Power Systems

Power Integrated Facility for Linux (Power IFL)

IBM

Power Systems

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IBM

Contents

Power Integrated Facility for Linux (Power IFL)

Power® Integrated Facility for Linux (Power IFL) is an optional lower-cost per processor core activation feature for IFL-compliant workloads on IBM® Power Systems™ servers. You can activate Power IFL processor cores that are restricted to running IFL workloads. In contrast, processor cores that are activated for general-purpose workloads can run any supported operating system. If you choose to activate Power IFL processor cores, configure your systems to be in compliance with the license terms.

The procedures and functions of the HMC Enhanced + Tech Preview (Pre-GA) login option and interface type, which was provided with the Hardware Management Console (HMC) version 8.2.0, are the same as the HMC Enhanced+ login option and interface type that is provided with HMC version 8.3.0 and later. Only the HMC Enhanced+ is referred to in the documentation, but that content also applies to the HMC Enhanced + Tech Preview (Pre-GA) interface.

What's new in Power Integrated Facility for Linux (Power IFL)

Read about new or significantly changed information in Power IFL since the previous update of this topic collection.

August 2017

The following change was made to this content:
- New machine type models are available for the Power IFL feature.

October 2016

The following change was made to this content:
- The IBM Power System E850C (8408-44E) machine type model is new for the Power IFL feature.

September 2016

The following machine types and models are new for Power IFL feature:
- IBM Power System E880C (9080-MHE)
- IBM Power System E870C (9080-MME)

October 2015

The following changes were made to this content:
- Server firmware FW840 automatically ensures that the total entitled capacity used by active AIX® and IBM i partitions does not exceed the number of general-purpose processor cores.
  - An AIX or IBM i partition can start only if the available number of general-purpose processor cores can satisfy the partition minimum requirement. If the available number of general-purpose processor cores is less than the desired number of processors, the available number is used.
  - You can add processor resources dynamically to an AIX or IBM i partition only if general-purpose processor cores are available. If you request more processors than the available number of general-purpose processor cores, the available number is added to the partition.
  - The PowerVM® hypervisor automatically ensures that uncapped AIX and IBM i partitions do not exceed the number of general-purpose processor cores.
- In Hardware Management Console (HMC) version 8.4.0, the user interface and commands were changed to indicate that both Linux and Virtual I/O Server (VIOS) partitions are IFL compliant

workloads for systems that are running firmware level FW830, or later. Also, the command `lssyscfg -r sys -F capabilities` shows whether the server firmware categorizes VIOS partitions as IFL compliant workloads. Updated information in the "Basic Power IFL configuration techniques" on page 3 topic.

June 2015

The following changes were made to this content:
* The IBM Power System E850 (8408-E8E) machine type model is new for the Power IFL feature.
* The procedure to use when you select the HMC Enhanced+ interface was added to "Configuration example with shared processor pools" on page 6.
* The procedures and functions of the HMC Enhanced + Tech Preview (Pre-GA) login option and interface type, which was provided with the Hardware Management Console (HMC) version 8.2.0, are the same as the HMC Enhanced+ login option and interface type that is provided with HMC version 8.3.0 and later. Only the HMC Enhanced+ is referred to in the documentation, but that content also applies to the HMC Enhanced + Tech Preview (Pre-GA) interface.
* For systems that are running firmware level FW830 or later, partitions that are running the Linux operating system and partitions that are configured to run as Virtual I/O Server (VIOS) partitions are IFL compliant workloads and can use IFL cores. In systems that are running firmware that is earlier than firmware level FW830, VIOS partitions are not IFL compliant workloads and cannot use the IFL licensed cores.
* Compliance monitoring assistance is available in firmware levels FW780 and FW820, but it is not available in firmware level FW830.

October 2014

The following machine types and models are new for Power IFL feature:
* IBM Power System E880 (9119-MHE)
* IBM Power System E870 (9119-MME)

June 2014
* Updated information about monitored compliance in the "Compliance monitoring assistance" on page 11 topic.

Supported systems for Power IFL

You can use Capacity Upgrade on Demand (CUoD) activations to enable Power IFL processor cores on certain models of IBM Power Systems servers.

Power IFL activations are available for the following models:

Machine type and model	Power IFL feature code
8408-44E	ELJ1
8408-E8E	ELJ1
9080-MHE	ELJ1
9080-MME	ELJ1
9117-MMB	ELJ1
9117-MMC	ELJ1
9117-MMD	ELJ1
9119-FHB	ELJ1
9179-MHB	ELJ1

Machine type and model	Power IFL feature code
9179-MHC	ELJ1
9179-MHD	ELJ1
9119-MHE	ELJ1
9119-MME	ELJ1

Basic Power IFL configuration techniques

A Power IFL processor core is licensed for use with IFL-compliant workloads only. Power IFL processing capacity cannot be used to satisfy the licensed processor core requirement for non-IFL compliant workloads.

The server firmware determines which workloads can use Power IFL processor cores on a managed system.

Firmware level	IFL-compliant workloads	Non-IFL compliant workloads
FW830 or later	Virtual I/O Server or Linux partitions	AIX or IBM i partitions
FW820 or earlier	Linux partitions	AIX, IBM i, or Virtual I/O Server partitions

To verify whether the server firmware categorizes VIOS partitions as IFL workloads, use the Hardware Management Console (HMC) command `lssyscfg -r sys -F capabilities` on HMC version 8.4.0 or later. If the server firmware categorizes VIOS partitions as IFL workloads, the output lists the `ifl_vios_capable` attribute.

Verifying the Power IFL license configuration for a managed server by using the HMC

You can see the license configuration for a managed server with Power IFL activations in the Processors tab when you view the HMC server properties. Two categories are listed in the Configurable section. Processors that are listed as **Linux only** or **Linux or VIOS only** represent the number of Power IFL processor cores. Processors that are listed as **Any** can be used for any (general purpose) workload. This same information is available in the CoD Processor Capacity Settings window.

You can also use the `lscod` and `lshwres` HMC commands to display the number of Power IFL processor cores and general-purpose processor cores.

The `lscod` command displays the number of processors that are permanently licensed for Power IFL and general-purpose workloads. Depending upon the HMC version and server firmware version, the number of permanently licensed Power IFL processors is listed in either the `perm_procs_linux_vios` parameter or the `perm_procs_linux` parameter. The `perm_procs_linux` parameter is always displayed for HMC version 8.3.0, or earlier, even if the server has server firmware FW830, or later. For example,

```
# lscod -t cap -c cuod -r proc -m <managed system>

perm_procs=10,perm_procs_linux_vios=3,perm_procs_all_os=7
```

Where the `perm_procs_linux_vios=3` parameter value indicates that three processor cores are licensed for IFL-compliant workloads. If the `perm_procs_linux_vios` parameter value is 0, it is not displayed in the command output unless you specify the -F flag. The `perm_procs_all_os=7` parameter value indicates that seven processor cores can be used for any workload. If the value of the `perm_procs_all_os` parameter is equal to the value of the `perm_procs` parameter, the `perm_procs_all_os` parameter value is not displayed in the command output unless you specify the -F flag.

The lshwres command can also show the number of processor units that are licensed for Power IFL or general-purpose workloads. Depending upon the HMC version and server firmware version, the number of configurable processors for IFL-compliant workloads is listed in either the configurable_sys_proc_units_linux_vios parameter or the configurable_sys_proc_units_linux parameter. The configurable_sys_proc_units_linux parameter is always displayed for HMC version 8.3.0, or earlier, even if the server has server firmware FW830, or later. For example (backslashes represent line continuation),

```
# lshwres -m <managed system> -r proc --level sys

configurable_sys_proc_units=10.0,curr_avail_sys_proc_units=1.0,pend_avail_sys_proc_units=0.0,\
installed_sys_proc_units=16.0,deconfig_sys_proc_units=0,min_proc_units_per_virtual_proc=0.05,\
max_virtual_procs_per_lpar=256,max_procs_per_lpar=256,max_curr_virtual_procs_per_aixlinux_lpar=64,\
max_curr_virtual_procs_per_vios_lpar=64,max_curr_virtual_procs_per_os400_lpar=64,\
max_curr_procs_per_aixlinux_lpar=64,max_curr_procs_per_vios_lpar=64,max_curr_procs_per_os400_lpar=64,\
max_shared_proc_pools=64,configurable_sys_proc_units_linux_vios=3.0,configurable_sys_proc_units_all_os=7.0
```

Where the configurable_sys_proc_units_linux_vios=3.0 parameter value indicates that 3.0 processor cores are configurable for IFL-compliant workloads. If the configurable_sys_proc_units_linux_vios parameter value is 0, it is not displayed in the command output unless you specify the -F flag. The configurable_sys_proc_units_all_os=7.0 parameter value indicates that 7.0 processor cores are configurable for general-purpose workloads. If the value of the configurable_sys_proc_units_all_os parameter is equal to the value of the configurable_sys_proc_units parameter, the configurable_sys_proc_units_all_os parameter value is not displayed in the command output unless you specify the -F flag.

Ensuring Power IFL license compliance for a managed system

The number of general-purpose processor cores is the total number of licensed activations minus any Power IFL activations. The result represents the processing capacity that is available for non-IFL workloads. A managed system is out of compliance with the Power IFL license terms if non-IFL workloads use more processor cores than the number of general-purpose processor cores.

The responsibility for ensuring Power IFL license compliance depends upon the server firmware level that is used.

Firmware level	Responsibility for ensuring Power IFL license compliance
FW840 or later	The server firmware automatically ensures that the total entitled capacity used by active AIX and IBM i partitions does not exceed the number of general-purpose processor cores.
	• An AIX or IBM i partition can start only if the available number of general-purpose processor cores can satisfy the partition minimum requirement. If the available number of general-purpose processor cores is less than the desired number of processors, the available number is used.
	• You can add processor resources dynamically to an AIX or IBM i partition only if general-purpose processor cores are available. If you request more processors than the available number of general-purpose processor cores, the available number is added to the partition.
	• The PowerVM hypervisor automatically ensures that uncapped AIX and IBM i partitions do not exceed the number of general-purpose processor cores.

Firmware level	Responsibility for ensuring Power IFL license compliance
• FW830 • FW780, or earlier	You must configure the system so that the system is in compliance with the Power IFL license terms. For more information about how to configure the system properly, see "Restricting CPU consumption for non-IFL workloads." Compliance monitoring assistance is not available.
• FW820 • FW780.10, or later	You must configure the system so that the system is in compliance with the Power IFL license terms. For more information about how to configure the system properly, see "Restricting CPU consumption for non-IFL workloads." Server firmware periodically determines whether the system is in compliance with the Power IFL license terms. If the system is not in compliance, the HMC displays a message every hour, and the server firmware logs system reference codes (SRCs). For more information about compliance monitoring assistance, see "Compliance monitoring assistance" on page 11.

You do not need to limit the CPU for partitions that are running IFL workloads to satisfy licensing requirements. Any licensed processor core can be used to supply processor capacity for IFL workloads. Therefore, IFL workloads that are targeted to run on Power IFL processor cores can overflow onto the general-purpose processor cores when that capacity is available.

You can create a shared processor pool for Linux partitions to control software licensing costs. Set the maximum processing capacity of this shared processor pool to minimize your software licensing costs. The maximum processing capacity of a Linux-only shared processor pool has no effect on Power IFL licensing.

Restricting CPU consumption for non-IFL workloads

For servers that use server firmware FW830, or earlier, you must configure the system so that the system is in compliance with the Power IFL license terms. Restrict the CPU consumption for non-IFL workloads so that these workloads can never use more processors than the licensed number of general-purpose processor cores.

Power IFL configuration examples

Ensure that you understand how Power IFL licensing affects how you can configure your system.

Compliance with only general-purpose processor cores

The example system with only general-purpose processor cores is compliant with Power IFL license terms.

In this example, the system has only general-purpose processor cores. With 16 total activations and no Power IFL activations, 16 general-purpose processor cores are available. The AIX, IBM i, and Virtual I/O Server (VIOS) partitions can use 16 activated processor cores. No processor cores are restricted to IFL workloads. Therefore, the AIX, IBM i, VIOS, and Linux partitions can use any processor core. The following table shows a system configuration with no Power IFL activations.

Table 1. No Power IFL processor cores.

Without Power IFL features, these types of processor resources are available for various workloads.

Partition type and processor core usage		Activations and available processor capacity	
		Installed processor cores	16
		General-purpose permanent	16
		IFL-only	0
		Total cores available	16
AIX partitions	Each partition can use any activated processor cores, whether dedicated or shared.	16 activated general-purpose processor cores	
IBM i partitions			
VIOS partitions			
Linux partitions			

Compliance with general-purpose and Power IFL processor cores

The example system with Power IFL and general-purpose processor cores is compliant with Power® IFL license terms.

In this example, there are 12 total activations, with four Power IFL activations. The processing capacity that is available for non-IFL workloads is determined by the formula 12 - 4 = 8. In this configuration, the AIX and IBM i partitions can use only up to eight processor cores of capacity. IFL workload partitions can use any available capacity on the server. The following table shows a system configuration with eight general-purpose and four Power IFL processor cores.

Table 2. Four Power IFL processor cores

Partition type and processor core usage		Activations and available processor capacity	
		Installed processor cores	16
		General-purpose permanent	8
		IFL-only	4
		Total cores available	12
Linux partitions	Each partition can use any activated processor core.	12 activated processor cores	
VIOS partitions			
AIX partitions	Each partition can use any of eight activated dedicated processor cores.	12 - 4 = 8 activated general-purpose processor cores	
IBM i partitions			

Configuration example with shared processor pools

This set of examples shows how you can use shared processor pools to resolve system configuration issues that are related to Power IFL licensing.

Initial configuration without Power IFL processor cores

In this example, the system initially has nine general-purpose processor cores and no Power IFL processor cores. The non-IFL workloads can use nine processor cores of capacity. As shown in the following table, the system is in compliance with Power IFL license terms.

Table 3. No Power IFL processor cores on the compliant system. The configuration is compliant.

Partition type and processor core usage		Activations and available processor capacity	
		Installed processor cores	16
		General-purpose permanent	9
		IFL-only	0
		Total activated cores available	9
IBM i partition	`ibmi_ded`	1 dedicated processor core	
AIX partition	`aix_ded`	4 dedicated processor cores	
Default physical shared processor pool (SPP)			
AIX `aix_shr1`, default SPP	4 uncapped virtual processors	4 processor cores	
	2.0 processor core entitlement		
IBM i `ibmi_shr1`, default SPP	3 uncapped virtual processors		
	2.0 processor core entitlement		

Adding Power IFL processor cores

You can add IFL workload partitions that require four cores of processing capacity. You also want to take advantage of lower-cost Power IFL processor core licensing.

To begin, follow these steps:
1. Purchase a feature code for four Power IFL processor cores for your system.
2. Apply the activation code to activate four Power IFL processor cores.
3. Configure `linux1` as a Linux partition with two uncapped virtual processors and an entitlement of 1.0 processor cores.
4. Configure `linux2` and `linux3` as Linux partitions with three uncapped virtual processors and an entitlement of 1.5 cores each.

If the server uses server firmware FW830, or earlier, then the system is not compliant with Power IFL license terms. The AIX and IBM i partitions are not prevented from using the newly activated Power IFL capacity. Eight processor cores are in the physical shared processor pool. Partition `aix_shr1` is uncapped with four virtual processors, so it can use up to four processor cores of capacity. Partition `ibmi_shr1` is also uncapped with three virtual processors. Therefore, it can use up to three processor cores of capacity. The total shared processor capacity for AIX and IBM i partitions is seven cores. Additionally, partition `aix_ded` has four cores of dedicated capacity and partition `ibmi_ded` has one processor core of dedicated capacity. Therefore, the total processor usage for AIX and IBM i partitions is 12 processor cores. This usage exceeds the licensed capacity of nine general-purpose processor cores. (If the server uses server firmware FW840, or later, the uncapped AIX or IBM i partitions can use only general-purpose processor cores. The system would therefore be compliant with Power IFL license terms.) The following table provides more detail.

Table 4. Four new Power IFL processor cores and three new Linux partitions. If the server uses server firmware FW830, or earlier, then the system is no longer in compliance with license terms.

Partition type and processor core usage		Activations and available processor capacity	
		Installed processor cores	16
		General-purpose permanent	9
		IFL-only	4
		Total activated cores available	13
IBM i partition	`ibmi_ded`	1 dedicated processor core	
AIX partition	`aix_ded`	4 dedicated processor cores	
Default physical shared processor pool (SPP)		8 processor cores	
AIX `aix_shr1`, default SPP	4 uncapped virtual processors		
	2.0 processor core entitlement		
IBM i `ibmi_shr1`, default SPP	3 uncapped virtual processors		
	2.0 processor core entitlement		
Linux `linux1_shr`, default SPP	2 uncapped virtual processors		
	1.0 core entitlement		
Linux `linux2_shr`, default SPP	3 uncapped virtual processors		
	1.5 core entitlement		
Linux `linux3_shr`, default SPP	3 uncapped virtual processors		
	1.5 core entitlement		

Configuring a compliant system with server firmware FW830, or earlier

To avoid compliance issues for systems with server firmware FW830, or earlier, use shared processor pools to limit the use of processor capacity for the AIX and IBM i partitions. Configure each shared processor pool to contain partitions for a specific type of processor core. For example, if a shared processor pool contains AIX or IBM i partitions, the shared processor pool must not contain IFL workload partitions.

Choose one of the following navigation options, based on the interface type of the Hardware Management Console (HMC):

1. If you are using the HMC Classic interface, complete the following steps:
   a. In the HMC navigation area, click **Systems Management** > **Servers**.
   b. In the content pane, click the name of the server.
   c. In the Tasks pane, expand **Configuration** > **Virtual Resources**.
   d. Launch **Shared Processor Pool Management**.
   e. Select the **Pools** tab, if it is not selected.
2. If you are using the HMC Enhanced+ interface, complete the following steps:

a. In the navigation pane, click the **Resources** icon .

b. Click **All Systems**. The All Systems page is displayed.

c. Click the name of the server for which you want to view the shared processor pool data.

d. In the navigation area, select **PowerVM** > **Shared Processor Pool**.

e. Select the **Pools** tab, if it is not selected.

In this example, the pools tab shows shared processor pools that are named `DefaultPool`, `SharedPool01`, `SharedPool02`, and so on, through `SharedPool63`. Any partition that is not explicitly assigned to a shared processor pool is automatically assigned to `DefaultPool`. A value for maximum processing units is associated with each shared processor pool, except for the default pool (you cannot assign a maximum processing unit value to the default shared processor pool). This value limits the processor usage of the partitions that are assigned to a processor pool.

You can select the partitions tab to assign individual partitions to a specific shared processor pool. By assigning partitions to pools and correctly setting the maximum processing units for a shared processor pool, you can maintain a server in compliance with its Power IFL processor core licenses.

Placing `aix_shr1` and `ibmi_shr1` partitions into a shared processor pool with a maximum processor entitlement of 4.0 brings the system into compliance. The total processor core usage by the AIX and IBM i partitions is four dedicated cores for the `aix_ded` partition, one dedicated processor core for the `ibmi_ded` partition, and a shared processor pool with a limit of four processor cores. The total usage by dedicated processors plus shared processors is nine cores. The following table shows that this usage is equal to the allowed usage for the AIX and IBM i partitions.

Table 5. A new virtual shared processor pool. After using shared processor pools, the system is now compliant with Power IFL license terms.

Partition type and processor core usage		Activations and available processor capacity	
		Installed processor cores	16
		General-purpose permanent	9
		IFL-only	4
		Total activated cores available	13
IBM i partition	`ibmi_ded`	1 dedicated processor core	
AIX partition	`aix_ded`	4 dedicated processor cores	

Table 5. A new virtual shared processor pool (continued). After using shared processor pools, the system is now compliant with Power IFL license terms.

Partition type and processor core usage		Activations and available processor capacity
Virtual SPP 1 (maximum processing units = 4.0)		8 processor cores
AIX `aix_shr1`, default SPP	4 uncapped virtual processors	
	2.0 processor core entitlement	
IBM i `ibmi_shr1`, default SPP	3 uncapped virtual processors	
	2.0 processor core entitlement	
Default physical shared processor pool (SPP)		
Linux `linux1_shr`, default SPP	2 uncapped virtual processors	
	1.0 core entitlement	
Linux `linux2_shr`, default SPP	3 uncapped virtual processors	
	1.5 core entitlement	
Linux `linux3_shr`, default SPP	3 uncapped virtual processors	
	1.5 core entitlement	

Multiple shared processor pools for AIX and IBM i partitions

You can use multiple shared processor pools to manage processor core usage by IBM i partitions on your systems.

On systems that contain IBM i partitions and AIX or Linux partitions, you can use one or more shared processor pools to limit the processor usage by the IBM i partitions. You can use the same shared processor pools strategy with licensing of Power IFL processor cores. For example, all of the IBM i partitions are in one or more shared processor pools with appropriate maximum values set. The server is in compliance with the number of operating system licenses. Therefore, activating Power IFL processor cores does not cause the system to be out of compliance with their license terms.

You can also use multiple shared processor pools to manage other software license requirements. For example, your server has software licenses for three processor cores of AIX software database capability from a database vendor. It also has four cores of AIX software application middleware capability from a middleware vendor. In this example, set up two shared processor pools: one for the database applications and one for the middleware applications. The sum of the maximum processing units for all of these shared processor pools defines the maximum amount of AIX processing available to be used by shared processor partitions. There are seven processor cores in this example. The AIX and IBM i shared processor pool values added to the total dedicated processor cores determines the overall amount of AIX and IBM i processor core usage.

Shared-dedicated processor partitions

You can use dedicated processor sharing to provide extra capacity for shared processor partitions

If you configure dedicated processor partitions and enable dedicated processor sharing, you can use this extra capacity for shared processor partitions. Set the shared processor pool maximum processing units to be within your entitled license limit for general-purpose cores.

Capacity on Demand (CoD) with Power IFL

On/Off Capacity on Demand (CoD) and Utility CoD do not license Power IFL processor cores. You can use On/Off CoD and Utility CoD to manage the other, general-purpose processor core activations on your system. Power IFL processor cores cannot be used in a Power Enterprise Pool. They cannot be licensed as Mobile CoD cores.

On/Off Capacity on Demand (CoD) and Power IFL

On/Off Capacity on Demand (CoD) licenses only provide general-purpose processor cores. Power IFL licenses are not available through On/Off CoD requests.

To use previously configured On/Off CoD capacity for non-IFL workload partitions, activate more general-purpose processor cores by using the CoD interface on the Hardware Management Console (HMC). After processors are activated, if partitions in a shared processor pool need this capacity, increase the maximum processing units. When the demand for more capacity subsides, you can return the excess capacity by reducing the shared processor pool limit and deactivating processor cores that are not required.

Utility Capacity on Demand (CoD) and Power IFL

Utility Capacity on Demand (CoD) licenses only general-purpose processor cores. Power IFL licenses are not available through Utility CoD requests.

After processors are activated, these processor cores are available as needed. Manage the partition configuration to be in compliance with license terms.

Compliance monitoring assistance

For certain models of IBM Power Systems servers, the Hardware Management Console (HMC) Version 7, Release 7.9.0, or later, displays a message when the managed system is not in compliance with the Power Integrated Facility for Linux (Power IFL) license terms. Compliance monitoring assistance also requires the server firmware to be at level FW780.10, or later, or any version of server firmware FW820.

Compliance monitoring assistance is not available in server firmware level FW830, or later. For servers that use server firmware FW840, or later, server firmware automatically ensures that the system is in compliance with the Power IFL license terms. Compliance monitoring is therefore unnecessary for servers that use server firmware FW840, or later.

With the documented HMC and server firmware levels, compliance monitoring assistance is available on the following models:
- 8408-44E
- 8408-E8E
- 9080-MHE
- 9080-MME
- 9117-MMB
- 9117-MMD
- 9119-FHB
- 9179-MHB
- 9179-MHD
- 9119-MHE
- 9119-MME

System firmware on supported models periodically computes the actual processor core consumption. If your system is determined to be out of compliance with the processor core license terms, the HMC displays a message every hour. You must be logged into the HMC graphical user interface to see these messages. Otherwise, they are discarded.

The system records an entry in the CoD history log when an out of compliance condition is first detected, and when the number of out of compliance processor units changes. In addition, an A7004735 system reference code (SRC) is logged. If a system is out of compliance for 24 continuous hours, an A7004736 SRC is logged as a serviceable event.

If you determine that your system is out of compliance, you must correct the problem. Reduce the processor usage of one or more of the non-IFL workload partitions that are running on the managed system. Reduce processor usage through a dynamic logical partitioning operation (DLPAR operation), or shut down or suspend a partition. Follow the steps in this publication to prevent further compliance issues by setting up shared processor pools.

Related concepts:

Configuration example with shared processor pools
This set of examples shows how you can use shared processor pools to resolve system configuration issues that are related to Power IFL licensing.

Basic Power IFL configuration techniques
A Power IFL processor core is licensed for use with IFL-compliant workloads only. Power IFL processing capacity cannot be used to satisfy the licensed processor core requirement for non-IFL compliant workloads.

Related information:

 HMC commands

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Accessibility features for IBM Power Systems servers

Accessibility features assist users who have a disability, such as restricted mobility or limited vision, to use information technology content successfully.

Overview

The IBM Power Systems servers include the following major accessibility features:
- Keyboard-only operation
- Operations that use a screen reader

The IBM Power Systems servers use the latest W3C Standard, WAI-ARIA 1.0 (www.w3.org/TR/wai-aria/), to ensure compliance with US Section 508 (www.access-board.gov/guidelines-and-standards/ communications-and-it/about-the-section-508-standards/section-508-standards) and Web Content Accessibility Guidelines (WCAG) 2.0 (www.w3.org/TR/WCAG20/). To take advantage of accessibility features, use the latest release of your screen reader and the latest web browser that is supported by the IBM Power Systems servers.

The IBM Power Systems servers online product documentation in IBM Knowledge Center is enabled for accessibility. The accessibility features of IBM Knowledge Center are described in the Accessibility section of the IBM Knowledge Center help (www.ibm.com/support/knowledgecenter/doc/ kc_help.html#accessibility).

Keyboard navigation

This product uses standard navigation keys.

Interface information

The IBM Power Systems servers user interfaces do not have content that flashes 2 - 55 times per second.

The IBM Power Systems servers web user interface relies on cascading style sheets to render content properly and to provide a usable experience. The application provides an equivalent way for low-vision users to use system display settings, including high-contrast mode. You can control font size by using the device or web browser settings.

The IBM Power Systems servers web user interface includes WAI-ARIA navigational landmarks that you can use to quickly navigate to functional areas in the application.

Vendor software

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Related accessibility information

In addition to standard IBM help desk and support websites, IBM has a TTY telephone service for use by deaf or hard of hearing customers to access sales and support services:

TTY service
800-IBM-3383 (800-426-3383)
(within North America)

For more information about the commitment that IBM has to accessibility, see IBM Accessibility (www.ibm.com/able).

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Programming interface information

This Power Integrated Facility for Linux (Power IFL) publication documents intended Programming Interfaces that allow the customer to write programs to obtain the services of the Hardware Management Console (HMC) Version 8 Release 8.7.0 Maintenance Level 0, or later.

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