



System i

i5/OS and related software

i5/OS client partition considerations

Version 6 Release 1





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Note

Before using this information and the product it supports, read the information in "Notices," on page 11.

This edition applies to version 6, release 1, modification 0 of IBM i5/OS (product number 5761-SS1) and to all subsequent releases and modifications until otherwise indicated in new editions. This version does not run on all reduced instruction set computer (RISC) models nor does it run on CISC models.

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i5/OS client partition considerations

There are important considerations for setting up and using i5/OS[®] client logical partitions on system hardware, such as the IBM[®] BladeCenter[®] blade server. Starting with V6R1, you can use the Hardware Management Console (HMC) or IBM Integrated Virtualization Manager to manage i5/OS client logical partitions.

A *client logical partition* is a partition that is using the I/O resources of another partition. For example, i5/OS is using the resources of the Virtual I/O Server logical partition on a blade server. In contrast, a traditional logical partition environment is a system with individual partitions that use their own I/O resources.

i5/OS client logical partition environments

The following table summarizes the environments in which i5/OS can be a client logical partition. The Integrated Virtualization Manager provides a Web-based system management interface that you can use to manage blade servers and POWER[™] processor-based servers that use the Virtual I/O Server. The following are specific requirements regarding the management and configuration of i5/OS client logical partitions:

- On blade servers, the server logical partition must be a Virtual I/O Server partition and the Integrated Virtualization Manager must be used to manage the system.
- In a Hardware Management Console (HMC) environment, the server partition can be either a Virtual I/O Server or i5/OS partition.

Table 1. i5/OS client logical partition environments

System hardware	Management tool	Server logical partition	Client logical partition
Blade server	Integrated Virtualization Manager	Virtual I/O Server	i5/OS
POWER processor-based server	Integrated Virtualization Manager	Virtual I/O Server	i5/OS
POWER processor-based server	Hardware Management Console	Virtual I/O Server	i5/OS
POWER processor-based server	Hardware Management Console	i5/OS	i5/OS

When the i5/OS client logical partition is managed by Integrated Virtualization Manager, you can assign only virtual resources to the i5/OS partition. Disk units, optical devices, and Ethernet are accessed using virtual I/O adapters. The Virtual I/O Server logical partition provides the disk, optical, and network resources to the client logical partition. A major benefit of using virtual I/O is that you can share the hardware among the client logical partitions through the server logical partition, which allows you to optimize the amount of hardware and energy used by your system. If you are using Integrated Virtualization Manager to manage your system, certain limitations exist for i5/OS client logical partitions, because only virtual hardware can be assigned to those logical partitions.

The HMC allows you to assign physical I/O to i5/OS client logical partitions without regard to the operating system on the logical partition that provides disk resources. In contrast, if you use Integrated Virtualization Manager, Virtual I/O Server must own all physical I/O on the system, which means that the i5/OS client logical partitions cannot own any physical I/O. In the HMC environment, you can use either Virtual I/O Server or i5/OS as the server logical partition. The main advantage of using this environment is to enable backups from the logical partition that provides disk resources. You do not need

to run the backup procedure on each client logical partition. When you run backups on the i5/OS or Virtual I/O Server logical partition that provides the disk resources, the information for every i5/OS client logical partition is backed up along with the information belonging to the server logical partition.

Although you can run the i5/OS client logical partition with only virtual I/O hardware on HMC-managed systems, you still have the option to assign physical hardware to the i5/OS client logical partition for any functions that are not supported by virtual I/O hardware.

Related information



[i5/OS on a POWER Blade Read-me First](#)



[IBM i Virtualization and Open Storage Read-me First](#)



[BladeCenter Information Center](#)



[PowerVM Editions](#)



[Logical Partitioning](#)

What's new for V6R1

The i5/OS client partition considerations topic collection is new for this release.

Storage in i5/OS logical partitions can be virtualized, without the need of a disk adapter or drives for each logical partition. i5/OS client logical partitions can use the storage resources from another i5/OS logical partition or from a Virtual I/O Server partition. You also can use i5/OS on an IBM BladeCenter blade server.

To find other information about what's new or changed this release, see the Memo to users.

PDF file for i5/OS client partition considerations

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Setting up i5/OS client logical partitions

This topic provides important sources of information for setting up i5/OS client logical partitions on a blade server or POWER6™ processor-based system.



Setting up i5/OS client logical partitions on a blade server:

You must use Integrated Virtualization Manager to manage an i5/OS client logical partition on a blade server.

Use these references in the following order to set up and use the blade server hardware, Virtual I/O Server logical partition, and the i5/OS client logical partition:

1. Before you start using i5/OS on a blade server, see “Considerations and limitations for i5/OS client partitions managed by the Integrated Virtualization Manager” on page 4.
2. Start with the i5/OS on a POWER Blade Read-me First  when setting up and using blade servers with i5/OS. This document is a step-by-step process that explains how to set up the BladeCenter solution, which involves multiple hardware and software components: BladeCenter chassis, management module, blade server, switch modules, Virtual I/O Server, Integrated Virtualization Manager, and i5/OS.

The readme document contains links to the following references, pointing to the topics that are needed to complete the setup tasks:






- a. To set up the BladeCenter solution, see the BladeCenter Information Center and i5/OS on POWER Blades Supported Environments .
- b. To set up the Virtual I/O Server and Integrated Virtualization Manager, see the PowerVM Editions Operations Guide. This publication provides system operators and administrators with information about installing, configuring, managing, and using the PowerVM Editions (or Advanced POWER Virtualization) feature, which includes Virtual I/O Server and Integrated Virtualization Manager. You also can use the System Planning Tool to plan for using Virtual I/O Server.
- c. To install i5/OS, see the step-by-step instructions in the i5/OS on a POWER Blade Read-me First .

Setting up i5/OS logical partitions in the HMC environment:

In the HMC environment, you can create an i5/OS logical partition that uses i5/OS virtual I/O resources on System i® models that use POWER technology. You also can create a Virtual I/O Server logical partition and configure the i5/OS client logical partition to use the virtual SCSI and virtual Ethernet resources of the Virtual I/O Server logical partition. You might need to enter a PowerVM Editions activation code to create a Virtual I/O Server logical partition on your server.

For information about using a Hardware Management Console (HMC) to create and maintain logical partitions on a server, see the Logical Partitioning Guide.

Related information

-  [i5/OS on a POWER Blade Read-me First](#)
-  [IBM i Virtualization and Open Storage Read-me First](#)
-  [BladeCenter Information Center](#)
-  [PowerVM Editions](#)
-  [Logical Partitioning](#)


Backing up and restoring i5/OS partitions on a blade server

i5/OS client partitions use only virtual I/O resources, and do not have a physical tape drive available for backing up and restoring i5/OS. Backing up and restoring i5/OS client logical partitions on a blade server is a two-stage process.

The preferred method is to use virtual optical media for both full-system and partial backups. You create the virtual optical images in Integrated Virtualization Manager and assign them to the i5/OS partition, before beginning the backup. Although the virtual optical images reside in Virtual I/O Server, you can access the images from i5/OS. Therefore, you can do a D-mode IPL if you need to restore the i5/OS partition.

If you back up to virtual tape, you create the tape image catalog in i5/OS. You can use virtual tape to back up individual files or libraries that you want to move to another i5/OS partition. However, you cannot do a complete system restore because you cannot do a D-mode IPL from those image files.

For information about the **backup** and **restore** commands, see the *Virtual I/O Server and Integrated Virtualization Manager Command Reference*. For information about working with virtual optical media, see “Creating virtual optical devices using the Integrated Virtualization Manager” in the *PowerVM Editions Operations Guide*.

For the complete steps to back up and restore i5/OS partitions on a blade server, see the i5/OS on a POWER Blade Read-me First  .

Related information



i5/OS on a POWER Blade Read-me First



Virtual I/O Server and Integrated Virtualization Manager Command Reference



PowerVM Editions

Storage Solutions

Considerations and limitations for i5/OS client partitions managed by the Integrated Virtualization Manager

This information summarizes unique i5/OS considerations when you install, service, and use APIs, commands, and Common Information Model (CIM), and you perform save and restore operations on i5/OS client logical partitions with virtual hardware.

Because only virtual resources can be assigned to an i5/OS client logical partition that is managed by Integrated Virtualization Manager, i5/OS partitions have unique system, storage, networking, and operating system requirements and considerations.

The i5/OS limitations do not apply to i5/OS client logical partitions in the Hardware Management Console (HMC) environment because you can assign physical hardware to a partition.

In a logical partition with only virtual hardware (i5/OS partition that is a client to the Virtual I/O Server and managed by Integrated Virtualization Manager), you might need to change your existing applications and operational procedures to work in this environment. Key differences include the following items:

- Physical tape is not available for i5/OS client logical partitions, which affects save and restore operations and system dump functions.

- i5/OS client logical partitions do not own any physical I/O resources. All I/O resources on the i5/OS client logical partition are virtual Ethernet and virtual storage (disk and optical).
- You can view the physical and virtual hardware using the system plan on the Integrated Virtualization Manager interface. However, the i5/OS client logical partition has no view of the physical hardware. This affects servicing of the physical hardware, and also the operation and amount of data returned by some commands, APIs, and the MATMATR machine instruction.

Note: You need at least 768 MB to 1 GB of memory for the Virtual I/O Server partition and 1 GB of memory for the i5/OS partition on a blade or POWER processor-based system.

Installation considerations

The best way to install i5/OS is from a physical DVD drive that is owned by Virtual I/O Server. Use Integrated Virtualization Manager to virtualize and assign the optical drive, which is physically owned by Virtual I/O Server, to i5/OS. Then you can access the DVD drive virtually from the i5/OS partition.

If the Virtual I/O Server does not have a DVD drive, you can upload the i5/OS install media to a virtual optical file in the Virtual I/O Server. Because the installation media for i5/OS is greater than 2 GB, you must use the Virtual I/O Server command line to upload the i5/OS installation media to the Virtual I/O Server.

For more information about installing i5/OS on a blade server, see the i5/OS on a POWER Blade

Read-me First .

Backup and recovery

The preferred method is to use virtual optical media for both full-system and partial backups. No physical tape support is available in i5/OS logical partitions that are clients of the Virtual I/O server and managed by Integrated Virtualization Manager. If you do a backup to virtual tape, you cannot do a complete system restore. However, you can use virtual tape to back up small objects or libraries that you want to move to another i5/OS partition. You cannot save to virtual tape using the Save Storage (SAVSTG) command.

For more information, see the backup and restore information in the i5/OS on a POWER Blade Read-me

First .

Cryptographic coprocessors

Cryptographic coprocessors are not supported in this environment. You also cannot use a Cryptographic coprocessor to generate and store private keys associated with digital certificates. None of the Common Cryptographic Architecture APIs in Option 35 - CCA Cryptographic Service Provider are supported, because these APIs route requests to cryptographic hardware.

Applications that use i5/OS Cryptographic Services APIs must use a software cryptographic service provider because hardware cryptographic service providers are not supported.

Disk Management graphical interface

The Disk Management graphical interface has some restrictions in this environment because the view of the disk resources is virtual rather than physical. You can still get information about disk capacity and utilization, but the following physical information is not available to the i5/OS partition:

- These columns are blank in the main Disk Units List:
 - Location
 - Part number

- Device position
- Frame unit
- Frame unit number
- If you use the graphical view from any of the containers or directly from the tasks, the main graph that displays the map of the system with the slots is not visible.
- The Physical Location graph in the Disk Unit properties is blank.
- The following lists are blank:
 - Disk units by location
 - Parity set list
- The following functions are unavailable:
 - Replace a failed disk unit with a new one.
 - Install a disk unit.
 - Start parity and other tasks related with parity.
 - Change optimization.
 - Resynchronize, include a disk unit, or exclude a disk unit.

Hardware resource APIs

The following hardware resource APIs return different information in this environment. Some of the fields return blank information or return the “No” value for hardware and virtual resources. For information about each API, use the API finder:

- Retrieve Hardware Resource Information (QGYRHRI, QgyRtvHdwRscInfo) API
- Retrieve Hardware Resource List (QGYRHRL, QgyRtvHdwRscList) API
- Retrieve Hardware Resource Relative (QRZRTVR) API
- Retrieve Resource Information (QRZRRSI) API
- Search Hardware Resource Entry (QRZSCHE) API

Management Central

You cannot view physical resources in this environment using Hardware Inventory functions in Management Central. Instead, you can view physical resources using Integrated Virtualization Manager. For more information about viewing physical resources, see the *PowerVM Editions Operations Guide*.

MATMATR MI instruction

The only information that is returned using Materialize Machine Attributes (MATMATR) option 012C is the Central Electronic Complex vital product data (VPD) information. The **pseudo model number** field in the VPD information is blank. For more information, see the Materialize Machine Attributes (MATMATR) topic.

Operations Console

In the Integrated Virtualization Manager environment, you must use a PC and Operations Console LAN to manage the i5/OS client logical partitions. You can use the same PC that is running the Integrated Virtualization Manager for the client logical partitions, or you can use separate PCs. To access the console, you must configure virtual Ethernet bridging on the Integrated Virtualization Manager. You cannot configure a local console directly attached to the server.

Servicing of the partition

Servicing of the physical hardware is performed from the Virtual I/O Server, not from the i5/OS client logical partition. The error messages might direct you to the Virtual I/O Server partition, which is where you would service the physical hardware.

System dumps:

You can obtain dumps in one of the following ways:

- You can write the data to storage, copy it to virtual tape that is backed by files from the integrated file system, and then send it to IBM service and support using FTP.
- You can write the data to virtual file-backed optical media, transfer the data to physical tape, and then send the physical tape to IBM service and support.

Electronic customer support and Electronic Service Agent:

If you plan to configure Electronic customer support or Electronic Service Agent™ (ESA), you must use either a direct or multi-hop connection. You cannot use a modem or dial-up connection. You need to configure Electronic customer support on each i5/OS client partition. To configure Electronic customer support, use either the Create Service Configuration (CRTSRVCFG) command or the Universal Connection Wizard in System i Navigator.

Dedicated service tools (DST):

Physical tape is not supported for DST functions.

Because the following Work with disk units options require the use of a tape, they are not supported in this environment. However, you can use other disk management options:

- Save disk unit data
- Restore disk unit data
- Save storage
- Restore storage

Other disk management options that use tape also are not supported.

System service tools (SST):

The physical location fields in the Disk Unit Hardware Resource Information Details display are blank. However, you still can use SST to obtain information about virtual disks.

Hardware Service Manager:

Hardware Service Manager, which is available under SST or under DST, allows you to display, work with, and print the stored hardware resources information. In this environment, some of the Hardware Service Manager options provide information for virtual hardware, and other options do not display any information.

Technologies that are not supported on i5/OS client logical partitions

The following technologies are not supported on i5/OS client logical partitions:

- High availability using clustering
- Virtual OptiConnect
- Cryptographic coprocessors
- IBM Facsimile for iSeries® licensed program

You can use the IBM Universal Manageability Enablement for i5/OS licensed program (5722-UME) on i5/OS client logical partitions, with limitations. For details, see the Common Information Model topic.

Related information



i5/OS on a POWER Blade Read-me First

Installing i5/OS and related software on a new system or logical partition

API finder

 PowerVM Editions

 Logical Partitioning

 Hardware Service Manager

 CCA Basic Services Reference and Guide for the IBM 4758 PCI and IBM 4764 PCI-X Cryptographic Coprocessors

Common Information Model

Materialize Machine Attributes (MATMATR) MI

CL commands

The following control language (CL) commands have limitations, when used on a system that is managed by the Integrated Virtualization Manager. For example, the Work with Hardware Products (WRKHDWPRD) command does not return a location for virtual resources.

Create Service Configuration (CRTSRVCFG) command

You cannot use this command to create a dial-up connection. In an i5/OS logical partition that is a client to Virtual I/O Server and managed by Integrated Virtualization Manager, the *DIRECT, *MULTIHOP, and *RMTDIAL values for the Connection type (CNNTYPE) parameter are valid for virtual Ethernet. If you select the *OTHERISP or *LCLDIAL values, no hardware resources are listed, because a hardware resource capable of supporting Point-to-Point Protocol (PPP) is required. Thus, you cannot configure those connection types.

Device configuration commands

You can vary on and off only supported virtual resources, such as virtual Ethernet and virtual optical devices, with device configuration commands. Use the Work Configuration Status (WRKCFGSTS) or Vary Configuration (VRYCFG) commands to vary on or off the virtual resources.

Save Storage (SAVSTG) command

The SAVSTG command is not supported.

Save and restore commands

You must use a virtual optical device to save or restore the entire system. However, you can save or restore individual objects or libraries to virtual tape media in the i5/OS client logical partition.

Work with Hardware Products (WRKHDWPRD) command

This command does not return a location for virtual resources. Functions that were used to set up physical configurations are not useful in this environment.

Work with Order Information (WRKORDINF) command

A view of the physical hardware is not returned with this information.

Work with Problems (WRKPRB) command

This command does not analyze hardware errors.

Display Hardware Resources (DSPHDWRSC) command

This command displays or prints virtual hardware information only.

The following resource types are not displayed or printed:

- *CRP (cryptographic)
- *CSA (coupled system adapters)
- *LWS (local work stations)
- *PRC (processors)

Packaging information is not included in the database files that are created as output from the DSPHDWRSC command. Depending on the type specified for this command, empty database files might be created.

The following table shows what information is returned for the output files created when you use the DSPHDWRSC command in this environment. For those types that have resources returned, the following fields show blanks:

- Resource part number
- Resource frame location
- Resource EIA location
- Resource card position
- Resource frame identification
- Resource device position (applies to *STG only)
- Resource card position
- Alternate device position (applies to *STG only)
- Alternate frame identification
- Alternate card position
- Location code

Table 2. Outfile formats for the DSPHDWRSC command

TYPE parameter value	Description	Output file	Resources in partition managed by Integrated Virtualization Manager
*CMN	Communications	QARZDCMN	Only virtual resources are returned.
*CRP	Cryptographic	QARZSCRIP	Empty file is returned.
*CSA	Coupled system adapters	QARZDCSA	Empty file is returned.
*LWS	Local workstations	QARXDLWS	Empty file is returned.
*PRC	Processors	QARZDPRC	Only system CEC and bus adapter are returned.
*STG	Storage	QARZDSTG	Only virtual resources are returned.
*LAN	LAN	QARZDTRA	Only virtual resources are returned.

Work with Hardware Resources (WRKHDWRSC) command

This command displays or prints virtual hardware information only. This command has the same limitations as described above for the Display Hardware Resources (DSPHDWRSC) command.

Related information

CL command finder

Universal Manageability Enablement for i5/OS

You can use the IBM Universal Manageability Enablement for i5/OS licensed program (5722-UME) on i5/OS client logical partitions, with limitations. Physical hardware information is not accessible to i5/OS client logical partitions that are managed by Integrated Virtualization Manager.

The following tables show the limitations to the functions of the Common Information Model (CIM) provider.

Table 3. Providers that are inherited from the operating system

CIM classes	Value returned
IBMOS400_ComputerSystem	No value returned for the property OtherIdentifyingInfo and IdentifyingDescriptions
IBMP5G_Chassis	No instance returned
IBMP5G_ComputerSystem	No value returned for the property OtherIdentifyingInfo and IdentifyingDescriptions

Table 3. Providers that are inherited from the operating system (continued)

CIM classes	Value returned
IBMPSG_FRU	No instance returned
IBMPSG_PhysicalDisk	No instance returned
IBMPSG_PhysicalMemory	No instance returned
IBMPSG_PhysicalNetworkAdapter	No instance returned
IBMPSG_Port	No instance returned
IBMPSG_Processor	No instance returned
IBMPSG_SerialNumberInformation	No instance returned
IBM_BaseBoard	No instance returned
IBM_ComputerSystemDetails	No value returned for the property Model and SerialNumber
IBM_CSBaseBoard	No instance returned

Table 4. Hardware inventory and network management providers that do not return instances

CIM classes		
IBM_AssociatedMemory	IBM_Card	IBM_CardOnCard
IBM_CDRomDrive	IBM_Chassis	IBM_Chip
IBM_ComputerSystemPackage	IBM_DiskDrive	IBM_DVDDRIVE
IBM_ElementFRU	IBM_Memory	IBM_PackagedComponent
IBM_PackageInChassis	IBM_PCIController	IBM_PCIDevice
IBM_PhysicalMedia	IBM_PhysicalMemory	IBM_PhysicalNetworkAdapter
IBM_Processor	IBM_Product	IBM_ProductPhysicalComponent
IBM_Realizes	IBM_ReplacementFRU	IBM_SystemPackaging

Table 5. SMI-S host bus adapter (HBA) and host discovered resources (HDR) providers that do not return instances

CIM classes		
IBM_Card	IBM_FCControlledBy	IBM_FCDeviceSAPImplementation
IBM_FCElementSoftwareIdentity	IBM_FCElementStatisticalData	IBM_FCHostedAccessPoint
IBM_FCPort	IBM_FCPortStatistics	IBM_FCProductPhysicalComponent
IBM_FCRealizes	IBM_FCSystemDevice	IBM_PortController
IBM_Product	IBM_SCSIInitiatorTargetLogicalUnitPath	IBM_SCSIProtocolEndpoint
IBM_SoftwareIdentity (for firmware)		

Related information

Common Information Model

Appendix. Notices

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