote system or to a file on removable media.
10. In the Save CoD Code Information panel, select one of these options, and then perform the tasks associated with that option.

Option	Description
<b>Save to a file on a remote system</b>	<ol style="list-style-type: none"> <li>1. Enter the remote system name, file name, user ID, and password.</li> <li>2. Click <b>OK</b> to save the CoD code information or click <b>Cancel</b> to exit the panel without saving the CoD code information.</li> </ol>
<b>Save to media</b>	<ol style="list-style-type: none"> <li>1. Click <b>OK</b>.</li> <li>2. Select the required device. These options might be included in the list (the list includes only those removable media devices that are available for use on the HMC): <ul style="list-style-type: none"> <li>• <b>Diskette drive</b></li> <li>• <b>Flash memory</b></li> <li>• <b>USB diskette drive</b></li> </ul> </li> <li>3. Click <b>OK</b> to save the CoD code-generation information, or click <b>Cancel</b> to exit the panel without saving the CoD code information.</li> </ol>

To fax or e-mail the CoD code information to your CoD administrator, use one of these options to send your information:

- Fax-to information:
  - **Send to:** Capacity on Demand Administrator
  - **Fax number:** 507-253-4553
  - **Location:** Rochester, Minnesota, U.S.
- Fax-from information:
  - **Customer name:**
  - **Customer contact name:**
  - **Customer address:**
  - **Customer phone number:**
  - **Customer fax number:**
- If you are using e-mail, send the electronic image of the code information in an e-mail to the appropriate address:
  - IBM i models: [icod@us.ibm.com](mailto:icod@us.ibm.com)
  - Power Systems models: [pcod@us.ibm.com](mailto:pcod@us.ibm.com)

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## On/Off Capacity on Demand

On/Off Capacity on Demand (CoD) allows you to temporarily activate and deactivate processors and memory units to help meet the demands of business peaks. After you request that a number of processors or memory units are to be made temporarily available for a specified number of days, those processors and memory units are available immediately. You can start and stop requests for On/Off CoD, and you are billed for usage at the end of each quarter.

You can change the number of resources and number of days in a running On/Off CoD request. Instead of having to stop the current request and start a new request, or wait until the current request expires, you can change the number of resources and number of days in the current request. For more information about how billing works when changing a current request, or how to change a current request, see “Billing when changing a running On/Off Capacity on Demand request” on page 19 or “Changing a running On/Off Capacity on Demand request” on page 25.

Make sure that you have prepared your server before continuing. For more information, see “Preparing for Capacity on Demand” on page 2.

### On/Off Capacity on Demand concepts

You can activate inactive processors or memory units on a temporary basis with On/Off Capacity on Demand (CoD).

You can turn on inactive processors or memory units for a number of days as your business peaks demand and pay only for the days that the processors or memory units remain activated.

When action on your part is required after you implement this CoD offering, the HMC displays messages on the HMC desktop.

### On/Off Capacity on Demand processor days or memory days

Temporary capacity provided by On/Off Capacity on Demand (CoD) is measured and billed in units called processor days or memory days.

#### Requested processor or memory days

Requested processor days or memory days equal the number of temporarily activated processors or memory units multiplied by the number of days that are specified on a request for temporary capacity using On/Off CoD. After a request for temporary capacity is made on the server, the server records one processor day for each requested processor or one memory day for each requested memory unit at the beginning of each 24-hour period that the request is running. One memory unit is one GB of memory.

[number of processors or memory units] \* [number of requested days]

#### Unreturned processor or memory days

Unreturned processor days or memory days equal the number of days (24-hour periods) that the temporarily activated processors or memory units were used beyond the expiration of the request for temporary capacity, multiplied by the number of requested processors or memory units that are still in use.

[number of days processors or memory units were used beyond expiration of temporary capacity request] \* [number of requested processors or memory units still in use]

**Tip:** Unreturned processor or memory days are charged at the beginning of each 24-hour period that the temporarily activated processors or memory units are still being used after the expiration of the request for temporary capacity.

## Related concepts

### “Billing for On/Off Capacity on Demand”

The customer contract that must be signed prior to receiving your On/Off CoD enablement code requires you to report billing data, at least once per month, regardless of whether you have used the temporary capacity provided by On/Off CoD during the period.

## On/Off Capacity on Demand enablement code

After you have decided to take advantage of On/Off Capacity on Demand (CoD), you must order an On/Off CoD enablement feature. The enablement feature provides the On/Off CoD enablement code that allows you to request temporary activation of inactive processors or memory units by entering the code on your server.

### Notes:

- An HMC is required to use On/Off Capacity on Demand.
- You must have an assigned contract for the enablement code before you can obtain the enablement code.
- The enablement code is available only through an MES upgrade order.
- An On/Off CoD enablement code enables you to request temporary capacity on the server. You can make requests for temporary capacity over the life of the machine as long as your total days do not exceed the predefined limit. When the limit is reached, a new On/Off CoD enablement feature must be ordered and a new enablement code entered on your server. Each time a new enablement code is entered, it will reset the limit of processor days or memory days that can be requested as temporary capacity.

Table 6. On/Off CoD processor enablement features

Machine type-model	On/Off CoD processor enablement feature
9406-MMA	7951
9117-MMA	7951
9119-FHA	7971

Table 7. On/Off CoD memory enablement features

Machine type-model	On/Off CoD memory enablement feature
9406-MMA	7954
9117-MMA	7954
9119-FHA	7973

After your On/Off CoD enablement code has been generated, you can access it using your system type and serial number at the following Capacity on Demand Web site:

- <http://www-912.ibm.com/pod/pod> 

## Billing for On/Off Capacity on Demand

The customer contract that must be signed prior to receiving your On/Off CoD enablement code requires you to report billing data, at least once per month, regardless of whether you have used the temporary capacity provided by On/Off CoD during the period.

Billing data is used to calculate billing amounts at the end of each billing period (calendar quarter). For instructions about setting up a method of reporting, see “Establishing monthly reporting to IBM” on page 24.

Ensure that you report billing data if your server has been enabled for On/Off CoD. Failure to report the billing data results in an estimated bill for 90 processor days or memory days of temporary capacity.

Processor days or memory days of credit are applied against any requested or unreturned processor days or memory days of temporary capacity that are provided by On/Off CoD. This credit happens automatically until all of the days of credit are used.

If the temporary resources that are provided by On/Off CoD are still assigned to partitions after your request has expired, the processor days or memory days continue to be recorded at the beginning of each 24-hour period, and you continue to be billed for these days at the end of the On/Off CoD billing cycle. You are charged for these unreturned processor days or memory days at the same rate as requested processor days or memory days.

You must return the resources before your request expires, so you are not billed for any unreturned processors or memory units. If your request has already expired and you do not want to be billed for any more unreturned processors or memory units, return the expired processors or memory units immediately. For more information about returning CoD resources, see “Returning On/Off Capacity on Demand resources” on page 27.

This table lists the models, processor features, and billing features for On/Off CoD.

*Table 8. On/Off CoD processor features and billing features*

Machine type-model	Orderable processor feature	On/Off CoD processor day billing feature
9117-MMA	5620	5650
9117-MMA	5621/5622	5653
9117-MMA	7380	5656
9117-MMA	7388	7333
9117-MMA	7540	7702
9117-MMA	7387	7745
9117-MMA	5620	5483 (IBM i)
9117-MMA	5621/5622	5484 (IBM i)
9117-MMA	7380	5485 (IBM i)
9117-MMA	7388	7346 (IBM i)
9117-MMA	7540	7709 (IBM i)
9117-MMA	7387	7744 (IBM i)
9406-MMA	7380	5656 (IBM i)
9119-FHA	4694	7234
9119-FHA	4695	7244
9119-FHA	4694	5945 (IBM i)
9119-FHA	4695	5946 (IBM i)
9119-FHA	4705	7244
9119-FHA	4705	5946 (IBM i)

This table lists the models, memory features, and billing features for On/Off CoD.

*Table 9. On/Off CoD memory features and billing features*

Machine type-model	Orderable memory feature	On/Off memory day billing feature
9406-MMA	5692, 5693, 5694, 5695, 5696, 5697	5691



Table 9. On/Off CoD memory features and billing features (continued)

Machine type-model	Orderable memory feature	On/Off memory day billing feature
9117-MMA	5692/5693/5694/5695/5696/8129	5691
9119-FHA	5693-5697, 8201-8205	5691

### Related concepts

“On/Off Capacity on Demand processor days or memory days” on page 16

Temporary capacity provided by On/Off Capacity on Demand (CoD) is measured and billed in units called processor days or memory days.

### Billing when changing a running On/Off Capacity on Demand request:

Ensure that you understand the implications to billing before you decide to change a running On/Off Capacity on Demand (CoD) request.

When you issue a change request, the days in the running request are not preserved; however, the time in the current resource day is carried forward from the running request. It is important to understand that the resource days that remain in a request are decremented at the start of each day. Therefore, the number of resource days billed is incremented at the start of each day.

The change request expires in the number of days that are requested in the change request plus the time that remains in the current resource day of the running request since you have already been charged for that entire resource day. For example, if there are 23 hours and 12 minutes in the current On/Off CoD request, and the request is changed to 5 days, the new request will expire in 5 days, 23 hours, and 12 minutes (the 5 days that are specified by the change request plus the time in the current resource day).

**Note:** In the confirmation message, the time is rounded up to the nearest hour, so it will show 6 days and 0 hours.

Another example, if there are 3 hours and 45 minutes that remain in the current On/Off CoD request, and the request is changed to 5 days, the new request will expire in 5 days, 3 hours, and 45 minutes (the 5 days that are specified by the change request plus the time that remains in the current resource day).

**Note:** The time displayed by the confirmation message is rounded up to the nearest hour and will be 5 days and 4 hours.

If the change request decreases the amount of resources in the running request, the remainder of the current resource day is forfeited for each of the resources that are being canceled. No credit is given for any partial resource days that are forfeited. If the change request increases the amount of resources in the running request, a charge for the additional resources for the time that remains in the current resource day is immediately applied. That charge is calculated as additional resources multiplied by the quantity (time that remains in the current resource day rounded up to the whole hour and divided by 24). The result is rounded up to whole resource days. The usual charge for any requested days in the change request applies.

The number of resource days in the On/Off CoD enablement is calculated separately from the number of resource days that are billed. When an On/Off CoD request is started, the number of enabled resource days is reduced by the number of requested resource days (number of requested resources multiplied by the number of requested days). When a running On/Off CoD request is changed, the number of enabled resource days is increased by the number of resource days in the running request, then reduced by the number of requested resource days in the change request. If the change request increases the number of resources, the number of enabled resource days is also reduced by the number of resource days that are charged for the additional resources for the time in the current resource day.

If you decide, within the same day, to again activate the On/Off CoD processors, such as during a test period, the implications to billing are slightly different. The 24-hour test period starts when the first On/Off CoD request is made. During the 24-hour test period that your server is powered on, a record is kept of the maximum number of On/Off CoD processors or memory requested when you make On/Off CoD activation or change requests. Therefore, as the testing reactivation occurs, you can start and stop, or change, On/Off CoD requests repeatedly. Any subsequent requests during the same 24-hour period for the same or fewer resources are not charged. Requests that are made for more resources result in a pro-rated charge for the excess resources. This new, higher level of resources becomes the maximum resource amount for the 24-hour period, and subsequent requests during the same 24-hour period are not charged for resources up to this new maximum amount. For information about testing your On/Off CoD activations, see *Testing your On/Off Capacity on Demand activations*.

#### **Examples: Changing a running On/Off CoD request**

**At 9:00 a.m. on Monday, you start a new request for 5 processors for 1 day. The result is:**

- 24 hours remain in current processor day
- 1 day plus 0 hours until request expires
- Charge for 5 processor days (5 processors multiplied by 1 day)
- Enablement reduced by 5 processor days

**At 11:00 a.m. on Monday, you change the request to 5 processors for 2 days. The result is:**

- 22 hours remain in current processor day
- 2 days plus 22 hours until request expires
- No additional charge
- Enablement reduced by 10 processor days (5 processors multiplied by 2 days)

**At 3:00 p.m. on Monday, you change the request to 10 processors for 2 days. The result is:**

- 18 hours remain in current processor day
- 2 days + 18 hours until request expires
- Charge for 4 processor days (5 additional processors multiplied by 18 hours in current processor day divided by 24 equals 3.75, which is then rounded up to 4)
- Enablement increase by the 10 processor days in the running request, then reduced by 24 processor days (10 processors multiplied by 2 days plus 4 processor days charged for the hours in the current processor day)

**At 5:00 p.m. on Monday, you change the request to 2 processors for 2 days. The result is:**

- 16 hours remain in current processor day
- 2 days plus 16 hours until request expires
- No charge and no credit for the 8 canceled processors
- Enablement increased by the 20 processor days in the running request, then reduced by 4 processor days (2 processors multiplied by 2 days)

**At 7:00 p.m. on Monday, you change the request to 2 processors for 1 day. The result is:**

- 14 hours remain in current processor day
- 1 day plus 14 hours until request expires
- No charge and no credit
- Enablement increased by the 4 processor days in the running request, then reduced by 2 processor days (2 processors multiplied by 1 day)

**At 9:00 a.m. on Tuesday, the request is still active. The result is:**

- Start of new processor day

- 24 hours remain in current processor day
- 1 day plus 0 hours until request expires
- Charge for 2 processor days
- No change to enablement

**At 9:00 a.m. on Wednesday, the request expires. The result is:**

- No charge or credit
- No change to enablement

**At 10:00 a.m. on Wednesday, you start a new request for 5 processors for 2 days. The result is:**

- 24 hours remain in current processor day
- Charge for 5 processor days
- Enablement reduced by 10 processor days

**Related concepts**

“Billing when testing your On/Off Capacity on Demand activations”

You can test your On/Off Capacity on Demand (CoD) and Capacity BackUp activations several times within a 24-hour period without incurring duplicate billing charges.

**Billing when testing your On/Off Capacity on Demand activations:**

You can test your On/Off Capacity on Demand (CoD) and Capacity BackUp activations several times within a 24-hour period without incurring duplicate billing charges.

With this capability, you can test your activations several times over a 24-hour period while the server is powered on. When performing this test, you are only charged for the maximum number of On/Off CoD processors or memory that you request during that 24-hour period. The 24-hour period only accounts for when your server is powered on, which eliminates the possibility that the period would expire if you power off your system for an extended period of time.

The following is an example of how billing works if you decide to test your On/Off CoD activations.

**Examples: On/Off CoD processor activations and billing results**

*Table 10. Billing example for testing On/Off CoD activations*

Time	Processor activations and billing results
8:00 a.m.	<ul style="list-style-type: none"> <li>• 5 processors activated</li> <li>• 5 processor days charged</li> <li>• 5 processor maximum</li> </ul>
11:00 a.m. (3 hours later)	<ul style="list-style-type: none"> <li>• 3 processors added</li> <li>• 3 processor day charged</li> <li>• 8 processor maximum</li> </ul>
3:00 p.m. (4 hours later)	<ul style="list-style-type: none"> <li>• 3 processors canceled (no credit)</li> <li>• 8 processor maximum</li> </ul>
5:00 p.m. (2 hours later)	<ul style="list-style-type: none"> <li>• 3 processors added (no charge)</li> <li>• 8 processor maximum</li> </ul>
8:00 p.m. (3 hours later)	<ul style="list-style-type: none"> <li>• 3 processors canceled (no credit)</li> <li>• 8 processor maximum</li> </ul>

Table 10. Billing example for testing On/Off CoD activations (continued)

Time	Processor activations and billing results
11:00 p.m. (3 hours later)	<ul style="list-style-type: none"> <li>• 3 processors added (no charge)</li> <li>• 8 processor maximum</li> </ul>
4:00 a.m. (5 hours later; 20 hours since 8:00 a.m. initial activation)	<ul style="list-style-type: none"> <li>• 3 processors canceled (no credit)</li> <li>• 8 processor maximum</li> </ul>
Total charge	8 processor days total

This is billing example when starting and stopping On/Off CoD requests during a test.

Table 11. Billing example for starting and stopping On/Off CoD requests when testing

Time	Processor activations and billing results
8:00 a.m.	<ul style="list-style-type: none"> <li>• 3 processors activated</li> <li>• 3 processor days charged</li> <li>• 3 processor maximum</li> </ul>
9:00 a.m. (1 hour later)	<ul style="list-style-type: none"> <li>• 1 processor canceled (no credit)</li> <li>• 3 processor maximum</li> </ul>
10:00 a.m. (1 hour later)	<ul style="list-style-type: none"> <li>• 1 processor added</li> <li>• No charge</li> <li>• 3 processor maximum</li> </ul>
11:00 a.m. (1 hour later)	<ul style="list-style-type: none"> <li>• 3 processors stopped (no credit)</li> <li>• 3 processor maximum</li> </ul>
12:00 p.m. (1 hour later)	<ul style="list-style-type: none"> <li>• 4 processors activated</li> <li>• 1 processor day charged (1 multiplied by 20 hours &lt; 24 hours)</li> <li>• 4 processor maximum</li> </ul>
1:00 p.m. (1 hour later)	<ul style="list-style-type: none"> <li>• 4 processors stopped (no credit)</li> <li>• 4 processor maximum</li> </ul>
2:00 p.m. (1 hour later)	<ul style="list-style-type: none"> <li>• 1 processor activated</li> <li>• No charge</li> <li>• 4 processor maximum</li> </ul>
4:00 p.m. (2 hours later)	<ul style="list-style-type: none"> <li>• 1 processor stopped (no credit)</li> <li>• 4 processor maximum</li> </ul>
Total charge	4 processor days total

### Related concepts

“Billing when changing a running On/Off Capacity on Demand request” on page 19

Ensure that you understand the implications to billing before you decide to change a running On/Off Capacity on Demand (CoD) request.

## Ordering On/Off Capacity on Demand

To order On/Off Capacity on Demand (CoD), contact your IBM Business Partner or IBM sales representative.

Your IBM Business Partner or IBM sales representative guides you through the completion of the required On/Off CoD contracts with IBM. Then, your IBM Business Partner or IBM sales representative

places a customer order for an On/Off CoD enablement feature. For more information about the enablement feature, see “On/Off Capacity on Demand enablement code” on page 17.

Before using On/Off CoD, you must enable On/Off CoD. See “Enabling On/Off Capacity on Demand” for more information.

## Using On/Off Capacity on Demand

You must use the Hardware Management Console (HMC) to use and manage On/Off Capacity on Demand (CoD).

Most Capacity on Demand (CoD) tasks on the HMC require the HMC Super Administrator user role.


After you have enabled and activated On/Off CoD, minimal day-to-day management of your temporary capacity is required.

### Enabling On/Off Capacity on Demand

Before requesting temporary capacity on your server, you must enable your server for On/Off Capacity on Demand (CoD). To enable your server for On/Off CoD, you must use the Hardware Management Console (HMC).

Most CoD tasks on the HMC require the HMC super administrator user role.

To enable your server for On/Off CoD:

1. Retrieve the On/Off CoD enablement code by going to <http://www-912.ibm.com/pod/pod> .
2. Enter your activation code on your server using the HMC. To enter your code:
  - a. In the navigation area of the HMC window, expand **Systems Management**.
  - b. Select **Servers**.
  - c. In the contents area, select the server on which you want enter your activation code.
  - d. Select **Tasks > Capacity on Demand (CoD) > Enter CoD Code**.
  - e. Type your activation code in the **Code** field.
  - f. Click **OK**.

Your server is now enabled for On/Off CoD. To use your processors or memory, see “Activating On/Off Capacity on Demand.”

### Activating On/Off Capacity on Demand

After you have ordered On/Off CoD and enabled On/Off CoD, you can request temporary activation of On/Off CoD resources.

For information about entering On/Off CoD enablement codes, see “Ordering On/Off Capacity on Demand” on page 22 and “Enabling On/Off Capacity on Demand.”

To request activation of On/Off CoD resources:

1. In the navigation area of the Hardware Management Console window, expand **Systems Management**.
2. Select **Servers**.
3. In the contents area, select the server on which you want to activate processors or memory temporarily.
4. Select **Tasks**.
5. Select **Capacity on Demand**.
6. Select either **Processor** or **Memory**.
7. Select **On/Off CoD**.

8. Select **Manage**.
9. Type the number of On/Off CoD resources you want and the number of days you want them for, and then click **OK**.

Any newly activated processors are now available for use by uncapped logical partitions. If there are no uncapped logical partitions, you must assign the processors to one or more logical partitions in order to begin using the processors. Any newly activated memory must be assigned to one or more logical partitions to begin using the newly activated memory.

If your server is in the manufacturing default configuration, the server can begin using the newly activated processors or memory immediately after restarting your server operating system. Alternatively, you can dynamically assign the newly activated processors or memory to the default partition.

You will be billed for the activated On/Off CoD resources regardless of whether they have been assigned to a logical partition or are being used. You can stop an active request for On/Off Capacity on Demand before it expires. For more information, see “Stopping an On/Off Capacity on Demand request” on page 25.

You can change a running On/Off CoD request. For more information, see “Changing a running On/Off Capacity on Demand request” on page 25. If you stopped the previous On/Off CoD request that was running on your server, and you start a new On/Off CoD request before the current resource day from the previous request expires (the hours remaining in the current resource day is a non-zero number), the new On/Off CoD request will be handled like a change request for billing purposes. For more information, see “Billing when changing a running On/Off Capacity on Demand request” on page 19.

To avoid being billed for unreturned processor or memory days, you must return the On/Off CoD resources before your On/Off CoD request expires. For more information, see “Returning On/Off Capacity on Demand resources” on page 27.

## **Establishing monthly reporting to IBM**

You can establish monthly reporting to IBM by using the IBM Electronic Service Agent™, fax, or e-mail.

The customer contract that is required prior to receiving your On/Off Capacity on Demand (CoD) enablement code requires you to report billing data, at least once per month, regardless of whether you have used temporary capacity during the period.

You can use several methods to report information about your requests for temporary capacity provided by On/Off CoD to IBM. The preferred method of reporting is to send information electronically using the Electronic Service Agent. Reporting can also be done using fax or e-mail. If fax or e-mail is used, you must sign a separate contract with IBM.

### **Establish monthly reporting using the Electronic Service Agent**

Monthly reporting of your temporary capacity billing information can be sent to IBM electronically by using the Electronic Service Agent, which is part of the Hardware Management Console. The Electronic Service Agent is designed to monitor events and to transmit server inventory information to IBM on a periodic, customer-definable timetable.

### **Establish monthly reporting using fax or e-mail**

To fax or send an e-mail containing your billing information for On/Off CoD, do the following:

1. Save your billing information. For instructions about how to save your billing information, see “Viewing and saving On/Off Capacity on Demand information” on page 28.
2. If you are using fax, prepare a fax document with the following information:
  - Fax-to Information:

- **Send to:** Capacity on Demand Administrator
  - **Fax number:** 507-253-4553
  - **Location:** Rochester, Minnesota USA
  - Fax-from Information:
    - **Customer name:**
    - **Customer contact name:**
    - **Customer address:**
    - **Customer phone number:**
    - **Customer fax number:**
3. If you are using e-mail, send the electronic image of the billing information in an e-mail to the appropriate address. For IBM System i5<sup>®</sup> or eServer i5 models, send to icod@us.ibm.com. For IBM System p5<sup>®</sup> or eServer p5 models, send to pcod@us.ibm.com.

### Stopping an On/Off Capacity on Demand request

You can stop a request for temporary capacity before it expires.

On/Off Capacity on Demand (CoD) remains enabled on your server, but an issued request for temporary capacity will be stopped. For example, consider this scenario: you have requested the temporary activation of one inactive processor for 14 days. After seven days of this request, you determine that you do not need the temporarily activated processor for the remaining seven days of the request. You can stop the request and avoid being billed for any unused processor or memory days of your request. Stopping a request does not preclude making any further requests at a later time.

To stop a request for temporary capacity at any time during the period of requested temporary capacity:

1. Return the On/Off CoD resources. See “Returning On/Off Capacity on Demand resources” on page 27 for information about how to return On/Off CoD resources.
2. In the navigation area of the Hardware Management Console window, expand **Systems Management**.
3. Select **Servers**.
4. In the contents area, select the server on which you want to stop your On/off CoD request.
5. Select **Tasks**.
6. Select **Capacity on Demand**.
7. Select either **Processor** or **Memory**.
8. Select **On/Off CoD**.
9. Select **Manage**.
10. Type **0** for the number of On/Off CoD processors and type **0** for the number of days, then click **OK**.

### Changing a running On/Off Capacity on Demand request

In a running On/Off Capacity on Demand (CoD) request, you can change the number of resources, number of days, or both the number of resources and number of days. You do not need to stop the current request to start a new request or wait until the current request expires.

Before you change a running On/Off CoD request, ensure that you understand the implications to billing. For more information, see “Billing when changing a running On/Off Capacity on Demand request” on page 19.

To successfully change a running On/Off CoD request:

1. If you are decreasing the amount of resources in the running request, return the On/Off CoD resources to be deactivated. See “Returning On/Off Capacity on Demand resources” on page 27 for details about how to return On/Off CoD resources.

2. In the navigation area of the Hardware Management Console window, expand **Systems Management**.
3. Select **Servers**.
4. In the contents area, select the server on which you want to change your request.
5. Select **Tasks**.
6. Select **Capacity on Demand**.
7. Select either **Processor** or **Memory**.
8. Select **On/Off CoD**.
9. Select **Manage**.
10. Type the new number of On/Off CoD resources that you want and how many days you want them for and then click **OK**.

Any newly activated processors are now available for use by uncapped logical partitions. If there are no uncapped logical partitions, you must assign the processors to one or more logical partitions in order to begin using the processors. Any newly activated memory must be assigned to one or more logical partitions to begin using the newly activated memory.

If your server is in the manufacturing default configuration, the server can begin using the newly activated processors or memory immediately after restarting your server operating system. Alternatively, you can dynamically assign the newly activated processors or memory to the default partition.

### **Testing your On/Off Capacity on Demand activations**

You can test your On/Off Capacity on Demand (CoD) and Capacity BackUp activations several times within a 24-hour period without incurring duplicate billing charges.

You can test your activations several times over a 24-hour period while the server is powered on. When performing this test, you are only charged for the maximum number of On/Off CoD processors or memory that you request during that 24-hour period. The 24-hour period only accounts for when your server is powered on, which eliminates the possibility that the period would expire if you power off your system for an extended period of time.

For an example of how billing works when testing your On/Off CoD activations, see Table 10 on page 21.

### **Discontinuing On/Off Capacity on Demand**

To discontinue the On/Off Capacity on Demand (CoD) function on your server, disabling the capability for future use, you must obtain and enter an On/Off CoD termination code on your server.

To obtain this termination code, send a request for an On/Off CoD termination code to the appropriate CoD administrator at one of these e-mail addresses:

- IBM i: [icod@us.ibm.com](mailto:icod@us.ibm.com)
- Power Systems: [pcod@us.ibm.com](mailto:pcod@us.ibm.com)

A single On/Off CoD termination code disables On/Off CoD for both processors and memory units. The termination code cannot be entered if an active On/Off CoD request exists on the system, or if unreturned On/Off CoD resources are in use on the system. The active request must be stopped and any unreturned resources must be returned before On/Off CoD can be discontinued. For information about how to stop the active On/Off CoD request, see “Stopping an On/Off Capacity on Demand request” on page 25. For information about how to return On/Off CoD resources, see “Returning On/Off Capacity on Demand resources” on page 27.

If your server unexpectedly loses power after you have stopped an On/Off CoD request, you might need to perform “Recovery actions” on page 27 to successfully power on your server.

To disable future use of On/Off CoD on your server after you have obtained a termination code:



1. In the navigation area of the HMC window, expand **Systems Management**.
2. Select **Servers**.
3. In the contents area, select the server on which you want enter your termination code.
4. Select **Tasks > Capacity on Demand > Enter CoD Code**.
5. Type your termination code in the **Code** field.
6. Click **OK**.

#### **Recovery actions:**

Perform these recovery actions in the event the server is powered off or loses power when there are unreturned Trial CoD or On/Off CoD resources. Unreturned Trial CoD resources result when the trial period ends before the Trial CoD resources have been removed from your logical partition. Unreturned On/Off CoD resources result when the On/Off CoD request expires before the On/Off CoD resources have been removed from your logical partition. These recovery actions need to be used to ensure that logical partitions that were running prior to the power off or loss of power are successfully powered on.

When a server is powered off or loses power, all unreturned Trial CoD or On/Off CoD resources are reclaimed by the server. As a result, when the server is powered back on, all logical partitions that were running prior to the power off or loss of power might not be able to be restarted since only licensed resources are available for use. Furthermore, when a logical partition is powered on, if there are not enough licensed resources to satisfy the logical partition's memory or processor requirements, the power on of that logical partition will fail. The failure might result in an HMC message of HSCL03F4 (not enough processing resources to meet the allocation setting), or a system reference code of B2xx1150 or B2xx1230.

**Note:** The server can power on to standby mode only if you have specified that option prior to powering on your server.

To successfully power on those logical partitions, perform either step 1 or 2, or a combination of the 2 steps.

1. Reduce logical partition resources so that the total of logical partition resources across all logical partitions to be powered on does not exceed the total number of activated resources.
2. Enter new Capacity on Demand activation codes to satisfy these requirements. Additionally, start an On/Off CoD request (if On/Off CoD is still enabled) or enter a new Trial CoD activation code. If the On/Off CoD enablement is exhausted, a new On/Off CoD enablement code would need to be entered before doing a new On/Off CoD request.

#### **Returning On/Off Capacity on Demand resources**

To return On/Off Capacity on Demand (CoD) processors or memory, you must remove the processors or memory from the logical partitions to which they are assigned, thus making them available to be reclaimed by the server.

You do not need to remove the processors or memory from the same logical partitions to which they were assigned when you started your On/Off CoD request or Trial CoD. You can remove the processors or memory from any of your logical partitions.

It is best to remove processors or memory from a logical partition when the logical partition is running.

Logical partitions that are not activated might still have processors and memory assigned to them. To remove processors or memory from a logical partition that is not activated, you have these options:

- Modify a partition profile for the logical partition to reduce the number of processors or memory, and then activate the logical partition by using the modified partition profile.
- Delete the logical partition.

## Viewing settings for On/Off Capacity on Demand resources

You can use the Hardware Management Console (HMC) to view On/Off Capacity on Demand (CoD) settings. You can see how many processors or memory units you have, how many are active, and how many are available for activation using CoD with these settings. You can also view information about On/Off CoD processors and memory units.

You can see how many processors or memory units you have, how many are active, and how many are available for activation using CoD with these settings. You can also view information about your On/Off CoD processors and memory units, Trial CoD processors and memory units, and your Utility CoD processors.

To view the capacity settings for processors or memory, do the following:

1. In the navigation area of the HMC window, expand **Systems Management**.
2. Select **Servers**.
3. In the contents area, select the server on which you want to view capacity settings.
4. Select **Capacity on Demand**.
5. Select either **Processor** or **Memory**.
6. Select the CoD offering that you want to view.
7. Select **View Capacity Settings**.

## Viewing and saving On/Off Capacity on Demand information

You can use the Hardware Management Console (HMC) to view and save On/Off Capacity on Demand CoD code-generation and billing information. You might need to do this if the CoD code that was provided for your server does not work.

You can view CoD code-generation information and save it to a file on a remote system or to a file on removable media. The information that is used to generate your CoD codes must exactly match the information that is shown on the HMC CoD Code Information window. To collect the information that is used to generate your CoD codes, use the CoD Code Information window to save the CoD code information to a file on a remote system or to a file on removable media. Then, you can either attach the file to an e-mail, or print the file and fax it to your CoD administrator.

To view and save CoD code-generation information:

1. In the navigation area of the HMC window, expand **Systems Management**.
2. Select **Servers**.
3. In the contents area, select the server on which you want to view and save the CoD code information.
4. Select **Tasks**.
5. Select **Capacity on Demand (CoD)**.
6. Select **Processors (or Memory)**.
7. Select the CoD offering you want to view or save.
8. Select **View Code Information**.
9. In the CoD Code Information window, click **Save** to save the CoD code information to a file on a remote system or to a file on removable media.
10. In the Save CoD Code Information panel, select one of these options, and then perform the tasks associated with that option.

Option	Description
Save to a file on a remote system	<ol style="list-style-type: none"> <li>1. Enter the remote system name, file name, user ID, and password.</li> <li>2. Click <b>OK</b> to save the CoD code information or click <b>Cancel</b> to exit the panel without saving the CoD code information.</li> </ol>
Save to media	<ol style="list-style-type: none"> <li>1. Click <b>OK</b>.</li> <li>2. Select the required device. These options might be included in the list (the list includes only those removable media devices that are available for use on the HMC): <ul style="list-style-type: none"> <li>• <b>Diskette drive</b></li> <li>• <b>Flash memory</b></li> <li>• <b>USB diskette drive</b></li> </ul> </li> <li>3. Click <b>OK</b> to save the CoD code-generation information, or click <b>Cancel</b> to exit the panel without saving the CoD code information.</li> </ol>

#### Viewing and saving Capacity on Demand billing information:

You can view CoD billing information and save it to a file on a remote system or to a file on removable media. If you choose to manually report the billing information, use the CoD Billing Information window on the HMC to save the billing information. Then, you can either attach the file to an e-mail or print the file and fax it to your CoD administrator.

To view and save CoD billing information, do the following:

1. In the navigation area of the HMC window, expand **Systems Management**.
2. Select **Servers**.
3. In the contents area, select the server on which you want to view and save your billing information.
4. Select **Tasks**.
5. Select **Capacity on Demand**.
6. Select **Processor** or **Memory**.
7. Select **On/Off CoD**.
8. Select **View Billing Information**.
9. In the CoD Billing Information window, click **Save** to save the CoD billing information to a file on a remote system or to media.
10. In the Save Billing Information panel, select one of these options, and then perform the tasks associated with that option.

Option	Description
Save to a file on a remote system	<ol style="list-style-type: none"> <li>1. Enter the remote system name, file name, user ID, and password</li> <li>2. Click <b>OK</b> to save the CoD billing information or click <b>Cancel</b> to exit the panel without saving the CoD billing information.</li> </ol>

Option	Description
Save to media	<ol style="list-style-type: none"> <li>1. Click <b>OK</b>.</li> <li>2. Select the required device. The following options might be displayed (the list will include only those removable media devices that are available for use on your HMC): <ul style="list-style-type: none"> <li>• <b>Diskette drive</b></li> <li>• <b>Flash memory</b></li> <li>• <b>USB diskette drive</b></li> </ul> </li> <li>3. Click <b>OK</b> to save the CoD billing information, or click <b>Cancel</b> to exit the panel without saving the CoD billing information.</li> </ol>

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## Utility Capacity on Demand

Utility Capacity on Demand automatically delivers additional processor capacity on a temporary basis within the system's default Shared Processor Pool.

### Utility Capacity on Demand concepts

The Utility Capacity on Demand (CoD) offering is for customers with unpredictable, short workload increases who need an automated and affordable way to help assure that adequate server resource is available as needed.

When you add utility CoD processors, they are automatically placed in the default shared processor pool. These processors are available to any uncapped partition in any shared processor pool.

The processors become available to the pool's resource manager. When the system recognizes that the combined processor utilization within the shared pool exceeds 100% of the level of base (purchased or active) processors assigned across uncapped partitions, a Utility CoD Processor Minute is charged, and this level of performance is available for the next minute of use. If additional workload requires a higher level of performance, the system will automatically allow the additional Utility CoD processors to be used. The system automatically and continuously monitors and charges for the performance needed above the base (permanent) level.

When action on your part is required after you implement this CoD offering, the HMC displays messages on the HMC desktop.

### Utility Capacity on Demand enablement code

Learn more about enabling your Hardware Management Console (HMC) so that it can use Utility Capacity on Demand. An HMC is required to use Utility Capacity on Demand.

You must enable your system to use Utility Capacity on Demand. The Utility CoD web site can provide a Utility CoD Enablement Code. To start using the inactive capacity on your system as utility capacity, you must enter the enablement code. The Utility CoD enablement code is valid for 365 server powered-on days.

The HMC displays messages on the HMC desktop. Console messages are sent during the last 30 days of the enablement period. This allows you time to return to the CoD web site, accept the terms and conditions for another year and receive a new enablement code.

After you have enabled your machine to use Utility Capacity on Demand, you can move the inactive processors into the shared processor pool. Then you can use them as utility processors for uncapped partitions.

## Utility Capacity on Demand processor minutes

You can use CoD to add processor minutes to your managed system.

Utility CoD automatically delivers additional processor capacity on a temporary basis within the system's shared processor pool. You can place any number of inactive processors into the shared processor pool. After you have placed the processors in the shared processor pool, the processors become available to the pool's resource manager. When the system recognizes that all the used processors within the shared pool exceeds 100% of the level of base (purchased or active) processors assigned across uncapped partitions, a Utility CoD Processor Minute is charged. This level of performance is available for the next minute of use. If additional workload requires a higher level of capacity, the system automatically allows the additional Utility CoD processors to be used. The system automatically and continuously monitors and charges for the capacity needed above the base (permanent) level.

When system recognizes that the base processors assigned across uncapped partitions is 100% utilized and at least 10% of one processor is needed, the additional processor resource is automatically applied and chargeable processor minutes start accruing. Processor minutes stop accruing when the utilization level drops and the base processors assigned can handle the workload.

## Utility Capacity on Demand billing features

Learn more about the Utility CoD billing features associated with your machine type and model.

The following table describes the processor and billing features for Utility Capacity on Demand.

*Table 12. Utility CoD features*

Machine type-model	Processor feature	Billing feature
9117-MMA	5620	5640
9117-MMA	5621/5622	5641
9117-MMA	7380	5404
9117-MMA	7388	7332
9117-MMA	7540	7701
9117-MMA	7387	7726
9117-MMA	7380	5480 (IBM i)
9117-MMA	5620	5481 (IBM i)
9117-MMA	5621/5622/7388	5482 (IBM i)
9117-MMA	7388	7334 (IBM i)
9117-MMA	7540	7706 (IBM i)
9117-MMA	7387	7743 (IBM i)
9406-MMA	7380	5404 (IBM i)
9119-FHA	4694	5941
9119-FHA	4695	5942
9119-FHA	4694	5943 (IBM i)
9119-FHA	4695	5944 (IBM i)

**Note:** Each billing feature is purchased to pay for 100 Utility CoD processor minutes.

## Using Utility Capacity on Demand

Utility CoD automatically provides additional processor capacity on a temporary basis within the shared processor pool.

Utility CoD use is measured in processor minute increments and is reported at the Utility CoD web site. Payment is required based on the reported use of processor minutes. You must purchase and pay for an order that includes a quantity of Utility CoD billing features.

Each managed system has a *reporting limit* and a *reporting threshold*. These values are set by the Utility CoD Enablement Code. On managed systems with 1 to 4 inactive processors, the reporting threshold is 500 minutes, and the reporting limit is 1000 minutes. On managed systems with 5 to 16 inactive processors, the reporting threshold is 1000 minutes, and the reporting limit is 2000 minutes. If the number of inactive processors is more than 16, then the reporting threshold is 2500 minutes, and the reporting limit is 5000 minutes.


The HMC displays a message on the desktop when the number of unreported minutes reaches 90% of the reporting threshold. To ensure that you can continue to use your Utility CoD processors, you should report when your reporting threshold reaches 90%. For more information about reporting Utility Capacity on Demand processor minutes, see "Reporting Utility Capacity on Demand processor minutes" on page 33.

## Enabling Utility Capacity on Demand

Learn more about how to enable your managed system to use Utility Capacity on Demand.

Utility CoD allows you to report your use based on how your business uses utility processor minutes. There is no fixed reporting schedule, and there are no electronic or screen captures required to report use of utility processor minutes. The managed system notifies you when the reporting threshold has been reached. You can also choose to report at any time before the threshold has been reached. The enablement code sets the reporting threshold and reporting limit for the system.

To enable your managed system to use Utility Capacity on Demand, do the following:

1. Go to the following Web site: [https://www-912.ibm.com/u\\_dir/ucod.nsf/enableucod?OpenForm](https://www-912.ibm.com/u_dir/ucod.nsf/enableucod?OpenForm) 
2. Click **Utility CoD** to accept the Terms and Conditions associated with Utility CoD. A Utility CoD Enablement Code will be provided for your system after you agree to the Terms and Conditions.
3. Enter your activation code on your server using the HMC. To enter your code:
  - a. In the navigation area of the HMC window, expand **Systems Management**.
  - b. Select **Servers**.
  - c. In the contents area, select the server on which you want enter your activation code.
  - d. Select **Tasks > Capacity on Demand (CoD) > Enter CoD Code**.
  - e. Type your activation code in the **Code** field.
  - f. Click **OK**.
4. Assign a quantity of inactive processors (any number you choose) to the shared processor pool using the HMC.

You can then configure Utility CoD so that you can use the new utility processors based on your business priorities and performance requirements. For example, you can set an upper limit on the maximum amount of usage that Utility CoD consumes. For example, if you want to limit the total usage at 500 minutes, you can use the HMC to set this limit.

## Discontinuing Utility Capacity on Demand

You can stop Utility Capacity on demand by removing all utility processors from the shared processor pool.

To disable Utility Capacity on Demand, you must request a termination code from the Utility CoD web site. When you enter the termination code on the HMC, Utility CoD functions will be disabled. The termination code will not be accepted by the IBM if more than 100 minutes of use remain unreported.

## Reporting Utility Capacity on Demand processor minutes

Learn more about how to report the number of Utility CoD processor minutes your managed system has used.

To report utility processor minutes, go to the CoD web site and enter the number of processor minutes you would like to report. You can enter the value currently displayed on your system's HMC Utility CoD screen, or some amount less than what is displayed. You can also report some amount greater than what is displayed, if you would like to purchase minutes before they have been used.

You must report in increments of 100 processor minutes. The web site ensures you report only 100, 200, 300, or any multiple of 100 processor minutes.

After you report a quantity of processor minutes, a Utility CoD reporting code will be provided to you. This code acts like a receipt, showing that you reported processor minutes. You must enter this code on your HMC for the processor minutes you reported to be recorded.

To ensure that you can continue to use your Utility CoD processors, you should report when the HMC notifies you that the number of unreported minutes has reached 90% of the reporting threshold. The HMC displays a message on the desktop when the number of unreported minutes reaches 90% of the reporting threshold. At that point, you have 30 powered-on days to report or you have until the reporting limit is reached, whichever comes first. At this time, if the Utility CoD reporting code has not yet been entered at the HMC, Utility CoD will be disabled and all utility processors will be removed from the shared pool.

## Paying for Utility Capacity on Demand processor minutes

Learn more about how to pay for the Utility Capacity on demand processor minutes you have used and what will happen if you do not pay for processor minutes.

The sales channel you specify at time of enabling your system for Utility CoD will be notified of the processor minutes you report. The sales channel will work with you to process a standard MES order for a quantity of 100 Processor minute billing features (as an example, feature code 5404 for the 9406-MMA) so that you can pay for what you have used. If you do not pay for the utility processor minutes you report, the CoD web site will not accept future reported minutes. As a result, you will not be provided another Utility CoD Reporting Code to enter at your system to continue using Utility CoD.

## Entering Utility CoD enablement codes and reporting codes

Learn more about how to use the HMC to enter enablement and reporting codes.

To enter the Utility CoD enablement and reporting codes, do the following:

1. In the navigation area of the HMC window, expand **Systems Management**.
2. Select **Servers**.
3. In the contents area, select the server on which you want to enter your Utility CoD enablement or reporting code.
4. Select **Tasks > Capacity on Demand > Enter CoD Code**.
5. Type your enablement or reporting code in the **Code** field.
6. Click **OK**.

## Reviewing used or reported processor minutes

You can review the used or reported processor minutes using the Hardware Management Console (HMC) interface.

To review used or reported processor minutes, do the following:

1. In the Navigation area, click **Systems Management > Servers**.
2. Select the server for which you want to view Utility CoD processor minute information.

3. Click **Tasks > Capacity On Demand (CoD) > Processor > Utility CoD > View Capacity Settings**.

### Setting a usage limit on processor minutes

Learn more about setting a limit on the processor minutes that you use.

To set a usage limit on processor minutes, do the following:

1. In the Navigation area, click **Systems Management > Servers**.
2. Select the server for which you want to set a Utility CoD processor minute usage limit.
3. Click **Tasks > Capacity On Demand (CoD) > Processor > Utility CoD > Manage**.
4. Select **Enable processor minute usage limit**.
5. In the **New limit** field, type the number of processor minutes you want to set as the limit.
6. Click **OK**.

### Obtaining the information needed to report processor minutes

Read more about how to view the information you need to report Utility CoD processor minutes.

To view the information you need to report Utility CoD processor minutes for billing, do the following:

1. In the Navigation area, click **Systems Management > Servers**.
2. Select the server for which you want to report Utility CoD processor minutes.
3. Click **Tasks > Capacity on Demand > Processor > Utility CoD > View Code Information**.

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## Capacity BackUp

Capacity BackUp uses On/Off Capacity on Demand (CoD) capabilities to provide an off-site, disaster-recovery server.

The Capacity BackUp offering has a minimum set of active processors that can be used for any workload and a large number of inactive processors that can be activated using On/Off CoD in the event of a disaster. A specified number of no-charge On/Off CoD processor days is provided with Capacity BackUp.

For more information about On/Off CoD, see “On/Off Capacity on Demand” on page 16.

Make sure that you have prepared your server before continuing. For more information, see “Preparing for Capacity on Demand” on page 2.

You can test your Capacity BackUp activations while not incurring duplicate charges. For more information, see Testing your On/Off activations.

## Processors available for Capacity BackUp

Learn about the number of active and inactive processors available for each server model.

Capacity BackUp provides a minimum number of active processors that can be used for any workload and a large number of inactive processors that can be used in the event of a disaster. On/Off Capacity on Demand (CoD) is used to temporarily activate the processors for disaster testing or in the event of an actual disaster. For more information about On/Off CoD, see “On/Off Capacity on Demand” on page 16.

The following tables list the server models and processor features that offer inactive processors that can be temporarily activated using Capacity BackUp.

**Note:** Additional capacity backup configurations are available for various POWER systems. For more information, see the IBM Capacity Backup for Power Systems Web site at the following address:  
<http://www-03.ibm.com/systems/power/hardware/cbu/>.



Table 13. IBM i Capacity BackUp models, processor features, enablement features, and processor information

Machine type and model	CBU edition feature	Processor feature	On/Off CoD Enablement feature	Active processors	Inactive processors	Installed processors	No-charge processor days for test	No-charge processor days for disaster recovery
9406-MMA	7053	7380	7954	1	3	4	42	(1)
9406-MMA	7058	7380	7954	2	6	8	42	(1)
9406-MMA	7063	7380	7954	4	12	16	42	(1)

Note: 90 x (primary server active processors - Capacity BackUp active processors)

## Software licensing considerations for Capacity BackUp

Software licensing for IBM i is included with the active processors for the Capacity BackUp server and is not required with the use of temporary capacity.

AIX software licensing for permanently active processors is licensed separately. AIX software licensing of inactive processors is typically not required in the event of a disaster. IBM software licensing is not required on the Capacity BackUp server. Non-IBM software licensing is based on the software tier or conditional use licensing explicitly required by the software provider.

## PowerVM Editions

PowerVM Editions (also referred to as *PowerVM*) is activated with a code, similar to the way that capacity is activated on IBM Systems and IBM eServer hardware.

When you purchase an PowerVM Editions feature, a code is provided that can be entered on the Hardware Management Console (HMC) to activate the technology. You can enter PowerVM activation codes by using the Integrated Virtualization Manager (IVM).

## PowerVM Editions concepts

This information describes the virtualization technologies that are available.

The following virtualization technologies are available:

- Advanced POWER<sup>®</sup> and PowerVM are Virtualization Engine<sup>™</sup> technologies that enables the system for the following features:
  - Micro-Partitioning
  - Virtual I/O Server
  - Integrated Virtualization Manager
  - Live Partition Mobility
  - The ability to run x86 Linux applications on Power Systems

The following table describes the features each PowerVM Edition offers:

Table 14. PowerVM Editions offerings

Offering	Express Edition	Standard Edition	Enterprise Edition
Maximum number of logical partitions offered	3 per server	10 per processor	10 per processor
Management offering	IVM	IVM, HMC	IVM, HMC
Virtual I/O server	Offered	Offered	Offered
Lx86	Offered	Offered	Offered

Table 14. PowerVM Editions offerings (continued)

Offering	Express Edition	Standard Edition	Enterprise Edition
Shared dedicated capacity	Offered	Offered	Offered
Multiple shared processor pools	Not offered	Offered	Offered
Live partition mobility	Not offered	Not offered	Offered

This table shows the PowerVM Edition features.

Table 15. PowerVM Edition features

Machine Type	Express Edition feature	Standard Edition feature	Enterprise Edition feature
9119-FHA	Not offered	7943	8002
9406-MMA	Not offered	7942	7995
9117-MMA	Not offered	7942	7995
8234-EMA	Not offered	7942	7995
8204-E8A	7983	7982	7986
8203-E4A	7983	8506	8507
7998-61X	Not offered	5409	5649
799-60X	Not offered	5406	5606

This table contains the Enterprise Enablement features. Full Enterprise Enablement means that 100 percent of the processors are enabled.

Enterprise Enablement is an advanced function on demand technology that enables the system for 5250 online transaction processing (OLTP).

Table 16. Enterprise Enablement Features

Machine type and model	Single Processor Enterprise Enablement	Full System Enterprise Enablement
9406-MMA	5490, 9299*	5491
9409-M50	4998, 9299*	4999, 9298*
8204-E8A	4998	4999
8234-EMA	4990	4991
9117-MMA	4990	4991
9119-FHA	4995	4996

\* Zero-priced features are available only with initial orders of specially-configured systems.

## Ordering PowerVM Editions features

You can order PowerVM Editions features for a new server, a server model upgrade, or an installed server.

For a new server or a server model upgrade, your order can contain one or more PowerVM Editions features, resulting in a single PowerVM Editions code. In this case, the PowerVM Editions code is entered before the server is sent to you.

When you order PowerVM Editions features for an installed server, determine which PowerVM Editions technology you want to enable and then order the associated features. A single PowerVM Editions code will be generated for you to enter that enables all of the technologies that you ordered.

To order one or more PowerVM Editions features, do the following:

1. Determine which PowerVM Editions features you want to enable. For more information, see “PowerVM Editions concepts” on page 35.
2. Contact your IBM Business Partner or IBM sales representative to place your order for one or more PowerVM Editions features.
3. Enter the resulting code on your server to enable PowerVM Editions. See “Activating PowerVM Editions” for more information.

## Using PowerVM Editions

You can activate Virtualization Engine technologies after you order the features. Learn about how to view a history log of your past PowerVM Editions activations and code-generation information.

### Activating PowerVM Editions

To activate PowerVM Editions, you must enter an activation code from the Hardware Management Console or the Advanced System Management Interface (ASMI) menu interface. You can also use the Integrated Virtualization Manager (IVM) interface.

To activate PowerVM Editions on the HMC, you must have an HMC super administrator user role.

To enter a PowerVM Editions code, do the following:

1. Retrieve the enablement code by going to <http://www-912.ibm.com/pod/pod>.
2. Enter your activation code on your server using the HMC. To enter your code, do the following:
  - a. In the navigation area of the HMC window, expand **Systems Management**.
  - b. Select **Servers**.
  - c. In the contents area, select the server on which you want enter your activation code.
  - d. Select **Tasks**.
  - e. Select **Capacity on Demand**.
  - f. Select **PowerVM**.
  - g. Select **Enter Activation Code**.
  - h. Type your activation code in the **Code** field and click **OK**.

You can now begin using PowerVM Editions.

### Viewing history log for PowerVM Editions activations

You can see what PowerVM Editions technologies activations are entered and what capabilities have been enabled on your server by using the history log.

To view the PowerVM Editions technologies activations that have been entered and the capabilities that have been enabled, do the following:

1. In the navigation area of the HMC window, expand **Systems Management**.
2. Select **Servers**.
3. In the contents area, select the server on which you want to view the history log.
4. Select **Tasks**.
5. Select **Capacity on Demand**.
6. Select **Power VM**.
7. Select **View History Log**.

### Viewing and saving PowerVM Editions technologies code-generation information

You can view and save PowerVM Editions code-generation information using the Hardware Management Console (HMC). You might need to do this if the PowerVM Editions code that was provided for your server does not work.

You can view PowerVM Editions code-generation information, and then save it to a file on a remote system or to a file on removable media. The information used to generate your PowerVM Editions codes must exactly match the information shown on the HMC PowerVM Editions Code Information window. To update the information that is used to generate your PowerVM Editions codes, use the PowerVM Editions Code Information window to save the PowerVM Editions code information to a file on a remote system or to a file on removable media. Then, you can either attach the file to an e-mail, or print the file and fax it to your Capacity on Demand (CoD) administrator.

To view and save PowerVM Editions code-generation information, do the following:

1. In the navigation area of the HMC window, expand **Systems Management**.
2. Select **Servers**.
3. In the contents area, select the server on which you want to view and save your code-generation information.
4. Select **Tasks**.
5. Select **Capacity on Demand**.
6. Select **Power VM**.
7. Select **View Code information**.
8. On the **Show Code Information** page, click **Save** to save the activation code information to a file on a remote system or to media.
9. In the Save Activation Code Information window, select one of the following options, and then perform the task associated with that option.

Option	Description
<b>Save to a file on a remote system</b>	<ol style="list-style-type: none"> <li>1. Enter the remote system name, file name, user ID, and password</li> <li>2. Click <b>OK</b> to save the activation code information or click <b>Cancel</b> to exit the panel without saving the activation code information.</li> </ol>
<b>Save to media</b>	<ol style="list-style-type: none"> <li>1. Click <b>OK</b>.</li> <li>2. Select your device. The following options might be displayed (the list will include only those removable media devices that are available for use on the HMC): <ul style="list-style-type: none"> <li>• <b>Diskette drive</b></li> <li>• <b>Flash memory</b></li> <li>• <b>USB diskette drive</b></li> </ul> </li> <li>3. Click <b>OK</b> to save the CoD code-generation information, or click <b>Cancel</b> to exit the panel without saving the CoD code information.</li> </ol>

To fax or send an e-mail with the PowerVM Editions code information in it to your PowerVM Editions or CoD administrator, use one of these options to send your information:

- Fax-to information:
  - **Send to:** Capacity on Demand Administrator
  - **Fax number:** 507-253-4553
  - **Location:** Rochester, Minnesota, U.S.
- Fax-from information:
  - **Customer name:**
  - **Customer contact name:**
  - **Customer address:**



- **Customer phone number:**
- **Customer fax number:**
- If you are using e-mail, send the electronic image of the code information in an e-mail to the appropriate address:
  - IBM System i5 or eServer i5 models: [icod@us.ibm.com](mailto:icod@us.ibm.com)
  - IBM System p5 or eServer p5 models: [pcod@us.ibm.com](mailto:pcod@us.ibm.com)

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## Related information for Capacity on demand

Web sites contain information related to the Capacity on demand topic collection.

### Web sites

- Hardware Information Web site at  
[http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/iphdx/power\\_systems.htm](http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/iphdx/power_systems.htm)   
Provides the entire POWER6 library.
- Power Systems Capacity on Demand for IBM i  (<http://www-03.ibm.com/systems/power/hardware/cod/index.html>)  
Describes the various Capacity on Demand offerings.



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