ESCALA Power7

Managing system ressources using the SDMC

ESCALA Power7

Managing system ressources using the SDMC

The ESCALA Power7 publications concern the following models:

- Bull Escala E5-700 (Power 750 / 8233-E8B)
- Bull Escala M6-700 (Power 770 / 9117-MMB)
- Bull Escala M6-705 (Power 770 / 9117-MMC)
- Bull Escala M7-700 (Power 780 / 9179-MHB)
- Bull Escala M7-705 (Power 780 / 9179-MHC)
- Bull Escala E1-700 (Power 710 / 8231-E2B)
- Bull Escala E1-705 (Power 710 / 8231-E1C)
- Bull Escala E2-700 / E2-700T (Power 720 / 8202-E4B)
- Bull Escala E2-705 / E2-705T (Power 720 / 8202-E4C)
- Bull Escala E3-700 (Power 730 / 8231-E2B)
- Bull Escala E3-705 (Power 730 / 8231-E2C)
- Bull Escala E4-700 / E4-700T (Power 740 / 8205-E6B)
- Bull Escala E4-705 (Power 740 / 8205-E6C)

References to Power 755 / 8236-E8C models are irrelevant.

Hardware

October 2011

Trademarks and Acknowledgements

We acknowledge the right of proprietors of trademarks mentioned in this book.

Contents

Managing system resources with SDMC

The IBM® Systems Director Management Console (SDMC) provides information to manage system resources, such as virtual and physical hardware resources, virtual servers and hosts, virtual appliances, workloads, and system pools.

The SDMC is a system that controls hosts, including the management of virtual servers and the use of Capacity Upgrade on Demand (CoD). Using service applications, the SDMC communicates with hosts to detect, consolidate, and forward information to IBM for analysis.

The SDMC features a browser-based user interface. You can also configure the SDMC so that you can connect to it remotely by using a supported browser.

Virtual servers

A *virtual server* is a system composed of partitioned, shared, or virtualized resources presented from a host system. An operating system and other software can be installed on a virtual server.

Manage virtual server operations

You can use the IBM Systems Director Management Console (SDMC) **Manage Virtual Server** menu to perform many operations on virtual servers, including those operations that are analogous to dynamic logical partitioning (DLPAR) operations on the Hardware Management Console.

You can use the **Manage Virtual Server** panel to customize and modify existing virtual servers. In this panel, most of the settings previously available in different menus on the Hardware Management Console have been consolidated. Usage improvements provide easier navigation and handling of tasks related to virtual server management.

You must activate the virtual server after the creation of the virtual server. Thereafter, you can use **Manage Virtual Server** to manage the virtual server.

To access the **Manage Virtual Server** menu, follow these steps:
1. On the **Welcome** page, click the **Resources** tab.
2. Expand **Hosts** and click the host on which the virtual server is located.
3. In the work pane, select the virtual server that you want to manage.
4. Right click in the pane and click **System Configuration** → **Manage Virtual Server**.

When you create a virtual server, a default profile named `DefaultProfile` is created. To learn how to manage profiles, see "Managing profiles for virtual servers" on page 36.

The result of changes made to a virtual server by **Manage Virtual Server** depend on the following conditions:
- Changes made to the virtual server in *started state* take effect immediately. This feature is analogous to dynamic logical partitioning (DLPAR) operations on the Hardware Management Console.
- Changes made to the virtual server in *stopped state* are updated in the current configuration of the virtual server. These changes are updated in the hypervisor.
- To preserve these changes after a restart, save the current configuration. See "Saving the current configuration of a virtual server" on page 38.

- Changes made to the virtual server configuration by using **Manage Profiles** take effect only after the profile is reactivated. If you change any virtual server profile attributes, shut down and activate the virtual server with the modified profile to cause the new values to take effect. See "Managing profiles for virtual servers" on page 36.
- You see a text called **Pending** displayed next to the fields whose values you change when you click **Apply** , in the **Manage Virtual Server** option for a virtual server. This text indicates that the changes are being updated in the hypervisor. After the information is updated, the **Pending** text disappears.

Creating virtual servers

The Create Virtual Server wizard on the IBM Systems Director Management Console (SDMC) guides you through the procedure of creating virtual servers on your host.

After you create a virtual server, you must activate it once before it can be managed. After activation, you can manage it with the SDMC. To learn how to activate a virtual server, see "Activating a virtual server" on page 27.

When you create a virtual server, a default profile named `DefaultProfile` is created. To learn how to manage profiles, see "Managing profiles for virtual servers" on page 36.

Creating an AIX or Linux virtual server with the Create Virtual Server wizard

You can use the Create Virtual Server wizard to create an AIX® or Linux virtual server. The wizard takes you through steps required for creating the virtual server and for specifying the resources that are assigned to the virtual server.

To create a virtual server, the following conditions must be met:
- You must have system administrator access to the host.
- The host must be either in the started or standby state.
- If you are configuring the virtual server to use shared memory, check whether the host supports PowerVM™ Active Memory™ Sharing. Also ensure that a shared memory pool exists. If none exists, create a shared memory pool.
- If you are configuring the virtual server to use shared processor mode, the host must support Micro-Partitioning® technology.

To create a virtual server, complete the following steps:, complete the following steps:
1. On the **Welcome** page, click the **Resources** tab. The Power Systems™ Resources pane is displayed.
2. Expand **Hosts** and click the host on which you want to create the AIX or Linux virtual server.
3. Expand **System Configuration**
4. Right click in the pane and click **Create Virtual Server**. On the Name page, specify a virtual server name, the virtual server ID, and the operating system environment of the virtual server.
5. Enter a name for the virtual server in the **Virtual server name** field.
6. Enter a value for the virtual server ID in the **Virtual server ID** field, or use the value that is displayed in the field. The virtual server ID is a unique ID assigned to the virtual server within the managed system.
7. In the **Environment** field, select AIX/Linux as the environment you want to associate with the virtual server.
8. Select **Suspend capable** if the virtual server is to be capable of suspension.
9. To configure the resources for the virtual server manually, click **Next**. On the Memory page, select either **Dedicated** or **Shared** mode: If you selected **Dedicated Memory** mode, enter the amount of memory you want to assign to the virtual server in the **Assigned Memory (GB)** field. If you selected **Shared Memory** mode, enter the amount of shared memory you want to assign to the virtual server in the **Assigned Memory (GB)** field.

10. Click **Next**. On the Processor page, select either **Dedicated** or **Shared** mode: If you selected **Dedicated** processing mode, enter the number of processors that the virtual server should receive in the **Assigned processors** field. If you selected **Shared** mode, enter the number of virtual processors to assign to the virtual server in the **Assigned processors** field.

11. Click **Next**. On the Ethernet page, select the virtual Ethernet for each of the virtual Ethernet adapters of the virtual server. You can modify the properties of the adapter, like **IEEE settings** or **Shared Ethernet adapter**, by clicking the **Edit** tab.

12. Click **Next**. On the Storage page, you can select whether the IBM Systems Director Management Console (SDMC) automatically manages the virtual storage adapters required for each client virtual server to ease management, or you can individually customize the virtual storage adapters required for each client virtual server.

    • To individually customize the virtual storage adapters required for each client virtual server, select **No, I want to manage the virtual storage adapters for this Virtual Server.** Click **Next** and go to step 13.

    • To have SDMC manage the virtual storage adapters, select **Yes, Automatically manage the virtual storage adapters for this Virtual Server**. Select the type of storage devices (virtual disks, physical volumes, or Fibre Channel) for one or more VIOS virtual servers. Click Next, and go to step 14.

13. On the **Virtual Adapters** page, specify the virtual storage adapters required for the virtual server.

    a. Select the adapter ID and click the **Edit** tab to specify the virtual storage adapter ID and client information. In no adapter exists, you can create an adapter by clicking on **Create Adapter**.

    b. Select the adapter type as either SCSI or Fibre Channel from the **Adapter type** field.

    c. Specify the virtual server that the adapter is configured to connect to in the **Connecting Virtual Server** field.

    d. Specify the adapter ID that this adapter will be connecting to on the connecting virtual server in the **Connecting Adapter ID** field and click **Ok**. Click **Next** and go to 15.

14. On the **Optical devices** page, you can assign physical or virtual optical devices for this virtual server. Specify a physical optical device or virtual optical device for the virtual server by using the options in the **Virtual Optical** section. Click **Next** and go to step 15.

15. On the **Physical I/O Adapters** page, select one or more physical adapters from the list of available physical adapters. Select **Display only adapters that are currently available** to view only the adapters that are currently available instead of all adapters in the system. To view only the adapters that are currently available, select **Display only adapters that are currently available**. From the displayed table, select one or more physical adapter assignments for the virtual server.

    Note: Virtual servers that are assigned physical adapters cannot be relocated.

16. Click **Next** and review the summary.

17. Click **Finish**.

Related information

Virtual I/O Server

Creating an IBM i virtual server with the Create Virtual Server wizard

You can use the Create Virtual Server wizard to create an IBM i virtual server. The wizard takes you through steps required for creating the virtual server and for specifying the resources that are assigned to the virtual server.

To create a virtual server, the following conditions must be met:

• You must have system administrator access to the host.

• The host must be either in the started or standby state.

• If you are configuring the virtual server to use shared memory, check whether the host supports PowerVM Active Memory Sharing. Also ensure that a shared memory pool exists. If none exists, create a shared memory pool.

- If you are configuring the virtual server to use shared processor mode, the host must support Micro-Partitioning technology.

To create a virtual server, complete the following steps:, complete the following steps:

1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and click the host on which you want to create the IBM i virtual server.
3. Expand **System Configuration**
4. Right click in the pane and click **Create Virtual Server**. On the Name page, specify a virtual server name, the virtual server ID, and the operating system environment of the virtual server.
5. Enter a name for the virtual server in the **Virtual server name** field.
6. Enter a value for the virtual server ID in the **Virtual server ID** field, or use the value that is displayed in the field. The virtual server ID is a unique ID assigned to the virtual server within the managed system.
7. In the **Environment** field, select IBM i as the environment you want to associate with the virtual server.
8. Select **Suspend capable** if the virtual server is to be capable of suspension. The operation of the suspended virtual server and its applications can be resumed on the same host only.
9. To assign all the resources of the host to the virtual server, select the **Assign all resources to this virtual server** check box. Click **Next** and go to step 10. To configure resources for the virtual server manually, click **Next** and go to step 11
10. On the Load Source and Console page, specify the load source, alternate load source, and console devices for IBM i virtual servers:

    Load source devices can be virtual SCSI or virtual Fibre Channel adapters and any physical adapters that are assigned to the virtual server. The alternate load source is used to specify the alternate load source device for the IBM i virtual server. Console devices can be virtual Ethernet adapters, physical adapters, or IBM Systems Director Management Console (SDMC).
11. Click **Next**. On the Memory page, select either **Dedicated** or **Shared** mode: If you selected **Dedicated Memory** mode, enter the amount of memory you want to assign to the virtual server in the **Assigned Memory (GB)** field. If you selected **Shared Memory** mode, enter the amount of shared memory you want to assign to the virtual server in the **Assigned Memory (GB)** field.
12. Click **Next**. On the Processor page, select either **Dedicated** or **Shared** mode: If you selected **Dedicated** processing mode, enter the number of processors that the virtual server should receive in the **Assigned processors** field. If you selected **Shared** mode, enter the number of virtual processors to assign to the virtual server in the **Assigned processors** field.
13. Click **Next**. On the Ethernet page, select the virtual Ethernet for each of the virtual Ethernet adapters of the virtual server. You can modify the properties of the adapter, like **IEEE settings** or **Shared Ethernet adapter**, by clicking the **Edit** tab.
14. Click **Next**. On the Storage page, you can select whether the IBM Systems Director Management Console (SDMC) automatically manages the virtual storage adapters required for each client virtual server to ease management, or you can individually customize the virtual storage adapters required for each client virtual server.
    - To individually customize the virtual storage adapters required for each client virtual server, select **No, I want to manage the virtual storage adapters for this Virtual Server.**. Click **Next** and go to step 15.
    - To have SDMC manage the virtual storage adapters, select **Yes, Automatically manage the virtual storage adapters for this Virtual Server**. Select the type of storage devices (virtual disks, physical volumes, or Fibre Channel) for one or more VIOS virtual servers. Click Next, and go to step 16 on page 5.
15. On the **Virtual Adapters** page, specify the virtual storage adapters required for the virtual server.
    a. Select the adapter ID and click the **Edit** tab to specify the virtual storage adapter ID and client information. In no adapter exists, you can create an adapter by clicking **Create Adapter**.

b. Select the adapter type as either SCSI or Fibre Channel from the **Adapter type** field.

c. Specify the virtual server that the adapter is configured to connect to in the **Connecting Virtual Server** field.

d. Specify the adapter ID that this adapter will be connecting to on the connecting virtual server in the **Connecting Adapter ID** field and click **Ok**. Click **Next** and go to 17.

16. On the **Optical devices** page, you can assign physical or virtual optical devices for this virtual server. Specify a physical optical device or virtual optical device for the virtual server by using the options in the **Virtual Optical** section. Click **Next** and go to step 17.

17. On the **Physical I/O Adapters** page, select one or more physical adapters from the list of available physical adapters. Select **Display only adapters that are currently available** to view only the adapters that are currently available instead of all adapters in the system. To view only the adapters that are currently available, select **Display only adapters that are currently available**. From the displayed table, select one or more physical adapter assignments for the virtual server. Click **Next** and go to step 10 on page 4

   Note: Virtual servers that are assigned physical adapters cannot be relocated.

18. Click **Next** and review the summary.

19. Click **Finish**.

Creating a VIOS virtual server with the Create Virtual Server wizard

You can use the Create Virtual Server wizard to create a VIOS virtual server. The wizard takes you through steps required for creating the virtual server and for specifying the resources that are assigned to the virtual server.

To create a virtual server, the following conditions must be met:

- You must have system administrator access to the host.
- The host must be either in the started or standby state.
- If you are configuring the virtual server to use shared memory, check whether the host supports PowerVM Active Memory Sharing. Also ensure that a shared memory pool exists. If none exists, create a shared memory pool.
- If you are configuring the virtual server to use shared processor mode, the host must support Micro-Partitioning technology.

To create a virtual server, complete the following steps:, complete the following steps:

1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.

2. Expand **Hosts** and click the host on which you want to create the VIOS virtual server.

3. Expand **System Configuration**

4. Right click in the pane and click **Create Virtual Server**. On the Name page, specify a virtual server name, the virtual server ID, and the operating system environment of the virtual server.

5. Enter a name for the virtual server in the **Virtual server name** field.

6. Enter a value for the virtual server ID in the **Virtual server ID** field, or use the value that is displayed in the field. The virtual server ID is a unique ID assigned to the virtual server within the managed system.

7. In the **Environment** field, select VIOS as the environment you want to associate with the virtual server.

8. Click **Next**. In the **Assigned Memory (GB)** field of the Memory page, enter the amount of memory you want to assign to the virtual server.

9. Click **Next**. On the Processor page, select either **Dedicated** or **Shared** mode: If you selected **Dedicated** processing mode, enter the number of processors that the virtual server should receive in the **Assigned processors** field. If you selected **Shared** mode, enter the number of virtual processors to assign to the virtual server in the **Assigned processors** field.

10. Click **Next**. On the Ethernet page, select the virtual Ethernet for each of the virtual Ethernet adapters of the virtual server. You can modify the properties of the adapter, like **IEEE settings** or **Shared Ethernet adapter**, by clicking the **Edit** tab.

11. Click **Next**. On the **Virtual Adapters** page, specify the virtual storage adapters required for the virtual server.

    a. Select the adapter ID and click the **Edit** tab to specify the virtual storage adapter ID and client information. In no adapter exists, you can create an adapter by clicking **Create Adapter**.

    b. Select the adapter type as either SCSI or Fibre Channel from the **Adapter type** field.

    c. Specify the virtual server that the adapter is configured to connect to in the **Connecting Virtual Server** field.

    d. Specify the adapter ID that this adapter will be connecting to on the connecting virtual server in the **Connecting Adapter ID** field and click **Ok**. Click **Next** and go to 12.

12. On the **Physical I/O Adapters** page, select one or more physical adapters from the list of available physical adapters. Select **Display only adapters that are currently available** to view only the adapters that are currently available instead of all adapters in the system. To view only the adapters that are currently available, select **Display only adapters that are currently available**. From the displayed table, select one or more physical adapter assignments for the virtual server.

    Note: Virtual servers that are assigned physical adapters cannot be relocated.

13. Click **Next** and review the summary.

14. Click **Finish**.

Deleting a virtual server

You can use the IBM Systems Director Management Console (SDMC) to delete a virtual server and all the virtual server profiles associated with the virtual server.

You cannot delete a virtual server if it is the service virtual server of your host. Before you can delete such a virtual server, you must designate another virtual server as the service virtual server of your host or remove the service virtual server designation from the virtual server.

Before you delete a virtual server, complete the following steps:

1. Shut down the virtual server that you plan to delete. For instructions, see "Shutting down and restarting virtual servers" on page 30.

2. If the virtual server that you plan to delete is a VIOS virtual server that is assigned to the shared memory pool (hereafter referred to as a *paging VIOS virtual server*), remove the paging VIOS virtual server from the shared memory pool. For instructions, see "Removing a paging VIOS virtual server from the shared memory pool" on page 23.

When you delete a virtual server that uses shared memory (hereafter referred to as a *shared memory virtual server*), the SDMC automatically performs the following tasks:

- The SDMC removes the shared memory virtual server from the shared memory pool.

- The SDMC returns the physical memory that was allocated to the shared memory virtual server for its I/O devices to the shared memory pool so that the hypervisor can allocate the physical memory to other shared memory virtual servers.

- The SDMC releases the paging space device that was allocated to the shared memory virtual server so that it becomes available for other shared memory virtual servers to use.

Attention: This procedure erases the virtual server and the virtual server configuration data stored in the virtual server profiles.

To delete a virtual server using the SDMC, complete the following steps:

1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.

2. Expand **Hosts** and click the host on which the virtual server is located.
3. In the work pane, select the virtual server.
4. Right click in the pane and select **Operations** → **Delete**.
5. Click **OK**.

Configuring virtual resources for virtual servers

You can use the Systems Director Management Console (SDMC) to configure virtual resources such as virtual Ethernet adapters, Host Ethernet Adapter, and shared processor pools. Configure virtual resources to help optimize the use of physical system resources.

Configuring Active Memory Expansion for AIX virtual servers

You can configure Active Memory Expansion for an AIX virtual server by using the IBM Systems Director Management Console (SDMC). Configuring Active Memory Expansion for a virtual server compresses the memory of the virtual server and thus expands its memory capacity.

You can configure Active Memory Expansion for virtual servers that use dedicated memory and virtual servers that use shared memory. Enter the required activation code to enable Active Memory Expansion on the server. For instructions, see "Entering the activation code for Active Memory Expansion" on page 17.

To configure Active Memory Expansion for a virtual server, complete the following tasks:
1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and click the host on which the virtual server is located.
3. In the work pane, click the virtual server.
4. Right click in the pane and select **System Configuration** → **Manage Virtual Server**.
5. Click **Memory**.
6. On the Memory Configuration page, select **Use Active Memory Expansion** to enable Active Memory Expansion for the virtual server.
7. In the **Active Memory Expansion factor** field, enter a value 1.00 - 10.00.
8. Click **Apply**.
9. Shut down and restart the virtual server with current the configuration.

After you configure Active Memory Expansion for the virtual server, monitor the performance of the workload and adjust the configuration, if necessary.

Related tasks

"Changing the Active Memory Expansion factor for AIX virtual servers" on page 45
You can change the Active Memory Expansion factor for an AIX virtual server by using the IBM Systems Director Management Console (SDMC). Changing the Active Memory Expansion factor for a virtual server increases or decreases the desired degree of expanded memory capacity for the virtual server.

"Entering the activation code for Active Memory Expansion" on page 17
You can enable Active Memory Expansion for a host by entering an activation code on the IBM Systems Director Management Console (SDMC). When you enable Active Memory Expansion, you can configure the virtual servers that run on the host to compress their memory and thus expand their memory capacities.

Configuring a virtual Ethernet adapter

You can configure a virtual Ethernet adapter dynamically for a running virtual server by using the IBM Systems Director Management Console (SDMC). Doing so will connect the virtual server to a virtual LAN.

You can configure a virtual Ethernet adapter for a Linux virtual server only if the following conditions are met:

- A Linux distribution is installed on the Linux virtual server. The distributions are SUSE Linux Enterprise Server 9 and later versions.
- The DynamicRM tool package is installed on the Linux virtual server. To download the DynamicRM tool package, see the Service and productivity tools for Linux on POWER® systems website.

If you plan to configure an Ethernet adapter for a virtual server that uses shared memory (hereafter referred to as a *shared-memory virtual server*), you might need to adjust the amount of I/O entitled memory assigned to the shared-memory virtual server before you configure the adapter:

- If the I/O entitled memory mode of the shared-memory virtual server is set to the automatic mode, you do not need to take action. When you configure the new Ethernet adapter, the SDMC automatically increases the I/O entitled memory of the shared-memory virtual server to accommodate the new adapter.
- If the I/O entitled memory mode of the shared-memory virtual server is set to the manual mode, you must increase the I/O entitled memory that is assigned to the shared-memory virtual server to accommodate the new adapter.

To configure a virtual Ethernet adapter for a virtual server, complete the following steps:

1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and click the host on which the virtual server is located.
3. In the work pane, select the virtual server.
4. Right click in the pane and click **System Configuration** → **Manage Virtual Server**.
5. Click the **Ethernet** tab.
6. Click **Create Adapter** tab.
7. Enter the slot number for the virtual Ethernet adapter into the **Adapter ID** field.
8. Enter the Port Virtual Ethernet into the **Port Virtual Ethernet** field.
9. If you want to configure the virtual Ethernet adapter to communicate over multiple virtual LANs, select **IEEE 802.1 compatible adapter** If you leave this option cleared and you want this virtual server to connect to multiple virtual networks, you must create multiple virtual adapters by creating additional virtual LAN IDs.

   Note: You can assign multiple VLAN IDs to an already configured virtual Ethernet adapter that is being used by a running virtual server without rebooting the virtual server. For a running virtual server, you can remove or change the VLAN IDs, and configure the Quality of Service (QoS) priority without restarting the virtual server. For instructions, see "Changing the VLAN IDs of a virtual Ethernet adapter," and "Configuring the Quality of Service priority for a virtual Ethernet adapter" on page 9.
10. Click **OK** → **Apply**.

Related tasks

"Changing virtual server profile properties" on page 37
You can change the properties of a virtual server profile using the IBM Systems Director Management Console (SDMC).

Changing the VLAN IDs of a virtual Ethernet adapter

You can change the VLAN IDs of the virtual Ethernet adapter of a virtual server by using the IBM Systems Director Management Console (SDMC).

Before you start, verify that the Virtual I/O Server is at version 2.2.0.0, or later.

To change the VLAN IDs of a virtual Ethernet adapter, complete the following tasks:

1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and click the host on which the virtual server is located.
3. In the work pane, select the virtual server.

4. Right click in the pane and click **System Configuration** → **Manage Virtual Server**.
5. Click the **Network** tab.
6. Click the **Create Adapter** tab.
7. Select **IEEE 802.1q compatible adapter**.
8. To add additional VLAN IDs for the Virtual Ethernet Adapter, type a comma-separated list of values or a range of values into the **Additional VLANs** field and click **OK**.
9. To remove an existing virtual LAN ID from the list, delete the VLAN ID to be removed from the **Additional VLANs** list and click **OK**.
10. Click **OK**.

After you have completed changing the VLAN IDs of a virtual Ethernet adapter, access any existing virtual server profiles for the virtual server and add the VLAN IDs of the virtual Ethernet adapters to those virtual server profiles. The values set in the additional VLANs are lost if you power off and then power on the virtual server by using a virtual server profile that does not have the new list of VLAN IDs of the virtual Ethernet adapter.

Configuring the Quality of Service priority for a virtual Ethernet adapter

You can configure the Quality of Service (QoS) priority of the virtual Ethernet adapter of a virtual server by using the IBM Systems Director Management Console (SDMC). You can prioritize the virtual server network traffic by specifying the value of IEEE 802.1Q priority level for each virtual Ethernet adapter.

Before you start, verify that the host is a POWER7® processor-based server.

To configure the Quality of Service (QoS) priority of a virtual Ethernet adapter, complete the following steps:

1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and click the host on which the virtual server is located.
3. In the work pane, select the virtual server.
4. Right click in the pane and click **System Configuration** → **Manage Virtual Server**.
5. Click the **Ethernet** tab. page is displayed.
6. Under Virtual Ethernet, on the virtual Ethernet and Logical Host Ethernet adapters page, select the virtual Ethernet adapter and click **Edit**.
7. Enable the QOS for the virtual Ethernet adapter.
8. Enter the priority level into the **Priority** field.

   The virtual Ethernet QoS priority level values are in the range 1 - 7. The following table lists the different priority levels.

VLAN user priority level	Quality of Service priority
1	Background
2	Spare
0 (default)	Best effort
3	Excellent effort
4	Controlled load
5	Video < 100 ms latency and jitter
6	Voice < 10 ms latency and jitter
7	Network control

   Using this scheme, packets with VLAN priority of 7 are given the highest Quality of Service.
9. Click **OK**.

Specifying MAC address controls

The IBM Systems Director Management Console (SDMC) provides controls and policies for Media Access Control address (MAC) address assignment to virtual Ethernet adapters and to logical Host Ethernet Adapter (LHEA).

By using the SDMC, you can do the following tasks:

- Specify a custom MAC address for the virtual Ethernet adapters of a virtual server.

  Note: For a virtual Ethernet adapter, the default value is the SDMC-generated MAC address.

  Tip: Avoid specifying a MAC address to enable automatic generation of a MAC address.
- Apply the following controls to MAC address overrides that are specified at the operating-system level:
  - Allow all operating-system-defined MAC addresses
  - Deny all operating-system-defined MAC addresses
  - Specify allowable operating-system-defined MAC addresses (you can specify a maximum of four operating-system-defined MAC addresses)

    Note: By default, all overrides are allowed. This is applicable to both virtual Ethernet adapters and LHEA.
- Specify an optional initial MAC address for a virtual Ethernet adapter to replace an SDMC-generated initial MAC address.

Note: The MAC address controls can be applied when you create a virtual server, when you modify the profile of the virtual server, or when you add a virtual Ethernet adapter and LHEA.

The rules for custom virtual Ethernet MAC addresses are:

- The MAC address must be 6 bytes long.
- Bit 1 of byte 0 is reserved for Ethernet multicasting and must always be off.
- Bit 2 of byte 0 indicates that the MAC address is a locally administered address and must always be on.

Configuring the MAC address controls for a virtual Ethernet adapter

By using the IBM Systems Director Management Console (SDMC), you can configure the MAC address controls of the virtual Ethernet adapter of a virtual server during virtual server creation, when modifying the profile of the virtual server, or when adding a virtual Ethernet adapter. You can also specify controls to MAC address overrides that are specified at the operating-system level.

To configure the MAC address controls, complete the following steps:

1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and click the host on which the virtual server is located.
3. In the work pane, select the virtual server.
4. Right click in the pane and click **System Configuration** → **Manage Virtual Server**.
5. Click the **Network** tab.
6. Under Virtual Ethernet, in the virtual Ethernet and Logical Host Ethernet adapters page, select the virtual Ethernet adapter and click **Add**.
7. Click the **Advanced virtual Ethernet configuration** section.
8. To assign a custom MAC address, clear the **Auto assign MAC address** check box, and type the MAC address for the virtual Ethernet adapter in the **Enter Custom MAC Address** field.
9. To allow all or deny all operating-system-defined MAC addresses, select either **Allow all OS Defined MAC Addresses** or **Deny all OS Defined MAC Addresses**.

10. To specify allowable operating-system-defined MAC addresses, select **Specify Allowable OS Defined MAC Addresses**. Type the allowed MAC address in the **Enter custom MAC Address** field and click **Add**.

11. To remove a specified operating-system-defined MAC address from the **Allowed MAC Address** list, select the MAC address that you want to remove from the list and click **Remove**.

12. Click **OK**.

Configuring a virtual fibre-channel adapter

You can configure a virtual fibre-channel adapter for a running virtual server by using the IBM Systems Director Management Console (SDMC). The rules and assumptions for virtual client adapter management are identical to those that are used for creating virtual adapters and mapping storage for physical volumes.

A Linux virtual server supports the dynamic addition of virtual fibre-channel adapters only if the DynamicRM tool package is installed on the Linux virtual server. To download the DynamicRM tool package, see the Service and productivity tools for Linux on POWER systems website.

If you plan to configure a virtual fibre-channel adapter for a virtual server that uses shared memory (hereafter referred to as a *shared memory virtual server*), you might need to adjust the amount of I/O entitled memory assigned to the shared memory virtual server before you configure the adapter:

- If the I/O entitled memory mode of the shared memory virtual server is set to the auto mode, you do not need to take action. When you configure the new virtual fibre-channel adapter, the SDMC automatically increases the I/O entitled memory of the shared memory virtual server to accommodate the new adapter.
- If the I/O entitled memory mode of the shared memory virtual server is set to the manual mode, you must increase the I/O entitled memory that is assigned to the shared memory virtual server to accommodate the new adapter.

When you configure a virtual fibre-channel adapter on a client virtual server that uses Virtual I/O Server resources, the virtual fibre-channel adapter is lost when you restart the virtual server with the profile because the virtual server profile does not include the virtual fibre-channel adapter. You cannot add the virtual fibre-channel adapter to a virtual server profile after you configure it on the virtual server because the virtual fibre-channel adapter that you add to the virtual server profile is assigned a different pair of worldwide port names (WWPNs) than the virtual fibre-channel adapter that you configured on the virtual server.

If you want to include the virtual fibre-channel adapter in a virtual server profile, then do not configure the virtual fibre-channel adapter on the virtual server. Instead, create the virtual fibre-channel adapter in a virtual server profile and then start the virtual server using that virtual server profile.

To configure a virtual fibre-channel adapter for a running virtual server, complete the following tasks:

1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and click the host on which the virtual server is located.
3. In the work pane, select the virtual server.
4. Right click in the pane and click **System Configuration** → **Manage Virtual Server**.
5. Click the **Storage Adapters** tab.
6. Click the **Add** tab.
7. Select the **Fibre Channel** as the adapter type from the **Adapter type** field.
8. Select the connecting virtual server and enter the connecting adapter ID as follows:
    - If you create a virtual fibre-channel adapter on the *VIOS virtual server*, select the client virtual server that uses this host adapter to connect to a physical port on a physical fibre channel adapter.

Then, enter the ID of the virtual fibre-channel adapter on the client virtual server that uses this host adapter to connect to a physical port on a physical fibre channel adapter. Click **OK**, and go to step 10

- If you create a virtual fibre-channel adapter on a *client virtual serve*, select the VIOS virtual server that contains the virtual fibre-channel adapter to which this client adapter connects. Then, enter the ID of the virtual fibre-channel adapter on the VIOS virtual server to which this client adapter connects.

9. Click **OK**. If you create a virtual fibre-channel adapter on a client virtual server, the SDMC generates a pair of WWPNs for the virtual fibre-channel adapter. If all of the WWPNs on the server are used, you can reset the WWPN prefix to add WWPNs to the server. After you reset the WWPN prefix, repeat this procedure to add a virtual fibre-channel adapter to a client virtual server.

10. If you created a virtual fibre-channel adapter on a VIOS virtual server, complete the following steps:

    a. Access any existing virtual server profiles for the VIOS virtual server and add the virtual fibre-channel adapter to those virtual server profiles. The virtual fibre-channel adapter is lost when you shut down the VIOS virtual server and activate it using a virtual server profile that does not include the virtual fibre-channel adapter.

    b. Assign the virtual fibre-channel adapter to a physical port on the physical fibre channel adapter that is connected to the physical storage that you want the associated client virtual server to access.

Related tasks

"Changing virtual server profile properties" on page 37
You can change the properties of a virtual server profile using the IBM Systems Director Management Console (SDMC).
"Obtaining additional WWPNs for the host" on page 46
When all of the worldwide port names (WWPNs) on the host are used, you can add more WWPNs to the host using the IBM Systems Director Management Console (SDMC). Adding WWPNs allows you to create additional virtual fibre channel adapters on client virtual servers that use virtual resources provided by the Virtual I/O Server.

Related information

Redundancy configuration using virtual fibre channel adapters

Configuring physical ports on a Host Ethernet Adapter

You can use an IBM Systems Director Management Console (SDMC) to configure the properties of each physical port on a Host Ethernet Adapter (HEA). These properties include port speed, duplex mode, maximum packet size, flow control setting, and the virtual server for unicast packets. The physical port properties are also used by the logical ports that are associated with each physical port. HEAs are also known as Integrated Virtual Ethernet adapters (IVE adapters).

To configure physical ports on a HEA, complete the following tasks:

1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and click the host on which the virtual server is located.
3. Right click in the pane and click **Hardware Information** → **Adapter** → **Host Ethernet**.
4. In the **Current Status** table, select a physical port that you want to configure and click **Configure**.
5. Change the HEA physical port configuration settings as necessary, and click **OK**.
6. Repeat steps 4 and 5 for any other physical ports that you want to configure.
7. When you are done configuring physical ports, click **OK**.

After this procedure is completed, you might need to reconfigure any logical ports that are associated with the changed physical ports. For example, if you change the maximum packet size on the physical port, you might also need to access the operating systems that use the resources on that physical port and change the maximum packet size for the corresponding logical ports.

Related tasks

"Creating a logical Host Ethernet Adapter for a running virtual server" on page 14
If your managed system has a Host Ethernet Adapter (HEA), you can set up a virtual server to use HEA resources by using the IBM Systems Director Management Console (SDMC) to create a logical Host Ethernet Adapter (LHEA) for the virtual server.

Configuring shared processor pools

If your managed system supports more than one shared processor pool, you can use the IBM Systems Director Management Console (SDMC) to configure shared processor pools on your managed system in addition to the default shared processor pool.

The additional shared processor pools allow you to limit the processor usage of the virtual servers that belong to the shared processor pools. All shared processor pools other than the default shared processor pool must be configured before you can assign virtual servers to these shared processor pools.

Use this procedure only if the managed system supports more than one shared processor pool. The default shared processor pool is preconfigured, and you cannot change the properties of the default shared processor pool.

To configure shared processor pools, complete the following tasks:

1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and click the host on which shared processor pool is located.
3. Right click in the pane and click **System Configuration** → **Virtual Resources** → **Shared Processor Pool Management**.
4. Click the name of the shared processor pool that you want to configure and click **Edit**.
5. Enter the maximum number of processing units you want the virtual servers in the shared processor pool to use, in the **Maximum processing units** field. If required, change the name of the shared processor pool in the **Pool name** field, and enter the number of processing units that you want to reserve for uncapped virtual servers in the shared processor pool in the **Reserved processing units** field. (The name of the shared processor pool must be unique on the host). Click **OK**.
6. Repeat steps 4 and 5 for any other shared processor pools that you want to configure.

After this procedure is complete, assign virtual servers to the configured shared processor pools. You can assign a virtual server to a shared processor pool at the time that you create the virtual server, or you can reassign existing virtual servers from their current shared processor pools to the shared processor pools that you configured using this procedure.

When you no longer want to use a shared processor pool, you can unconfigure the shared processor pool by using this procedure to set the maximum number of processing units and reserved number of processing units to 0. Before you can unconfigure a shared processor pool, you must reassign all virtual servers that use the shared processor pool to other shared processor pools.

Configuring the shared memory pool

You can configure the size of the shared memory pool, assign paging space devices to the shared memory pool, and assign one or two VIOS virtual servers (that provide access to the paging space devices) to the shared memory pool by using the IBM Systems Director Management Console (SDMC).

Before you start, complete the following steps:

1. Enter the activation code for the PowerVM Enterprise Edition. For instructions, see "Entering the activation code for PowerVM Editions using the SDMC" on page 48. The ability to share memory among multiple virtual servers is known as the PowerVM Active Memory Sharing technology. The PowerVM Active Memory Sharing technology is available with the PowerVM Enterprise Edition for which you must obtain and enter a PowerVM Editions activation code.
2. Ensure that your configuration meets the configuration requirements for shared memory.

3. Create the VIOS virtual servers (hereafter referred to as *paging VIOS virtual servers*) that you plan to assign to the shared memory pool, and then install the Virtual I/O Server.
4. Create and configure the paging space devices that are owned by the paging VIOS virtual servers that you plan to assign to the shared memory pool. If you plan to use logical volumes as paging space devices, then create the logical volumes. For instructions, see "Creating a virtual disk for a VIOS virtual server using the SDMC" on page 16.
5. Ensure that you are a super administrator or operator of the SDMC.

If there is not enough physical memory available in the system to allocate to the shared memory pool, you can release the physical memory that is currently assigned to virtual servers that use dedicated memory and that are shut down or suspended. You can then assign the released physical memory to the shared memory pool.

To configure the shared memory pool, complete the following steps:
1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and click the host on which the shared memory pool is located.
3. Right click in the pane and click **System Configuration** → **Virtual Resources** → **Shared Memory Pool Management**. On the **Shared Memory Pool Management** page, you can modify the size of the shared memory pool, modify the paging VIOS virtual server to be associated with the shared memory pool, and add or remove paging devices available to the shared memory pool.

   Tip: If you expect to see a particular device on the list of eligible devices to add to the shared memory pool, but the device does not appear, you can run the `prepdev` command from the Virtual I/O Server command-line to determine why the device does not meet the requirements for paging space devices and learn what tasks need to be performed on the device to satisfy the requirements.

   If a device was used by a virtual server and then the virtual server was removed, the device might not meet the requirements for a paging space device, even though the virtual server was removed. The `prepdev` command detects this situation and provides instructions about how to change the device so that it meets the requirements for a paging space device.
4. Click **OK**.

After you create the shared memory pool, you can create virtual servers that use shared memory.

Related tasks

"Reassigning virtual servers to shared processor pools" on page 18
If you use more than one shared processor pool on your managed system, you can use the IBM Systems Director Management Console (SDMC) to reassign virtual servers from one shared processor pool to another shared processor pool on your managed system.

Related information

prepdev command

Creating a logical Host Ethernet Adapter for a running virtual server

If your managed system has a Host Ethernet Adapter (HEA), you can set up a virtual server to use HEA resources by using the IBM Systems Director Management Console (SDMC) to create a logical Host Ethernet Adapter (LHEA) for the virtual server.

A *logical Host Ethernet Adapter* is a representation of a physical HEA on a virtual server. An LHEA allows the virtual server to connect to external networks directly through the HEA. HEAs are also known as Integrated Virtual Ethernet adapters (IVE adapters).

You can add an LHEA to a virtual server running in the Linux environment only if you install Red Hat Enterprise Linux version 5.1, Red Hat Enterprise Linux version 4.6, or a later version of Red Hat Enterprise Linux on the virtual server. To add an LHEA to a virtual server running Linux with a Linux

distribution other than these distributions, you must power off the virtual server and power on the virtual server by using a virtual server profile that specifies the LHEA.

If a virtual server is not currently running, you can create an LHEA for the virtual server by changing the virtual server profiles for the virtual server.

To create an LHEA for a running virtual server, complete the following steps:
1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and click the host on which the virtual server is located.
3. In the work pane, select the virtual server.
4. Right click in the pane and click **System Configuration** → **Manage Virtual Server**.
5. Click the **Network** tab.
6. Click **Add** in the **Logical Host Ethernet Adapters** section.
7. Enter the physical location code of the HEA port by selecting the location code from the **Add Host Ethernet Adapters** table.
8. Select the logical port from the list in the table.
9. Select the VLAN ID that you want the logical port to accept packets from the **Allow VLAN** list.
10. Click **OK**.
11. Review the information on the **Logical Host Ethernet Adapters** page and click **Apply**.

When you have completed the procedure, one or more new Ethernet adapters will be recognized by the operating system of the virtual server.

Related tasks

"Configuring physical ports on a Host Ethernet Adapter" on page 12
You can use an IBM Systems Director Management Console (SDMC) to configure the properties of each physical port on a Host Ethernet Adapter (HEA). These properties include port speed, duplex mode, maximum packet size, flow control setting, and the virtual server for unicast packets. The physical port properties are also used by the logical ports that are associated with each physical port. HEAs are also known as Integrated Virtual Ethernet adapters (IVE adapters).

"Changing virtual server profile properties" on page 37
You can change the properties of a virtual server profile using the IBM Systems Director Management Console (SDMC).

Creating a shared Ethernet adapter for a VIOS virtual server using the SDMC

You can create a Shared Ethernet Adapter on the Virtual I/O Server (VIOS) virtual server by using the IBM Systems Director Management Console (SDMC).

To create a Shared Ethernet Adapter, ensure that you meet the following requirements:
- If the physical Ethernet adapter that you want to use as the shared adapter has TCP/IP configured, the VIOS must be at version 2.1.1.0 or later. If TCP/IP is not configured, the VIOS can be at any version.
- Ensure that the VIOS has one or more physical network devices or logical Host Ethernet Adapters (LHEA) assigned to the virtual server.
- Ensure that a virtual Ethernet adapter is created on the VIOS.
- Ensure that there is a Resource Monitoring and Control (RMC) connection between the SDMC and the Virtual I/O Server.

To create a Shared Ethernet Adapter, complete the following steps:
1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and click the host on which the VIOS virtual server is located.
3. Right click in the pane and click **System Configuration** → **Virtual Resources** → **Virtual Network Management**.

4. On the Virtual Network Management page, click the **Create SEA** tab.
5. On the shared Ethernet adapter page, select the VIOS and physical adapter on which to configure the shared Ethernet adapter. You can also enable and select a failover VIOS and physical adapter.

   Note: If you select a failover VIOS, consider the following requirements:
   - The two VIOS virtual servers used in the failover configuration must have different trunk priorities.
   - Shared Ethernet Adapter failover requires an additional virtual Ethernet adapter on both VIOS virtual servers to be used as a control channel. The control channel allows the VIOS virtual servers to communicate with one another and know when one of the VIOS loses its connection.
   - The SDMC graphical interface automatically selects a suitable virtual Ethernet control channel in numerical order (from highest to lowest) from the port VLAN IDs assigned to the virtual Ethernet adapters. For example, if both VIOS virtual servers use VLAN 99 and VLAN 50 and the VIOS virtual servers in each VLAN have virtual Ethernet adapters without a trunk adapter enabled, then VLAN 99 is selected instead of VLAN 50. If you intend to use a virtual Ethernet adapter as a control channel adapter, do not select the **Access external network** option in the adapter properties.
6. Click **OK** to create the Shared Ethernet Adapter.

   Note: In VIOS Version 2.2.0.11, Fix Pack 24, Service Pack 1, or later, the Shared Ethernet Adapter is not supported in the interrupt mode.

Related information

Shared Ethernet Adapter failover

Creating a virtual disk for a VIOS virtual server using the SDMC

You can use the IBM Systems Director Management Console (SDMC) to create a virtual disk on your host. Virtual disks are also known as *logical volumes*.

To change virtual optical media, ensure that you meet the following requirements:
- The Virtual I/O Server must be at version 2.1.1.0 or later.
- Ensure that there is a Resource Monitoring and Control connection (RMC) between the SDMC and the Virtual I/O Server to manage storage.

To create a virtual disk, complete the following steps:
1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and click the host on which the VIOS virtual server is located.
3. In the work pane, select the VIOS virtual server.
4. In the work pane, select the virtual server on which you want to create a virtual disk.
5. Right click in the pane and click **System Configuration** → **Virtual Resources** → **Virtual Storage Management**.
6. On the Virtual Storage Management page, enter a virtual disk name, select a storage pool, enter a size for the new virtual disk, and optionally assign the disk to a virtual server. Click **OK**. The VIOS creates the new virtual disk with your specifications, and the Virtual Disks page is displayed.

   Tip: If possible, do not create virtual disks within the rootvg storage pool. Create one or more additional storage pools and create the virtual disks using the additional storage pools.
7. Repeat this procedure for each virtual disk that you want to create.

These steps are equivalent to using thesmcli psm mkbdsp command in the SDMC command-line interface.

If there is not enough disk space for the virtual disk, increase the size of the storage pool.

Related tasks

"Changing a virtual disk for a VIOS virtual server by using the SDMC" on page 40
You can use the IBM Systems Director Management Console (SDMC) to change the properties of the virtual disks on the host and to start virtual disk management tasks.

"Changing a storage pool for a VIOS virtual server" on page 42
You can use the IBM Systems Director Management Console (SDMC) to extend a storage pool, to reduce or remove a storage pool, and to assign a storage pool as the default storage pool for the host.

Creating storage pools

You can use the IBM Systems Director Management Console (SDMC) to create a volume-group-based or file-based storage pool on your host.

To create a volume-group-based storage pool, you must assign at least one physical volume to the storage pool. When you assign physical volumes to a storage pool, the Virtual I/O Server erases the information on the physical volumes, divides the physical volumes into physical partitions, and adds the capacity of the physical partitions to the storage pool. Do not add a physical volume to the storage pool if the physical volume contains data that you want to preserve.

To create storage pools, be sure you meet the following requirements:
- The Virtual I/O Server must be at version 2.1.1.0 or later.
- Ensure that there is a resource monitoring and control connection (RMC) between the SDMC and the Virtual I/O Server.

To create a storage pool, complete the following steps:
1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and click the host on which the VIOS virtual server is located.
3. In the work pane, select the VIOS virtual server.
4. Right click in the pane and click **Configuration > Virtual Resources > Virtual Storage Management**.
5. On the Virtual Storage Management page, select a VIOS virtual server.
6. Click the **Storage Pools** tab.
7. From the Select Action menu, click **Create Storage Pool**.
8. On the Create Storage Pool page, enter a name for the storage pool and select the storage pool type.
9. Enter or select the information required to create the volume-group-based or file-based storage pool, and click **OK** to return to the Storage Pools page.

   Note: The new storage pool appears in the table. If you select one or more physical volumes that might belong to a different volume group, the SDMC displays a warning message to indicate that adding them to the new storage pool can result in data loss. To create the new storage pool with the selected physical volumes, select the Force option, and click **OK**.

Entering the activation code for Active Memory Expansion

You can enable Active Memory Expansion for a host by entering an activation code on the IBM Systems Director Management Console (SDMC). When you enable Active Memory Expansion, you can configure the virtual servers that run on the host to compress their memory and thus expand their memory capacities.

Before you start, complete the following prerequisite tasks:
1. Complete the required preparation tasks for Active Memory Expansion and ensure that your configuration meets the configuration requirements for Active Memory Expansion.
2. Verify that you have an activation code. You can obtain an activation code from your IBM Sales Representative or the Capacity on Demand website. To obtain an activation code from the Capacity on Demand website, complete the following steps:

a. Go to: Capacity on Demand website.
   b. Enter the system type and serial number of the host for which you need the activation code.
   c. Record the activation code that is displayed on the website.

To enter the activation code for Active Memory Expansion, complete the following tasks

1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and click the host on which you want to enter an activation code.
3. Right click in the pane and click **System Configuration** → **Capacity on Demand**.
4. On the Capacity on Demand (CoD) page, click **Advanced Functions** from the **Select On Demand Type field**.
5. Click the **Enter Activation Code** tab.
6. On the **Enter Code** page, enter the activation code and click **OK**.

Related tasks

"Configuring Active Memory Expansion for AIX virtual servers" on page 7
You can configure Active Memory Expansion for an AIX virtual server by using the IBM Systems Director Management Console (SDMC). Configuring Active Memory Expansion for a virtual server compresses the memory of the virtual server and thus expands its memory capacity.

Reassigning virtual servers to shared processor pools

If you use more than one shared processor pool on your managed system, you can use the IBM Systems Director Management Console (SDMC) to reassign virtual servers from one shared processor pool to another shared processor pool on your managed system.

You can use this procedure only if the managed system supports more than one shared processor pool.

Any shared processor pool other than the default shared processor pool must be configured before you can assign a virtual server to the shared processor pool.

A shared processor pool cannot contain virtual servers that belong to different workload management groups. You therefore cannot reassign a virtual server with a defined workload management group to a shared processor pool that contains virtual servers that belong to another workload management group.

To reassign virtual servers from one shared processor pool to another shared processor pool, complete the following steps:

1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and click the host on which the virtual server is located.
3. Right click in the pane and select **System Configuration** → **Virtual Resources** → **Shared Processor Pool Management**.
4. Select the **Virtual Servers** tab.
5. Select the virtual server and then click the **Assign Pool** tab.
6. Select the new shared processor pool for the virtual server in the **Pool name (ID)** field and click **OK**.
7. Repeat steps 4, 5, and 6 for any other virtual servers that you want to reassign from one shared processor pool to another shared processor pool.
8. Click **OK**.

Related tasks

"Configuring the shared memory pool" on page 13
You can configure the size of the shared memory pool, assign paging space devices to the shared memory pool, and assign one or two VIOS virtual servers (that provide access to the paging space devices) to the shared memory pool by using the IBM Systems Director Management Console (SDMC).

Managing the shared memory pool

By using the IBM Systems Director Management Console (SDMC), you can change the configuration of the shared memory pool. For example, you can change the amount of physical memory assigned to the shared memory pool, change the Virtual I/O Servers that are assigned to the shared memory pool, and add or remove paging space devices to or from the shared memory pool.

Changing the size of the shared memory pool

You can increase or decrease the amount of physical memory assigned to the shared memory pool by using the IBM Systems Director Management Console (SDMC).

You must be a super administrator or operator of the SDMC to change the size of the shared memory pool.

If there is not enough physical memory available in the system by which to increase the amount of memory assigned to the shared memory pool, you can release to the hypervisor the physical memory that is currently assigned to dedicated memory virtual servers that are powered off. The hypervisor can then assign the released physical memory to the shared memory pool.

If the shared memory pool has insufficient physical memory by which to decrease the amount of memory in the shared memory pool, you can release to the hypervisor the I/O entitled memory that is currently assigned to shared memory virtual servers that are powered off. The hypervisor can then remove the released physical memory from the shared memory pool.

To change the size of the shared memory pool, complete the following tasks from the SDMC:

1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and select the host on which the shared memory pool is configured.
3. Right click in the pane and click **System Configuration** → **Virtual Resources** → **Shared Memory Pool Management**.
4. In the **Pool size** field, enter a new value for the pool size and click **OK**. You can enter the size in a combination of gigabytes and megabytes. If you need to assign more memory to the shared memory pool than the current maximum pool size, you can also enter a new value for the maximum pool size.
   - If there is not enough physical memory available in the system by which to increase the maximum pool size, the Release Memory Resources window is displayed. Select dedicated-memory virtual servers that are shut down until the available memory is equal to or greater than the requested memory and click **OK**.
   - If the amount of memory by which you want to decrease the size of the shared memory pool is greater than the amount of available physical memory in the shared memory pool, the Release Memory Resources window is displayed. Select shared memory virtual servers that are powered off until the amount of memory by which you want to decrease the size of the shared memory pool is equal to or less than the available physical memory in the shared memory pool, and click **OK**.

Adding a paging VIOS virtual server to the shared memory pool

You can use the IBM Systems Director Management Console (SDMC) to assign a second VIOS virtual server (hereafter referred to as a *paging VIOS virtual server*) to the shared memory pool.

Before you assign a paging VIOS virtual server to the shared memory pool, complete the following steps:
- Verify that only one paging VIOS virtual server is currently assigned to the shared memory pool.

- Verify that the paging VIOS virtual server that is currently assigned to the shared memory pool is running.
- Verify that the VIOS virtual server that you plan to assign to the shared memory pool is running.
- Verify that you are a super administrator or an operator of the SDMC.

When you assign a paging VIOS virtual server to the shared memory pool and both paging VIOS virtual servers have access to the same paging space devices, those paging space devices become common.

To assign a paging VIOS virtual server to the shared memory pool, complete the following steps:
1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and select the host on which the shared memory pool is configured.
3. Right click in the pane and click **System Configuration** → **Virtual Resources** → **Shared Memory Pool Management**.
4. Click the **Add Paging Devices** tab.
5. Follow the steps on the Shared Memory Pool Management page to assign a paging VIOS virtual server to the shared memory pool.

After you assign a second paging VIOS virtual server to the shared memory pool, complete the following steps:
1. If no common paging space devices are assigned to the shared memory pool, assign them to the shared memory pool. For instructions, see "Adding and removing paging space devices to and from the shared memory pool" on page 26.
2. Configure the virtual servers that use shared memory to use the paging VIOS virtual server that you assigned to the shared memory pool. For instructions, see "Changing the paging VIOS virtual servers assigned to a shared memory virtual server" on page 44.

Related tasks

"Changing the paging VIOS virtual servers assigned to the shared memory pool"
You can use the IBM Systems Director Management Console (SDMC) to change the Virtual I/O Server (VIOS) virtual server (hereafter referred to as *paging VIOS virtual servers*) that are assigned to the shared memory pool.

"Removing a paging VIOS virtual server from the shared memory pool" on page 23
You can use the IBM Systems Director Management Console (SDMC) to remove a Virtual I/O Server (VIOS) virtual server (hereafter referred to as a *paging VIOS virtual server*) from the shared memory pool.

Changing the paging VIOS virtual servers assigned to the shared memory pool

You can use the IBM Systems Director Management Console (SDMC) to change the Virtual I/O Server (VIOS) virtual server (hereafter referred to as *paging VIOS virtual servers*) that are assigned to the shared memory pool.

Before you change the paging VIOS virtual servers that are assigned to the shared memory pool, complete the following steps:
1. Power off all of the shared memory virtual servers that use the paging VIOS virtual server that you plan to change. You must power off all of the shared memory virtual servers that use the paging VIOS virtual server (that you plan to change) as the primary paging VIOS virtual serve. Also you must power off all of the shared memory virtual servers that use the paging VIOS virtual server (that you plan to change) as the secondary paging VIOS virtual server. For instructions, see "Shutting down and restarting virtual servers" on page 30.
2. Verify that the VIOS virtual server that you plan to assign to the shared memory pool as a paging VIOS virtual server is running. (This is the VIOS virtual server to which you plan to change the VIOS assignment of a paging VIOS virtual server.)
3. Verify that you are a super administrator or an operator of the SDMC.

The following table describes the situations in which you can change a paging VIOS virtual server.

Table 1. Changing paging VIOS virtual server

State of one paging VIOS virtual server	State of the other paging VIOS virtual server	Change options
Running or powered off	None. Only one paging VIOS virtual server is assigned to the shared memory pool.	You can change the VIOS assignment of the paging VIOS virtual server. In this situation, you also need to add the paging space devices to which the changed paging VIOS virtual server has access.
Running	Running	You can change the VIOS assignment of one of the paging VIOS virtual servers. You cannot change the VIOS assignment of both paging VIOS virtual servers at the same time.
Running	Powered off	You can change the VIOS assignment of only the paging VIOS virtual server that is powered off.
Powered off	Running	You can change the VIOS assignment of only the paging VIOS virtual server that is powered off.
Powered off	Powered off	You cannot change the VIOS assignment of either paging VIOS virtual server. Instead, you can remove the paging VIOS virtual server that you do not want to change and then change the VIOS assignment of the remaining paging VIOS virtual server. In this situation, you also need to add the paging space devices to which the changed paging VIOS virtual server has access.

When you change the VIOS assignment of a paging VIOS virtual server, the following configuration changes occur to the paging space devices:

* Paging space devices that were common become independent if only one paging VIOS virtual server can access them.
* Paging space devices that were common remain common if both paging VIOS virtual servers can access them. (These are the paging space devices to which all three VIOS virtual servers have access. The three VIOS virtual servers are the two VIOS virtual servers that were originally assigned to the shared memory pool as paging VIOS virtual servers plus the VIOS virtual server that you assigned as a paging VIOS virtual server when you changed the VIOS assignment of a paging VIOS virtual server.)
* Paging space devices that were independent become common if both paging VIOS virtual servers can access them.

When you change the VIOS assignment of a paging VIOSvirtual server, the SDMC changes the configuration of the shared memory virtual servers to use the VIOS virtual server that you assign as the paging VIOS virtual server. When you activate the shared memory virtual server, the SDMC automatically reflects the name of the VIOS virtual server that you assigned as the paging VIOS virtual server in the virtual server profile. The following examples explain this automatic change in more detail:

- A shared memory virtual server uses only one paging VIOS virtual server and you change the VIOS assignment of that paging VIOS virtual server from VIOS_A to VIOS_B. When you activate the shared memory virtual server, the SDMC automatically shows VIOS_B as the paging VIOS virtual server in the virtual server profile.
- Two paging VIOS virtual servers are assigned to the shared memory pool. VIOS_A is assigned to the shared memory pool as PVP1, and VIOS_B is assigned to the shared memory pool as PVP2. A shared memory virtual server uses PVP1 as the primary paging VIOS virtual server and PVP2 as the secondary paging VIOS virtual server. You change the VIOS assignment of PVP1 from VIOS_A to VIOS_C. When you activate the shared memory virtual server, the SDMC automatically shows VIOS_C as the primary paging VIOS virtual server and VIOS_B as the secondary paging VIOS virtual server.

To change the VIOS virtual servers that are assigned to the shared memory pool as paging VIOS virtual servers, complete the following steps:

1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and select the host on which the shared memory pool is configured.
3. Right click in the pane and click **System Configuration** → **Virtual Resources** → **Shared Memory Pool Management**.
4. Click **Add Paging Devices** or **Delete Paging Devices**.
5. Follow the steps on the Shared Memory Pool Management page to change the paging VIOS virtual servers that are assigned to the shared memory pool.

After you change the VIOS assignment of a paging VIOS virtual server that is assigned to the shared memory pool, complete the following steps:

1. If necessary, assign paging space devices to the shared memory pool. For instructions, see "Adding and removing paging space devices to and from the shared memory pool" on page 26. You might need to add paging space devices in the following situations:
   - You changed the VIOS assignment of the only paging VIOS virtual server that is assigned to the shared memory pool. The VIOS virtual server that you assigned as the paging VIOS virtual server has access to different paging space devices than the VIOS virtual server that was previously assigned as the paging VIOS virtual server. The paging space devices to which the current paging VIOS virtual server has access must be assigned to the shared memory pool for the shared memory virtual servers to use them.
   - You removed a paging VIOS virtual server that was powered off and then changed the VIOS assignment of the other paging VIOS virtual server that was also powered off. Because you removed a paging VIOS virtual server from the shared memory pool, you changed the VIOS assignment of the only paging VIOS virtual server that is assigned to the shared memory pool. The VIOS virtual server that you assigned as the paging VIOS virtual server has access to different paging space devices than the VIOS virtual server that was previously assigned as the paging VIOS virtual server. The paging space devices to which the current paging VIOS virtual server has access must be assigned to the shared memory pool for the shared memory virtual servers to use them.
   - You changed the VIOS assignment of a paging VIOS virtual server that provided independent paging space devices to shared memory virtual servers. The VIOS virtual server that you assigned as the paging VIOS virtual server has access to different paging space devices than the VIOS virtual server that was previously assigned as the paging VIOS virtual server. The independent paging space devices to which the current paging VIOS virtual server has access must be assigned to the shared memory pool for the shared memory virtual servers to continue to use independent paging space devices.
2. Activate all of the shared memory virtual servers that you previously powered off so that the changes that you made can take effect. For instructions, see "Activating a virtual server" on page 27.

Related tasks

"Adding a paging VIOS virtual server to the shared memory pool" on page 19
You can use the IBM Systems Director Management Console (SDMC) to assign a second VIOS virtual server (hereafter referred to as a *paging VIOS virtual server*) to the shared memory pool.

"Removing a paging VIOS virtual server from the shared memory pool"
You can use the IBM Systems Director Management Console (SDMC) to remove a Virtual I/O Server (VIOS) virtual server (hereafter referred to as a *paging VIOS virtual server*) from the shared memory pool.

Removing a paging VIOS virtual server from the shared memory pool

You can use the IBM Systems Director Management Console (SDMC) to remove a Virtual I/O Server (VIOS) virtual server (hereafter referred to as a *paging VIOS virtual server*) from the shared memory pool.

Before you remove a paging VIOS virtual server from the shared memory pool, complete the following steps:

1. Verify that two paging VIOS virtual servers are currently assigned to the shared memory pool.
2. Shut down all of the shared memory virtual servers that use the paging VIOS virtual server that you plan to remove: You must shut down all of the shared memory virtual servers that use the paging VIOS virtual server (that you plan to remove) as the primary paging VIOS virtual server. Also you must shut down all of the shared memory virtual servers that use the paging VIOS virtual server (that you plan to remove) as the secondary paging VIOS virtual server. For instructions, see "Shutting down and restarting virtual servers" on page 30.
3. Verify that you are a super administrator or an operator of the SDMC.

The following table describes the situations in which you can remove a paging VIOS virtual server.

Table 2. Removing paging VIOS virtual servers

State of one paging VIOS virtual server	State of the other paging VIOS virtual server	Removal options
Running	Running	You can remove either paging VIOS virtual server.
Running	Shutdown	You can remove only the paging VIOS virtual server that is shut down.
Shutdown	Running	You can remove only the paging VIOS virtual server that is shut down.
Shutdown	Shutdown	You can remove either paging VIOS virtual server; however, you need to reassign the paging space devices to the shared memory pool when you activate the remaining paging VIOS virtual server. To avoid adding the paging space devices again, you can activate one of the paging VIOS virtual servers and then remove the other paging VIOS virtual server.

When you remove a paging VIOS virtual server from the shared memory pool, the following configuration changes occur:

- Paging space devices that were common become independent.
- The SDMC changes the configuration of each shared memory virtual server to use the remaining paging VIOS virtual server as the primary and only paging VIOS virtual server:

- If a shared memory virtual server uses only one paging VIOS virtual server and you remove that paging VIOS virtual server, the SDMC changes the configuration of the shared memory virtual server to use the remaining paging VIOS virtual server. When you activate the shared memory virtual server, the SDMC automatically reflects the name of the current paging VIOS virtual server in the virtual server profile.

  For example, two paging VIOS virtual servers, VIOS_A and VIOS_B, are assigned to the shared memory pool. A shared memory virtual server, SMP1, uses only VIOS_A as its paging VIOS virtual server. You remove VIOS_A from the shared memory pool. When you activate SMP1, the SDMC automatically shows VIOS_B as the primary and only paging VIOS virtual server in the virtual server profile.

- If a shared memory virtual server uses two paging VIOS virtual servers and you remove a paging VIOS virtual server, the SDMC changes the configuration of the shared memory virtual server to use the remaining paging VIOS virtual server as the primary and only paging VIOS virtual server. When you activate the shared memory virtual server, the SDMC ignores the primary and secondary settings in the virtual server profile and assigns the remaining paging VIOS virtual server as the primary and only paging VIOS virtual server for the shared memory virtual server. If you want to save the configuration, you can update the virtual server profile or save the virtual server configuration to a new virtual server profile.

To remove a paging VIOS virtual server from the shared memory pool, complete the following steps:

1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and select the host on which the shared memory pool is configured.
3. Right click in the pane and click **System Configuration** ⇒ **Virtual Resources** ⇒ **Shared Memory Pool Management**.
4. Click **Delete Paging Devices**.
5. Follow the steps on the Shared Memory Pool Management page to remove a paging VIOS virtual server from the shared memory pool.

After you remove a paging VIOS virtual server from the shared memory pool, complete the following steps:

1. If you have removed a paging VIOS virtual server that was powered off and the other paging VIOS virtual server was also powered off, complete the following steps:
   a. Activate the remaining paging VIOS virtual server. For instructions, see "Activating a virtual server" on page 27.
   b. Remove the remaining paging space devices from the shared memory pool and assign them again to the shared memory pool. Even though the paging space devices become independent when you remove a paging VIOS virtual server from the shared memory pool, they cannot be recognized as such until you reassign them to the shared memory pool. For instructions, see "Adding and removing paging space devices to and from the shared memory pool" on page 26.
2. If the paging VIOS virtual server that you removed was the only paging VIOS virtual server used by a shared memory virtual server and the remaining paging VIOS virtual server does not have access to an available paging space device that meets the size requirements of the shared memory virtual server, assign such a paging space device to the shared memory pool. For instructions, see "Adding and removing paging space devices to and from the shared memory pool" on page 26.
3. Activate all of the shared memory virtual servers that you previously powered off so that the changes that you made can take effect. For instructions, see "Activating a virtual server" on page 27.

Related tasks

"Adding a paging VIOS virtual server to the shared memory pool" on page 19
You can use the IBM Systems Director Management Console (SDMC) to assign a second VIOS virtual
server (hereafter referred to as a *paging VIOS virtual server*) to the shared memory pool.

"Changing the paging VIOS virtual servers assigned to the shared memory pool" on page 20
You can use the IBM Systems Director Management Console (SDMC) to change the Virtual I/O Server
(VIOS) virtual server (hereafter referred to as *paging VIOS virtual servers*) that are assigned to the shared
memory pool.

Reinstalling a paging VIOS virtual server

When you reinstall the Virtual I/O Server (VIOS) that is assigned to the shared memory pool (hereafter
referred to as a *paging VIOS virtual server*), you need to reconfigure the shared memory environment. For
example, you might need to add the paging space devices again to the shared memory pool.

The paging VIOS virtual servers store information about the paging space devices that are assigned to a
shared memory pool. The IBM Systems Director Management Console (SDMC) obtains information about
the paging space devices that are assigned to the shared memory pool from the paging VIOS virtual
servers. When you reinstall the VIOS, the information about the paging space devices is lost. For the
paging VIOS virtual servers to regain the information, you must assign the paging space devices again to
the share memory pool after you reinstall the VIOS.

The following table shows the reconfiguration tasks that you must perform in the shared memory
environment when you reinstall the VIOS of a paging VIOS virtual server.

Table 3. Shared memory reconfiguration tasks for reinstalling the VIOS of a paging VIOS virtual server

Number of paging VIOS virtual server that are assigned to the shared memory pool	Number of paging VIOS virtual server for which you want to reinstall the VIOS	Reconfiguration steps	Instructions
1	1	1. Shut down all virtual servers that use shared memory (hereafter referred to as *shared memory virtual servers*). 2. Reinstall the VIOS. 3. Add the paging space devices again to the shared memory pool.	1. Shutting down and restarting virtual servers 2. Installing the Virtual I/O Server manually by using the SDMC 3. Adding and removing paging space devices to and from the shared memory pool
2	1	1. Shut down each shared memory virtual server that uses the paging VIOS virtual server (that you plan to reinstall) as the primary or secondary paging VIOS virtual server. 2. Remove the paging VIOS virtual server from the shared memory pool. 3. Reinstall the VIOS. 4. Add the paging VIOS virtual server again to the shared memory pool.	1. Shutting down and restarting virtual servers 2. Removing a paging VIOS virtual server from the shared memory pool 3. Installing the Virtual I/O Server manually by using the SDMC 4. Adding a paging VIOS virtual server to the shared memory pool

Number of paging VIOS virtual server that are assigned to the shared memory pool	Number of paging VIOS virtual server for which you want to reinstall the VIOS	Reconfiguration steps	Instructions
2	2	1. Shut down all the shared memory virtual servers. 2. Reinstall the VIOS of each paging VIOS virtual server. 3. Add the paging space devices again to the shared memory pool.	1. Shutting down and restarting virtual servers 2. Installing the Virtual I/O Server manually by using the SDMC 3. Adding and removing paging space devices to and from the shared memory pool

Adding and removing paging space devices to and from the shared memory pool

After you create the shared memory pool, you can add and remove paging space devices to and from the shared memory pool by using the IBM Systems Director Management Console (SDMC).

Before you add a paging space device, complete the following tasks:

1. Configure the paging space device to the Virtual I/O Server (VIOS) virtual servers (hereafter referred to as *paging VIOS virtual servers*) that are assigned to the shared memory pool. If you plan to use logical volumes as paging space devices, create the logical volumes. For instructions, see "Creating a virtual disk for a VIOS virtual server using the SDMC" on page 16.
2. Verify that all paging VIOS virtual servers are running.

Before you remove a paging space device, complete the following tasks:

- If no virtual server that uses shared memory (hereafter referred to as a *shared memory virtual server*) is using the paging space device, verify that the paging space device is inactive.
- If a shared memory virtual server is using the paging space device, verify that the shared memory virtual server is powered off.
- Verify that all paging VIOS virtual servers are running.

You must be a super administrator or operator of the SDMC to add and remove paging space devices to and from the shared memory pool.

To add and remove paging space devices, complete the following steps:

1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and select the host on which the shared memory pool is configured.
3. Right click in the pane and click **System Configuration** � **Virtual Resources** � **Shared Memory Pool Management**.
4. To add a paging space device, complete the following steps:
   a. On the Shared Memory Pool Management window, click **Add Paging Devices**
   b. Enter desired values that match in **Maximum Size (GB)** field and the **Minimum Size (GB)** fields. Click **View Devices** to list devices that match the criteria.
   c. Select a paging space device from the list and click **OK**. A new paging device is added to the shared memory pool.
   d. Click **OK** in the Shared Memory Pool Management window to activate changes.
5. To delete a paging space device, complete the following steps:
   a. On the Shared Memory Pool Management window, click **Delete Paging Devices**.

b. Enter desired values in the **Maximum Size (GB)** field and the **Minimum Size (GB)** fields. Click **View Devices** to list devices that match the criteria.

c. Select a paging space device from the list and click **OK**. An existing paging device is deleted from the shared memory pool.

d. Click **OK** in the Shared Memory Pool Management window to activate changes.

Note: Paging space devices can only be assigned to one shared memory pool at a time. You cannot assign the same paging space device to a shared memory pool on one system and to another shared memory pool on another system at the same time.

Tip: If you expect to see a particular device on the list of eligible devices to add to the shared memory pool, but the device does not appear, you can run the `prepdev` command from the Virtual I/O Server command-line to determine why the device does not meet the requirements for paging space devices and learn what tasks need to be performed on the device to satisfy the requirements.

If a device was used by a virtual server and then the virtual server was removed, the device might not meet the requirements for a paging space device, even though the virtual server was removed. The `prepdev` command detects this situation and provides instructions about how to change the device so that it meets the requirements for a paging space device.

Deleting the shared memory pool

If you no longer want any of the virtual servers to use shared memory, you can delete the shared memory pool by using the IBM Systems Director Management Console (SDMC).

Before you start, remove all the virtual servers that use shared memory (hereafter referred to as *shared-memory virtual servers*) from the shared memory pool by completing one of the following tasks:

- Delete all the shared-memory virtual servers.
- Change all the shared-memory virtual servers to dedicated memory virtual servers. For instructions, see "Changing the memory mode of a virtual server" on page 46.

To delete the shared memory pool, complete the following steps:

1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and select the host on which the shared memory pool is configured.
3. Right click in the pane and click **System Configuration** → **Virtual Resources** → **Shared Memory Pool Management**.
4. Click the **Delete Memory Pool** tab.
5. Click **OK** to delete the shared memory pool.

Managing the configuration of virtual servers

You can manage the configuration of your virtual servers using the Systems Director Management Console (SDMC). You can use the SDMC to adjust the hardware resources that are used by each virtual server.

Activating a virtual server

You must activate a virtual server before you can use the virtual server. When you use the Systems Director Management Console (SDMC), you can activate a virtual server based on its current configuration or you can activate a virtual server by activating a virtual server profile.

Related tasks

"Restarting VIOS virtual servers using the SDMC" on page 35
You can restart Virtual I/O Server (VIOS) virtual servers by using the IBM Systems Director Management Console (SDMC). Restarting a VIOS virtual server shuts down the VIOS virtual server and then starts it again.

Activating a virtual server profile:

You can activate a virtual server profile by using the IBM Systems Director Management Console (SDMC). When you activate a virtual server profile, you activate a virtual server. The system commits resources to the virtual server based on the configuration in the virtual server profile and starts the operating system or software that is installed on the virtual server.

When you activate a virtual server by activating a virtual server profile, you must select a virtual server profile. A *virtual server profile* is a record on the SDMC that specifies a possible configuration for a virtual server.

If you plan to activate a virtual server that uses virtual resources provided by the Virtual I/O Server (VIOS), you must first activate the VIOS virtual server that provides the virtual resources.

If you plan to activate a virtual server that uses shared memory (hereafter referred to as a *shared memory virtual server*), you must first activate at least one VIOS virtual server that meets the following criteria:
- The VIOS virtual server (hereafter referred to as a *paging VIOS virtual server*) must provide access to an available paging space device that meets the size requirements of the shared memory virtual server.
- The paging VIOS virtual server must be assigned to the shared memory pool.

If the shared memory virtual server is configured with redundant paging VIOS virtual servers, activate both paging VIOS virtual servers before you activate the shared memory virtual server.

When you activate a shared memory virtual server and the shared memory pool does not contain enough physical memory required for activation, you can release to the hypervisor the physical memory that is currently assigned to other shared memory virtual servers that are powered off. The hypervisor can then assign the released physical memory to the shared memory virtual server that you want to activate.

To activate a virtual server profile, complete the following steps:
1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and click the host on which the virtual server is located.
3. In the work pane, select the virtual server.
4. Right click in the pane and select **Operations** → **Activate** → **Profile**.
5. Select the virtual server profile from the **Profiles** list, or select **DefaultProfile** from the list to use the default profile.
6. Click **OK**. Alternatively, you can also activate the virtual server by using the **System Configuration** → **Manage Virtual Server** option.

Activating a virtual server based on its current configuration:

You can use the Systems Director Management Console (SDMC) to activate a virtual server based on its current configuration instead of a virtual server profile. When you activate the virtual server, the system commits resources to the virtual server based on the current configuration of the virtual server and starts the operating system or software that is installed on the virtual server. Virtual servers start faster when activated based on their current configuration data than when activated with a virtual server profile.

You cannot activate a virtual server based on its current configuration if one of the following conditions is true:

- The state of the virtual server is such that the virtual server is not capable of starting. To activate the virtual server based on its current configuration, change the state of the virtual server such that it is capable of starting.
- There is no active virtual server profile associated with the virtual server. For example, a newly created virtual server that has never been activated does not have an active virtual server profile. This virtual server cannot be activated based on its current configuration because its current configuration has no resources. The first time you activate a virtual server, you must activate it by activating a virtual server profile.

If you plan to activate a virtual server that uses virtual resources provided by the Virtual I/O Server (VIOS), you must first activate the VIOS virtual server that provides the virtual resources.

If you plan to activate a virtual server that uses shared memory (hereafter referred to as a *shared memory virtual server*), you must first activate at least one VIOS virtual server that meets the following criteria:

- The VIOS virtual server (hereafter referred to as a *paging VIOS virtual server*) must provide access to an available paging space device that meets the size requirements of the shared memory virtual server.
- The paging VIOS virtual server must be assigned to the shared memory pool.

If the shared memory virtual server is configured with redundant paging VIOS virtual servers, activate both paging VIOS virtual servers before you activate the shared memory virtual server.

When you activate a shared memory virtual server and the shared memory pool does not contain enough physical memory required for activation, you can release to the hypervisor the physical memory that is currently assigned to other shared memory virtual servers that are powered off. The hypervisor can then assign the released physical memory to the shared memory virtual server that you want to activate.

To activate a virtual server based on its current configuration, complete the following steps:

1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and click the host on which the virtual server is located.
3. In the work pane, select the virtual server.
4. Right click in the pane and select **Operations** → **Activate** → **Current Configuration**.
5. Click **OK**. Alternatively, you can also activate the virtual server by using the **System Configuration** → **Manage Virtual Server** option.

Activating a system profile

You can activate many virtual servers at a time when you use the IBM Systems Director Management Console (SDMC) to activate a system profile. A *system profile* is an ordered list of virtual server profiles. When you activate a system profile, the host attempts to activate the virtual server profiles in the system profile in the order in which the virtual server profiles are listed.

Restriction: You cannot activate a system profile that contains virtual server profiles that specify shared memory.

To activate a system profile, complete the following tasks

1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and click the host on which the virtual server is located.
3. In the work pane, select the virtual server.
4. Right click in the pane and click **System Configuration** → **Manage System Profile**.
5. On the Manage System Profile page, select the system profile and click **Actions** → **Activate**.
6. Select the required activation settings for the system profile, and click **Continue**.

Shutting down and restarting virtual servers

You can shut down and restart virtual servers running on systems that are managed by an IBM Systems Director Management Console (SDMC).

Related tasks

"Shutting down VIOS virtual servers" on page 34
You can shut down Virtual I/O Server (VIOS) virtual servers by using the IBM Systems Director Management Console (SDMC). You can shut down the VIOS immediately or delay the shutdown.

"Restarting VIOS virtual servers using the SDMC" on page 35
You can restart Virtual I/O Server (VIOS) virtual servers by using the IBM Systems Director Management Console (SDMC). Restarting a VIOS virtual server shuts down the VIOS virtual server and then starts it again.

Shutting down and restarting AIX in a virtual server:

You can shut down and restart AIX in a virtual server using the IBM Systems Director Management Console (SDMC).

Shutting down AIX virtual servers:

You can shut down AIX virtual servers using the IBM Systems Director Management Console (SDMC).

To shut down an AIX virtual server, complete the following steps:
1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and select the virtual server that you want to shutdown.
3. Right click in the pane and click **Operations** → **Shutdown**.
4. Select one of the following options.

Option	Description
Delayed	The virtual server waits a predetermined amount of time to shut down. This allows the virtual server time to end jobs and write data to disks.
Immediate	The virtual server shuts down without any preset delay.
Operating System	The SDMC issues the AIX shutdown command to shut down the virtual server. This option is available only when the operating system is running, and not when the virtual server is in an `Open Firmware` state.
Operating System Immediate	The SDMC issues the AIX `shutdown -F` command to shutdown the virtual server as quickly as possible, bypassing messages to other users. This option is available only when the operating system is running, and not when the virtual server is in an `Open Firmware` state.

5. Click **OK**.

Restarting AIX virtual servers:

You can restart AIX virtual servers using the IBM Systems Director Management Console (SDMC). Restarting a virtual server powers off the virtual server down and then starts it again.

To restart an AIX virtual server, complete the following steps:
1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and select the virtual server which you want to restart.

3. Right click in the pane and click **Operations** → **Restart**.
4. Select one of the following options.

Option	Description
Dump	The SDMC initiates a main storage or system memory dump on the virtual server and restarts the virtual server after the dump.
Operating System	The SDMC issues the AIX `shutdown -r` command to shutdown and restart the virtual server. This option is available only when the operating system is running, and not when the virtual server is in an `Open Firmware` state.
Immediate	The virtual server is restarted as quickly as possible, without notifying the virtual server.
Operating System Immediate	The SDMC issues the AIX `shutdown -F -r` command to shutdown and restart the AIX virtual server as quickly as possible, bypassing messages to other users. This option is available only when the operating system is running, and not when the virtual server is in an `Open Firmware` state.

5. Click **OK**.

Shutting down IBM i virtual servers:

The correct way to shut down an IBM i virtual server safely is from an IBM i command line.

If you cannot shut down the IBM i virtual server from an IBM i command line, you can shut down the IBM i virtual server from the Shutdown Virtual Server window on the IBM Systems Director Management Console (SDMC) or from the remote control panel on the Operations Console. Using these methods can cause an abnormal shut down and can result in loss of data.

Before you shut down an IBM i virtual server, you must perform all of the basic IBM i powering off tasks. For example, all other users must be signed off of the IBM i virtual server before you can power it off. If you shut down the IBM i virtual server without completing all of the required tasks, you can cause damage to data or cause the system to behave in unpredictable ways.

Related information

Basic system operations

Shutting down IBM i virtual servers using the SDMC:

You can shut down IBM i virtual servers using the Systems Director Management Console (SDMC).

Before you shut down the IBM i virtual server, complete the following steps:
- If an integrated server is active on the system, shut down the integrated server by using IBM i options.
- Ensure that all jobs are completed and all applications are ended.
- Ensure that your virtual server profiles are updated with any dynamic virtual server resource changes that you want to keep when you restart the virtual server.

To shut down an IBM i virtual server from the SDMC, complete the following steps:
1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and select the virtual server that you want to shutdown.
3. Right click in the pane and click **Operations** → **Shutdown**.

4. Select one of the following options:

Option	Description
Delayed	The virtual server waits a predetermined amount of time to shut down. This allows the virtual server time to end jobs and write data to disks.
Immediate	The virtual server shuts down without any preset delay.

Attention: Use of these methods can cause an abnormal shut down and can result in loss of data.

5. Click **OK**.

Performing a delayed shut down of an IBM i virtual server:

You can perform a delayed shut down of a virtual server by using the Systems Director Management Console (SDMC). Using delayed shut down is equivalent to using the power button on the remote control panel. Use delayed shut down only when you must shut down a virtual server, and the Power Down System (PWRDWNSYS) command does not work.

When you use the delayed shut down option, the virtual server waits a predetermined amount of time to shut down. This allows the virtual server time to end jobs and write data to disks. If the virtual server is unable to shut down within the predetermined amount of time, it will end abnormally and the next power on might take a long time.

To perform a delayed shut down of an IBM i virtual server using the SDMC, complete the following steps:

1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and select the virtual server that you want to shut down.
3. Right click in the pane and click**Operations** → **Shutdown**.
4. From the **Shutdown Options** menu, click **Delayed** and click **OK**.

Performing an immediate shut down of an IBM i virtual server:

When you perform the immediate shut down option by using the Systems Director Management Console (SDMC), the system powers off without any preset delay. Using immediate shut down is equivalent to using function 8 on the remote control panel.

Attention: Using immediate shut down can cause an abnormal IPL of the IBM i virtual server and possibly cause loss of data. Use immediate shut down only when an IBM i virtual server cannot shut down by using the Power Down System (PWRDWNSYS) command or delayed shut down.

To perform an immediate shut down of an IBM i virtual server using the SDMC, complete the following steps:

1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and select the virtual server that you want to shut down.
3. Right click in the pane and click**Operations** → **Shutdown**.
4. From the **Shutdown options** menu, click **Immediate** and click **OK**.

Shutting down and restarting Linux in a virtual server:

You can shut down and restart Linux using the IBM Systems Director Management Console (SDMC).

Related information
PowerVM Editions

Shutting down Linux virtual servers:

You can shut down Linux virtual servers and the Linux operating system using the IBM Systems Director Management Console (SDMC).

To shut down a Linux virtual server, complete the following steps:
1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and select the virtual server that you want to shutdown.
3. Right click in the pane and click **Operations** → **Shutdown**.
4. Select one of the following options.

Option	Description
Operating System	The SDMC issues the Linux `shutdown -h +1` command to shut down the virtual server. This option is available only when the operating system is running, and not when the virtual server is in an `Open Firmware` state.
Operating System Immediate	The SDMC issues the Linux `shutdown -h now` command to shut down the virtual server as quickly as possible, bypassing messages to other users. This option is available only when the operating system is running, and not when the virtual server is in an `Open Firmware` state.
Delayed	The virtual server waits a predetermined amount of time to shut down. This allows the virtual server time to end jobs and write data to disks.
Immediate	The virtual server shuts down without any preset delay.

5. Click **OK**.

Restarting Linux virtual servers:

You can restart Linux virtual servers or the Linux operating system using the IBM Systems Director Management Console (SDMC).

To restart a Linux virtual server, complete the following steps from the SDMC:
1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and select the virtual server that you want to restart.
3. Right click and select **Operations** → **Restart**.
4. Select one of the following options:

Option	Description
Operating System	The SDMC issues the Linux `shutdown -r +1` command to shut down and restart the virtual server. This option is available only when the operating system is running, and not when the virtual server is in an `Open Firmware` state.
Operating System Immediate	The SDMC issues the Linux `shutdown -r now` command to shut down and restart the virtual server as quickly as possible, bypassing messages to other users.

Option	Description
Immediate	The virtual server is restarted as quickly as possible, without notifying the virtual server. Initiate® a main storage or system memory dump on the virtual server and restart the virtual server when complete.
Dump	The SDMC allows the Linux operating system on the Linux virtual server to run a diagnostic procedure. After the diagnostic procedure is completed, the virtual server restarts. The exact diagnostic procedure depends on which Linux operating system is installed on the virtual server and how the operating system is set. The operating system might run an OS debugger, the operating system might perform a main storage or system memory dump on the virtual server, or the operating system might not be set to run any diagnostic procedure at all.

5. Click **OK**.

Shutting down and restarting the Virtual I/O Server:

You can shut down and restart the Virtual I/O Server (VIOS) by using the IBM Systems Director Management Console (SDMC).

Shutting down VIOS virtual servers:

You can shut down Virtual I/O Server (VIOS) virtual servers by using the IBM Systems Director Management Console (SDMC). You can shut down the VIOS immediately or delay the shutdown.

Before you shut down the VIOS virtual server, complete the following tasks:
- If the client virtual servers that use storage and networking virtual resources provided by the Virtual I/O Server are not configured to use virtual resources provided by a redundant VIOS, then shut down the client virtual servers.
- Shut down each shared-memory virtual server that accesses its paging space device using only the VIOS virtual server that you plan to shut down. If you shut down the VIOS virtual server (hereafter referred to as a *paging VIOS virtual server*) before you shut down the shared-memory virtual servers and a shared-memory virtual server attempts to access memory that is located on its paging space device, the shared-memory virtual server might fail.

  If a shared-memory virtual server accesses its paging space device redundantly through two paging VIOS virtual servers, you do not need to shut down the shared-memory virtual server. When you shut down the paging VIOS virtual server, the shared-memory virtual server accesses its paging space device through the other paging VIOS virtual server.

To shut down a VIOS virtual server, complete the following steps:
1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and select the virtual server that you want to shutdown.
3. Right click in the pane and click **Operations** → **Shutdown**.
4. Select one of the following options.

Option	Description
Operating System	The SDMC issues the VIOS `shutdown` command to shut down the virtual server. This option is available only when the operating system is running, and not when the virtual server is in an `Open Firmware` state.
Operating System Immediate	The SDMC issues the VIOS `shutdown -force` command to shut down the virtual server as quickly as possible, bypassing messages to other users. This option is available only when the operating system is running, and not when the virtual server is in an `Open Firmware` state.
Delayed	The virtual server waits a predetermined amount of time to shut down. This allows the virtual server time to end jobs and write data to disks.
Immediate	The virtual server shuts down without any preset delay.

5. Click **OK**.

Related tasks

"Shutting down and restarting virtual servers" on page 30
You can shut down and restart virtual servers running on systems that are managed by an IBM Systems Director Management Console (SDMC).

Restarting VIOS virtual servers using the SDMC:

You can restart Virtual I/O Server (VIOS) virtual servers by using the IBM Systems Director Management Console (SDMC). Restarting a VIOS virtual server shuts down the VIOS virtual server and then starts it again.

Before you shut down the VIOS virtual server, complete the following tasks:

- If the client virtual servers that use storage and networking virtual resources provided by the Virtual I/O Server are not configured to use virtual resources provided by a redundant VIOS, then shut down the client virtual servers.

- Shut down each shared-memory virtual server that accesses its paging space device using only the VIOS virtual server that you plan to shut down. If you shut down the VIOS virtual server (hereafter referred to as a *paging VIOS virtual server*) before you shut down the shared-memory virtual servers and a shared-memory virtual server attempts to access memory that is located on its paging space device, the shared-memory virtual server might fail.

  If a shared-memory virtual server accesses its paging space device redundantly through two paging VIOS virtual servers, you do not need to shut down the shared-memory virtual server. When you shut down the paging VIOS virtual server, the shared-memory virtual server accesses its paging space device through the other paging VIOS virtual server.

To restart a VIOS virtual server, complete the following step:

1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and select the virtual server which you want to restart.
3. Right click in the pane and click **Operations** → **Restart**.
4. Select one of the following options.

Option	Description
Operating System	The SDMC issues the VIOS `shutdown -restart` command to shut down and restart the virtual server. This option is available only when the operating system is running, and not when the virtual server is in an `Open Firmware` state.
Operating System Immediate	The SDMC issues the VIOS `shutdown -force -restart` command to shut down and restart the virtual server as quickly as possible, bypassing messages to other users. This option is available only when the operating system is running, and not when the virtual server is in an `Open Firmware` state.
Immediate	The virtual server is restarted as quickly as possible, without notifying the virtual server.
Dump	The SDMC initiates a main storage or system memory dump on the virtual server and restarts the virtual server after the dump.

5. Click **OK**.

After the VIOS restarts, complete the following tasks:

- Activate the client virtual servers that use storage and networking virtual resources provided to them by the VIOS.
- Activate each shared-memory virtual server that accesses its paging space device by using only the paging VIOS virtual server that you restarted.

Related tasks

"Activating a virtual server" on page 27
You must activate a virtual server before you can use the virtual server. When you use the Systems Director Management Console (SDMC), you can activate a virtual server based on its current configuration or you can activate a virtual server by activating a virtual server profile.

"Shutting down and restarting virtual servers" on page 30
You can shut down and restart virtual servers running on systems that are managed by an IBM Systems Director Management Console (SDMC).

Managing profiles for virtual servers

You can manage the profiles for your virtual servers using the Systems Director Management Console (SDMC). You can change the resource specifications that are stored in your virtual servers profiles as your needs change.

Copying a virtual server profile:

You can create a copy of an existing virtual server profile by using the IBM Systems Director Management Console (SDMC). After you create a copy of the existing virtual server profile, you can change the resource allocations within the new virtual server profile. This action allows you to create multiple, nearly identical virtual server profiles without having to re-enter all of the resource allocations repeatedly.

To copy a virtual server profile, complete the following steps:

1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and click the host on which the virtual server is located.
3. In the work pane, select the virtual server.
4. Right click in the pane and clicl **System Configuration** → **Manage Profiles**.

5. On the Managed Profiles page, select the virtual server profile that you want to copy, and click **Actions** → **Copy**.

6. Enter the name that you want to use for the copy into the **New profile name** field and click **OK**.

7. Click **OK**.

Changing virtual server profile properties:

You can change the properties of a virtual server profile using the IBM Systems Director Management Console (SDMC).

A virtual server profile stores the required number of processors, memory, and hardware resources assigned to that profile. Any virtual server profile property changes are not applied to the virtual server until you activate the virtual server profile.

If you plan to change a virtual server profile that specifies dedicated memory to a virtual server profile that specifies shared memory, be aware of the following actions:

- The SDMC automatically deletes all of the physical I/O adapters specified in the virtual server profile. You can assign only virtual adapters to virtual servers that use shared memory.

- You must specify shared processors. Virtual servers that use shared memory must also use shared processors.

To change virtual server profile properties, complete the following steps:

1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.

2. Expand **Hosts** and click the host on which the virtual server is located.

3. In the work pane, select the virtual server.

4. Right click in the pane and click **System Configuration** → **Manage Profiles**. is displayed.

5. On the Managed Profiles page, select the virtual server profile that you want to change, and click **Actions** → **Edit**.

6. Make the appropriate changes and click **OK**.

If you have created at least one virtual fibre channel adapter, complete the following tasks to connect the virtual server to its storage:

1. Power on the virtual server. When you Power on the virtual server, the SDMC assigns a pair of worldwide port names (WWPNs) to the virtual fibre channel adapter. For instructions, see "Activating a virtual server" on page 27.

2. Power off the Virtual I/O Server (that provides the connection to a physical fibre channel adapter) or run the syscfg command. This action enables the Virtual I/O Server to recognize the WWPNs of the virtual fibre channel adapter on the client virtual server For instructions, see "Restarting VIOS virtual servers using the SDMC" on page 35.

3. Assign the virtual fibre channel adapter on the client logical virtual server to a physical port of a physical fibre channel adapter. For instructions, see "Changing virtual fibre channel for a Virtual I/O Server" on page 43.

Related tasks

"Configuring a virtual Ethernet adapter" on page 7
You can configure a virtual Ethernet adapter dynamically for a running virtual server by using the IBM Systems Director Management Console (SDMC). Doing so will connect the virtual server to a virtual LAN.

"Configuring a virtual fibre-channel adapter" on page 11
You can configure a virtual fibre-channel adapter for a running virtual server by using the IBM Systems Director Management Console (SDMC). The rules and assumptions for virtual client adapter management are identical to those that are used for creating virtual adapters and mapping storage for physical volumes.

"Creating a logical Host Ethernet Adapter for a running virtual server" on page 14
If your managed system has a Host Ethernet Adapter (HEA), you can set up a virtual server to use HEA resources by using the IBM Systems Director Management Console (SDMC) to create a logical Host Ethernet Adapter (LHEA) for the virtual server.

"Changing the memory mode of a virtual server" on page 46
You can create multiple profiles for a virtual server by using the IBM Systems Director Management Console (SDMC). Some of the virtual server profiles can specify dedicated memory and some of the virtual server profiles can specify shared memory. By creating virtual server profiles that specify both dedicated memory and shared memory for the same virtual server, you can change the memory mode of the virtual server by activating different virtual server profiles.

Deleting a virtual server profile:

You can delete a virtual server profile using the IBM Systems Director Management Console (SDMC).

Note: You cannot delete a virtual server profile that is the default profile for the virtual server. If the virtual server profile you want to delete is the default profile, you must first change the default profile to another virtual server profile.

To delete a virtual server profile, complete the following steps:
1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and click the host on which the virtual server is located.
3. In the work pane, select the virtual server.
4. Right click in the pane and click **System Configuration** › **Manage Profiles**. is displayed.
5. On the Managed Profiles page, select the virtual server profile that you want to delete and click **Actions** › **Delete**.
6. Click **OK** to confirm.

Saving the current configuration of a virtual server:

Changes made directly to a running or stopped virtual server are updated in the current configuration of the virtual server. To preserve these changes after a restart, save the current configuration.

If configuration changes have been made to a running or stopped virtual server, you can save the current configuration of the virtual server to a newly created profile or overwrite an existing profile. Saving to a new profile does not overwrite settings in the current profile. To save the current configuration of a virtual server, follow these steps:
1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and click the host on which the virtual server is located.
3. In the work pane, select the virtual server.
4. Right click in the pane and click **System Configuration** › **Save Current Configuration**.

5. To save the current configuration to an existing profile, select **Overwrite existing profile**, and select the profile you want to overwrite from the **Overwrite existing profile** list.
6. To save the current configuration to a new profile, select **New profile**, and type the name of the new profile in the **New profile** field.
7. Click **OK**.

Managing system profiles

You can manage the system profiles on your host by using the Systems Director Management Console (SDMC). You can change the virtual servers and virtual server profiles specified within the system profiles.

Copying a system profile:

You can use the IBM Systems Director Management Console (SDMC) to create a copy of an existing system profile. After you create a copy of the existing system profile, you can change the virtual server profiles that are contained within the new system profile. This allows action you to create multiple, nearly identical system profiles quickly and easily.

To copy a system profile, complete the following steps:
1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and click the host on which the virtual server is located.
3. In the work pane, select the virtual server.
4. Right click in the pane and click **System Configuration** → **Manage System Profile**. is displayed.
5. On the Manage System Profile page, select the system profile, and click **Actions** → **Copy**.
6. Enter the name that you want to use for the copy into the **New profile name** field and click **OK**.

Changing a system profile:

You can change the virtual server profiles that are included in a system profile by using the IBM Systems Director Management Console (SDMC).

Restriction: You cannot add virtual servers that use shared memory to system profiles.

To change a system profile, complete the following steps:
1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and click the host on which the virtual server is located.
3. In the work pane, select the virtual server.
4. Right click in the pane and click **System Configuration** → **Manage System Profile**.
5. On the Manage System Profile page, select the system profile, and click **Actions** → **Edit**.
6. In the **System Profile** window, select each virtual server profile that you want to remove from the system profile, and click **Remove**.
7. For each virtual server profile that you want to add to the system profile, open the virtual server to which the virtual server profile belongs, select the virtual server profile, and click **Add**.
8. Click **OK**.

Validating a system profile:

When you validate a system profile, the IBM Systems Director Management Console (SDMC) compares the resources defined in the system profile with the resources available on the host. If the system profile requires more resources than are available on the host, a message is displayed on the SDMC.

To validate a system profile, complete the following steps:

1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and click the host.
3. Right click in the pane and click **System Configuration** → **Manage System Profile**. Tis displayed.
4. On the Manage System Profile page, select the system profile, and click **Validate**.
5. When validation is complete, click **OK**.

Deleting a system profile:

You can delete a system profile using the IBM Systems Director Management Console (SDMC).

To delete a system profile, complete the following steps:
1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and click the host on which the virtual server is located.
3. Right click in the pane and click **System Configuration** → **Manage System Profile**. T is displayed.
4. On the Manage System Profile page, select the system profile, and click **Actions** → **Delete**.
5. Click **Yes** to confirm.

Managing virtual resources for VIOS virtual servers

You can use the IBM Systems Director Management Console (SDMC) to manage virtual storage that is associated with Virtual I/O Server (VIOS) virtual servers.

Changing a virtual disk for a VIOS virtual server by using the SDMC:

You can use the IBM Systems Director Management Console (SDMC) to change the properties of the virtual disks on the host and to start virtual disk management tasks.

Virtual disks are also known as logical volumes. To assign the virtual disk to a client virtual server, ensure that the client virtual server owns one or more virtual SCSI adapters and that the Virtual I/O Server (VIOS) owns corresponding virtual SCSI adapters that host the client adapter.

To change a virtual disk, ensure you meet the following requirements:
- The VIOS must be at version 2.1.1.0 or later.
- Ensure that there is a resource monitoring and control connection between the SDMC and the Virtual I/O Server.

To change virtual disks, complete the following steps:
1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and click the host on which the VIOS virtual server is located.
3. In the work pane, select the VIOS virtual server.
4. Right click in the pane and click **System Configuration** → **Virtual Resources** → **Virtual Storage Management**.
5. On the Virtual Storage Management page, click **Query VIOS**.
6. Select a VIOS virtual server.
7. Click the **Virtual Disks** tab to display a list of virtual disks on the host.
8. Select the virtual disk from the table that you want to change. If a virtual disk is defined as a paging space device and is assigned to a shared memory pool, it is dedicated to providing this function and is no longer available for any other purpose. Consequently, such a virtual disk is not listed here.
9. From the **Action** menu bar of the Virtual Disks table, select the storage management task you want to perform:
   - **Properties** to view the properties of the selected virtual disks.
   - **Extend** to add storage capacity to the selected virtual disks.

- **Delete** to delete the selected virtual disk and make the storage resources that belonged to that virtual disk available to other virtual disks.
- **Modify assignment** to change the virtual server to which the selected virtual disk is assigned, or to set the selected virtual disk so it is not assigned to any virtual servers.

Related tasks

"Creating a virtual disk for a VIOS virtual server using the SDMC" on page 16
You can use the IBM Systems Director Management Console (SDMC) to create a virtual disk on your host. Virtual disks are also known as *logical volumes*.

Changing an optical device for a VIOS virtual server:

You can use the IBM Systems Director Management Console (SDMC) to change physical optical devices and virtual optical media.

You can add optical devices to, or remove optical devices from, any virtual server, whether or not the virtual server is active. If you remove an optical device from an active virtual server, the SDMC prompts you to confirm the removal before removing the optical device. To assign an optical device to a client virtual server, ensure that the client virtual server owns one or more virtual SCSI adapters and that the Virtual I/O Server (VIOS) owns corresponding virtual SCSI adapters that host the client adapter.

To change virtual optical media, ensure that you meet the following requirements:
- The VIOS must be at version 2.1.1.0 or later.
- Ensure that there is a resource monitoring and control connection between the SDMC and the VIOS.
- Verify that a virtual media library exists before you manage, create, or assign virtual optical devices.

To change optical devices, complete the following steps:
1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and click the host on which the VIOS virtual server is located.
3. In the work pane, select the VIOS virtual server.
4. Right click in the pane and click **System Configuration** → **Virtual Resources** → **Virtual Storage Management**. is displayed.
5. On the Virtual Storage Management page, click **Query VIOS**.
6. Select a VIOS virtual server.
7. Click the **Optical Devices** tab.
8. To change the virtual server assignment for a physical optical device, complete the following steps. (You cannot assign a physical optical device to an IBM i virtual server. An IBM i virtual server must use virtual optical devices instead.)
   a. From the Physical Optical Devices table, select the optical device that you want to change and click **Modify assignment**. The Modify Physical Optical Device Assignment page is displayed.
   b. Either change the virtual server to which the optical device is assigned, or set the optical device so it is not assigned to any virtual server, and click **OK**. The list of optical devices reflects the changes you made.
9. To change virtual optical media, select one of the following tasks in the Virtual Optical Media section:
   - **Create/Extend Library** to extend the size of the media library.
   - **Delete Library** to delete the media library and the files within the library.
   - **Add Media** to add an optical media file to the media library and make it available for assignment to a virtual server.
   - **Modify partition assignment** to change the virtual server assignment for a media file by changing the virtual optical device to which a media file is assigned. You can assign read-only media to more than one virtual server.
   - **Delete** to delete the selected media files from the media library.

Changing a storage pool for a VIOS virtual server:

You can use the IBM Systems Director Management Console (SDMC) to extend a storage pool, to reduce or remove a storage pool, and to assign a storage pool as the default storage pool for the host.

To change storage pools, ensure that you meet the following requirements:
- The Virtual I/O Server (VIOS) must be at version 2.1.1.0 or later.
- Ensure that there is a Resource Monitoring and Control (RMC) connection between the SDMC and the Virtual I/O Server.

To change storage pools, complete the following steps:
1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and click the host on which the VIOS virtual server is located.
3. In the work pane, select the VIOS virtual server.
4. Right click in the pane and click **System Configuration** → **Virtual Resources** → **Virtual Storage Management**.
5. On the Virtual Storage Management page, select a VIOS virtual server.
6. Click VIOS.
7. Click the **Storage Pools** tab to display a list of storage pools defined for the host.
8. Select the storage pool from the table that you want to change.
9. From the **Select Action** menu bar of the Storage Pools table, select the storage management task that you want to perform:
   - **Properties** to view the properties of the selected storage pool.
   - **Extend** to add storage capacity to the selected storage pool. To extend logical-volume-based storage pools, add physical volumes to the storage pool. To extend file-based storage pools, add space from the parent storage pool to the file-based storage pool.

     Note: You cannot add a physical volume to a storage pool if it is already assigned to a virtual server.
   - **Reduce** to reduce the size of the selected storage pool. To reduce logical-volume-based storage pools, remove physical volumes from the storage pool. To reduce the file-based storage pool, the storage pool is deleted.

     Attention: Reducing a storage pool that contains virtual disks could potentially destroy data that is stored on the virtual disks.

Related tasks

"Creating a virtual disk for a VIOS virtual server using the SDMC" on page 16
You can use the IBM Systems Director Management Console (SDMC) to create a virtual disk on your host. Virtual disks are also known as *logical volumes*.

Changing a physical volume for a VIOS virtual server by using the SDMC:

You can use the IBM Systems Director Management Console (SDMC) to view the properties of the physical volumes on your host andto start physical volume management tasks.

To assign the physical volume to a client virtual server, ensure that the client virtual server owns one or more virtual SCSI adapters and that the Virtual I/O Server owns corresponding virtual SCSI adapters that host the client adapter.

A physical volume can be a hard disk or a logical device on a storage area network (SAN). You can either assign a physical volume directly to a virtual server, or you can add a physical volume to a storage pool and create virtual disks to assign to virtual servers from the storage pool.

To change physical volumes, ensure that you meet the following requirements:

- The Virtual I/O Server (VIOS) must be at version 2.1.1.0 or later.
- Ensure that there is a resource monitoring and control connection (RMC) between the SDMC and the VIOS.

To change physical volumes, complete the following steps:

1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and click the host on which the VIOS virtual server is located.
3. In the work pane, select the VIOS virtual server.
4. Right click in the pane and click **System Configuration** → **Virtual Resources** → **Virtual Storage Management**.
5. On the Virtual Storage Management page, select a VIOS virtual server.
6. Click the **Physical Volumes** tab to display a list of physical volumes on the host.
7. Select the physical volume from the table that you want to change. If a physical volume is defined as a paging space device and is assigned to a shared memory pool, it is dedicated to providing this function and is not available for any other purpose. Consequently, such a physical volume is not listed here.
8. From the **Select Action** menu bar of the Physical Volumes table, select the storage management task that you want to perform:
   - **Properties** to view or change the properties of the selected physical volume.
   - **Modify assignment** to change the virtual server to which the selected physical volume is assigned, or to set the physical volume so it is not assigned to any virtual server.
   - **Add to storage pool** to add the selected physical volume to a storage pool.
   - **Remove from storage pool** to remove the selected physical volume from the selected storage pool.

Changing virtual fibre channel for a Virtual I/O Server:

You can use the IBM Systems Director Management Console (SDMC) to manage virtual fibre channel on your host and the virtual server connections for the associated physical fibre channel ports. Assigning one or more physical ports to a virtual server enables the virtual server to communicate with storage devices in a storage area network (SAN). Configuring this type of storage resource is available only when the system supports the use of virtual fibre channel adapters and has a physical fibre channel adapter installed and connected that supports N_Port ID Virtualization (NPIV) ports.

To assign the virtual fibre channel adapter to a physical port, ensure that the client virtual server owns one or more virtual fibre channel adapters and that the Virtual I/O Server (VIOS) owns corresponding virtual fibre channel adapters to host the client adapter.

To change a port connection assignment for a virtual server, the virtual server must be either in the off or the on state.

To avoid configuring the physical fibre channel adapter to be a single point of failure for the connection between the client virtual server and its physical storage on the SAN, do not connect two virtual fibre channel adapters from the same client virtual server to the same physical fibre channel adapter. Instead, connect each virtual fibre channel adapter to a different physical fibre channel adapter.

To change virtual fibre channel, ensure you meet the following requirements:

- The VIOS must be at version 2.1.1.0 or later.
- Ensure that there is a Resource Monitoring and Control (RMC) connection between the SDMC and the VIOS.
- To use Virtual Fibre Channel Management, you must have at least one (N_Port ID Virtualization) NPIV-capable fibre channel card attached to the VIOS.

To configure the physical port connections for virtual fibre channel, complete the following steps:

1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and click the host on which the VIOS virtual server is located.
3. In the work pane, select the VIOS virtual server.
4. Right click in the pane and click **System Configuration** → **Virtual Resources** → **Virtual Storage Management**.
5. On the Virtual Storage Management page, click **Query VIOS**.
6. Select a VIOS virtual server.
7. Click the **Virtual Fibre Channel** tab.
8. Select a port with at least one available connection and click **Modify connections**.
9. Select one or more virtual servers that you want to connect to the fibre channel port, and click **OK**.

   Note: If you delete the client virtual fibre channel adapter from the virtual server or the virtual server profile, the worldwide port names associated with the port and the storage area network (SAN) are lost. If you only change the port assignment, the worldwide port names are preserved inside the virtual server profile. The SDMC does not reuse them when it generates port names in the future. If you run out of port names, you must obtain a code key to enable an additional prefix and range of port names for use on your system.

10. Click **OK**.

To determine the actual number of port names available on the host, use the SDMC to view the virtual server properties or virtual server profile properties of the client virtual server.

Managing the memory configuration of a virtual server

You can use the IBM Systems Director Management Console (SDMC) to change the memory configuration of a virtual server. For example, you can change the Virtual I/O Server (VIOS) virtual servers that are assigned to a virtual server that uses shared memory, change the memory mode of a virtual server, and add or remove dedicated or shared memory to and from a virtual server.

Changing the paging VIOS virtual servers assigned to a shared memory virtual server:

You can use the IBM Systems Director Management Console (SDMC) to change the primary and secondary Virtual I/O Server (VIOS) virtual servers (hereafter referred to as *paging VIOS virtual server*) that are assigned to a virtual server that uses shared memory. You can also add or remove a secondary paging VIOS virtual server to or from a virtual server that uses shared memory (hereafter referred to as a *shared memory virtual server*).

Before you change the paging VIOS virtual servers that are assigned to a shared memory virtual server, complete the following steps:

- Ensure that the VIOS virtual servers (that you plan to assign to the shared memory virtual server as paging VIOS virtual servers) are assigned to the shared memory pool. For instructions, see "Changing the paging VIOS virtual servers assigned to the shared memory pool" on page 20.
- Ensure that the paging space device (that is accessed through the paging VIOS virtual server that you plan to assign to the shared memory virtual server) is assigned to the shared memory pool. For instructions, see "Adding and removing paging space devices to and from the shared memory pool" on page 26.

To change the paging VIOS virtual servers that are assigned to a shared memory virtual server, complete the following steps:

1. On the **Welcome** page, click the **Resources** tab. Open **Hosts** and click the host on which the shared memory virtual server is located.
2. In the work pane, select the virtual server. Right click and click **System Configuration** → **Manage Profiles**.

3. Select the virtual server profile that you want to change.
4. Click the **Actions** tab, and click the **Edit** tab.
5. Click the **Memory** tab.
6. Specify a VIOS virtual server for VIOS 1 and VIOS 2.

Table 4. Change options for the paging VIOS virtual server

Desired change	Field to change
Change the VIOS virtual server that is assigned as the primary or the only paging VIOS virtual server.	Select a different VIOS virtual server for VIOS 1.
Define a secondary paging VIOS virtual server.	Select a VIOS virtual server for VIOS 2.
Change the VIOS virtual server that is assigned as the secondary paging VIOS virtual server.	Select a different VIOS virtual server for VIOS 2.
Remove the secondary paging VIOS virtual server.	Select None for VIOS 2.

7. Click **OK**.
8. Shut down the shared memory virtual server and reactivate it with the changed profile.

Changing the Active Memory Expansion factor for AIX virtual servers:

You can change the Active Memory Expansion factor for an AIX virtual server by using the IBM Systems Director Management Console (SDMC). Changing the Active Memory Expansion factor for a virtual server increases or decreases the desired degree of expanded memory capacity for the virtual server.

You can change the Active Memory Expansion factor for virtual servers that use dedicated memory and for virtual servers that use shared memory.

To change the Active Memory Expansion factor, complete the following steps::
1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and click the host on which the virtual server is located.
3. In the work pane, select the virtual server.
4. Right click in the pane and click **System Configuration** → **Manage Virtual Server**.
5. Click the **Memory** tab.
6. In the **Active Memory Expansion** field, enter a value 1.00 - 10.00.
7. Click **OK**.

Related tasks

"Configuring Active Memory Expansion for AIX virtual servers" on page 7
You can configure Active Memory Expansion for an AIX virtual server by using the IBM Systems Director Management Console (SDMC). Configuring Active Memory Expansion for a virtual server compresses the memory of the virtual server and thus expands its memory capacity.

Changing the memory weight of a shared memory virtual server:

You can use the IBM Systems Director Management Console (SDMC) to change the memory weight of a virtual server that uses shared memory (hereafter referred to as a *shared memory virtual server*). Changing the memory weight changes the probability that the shared memory virtual server receives physical memory from the shared memory pool in relation to other shared memory virtual servers.

A Linux shared memory virtual server supports changing the memory weight only if the DynamicRM tool package is installed on the Linux shared memory virtual server. To download the DynamicRM tool package, see the Service and productivity tools for Linux on POWER systems website.

To change the memory weight assigned to the shared memory virtual server, complete the following steps:

1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and click the host on which the virtual server is located.
3. In the work pane, select the virtual server.
4. Right click in the pane and click **System Configuration** → **Manage Virtual Server**.
5. Click the **Memory** tab.
6. In the **Memory Capacity Weight (0–255)** field, enter the memory weight that you want to assign to the shared memory virtual server.
7. Click **OK**.

Changing the memory weight of a shared memory virtual server is temporary and is not reflected in the virtual server profile. The new memory weight that you assigned to the shared memory virtual server will be lost the next time you activate the virtual server profile. If you want to save the changes that you made to the memory weight of the shared memory virtual server, either change the virtual server profile or save the virtual server configuration to a new virtual server profile.

Changing the memory mode of a virtual server:

You can create multiple profiles for a virtual server by using the IBM Systems Director Management Console (SDMC). Some of the virtual server profiles can specify dedicated memory and some of the virtual server profiles can specify shared memory. By creating virtual server profiles that specify both dedicated memory and shared memory for the same virtual server, you can change the memory mode of the virtual server by activating different virtual server profiles.

To change the memory mode of a virtual server, complete the following steps:

Create a new virtual server profile for the virtual server.

- If you plan to change a dedicated-memory virtual server to a shared memory virtual server, specify the shared-memory mode in the new virtual server profile.
- If you plan to change a shared-memory virtual server to a dedicated memory virtual server, specify the dedicated-memory mode in the new virtual server profile.

Related tasks

"Changing virtual server profile properties" on page 37
You can change the properties of a virtual server profile using the IBM Systems Director Management Console (SDMC).

Obtaining additional WWPNs for the host

When all of the worldwide port names (WWPNs) on the host are used, you can add more WWPNs to the host using the IBM Systems Director Management Console (SDMC). Adding WWPNs allows you to create additional virtual fibre channel adapters on client virtual servers that use virtual resources provided by the Virtual I/O Server.

The host contains 32,000 pairs of WWPNs that all contain the same 6–digit prefix. Each virtual fibre channel adapter that you create on a client virtual server requires one pair of WWPNs. When all of the WWPNs on the host are used, you cannot create additional virtual fibre channel adapters on any client virtual servers until you add more WWPNs to the host. You add more WWPNs to the host by obtaining an activation code that contains a new WWPN prefix that contains 32,000 new pairs of WWPNs.

Go to the Capacity on Demand website to obtain an activation code.To obtain an activation code, complete the following steps:

1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and click the host for which you want to obtain an activation code.

3. Right click in the pane and click**System Configuration** → **Capacity on Demand**.
4. On the Capacity on Demand page, click **Advanced Functions** from the **Select On Demand Type field**.
5. Click **Enter Activation Code**.
6. On the **Enter Code** page, enter the activation code and click **OK**.

After you finish, you can create virtual fibre channel adapters on client virtual servers and add virtual fibre channel adapters to client virtual servers.

Related tasks

"Configuring a virtual fibre-channel adapter" on page 11
You can configure a virtual fibre-channel adapter for a running virtual server by using the IBM Systems Director Management Console (SDMC). The rules and assumptions for virtual client adapter management are identical to those that are used for creating virtual adapters and mapping storage for physical volumes.

Suspending a virtual server

You can suspend a virtual server by using the IBM Systems Director Management Console (SDMC).

Ensure that the virtual server is in the running state. The virtual server must also be capable of suspension.

To suspend a virtual server, complete the following steps:
1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and click the host on which the virtual server is located.
3. In the work pane, select the virtual server.
4. Right click in the pane and click **Operations** → **Suspend Operations** → **Suspend**.
5. Click **Suspend**.

You can resume a suspended virtual server.

Related tasks

"Resuming the suspended virtual server" on page 115
You can resume a suspended AIX, IBM i, or Linux virtual server on the host by using the IBM Systems Director Management Console (SDMC).

Recovering a suspended virtual server

If a suspend or resume operation fails, the virtual server might be in an invalid state. You can recover a suspended virtual server by using the IBM Systems Director Management Console (SDMC).

To recover a virtual server, complete the following steps:
1. On the **Welcome** page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts** and click the host on which the virtual server is located.
3. In the work pane, select the virtual server.
4. Right click in the pane and click **Operations** → **Suspend Operations** → **Recover**.
5. Select either the **Suspend** or the **Recover** operation based on which operation had failed.
6. Click **OK**.

The recovery process performs cleanup and moves the virtual server into a valid state.

Virtual I/O Server

Manage the Virtual I/O Server (VIOS) and client virtual servers by using the IBM Systems Director Management Console (SDMC).

The PowerVM Editions feature includes the installation media for the VIOS software. The VIOS facilitates the sharing of physical I/O resources between client virtual servers within the host.

When you install the VIOS in a virtual server on a host that is managed by the SDMC, you can use the SDMC and the VIOS command-line interface to manage the VIOS and client virtual servers.

Installing the VIOS and client virtual hosts

Find instructions for installing the Virtual I/O Server (VIOS) and client virtual hosts by deploying a system plan or manually creating the virtual server and installing the VIOS and client operating systems.

These instructions apply to installing the VIOS and client virtual servers on a host that is managed by an IBM Systems Director Management Console (SDMC).

You can deploy a system plan that includes the VIOS and client virtual servers. When you deploy a system plan, the SDMC automatically performs the following tasks based on the information provided in the system plan:
- Creates the VIOS virtual server.
- Installs the VIOS and provisions virtual resources.
- Creates the client virtual servers.
- Installs the AIX and Linux operating systems on client virtual servers.

Related tasks

"Finishing the VIOS installation" on page 52
After you install Virtual I/O Server (VIOS), you must check for updates, set up remote connects, and create additional user IDs.

Related information

Installing the Virtual I/O Server using NIM

Installing the Virtual I/O Server manually

You can create the Virtual I/O Server (VIOS) virtual server, and you can install the VIOS by using the IBM Systems Director Management Console (SDMC).

Before you start, ensure that the host on which you plan to install the VIOS is managed by an SDMC.

Entering the activation code for PowerVM Editions using the SDMC:

Find instructions to enter the PowerVM Editions (or Advanced POWER Virtualization) activation code by using the IBM Systems Director Management Console (SDMC).

If PowerVM Editions is not enabled on your host, you can use the SDMC to enter the activation code that you received when you ordered the feature.

Use the following procedure to enter the activation code for the PowerVM Standard Edition, the PowerVM Enterprise Edition, and the PowerVM Express Edition.

To enter your activation code, complete the following steps by using the SDMC:
1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts**, and select the destination host.
3. Click **Actions**, and select **System Configuration** → **Capacity on Demand (CoD)**.
4. In the Capacity on Demand window, select **Advanced Functions** from the **Select On Demand Type** list.
5. Click **Enter Activation Code**.

6. In the Enter Activation Code window, enter your activation code in the **Enter Code** field, and click
   OK.

Related information

PowerVM Editions overview

Creating the VIOS virtual server on an SDMC managed host:

You can use the IBM Systems Director Management Console (SDMC) to create a virtual server for the
Virtual I/O Server (VIOS).

You can use the SDMC to create the VIOS virtual server. Otherwise, you can deploy a system plan to
create the VIOS virtual server. When you deploy a system plan, you can optionally create client virtual
servers on the managed host as well.

Creating the VIOS virtual server manually:

You can use the IBM Systems Director Management Console (SDMC) to create a virtual server for the
Virtual I/O Server (VIOS).

Before you start, ensure that you meet the following requirements:
- You are a super administrator or an operator.
- The PowerVM Editions (or Advanced POWER Virtualization) feature is activated. For instructions, see
  "Entering the activation code for PowerVM Editions using the SDMC" on page 48.

The VIOS requires a minimum of 16 GB of disk space. From the VIOS Version 2.2.0.11, Fix Pack 24,
Service Pack 1, or later, the VIOS requires a minimum of 30 GB of disk space.

To create a virtual server on your host, complete the following steps by using the SDMC:
1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts**, and select the host on which you want to create the VIOS virtual server.
3. In the contents area, select the server on which you want to create the virtual server.
4. Click **Actions**, and select **System Configuration → Create Virtual Server**.
5. In the Create Virtual Server window, enter a name for the virtual server in the **Virtual server name**
   field.
6. Enter a value for the virtual server ID in the **Virtual server ID** field, or use the value that is
   displayed in the field. The virtual server ID is a unique ID assigned to the virtual server within the
   managed host. For PowerVM Express® Edition, only one VIOS virtual server can be created, and it
   can only have the ID of 1.
7. Select **VIOS** from the **Environment** field. Click **Next**.
8. Click the **Memory** tab, enter the amount of memory you would like to assign to the virtual server in
   the **Assigned Memory (GB)** field. Only **Dedicated Memory** is available for VIOS virtual servers.
   Click **Next**.
9. Click the **Processor** tab, and select either **Dedicated** or **Shared** mode, and enter the appropriate
   amount of virtual processors that you want to assign to the VIOS virtual server. Click **Next**.
10. Click the **Ethernet** tab, and select the virtual Ethernet for each of the virtual Ethernet adapters of the
    virtual server. Click **Next**.
11. Click the **Virtual Adapters** tab, and specify the virtual storage adapters required for the virtual
    server. Click **Next**.
12. Click the **Physical I/O Adapters** tab, and select one or more physical adapters from the list of
    available physical adapters. Click **Next**
13. Verify your selections on the **Summary** tab and click **Finish**.

After you create the virtual server, you can install the VIOS by using one of the following procedures:
- "Installing the VIOS from the SDMC"
- "Installing the VIOS from CD or DVD" on page 51

Creating the VIOS virtual server and client virtual servers to deploy a system plan:

You can use the IBM Systems Director Management Console (SDMC) to deploy a system plan on a host managed by a POWER7 processor-based system to create a virtual server for the Virtual I/O Server (VIOS). You also can use the system plan to optionally create client virtual servers on the managed host. The system plan can only create the VIOS management virtual server and client virtual servers.

Before you start, ensure that the host to which you plan to deploy the system plan is managed by an SDMC.

When you deploy the system plan, the SDMC automatically performs the following tasks based on the information provided in the system plan:
- Creates the VIOS virtual server and virtual server profile.
- Creates the client virtual servers and virtual server profiles.

For instructions to deploy a system plan, see "Deploying a system plan" on page 136.

After you use the system plan to create your management and client virtual servers, you can install the VIOS. For instructions, see one of the following procedures:
- "Installing the VIOS from the SDMC"
- "Installing the VIOS from CD or DVD" on page 51

Related tasks

"Deploying a system plan" on page 136
You can use the IBM Systems Director Management Console (SDMC) to deploy all or part of a system plan to a managed host.

"Creating a system plan" on page 127
You can use the IBM Systems Director Management Console (SDMC) to create a system plan, based on an existing system configuration, and then deploy that system plan to other managed hosts.

"Importing a system plan" on page 134
You can import a `system-plan` file into a IBM Systems Director Management Console (SDMC) from a remote FTP site or to the computer from which you remotely access the SDMC. You can then deploy the imported system plan to a system that the SDMC manages.

Installing the VIOS from the SDMC:

Find instructions for installing the Virtual I/O Server (VIOS) from the IBM Systems Director Management Console (SDMC) by using the smcli psm installios command.

Before you start, complete the following tasks:
- Ensure that you meet the following requirements:
  - An SDMC is attached to the managed host.
  - The VIOS virtual server is created. For instructions, see "Creating the VIOS virtual server manually" on page 49.
  - The VIOS virtual server has at least one Ethernet adapter and a 16 GB disk assigned to it.
  - You have the super administrator authority.
- Gather the following information:
  - The static IP address for the VIOS
  - The subnet mask for the VIOS

- The default gateway for the VIOS

To install the VIOS, complete the following steps by using the SDMC:

1. Insert the VIOS CD or DVD into the SDMC.
2. If you are installing the VIOS through the public network interface, continue to step 3. If you are installing the VIOS through a private network interface, enter the following command from the SDMC command line:

   `smcli psm export INSTALLIOS_PRIVATE_IF=interface`

   where *interface* is the network interface through which the installation takes place.
3. From the SDMC command line, enter:

   `smcli psm installios`
4. Follow the installation instructions according to the system prompts.

After you install the VIOS, finish the installation tasks, such as checking for updates, setting up remote connections, and creating additional user IDs. For instructions, see "Finishing the VIOS installation" on page 52.

Installing the VIOS from CD or DVD:

Find instructions for installing the Virtual I/O Server (VIOS) from a CD or DVD device that is attached to the VIOS virtual server.

Before you start, ensure that you meet the following requirements:
- An IBM Systems Director Management Console (SDMC) is attached to the managed host.
- The VIOS virtual server is created. For instructions, see "Creating the VIOS virtual server manually" on page 49.
- A CD or DVD optical device is assigned to the VIOS virtual server.

To install the VIOS from CD or DVD, complete the following steps:

1. Activate the VIOS virtual server by using the SDMC:
   a. Insert the *VIOS* CD or DVD into the VIOS virtual server.
   b. In the SDMC Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
   c. Click the host on which the VIOS virtual server is located.
   d. Right click on the VIOS virtual server. Click **Operations** → **Activate** → **Current Configuration** or **Operations** → **Activate** → **Profile**, as applicable. The Activate Current Configuration or the Activate Virtual server window is displayed.
   e. To activate by using the current configuration, click **OK** in the Activate Current Configuration window. Continue to step 2.
   f. To activate by using a profile, select the profile from the **Virtual server profiles** list in the Activate Virtual server window. Click **OK**.
   g. Select **Open a terminal window or console session** to open a virtual terminal (vterm) window.
   h. Click **Advanced** to open the advanced options menu.
   i. For the boot mode, select **SMS**.
   j. Click **OK** to close the advanced options menu.
   k. Click **OK**. A virtual terminal window opens for the virtual server.
2. Select the boot device:
   a. Select **Select Boot Options**, and press Enter.
   b. Select **Select Install/Boot Device**, and press Enter.
   c. Select **Select 1st Boot Device**, and press Enter.

d. Select **CD/DVD**, and press Enter.

e. Select the media type that corresponds to the optical device, and press Enter.

f. Select the device number that corresponds to the optical device, and press Enter.

g. Set the boot sequence to configure the first boot device. The optical device is now the first device in the Current Boot Sequence list.

h. Exit the SMS menu by pressing the x key, and confirm that you want to exit SMS.

3. Install the VIOS:

a. Select the desired console, and press Enter.

b. Select a language for the BOS menus, and press Enter.

c. Select **Start Install Now with Default Settings**, and press Enter. The default edition that is selected is the PowerVM Express Edition. Select **Change/Show Installation Settings and Install** to change the installation and system settings.

d. Select **Continue with Install**. The system will reboot after the installation is completed.

After you install the VIOS, finish the installation tasks, such as checking for updates, setting up remote connects, and creating additional user IDs. For instructions, see "Finishing the VIOS installation."

Finishing the VIOS installation:

After you install Virtual I/O Server (VIOS), you must check for updates, set up remote connects, and create additional user IDs.

This procedure assumes that VIOS is installed.

To finish the installation, complete the following steps:

1. Accept the software maintenance terms and conditions, and the VIOS product license. For instructions, see "Viewing and accepting the VIOS license" on page 53.

2. Check for updates to the VIOS. For instructions, see "Updating the VIOS" on page 62.

3. Set up remote connections to the VIOS. For instructions, see Connecting using OpenSSH.

4. Optional: Create the following additional user IDs. After the installation, the only active user ID is the prime administrator (padmin). You can create the following additional user IDs: system administrator, service representative, and development engineer. For information about creating user IDs, see Managing users.

5. Configure the TCP/IP connection for the VIOS using the mktcpip command. You must complete this task before you can perform any virtual server operations on virtual servers in the Started state.

   Alternatively, you can use the configuration assistance menu to configure TCP/IP connections. You can access the configuration assistance menu by running the cfgassist command.

When you are finished, perform one of the following tasks:

• Create client virtual servers.

   Note: You do not need to perform this task if you deployed a system plan to create all your client virtual servers.

• Configure the VIOS and install client operating systems. For information, see "Virtual servers" on page 1.

Related concepts

"Installing the VIOS and client virtual hosts" on page 48
Find instructions for installing the Virtual I/O Server (VIOS) and client virtual hosts by deploying a system plan or manually creating the virtual server and installing the VIOS and client operating systems.

Viewing and accepting the VIOS license:

You must view and accept the license before using the Virtual I/O Server (VIOS).

Before you start, ensure that the VIOS virtual server is created and that the VIOS is installed. For instructions, see "Installing the VIOS and client virtual hosts" on page 48.

To view and accept the VIOS license, complete the following steps:
1. Log in to the VIOS using the padmin user ID.
2. Choose a new password. The software maintenance terms and conditions appear.
3. If VIOS is at Version 1.5 or later, view and accept the software maintenance terms and conditions:
   a. To view the software maintenance terms and conditions, enter v on the command line, and press Enter.
   b. To accept the software maintenance terms and conditions, enter a on the command line, and press Enter.
4. View and accept the VIOS product license.

   Note: If you installed the VIOS by deploying a system plan, then you have already accepted the VIOS product license and do not need to complete this step.
   a. To view the VIOS product license, enter `license -ls` on the VIOS command line. By default, the license is displayed in English. To change the language in which the license is displayed, complete the following steps:
      1) View the list of available locales to display the license by typing the following command:
         ```
         license -ls
         ```
      2) View the license in another language by typing the following command:
         ```
         license -view -lang name
         ```

         For example, to view the license in Japanese, enter the following command:
         ```
         license -view -lang ja_JP
         ```
   b. To accept the VIOS product license, enter `license -accept` on the command line.
5. To change the language setting for the system, complete the following steps. English is the default language.
   a. View the available languages by typing the following command:
      ```
      chlang -ls
      ```
   b. Change the language by typing the following command, replacing *name* with the name of the language you want:
      ```
      chlang -lang name
      ```

      Note: If the language file set is not installed, use the **-dev** *Media* flag to install it.
      For example, to install and change the language to Japanese, enter the following command:
      ```
      chlang -lang ja_JP -dev /dev/cd0
      ```

Reinstalling a paging VIOS virtual server

When you reinstall the Virtual I/O Server (VIOS) that is assigned to the shared memory pool (hereafter referred to as a *paging VIOS virtual server*), you need to reconfigure the shared memory environment. For example, you might need to add the paging space devices again to the shared memory pool.

The paging VIOS virtual servers store information about the paging space devices that are assigned to a shared memory pool. The IBM Systems Director Management Console (SDMC) obtains information about the paging space devices that are assigned to the shared memory pool from the paging VIOS virtual servers. When you reinstall the VIOS, the information about the paging space devices is lost. For the paging VIOS virtual servers to regain the information, you must assign the paging space devices again to the share memory pool after you reinstall the VIOS.

The following table shows the reconfiguration tasks that you must perform in the shared memory environment when you reinstall the VIOS of a paging VIOS virtual server.

Table 5. Shared memory reconfiguration tasks for reinstalling the VIOS of a paging VIOS virtual server

Number of paging VIOS virtual server that are assigned to the shared memory pool	Number of paging VIOS virtual server for which you want to reinstall the VIOS	Reconfiguration steps	Instructions
1	1	1. Shut down all virtual servers that use shared memory (hereafter referred to as *shared memory virtual servers*). 2. Reinstall the VIOS. 3. Add the paging space devices again to the shared memory pool.	1. Shutting down and restarting virtual servers 2. Installing the Virtual I/O Server manually by using the SDMC 3. Adding and removing paging space devices to and from the shared memory pool
2	1	1. Shut down each shared memory virtual server that uses the paging VIOS virtual server (that you plan to reinstall) as the primary or secondary paging VIOS virtual server. 2. Remove the paging VIOS virtual server from the shared memory pool. 3. Reinstall the VIOS. 4. Add the paging VIOS virtual server again to the shared memory pool.	1. Shutting down and restarting virtual servers 2. Removing a paging VIOS virtual server from the shared memory pool 3. Installing the Virtual I/O Server manually by using the SDMC 4. Adding a paging VIOS virtual server to the shared memory pool
2	2	1. Shut down all the shared memory virtual servers. 2. Reinstall the VIOS of each paging VIOS virtual server. 3. Add the paging space devices again to the shared memory pool.	1. Shutting down and restarting virtual servers 2. Installing the Virtual I/O Server manually by using the SDMC 3. Adding and removing paging space devices to and from the shared memory pool

Migrating the VIOS

You can migrate the Virtual I/O Server (VIOS) virtual server from the IBM Systems Director Management Console (SDMC) or from a DVD device that is attached to the VIOS virtual server.

Before you start, verify that the following statements are true:
- The host on which you plan to migrate the VIOS is managed by an SDMC.
- The VIOS is at version 1.3, or later.
- The rootvg volume group has been assigned to the VIOS.

In most cases, user configuration files from the previous version of the VIOS are saved when the new version is installed. If you have two or more VIOS virtual servers in your environment for redundancy, you can shut down and migrate one VIOS virtual server without interrupting any clients. After the migration is completed and the VIOS virtual server is running again, the virtual server will be available to clients without additional configuration.

Attention: Do not use the VIOS updateios command to migrate the VIOS.

Related information

Migrating the Virtual I/O Server using NIM

Migrating the VIOS from the SDMC

Find instructions for migrating the Virtual I/O Server (VIOS) to version 2.1.0.0, or later, from the IBM Systems Director Management Console (SDMC) by using the `smcli psm installios` command.

Before you start, verify that you meet the following requirements:
- SDMC is attached to the managed host.
- The VIOS virtual server has at least one Ethernet adapter and a 16 GB disk assigned to it.
- You have super administrator authority.
- You have the VIOS migration media.

  Note: The migration media is separate from the installation media.
- The VIOS is currently at version 1.3, or later.
- The disk name (**PV_name**) of your root volume group (rootvg) is `hdisk0`. You can verify the disk name by running the following command from the VIOS command line: `lsvg -pv rootvg`

  Note: If the disk name is anything other than `hdisk0`, you cannot use the migration DVD to perform the migration. Instead, see Migrating the VIOS from a downloaded migration image to ensure that you can migrate the VIOS successfully.
- The rootvg volume group has been assigned to the VIOS.
- Use the startnetsvc command from the VIOS command line to note what services you have started for the VIOS.
- Determine the services and agents that are configured by using the cfgsvc command from the VIOS command line for use with the VIOS. Use the lssvc command from the VIOS command line to display a list of all agents. Use the lssvc with the agent name parameter (`lssvc <agent_name>`) to display information for a specified agent.

  Note: If any parameters have been set for an agent or service, reconfigure the parameters after you complete the migration process.
- Back up the mksysb image before migrating VIOS. Run the backupios command from the VIOS command line and save the mksysb image to a safe location.

To migrate the VIOS, complete the following steps:
1. Insert the *VIOS migration* DVD into the SDMC.
2. If you are installing the VIOS through the public network interface, continue to step 3 on page 56. If you are installing the VIOS through a private network interface, enter the following command from the SDMC command line:
   ```
   smcli psm export INSTALLIOS_PRIVATE_IF=interface
   ```

where *interface* is the network interface through which the installation takes place.

3. From the SDMC command line, enter:

   `smcli psm installios`

   Attention: Do not use the VIOS updateios command to migrate the VIOS.

4. Follow the installation instructions according to the system prompts.

After the migration is completed, the VIOS virtual server is restarted to its preserved configuration before the migration installation. Perform the following tasks:

- Verify that the migration was successful by checking the results of the installp command and by running the ioslevel command. The results of the ioslevel command indicate that the VIOS level is now `$ ioslevel 2.1.0.0`.
- Restart previously running daemons and agents:
  1. Log on to the VIOS as padmin user.
  2. Complete the following command: `$ motd -overwrite "`*<enter the previous banner message>*`"`
  3. Start any previously running daemons, such as FTP and Telnet.
  4. Start any previously running agents, such as ituam.
- Check for updates to the VIOS. For instructions, see VIOS Support for Power Systems.

  Note: The VIOS migration media is separate from the VIOS installation media. Do not use the installation media for updates after you perform a migration. It does not contain updates, and you will lose your current configuration. Only apply updates by using the instructions from the VIOS Support for Power Systems website.

Related tasks

"Backing up the VIOS to a remote file system by creating a mksysb image" on page 65
You can back up the Virtual I/O Server (VIOS) base code, applied fix packs, custom device drivers to support disk subsystems, and some user-defined metadata to a remote file system by creating a `mksysb` file.

Related information

VIOS Support for Power Systems

Migrating the VIOS from a downloaded image

Find instructions for migrating the Virtual I/O Server (VIOS) to version 2.1.0.0, or later, from the IBM Systems Director Management Console (SDMC) when the disk name of the root volume group (rootvg) is not `hdisk0`.

Ensure that you have the latest SDMC installation image. You can obtain the latest installation image from the Fix Central website.

If the disk name (**PV_name**) of your root volume group (rootvg) is anything other than `hdisk0`, complete the following steps to migrate the VIOS:

1. If the host detects that the first migratable disk does not contain a VIOS installation during a nonprompted migration, the migration will switch to the prompted mode. At this point, the migration is canceled and the Migration Confirmation Menu on the console for the virtual server is displayed with the following message: `Cannot proceed with VIOS migration. The selected disk does not contain a VIOS.` To resolve this problem, you must end the installation process by pressing CTRL+C from the session that executed the `smcli psm installios` command.

2. Download the VIOS migration image from the VIOS website.

3. Determine the PVID value for the hard disk of your root volume group (rootvg) in one of the following ways:

   - From the SDMC command line, run the following command: `smcli psm viosvrcmd -m cec1 -p vios1 -c "lspv"`

The command returns information such as in the following example:

```
NAME            PVID                VG              STATUS
hdisk0          00cd1b0ef5e5g5g8    None
hdisk1          00cd1b0ec1b17302    rootvg          active
hdisk2          none                None
```

- From the VIOS command line with padmin user authority, run the `lspv` to obtain the PVID value of the disk targeted for the installation.

  The command returns information such as in the following example:

```
NAME            PVID                VG              STATUS
hdisk0          00cd1b0ef5e5g5g8    None
hdisk1          00cd1b0ec1b17302    rootvg          active
hdisk2          none                None
```

4. From the SDMC command line, run the `smcli psm installios` command with flags. Specify option -E with the PVID value of the VIOS target disk that is the migration destination. For example, based on the following example information, you might run this command: `smcli psm installios -s cec1 -S 255.255.255.0 -p vios -r vios_prof -i 10.10.1.69 -d /dev/cdrom -m 0e:f0:c0:00:40:02 -g 10.10.1.169 -P auto -D auto -E 00cd1b0ec1b17302`

```
VIOS image source           = /dev/cdrom
managed_system              = cec1
VIOS virtual server         = vios
VIOS virtual server profile     = vios_prof
VIOS IP address             = 10.10.1.69
VIOS subnet mask            = 255.255.255.0
VIOS gateway address        = 10.10.1.169
VIOS network MAC address    = 0ef0c0004002
VIOS network adapter speed  = auto
VIOS network adapter duplex = auto
VIOS target disk PVID       = 00cd1b0ec1b17302  △ rootvg
```

Note: When you install the VIOS with the `smcli psm installios` command, if the installation process cannot find the PVID value that you entered with the -E option, the installation proceeds in the prompt mode.
From the SDMC terminal that is running the `smcli psm installios` command, a message of `info=prompting_for_data_at_console` is displayed. The LED code for the virtual server shows a code of 0c48. Either run the `smcli psm mkvterm -m cec1 -p vios` command from the SDMC to interact with the virtual console to continue the migration or to rerun the `smcli psm installios` command with the corrected PVID value. Rerunning the `smcli psm installios` command recopies the image from media to the disk.

After the migration is complete, the VIOS virtual server is restarted to its preserved configuration before the migration installation. Perform the following tasks:

- Verify that migration was successful by checking the results of the installp command and by running the ioslevel command. The results of the ioslevel command indicate that the VIOS level is now *$ ioslevel 2.1.0.0*.
- Restart previously running daemons and agents:
  1. Log on to the VIOS as padmin user.
  2. Complete the following command: $ `motd -overwrite` "*<enter the previous banner message>*"
  3. Start any previously running daemons, such as FTP and Telnet.
  4. Start any previously running agents, such as ituam.
- Check for updates to the VIOS. For instructions, see VIOS Support for Power Systems.

  Note: The VIOS migration media is separate from the VIOS installation media. Do not use the installation media for updates after you perform a migration. It does not contain updates and you can lose your current configuration. Only apply updates using the instructions from the VIOS Support for Power Systems website.

Migrating the VIOS from DVD

Find instructions for migrating the Virtual I/O Server (VIOS) from a DVD device that is attached to the VIOS virtual server.

Before you start, ensure that you meet the following requirements:
- An IBM Systems Director Management Console (SDMC) is attached to the managed host.
- A DVD optical device is assigned to the VIOS virtual server.
- The VIOS migration installation media is required.

  Note: The VIOS migration installation media is separate from the VIOS installation media.
- The VIOS is currently at Version 1.3, or later.
- The root volume group (rootvg) has been assigned to the VIOS
- Use the startnetsvc command from the VIOS command line to note what services you have started for the VIOS.
- Determine the services and agents that are configured by using the cfgsvc command from the VIOS command line for use with the VIOS. Use the lssvc command to display a list of all agents. Use the lssvc command with the agent name parameter (lssvc <agent_name>) from the VIOS command line to display information for a specified agent.

  Note: If any parameters have been set for an agent or service, reconfigure the parameters after you complete the migration process.
- Back up the mksysb image before migrating the VIOS. Run the backupios command from the VIOS command line and save the mksysb image to a safe location.

To migrate the VIOS from a DVD, complete the following steps by using the SDMC:
1. Activate the VIOS virtual server using the SDMC:
   a. Insert the **VIOS migration DVD** into the DVD drive assigned to the VIOS virtual server.
   b. In the SDMC Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
   c. Click the host on which the VIOS virtual server is located.
   d. Select the VIOS virtual server.
   e. Click **Actions**, and select **System Configuration** → **Manage Virtual Server**. Click **Tasks** → **Operations** → **Activate** → **Current Configuration** or **Tasks** → **Operations** → **Activate** → **Profile**, as applicable. The Activate Current® Configuration or the Activate Virtual server window is displayed.
   f. To activate with the current configuration, click **OK** in the Activate Current Configuration window. Continue to step 2.
   g. Select **Open a terminal window or console session** to open a virtual terminal (vterm) window.
   h. Click **Advanced** to open the advanced options menu.
   i. For the boot mode, select **SMS**.
   j. Click **OK** to close the advanced options menu.
   k. Click **OK**. A virtual terminal window opens for the virtual server.
2. Select the boot device:
   a. Select **Select Boot Options**, and press Enter.
   b. Select **Select Install/Boot Device**, and press Enter.
   c. Select **CD/DVD**, and press Enter.
   d. Select the device number that corresponds to the DVD, and press Enter. You can also select **List all devices**, select the device number from a list, and press Enter.
   e. Select **Normal mode boot**.

    f. Select **Yes** to exit SMS.

3. Install the VIOS:

    a. Select the desired console, and press Enter.

    b. Select a language for the BOS menus, and press Enter.

    c. Select **Start Install Now with Default Settings**, and press Enter. You can also verify the installation and system settings by typing 2 (**Change/Show Installation Settings and Install**).

        Note: You should not have to change installation settings simply to select the migration installation method. If a previous version of the operating system exists, the installation method defaults to migration.

    d. Select **Continue with Install**. The system will reboot after the installation is completed.

After the migration is completed, the VIOS virtual server is restarted to its preserved configuration before the migration installation. Perform the following tasks:

- Verify that migration was successful by checking the results of the installp command and by running the ioslevel command. The results of the ioslevel command indicate that the VIOS level is now *$ ioslevel 2.1.0.0*.
- Restart previously running daemons and agents:

  1. Log on to the VIOS as padmin user.
  2. Complete the following command: $ motd -overwrite "*<enter previous banner message>*"
  3. Start any previously running daemons, such as FTP and Telnet.
  4. Start any previously running agents, such as ituam.

- Check for updates to the VIOS. For instructions, see VIOS Support for Power Systems.

  Note: The VIOS migration media is separate from the VIOS installation media. Do not use the installation media for updates after you perform a migration. It does not contain updates and you will lose your current configuration. Only apply updates using the instructions from the VIOS Support for Power Systems website.

Related tasks

"Backing up the VIOS to a remote file system by creating a mksysb image" on page 65
You can back up the Virtual I/O Server (VIOS) base code, applied fix packs, custom device drivers to support disk subsystems, and some user-defined metadata to a remote file system by creating a mksysb file.

Related information

VIOS Support for Power Systems

Setting the reserve policy attributes of a device

In some configurations, you must consider the reservation policy of the device on the Virtual I/O Server (VIOS).

The following list describes the situations in which the reservation policy of the device on the VIOS is important for systems that are managed by the IBM Systems Director Management Console (SDMC).

- To use a Multipath I/O (MPIO) configuration at the client, none of the virtual SCSI devices on the VIOS can reserve the virtual SCSI device. Set the reserve_policy attribute of the device to no_reserve.
- For virtual SCSI devices used with virtual server mobility or the Suspend/Resume feature, the reserve attribute on the physical storage that is used by the mobile virtual server can be set as follows:
  - You can set the reserve policy attribute to no_reserve.
  - You can set the reserve policy attribute to pr_shared when the following products are at the following versions:
    - VIOS Version 2.1.2.0, or later

- The physical adapters support the SCSI-3 Persistent Reserves standard

The reserve attribute must be the same on the source and destination VIOS virtual servers for successful virtual server mobility.

- For PowerVM Active Memory Sharing or Suspend/Resume features, the VIOS automatically sets the `reserve` attribute on the physical volume to `no reserve`. The VIOS performs this action when you add a paging space device to the shared memory pool.

1. From a VIOS virtual server, list the disks (or paging space devices) to which the VIOS has access. Enter the following command from the VIOS command line:

   `lsdev -type disk`

2. To determine the reserve policy of a disk, enter the following command, where *hdiskX* is the name of the disk that you identified in step 1. For example, hdisk5.

   `lsdev -dev hdiskX -attr reserve_policy`

   The results might look like the following output:

   ```
   ..
   reserve_policy  no_reserve                      Reserve Policy               True
   ```

   Based on the situations in which the reservation policy of the device on the VIOS is important for systems, you might need to change the reserve_policy so that you can use the disk in any of the described configurations.

3. To set the reserve_policy, enter the chdev command from the VIOS command line. For example:

   `chdev -dev hdiskX -attr reserve_policy=reservation`

   where:
   - *hdiskX* is the name of the disk for which you want to set the reserve_policy attribute to `no_reserve`.
   - *reservation* is either `no_reserve` or `pr_shared`.

4. Repeat this procedure from the other VIOS virtual server.

   Requirements:
   a. Although the reserve_policy attribute is an attribute of the device, each VIOS saves the value of the attribute. You must set the reserve_policy attribute from both VIOS virtual servers so that both VIOS virtual servers recognize the reserve_policy of the device.
   b. For virtual server mobility, the reserve_policy on the destination VIOS virtual server must be the same as the reserve_policy on the source VIOS virtual server. For example, if the reserve_policy on the source VIOS virtual server is `pr_shared`, the reserve_policy on the destination VIOS virtual server must also be `pr_shared`.

Configuring virtual Ethernet on the VIOS

You can create and configure a shared Ethernet adapter and configure a link aggregation device.

Creating a virtual Ethernet adapter using SDMC

You can create a virtual Ethernet adapter on a Virtual I/O Server (VIOS) so that client virtual servers can access the external network without having to own a physical Ethernet adapter.

If you plan to use a shared Ethernet adapter with a Host Ethernet Adapter (or Integrated Virtual Ethernet), ensure that the logical Host Ethernet Adapter (LHEA) on the VIOS is set to promiscuous mode. For instructions, see "Setting the LHEA to promiscuous mode" on page 61.

To create a virtual Ethernet adapter on the VIOS, complete the following steps by using the SDMC:
1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts**, and click the managed host on which the VIOS virtual server is located.
3. Select the VIOS virtual server.

4. Click **Actions**, and select **System Configuration** → **Manage Virtual Server**.
5. Click the **Network** tab, and click **Add** in the Virtual Ethernet area.
6. In the Create Virtual Ethernet Adapter window, specify the adapter ID and port virtual Ethernet value.
7. Select **IEEE 802.1Q-compatible adapter**.
8. If you are using multiple VLANs, add any additional VLAN IDs for the client virtual servers that must communicate with the external network using this virtual adapter in the **Additional VLANs** field.
9. In the Shared Ethernet Settings area, select **Use this adapter for Ethernet bridging** to use this adapter as a gateway between VLANs and an external network. This Ethernet adapter is configured as part of the shared Ethernet adapter.
10. When you are finished, click **OK**.
11. Assign or create one of the following real adapters:
    - Assign a physical Ethernet adapter to the VIOS.
    - If you plan to aggregate more than one physical Ethernet adapter into a link aggregation or EtherChannel device, then assign multiple physical Ethernet adapters to the VIOS.
    - If you plan to use the shared Ethernet adapter with a Host Ethernet Adapter, create an LHEA for the VIOS virtual server.
12. Click **Apply**.
13. Repeat this procedure for additional shared Ethernet adapters that you require.

When you complete the procedure, configure the shared Ethernet adapter by using the VIOS command-line interface or the SDMC.

Setting the LHEA to promiscuous mode:

To use a shared Ethernet adapter with a Host Ethernet Adapter (or Integrated Virtual Ethernet), you must set the logical Host Ethernet Adapter (LHEA) to promiscuous mode.

Before you start, use the IBM Systems Director Management Console (SDMC) to determine the physical port of the Host Ethernet Adapter that is associated with the logical host Ethernet port. Determine this information for the Logical Host Ethernet port that is the real adapter of the shared Ethernet adapter on the VIOS. You can find this information in the virtual server properties of the VIOS, and the managed host properties of the host on which the VIOS is located.

To set the logical host Ethernet port (that is the real adapter of the shared Ethernet adapter) to promiscuous mode, complete the following steps by using the SDMC:
1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts**, and select the managed host on which the VIOS virtual server is located.
3. Click **Actions**, and select **Hardware Information** → **Adapter** → **Host Ethernet**. The Host Ethernet Adapters window is displayed.
4. Select the physical location code of the Host Ethernet Adapter.
5. Select the physical port associated with the logical host Ethernet port on the VIOS virtual server, and click **Configure**.
6. In the HEA Physical Port Configuration window, select the **VIOS** virtual server in the **Promiscuous virtual server** list.
7. Click **OK** in the HEA Physical Port Configuration window.
8. Click **OK** in the Host Ethernet Adapters window.

Updating the VIOS

To install an update to the Virtual I/O Server (VIOS), you can obtain the update either from a CD or download the update.

To update the VIOS, complete the following steps:

1. Make a backup of the VIOS by following the steps in "Backing up the VIOS."
2. Download the required updates from the VIOS support site. Alternatively, you can get the updates from the update CD.
3. Install the update using the updateios command from the VIOS command line. For example, if your update file set is located in the /home/padmin/update directory, enter the following command:

   updateios -install -accept -dev /home/padmin/update

   Notes:

   - The updateios command installs all updates located in the specified directory.
   - The VIOS Version 2.2.0.11, Fix Pack 24, Service Pack 1, or later, does not support the -reject option of the updateios command.

Backing up the VIOS

You can back up the Virtual I/O Server (VIOS) and user-defined virtual devices using the backupios command or the viosbr command from the VIOS command line. You can also use IBM Tivoli® Storage Manager to schedule backups and to store backups on another server.

The VIOS contains the following types of information that you need to back up the VIOS and user-defined virtual devices.

- The VIOS includes the base code, applied fix packs, custom device drivers to support disk subsystems, and some user-defined metadata. All this information is backed up when you use the backupios command.
- User-defined virtual devices include metadata, like virtual devices mappings, that define the relationship between the physical environment and the virtual environment. You can back up user-defined virtual devices in one of the following ways:
  - You can back up user-defined virtual devices by using the viosbr command. Use this option in situations where you plan to restore the configuration information to the same VIOS virtual server from which it was backed up.
  - You can back up user-defined virtual devices by saving the data to a location that is automatically backed up when you use the backupios command to back up the VIOS. Use this option in situations where you plan to restore the VIOS to a new or different host. (For example, in the event of a system failure or disaster.) Furthermore, in these situations, you must also back up the following components of your environment. Back up these components to fully recover your VIOS configuration:
    - External device configurations, such as storage area network (SAN) devices.
    - Resources defined on the IBM Systems Director Management Console (SDMC), such as processor and memory allocations. In other words, back up your SDMC virtual server profile data for the VIOS and its client virtual servers.
    - The operating systems and applications running in the client virtual servers.

You can back up and restore the VIOS as listed in the following table.

Table 6. Backup and restoration methods for the VIOS

Backup method	Media	Restoration method
To tape	Tape	From tape
To DVD	DVD-RAM	From DVD

Table 6. Backup and restoration methods for the VIOS (continued)

Backup method	Media	Restoration method
To remote file system	nim_resources.tar image	From an SDMC using the Network Installation Management (NIM) in a Linux environment and the smcli psm installios command
To remote file system	mksysb image	From an AIX 5L™ NIM server and a standard mksysb system installation
Tivoli Storage Manager	mksysb image	Tivoli Storage Manager

Related tasks

"Restoring the VIOS" on page 72
You can restore the Virtual I/O Server (VIOS) and user-defined virtual devices using the smcli psm installios command, the viosbr command, or IBM Tivoli Storage Manager.

Related information

backupios command

viosbr command

Backing up the VIOS to tape

You can back up the Virtual I/O Server (VIOS) base code, applied fix packs, custom device drivers to support disk subsystems, and some user-defined metadata to tape.

To back up the VIOS to tape, complete the following steps:

1. Assign a tape drive to the VIOS.
2. Get the device name by entering the following command from the VIOS command line:

   lsdev -type tape

   If the tape device is in the Defined state, enter the following command from the VIOS command line, where *dev* is the name of your tape device:

   cfgdev -dev *dev*

3. Enter the following command from the VIOS command line, where *tape_device* is the name of the tape device that you want to back up to:

   backupios -tape *tape_device*

   This command creates a bootable tape that you can use to restore the VIOS.

4. If you plan to restore the VIOS to a different system from which it was backed up, you need to back up the user-defined virtual devices. For instructions, see "Backing up user-defined virtual devices by using the backupios command" on page 66.

Related information

IBM System p Advanced POWER Virtualization Best Practices Redpaper

Backing up the VIOS to one or more DVDs

You can back up the Virtual I/O Server (VIOS) base code, applied fix packs, custom device drivers to support disk subsystems, and some user-defined metadata to DVD.

To back up the VIOS to one or more DVDs, complete the following steps. Only DVD-RAM media can be used to back up the VIOS.

Note: Vendor disk drives might support burning to additional disk types, such as CD-RW and DVD-R. See the documentation for your drive to determine which disk types are supported.

1. Assign an optical drive to the VIOS virtual server.
2. Obtain the device name by entering the following command from the VIOS command line:

```
lsdev -type optical
```

If the device is in the `Defined` state, enter the following command from the VIOS command line:

```
cfgdev -dev dev
```

3. Run the backupios command with the **-cd** option from the VIOS command line. Specify the path to the device. For example:

```
backupios -cd /dev/cd0
```

Note: If the VIOS does not fit on one DVD, the backupios command provides instructions for disk replacement and removal until all the volumes have been created.
This command creates one or more bootable DVDs that you can use to restore the VIOS.

4. If you plan to restore the VIOS to a different host from which it was backed up, back up the user-defined virtual devices. For instructions, see "Backing up user-defined virtual devices by using the backupios command" on page 66.

Related information

IBM System p Advanced POWER Virtualization Best Practices Redpaper

Backing up the VIOS to a remote file system by creating a nim_resources.tar file

You can back up the Virtual I/O Server (VIOS) base code, applied fix packs, custom device drivers to support disk subsystems, and some user-defined metadata to a remote file system by creating a `nim_resources.tar` file.

Backing up the VIOS to a remote file system will create the nim_resources.tar image in the directory you specify. The `nim_resources.tar` file contains all the necessary resources to restore the VIOS, including the mksysb image, the `bosinst.data` file, the network boot image, and the Shared Product Object Tree (SPOT) resource.

The backupios command empties the target_disks_stanza section of the `bosinst.data` file and sets the following value:

```
RECOVER_DEVICES=Default
```

This setting allows the `mksysb` file generated by the command to be cloned to another virtual server. If you plan to use the nim_resources.tar image to install to a specific disk, repopulate the target_disk_stanza section of the `bosinst.data` file and replace this file in the nim_resources.tar image. All other parts of the nim_resources.tar image must remain unchanged.

Before you start, complete the following tasks:
• Ensure that the remote file system is available and mounted.
• Ensure that the VIOS has root write access to the server on which the backup will be created.

To back up the VIOS to a remote file system, complete the following steps:

1. Create a mount directory where the backup image, nim_resources.tar, will be written. For example, to create the directory /home/backup, enter the following command:

```
mkdir /home/backup
```

2. Mount an exported directory on the mount directory. For example, enter the following command from the VIOS command line:

```
mount server1:/export/ios_backup /home/backup
```

3. Run the backupios command with the **-file** option from the VIOS command line. Specify the path to the mounted directory. For example:

```
backupios -file /home/backup
```

This command creates a `nim_resources.tar` file that you can use to restore the VIOS from the IBM Systems Director Management Console (SDMC).

4. If you plan to restore the VIOS to a different host from which it was backed up, back up the user-defined virtual devices. For instructions, see "Backing up user-defined virtual devices by using the backupios command" on page 66.

Related information

IBM System p Advanced POWER Virtualization Best Practices Redpaper

Backing up the VIOS to a remote file system by creating a mksysb image

You can back up the Virtual I/O Server (VIOS) base code, applied fix packs, custom device drivers to support disk subsystems, and some user-defined metadata to a remote file system by creating a `mksysb` file.

Backing up the VIOS to a remote file system will create the mksysb image in the directory you specify. The mksysb image is an installable image of the root volume group in a file.

Before you start, complete the following tasks:
- If you plan to restore the VIOS from a Network Installation Management (NIM) server, verify that the NIM server is at the latest release of AIX. To find the latest updates, see the Fix Central website.
- Ensure that the remote file system is available and mounted.
- Ensure that the VIOS has root write access to the server on which the backup will be created.

To back up the VIOS to a remote file system, complete the following steps:

1. Create a mount directory where the backup image, mksysb image, will be written. For example, to create the directory /home/backup, enter:

   `mkdir /home/backup`

2. Mount an exported directory on the mount directory. For example, enter the following command from the VIOS command line:

   `mount server1:/export/ios_backup /home/backup`

   where *server1* is the NIM server from which you plan to restore the VIOS.

3. Run the backupios command with the **-file** option from the VIOS command line. Specify the path to the mounted directory. For example:

   `backupios -file /home/backup/filename.mksysb -mksysb`

   where *filename* is the name of mksysb image that this command creates in the specified directory. You can use the mksysb image to restore the VIOS from a NIM server.

4. If you plan to restore the VIOS to a different host from which it was backed up, back up the user-defined virtual devices. For instructions, see "Backing up user-defined virtual devices by using the backupios command" on page 66.

Related tasks

"Migrating the VIOS from the SDMC" on page 55
Find instructions for migrating the Virtual I/O Server (VIOS) to version 2.1.0.0, or later, from the IBM Systems Director Management Console (SDMC) by using the `smcli psm installios` command.

"Migrating the VIOS from DVD" on page 58
Find instructions for migrating the Virtual I/O Server (VIOS) from a DVD device that is attached to the VIOS virtual server.

Backing up user-defined virtual devices

You can back up user-defined virtual devices by saving the data to a location that is automatically backed up when you use the backupios command from the Virtual I/O Server (VIOS) command line to back up the VIOS. Alternatively, you can back up user-defined virtual devices by using the viosbr command from the VIOS command line.

User-defined virtual devices include metadata, such as virtual device mappings, that define the relationship between the physical environment and the virtual environment. You can back up user-defined virtual devices in one of the following ways:

- You can back up user-defined virtual devices by saving the data to a location that is automatically backed up when you use the backupios command to back up the VIOS. Use this option in situations where you plan to restore the VIOS to a new or different host. (For example, in the event of a system failure or disaster.)
- You can back up user-defined virtual devices by using the viosbr command. Use this option in situations where you plan to restore the configuration information to the same VIOS virtual server from which it was backed up.

Related tasks

"Restoring user-defined virtual devices" on page 75
You can restore user-defined virtual devices on the Virtual I/O Server (VIOS) by restoring volume groups and manually recreating virtual device mappings. Alternatively, you can restore user-defined virtual devices by using the viosbr command from the VIOS command line.

Backing up user-defined virtual devices by using the backupios command:

In addition to backing up the Virtual I/O Server (VIOS), you must back up user-defined virtual devices (such as virtual device mappings) in case you have a system failure or disaster. In this situation, back up user-defined virtual devices by saving the data to a location that is automatically backed up when you use the backupios command from the VIOS command line to back up the VIOS.

User-defined virtual devices include metadata, such as virtual device mappings, that define the relationship between the physical environment and the virtual environment. In situations where you plan to restore the VIOS to a new or different host, you need to back up both the VIOS and user-defined virtual devices (for example, in the event of a system failure or disaster).

Before you start, complete the following tasks:

- Back up the VIOS to tape, DVD, or a remote file system. For instructions, see one of the following procedures:
  - "Backing up the VIOS to tape" on page 63
  - "Backing up the VIOS to one or more DVDs" on page 63
  - "Backing up the VIOS to a remote file system by creating a nim_resources.tar file" on page 64
  - "Backing up the VIOS to a remote file system by creating a mksysb image" on page 65
- Decide whether you want to create a script of the following procedure. Creating scripts of these commands makes it easy to schedule automated backups of the information.

To back up user-defined virtual devices, complete the following steps:

1. List volume groups (and storage pools) to determine what user-defined disk structures you want to back up by running the following command from the VIOS command line:

   `lsvg`

2. Activate each volume group (and storage pool) that you want to back up by running the following command from the VIOS command line for each volume group:

   `activatevg volume_group`

   where *volume_group* is the name of the volume group (or storage pool) that you want to activate.

3. Back up each volume group (and storage pool) by running the following command from the VIOS command line for each volume group:

   `savevgstruct volume_group`

where *volume_group* is the name of the volume group (or storage pool) that you want to back up. This command writes a backup of the structure of a volume group (and therefore a storage pool) to the `/home/ios/vgbackups` directory.

4. Save the information about network settings, adapters, users, and security settings to the `/home/padmin` directory by running each command with the tee command as follows:

   `command | tee /home/padmin/filename`

   where:
   - *command* is the command that produces the information you want to save.
   - *filename* is the name of the file to which you want to save the information.

Table 7. VIOS commands that provide the information to save

Command	Information provided
`cfgnamesrv -ls`	Shows all system configuration database entries related to domain name server information that is used by local resolver routines.
`entstat -all devicename` where *devicename* is the name of a device for those attributes or statistics you want to save. Run this command for each device of those attributes or statistics you want to save.	Shows Ethernet driver and device statistics for the device specified.
`hostmap -ls`	Shows all entries in the system configuration database.
`ioslevel`	Shows the current maintenance level of the VIOS.
`lsdev -dev devicename -attr` where *devicename* is the name of a device for those attributes or statistics you want to save. Run this command for each device of those attributes or statistics you want to save.	Shows the attributes of the device specified.
`lsdev -type adapter`	Shows information about physical and logical adapters.
`lsuser`	Shows a list of all attributes of all the system users.
`netstat -routinfo`	Shows the routing tables, including the user-configured and current costs of each route.
`netstat -state`	Shows the state of all configured interfaces.
`optimizenet -list`	Shows characteristics of all network tuning parameters, including the current and reboot value, range, unit, type, and dependencies.
`viosecure -firewall view`	Shows a list of allowed ports.
`viosecure -view -nonint`	Shows all the security level settings for noninteractive mode.

Related tasks

"Backing up user-defined virtual devices by using the viosbr command"
You can back up user-defined virtual devices by using the viosbr command from the Virtual I/O Server (VIOS) command line. Use the viosbr command when you plan to restore the information to the same VIOS virtual server from which it was backed up.

"Scheduling backups of the VIOS and user-defined virtual devices by creating a script and **crontab** file entry" on page 69
You can schedule regular backups of the Virtual I/O Server (VIOS) and user-defined virtual devices to ensure that your backup copy accurately reflects the current configuration.

Related information

IBM System p Advanced POWER Virtualization Best Practices Redpaper

Backing up user-defined virtual devices by using the viosbr command:

You can back up user-defined virtual devices by using the viosbr command from the Virtual I/O Server (VIOS) command line. Use the viosbr command when you plan to restore the information to the same VIOS virtual server from which it was backed up.

You can use the viosbr command to back up all the relevant data to recover a VIOS after an installation. The viosbr command backs up all the device properties and the virtual devices configuration on the VIOS. You can include information about some or all of the following devices in the backup:

- Logical devices, such as storage pools, clusters (VIOS Version 2.2.0.11, Fix Pack 24, Service Pack 1, or later), file-backed storage pools, the virtual media repository, and paging space devices.
- Virtual devices, such as Etherchannel, shared Ethernet adapter, virtual server adapters, and virtual-server fiber channel adapters.
- Device attributes for devices like disks, optical devices, tape devices, fscsi controllers, Ethernet adapters, Ethernet interfaces, and logical Host Ethernet Adapters.

Before you start, run the ioslevel command to verify that the VIOS is at version 2.1.2.0, or later.

To back up all the device attributes and logical and virtual device mappings on the VIOS, run the following command from the VIOS command line:

```
viosbr -backup –file /tmp/myserverbackup
```

where */tmp/myserverbackup* is the file to which you want to back up the configuration information.

Related tasks

"Backing up user-defined virtual devices by using the backupios command" on page 66
In addition to backing up the Virtual I/O Server (VIOS), you must back up user-defined virtual devices (such as virtual device mappings) in case you have a system failure or disaster. In this situation, back up user-defined virtual devices by saving the data to a location that is automatically backed up when you use the backupios command from the VIOS command line to back up the VIOS.

"Restoring user-defined virtual devices by using the viosbr command" on page 76
You can restore user-defined virtual devices by using the viosbr command from the Virtual I/O Server (VIOS) command line. Use the viosbr command when you plan to restore the information to the same VIOS virtual server from which it was backed up.

"Scheduling backups of user-defined virtual devices by using the viosbr command" on page 70
You can schedule regular backups of the user-defined virtual devices on the Virtual I/O Server (VIOS) virtual server. Scheduling regular backups ensures that your backup copy accurately reflects the current configuration.

Related information

ioslevel command

viosbr command

Scheduling backups of the VIOS and user-defined virtual devices

You can schedule regular backups of the Virtual I/O Server (VIOS) and user-defined virtual devices to ensure that your backup copy accurately reflects the current configuration.

To ensure that your backup of the VIOS accurately reflects your current running VIOS, back up the VIOS and the user-defined virtual devices each time that the configuration changes. For example:

*   Changing the VIOS, like installing a fix pack.
*   Adding, deleting, or changing the external device configuration, like changing the SAN configuration.
*   Adding, deleting, or changing resource allocations and assignments for the VIOS, like memory, processors, or virtual and physical devices.
*   Adding, deleting, or changing user-defined virtual device configurations, like virtual device mappings.

You can schedule backups in one of the following ways:

*   You can schedule backups of the VIOS and user-defined virtual devices by creating a script that includes the backupios command. Then, create a crontab file entry that runs the script on a regular interval. Use this option in situations where you plan to restore the VIOS to a new or different host. (For example, use this option in the event of a system failure or disaster.)
*   You can schedule backups of the configuration information for the user-defined virtual devices by using the viosbr command from the VIOS command line. Use this option in situations where you plan to restore the configuration information to the same VIOS virtual server from which it was backed up.

Scheduling backups of the VIOS and user-defined virtual devices by creating a script and crontab file entry:

You can schedule regular backups of the Virtual I/O Server (VIOS) and user-defined virtual devices to ensure that your backup copy accurately reflects the current configuration.

To ensure that your backup of the VIOS accurately reflects your current running VIOS, back up the VIOS each time that its configuration changes. For example:

*   Changing the VIOS, like installing a fix pack.
*   Adding, deleting, or changing the external device configuration, like changing the SAN configuration.
*   Adding, deleting, or changing resource allocations and assignments for the VIOS, like memory, processors, or virtual and physical devices.
*   Adding, deleting, or changing user-defined virtual device configurations, like virtual device mappings.

Before you start, ensure that you are logged in to the VIOS as the prime administrator (padmin).

To back up the VIOS and user-defined virtual devices, complete the following steps:

1. Create a script for backing up the VIOS, and save it in a directory that is accessible to the padmin user ID. For example, create a script called **backup** and save it in the /home/padmin directory. Ensure that your script includes the following information:
   - The backupios command for backing up the VIOS.
   - Commands for saving information about user-defined virtual devices.
   - Commands to save the virtual devices information to a location that is automatically backed up when you use the backupios command to back up the VIOS.

2. Create a **crontab** file entry that runs the **backup** script on a regular interval. For example, to run **backup** every Saturday at 2:00 a.m., enter the following commands:
   a. `crontab -e`
   b. `0 2 * * 6 /home/padmin/backup`
   c. Save and exit.

Related tasks

"Backing up user-defined virtual devices by using the backupios command" on page 66
In addition to backing up the Virtual I/O Server (VIOS), you must back up user-defined virtual devices (such as virtual device mappings) in case you have a system failure or disaster. In this situation, back up user-defined virtual devices by saving the data to a location that is automatically backed up when you use the backupios command from the VIOS command line to back up the VIOS.

Related information

backupios command

crontab command

IBM System p Advanced POWER Virtualization Best Practices Redpaper

Scheduling backups of user-defined virtual devices by using the viosbr command:

You can schedule regular backups of the user-defined virtual devices on the Virtual I/O Server (VIOS) virtual server. Scheduling regular backups ensures that your backup copy accurately reflects the current configuration.

To ensure that your backup of the user-defined virtual devices accurately reflects your currently running VIOS, back up the configuration information of the user-defined virtual devices each time that the configuration changes.

Before you start, run the ioslevel command from the VIOS command line to verify that the VIOS is at version 2.1.2.0, or later.

To back up the configuration information of the user-defined virtual devices, run the viosbr command from the VIOS command line:

`viosbr -backup -file /tmp/myserverbackup -frequency how_often`

where:
- */tmp/myserverbackup* is the file to which you want to back up the configuration information.
- *how_often* is the frequency with which you want to back up the configuration information. You can specify one of the following values:
  - daily: Daily backups occur every day at 00:00.
  - weekly: Weekly backups occur every Sunday at 00:00.
  - monthly: Monthly backups occur on the first day of every month at 00:01.

Related tasks

"Backing up user-defined virtual devices by using the viosbr command" on page 68
You can back up user-defined virtual devices by using the viosbr command from the Virtual I/O Server
(VIOS) command line. Use the viosbr command when you plan to restore the information to the same
VIOS virtual server from which it was backed up.

Related information

ioslevel command

viosbr command

Backing up the VIOS using IBM Tivoli Storage Manager

You can use the IBM Tivoli Storage Manager to automatically back up the Virtual I/O Server (VIOS) on
regular intervals, or you can do incremental backups.

Backing up the VIOS using IBM Tivoli Storage Manager automated backup:

You can automate backups of the Virtual I/O Server (VIOS) using the crontab command and the IBM
Tivoli Storage Manager scheduler.

Before you start, complete the following tasks:
* Ensure that you configured the Tivoli Storage Manager client on the VIOS. For instructions, see
  Configuring the IBM Tivoli Storage Manager client.
* Ensure that you are logged into the Virtual I/O Server as the prime administrator (padmin).

To automate backups of the VIOS, complete the following steps:
1. Write a script that creates a mksysb image of the VIOS and save it in a directory that is accessible to
   the padmin user ID. For example, create a script called **backup** and save it in the `/home/padmin`
   directory. If you plan to restore the VIOS to a different host from which it was backed up, ensure that
   your script includes commands for saving information about user-defined virtual devices. For more
   information, see the following tasks:
   * For instructions about how to create a mksysb image, see "Backing up the VIOS to a remote file
     system by creating a mksysb image" on page 65.
   * For instructions about how to save user-defined virtual devices, see "Backing up user-defined
     virtual devices by using the backupios command" on page 66.
2. Create a crontab file entry that runs the **backup** script on a regular interval. For example, to create a
   mksysb image every Saturday at 2:00 a.m., enter the following commands:
   a. `crontab -e`
   b. `0 2 0 0 6 /home/padmin/backup`

   Save and exit.
3. Work with the Tivoli Storage Manager administrator to associate the Tivoli Storage Manager client
   node with one or more schedules that are part of the policy domain. This task is not performed on
   the Tivoli Storage Manager client on the VIOS. This task is performed by the Tivoli Storage Manager
   administrator on the Tivoli Storage Manager server.
4. Start the client scheduler and connect to the server schedule using the dsmc command as follows:
   `dsmc -schedule`
5. If you want the client scheduler to restart when the VIOS restarts, add the following entry to the
   /etc/inittab file:
   `itsm::once:/usr/bin/dsmc sched > /dev/null 2>&1 # TSM scheduler`

Related information

IBM Tivoli Storage Manager for UNIX and Linux Backup-Archive Clients Installation and User's Guide

Backing up the VIOS using IBM Tivoli Storage Manager incremental backup:

You can back up the Virtual I/O Server (VIOS) at any time by doing an incremental backup with the IBM Tivoli Storage Manager.

Use incremental backups in situations where the automated backup does not suit your needs. For example, before you upgrade the VIOS, do an incremental backup to ensure that you have a backup of the current configuration. Then, after you upgrade the VIOS, perform another incremental backup to ensure that you have a backup of the upgraded configuration.

Before you start, complete the following tasks:
- Ensure that you configured the Tivoli Storage Manager client on the VIOS. For instructions, see Configuring the IBM Tivoli Storage Manager client.
- Ensure that you have a mksysb image of the VIOS. If you plan to restore the VIOS to a different host from which it was backed up, ensure that the mksysb includes information about user-defined virtual devices. For more information, see the following tasks:
  - For instructions about how to create a mksysb image, see "Backing up the VIOS to a remote file system by creating a mksysb image" on page 65.
  - For instructions about how to save user-defined virtual devices, see "Backing up user-defined virtual devices by using the backupios command" on page 66.

To do an incremental backup of the VIOS, run the dsmc command. For example,

```
dsmc -incremental sourcefilespec
```

Where *sourcefilespec* is the directory path to where the mksysb file is located. For example, /home/padmin/mksysb_image.

Related information

IBM Tivoli Storage Manager for UNIX and Linux Backup-Archive Clients Installation and User's Guide

Restoring the VIOS

You can restore the Virtual I/O Server (VIOS) and user-defined virtual devices using the smcli psm installios command, the viosbr command, or IBM Tivoli Storage Manager.

The VIOS contains the following types of information that you need to restore the VIOS and user-defined virtual devices.
- The VIOS includes the base code, applied fix packs, custom device drivers to support disk subsystems, and some user-defined metadata. All this information is restored when you use the smcli psm installios command.
- User-defined virtual devices include metadata, such as virtual devices mappings, that define the relationship between the physical environment and the virtual environment. You can restore user-defined virtual devices in one of the following ways:
  - You can restore user-defined virtual devices by using the viosbr command from the VIOS command line. Use this option in situations where you plan to restore the configuration information to the same VIOS virtual server from which it was backed up.
  - You can restore user-defined virtual devices by restoring the volume groups and manually recreating virtual device mappings. Use this option in situations where you plan to restore the VIOS to a new or different host (for example, in the event of a system failure or disaster). Furthermore, in these situations, you also need to restore the following components of your environment. Back up these components to fully recover your VIOS configuration:
    - External device configurations, such as storage area network (SAN) devices.
    - Resources defined on the IBM Systems Director Management Console (SDMC), such as processor and memory allocations. In other words, restore your SDMC virtual server data for the VIOS and its client virtual servers.
    - The operating systems and applications running in the client virtual servers.

You can back up and restore the VIOS as follows.

Table 8. Backup and restoration methods for the VIOS

Backup method	Media	Restoration method
To tape	Tape	From tape
To DVD	DVD-RAM	From DVD
To remote file system	nim_resources.tar image	From an SDMC using the Network Installation Management (NIM) in a Linux environment and the smcli psm installios command
To remote file system	mksysb image	From an AIX 5L NIM server and a standard mksysb system installation
Tivoli Storage Manager	mksysb image	Tivoli Storage Manager

Related tasks

"Backing up the VIOS" on page 62

You can back up the Virtual I/O Server (VIOS) and user-defined virtual devices using the backupios command or the viosbr command from the VIOS command line. You can also use IBM Tivoli Storage Manager to schedule backups and to store backups on another server.

Related information

installios command

viosbr command

Restoring the VIOS from tape

You can restore the Virtual I/O Server (VIOS) base code, applied fix packs, custom device drivers to support disk subsystems, and some user-defined metadata from tape.

To restore the VIOS from tape, complete the following steps:

1. Specify the VIOS virtual server to boot from the tape by using the bootlist command. Alternatively, you can change the bootlist in the System Management Services (SMS).
2. Insert the tape into the tape drive.
3. From the SMS menu, select to install from the tape drive.
4. Follow the installation steps according to the system prompts.
5. If you restored the VIOS to a different host from which it was backed up, restore the user-defined virtual devices. For instructions, see "Restoring user-defined virtual devices manually" on page 75.

Related information

IBM System p Advanced POWER Virtualization Best Practices Redpaper

Restoring the VIOS from one or more DVDs

You can restore the Virtual I/O Server (VIOS) base code, applied fix packs, custom device drivers to support disk subsystems, and some user-defined metadata from one or more DVDs.

To restore the VIOS from one or more DVDs, complete the following steps:

1. Specify the VIOS virtual server to boot from the DVD by using the bootlist command from the VIOS command line. Alternatively, you can change the bootlist in the System Management Services (SMS).
2. Insert the DVD into the optical drive.
3. From the SMS menu, select to install from the optical drive.
4. Follow the installation steps according to the system prompts.
5. If you restored the VIOS to a different host from which it was backed up, restore the user-defined virtual devices. For instructions, see "Restoring user-defined virtual devices manually" on page 75.

Restoring the VIOS from the SDMC using a nim_resources.tar file

You can restore the Virtual I/O Server (VIOS) base code, applied fix packs, custom device drivers to support disk subsystems, and some user-defined metadata from a nim_resources.tar image stored in a remote file system.

To restore the VIOS from a nim_resources.tar image in a file system, complete the following steps:

1. Run the smcli psm installios command from the IBM Systems Director Management Console (SDMC) command line. This action restores a backup image, nim_resources.tar, that was created by using the backupios command.

2. Follow the installation procedures according to the system prompts. The source of the installation images is the exported directory from the backup procedure. For example, `server1:/export/ios_backup`.

3. When the restoration is finished, open a virtual terminal connection (for example, using Telnet) to the VIOS that you restored. Some additional user input might be required.

4. If you restored the VIOS to a different host from which it was backed up, you must restore the user-defined virtual devices. For instructions, see "Restoring user-defined virtual devices manually" on page 75.

Restoring the VIOS from a NIM server using a mksysb file

You can restore the Virtual I/O Server (VIOS) base code, applied fix packs, custom device drivers to support disk subsystems, and some user-defined metadata from a mksysb image stored in a remote file system.

Before you start, complete the following tasks:

- Ensure that the server to which you plan to restore the VIOS is defined as a Network Installation Management (NIM) resource.
- Ensure that the `mksysb` file (that contains the backup of the VIOS) is on the NIM server.

To restore the VIOS from a mksysb image in a file system, complete the following steps:

1. Define the `mksysb` file as a NIM resource, specifically, a NIM object, by running the nim command. To view a detailed description of the nim command, see nim Command. For example:

   ```
   nim -o define -t mksysb -a server=servername -alocation=/export/ios_backup/
   filename.mksysb objectname
   ```

   where:
   - *servername* is the name of the server that holds the NIM resource.
   - *filename* is the name of the `mksysb` file.
   - *objectname* is the name by which NIM registers and recognizes the `mksysb` file.

2. Define a Shared Product Object Tree (SPOT) resource for the `mksysb` file by running the nim command. For example:

   ```
   nim -o define -t spot -a server=servername -a location=/export/ios_backup/
   SPOT -a source=objectname SPOTname
   ```

   where:
   - *servername* is the name of the server that holds the NIM resource.
   - *objectname* is the name by which NIM registers and recognizes the `mksysb` file.
   - *SPOTname* is the NIM object name for the mksysb image that was created in the previous step.

3. Install the VIOS from the `mksysb` file by using the smit command. For example:

   `smit nim_bosinst`

4. Ensure that the following entry fields contain the following specifications.

Table 9. Specifications for the SMIT command

Field	Specification
Installation TYPE	mksysb
SPOT	*SPOTname* from step 2 on page 74
MKSYSB	*objectname* from step 2 on page 74
Remain NIM client after install?	No

5. Start the VIOS virtual server. For instructions, see step 3, boot the VIOS, of Installing the VIOS using NIM.

6. If you restored the VIOS to a different host from which it was backed up, you must restore the user-defined virtual devices. For instructions, see "Restoring user-defined virtual devices manually."

Related information

Defining a SPOT resource

IBM System p Advanced POWER Virtualization Best Practices Redpaper

Installing a client using NIM

Using the NIM define operation

Restoring user-defined virtual devices

You can restore user-defined virtual devices on the Virtual I/O Server (VIOS) by restoring volume groups and manually recreating virtual device mappings. Alternatively, you can restore user-defined virtual devices by using the viosbr command from the VIOS command line.

User-defined virtual devices include metadata, such as virtual device mappings, that define the relationship between the physical environment and the virtual environment. You can restore user-defined virtual devices in one of the following ways:

- You can restore user-defined virtual devices by restoring volume groups and manually recreating virtual device mappings. Use this option in situations where you plan to restore the VIOS to a new or different host. (For example, use this option in the event of a system failure or disaster.)

- You can restore user-defined virtual devices by using the viosbr command from the VIOS command line. Use this option in situations where you plan to restore the configuration information to the same VIOS virtual server from which it was backed up.

Related tasks

"Backing up user-defined virtual devices" on page 65
You can back up user-defined virtual devices by saving the data to a location that is automatically backed up when you use the backupios command from the Virtual I/O Server (VIOS) command line to back up the VIOS. Alternatively, you can back up user-defined virtual devices by using the viosbr command from the VIOS command line.

Restoring user-defined virtual devices manually:

In addition to restoring the Virtual I/O Server (VIOS), you might need to restore user-defined virtual devices (such as virtual device mappings). For example, in the event of a system failure, system migration, or disaster, you need to restore both the VIOS and user-defined virtual devices. In this situation, restore the volume groups by using the restorevgstruct command from the VIOS command line and manually re-create the virtual device mappings by using the mkvdev command from the VIOS command line.

User-defined virtual devices include metadata, such as virtual device mappings, that define the relationship between the physical environment and the virtual environment. In situations where you plan to restore the VIOS to a new or different host, you need to back up both the VIOS and user-defined virtual devices. (For example, in the event of a system failure or disaster, you must restore both the VIOS and user-defined virtual devices.)

Before you start, restore the VIOS from tape, DVD, or a remote file system. For instructions, see one of the following procedures:
- "Restoring the VIOS from tape" on page 73
- "Restoring the VIOS from one or more DVDs" on page 73
- "Restoring the VIOS from the SDMC using a nim_resources.tar file" on page 74
- "Restoring the VIOS from a NIM server using a mksysb file" on page 74

To restore user-defined virtual devices, complete the following steps:
1. List all the backed-up volume groups (or storage pools) by running the following command from the VIOS command line:

   `restorevgstruct -ls`

   This command lists the files located in the `/home/ios/vgbackups` directory.
2. Run the lspv command from the VIOS command line to determine which disks are empty.
3. Restore the volume groups (or storage pools) to the empty disks by running the following command for each volume group (or storage pool) from the VIOS command line:

   `restorevgstruct -vg volumegroup hdiskx`

   where:
   - *volumegroup* is the name of a volume group (or storage pool) from step 1.
   - *hdiskx* is the name of an empty disk from step 2.
4. Re-create the mappings between the virtual devices and physical devices by using the mkvdev command. Re-create mappings for storage device mappings, shared Ethernet and Ethernet adapter mappings, and virtual LAN settings. You can find mapping information in the file that you specified in the tee command from the backup procedure. For example, `/home/padmin/filename`.

Related information

IBM System p Advanced POWER Virtualization Best Practices Redpaper

mkvdev command

restorevgstruct command

tee command

Restoring user-defined virtual devices by using the viosbr command:

You can restore user-defined virtual devices by using the viosbr command from the Virtual I/O Server (VIOS) command line. Use the viosbr command when you plan to restore the information to the same VIOS virtual server from which it was backed up.

The viosbr command restores the VIOS virtual server to the same state in which it was when the backup was taken. With the information available from the backup, the command performs the following actions:
- Sets the attribute values for physical devices, such as controllers, adapters, disks, optical devices, tape devices, and Ethernet interfaces.
- Imports logical devices, such as volume groups or storage pools, clusters (VIOS Version 2.2.0.11, Fix Pack 24, Service Pack 1, or later), logical volumes, file systems, and repositories.
- Creates virtual devices and their corresponding mappings for devices like Etherchannel, shared Ethernet adapter, virtual target devices, virtual fiber channel adapters, and paging space devices.

Before you start, complete the following tasks:

- Run the ioslevel command from the VIOS command line to verify that the VIOS is at version 2.1.2.0, or later.
- Determine the backup file that you want to restore. The backup file must be a file that was created by using the viosbr -backup command.
- Verify that the VIOS virtual server to which you plan to restore the information is the same VIOS virtual server from which it was backed up.

To restore all the possible devices and display a summary of deployed and nondeployed devices, run the following command:

```
viosbr -restore  —file /home/padmin/cfgbackups/myserverbackup.002.tar.gz
```

where */home/padmin/cfgbackups/myserverbackup.002.tar.gz* is the backup file that contains the information that you want to restore. The system displays information similar to the following output:

```
Backed up Devices that are unable to restore/change
===================================================
<Names of nondeployed devices>
DEPLOYED or CHANGED devices:
===========================
Dev name during BACKUP              Dev name after RESTORE
----------------------------        ------------------------------
<Names of deployed devices>
```

Related tasks

"Backing up user-defined virtual devices by using the viosbr command" on page 68
You can back up user-defined virtual devices by using the viosbr command from the Virtual I/O Server (VIOS) command line. Use the viosbr command when you plan to restore the information to the same VIOS virtual server from which it was backed up.

Related information

ioslevel command

viosbr command

Restoring the VIOS using IBM Tivoli Storage Manager

You can use the IBM Tivoli Storage Manager to restore the mksysb image of the Virtual I/O Server (VIOS).

You can restore the VIOS to the host from which it was backed up, or to a new or different host (for example, in the event of a system failure or disaster). The following procedure applies to restoring the VIOS to the host from which it was backed up. First, you restore the mksysb image to the VIOS using the dsmc command on the Tivoli Storage Manager client. But restoring the mksysb image does not restore the VIOS. You then transfer the mksysb image to another host and convert the mksysb image to an installable format.

To restore the VIOS to a new or different host, use one of the following procedures:

- "Restoring the VIOS from tape" on page 73
- "Restoring the VIOS from one or more DVDs" on page 73
- "Restoring the VIOS from the SDMC using a nim_resources.tar file" on page 74
- "Restoring the VIOS from a NIM server using a mksysb file" on page 74

Before you start, complete the following tasks:

- Ensure that the host to which you plan to transfer the mksysb image is running AIX.
- Ensure that the host running AIX has a DVD-RW or CD-RW drive.
- Ensure that AIX has the cdrecord and mkisofs RPMs downloaded and installed. To download and install the RPMs, see the AIX Toolbox for Linux Applications website.

Restriction: Interactive mode is not supported on the VIOS. You can view session information by typing dsmc on the VIOS command line.

To restore the VIOS by using Tivoli Storage Manager, complete the following steps:

1. Determine which file you want to restore by running the dsmc command to display the files that have been backed up to the Tivoli Storage Manager server:

   dsmc -query

2. Restore the mksysb image by using the dsmc command. For example:

   dsmc -restore *sourcefilespec*

   where *sourcefilespec* is the directory path to the location where you want to restore the mksysb image. For example, /home/padmin/mksysb_image.

3. Transfer the mksysb image to a server that has a DVD-RW or CD-RW drive by running the following File Transfer Protocol (FTP) commands:

   a. Run the following command from the VIOS command line to make sure that the FTP server is started on the VIOS: startnetsvc ftp

   b. Run the following command from the VIOS command line to make sure that the FTP server is started on the VIOS: startnetsvc ftp

   c. Open an FTP session to the server that has the DVD-RW or CD-RW drive: ftp *server_hostname*, where *server_hostname* is the host name of the server with the DVD-RW or CD-RW drive.

   d. At the FTP prompt, change to the installation directory to the directory where you want to save the mksysb image.

   e. Set the transfer mode to binary: binary

   f. Turn off interactive prompting if it is on: prompt

   g. Transfer the mksysb image to the server: mput mksysb_image

   h. Close the FTP session, after transferring the mksysb image, by typing quit.

4. Write the mksysb image to CD or DVD by using the mkcd or mkdvd commands.

5. Reinstall the VIOS by using the CD or DVD that you just created. For instructions, see "Restoring the VIOS from one or more DVDs" on page 73.

Recovering when disks cannot be located

Learn how to recover from disks not displaying when trying to boot or install a client virtual server.

Occasionally, the disk that is needed to install the client virtual server cannot be located. In this situation, if the client is already installed, start the client virtual server. Ensure that you have the latest levels of the software and firmware. Then, ensure that the **Slot number** of the virtual SCSI server adapter matches the **Remote partition virtual slot number** of the virtual SCSI client adapter.

1. Ensure that you have the latest levels of the firmware and Virtual I/O Server (VIOS). Follow these steps:

   a. Ensure that you have the latest firmware.

   b. To check whether you have the latest level of the VIOS, see "Updating the VIOS" on page 62.

2. Ensure the server virtual SCSI adapter slot number is mapped correctly to the client virtual server remote slot number:

   a. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.

   b. Expand Hosts, and click the host on which the VIOS virtual server is located.

   c. Select the VIOS virtual server.

   d. Click **Actions**, and select **System Configuration → Manage Virtual Server**.

   e. Click the **Storage Adapters** tab.

f. If the values of the **Connecting virtual server** and **Connecting virtual adapter ID** for the virtual SCSI adapter are **Any Partition** and **Any Partition Slot**, complete the following steps:

- Select the virtual SCSI adapter, click **Remove**, and then click **Apply**.
- Click **Add** to create a new virtual SCSI adapter with the same slot number, the appropriate client virtual server ID for the connecting virtual server, and the remote slot number for the connecting virtual adapter ID.
- Click **Apply**.

g. Repeat steps a through f for the client virtual server.

3. Ensure that the server virtual SCSI adapter slot number is mapped correctly to the client virtual server remote slot number:

a. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.

b. Expand Hosts, and click the host on which the VIOS virtual server is located.

c. Select the VIOS virtual server.

d. Click **Actions**, and select **System Configuration → Manage Virtual Server**.

e. Click the **Storage Adapters** tab.

f. Note the **Remote partition** and **Remote partition virtual slot number** values. These values should be the same as the VIOS virtual server ID and the VIOS virtual SCSI adapter slot number recorded in step 2. If the values are different, complete the following steps:

- Select the virtual SCSI adapter, click **Remove**, and then click **Apply**.
- Click **Add** to create a new virtual SCSI adapter with the same slot number, the appropriate VIOS virtual server ID for the connecting virtual server, and the remote slot number for the connecting VIOS virtual adapter ID.
- Click **Apply**.

g. Repeat items a through f in this step for the client virtual server.

4. The **Adapter** value on the client virtual server must match the **Remote Adapter** on the VIOS virtual server, and the **Adapter** value on the VIOS virtual server must match the **Remote Adapter** on the client virtual server. If these numbers do not match, from the IBM Systems Director Management Console (SDMC), change the profile properties to reflect the correct mapping.

5. From the VIOS command line, enter `cfgdev`.

6. Shut down and reactivate the client virtual server.

7. From the VIOS command line, enter `lsmap -all`. You see results similar to the following:

```
SVSA            Physloc                                 Client Virtual Server ID
--------------- --------------------------------------- ------------------
vhost0          U9113.550.10BE8DD-V1-C3                 0x00000002

VTD              vhdisk0
LUN              0x8100000000000000
Backing device   hdisk5
Physloc          U787B.001.DNW025F-P1-C5-T1-W5005076300C10899-L536F000000000000
```

In this example, the client virtual server ID is 2 (0x00000002).

Note: If the client virtual server is not yet installed, the client virtual server ID is 0x00000000. The slot number of the server SCSI adapter is displayed in the Physloc column. The digits following the `-C` specify the slot number. In this case, the slot number is 3.

8. From the VIOS command line, enter `lsdev -virtual`. You see results similar to the following:

```
name            status      description

vhost0          Available   Virtual SCSI Server Adapter

vhdisk0         Available   Virtual Target Device - Disk
```

Live Virtual Server Mobility

Live Virtual Server Mobility, a component of the PowerVM Enterprise Edition hardware feature, provides the ability to move AIX and Linux virtual servers from one host to another. The mobility process transfers the system environment including the processor state, memory, attached virtual devices, and connected users.

Active virtual server mobility allows you to move AIX and Linux virtual servers that are running, including the operating system and applications, from one host to another. The virtual server and the applications running on that migrated virtual server do not need to be shut down.

Inactive virtual server mobility allows you to move a powered off AIX and Linux virtual server from one host to another.

Because the IBM Systems Director Management Console (SDMC) always moves the last activated profile, an inactive virtual server that has never been activated cannot be moved. For inactive virtual server mobility, you can either select the virtual server state defined in the hypervisor, or select the configuration data defined in the last activated profile on the source host.

Related concepts

"Moving the virtual server" on page 111
You can move an active, inactive, or suspended virtual server from one host to another host by using the Virtual Server Migration wizard on the IBM Systems Director Management Console (SDMC).

Related tasks

"Preparing for virtual server mobility"
To successfully move the virtual server from the source host to the destination host, verify that the source and destination hosts are configured correctly. In addition, verify the configuration of the source and destination hosts, the IBM Systems Director Management Console (SDMC), the Virtual I/O Server (VIOS) virtual servers, the virtual servers, the virtual storage configuration, and the virtual network configuration.

Preparing for virtual server mobility

To successfully move the virtual server from the source host to the destination host, verify that the source and destination hosts are configured correctly. In addition, verify the configuration of the source and destination hosts, the IBM Systems Director Management Console (SDMC), the Virtual I/O Server (VIOS) virtual servers, the virtual servers, the virtual storage configuration, and the virtual network configuration.

Related concepts

"Live Virtual Server Mobility"
Live Virtual Server Mobility, a component of the PowerVM Enterprise Edition hardware feature, provides the ability to move AIX and Linux virtual servers from one host to another. The mobility process transfers the system environment including the processor state, memory, attached virtual devices, and connected users.

Preparing the source and destination hosts for virtual server mobility

To successfully move the virtual server from the source host to the destination host by using the IBM Systems Director Management Console (SDMC), verify that the source and destination hosts are configured correctly. In addition, verify the logical memory block size of the source and destination hosts, and the available memory and processor resources of the destination host.

To prepare the source and destination hosts for active or inactive virtual server mobility, complete the following tasks.

Table 10. Preparation tasks for the source and destination hosts

Host planning tasks	Active mobility task	Inactive mobility task	Information resources
1. Ensure that the PowerVM Enterprise Edition hardware feature is activated.	X	X	"Entering the activation code for PowerVM Editions using the SDMC" on page 48
2. If you do not have the PowerVM Enterprise Edition hardware feature, you can evaluate Live Virtual Server Mobility at no cost by using Trial Live Virtual Server Mobility. Ensure that you enter the activation code for Trial Live Virtual Server Mobility.	X	X	"Entering the activation code for PowerVM Editions using the SDMC" on page 48
3. Ensure that the source and destination hosts are one of the following POWER7 models: • 8202-E4B • 8205-E6B • 8231-E2B • 8233-E8B • 8236-E8C • 9117-MMB • 9119-FHB • IBM BladeCenter® PS700 • IBM BladeCenter PS701 • IBM BladeCenter PS702 • IBM BladeCenter PS703 • IBM BladeCenter PS704 **Notes:** • The source and destination hosts can also be POWER6® processor-based servers. See Processor compatibility mode definitions for processor compatibility mode information. • Ensure that the destination host has the necessary software licenses and support maintenance contracts. To verify the entitlements that are active on your hosts, see the Entitled Software Support website.	X	X	
4. Ensure that the firmware levels on the source and destination hosts are compatible.	X	X	"Virtual-server mobility firmware support" on page 82
5. Ensure that the source and destination hosts are managed in one of the following ways: • The source and destination hosts are managed by the same SDMC (or redundant SDMC pair). • The source host is managed by an SDMC and the destination host is managed by a Hardware Management Console (HMC). • The source host is managed by an HMC and the destination host is managed by an SDMC. • The source host is managed by one SDMC and the destination host is managed by a different SDMC.	X	X	
6. Ensure that the logical memory block size is the same on the source and destination hosts.	X	X	Changing the logical memory block size

Table 10. Preparation tasks for the source and destination hosts (continued)

Host planning tasks	Active mobility task	Inactive mobility task	Information resources
7. Ensure that the destination host is not running on battery power. If the destination host is running on battery power, return the host to its regular power source before moving a virtual server.	X	X	
8. If the virtual server uses shared memory, ensure that the shared memory pool is created on the destination host.	X	X	"Configuring the shared memory pool" on page 13
9. Ensure that the destination host has enough available memory to support the virtual server.	X		• If the virtual server uses dedicated memory, see "Determining the available physical memory on the destination host" on page 83. • If the virtual server uses shared memory, see "Determining the available I/O-entitled memory on the destination host" on page 84.
10. Ensure that the destination host has enough available processors to support the virtual server.	X		"Determining available processors on the destination host" on page 86
11. Verify that the mover-service virtual servers on the source and destination hosts can communicate with each other.	X		
12. Optional: Define the virtual-server profile policy for inactive virtual server mobility.		X	"Defining the virtual-server profile policy for inactive virtual server mobility" on page 85
13. If the virtual server on the source host uses Active Memory Expansion, verify that the destination host is capable of Active Memory Expansion.	X	X	"Verifying the destination host for Active Memory Expansion" on page 85
14. If the virtual server on the source host is capable of suspension, verify that the destination host also supports suspend-capable virtual servers. Also verify that there is a minimum of one reserved storage device with a size of at least 110% of the maximum virtual server memory.	X	X	• To verify that the destination host supports suspend-capable virtual servers, see "Verifying that the destination host supports suspension-capable virtual servers" on page 85. • To verify that there is a minimum of one reserved storage device with a size of at least 110% of the maximum virtual server memory, see "Determining the reserved storage device size in the destination host" on page 86.

Virtual-server mobility firmware support:

Ensure that the firmware levels on the source and destination hosts are compatible before upgrading.

In the following table, the values in the left column represent the firmware level you are migrating from, and the values in the top row represent the firmware level you are migrating to. For each combination,

blocked entries are blocked by code from migrating; *not supported* entries are not blocked from migrating, but are not supported by IBM; *mobile* entries are eligible for migration.

Table 11. Firmware levels of migration

Firmware level migrating from	To 320_xxx	To 330_034 +	To 340_039 +	To 350_xxx +	To 710_xxx	To 720_xxx	To 730_xxx
320_xxx	Not supported	Not supported	Not supported	Not supported	Blocked	Blocked	Blocked
330_034 +	Not supported	Mobile	Mobile	Mobile	Mobile	Blocked	Blocked
340_039 +	Not supported	Mobile	Mobile	Mobile	Mobile	Mobile	Blocked
350_xxx +	Not supported	Mobile	Mobile	Mobile	Mobile	Mobile	Mobile
710_xxx	Blocked	Mobile	Mobile	Mobile	Mobile	Mobile	Mobile
720_xxx	Blocked	Blocked	Mobile	Mobile	Mobile	Mobile	Mobile
730_xxx	Blocked	Blocked	Blocked	Mobile	Mobile	Mobile	Mobile

Determining the available physical memory on the destination host:

You can determine whether the destination host has enough physical memory available to support the virtual server. If required, you can make more physical memory available by using the IBM Systems Director Management Console (SDMC).

You must be a super administrator to do this task.

To determine whether the destination host has enough physical memory available to support the virtual server, complete the following steps by using the SDMC:

1. Identify the amount of physical memory that the virtual server requires:
   a. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
   b. Expand **Hosts**, and click the source host on which the virtual server is located.
   c. Select the virtual server.
   d. Click **Actions**, and select **System Configuration** → **Manage Virtual Server**.
   e. In the Manage Virtual Server window, click the **Memory** tab.
   f. Record the dedicated minimum, assigned, and maximum memory settings.
2. Identify the amount of physical memory that is available on the destination host:
   a. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
   b. Expand **Hosts**, and select the destination host to which you plan to move the virtual server.
   c. Click **Actions**, and select **System Configuration** → **Edit Host**.
   d. In the Edit Host window, click the **Memory** tab.
   e. Record the value in the **Available** field.
   f. Click **OK**.
3. Compare the values from steps 1 and 2. If the destination host does not have enough physical memory available to support the virtual server, you can add more available physical memory to the destination host. If the destination host is configured with a shared memory pool, remove physical memory from the shared memory pool to add more available physical memory to the destination host. For instructions, see "Changing the size of the shared memory pool" on page 19.

Determining the available I/O-entitled memory on the destination host:

You can determine whether the shared memory pool on the destination host has enough available memory to accommodate the I/O entitled memory required by the virtual server. You can then allocate more physical memory to the shared memory pool, if necessary, by using the IBM Systems Director Management Console (SDMC).

You must be a super administrator to do this task.

To determine whether the shared memory pool on the destination host has enough available memory to accommodate the I/O entitled memory required by the virtual server, complete the following steps by using the SDMC:

1. Identify the amount of I/O entitled memory that the virtual server requires:
   a. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
   b. Expand **Hosts**, and click the source host on which the virtual server is located.
   c. Select the virtual server.
   d. Click **Actions**, and select **System Configuration** → **Manage Virtual Server**.
   e. In the Manage Virtual Server window, click the **Memory** tab.
   f. Record the value in the **Assigned I/O Entitled Memory** field. This is the amount of I/O entitled memory that the virtual server requires on the destination host.
2. Identify the amount of available physical memory in the shared memory pool on the destination host:
   a. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
   b. Expand **Hosts**, and select the destination host to which you plan to move the virtual server.
   c. Click **Actions**, and select **System Configuration** → **Virtual Resources** → **Shared Memory Pool Management**.
   d. In the Shared Memory Pool Management window, record the value in the **Available System Memory** field.
3. Compare the amount of available memory from step 2 with the amount of I/O entitled memory required by the virtual server from step 1.
   - If more memory is available than the amount of I/O entitled memory required by the virtual server, the shared memory pool on the destination host has enough available memory to support the virtual server on the destination host.
   - If the amount of I/O entitled memory required by the virtual server is greater than the amount of available memory, do one or more of the following tasks:
     – Add memory to the shared memory pool so that the shared memory pool has enough available memory to accommodate the I/O entitled memory required by the virtual server. For instructions, see "Changing the size of the shared memory pool" on page 19
     – Remove one or more shared-memory virtual servers from the shared memory pool until the shared memory pool has enough available memory to accommodate the I/O entitled memory required by the virtual server. You can remove a virtual server from the shared memory pool by changing the memory mode of the virtual server from shared to dedicated. For instructions, see "Changing the memory mode of a virtual server" on page 46
   - If the amount of I/O entitled memory that is required by the virtual server is equal to, or almost equal to, the amount of available memory, the shared memory pool is probably greatly overcommitted, which can affect performance. Consider adding more memory to the shared memory pool to reduce the degree to which the shared memory pool is overcommitted.

Attention: If you move an active virtual server whose I/O entitled memory mode is set to automatic, the SDMC does not automatically recalculate and reassign the I/O entitled memory for the virtual server until you restart the virtual server on the destination host. If you restart the virtual server on the destination host and you plan to move the virtual server back to the source host, verify that the shared memory pool on the source host has enough available memory to accommodate the new amount of I/O entitled memory required by the virtual server.

Defining the virtual-server profile policy for inactive virtual server mobility:

You can select the virtual server profile policy for inactive virtual server mobility in the IBM Systems Director Management Console (SDMC). You can either select the virtual server state defined in the hypervisor, or select the configuration data defined in the last activated profile on the source host. By default, the virtual server state defined in the hypervisor is selected.

To define a policy for inactive virtual server mobility, complete the following steps by using the SDMC:
1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts**, and select the source host.
3. Click **Actions**, and select **System Configuration** → **Edit Host**.
4. In the Edit Host window, click the **Migration** tab.
   - To use the virtual server state that is defined in the hypervisor for memory and processor-related settings, select **Virtual Server Configuration** from the **Inactive profile migration policy** list. However, if you are unable to start the virtual server, the data defined in the last activated profile on the source host is used, even though you select the **Virtual Server Configuration** option.
   - To use the data defined in the last activated profile on the source-managed system for memory and processor-related settings, select **Last Activated Profile** from the **Inactive profile migration policy** list.
5. Click **OK**.

Verifying the destination host for Active Memory Expansion:

To move an AIX virtual server that uses Active Memory Expansion, verify that the destination host is capable of Active Memory Expansion by using the IBM Systems Director Management Console (SDMC).

To verify that the destination host is capable of Active Memory Expansion, complete the following steps by using the SDMC:
1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts**, and select the destination host.
3. Click **Actions**, and select **System Configuration** → **Edit Host**.
4. In the Edit Host window, click the **Capabilities** tab.
   - If Active Memory Expansion Capable is **True**, the destination host is capable of Active Memory Expansion.
   - If Active Memory Expansion Capable is **False**, the destination host is not capable of Active Memory Expansion, and you cannot move the virtual server to the destination host. To move the virtual server, change the virtual server configuration so that it does not use Active Memory Expansion.
5. Click **OK**.

Verifying that the destination host supports suspension-capable virtual servers:

To move an AIX or Linux virtual server that is capable of suspension, verify that the destination host supports suspension-capable virtual servers by using the IBM Systems Director Management Console (SDMC).

With SDMC, you can suspend an AIX or Linux virtual server with its operating system and applications, and store its virtual server state to persistent storage. At a later stage, you can resume the operation of the virtual server. To verify that the destination host supports suspension-capable virtual servers, complete the following steps by using the SDMC:

1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts**, and select the destination host.
3. Click **Actions**, and select **System Configuration** → **Edit Host**.
4. In the Edit Host window, click the **Capabilities** tab.
   - If Virtual Server Suspend Capable is **True**, the destination host supports suspension-capable virtual servers.
   - If Virtual Server Suspend Capable is **False**, the destination host does not support suspension-capable virtual servers, and you cannot move the virtual server to the destination host. To move the virtual server, change the virtual server configuration so that it is not capable of suspension.
5. Click **OK**.

Determining available processors on the destination host:

You can determine the available processors on the destination host and allocate more processors, if necessary, by using the IBM Systems Director Management Console (SDMC).

You must be a super administrator to do this task.

To determine the available processors on the destination host, complete the following steps by using the SDMC:

1. Determine how many processors the virtual server requires:
   a. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
   b. Expand **Hosts**, and click the managed host of your choice.
   c. Select the virtual server of your choice.
   d. Click **Actions**, and select **System Configuration** → **Manage Virtual Server**.
   e. In the Manage Virtual Server window, click the **Processor** tab.
   f. Record the assigned processor settings.
2. Determine the processors available on the destination host:
   a. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
   b. Expand **Hosts**, and select the managed host of your choice.
   c. Click **Actions**, and select **System Configuration** → **Edit Host**.
   d. In the Edit Host window, click the **Processors** tab.
   e. Record the value in the **Available** field.
   f. Click **OK**.
3. Compare the values from steps 1 and 2:
   - If the destination host has enough available processors to support the virtual server, continue to "Preparing the source and destination hosts for virtual server mobility" on page 80.
   - If the destination host does not have enough available processors to support the virtual server, use the SDMC, to remove the processors from the virtual server, or remove processors from virtual servers on the destination host.

Determining the reserved storage device size in the destination host:

Determine the reserved storage device size in the destination host by using the IBM Systems Director Management Console (SDMC).

You must be a super administrator to do this task.

To ensure that you can perform the suspend operation on virtual servers that are capable of suspension in the destination host, determine whether there is a minimum of one reserved storage device with a size of at least 110% of the maximum virtual server memory in the destination host.

To determine that there is a minimum of one reserved storage device with a size of at least 110% of the maximum virtual server memory, complete the following steps by using the SDMC:

1. Determine the maximum virtual server memory on the destination host:
   a. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
   b. Expand **Hosts**, and click the destination host.
   c. Select the virtual server.
   d. Click **Actions**, and select **System Configuration** → **Manage Virtual Server**.
   e. In the Manage Virtual Server window, click the **Memory** tab.
   f. Record the maximum virtual server memory value in the **Maximum** field.
2. Determine the reserved storage device size on the destination host:
   a. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
   b. Expand **Hosts**, and select the destination host.
   c. Click **Actions**, and select **System Configuration** → **Virtual Resources** → **Reserved Storage Device Pool Management**, or **System Configuration** → **Virtual Resources** → **Shared Memory Pool Management**, as applicable. The Reserved Storage Device Pool Management window or the Shared Memory Pool Management window is displayed.
      • If the Reserved Storage Device Pool Management window is displayed, click **Edit Pool**.
      • If the Shared Memory Pool Management window is displayed, click the **Paging Space Devices** tab.
   d. Record the size of the reserved storage devices.
3. Compare the reserved storage device size from step 2 with 110% of the maximum virtual server memory value from step 1. There must be a minimum of one reserved storage device on the destination host with a size of at least 110% of the maximum virtual server memory.

Preparing the SDMC for virtual server mobility

To successfully move the virtual server from the source host to the destination host, verify that the IBM Systems Director Management Consoles (SDMCs) or management consoles that manage the source and destination hosts are configured correctly.

To prepare the SDMCs for active or inactive virtual server mobility, complete the following task.

Table 12. Preparation tasks for the SDMC

SDMC planning tasks	Active mobility task	Inactive mobility task	Information resources
1. If the source host is managed by an SDMC and the destination host is managed by a different management console, verify that the Secure Shell (SSH) authentication keys are set up correctly between the SDMC that manages the source host and the management console that manages the destination host.	X	X	"Verifying SSH authentication between the source and destination management consoles"

Verifying SSH authentication between the source and destination management consoles:

Secure Shell (SSH) authentication allows the IBM Systems Director Management Consoles (SDMCs) or management consoles to send and receive virtual server mobility commands to and from each other.

You can run the smcli psm mkauthkeys command from the SDMC that manages the source host. Use this command to verify that the SSH authentication keys are correctly set up between the SDMC that manages the source host and the management console that manages the destination host.

To verify that the SSH authentication keys are set up correctly, complete the following steps:

1. Run the following command from the SDMC command line of the SDMC that manages the source host:

   ```
   smcli psm mkauthkeys -u <remoteUserName> --ip <remoteHostName> --test
   ```

   where:
   - *remoteUserName* is the name of the user on the management console that manages the destination host. This parameter is optional. If you do not specify a user name for the management console that manages the destination host, the migration process uses the current user name as the *remoteUserName*.
   - *remoteHostName* is the IP address or the host name of the management console that manages the destination host.

   If this command produces a return code of 0, the SSH authentication keys are set up correctly between the SDMC that manages the source host and the management console that manages the destination host.

   If this command produces an error code, continue to the next step to set up the SSH authentication keys between the SDMC that manages the source host and the management console that manages the destination host.

2. Run the following command to set up the SSH authentication keys between the SDMC that manages the source host and the management console that manages the destination host:

   ```
   smcli psm mkauthkeys -u <remoteUserName> --ip <remoteHostName> -g
   ```

   where *remoteUserName* and *remoteHostName* represent the same values that they represented in step 2.

   The –g option automatically sets up the SSH authentication keys from the SDMC that manages the source host to the management console that manages the destination host, and it automatically sets up the SSH authentication keys from the management console that manages the destination host to the SDMC that manages the source host. If you do not include the –g option, the command automatically sets up the SSH authentication keys from the SDMC that manages the source host to the management console that manages the destination host, but the command does not automatically set up the SSH authentication keys from the management console that manages the destination host to the SDMC that manages the source host.

Preparing the source and destination VIOS virtual servers for virtual server mobility

To successfully move the virtual server from the source host to the destination host by using the SDMC, verify that the source and destination VIOS virtual servers are configured correctly.

To prepare the source and destination VIOS virtual servers for active or inactive virtual server mobility, complete the following tasks.

Table 13. Preparation tasks for the source and destination VIOS virtual servers

VIOS planning tasks	Active mobility task	Inactive mobility task	Information resources
1. Ensure that at least one VIOS virtual server is installed and activated on both the source and destination hosts. If the virtual server receives virtual storage resources from redundant VIOS virtual servers on the source host, install the same number of VIOS virtual servers on the destination host, if possible. **Remember:** In some situations, you can select the option to override virtual storage errors, if possible, and move a virtual server to a destination host with less redundancy.	X	X	"Creating a VIOS virtual server with the Create Virtual Server wizard" on page 5
2. Ensure that the source and destination VIOS virtual servers are at release level 2.1.2 with service pack 1, or later. **Note:** The VIOS Version 2.2.0.11, Fix Pack 24, Service Pack 1, or later, does not support Live Virtual Server Mobility. It also does not support the Suspend/Resume feature for an AIX, IBM i, or Linux virtual server that has resources exported to it from a VIOS virtual server that is part of a cluster.	X	X	• Virtual I/O Server and Integrated Virtualization Manager commands • "Migrating the VIOS" on page 54 • "Updating the VIOS" on page 62
3. Ensure that the mover service is enabled on one or more source and destination VIOS virtual servers. **Note:** In the VIOS Version 2.2.0.11, Fix Pack 24, Service Pack 1, or later, you cannot use devices from a cluster as a mover-service virtual server.	X		"Enabling mover service on the source and destination hosts"
4. If the virtual server uses shared memory, verify that at least one VIOS virtual server is assigned to the shared memory pool on the destination host (subsequently referred to as a *paging VIOS virtual server*) and that the VIOS virtual server is at release level 2.1.1, or later. If the virtual server accesses its paging space device redundantly through two paging VIOS virtual servers and you want to maintain this redundancy on the destination host, verify that two paging VIOS virtual servers are assigned to the shared memory pool on the destination host. **Note:** In the VIOS Version 2.2.0.11, Fix Pack 24, Service Pack 1, or later, you cannot use devices from a cluster as paging devices.	X	X	• "Configuring the shared memory pool" on page 13 • "Adding a paging VIOS virtual server to the shared memory pool" on page 19
5. If the virtual server uses shared memory, verify that the shared memory pool on the destination host contains a paging space device that satisfies the size requirements and redundancy configuration of the virtual server.	X	X	"Verifying that the destination shared memory pool contains an available paging space device" on page 90
6. Optional: Synchronize the time-of-day clocks for the source and destination VIOS virtual servers.	X		"Synchronizing the time-of-day clocks of the source and destination VIOS virtual servers" on page 91

Enabling mover service on the source and destination hosts:

You can enable the mover service attribute on a Virtual I/O Server (VIOS) virtual server by using the IBM Systems Director Management Console (SDMC).

You must be a super administrator or operator to do this task.

There must be at least one mover service virtual server on the source and destination VIOS for the virtual server to participate in active virtual server mobility. If the virtual server is disabled on either the source or destination VIOS, the virtual server can participate only in inactive virtual server mobility.

To enable mover service on the source and destination hosts, complete the following steps by using the SDMC:

1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts**, and click the managed host of your choice.
3. Select the VIOS virtual server.
4. Click **Actions**, and select **System Configuration** → **Manage Virtual Server**.
5. In the Manage Virtual Server window, click the **General Settings** tab.
6. Select **Mover Service**, and click **Apply**.
7. Repeat steps 3 through 6 for the destination host.

Verifying that the destination shared memory pool contains an available paging space device:

You can verify that the shared memory pool on the destination host contains a paging space device that satisfies the size requirements and redundancy configuration of the virtual server by using the IBM Systems Director Management Console (SDMC).

To verify that the shared memory pool on the destination host contains a paging space device that satisfies the size requirements and redundancy configuration of the virtual server, complete the following steps by using the SDMC:

1. Identify the size requirements of the virtual server. The paging space device for an AIX or Linux virtual server that uses shared memory (subsequently referred to as a *shared-memory virtual server*) must be at least the size of the maximum logical memory of the shared-memory virtual server. To view the maximum logical memory of the virtual server, complete the following steps:
   a. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
   b. Expand **Hosts**, and click the host on which the virtual server is located.
   c. Select the virtual server.
   d. Click **Actions**, and select **System Configuration** → **Manage Virtual Server**.
   e. In the Manage Virtual Server window, click the **Memory** tab.
   f. Record the maximum logical memory value in the **Maximum** field. This is the size requirement for the paging space device for the virtual server.
2. Identify the redundancy configuration of the virtual server. From the **Paging Information** pane in the **Memory** tab in the Manage Virtual Server window, record the number of VIOS virtual servers (subsequently referred to as *paging VIOS virtual servers*) that are assigned to the virtual server:
   - If the virtual server is assigned a primary paging VIOS virtual server and no secondary paging VIOS virtual server is assigned, the virtual server does not use redundant paging VIOS virtual servers. In this case, the virtual server uses a paging space device that can only be accessed by one paging VIOS virtual server in the shared memory pool.
   - If the virtual server is assigned a primary paging VIOS virtual server and a secondary paging VIOS virtual server, the virtual server uses redundant paging VIOS virtual servers. In this case, the virtual server uses a paging space device that can be accessed redundantly by both paging VIOS virtual servers in the shared memory pool.
3. View the paging space devices that are currently assigned to the shared memory pool on the destination host:

a. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.

b. Expand **Hosts**, and select the destination host.

c. Click **Actions**, and select **System Configuration** → **Virtual Resources** → **Shared Memory Pool Management**.

d. In the Shared Memory Pool Management window, record the available paging space devices, their size, and whether they are capable of redundancy from the **Paging space devices** table.

Note: Paging space devices can only be assigned to one shared memory pool at a time. You cannot assign the same paging space device to shared memory pools on two different hosts at the same time.

4. Determine whether the shared memory pool on the destination host has a suitable paging space device for the virtual server.

a. If the virtual server *does not use* redundant paging VIOS virtual servers, verify that there is a paging space device that is not capable of redundancy and meets the size requirement of the virtual server. If no such device exists, you have the following options:

- You can add a paging space device to the shared memory pool on the destination host. For instructions, see "Adding and removing paging space devices to and from the shared memory pool" on page 26.
- If the shared memory pool contains an available paging space device that satisfies the size requirements of the virtual server, but is capable of redundancy, you can move the virtual server to the destination host. In this case, when you move the virtual server to the destination host (active virtual server mobility) or when you activate the virtual server on the destination host (inactive virtual server mobility), the SDMC assigns the paging space device that is capable of redundancy to the virtual server.

b. If the virtual server *uses* redundant paging VIOS virtual servers, verify that there is a paging space device that is capable of redundancy and meets the size requirements of the virtual server. If no such device exists, you have the following options:

- You can add a paging space device to the shared memory pool on the destination host. For instructions, see "Adding and removing paging space devices to and from the shared memory pool" on page 26.
- If the shared memory pool contains an available paging space device that satisfies the size requirements of the virtual server, but is not capable of redundancy, you can move the virtual server to the destination host. However, to perform this action, complete one of the following tasks:
  - Specify that the SDMC must either use a paging space device that is not capable of redundancy or use a paging space device that is capable of redundancy if possible in the Virtual Server Migration wizard during migration.
  - Run the following command from the SDMC command line:

    ```
    smcli psm migrlpar -o m -m <source_host> -t <destination_host> -p <virtual server>
    -redundantvios {0 | 2}
    ```

    where, 0 indicates that the SDMC must use a paging space device that is not capable of redundancy and 2 indicates that the SDMC must use a redundancy device if possible.

  In this case, during active virtual server mobility, the SDMC assigns the paging space device that is not capable of redundancy to the virtual server that is being migrated. However, for inactive virtual server mobility, the SDMC does not assign a paging space device during migration. After migration, the SDMC assigns a paging device only on activation of the virtual server.

Synchronizing the time-of-day clocks of the source and destination VIOS virtual servers:

You can synchronize the time-of-day clocks for the source and destination VIOS virtual servers by using the IBM Systems Director Management Console (SDMC).

You must be a super administrator to complete this task.

Synchronizing the time-of-day clocks for the source and destination VIOS virtual servers is an optional step for active virtual server mobility. If you choose not to complete this step, the source and destination hosts will synchronize the clocks while the virtual server is moving from the source host to the destination host. Completing this step before the virtual server is moved can prevent possible errors.

To synchronize the time-of-day clocks on the source and destination VIOS virtual servers, complete the following steps by using the SDMC:

1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts**, and click the managed host of your choice.
3. Select the virtual server.
4. Click **Actions**, and select **System Configuration** → **Manage Virtual Server**.
5. In the Manage Virtual Server window, click the **General Settings** tab, and expand **Other Settings**.
6. Select **Time reference**, and click **Apply**.
7. Repeat steps 3 through 6 for the destination host and the destination VIOS.

Preparing the virtual server for virtual server mobility

To successfully move the virtual server from the source host to the destination host by using the IBM Systems Director Management Console (SDMC), verify that the virtual server is configured correctly.

To prepare the virtual server for active or inactive virtual server mobility, complete the following tasks.

Table 14. Preparation tasks for the virtual server

Virtual server planning tasks	Active mobility task	Inactive mobility task	Information resources
1. Ensure that the operating system running in the virtual server is either the AIX or Linux operating system. **Restriction:** The virtual server cannot be a VIOS virtual server or an IBM i virtual server.	X	X	

Table 14. Preparation tasks for the virtual server (continued)

Virtual server planning tasks	Active mobility task	Inactive mobility task	Information resources

2. Ensure that the operating system is at one of the following levels:
 	
• For AIX versions, see the Fix Level Recommendation Tool:
 	
You can view all AIX versions that are supported on POWER7 processor-based servers using the Fix Level Recommendation Tool.
 	
  1. Select AIX in **Select your OS family**.
 	
  2. In **Select products and enter the version information**, select POWER7 server in the **Server MTM** field.
 	
  3. Select the GHz of the POWER7 server, and select the **AIX** field.
 	
The **AIX** field displays the AIX versions that are supported on the selected POWER7 server, where *xxxx-xx-xx* is the *<release>-<technology level>-<service pack>* information.
 	
• Red Hat Enterprise Linux version 5 Update 5, or later
 	
• SUSE Linux Enterprise Server 10 Service Pack 3, or later
 	
• SUSE Linux Enterprise Server 11 Service Pack 1, or later
 	
Earlier versions of the AIX and Linux operating systems can participate in inactive virtual server mobility if the operating systems support virtual devices and POWER6 or POWER7 processor-based servers.
	X		

3. If the Linux operating system is running in the virtual server, ensure that the DynamicRM tool package is installed.	X		Service and productivity tools for Linux on POWER systems
4. Ensure that Resource Monitoring and Control (RMC) connections are established with the virtual server, the source and destination VIOSs, and the source and destination mover service virtual servers.	X		"Verifying RMC connections for the virtual server" on page 94
5. Verify that the processor compatibility mode of the virtual server is supported on the destination host.	X	X	"Verifying the processor compatibility mode of the virtual server" on page 95
6. Ensure that the virtual server is not enabled for redundant error path reporting.	X	X	"Disabling the virtual server for redundant error-path reporting" on page 96
7. Ensure that the virtual server is only using a virtual serial adapter for virtual terminal connections.	X	X	"Disabling virtual serial adapters for the virtual server" on page 97
8. Ensure that the virtual server is not part of a virtual server workload group.	X	X	"Removing the virtual server from a virtual server workload group" on page 97
9. Ensure that the virtual server is not using barrier synchronization register (BSR) arrays.	X		"Disabling BSR arrays for the virtual server" on page 98

Table 14. Preparation tasks for the virtual server (continued)

Virtual server planning tasks	Active mobility task	Inactive mobility task	Information resources
10. Ensure that the virtual server is not using huge pages.	X		"Disabling huge pages for the virtual server" on page 99
11. Ensure that the virtual server does not have physical I/O adapters.	X		
12. Ensure that the virtual server does not use Host Ethernet Adapters (or Integrated Virtual Ethernet).	X		"Removing Host Ethernet Adapters from the virtual server" on page 100
13. If the virtual server is a diskless AIX virtual server and its logical partitioning scripts are located in the default directory, /usr/lib/dr/scripts/all, use the drmgr command to change the directory to a directory with write access.	X		drmgr Command
14. Optional: Determine the name of the virtual server profile for the virtual server on the destination host.	X	X	
15. Ensure that the applications running in the virtual server are mobility-safe or mobility-aware.	X		Software applications that recognize virtual server mobility
16. If you changed any virtual server profile attributes, shut down and activate the virtual server by using the changed profile for the new values to take effect.	X	X	"Shutting down and restarting virtual servers" on page 30

Verifying RMC connections for the virtual server:

You can verify the Resource Monitoring and Control (RMC) connection between the virtual server and the IBM Systems Director Management Console (SDMC). This RMC connection is required to perform active virtual server mobility.

You must be a super administrator to complete this task.

RMC is a no-charge feature of the AIX operating system that can be configured to monitor resources and perform an action in response to a defined condition. With RMC, you can configure response actions or scripts that manage general system conditions with little or no involvement from the system administrator. On the SDMC, RMC is used as the main communication channel between AIX and Linux virtual servers and the SDMC.

To verify an RMC connection for the virtual server, complete the following steps:

1. Using the SDMC command line, enter `smcli psm lssyscfg -m XXXX -r lpar -F lpar_id,lpar_name,rmc_state`.

   where *XXXX* is the host name.

   Your command results will look similar to this example:

```
ze25b:/var/ct/IW/log/mc/IBM.LparCmdRM # lspartition -dlpar
<#0> Partition:<5*8203-E4A*1000xx, servername1.austin.ibm.com, x.x.xxx.xx>
       Active:<0>, OS:< , , >, DCaps:<0x2f>, CmdCaps:<0x0b, 0x0b>, PinnedMem:<0>
<#1> Partition:<4*8203-E4A*10006xx, servername2.austin.ibm.com, x.x.xxx.xx>
       Active:<0>, OS:<AIX>, DCaps:<0x2f>, CmdCaps:<0x0b, 0x0b>, PinnedMem:<0>
<#2> Partition:<3*8203-E4A*10006xx, servername3.austin.ibm.com, x.x.xxx.xx>
       Active:<1>, OS:<AIX>, DCaps:<0x2f>, CmdCaps:<0x0b, 0x0b>, PinnedMem:<340>
<#4> Partition:<5*8203-E4A*10006xx, servername4.austin.ibm.com, x.x.xxx.xx>
       Active:<1>, OS:<AIX>, DCaps:<0x2f>, CmdCaps:<0x0b, 0x0b>, PinnedMem:<140>
       </AIX></AIX></AIX>
```

- If the results for your virtual server are <Active 1>, the RMC connection is established. Skip the rest of this procedure and return to "Preparing the virtual server for virtual server mobility" on page 92.
- If the results for your virtual server are <Active 0> or your virtual server is not displayed in the command results, continue to the next step.

2. Verify that the RMC firewall port on the SDMC is disabled:
- If the RMC firewall port is disabled, skip to step 3.
- If the RMC firewall port is enabled, change your SDMC firewall setting. Repeat step 1 on page 94.

3. Use Telnet to access the virtual server. If you cannot use Telnet, open a virtual terminal on the SDMC to set up the network on the virtual server.

4. If the virtual server network has been set up correctly and there is still no RMC connection, verify that the RSCT file set is installed:
- If the RSCT file set is installed, use Telnet to the SDMC from the virtual server to verify that the network is working correctly and that the firewall has been disabled. After verifying these tasks, repeat step 1 on page 94. If you continue to have problems establishing an RMC connection for your virtual server, contact your next level of support.
- If the RSCT file set is not installed, use your *AIX installation* CD to install the file set.

Important: It takes approximately 5 minutes for RMC connection to establish the connection after the network setup has been changed or after activating the virtual server.

Verifying the processor compatibility mode of the virtual server:

You can use the IBM Systems Director Management Console (SDMC) to determine whether the processor compatibility mode of the virtual server is supported on the destination host. You can also update the mode by using the SDMC, if necessary, so that you can successfully move the virtual server to the destination host.

To verify that the processor compatibility mode of the virtual server is supported on the destination host, complete the following steps by using the SDMC:

1. To identify the processor compatibility modes that are supported by the destination host, enter the following command on the command line of the SDMC that manages the destination host:

   ```
   smcli psm lssyscfg -r sys -F lpar_proc_compat_modes
   ```

   Record these values so that you can refer to them later.

2. Identify the preferred processor compatibility mode of the virtual server:
   a. On the Welcome page of the SDMC that manages the source host, click the **Resources** tab. The Power Systems Resources pane is displayed.
   b. Expand **Hosts**, and click the source host.
   c. Select the virtual server.
   d. Click **Actions**, and select **System Configuration → Manage Profiles**.
   e. In the Managed Profiles window, select the active virtual server profile of the virtual server or select the virtual server profile from which the virtual server was last activated.
   f. Click **Actions**, and select **Edit**.
   g. In the Virtual Server Profile Properties window, click the **Processors** tab to view the preferred processor compatibility mode in the **Processor compatibility mode** field. Record this value so that you can refer to it later.

3. Identify the current processor compatibility mode of the virtual server. If you plan to do an inactive migration, skip this step and go to step 4 on page 96.
   a. On the Welcome page of the SDMC that manages the source host, click the **Resources** tab. The Power Systems Resources pane is displayed.

b. Expand **Hosts**, and click the source host.

c. Select the virtual server.

d. Click **Actions**, and select **System Configuration** → **Manage Virtual Server**.

e. In the Manage Virtual Server window, click the **Processor** tab, and view the processor compatibility mode in the **Processor Compatibility Mode** field. This is the current processor compatibility mode of the virtual server. Record this value so that you can refer to it later.

4. Verify that the preferred and current processor compatibility modes that you identified in steps 2 on page 95 and 3 on page 95 are in the list of supported processor compatibility modes that you identified in step 1 on page 95 for the destination host. For active migrations, both the preferred and current processor compatibility modes of the virtual server must be supported by the destination host. For inactive migrations, only the preferred processor compatibility mode must be supported by the destination host.

Attention: If the current processor compatibility mode of the virtual server is the POWER5™ mode, the POWER5 mode does not appear in the list of modes supported by the destination host. However, the destination host supports the POWER5 mode even though it does not appear in the list of supported modes.

5. If the preferred processor compatibility mode of the virtual server is not supported by the destination host, use step 2 on page 95 to change the preferred mode to a mode that is supported by the destination host. For example, the preferred mode of the virtual server is the POWER7 mode and you plan to move the virtual server to a POWER6 processor-based server. The POWER6 processor-based server does not support the POWER7 mode, but it does support the POWER6 mode. Therefore, you change the preferred mode to the POWER6 mode.

6. If the current processor compatibility mode of the virtual server is not supported by the destination host, try the following solutions:

- If the virtual server is active, it is possible that the hypervisor has not had the opportunity to update the current mode of the virtual server. Restart the virtual server so that the hypervisor can evaluate the configuration and update the current mode of the virtual server.

- If the current mode of the virtual server still does not match the list of supported modes that you identified for the destination host, use step 2 on page 95 to change the preferred mode of the virtual server to a mode that is supported by the destination host.

  Then, restart the virtual server so that the hypervisor can evaluate the configuration and update the current mode of the virtual server.

  For example, assume that the virtual server runs on a POWER7 processor-based server and its current mode is the POWER7 mode. You want to move the virtual server to a POWER6 processor-based server, which does not support the POWER7 mode. You change the preferred mode of the virtual server to the POWER6 mode and restart the virtual server. The hypervisor evaluates the configuration and sets the current mode to the POWER6 mode, which is supported on the destination host.

Disabling the virtual server for redundant error-path reporting:

By using the IBM Systems Director Management Console (SDMC), you can disable the virtual server for redundant error-path reporting. You must do this task to move the virtual server from the source host to the destination host.

You must be a super administrator to complete this task.

If you enable redundant error-path reporting, the virtual server reports common server hardware errors and virtual server hardware errors to the SDMC. If you disable redundant error-path reporting, the virtual server reports only virtual server hardware errors to the SDMC. If you want to move a virtual server, disable redundant error-path reporting.

To disable the virtual server for redundant error-path reporting, complete the following steps by using the SDMC:

1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts**, and click the managed host of your choice.
3. Select the virtual server.
4. Click **Actions**, and select **System Configuration ⇨ Manage Virtual Server**.
5. In the Manage Virtual Server window, click the **General Settings** tab, and expand **Other Settings**.
6. Clear the **Redundant Error path reporting** check box, and click **Apply**.

Disabling virtual serial adapters for the virtual server:

You can disable unreserved virtual serial adapters for the virtual server by using the IBM Systems Director Management Console ((SDMC)) so that you can move the virtual server from the source host to the destination host.

You must be a super administrator to do this task.

Virtual serial adapters are often used for virtual terminal connections to the operating system. The first two virtual serial adapters (slots 0 and 1) are reserved for the SDMC. For a virtual server to participate in virtual server mobility, it cannot have any virtual serial adapters, except for the two that are reserved for the SDMC.

To disable unreserved virtual serial adapters, complete the following steps by using the SDMC:

1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts**, and click the managed host of your choice.
3. Select the virtual server.
4. Click **Actions**, and select **System Configuration ⇨ Manage Profiles**.
5. In the Managed Profiles window, select the profile of your choice, click **Actions**, and select **Edit**.
6. In the Virtual Server Profile Properties window, click the **Virtual Adapters** tab.
7. If more than two virtual serial adapters are listed, ensure that **Yes** is not selected in the Required column for the additional adapters beyond 0 and 1. If **Yes** is selected in the Required column for the additional virtual serial adapters, select the adapter that you would like to remove. Click **Actions**, and select **Delete** to remove the adapter from the virtual server profile.
8. Click **OK**.

Removing the virtual server from a virtual server workload group:

You can remove the virtual server from a virtual server workload group by using the IBM Systems Director Management Console (SDMC) so that you can move the virtual server from the source host to the destination host.

You must be a super administrator to do this task.

A virtual server workload group identifies a set of virtual servers that are located on the same physical system. The virtual server profile specifies the name of the virtual server workload group that it belongs to, if applicable. A virtual server workload group is defined when you use the SDMC to configure a virtual server. For a virtual server to participate in virtual server mobility, it cannot be assigned to a virtual server workload group.

To remove the virtual server from a virtual server workload group, complete the following steps by using the SDMC:

1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.

2. Expand **Hosts**, and click the managed host of your choice.
3. Select the virtual server of your choice.
4. Click **Actions**, and select **System Configuration** → **Manage Virtual Server**.
5. In the Manage Virtual Server window, click the **General Settings** tab, and expand **Other Settings**.
6. In the Work Load Management area, enter **None** in the **Virtual server workload group** field, and click **Apply**.

Disabling BSR arrays for the virtual server:

You can disable barrier synchronization register (BSR) arrays for the virtual server by using the IBM Systems Director Management Console (SDMC) so that you can perform active virtual server mobility.

You must be a super administrator to perform this task.

BSR is a memory register that is located on certain POWER processor-based systems. A parallel-processing application running on the AIX operating system can use a BSR to perform barrier synchronization, which is a method for synchronizing the threads in the parallel-processing application.

For a virtual server to participate in active virtual server mobility, it cannot use BSR arrays. If the virtual server uses BSR, the virtual server can participate in inactive virtual server mobility.

To disable BSR for the virtual server, complete the following steps by using the SDMC:
1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts**, and select the managed host of your choice.
3. Click **Actions**, and select **System Configuration** → **Edit Host**.
4. In the Edit Host window, click the **Capabilities** tab.
   - If Barrier Synchronization Register (BSR) Capable is **True**, click **OK** and continue with the next step.
   - If Barrier Synchronization Register (BSR) Capable is **False**, the host does not support BSR. Skip the rest of this procedure and continue to "Preparing the virtual server for virtual server mobility" on page 92.
5. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
6. Expand **Hosts**, and click the managed host of your choice.
7. Select the virtual server of your choice.
8. Click **Actions**, and select **System Configuration** → **Manage Virtual Server**.
9. In the Manage Virtual Server window, click the **Memory** tab.
   - In the **Advanced** pane, if the value in the **Assigned BSR Array** field equals zero, the virtual server can participate in active or inactive virtual server mobility. Skip the rest of this procedure and continue to "Preparing the virtual server for virtual server mobility" on page 92.
   - If the value in the **Assigned BSR Array** field is not equal to zero, complete one of the following actions:
     – Enter 0 in the **Assigned BSR Array** field.
     – Perform an inactive movement instead of an active movement.
10. Click **Apply**.
11. Restart the virtual server for this change to take effect.

Note: You can also disable BSR arrays in virtual server profiles.

Related tasks

"Disabling BSR arrays in the virtual server profile"
You can disable barrier synchronization register (BSR) arrays in the virtual server profile by using the
IBM Systems Director Management Console (SDMC) so that you can perform active virtual server
mobility.

Disabling BSR arrays in the virtual server profile:

You can disable barrier synchronization register (BSR) arrays in the virtual server profile by using the
IBM Systems Director Management Console (SDMC) so that you can perform active virtual server
mobility.

You must be a super administrator to perform this task.

To disable BSR in the virtual server profile, complete the following steps by using the SDMC:
1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts**, and click the managed host of your choice.
3. Select the virtual server.
4. Click **Actions**, and select **System Configuration** → **Manage Profiles**.
5. In the Managed Profiles window, select the virtual server profile with which you will reactivate the
   virtual server, click **Actions**, and select **Edit**.
6. In the Virtual Server Profile Properties window, click the **Memory** tab.
7. Enter 0 in the **Desired BSR arrays** field.
8. Click **OK**.
9. Shut down and activate the virtual server by using the changed profile for this change to take effect.

Related tasks

"Disabling BSR arrays for the virtual server" on page 98
You can disable barrier synchronization register (BSR) arrays for the virtual server by using the IBM
Systems Director Management Console (SDMC) so that you can perform active virtual server mobility.

Disabling huge pages for the virtual server:

You can disable huge pages for the virtual server by using the IBM Systems Director Management
Console (SDMC) so that you can perform active virtual server mobility.

You must be a super administrator to perform this task.

Huge pages can improve performance in specific environments that require a high degree of parallelism,
such as in DB2® partitioned database environments. You can specify the minimum, desired, and
maximum number of huge pages to assign to a virtual server when you create the virtual server or
virtual server profile.

For a virtual server to participate in active virtual server mobility, it cannot use huge pages. If the virtual
server uses huge pages, it can participate in inactive virtual server mobility.

To disable huge pages for the virtual server, complete the following steps by using the SDMC:
1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts**, and select the managed host of your choice.
3. Click **Actions**, and select **System Configuration** → **Edit Host**.
4. In the Edit Host window, click the **Capabilities** tab.
   - If Huge Page Capable is **True**, click **OK** and continue with the next step.

- If Huge Page Capable is **False**, the source host does not support huge pages. The virtual server can participate in active or inactive virtual server mobility. Skip the rest of this procedure and continue to "Preparing the virtual server for virtual server mobility" on page 92.
5. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
6. Expand **Hosts**, and click the managed host of your choice.
7. Select the virtual server of your choice.
8. Click **Actions**, and select **System Configuration** → **Manage Virtual Server**.
9. In the Manage Virtual Server window, click the **Memory** tab.
   - In the **Advanced** pane, if the value in the **Assigned** field in the Huge Page Memory area equals 0, the virtual server can participate in active or inactive virtual server mobility. Skip the rest of this procedure and continue to "Preparing the virtual server for virtual server mobility" on page 92.
   - If the value in the **Assigned** field is not equal to 0, then complete one of the following actions:
     – Enter 0 in the **Assigned** field.
     – Perform an inactive movement instead of an active movement.
10. Click **Apply**.
11. Restart the virtual server for this change to take effect.

Note: You can also disable huge pages in virtual server profiles.

Related tasks

"Disabling huge pages in the virtual server profile"
You can disable huge pages in the virtual server profile by using the IBM Systems Director Management Console (SDMC) so that you can perform active virtual server mobility.

Disabling huge pages in the virtual server profile:

You can disable huge pages in the virtual server profile by using the IBM Systems Director Management Console (SDMC) so that you can perform active virtual server mobility.

You must be a super administrator to perform this task.

To disable huge pages in the virtual server profile, complete the following steps by using the SDMC:
1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts**, and click the managed host of your choice.
3. Select the virtual server of your choice.
4. Click **Actions**, and select **System Configuration** → **Manage Profiles**.
5. In the Managed Profiles window, select the virtual server profile of your choice, click **Actions**, and select **Edit**.
6. In the Virtual Server Profile Properties window, click the **Memory** tab.
7. Enter 0 in the **Desired pages** field.
8. Click **OK**.
9. Shut down and activate the virtual server by using the changed profile for this change to take effect.

Related tasks

"Disabling huge pages for the virtual server" on page 99
You can disable huge pages for the virtual server by using the IBM Systems Director Management Console (SDMC) so that you can perform active virtual server mobility.

Removing Host Ethernet Adapters from the virtual server:

You can remove logical Host Ethernet Adapters (LHEA) from a virtual server by using the IBM Systems Director Management Console (SDMC) so that you can perform active virtual server mobility.

You must be a super administrator to perform this task.

For a virtual server to participate in active virtual server mobility, it cannot be assigned any LHEAs. If the virtual server is assigned one or more LHEAs, it can participate in inactive virtual server mobility.

To remove LHEAs from the virtual server, complete the following steps by using the SDMC:
1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts**, and click the managed host of your choice.
3. Select the virtual server of your choice.
4. Click **Actions**, and select **System Configuration** → **Manage Virtual Server**.
5. In the Manage Virtual Server window, click the **Network** tab.
6. In the **Logical Host Ethernet Adapters** pane, select the LHEA and click **Remove**.
7. Repeat step 6 for each LHEA.
8. Click **Apply**.
9. Restart the virtual server for this change to take effect.

Note: You can also remove LHEAs in virtual server profiles.

Related tasks

"Removing logical Host Ethernet Adapters in the virtual server profile"
You can remove logical Host Ethernet Adapters (LHEA) from the virtual server profile by using the IBM Systems Director Management Console (SDMC) so that you can perform active virtual server mobility.

Removing logical Host Ethernet Adapters in the virtual server profile:

You can remove logical Host Ethernet Adapters (LHEA) from the virtual server profile by using the IBM Systems Director Management Console (SDMC) so that you can perform active virtual server mobility.

You must be a super administrator to perform this task.

To remove LHEAs from the virtual server profile, complete the following steps by using the SDMC:
1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts**, and click the managed host of your choice.
3. Select the virtual server.
4. Click **Actions**, and select **System Configuration** → **Manage Profiles**.
5. In the Managed Profiles window, select the virtual server profile of your choice, click **Actions**, and select **Edit**.
6. In the Virtual Server Profile Properties window, click the **Logical Host Ethernet Adapters (LHEA)** tab.
7. Select the physical port locations that have a logical port ID assigned to it and click **Reset**.
8. Click **OK**.
9. Shut down and activate the virtual server by using the changed profile for this change to take effect.

Related tasks

"Removing Host Ethernet Adapters from the virtual server" on page 100
You can remove logical Host Ethernet Adapters (LHEA) from a virtual server by using the IBM Systems Director Management Console (SDMC) so that you can perform active virtual server mobility.

Preparing the network configuration for virtual server mobility

To successfully move the virtual server from the source host to the destination host by using the IBM Systems Director Management Console (SDMC), verify that the network configuration is configured correctly. In addition, create a Shared Ethernet Adapter on the source and destination Virtual I/O Server (VIOS) virtual servers and create at least one virtual Ethernet adapter on the virtual server.

To prepare the network configuration for active or inactive virtual server mobility, complete the following tasks.

Table 15. Planning tasks for the network

Network planning tasks	Active mobility task	Inactive mobility task	Information resources
1. Create a Shared Ethernet Adapter on the source and destination VIOS virtual server by using the SDMC.	X	X	"Creating a shared Ethernet adapter for a VIOS virtual server using the SDMC" on page 15
2. Configure virtual Ethernet adapters on the source and destination VIOS virtual servers.	X	X	"Configuring a virtual Ethernet adapter" on page 7
3. Create at least one virtual Ethernet adapter on the virtual server.	X		"Configuring a virtual Ethernet adapter" on page 7
4. Activate the virtual server to establish communication between the virtual Ethernet adapter and VIOS virtual Ethernet adapter.	X		"Activating a virtual server" on page 27
5. Verify that the operating system of the virtual server recognizes the new Ethernet adapter.	X		
6. Set up the LAN so that the virtual server can continue to communicate with other necessary clients and hosts after the migration is completed.	X	X	
7. Optional: Configure and enable secure IP tunnels between the mover-service virtual servers on the source and destination hosts.	X		"Configuring secure IP tunnels between the mover service virtual servers on the source and destination hosts"
8. For VIOS virtual servers that are designated as mover service virtual servers, ensure that the network bandwidth between them is 1 GB or greater.	X		

Related information

cfgsvc command

startsvc command

Configuring secure IP tunnels between the mover service virtual servers on the source and destination hosts:

With Virtual I/O Server (VIOS) Version 2.1.2.0, or later, you can configure secure IP tunnels between the mover service virtual servers on the source and destination hosts. A mover service virtual server is a VIOS virtual server that supports active virtual server migration.

Consider enabling secure IP tunnels between the mover service virtual server on the source host and the mover service virtual server on the destination host. For example, you might want to enable secure IP tunnels when the source and destination hosts are not on a trusted network. Secure IP tunnels encrypt the virtual server state data that the mover service virtual server on the source host sends to the mover service virtual server on the destination host during active virtual server mobility.

Before you start, complete the following tasks:
- Verify that the mover service virtual servers on the source and destination hosts are at version 2.1.2.0, or later, by using the ioslevel command.
- Obtain the IP address of the mover service virtual server on the source host.
- Obtain the IP address of the mover service virtual server on the destination host.
- Obtain the preshared authentication key for the source and destination mover service virtual servers.

To configure and enable secure IP tunnels, complete the following steps from the command-line interface on the VIOS virtual server:

1. List the available secure tunnel agents by using the lssvc command. For example:

   ```
   $lssvc
   ipsec_tunnel
   ```

2. List all the attributes that are associated with the secure tunnel agent by using the cfgsvc command. For example:

   ```
   $cfgsvc ipsec_tunnel -ls
   local_ip
   remote_ip
   key
   ```

3. Configure a secure tunnel between the mover service virtual server on the source host and the mover service virtual server on the destination host by using the cfgsvc command:

   ```
   cfgsvc ipsec_tunnel  -attr local_ip=src_msp_ip destination_ip=dest_msp_ip key=key
   ```

   where:
   - *src_msp_ip* is the IP address of the mover service virtual server on the source host.
   - *dest_msp_ip* is the IP address of the mover service virtual server on the destination host.
   - *key* is the preshared authentication key for the mover service virtual servers on the source and destination hosts. For example, abcderadf31231adsf.

4. Enable the secure tunnel by using the startsvc command. For example:

   ```
   startsvc ipsec_tunnel
   ```

Related information

cfgsvc command

startsvc command

Preparing the virtual SCSI configuration for virtual server mobility

To successfully move the virtual server from the source host to the destination host by using the IBM Systems Director Management Console (SDMC), verify that the virtual SCSI configuration is configured correctly. In addition, verify the reserve_policy of the physical volumes, and verify that the virtual devices have the same unique identifier, physical identifier, or IEEE volume attribute.

The destination host must provide the same virtual SCSI configuration as the source host. In this configuration, the virtual server can access its physical storage on the storage area network (SAN) after it moves to the destination host.

To prepare the virtual SCSI configuration for active or inactive virtual server mobility, complete the following tasks.

Table 16. Preparation tasks for the virtual SCSI configuration on systems that are managed by the SDMC

Storage planning tasks	Active mobility task	Inactive mobility task	Information resources
1. Verify that the physical storage that is used by the virtual server is assigned to at least one VIOS virtual server on the source host and to at least one VIOS virtual server on the destination host.	X	X	IBM System Storage® SAN Volume Controller
2. Verify that the reserve attributes on the physical volumes are the same for the source and destination VIOS virtual servers.	X	X	"Setting the reserve policy attributes of a device" on page 59
3. Verify that the virtual devices have the same unique identifier, physical identifier, or an IEEE volume attribute.	X	X	Identifying exportable disks

Storage planning tasks	Active mobility task	Inactive mobility task	Information resources
4. Verify that the virtual SCSI adapters on the virtual server can access the virtual SCSI adapters on the source VIOS virtual server.	X	X	"Verifying the virtual adapter connections between the virtual server and the VIOS virtual servers on the source host"
5. Optional: Specify a new name for one or more virtual target devices to use on the destination VIOS virtual server.	X	X	"Specifying a new name for a virtual target device to use on a destination VIOS virtual server" on page 106
6. Verify that the virtual server has access to the physical storage on the SAN.	X	X	"Verifying that the virtual server has access to its physical storage" on page 105
7. If you changed any virtual-server profile attributes, shut down and activate the virtual server by using the changed profile for the new values to take effect.	X	X	"Shutting down and restarting virtual servers" on page 30

Verifying the virtual adapter connections between the virtual server and the VIOS virtual servers on the source host:

You can verify the virtual adapter connections between the virtual server and the Virtual I/O Server (VIOS) virtual servers on the source host so that the IBM Systems Director Management Console (SDMC) correctly configures the virtual adapters on the destination host when you move the virtual server.

To verify the virtual adapter connections between the virtual server and the source VIOS virtual servers, complete the following steps by using the SDMC:

1. Verify the virtual adapter configuration of the virtual server:
   a. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
   b. Expand **Hosts**, and click the managed host on which the virtual server is located.
   c. Select the virtual server.
   d. Click **Actions**, and select **System Configuration** → **Manage Virtual Server**.
   e. In the Manage Virtual Server window, click the **Storage Adapters** tab.
   f. Record the value in the **Connecting virtual server** and the **Connecting virtual adapter (ID)** fields for each virtual adapter on the virtual server.
      - The value in the **Connecting virtual server** field is the VIOS virtual server that contains the server virtual adapter to which the virtual adapter on the virtual server connects.
      - The value in the **Connecting virtual adapter (ID)** field is the ID of the virtual adapter on the VIOS virtual server to which the virtual adapter on the virtual server connects.

   The following table illustrates an example of the virtual adapter configuration of a virtual server.

Table 17. Example information for virtual adapters on the virtual server

Adapter (ID)	Type	Connecting virtual server	Connecting virtual adapter (ID)	Backing Devices
(3)	SCSI	vios-1 (1)	(13)	
(3)	SCSI	vios-3 (1)	(14)	

2. Verify the virtual adapter configuration of each connecting virtual server, or VIOS virtual server, that you identified in the previous step:

a. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.

b. Expand **Hosts**, and click the managed host on which the virtual server is located.

c. Select the VIOS virtual server from which the virtual server receives virtual I/O resources.

d. Click **Actions**, and select **System Configuration → Manage Virtual Server**.

e. In the Manage Virtual Server window, click the **Storage Adapters** tab.

f. Verify that the virtual adapters on the VIOS virtual server are connected to the virtual adapters on the virtual server:

- The value in the **Adapter (ID)** field of the virtual adapter on the VIOS virtual server corresponds to the value in the **Connecting virtual adapter (ID)** field that you recorded for the virtual adapter on the virtual server.

- The value in the **Connecting virtual adapter (ID)** field of the virtual adapter on the VIOS virtual server corresponds to the value in the **Adapter (ID)** field that you recorded for the virtual adapter on the virtual server. The value for the **Connecting virtual adapter (ID)** field can also be set to **Any Partition Slot**.

The following table illustrates an example of the virtual adapter configuration of a VIOS virtual server.

Table 18. Example information for virtual adapters on the VIOS virtual server

Adapter (Id)	Type	Connecting virtual server	Connecting virtual adapter (ID)
vhost0 (13)	SCSI	aix-11 (2)	(3)
vhost1 (14)	SCSI	linux-13 (3)	Any Partition Slot

3. If all the virtual SCSI adapters on the VIOS virtual server allow access to virtual SCSI adapters of every virtual server (the **Connecting virtual server** for every virtual SCSI adapter is set to **Any Partition Slot**), complete one the following steps:

- Create a new virtual SCSI adapter on the VIOS virtual server and allow only a virtual SCSI adapter on the virtual server to access it.

- Change the connection specifications of a virtual SCSI adapter on the VIOS virtual server so that it only allows access to a virtual SCSI adapter on the virtual server.

Verifying that the virtual server has access to its physical storage:

You can use the IBM Systems Director Management Console (SDMC) to verify that the virtual server has access to its physical storage on the storage area network (SAN) so that the virtual server can access its physical storage after it moves to the destination host.

For virtual server mobility to be successful, the virtual server must have access to the same physical storage from both the source and destination environments. In the source environment, the following connections must exist:

- Each virtual SCSI adapter on the virtual server must have access to a target virtual SCSI adapter on the source VIOS virtual server.

- The target virtual SCSI adapters on the source VIOS virtual server must have access to a SAN host-attached adapter on the source VIOS virtual server.

- The SAN host-attached adapter on the source VIOS virtual server must be connected to a SAN and have access to the physical storage devices for which you want the virtual server to have access to in the SAN.

In the destination environment, the following connections must exist:

- The destination VIOS virtual server has unused virtual slots available.

- The SAN host-attached adapter on the destination VIOS virtual server must be connected to the same SAN as the source VIOS virtual server and have access to the same virtual server physical storage as the source VIOS virtual server.

You must be a super administrator to do this task.

To verify these connections, complete the following steps by using the SDMC:

1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts**, and click the managed host of your choice.
3. Select the source VIOS virtual server.
4. Click **Actions**, and select **Hardware Information** → **Virtual Adapters** → **SCSI**.
5. Verify the following information and click **OK**:
   - Virtual adapter
   - Backing device
   - Remote virtual server
   - Remote adapter
   - Remote backing device

   Tip: The virtual SCSI adapter fields might be blank if the virtual server is powered off or if the physical disk has not been linked to the virtual SCSI adapter of the VIOS.

   If the information is incorrect, return to "Preparing the virtual SCSI configuration for virtual server mobility" on page 103 and complete the task that is associated with the incorrect information.

Specifying a new name for a virtual target device to use on a destination VIOS virtual server:

Before you move a virtual server, you can specify a new name for a virtual target device, if needed. After you move the virtual server, the virtual target device assumes the new name on the VIOS virtual server on the destination host.

Before you start, verify that the following product is at the correct version:

- The Virtual I/O Server (VIOS) virtual servers are at version 2.1.2.0, or later. This requirement applies to both the source VIOS virtual servers and the destination VIOS virtual servers.

Where possible, virtual server mobility preserves user-defined names of the virtual target devices on the destination host. Virtual server mobility does not preserve vtscsi*x* IDs.

In some situations, virtual server mobility might not be able to preserve a user-defined name (for example, when the name is already in use on the destination VIOS virtual server).

If you want to maintain user-defined names on the destination VIOS virtual server, you can specify a new name for the virtual target device to use on the destination VIOS virtual server. If you do not specify a new name, virtual server mobility automatically assigns the next available vtscsi*x* name to the virtual target device on the destination VIOS virtual server.

To specify a new name for a virtual target device, complete the following steps:

1. To view the names and mappings of the virtual target devices, run the lsmap command as follows. Run the command from the command-line interface on the source VIOS virtual server:

   ```
   lsmap -all
   ```

   The output might look like the following example:
   ```
   SVSA            Physloc                                  Client Virtual Server ID
   --------------- ---------------------------------------- ------------------
   vhost4          U8203.E4A.10D4431-V8-C14                 0x0000000d
   ```

```
VTD                     client3_hd0
Status                  Available
LUN                     0x8100000000000000
Backing device          hdisk5
Physloc                 U789C.001.DQ1234#-P1-C1-T1-W500507630508C075-L4002402300000000

VTD                     client3_hd1
Status                  Available
LUN                     0x8200000000000000
Backing device          hdisk6
Physloc                 U789C.001.DQ1234#-P1-C1-T1-W500507630508C075-L4002402400000000
```

In this example, the user-defined names of the virtual target devices are `client3_hd0` and `client3_hd1`.

2. To specify a user-defined name for a virtual target device to use on the destination VIOS virtual server, run the chdev command as follows. Run the command from the command-line interface on the source VIOS virtual server:

```
chdev -dev dev_id -attr mig_name=partition_mobility_id
```

where:
- *dev_id* is the user-defined name of the virtual target device on the source VIOS virtual server.
- *partition_mobility_id* is the user-defined name that you want the virtual target device to have on the destination VIOS virtual server.

Related tasks

"Validating the configuration for virtual server mobility" on page 110
You can use the Virtual Server Migration wizard on the IBM Systems Director Management Console (SDMC) to validate the configuration of the source and destination hosts for virtual server mobility. If the SDMC detects a configuration or connection problem, it displays an error message with information to help you resolve the problem.

Preparing the virtual fibre channel configuration for virtual server mobility

To successfully move the virtual server from the source host to the destination host by using the IBM Systems Director Management Console (SDMC), verify that the virtual fibre channel configuration is configured correctly. In addition, verify the worldwide port names (WWPNs) of the virtual-fibre channel adapters on the virtual server, and verify that the physical-fibre channel adapters and the physical fibre channel switches support N_Port ID Virtualization (NPIV).

The destination host must provide the same virtual fibre channel configuration as the source host so that the virtual server can access its physical storage on the storage area network (SAN) after it moves to the destination host. To prepare the virtual fibre channel configuration for active or inactive virtual server mobility, complete the following tasks.

Table 19. Preparation tasks for the virtual fibre channel configuration on systems that are managed by the SDMC

Storage planning tasks	Active mobility task	Inactive mobility task	Information resources
1. For each virtual-fibre channel adapter on the virtual server, verify that both WWPNs are assigned to the same set of logical unit numbers (LUNs) on the SAN.	X	X	• "Identifying the WWPNs that are assigned to a virtual-fibre channel adapter" on page 108 • IBM System Storage SAN Volume Controller

Table 19. Preparation tasks for the virtual fibre channel configuration on systems that are managed by the SDMC (continued)

Storage planning tasks	Active mobility task	Inactive mobility task	Information resources
2. Verify that the physical-fibre channel adapters that are assigned to the source and destination VIOS virtual servers support NPIV. Run the lsnports command to view the physical ports on the physical-fibre channel adapters that support NPIV.	X	X	Virtual I/O Server and Integrated Virtualization Manager commands
3. Verify that the switches to which the physical-fibre channel adapters on both the source and destination VIOS virtual servers are cabled support NPIV. Run the lsnports command to view the `fabric support` of the physical ports on the physical-fibre channel adapters. If the `fabric support` is 1, the physical port is cabled to a switch that supports NPIV.	X	X	Virtual I/O Server and Integrated Virtualization Manager commands
4. Verify that the virtual server has access to the virtual-fibre channel adapters on the source VIOS virtual server.	X	X	"Verifying the virtual adapter connections between the virtual server and the VIOS virtual servers on the source host" on page 104
5. If you changed any virtual server profile attributes, shut down and activate the virtual server by using the changed profile for the new values to take effect.	X	X	"Shutting down and restarting virtual servers" on page 30

Related information

Redundancy configuration using virtual fibre channel adapters

Identifying the WWPNs that are assigned to a virtual-fibre channel adapter:

You can identify the worldwide port names (WWPNs) that are assigned to the virtual-fibre channel adapters on the virtual server by using the IBM Systems Director Management Console (SDMC) to view the properties of the virtual server.

To identify the WWPNs that are assigned to a virtual-fibre channel adapter, complete the following steps by using the SDMC:
1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts**, and click the host on which the virtual server is located.
3. Select the virtual server.
4. Click **Actions**, and select **System Configuration** → **Manage Virtual Server**.
5. In the Manage Virtual Server window, click the **Storage Devices** tab.
6. In the Fibre channel pane, record the WWPNs that are assigned to the virtual-fibre channel adapters on the virtual server.

Verifying the virtual adapter connections between the virtual server and the VIOS virtual servers on the source host:

You can verify the virtual adapter connections between the virtual server and the Virtual I/O Server (VIOS) virtual servers on the source host so that the IBM Systems Director Management Console (SDMC) correctly configures the virtual adapters on the destination host when you move the virtual server.

To verify the virtual adapter connections between the virtual server and the source VIOS virtual servers, complete the following steps by using the SDMC:

1. Verify the virtual adapter configuration of the virtual server:

   a. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.

   b. Expand **Hosts**, and click the managed host on which the virtual server is located.

   c. Select the virtual server.

   d. Click **Actions**, and select **System Configuration** → **Manage Virtual Server**.

   e. In the Manage Virtual Server window, click the **Storage Adapters** tab.

   f. Record the value in the **Connecting virtual server** and the **Connecting virtual adapter (ID)** fields for each virtual adapter on the virtual server.

      - The value in the **Connecting virtual server** field is the VIOS virtual server that contains the server virtual adapter to which the virtual adapter on the virtual server connects.

      - The value in the **Connecting virtual adapter (ID)** field is the ID of the virtual adapter on the VIOS virtual server to which the virtual adapter on the virtual server connects.

   The following table illustrates an example of the virtual adapter configuration of a virtual server.

Table 20. Example information for virtual adapters on the virtual server

Adapter (ID)	Type	Connecting virtual server	Connecting virtual adapter (ID)	Backing Devices
(3)	SCSI	vios-1 (1)	(13)	
(3)	SCSI	vios-3 (1)	(14)	

2. Verify the virtual adapter configuration of each connecting virtual server, or VIOS virtual server, that you identified in the previous step:

   a. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.

   b. Expand **Hosts**, and click the managed host on which the virtual server is located.

   c. Select the VIOS virtual server from which the virtual server receives virtual I/O resources.

   d. Click **Actions**, and select **System Configuration** → **Manage Virtual Server**.

   e. In the Manage Virtual Server window, click the **Storage Adapters** tab.

   f. Verify that the virtual adapters on the VIOS virtual server are connected to the virtual adapters on the virtual server:

      - The value in the **Adapter (ID)** field of the virtual adapter on the VIOS virtual server corresponds to the value in the **Connecting virtual adapter (ID)** field that you recorded for the virtual adapter on the virtual server.

      - The value in the **Connecting virtual adapter (ID)** field of the virtual adapter on the VIOS virtual server corresponds to the value in the **Adapter (ID)** field that you recorded for the virtual adapter on the virtual server. The value for the **Connecting virtual adapter (ID)** field can also be set to **Any Partition Slot**.

   The following table illustrates an example of the virtual adapter configuration of a VIOS virtual server.

Table 21. Example information for virtual adapters on the VIOS virtual server

Adapter (Id)	Type	Connecting virtual server	Connecting virtual adapter (ID)
vhost0 (13)	SCSI	aix-11 (2)	(3)
vhost1 (14)	SCSI	linux-13 (3)	Any Partition Slot

3. If all the virtual SCSI adapters on the VIOS virtual server allow access to virtual SCSI adapters of every virtual server (the **Connecting virtual server** for every virtual SCSI adapter is set to **Any Partition Slot**), complete one the following steps:

- Create a new virtual SCSI adapter on the VIOS virtual server and allow only a virtual SCSI adapter on the virtual server to access it.
- Change the connection specifications of a virtual SCSI adapter on the VIOS virtual server so that it only allows access to a virtual SCSI adapter on the virtual server.

Validating the configuration for virtual server mobility

You can use the Virtual Server Migration wizard on the IBM Systems Director Management Console (SDMC) to validate the configuration of the source and destination hosts for virtual server mobility. If the SDMC detects a configuration or connection problem, it displays an error message with information to help you resolve the problem.

If the source and destination hosts are managed by different SDMCs, verify that the Secure Shell (SSH) authentication keys are set up correctly between the SDMCs. For instructions, see "Verifying SSH authentication between the source and destination management consoles" on page 87.

You must be a super administrator to validate the virtual server mobility environment.

To validate the source and destination hosts for virtual server mobility, complete the following steps by using the SDMC:

1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts**, and click the host.
3. Select the virtual server.
4. Click **Actions**, and select **Operations** → **Mobility** → **Validate**.
5. On the Virtual Server Migration Validation window, specify information about the virtual server mobility environment, and click **Validate**. The **Virtual Storage assignments** table is populated with suggested virtual adapter settings.

   Remember: Select the **Override virtual storage errors when possible** option to validate moving the virtual server to a destination host with less redundancy.
6. Review the available virtual adapter settings on the destination host.
7. Click **Validate** to confirm that the changed settings are still acceptable for virtual server mobility.

Where possible, the SDMC preserves the virtual slot assignments of the virtual server adapters on the destination host. However, in some situations the SDMC might not be able to preserve a virtual slot ID (for example, when the slot ID is already occupied on the destination VIOS virtual server). When the SDMC cannot preserve a virtual slot ID, you will receive an error message, and the SDMC assigns an available slot ID. You can override the assignments by completing the following steps from the SDMC command-line interface:

1. Run the `smcli psm lslparmigr` command to show a list of available slot IDs for a VIOS virtual server.
2. Run the `smcli psm migrlpar` command to accomplish the following tasks:
   - Specify virtual slot IDs for one or more virtual adapter mappings.
   - Validate the specified slot IDs.

Related concepts

"Live Virtual Server Mobility" on page 80
Live Virtual Server Mobility, a component of the PowerVM Enterprise Edition hardware feature, provides the ability to move AIX and Linux virtual servers from one host to another. The mobility process transfers the system environment including the processor state, memory, attached virtual devices, and connected users.

Related tasks

"Specifying a new name for a virtual target device to use on a destination VIOS virtual server" on page 106
Before you move a virtual server, you can specify a new name for a virtual target device, if needed. After you move the virtual server, the virtual target device assumes the new name on the VIOS virtual server on the destination host.

Moving the virtual server

You can move an active, inactive, or suspended virtual server from one host to another host by using the Virtual Server Migration wizard on the IBM Systems Director Management Console (SDMC).

Related concepts

"Live Virtual Server Mobility" on page 80
Live Virtual Server Mobility, a component of the PowerVM Enterprise Edition hardware feature, provides the ability to move AIX and Linux virtual servers from one host to another. The mobility process transfers the system environment including the processor state, memory, attached virtual devices, and connected users.

Moving active or inactive virtual servers

You can move an active or inactive virtual server from one host to another host by using the Virtual Server Migration wizard on the IBM Systems Director Management Console (SDMC).

Before you move a virtual server from one host to another host, complete the following tasks from the SDMC.

Table 22. Prerequisite tasks for moving a virtual server

Virtual server mobility prerequisite tasks	Active mobility task	Inactive mobility task	Information resources
1. Verify that you have completed all the required preparation tasks for virtual server mobility.	X	X	"Preparing for virtual server mobility" on page 80
2. Verify that the source and destination hosts are in the Operating state.	X	X	To power on a managed system, see Power on.
3. Verify that the virtual server is powered off. **Requirement:** Return the virtual server to an Operating state when the following conditions are true: • You want to actively move the virtual server. • The virtual server is in a failed state.		X	• "Shutting down and restarting virtual servers" on page 30 • Reference Code finder
4. Verify that the virtual server is in the Operating state.	X		"Activating a virtual server" on page 27
5. Verify that the source and destination VIOSs are active.	X	X	"Activating a virtual server" on page 27
6. Verify that all tape and CD jobs are completed or stopped.	X		

Table 22. Prerequisite tasks for moving a virtual server (continued)

Virtual server mobility prerequisite tasks	Active mobility task	Inactive mobility task	Information resources
7. Verify that no virtual server operations are running on any of the virtual servers on the source host and destination host. Do not perform any virtual server operations on any of the virtual servers on the source host and the destination host during virtual server mobility. You can perform virtual server operations on the virtual servers after the virtual server successfully moves to the destination host.	X	X	
8. If the source and the destination hosts are managed by different SDMCs, verify that the Secure Shell (SSH) authentication keys are set up correctly between the SDMCs.	X	X	"Verifying SSH authentication between the source and destination management consoles" on page 87
9. Run the migration verification tool on the SDMC to verify that the hosts, VIOSs, virtual servers, storage, and network are ready for virtual server mobility.	X	X	"Validating the configuration for virtual server mobility" on page 110

To move a virtual server from one host to another host, complete the following steps by using the SDMC:

1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts**, and click the host.
3. Select the virtual server.
4. Click **Actions**, and select **Operations** ▸ **Mobility** ▸ **Migrate**. The Migrate window is displayed.
5. Complete the wizard.

   Tips:

   a. Select the **Override virtual storage errors when possible** option if you want to move the virtual server to a destination host with less redundancy.
   b. Where possible, the SDMC preserves the virtual slot assignments of the virtual server adapters on the destination host. However, in some situations the SDMC might not be able to preserve one or more virtual slot IDs. In this situation, the SDMC assigns available slot IDs. To override the assignments, move the virtual server by running the `smcli psm migrlpar` command from the SDMC command-line interface.
   c. You can specify the IP address of the mover service virtual server on the source host, the mover service virtual server on the destination host, or both. For example, you want virtual server mobility to use the fastest IP address available on a mover service virtual server. To specify the IP address of a mover service virtual server, the following product must be at the specified version:

      • The mover service virtual server for which you specify an IP address must be at VIOS Version 2.1.2.0, or later.

      To specify the IP addresses of the mover service virtual servers, move the virtual server by running the `smcli psm migrlpar` command from the SDMC command-line interface.

After you move a virtual server from one host to another host, complete the following tasks.

Table 23. Postrequisite tasks for moving a virtual server

Virtual server mobility postrequisite tasks	Active mobility task	Inactive mobility task	Information resources
1. Activate the virtual server on the destination host.		X	"Activating a virtual server" on page 27

Table 23. Postrequisite tasks for moving a virtual server (continued)

Virtual server mobility postrequisite tasks	Active mobility task	Inactive mobility task	Information resources
2. Optional: Add dedicated I/O adapters to the virtual server on the destination host.	X	X	
3. If any virtual terminal connections were lost during the migration, re-establish the connections on the destination host.	X	X	
4. Optional: Assign the virtual server to a virtual server workload group.	X	X	"Adding the virtual server to a virtual server workload group"
5. If mobility-unaware applications ended on the virtual server before it was moved, restart those applications on the destination host.	X		
6. If you changed any virtual server profile attributes, shut down and activate the virtual server by using the changed profile for the new values to take effect.	X	X	"Shutting down and restarting virtual servers" on page 30
7. Optional: Back up the VIOS virtual servers on the destination host to preserve the new virtual device mappings.	X	X	Backing up the VIOS
8. Optional: Disable secure IP tunnels between the mover service virtual servers on the source and destination hosts.	X		stopsvc command

Adding the virtual server to a virtual server workload group:

You can add the virtual server to a virtual server workload group by using the IBM Systems Director Management Console (SDMC) after you move the virtual server from the source host to the destination host.

You must be a super administrator to complete this task.

A virtual server workload group identifies a set of virtual servers that are located on the same physical system. Workload management tools use virtual server workload groups to identify which virtual servers they can manage.

Before moving the virtual server from the source environment to the destination environment, you might have removed the virtual server from a virtual server workload group. Now that you have successfully moved the virtual server to the destination environment, you can add it to a virtual server workload group.

To add the virtual server to a virtual server workload group, complete the following steps by using the SDMC:
1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts**, and click the managed host of your choice.
3. Select the virtual server of your choice.
4. Click **Actions**, and select **System Configuration** → **Manage Virtual Server**.
5. In the Manage Virtual Server window, click the **General Settings** tab, and expand **Other Settings**.
6. In the Workload Management area, enter **None** in the **Virtual Server workload group** field and click **Apply**.

Moving the suspended virtual server

You can move a suspended AIX or Linux virtual server from one host to another host by using the Virtual Server Migration wizard on the IBM Systems Director Management Console (SDMC).

Before you move a suspended virtual server from one server to another server by using the SDMC, complete the following tasks from the SDMC.

Table 24. Prerequisite tasks for moving a suspended virtual server

Virtual server mobility prerequisite tasks	Information resources
1. Verify that you have completed all the required preparation tasks for active virtual server mobility. **Notes:** 1. The SDMC does not assign processor and memory resources on the destination host while moving suspended virtual servers. 2. The SDMC does not create associated virtual server adapters on the VIOS, or change the last activated profile of the VIOS during suspended virtual server mobility.	• "Preparing for virtual server mobility" on page 80 • "Moving active or inactive virtual servers" on page 111
2. Verify that the destination host supports virtual servers that are capable of suspension.	"Verifying that the destination host supports suspension-capable virtual servers" on page 85
3. Verify that there is a minimum of one paging device with a size of at least 110% of the maximum virtual server memory in the destination host.	"Determining the reserved storage device size in the destination host" on page 86
4. Verify that mover service virtual servers are enabled on the source and destination hosts.	"Enabling mover service on the source and destination hosts" on page 89

With the SDMC, you can suspend an AIX or Linux virtual server with its operating system and applications, and store its virtual server state to persistent storage. At a later stage, you can resume the operation of the virtual server.

To move a suspended virtual server from one server to another server, complete the following steps by using the SDMC:

1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts**, and click the host.
3. Select the suspended virtual server.
4. Click **Actions**, and select **Operations** → **Mobility** → **Migrate**.
5. Complete the Virtual Server Migration wizard.

After you move a suspended virtual server from one host to another host, you can perform one of the following actions:

• Resume the virtual server on the destination host. For instructions, see "Resuming the suspended virtual server" on page 115.
• Shut down the virtual server on the destination host. For instructions, see "Shutting down the suspended virtual server" on page 115.

Related tasks

"Resuming the suspended virtual server"
You can resume a suspended AIX, IBM i, or Linux virtual server on the host by using the IBM Systems Director Management Console (SDMC).

"Shutting down the suspended virtual server"
You can shut down a suspended AIX, IBM i, or Linux virtual server on the host by using the IBM Systems Director Management Console (SDMC).

Resuming the suspended virtual server:

You can resume a suspended AIX, IBM i, or Linux virtual server on the host by using the IBM Systems Director Management Console (SDMC).

To resume a suspended virtual server on the host, complete the following steps by using the SDMC:

1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts**, and click the host.
3. Select the suspended virtual server.
4. Click **Actions**, and select **Operations** → **Suspend Operations** → **Resume**.

Related tasks

"Moving the suspended virtual server" on page 114
You can move a suspended AIX or Linux virtual server from one host to another host by using the Virtual Server Migration wizard on the IBM Systems Director Management Console (SDMC).

"Suspending a virtual server" on page 47
You can suspend a virtual server by using the IBM Systems Director Management Console (SDMC).

Shutting down the suspended virtual server:

You can shut down a suspended AIX, IBM i, or Linux virtual server on the host by using the IBM Systems Director Management Console (SDMC).

To shut down a suspended virtual server on the host, complete the following steps by using the SDMC:

1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts**, and click the host.
3. Select the suspended virtual server.
4. Click **Actions**, and select **Operations** → **Suspend Operations** → **Shut Down**.

Related tasks

"Moving the suspended virtual server" on page 114
You can move a suspended AIX or Linux virtual server from one host to another host by using the Virtual Server Migration wizard on the IBM Systems Director Management Console (SDMC).

System plans

A *system plan* is a specification of the hardware and the virtual servers contained in one or more systems. You can use system plans in a number of ways that are useful for managing your system.

For example, you can use a system plan to create a record of hardware and virtual server configuration data for a system, to create a set of system specifications for ordering a system, and to deploy virtual servers to a system. A system plan is stored in a `system-plan` file, which has a file suffix of .sysplan. A `system-plan` file can contain more than one system plan, although multiple plans in a single file are not common. After you create a system plan, you also can view, delete, and export the system plan.

System plans have a number of uses. For example, you can use system plans to accomplish the following goals:

- You can create a system plan to capture up-to-date system documentation. The system plan provides a record of the hardware and virtual server configuration of the managed host at a given time.
- You can use a system plan that you create for system documentation as part of your disaster recovery planning. On the IBM Systems Director Management Console (SDMC), you can export the `system-plan` file to an off-site location so that you have the system documentation that you need available if you must recover a managed host.

  Note: Although the system plan contains a large amount of system configuration information, it does not contain all the configuration information for a system. Consequently, the system plan is not intended to provide complete system documentation.
- You can use system plans as audit records to track system hardware resources for accounting and accountability purposes by exporting the information in them to a spreadsheet.
- You can use system plans to help you plan new workloads that require additional system and hardware resources. You can use a system plan, along with appropriate capacity planning information, to decide about whether your current system can handle a new workload.
- You can create a system plan based on one managed host and deploy the system plan to another system to more quickly and easily create virtual servers on that system.
- You can use the System Planning Tool (SPT) to design a managed host based on workload data from your current systems, based on new workloads that you want the managed host to support, based on sample systems that are provided with the utility, or based on your own custom specifications. You can then use the system plan to order a system based on the specifications that the system plan contains. Also, you can use the SDMC to deploy the system plan to configure an existing system when the target system meets the requirements for deployment.

You can create a system plan by using one of the following methods:

- **SPT**: You can create a system plan to capture the configuration of a system or systems that you want to order. A `system-plan` file created in the SPT can contain more than one system plan, although multiple plans in a single file are not common.
- **SDMC**: You can create a system plan that documents the configuration of a system that is managed by the SDMC.

System Planning Tool

The System Planning Tool (SPT) helps you design a managed host that can support a specified set of workloads.

You can design a managed host based on workload data from your current systems, based on new workloads that you want the managed host to support, based on sample systems that are provided with the utility, or based on your own custom specifications. The SPT helps you design a system to fit your needs, whether you want to design a logically partitioned system or want to design an unpartitioned system.

SPT incorporates the function from Workload Estimator to help you create an overall system plan. The SPT opens the Workload Estimator to help you gather and integrate workload data and provides advanced users with the option of creating a system plan without the help of additional tools.

Note: The SPT currently does not help you plan for high availability on virtual servers or Redundant Array of Independent Disks (RAID) solutions.

There are a number of options available to help you get started with using the SPT:

- You can use the sample system plans that the SPT provides as a starting point for planning your system.

- You can create a system plan based on existing performance data.
- You can create a system plan based on new or anticipated workloads.
- You can create a system plan by using the IBM Systems Director Management Console (SDMC). You can then use the SPT to convert the system plan to SPT format, and change the system plan for use in system ordering or system deployment.
- With the SPT, you can copy virtual servers from a system in one system plan to either another system in the same system plan or to a different system in another system plan. For example, you can build system plans that contain your own sample virtual servers, and then copy one or more of these sample virtual servers into a new system plan that you are creating. You also can copy a virtual server within the same system plan. For example, you can define the attributes of a virtual server within a system plan and then make seven copies of that virtual server within the same plan.
- You can export a system plan as a `.cfr` file and import it into the marketing configurator (eConfig) tool to use for ordering a system. When you import the `.cfr` file into the eConfig tool, the tool populates your order with the information from the `.cfr` file. However, the `.cfr` file does not contain all the information that the eConfig tool requires. You must enter all required information before you can submit your order.

If you change the hardware assignments or their placement in the system, the SPT validates the changes to ensure that the resulting system fulfills the minimum hardware requirements and hardware placement requirements for the virtual servers.

When you complete the changes to the system, you can save your work as a system plan. You can import this file into your SDMC. You then can deploy the system plan to a managed host that the SDMC manages. When you deploy the system plan, the SDMC creates the virtual servers from the system plan on the managed host that is the target of the deployment.

To download the SPT, go to the IBM System Planning Tool website.

Related concepts

"System plan conversion"
You can convert a `system-plan` file that you have created, by using the IBM Systems Director Management Console (SDMC), into the format that the System Planning Tool (SPT) uses.

"System plans" on page 124
You can use system plans with the IBM Systems Director Management Console (SDMC) to perform a number of system management tasks.

Related tasks

"Converting a system plan to System Planning Tool format" on page 121
You can use the System Planning Tool (SPT) Conversion wizard to convert a system plan, which you created on an IBM Systems Director Management Console (SDMC), to the format that the SPT uses for system plans.

System plan conversion

You can convert a `system-plan` file that you have created, by using the IBM Systems Director Management Console (SDMC), into the format that the System Planning Tool (SPT) uses.

Converting a system plan so that you can work with it in the SPT has several benefits:
- You can reconfigure your existing system and validate the changes in SPT before deploying them to your server. For example, try adding or moving some parts, or changing the layout of the virtual servers.
- You can plan an upgrade to a new system. For example, you can move from a 9117-MMA POWER6 processor-based server to a 9117-MMB POWER7 processor-based server.
- You can move workloads from one system to another. You can also move a virtual server configuration from one system to another and ensure that the configuration works with the existing hardware.
- You can validate that the configuration on the system is what you want it to be.

To convert a system plan that you created by using the SDMC into the SPT format successfully, ensure that you optimize the data that you collect when you create the plan. You must also gather some information to prepare for the conversion and to understand the limitations of the conversion process.

After you complete the conversion process, you can change the system plan for redeployment of newly added virtual servers.

For example, assume that you converted an SDMC system plan that contains two client virtual servers. You can use the SPT to add another virtual server and specify virtual Ethernet adapters and virtual Small Computer System Interface (SCSI) adapters for the new virtual server. You can then use the SDMC to redeploy the changed system plan to configure the new virtual server.

Note: Although you can add virtual servers, you cannot use SPT to change existing items and redeploy the system plan to the original managed host.

After you create or convert a system plan on the SPT, you can use the SDMC to deploy the system plan. However, the SPT must validate this system plan successfully before you can deploy it. The SDMC only supports deployment of system plans on which you have created virtual servers and virtual server profiles. It does not support deployment of system plans on which you have changed attributes of existing virtual servers and virtual server profiles.

For example, if you use the SPT to add a virtual server and assign unassigned resources to the virtual server, you can deploy the system plan by using the SDMC. However, if you use the SPT to move resources from an existing virtual server to a new virtual server, you cannot deploy the system plan by using the SDMC.

Related concepts

"System Planning Tool" on page 116
The System Planning Tool (SPT) helps you design a managed host that can support a specified set of workloads.

"System plan validation" on page 138
You can deploy a system plan to a system that is managed by a IBM Systems Director Management Console (SDMC) managed host by using the System Plan Deployment wizard. The wizard validates the information in the system plan against the configuration of the managed host before beginning the deployment process.

"Limitations of system plan conversion" on page 120
You can convert a system plan that you created on the IBM Systems Director Management Console (SDMC) for use in the System Planning Tool (SPT). However, there are some limitations in the data that the SPT can convert.

"Optimizing data when creating a system plan" on page 129
The quantity and quality of hardware information that the IBM Systems Director Management Console (SDMC) can capture in a new system plan varies based on the operating environment of the virtual server for which you are capturing information.

Preparing for system plan conversion:

Before you convert the system plan to the format that the System Planning Tool (SPT) uses for system plans, you must collect some information to use during the conversion process.

Your original `system-plan` file remains intact after the conversion. You will not lose any of your data. When you convert your system plan to the format that the SPT uses for system plans, the SPT gives the converted plan a new name and saves it as a new system plan.

Before you convert a system plan to the format that the SPT uses for system plans, you must collect some information to use during the conversion process. Some of this information can help with potential conversion limitations. You must gather the following information:

- **System attributes**: You must provide the processor, server, and edition features for the system that you want to convert. The SPT Conversion wizard reduces the options to those options that are valid for the system you are converting, but you must select the correct values from the list of valid options.
- **Additional system units**: If your processor feature has multiple system units that support different processor features, select the correct processor feature for each system unit from a list of valid options.
- **Backplane**: If the system in the plan that you are converting supports more than one type of backplane, select the backplane that your system uses from a list of valid options.
- **Virtual servers**: When you convert your `system-plan` file to the SPT format, select the virtual servers that you want to include in the converted plan. Thus, you can pick just the virtual servers that you want to work with in the SPT. For example, if you are considering moving a particular workload to a new system, you can select just those virtual servers that are used to run that workload and include them in the plan that is converted to the SPT format.

  After you know the virtual servers that you want to include, select the profile to associate with each virtual server in the converted plan. The SPT can only associate one profile with a virtual server. For this reason, you might be required to convert your original system plan more than once to work with different views of the data. For example, if you have virtual servers that use one profile during the day and another profile at night, select the virtual servers and profiles that are used at the same time to ensure that your converted system plan has an accurate view of how your system is used.

  You also might be required to select the operating system of the virtual server, if that information is unavailable in your original system plan.
- **Expansion units**: You must match the top and bottom enclosures of any double-high expansion units that are attached to your system. To perform this task, procure the serial numbers of the top and bottom enclosures when you use the wizard.
- **Adapters**: You must identify the adapters in each physical location on your system. Based on the vital product data that the system plan contains, the SPT identifies as many adapters as possible. For those adapters that the SPT is unable to identify, the SPT can provide a few possibilities for you to select from. However, if those possibilities are not correct or if the SPT cannot identify any possibilities, you might be required to provide the field-replaceable unit (FRU), custom card identification number (CCIN), part number, or feature number of the correct adapter. If you do not know the number, you can find it by looking at the physical system or by using the following operating system commands to query and obtain the correct number.

Table 25. Operating system commands for identifying adapters

Operating environment	Command	When to use the command
IBM i	DSPHDWRSC	This command is useful if you have a number of adapters to look up because the command writes the results for multiple adapters to a single output file.
	STRSST	This command accesses the Hardware Resource Manager. By using this command, you can look up information about individual adapters. Use this command if you only have a few numbers to look up.
AIX and Linux	lsslot	Use this command if you are trying to obtain information about an adapter in a hot-plug slot. By using this command, you can view all the adapters and integrated hardware for the hot-plug slot so that you can determine the adapter for which you need the number.
	lscfg	Use this command if you are trying to obtain information about an adapter that is not in a hot-plug slot, or if you have already used the lsslot command to obtain adapter information for a hot-plug slot.

You can find additional details about how to use these commands in the online help for the SPT Conversion wizard.

After you finish preparing for the conversion process, export the system plan that you want to convert from the IBM Systems Director Management Console (SDMC).

Related concepts

"Limitations of system plan conversion"
You can convert a system plan that you created on the IBM Systems Director Management Console (SDMC) for use in the System Planning Tool (SPT). However, there are some limitations in the data that the SPT can convert.

Related tasks

"Converting a system plan to System Planning Tool format" on page 121
You can use the System Planning Tool (SPT) Conversion wizard to convert a system plan, which you created on an IBM Systems Director Management Console (SDMC), to the format that the SPT uses for system plans.

Limitations of system plan conversion:

You can convert a system plan that you created on the IBM Systems Director Management Console (SDMC) for use in the System Planning Tool (SPT). However, there are some limitations in the data that the SPT can convert.

By setting up your system to optimize the hardware information that you capture when you create a system plan by using the SDMC, you can ensure that your system plan provides you with the most valuable information possible. You can also ensure that you have the most usable configuration information possible when you convert the system plan for use in the SPT.

There are some limitations in the data that the SPT can convert at this time. The system plans that you create contain information about the hardware parts that are on your system. To convert one of these plans, the SPT maps the information about the parts back to the features that represent those parts.

In some cases, the SDMC system plans do not contain enough information for the SPT to do the necessary mapping conclusively. For hardware parts that have inconclusive mapping information, the SPT performs one of the following actions to resolve the inconclusive mapping:

- When possible, the SPT Conversion wizard prompts you for additional information about the parts during the conversion process. For example, in the case of PCI cards, the wizard prompts you to provide a part identifier for the card or to select the card from a list.
- The wizard identifies the part based on the content in the SDMC system plan, even if the information is not conclusive.
- The wizard disregards the part if the level of information in the plan is insufficient to do any kind of identification.

The following table shows some specific examples of parts or configurations that are more difficult to convert and what SPT does when it encounters them.

Table 26. Conversion examples

Part or configuration	SPT action during conversion
Virtual servers with more than one virtual server profile	SPT can only convert one profile per virtual server. SPT prompts you to select the profile you want to use for that virtual server during the conversion process.
Cards that are referred to by more than one virtual server profile	SPT assigns the card to the first profile it encounters that references the card and discards all other references to the card.
CD, DVD, or optical storage	SPT does not convert these devices.
Disk drives in a Redundant Array of Independent Disks (RAID) array	SPT does not convert any information about these drives.

Related concepts

"Preparing for system plan conversion" on page 118
Before you convert the system plan to the format that the System Planning Tool (SPT) uses for system plans, you must collect some information to use during the conversion process.

"System plan conversion" on page 117
You can convert a `system-plan` file that you have created, by using the IBM Systems Director Management Console (SDMC), into the format that the System Planning Tool (SPT) uses.

"Troubleshooting system plan conversion" on page 123
When you convert a system plan into the format that the System Planning Tool (SPT) uses, you might encounter some problems that you must resolve or understand better.

"Optimizing data when creating a system plan" on page 129
The quantity and quality of hardware information that the IBM Systems Director Management Console (SDMC) can capture in a new system plan varies based on the operating environment of the virtual server for which you are capturing information.

Related tasks

"Converting a system plan to System Planning Tool format"
You can use the System Planning Tool (SPT) Conversion wizard to convert a system plan, which you created on an IBM Systems Director Management Console (SDMC), to the format that the SPT uses for system plans.

Converting a system plan to System Planning Tool format

You can use the System Planning Tool (SPT) Conversion wizard to convert a system plan, which you created on an IBM Systems Director Management Console (SDMC), to the format that the SPT uses for system plans.

After you export a system plan from the SDMC, you can convert that system plan into the format that the SPT uses.

Before you use the SPT Conversion wizard, ensure that you have the information that you collected as described in "Preparing for system plan conversion" on page 118. Some of the information that you collect can help you minimize potential conversion limitations.

There are two stages to the conversion process. In the first stage, convert the `system-plan` file to the SPT format by using the wizard. In the second stage, complete the conversion by handling any messages or warnings that you receive in the SPT.

Converting a system plan

You can convert a system plan by using the System Planning Tool (SPT) Conversion wizard.

After you gather the required information, complete the following steps to convert the system plan:
1. Open the System Planning Tool.
2. On the Getting Started page, click **Open an existing system plan**.
3. In the **File name** field of the Open System Plan window, enter the name of the system plan you want to open in the SPT, or click **Browse** to select the `system-plan` file from the local file system.
4. Click **OK**. The Work with Planned Systems page displays with a message indicating that you must convert the file to the SPT format before you can use the SPT to change it.
5. Click **Convert** to convert the `system-plan` file to the SPT format.
6. On the Overview page of the Conversion wizard, click **Next** to continue with the wizard.

   Note: On the System Attributes page, and many other pages in the wizard, you can save your selections by clicking **Save as Draft**. The wizard saves the selections that you have made, but does not create a `system-plan` file because the conversion process is not complete. If you exit the wizard

before converting the system plan and restart the wizard at a later time, your previous selections are displayed on the appropriate pages as you progress through the wizard.

7. As necessary, specify the **Processor feature**, **Server feature**, and **Edition feature** of your system, and click **Next**. If your processor feature supports multiple system units, the Additional system units page is displayed.

8. If your processor feature has multiple systems that support different processor features, select the **Processor Feature** that you want to associate with each system, and click **Next**. If your system in your plan supports different backplanes, the Backplane page is displayed.

9. If your system supports multiple backplanes, select the appropriate backplane for your system and click **Next**.

10. On the Partitions page, select the virtual servers that you want to include in the converted system plan and, if necessary, select the profile name and operating system for each selected virtual server. On the SDMC, a partition is seen as a virtual server. By default, all virtual servers are selected to be included in the converted system plan. If a virtual server has more than one profile associated with it, you must select the profile that you want to include with this virtual server in the converted system plan. A virtual server can have only one profile associated with it in the SPT. If the SPT is unable to determine the operating system for the virtual server, select the operating system as well.

11. Click **Next**. If you have double-high expansion units, the Expansion Units page is displayed.

12. If the system has double-high expansion units, match the bottom part of each expansion unit with the corresponding top part of each unit, and click **Next**. You can use the serial numbers of the units to do this. If the wizard is unable to identify some adapters in the system plan, the Adapters page is displayed.

13. Select the location of the adapter that you want to identify, and click **Identify** to select from a list of identification choices for the adapter in the selected location. You also can select **Group similar** for the list of adapters. This option groups those adapters that have the same set of possible feature code choices into a single group so that you can select all members of the group for identification. The Identify Adapters page displayed.

14. Select the adapter from a list of possible choices or click **Advanced lookup** to look up the adapter by FRU, CCIN, part number, or feature number. If you need help finding the FRU, CCIN, part number, or feature number, click **Help** to get instructions on how to find that information by using operating system commands.

15. When you have identified the adapter in selected location, click **OK** to return to the Adapters page and identify additional adapters, as necessary.

   Note: The wizard deletes from the system plan any adapters that you do not identify.

16. Click **Next**. The Summary page is displayed.

17. Verify that the information about the summary page is accurate and click **Finish**. If you need to change any of the information, click **Back** to return to the relevant pages in the wizard and make corrections. The Work with Planned Systems page is displayed.

At this point, you have finished with the SPT Conversion wizard. The SPT renames your original `system-plan` file by adding `–converted` to the end of the original file name. The next step is to handle any messages that the SPT provides about conversion results.

Important: Do not exit the converted `system-plan` file until you handle messages. If you close the `system-plan` file without handling the messages, you can no longer view the messages from the conversion.

Handling conversion messages

When you finish using the System Planning Tool Conversion wizard, you must perform additional configuration before your plan is valid in the SPT. To view the messages from the conversion and understand what the SPT did when it converted the file, click the link for the system plan name at the

top of the Work with Planned Systems page. When you click this link, the System Plan Messages page displays what the SPT did with the hardware parts that it was not able to identify in your original `system-plan` file.

Important: After you save and exit your converted `system-plan` file, these messages are lost, so do not exit the converted file until you address these messages.

Messages with an *exclamation point icon* indicate that the SPT was not able to identify a part or was not able to interpret what to do with a part from your original system plan. Add the specified part manually into the converted plan.

Messages with an *informational icon* indicate that the SPT placed or configured a part based on the data it had available to it. Review these instances to ensure that the information is correct.

Related concepts

"System Planning Tool" on page 116
The System Planning Tool (SPT) helps you design a managed host that can support a specified set of workloads.

"Preparing for system plan conversion" on page 118
Before you convert the system plan to the format that the System Planning Tool (SPT) uses for system plans, you must collect some information to use during the conversion process.

"Limitations of system plan conversion" on page 120
You can convert a system plan that you created on the IBM Systems Director Management Console (SDMC) for use in the System Planning Tool (SPT). However, there are some limitations in the data that the SPT can convert.

"Troubleshooting system plan conversion"
When you convert a system plan into the format that the System Planning Tool (SPT) uses, you might encounter some problems that you must resolve or understand better.

Troubleshooting system plan conversion:

When you convert a system plan into the format that the System Planning Tool (SPT) uses, you might encounter some problems that you must resolve or understand better.

Problem: My IBM Systems Director Management Console (SDMC) system plan is not as detailed as I expected it to be.

Solution: The following factor influences the quantity of data that you can capture when you create your system plan:

* Hardware discovery. Ensure that you have the current hardware information in the inventory cache before creating the system plan. For more information, see "Optimizing data when creating a system plan" on page 129.

  Important: Before you convert a system plan into the format that the SPT uses, ensure that you run the hardware discovery process.

Ensure that you optimize the data that you collect in the system plan when you create the plan on the SDMC.

Problem: I do not see some of my hardware in the converted plan.

Solution: At this time, the SPT Conversion wizard might not be able to identify all the hardware that is in your system plan. It identifies some components based on the information it has and ignores others if it does not have enough information to make an identification. When you get to the end of the wizard, you can view information about the hardware that the wizard was not able to identify.

Related concepts

"Limitations of system plan conversion" on page 120
You can convert a system plan that you created on the IBM Systems Director Management Console (SDMC) for use in the System Planning Tool (SPT). However, there are some limitations in the data that the SPT can convert.

"Optimizing data when creating a system plan" on page 129
The quantity and quality of hardware information that the IBM Systems Director Management Console (SDMC) can capture in a new system plan varies based on the operating environment of the virtual server for which you are capturing information.

Related tasks

"Converting a system plan to System Planning Tool format" on page 121
You can use the System Planning Tool (SPT) Conversion wizard to convert a system plan, which you created on an IBM Systems Director Management Console (SDMC), to the format that the SPT uses for system plans.

System plans

You can use system plans with the IBM Systems Director Management Console (SDMC) to perform a number of system management tasks.

You can use system plans with the SDMC to accomplish the following goals:

- You can deploy a system plan that you create based on one system that an SDMC manages to other systems that the SDMC manages with identical hardware as in the system plan. Any internal drive bays and external SCSI cables also must be cabled in an identical manner on the target system. In this way, you can rapidly configure and use other, similar systems in your business.
- You can export a system plan from one SDMC to another SDMC and use it to deploy the system plan to other systems that the target SDMC manages with identical hardware and identical cabling as that in the system plan. In this case and the previous case, you can use the system plan to create virtual servers on new managed hosts that do not already have virtual servers created on them.
- You can convert a system plan that you created by using the SDMC for use in the System Planning Tool (SPT). However, the SPT Conversion wizard can convert a limited amount of hardware information from the original system plan. How much the wizard can convert depends on how current the hardware information is in the inventory cache. For more information, see "Optimizing data when creating a system plan" on page 129.

  You must use the SPT to manually specify any missing or incomplete information. After you convert the system plan, you can use the SPT to change the system plan for redeployment of newly added virtual servers. For example, assume that you converted an SDMC system plan that contains two client virtual servers. You can use the SPT to add another virtual server and to specify Ethernet adapters, Small Computer System Interface (SCSI) disks, and virtual Ethernet adapters for the new virtual server. You can then use the SDMC to redeploy the changed system plan to configure the new virtual server.

  After you create or convert a system plan on the SPT, you can use the SDMC to deploy the system plan. However, the SPT must validate this system plan successfully before you can deploy it. The SDMC only supports deployment of system plans on which you have created virtual servers and virtual server profiles. It does not support deployment of system plans on which you have changed attributes of existing virtual servers and virtual server profiles.

  For example, if you use the SPT to add a virtual server and assign unassigned resources to the virtual server, you can deploy the system plan by using the SDMC. However, if you use the SPT to move resources from an existing virtual server to a new virtual server, you cannot deploy the system plan by using the SDMC.

To create virtual servers from a system plan, first complete the following steps:

1. Create the system plan.
2. Import the system plan (when necessary).

3. If you are deploying a system plan that you created in the SPT, verify that cards and disk drives on the target system are in the same locations specified for the cards and disk drives that are in the system plan. Also, verify that any cabling instructions for disk-drive bays have been followed. You can obtain these instructions by using the report function in the SPT.

4. If you are deploying a system plan that you created by using the SDMC, verify that the hardware and cabling on the target system is identical to the hardware and cabling on the source system.

5. Deploy the system plan.

After you create a system plan, you also can view, delete, and export the system plan. The following table provides a complete overview of system plan tasks.

Table 27. Overview of the tasks for system plans

Task	Overview
Create a system plan	You can create system plans by using any of the following methods: • System Planning Tool (SPT) SPT helps you design a system to fit your needs, whether you want to design a logically partitioned system or design an unpartitioned system. SPT incorporates the function from the Workload Estimator to help you create an overall system plan. The SPT opens the Workload Estimator to help you gather and integrate workload data, and provides advanced users with the option to create a system plan without the help of additional tools. • SDMC web interface You can use the SDMC to create a system plan based on the configuration of one managed host, and then use the SDMC to deploy that plan to another managed host. Based on the virtual server configuration in the system plan, the SDMC creates virtual servers on the managed host to which it deploys the system plan. • SDMC command-line interface You also can use the `smcli psm mksysplan` command to create a system plan. After the system plan is created, you can also use the command-line interface to deploy that plan to a managed host. Based on the virtual server configuration in the system plan, the SDMC creates virtual servers on the managed host to which it deploys the system plan.
Import the system plan	Before you can use a system plan to create virtual servers, the `system-plan` file must exist on the SDMC that manages the managed host to which you want to deploy the system plan. If the `system-plan` file does not exist on the SDMC, you must import the file into the SDMC. You can use the SDMC web interface to import the file into the SDMC from one of the following sources: • Upload the `system-plan` file from the remote console (the computer from which you remotely access the SDMC) • Download the `system-plan` file from a remote FTP site. **Note:** You can also use the SDMC command-line interface to import a system plan. After you import the `system-plan` file into an SDMC, you can deploy the system plan within that file to other systems that the SDMC manages.

Table 27. Overview of the tasks for system plans (continued)

Task	Overview
Deploy the system plan	You can deploy a system plan in stages, with some virtual servers being created in one stage and other virtual servers being created in later stages. However, you cannot deploy a system plan to a managed host if the managed host has virtual servers that are not also in the system plan. If you change resource allocations on virtual servers that you have already deployed in one stage, make the same changes in the system plan by using the SPT. The system plan can only then be validated successfully when you deploy additional virtual servers in later stages. When you deploy a system plan by using the SDMC web interface, the SDMC validates the system plan. The managed host on which you deploy a system plan must have hardware, including any internal-drive bay cabling and external SCSI cabling, that is identical to the hardware in the system plan. The SDMC deploys a system plan to a managed host only if the system plan level is supported by the SDMC, the format of the system plan is valid, and the hardware and each existing virtual server on the managed host passes validation.
Export the system plan	You can use the SDMC web interface to export a `system-plan` file from the SDMC to one of the following locations: • Save the `system-plan` file to the remote console (the computer from which you remotely access the SDMC). • Export the `system-plan` file to a remote FTP site. **Note:** You can also use the SDMC command-line interface to export a system plan.
View the system plan	You can view the contents of a `system-plan` file in the SDMC by using the System Plan Viewer that is integrated with the SDMC. The System Plan Viewer uses a navigation tree and tables to display the information in the `system-plan` file. It includes functions such as column sorting. You can open a system plan in the System Plan Viewer, either by using the View System Plan task or by clicking the name of a system plan. When you start the System Plan Viewer, enter your SDMC user ID and password to view the system plan. **Note:** Some messages, such as cabling instructions for internal drive bays, are viewable only when you use the System Plan Viewer in the SPT.
Print the system plan	You can use the System Plan Viewer to print a system plan that you have open in the System Plan Viewer. You can print all of the system plan or a portion of the system plan, depending on the current view of the system plan. To print the current view of the system plan, click **Print** on the Actions page of the System Plan Viewer.
Delete the system plan	You can delete unnecessary system plans from your SDMC.

Related concepts

"System Planning Tool" on page 116
The System Planning Tool (SPT) helps you design a managed host that can support a specified set of workloads.

"Optimizing data when creating a system plan" on page 129
The quantity and quality of hardware information that the IBM Systems Director Management Console (SDMC) can capture in a new system plan varies based on the operating environment of the virtual server for which you are capturing information.

"System plan validation" on page 138
You can deploy a system plan to a system that is managed by a IBM Systems Director Management Console (SDMC) managed host by using the System Plan Deployment wizard. The wizard validates the information in the system plan against the configuration of the managed host before beginning the deployment process.

Related tasks

"Creating a system plan"
You can use the IBM Systems Director Management Console (SDMC) to create a system plan, based on an existing system configuration, and then deploy that system plan to other managed hosts.

"Importing a system plan" on page 134
You can import a `system-plan` file into a IBM Systems Director Management Console (SDMC) from a remote FTP site or to the computer from which you remotely access the SDMC. You can then deploy the imported system plan to a system that the SDMC manages.

"Deploying a system plan" on page 136
You can use the IBM Systems Director Management Console (SDMC) to deploy all or part of a system plan to a managed host.

"Exporting a system plan" on page 141
You can export a `system-plan` file from the IBM Systems Director Management Console (SDMC) to a remote FTP site or to the computer from which you remotely access the SDMC.

"Viewing a system plan" on page 142
You can use the System Plan Viewer on the IBM Systems Director Management Console (SDMC) to view a system plan.

"Deleting a system plan" on page 143
Removing a system plan from the IBM Systems Director Management Console (SDMC) does not undo any virtual server or hardware configuration changes that occurred if the specified system plan was deployed to a managed host.

Creating a system plan

You can use the IBM Systems Director Management Console (SDMC) to create a system plan, based on an existing system configuration, and then deploy that system plan to other managed hosts.

When you create a system plan on the SDMC, you can deploy the resulting system plan to create identical virtual server configurations on managed hosts with identical hardware. The system plan contains specifications for the virtual servers and virtual server profiles of the managed host that you used as the basis of creating the system plan.

The new system plan also can contain hardware information that the SDMC is able to obtain from the selected managed host. However, the amount of hardware information that the SDMC can capture for the new system plan varies based by the method that the SDMC uses to gather the hardware information.

Note: System plans that are created by using the SDMC do not include VIOS provisioning information.

The SDMC uses the hardware discovery method to capture data about the hardware on your system. For example, when using hardware discovery, the SDMC can detect information about hardware that is unassigned to a virtual server or that is assigned to an inactive virtual server. Additionally, the SDMC can use the hardware discovery method to detect disk information for IBM i virtual servers.

Ensure that you meet the requirements for using the hardware discovery method before you create your system plan. See "Requirements for creating a system plan" for more information.

To create a system plan, complete the following steps by using the SDMC:

1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Expand **Hosts**, and select the managed host that you want to use as the basis for the new system plan.
3. Click **Actions**, and select **System Configuration** → **Manage System Plans**.
4. In the Manage System Plans window, select **Actions** → **Create**.
5. In the Create System Plan window, select the managed host that you want to use as the basis for the new system plan.
6. Enter a name and description for the new system plan.
7. Optional: Select whether you want to retrieve inactive and unallocated hardware resources.

   Note: If you do not select the **Retrieve inactive and unallocated hardware resources** option, the SDMC does not perform a new hardware discovery, but instead uses the data in the inventory cache on the system.

8. Optional: Select the **View system plan after creation** option if you want to view the system plan immediately after the SDMC creates it.
9. Click **Create**.

Now that you have a new system plan, you can export the system plan, import it to another managed host, and deploy the system plan to that managed host.

Alternative method: As an alternative to the SDMC web interface, you can run the `smcli psm mksysplan` command on the SDMC command-line interface to create a system plan based on the configuration of an existing managed host.

Related concepts

"System plans" on page 124
You can use system plans with the IBM Systems Director Management Console (SDMC) to perform a number of system management tasks.

Related tasks

"Importing a system plan" on page 134
You can import a `system-plan` file into a IBM Systems Director Management Console (SDMC) from a remote FTP site or to the computer from which you remotely access the SDMC. You can then deploy the imported system plan to a system that the SDMC manages.

"Deploying a system plan" on page 136
You can use the IBM Systems Director Management Console (SDMC) to deploy all or part of a system plan to a managed host.

"Exporting a system plan" on page 141
You can export a `system-plan` file from the IBM Systems Director Management Console (SDMC) to a remote FTP site or to the computer from which you remotely access the SDMC.

"Viewing a system plan" on page 142
You can use the System Plan Viewer on the IBM Systems Director Management Console (SDMC) to view a system plan.

"Deleting a system plan" on page 143
Removing a system plan from the IBM Systems Director Management Console (SDMC) does not undo any virtual server or hardware configuration changes that occurred if the specified system plan was deployed to a managed host.

Requirements for creating a system plan:

To use the IBM Systems Director Management Console (SDMC) to create a system plan successfully, ensure that your system meets the prerequisite conditions.

A system plan that you create by using SDMC contains hardware information that the SDMC is able to obtain from the selected managed host.

The SDMC uses the hardware discovery method to capture data about the hardware on your system. For example, when using hardware discovery, the SDMC can detect information about hardware that is unassigned to a virtual server or that is assigned to an inactive virtual server.

To create a system plan successfully, ensure that your system meets the requirements for hardware discovery.

If all requirements are met and system plan creation is failing with a specific type of problem or if you are not able to capture the type of information that you are expecting to capture, troubleshoot the possible nature of the problem and determine the potential actions that you can take to resolve the problem.

Related concepts

"Requirements for hardware discovery" on page 132
By meeting the requirements for using the hardware discovery process, you can enhance the quality and quantity of data that you collect in the system plans that you create on the IBM Systems Director Management Console (SDMC).

"Troubleshooting system plan creation" on page 133
Use this information to help resolve problems that you might encounter when you create a system plan by using the IBM Systems Director Management Console (SDMC).

Optimizing data when creating a system plan:

The quantity and quality of hardware information that the IBM Systems Director Management Console (SDMC) can capture in a new system plan varies based on the operating environment of the virtual server for which you are capturing information.

The data that you use in the System Planning Tool (SPT) is only as good as the data that you capture when you create your system plan.

The following factors affect the quantity of hardware information in a system plan that you create:
- Type and level of management tool.
- Operating environment. You can capture more data for virtual servers that run IBM i than for virtual servers that run on AIX or Linux operating systems.

Related concepts

"System plan conversion" on page 117
You can convert a `system-plan` file that you have created, by using the IBM Systems Director Management Console (SDMC), into the format that the System Planning Tool (SPT) uses.

"Limitations of system plan conversion" on page 120
You can convert a system plan that you created on the IBM Systems Director Management Console (SDMC) for use in the System Planning Tool (SPT). However, there are some limitations in the data that the SPT can convert.

"Troubleshooting system plan conversion" on page 123
When you convert a system plan into the format that the System Planning Tool (SPT) uses, you might encounter some problems that you must resolve or understand better.

"System plans" on page 124
You can use system plans with the IBM Systems Director Management Console (SDMC) to perform a number of system management tasks.

Hardware discovery process:

The IBM Systems Director Management Console (SDMC) uses the hardware discovery process to capture additional information in a system plan about the hardware on a managed host.

Some systems are capable of providing greater details about their hardware inventory through the process of hardware discovery. Hence, you can create a system plan with more extensive hardware information. By using the hardware discovery process, the SDMC can capture information about hardware that does not have a virtual server assignment and hardware with assignments to inactive virtual servers.
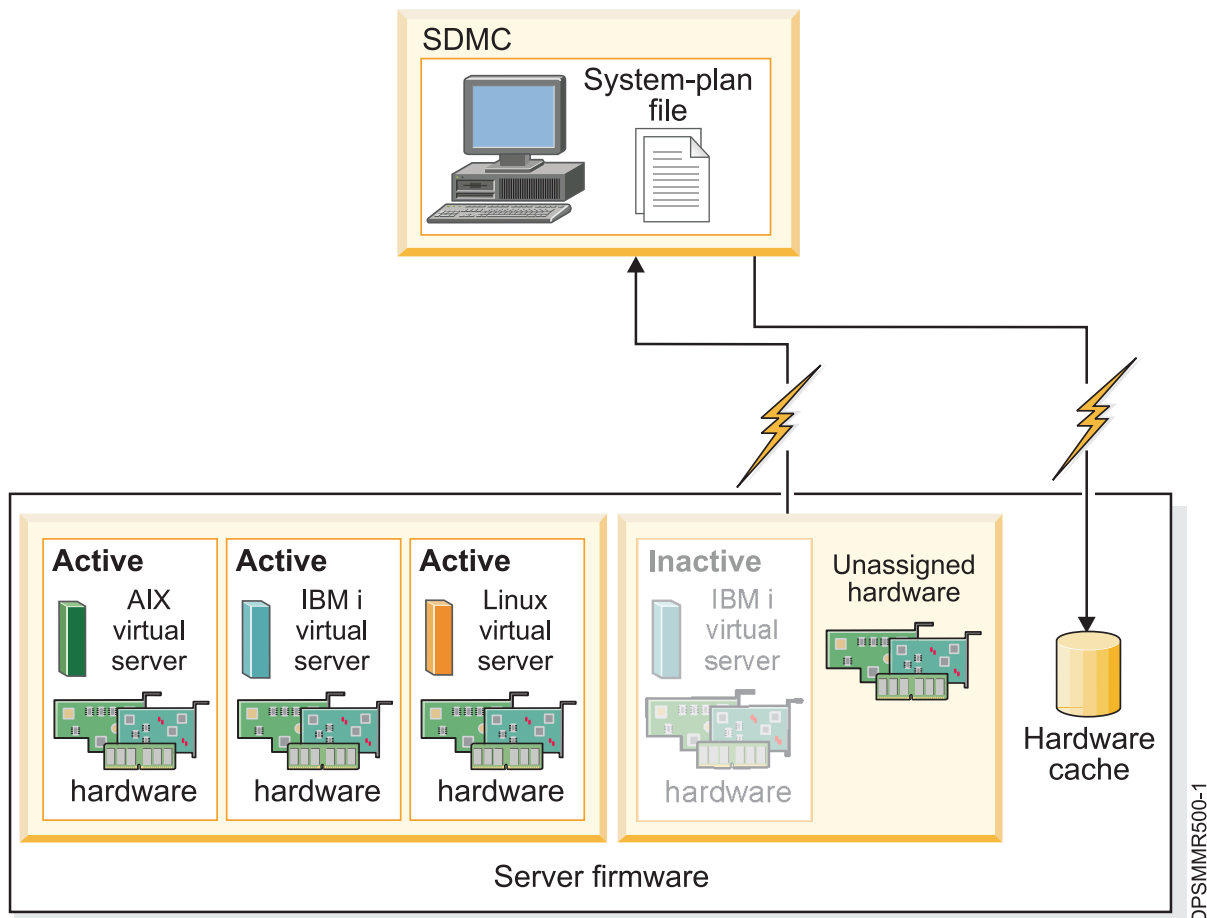
Additionally, the hardware discovery process writes hardware inventory information to a cache on the system. The hardware inventory cache ensures that a certain amount of hardware information is available on the system when you create a system plan. If a virtual server is active, the hardware discovery process cannot capture hardware information from the virtual server to update the hardware cache.

On a system that can use hardware discovery, the hardware discovery process runs whenever the system is powered on in hardware discovery mode. When you enable this option, the system powers on in a special mode that performs the hardware discovery process and records hardware inventory information to a cache on the system. This collected information is then available for use when you display data for I/O devices or when you create a system plan.

You also can run the hardware discovery process when you create a system plan. In the Create System Plan page, you can use the **Retrieve inactive and unallocated hardware resources** option to capture hardware configuration information for the managed host, regardless of the state of the hardware.

If the new or changed hardware is deallocated from a virtual server, use the **Retrieve inactive and unallocated hardware resources** option whenever you add or change the hardware. Otherwise, if the new or changed hardware is allocated to a virtual server, use this option to create the system plan when the virtual server is inactive. Doing so ensures that the inventory cache has the most current data possible.

The following figure illustrates how the hardware discovery process works when you select this option.

The SDMC uses hardware discovery to collect information about the hardware assigned to the inactive IBM i virtual server and about the unassigned hardware on the system. The SDMC writes all the data collected by this process to the system plan. The data collected through hardware discovery is also written to the inventory cache on the system. The SDMC uses both sources of information to create the `system-plan` file.

When you create a system plan and do not select the **Retrieve inactive and unallocated hardware resources** option, the SDMC does not perform a new hardware discovery. Instead the SDMC uses the data in the inventory cache on the system.

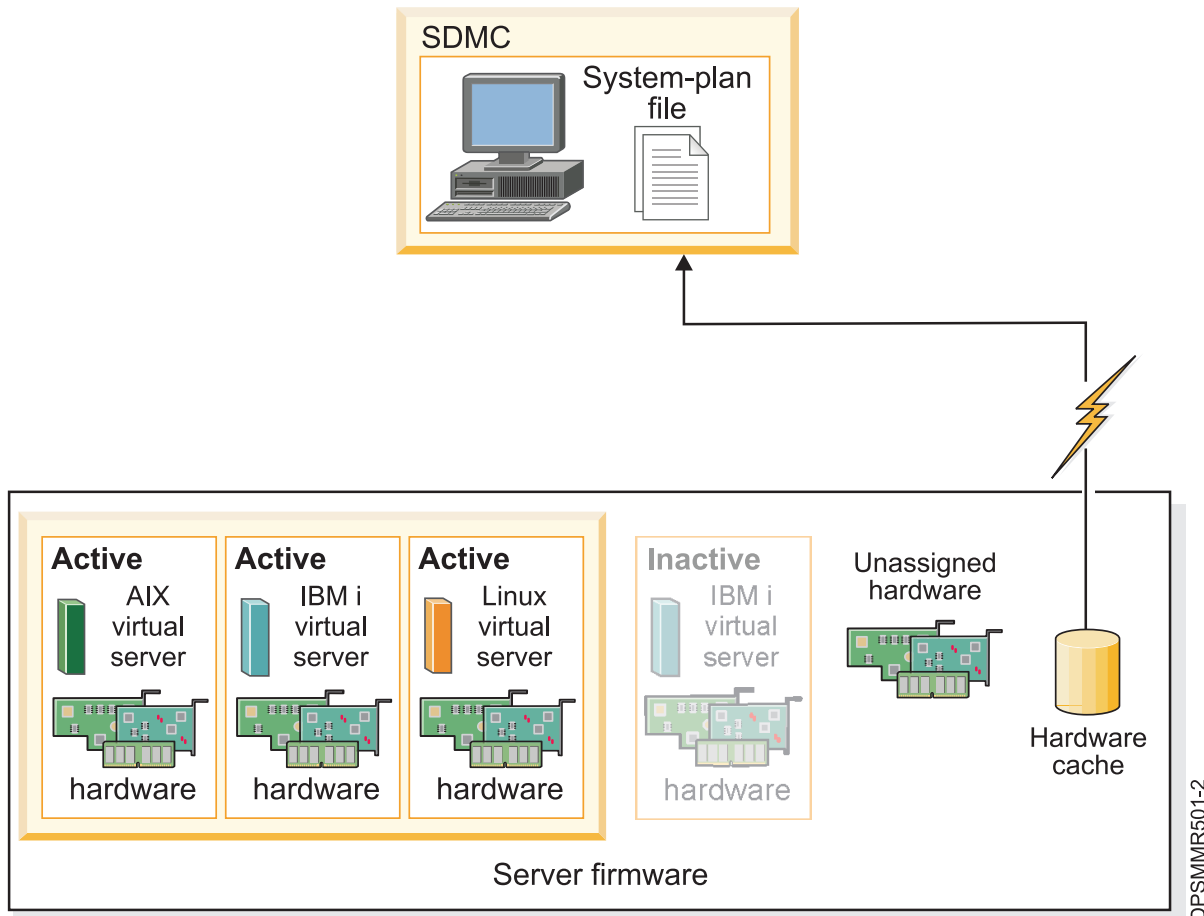The following figure illustrates how the hardware discovery process works when you do not select this option.

You can also use the `smcli psm mksysplan` command from the SDMC command-line interface to perform hardware discovery. When you run the `smcli psm mksysplan` command, the hardware inventory cache is updated with information about the hardware assigned to the inactive virtual servers and the unassigned hardware on the system. When you move or replace hardware, run the `smcli psm mksysplan` command from the SDMC command-line interface to update the hardware inventory cache with the current information.

Requirements for hardware discovery:

By meeting the requirements for using the hardware discovery process, you can enhance the quality and quantity of data that you collect in the system plans that you create on the IBM Systems Director Management Console (SDMC).

To use the hardware discovery capability when you create a system plan, ensure that you complete the following tasks:

- Ensure that a minimum of 0.5 processor is available.
- Ensure that a minimum of 256 MB of free memory is available.

  Note: If you do not have the minimum processor or memory available, you can meet these requirements either by shutting down one or more virtual servers or by adjusting dynamic processor and memory settings for one or more virtual servers.

- Ensure that all virtual servers on the managed host for which you want to use the hardware discovery process are inactive to maximize the information that the hardware discovery process can capture. If a virtual server is active, the hardware discovery process cannot capture new information from the

virtual server and instead retrieves information about the hardware assigned to the inactive virtual server from the hardware inventory cache on the managed host.

Note: Hardware discovery does not require the use of Resource Monitoring and Control (RMC).

- Ensure that the **Power off the system after all the virtual servers are powered off** option for the managed system is not selected. The hardware discovery process starts virtual servers and powers off virtual servers to gather information. If the hardware discovery process powers off the only running virtual server on the system, the managed host powers off and the system plan creation fails.

  To verify the setting for this system attribute, complete the following steps by using the SDMC:

  1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
  2. Expand **Hosts**, and select the managed host.
  3. Click **Actions**, and select **System Configuration** → **Edit Host**.
  4. In the Edit Host window, click the **General** tab, and verify that the **Power off the system after all the virtual servers are powered off** option is not selected.
  5. Click **OK**.

Related concepts

"Requirements for creating a system plan" on page 128
To use the IBM Systems Director Management Console (SDMC) to create a system plan successfully, ensure that your system meets the prerequisite conditions.

Tips for maximizing data in a system plan:

By setting up your system to optimize the hardware information that you capture in a system plan, created by using the IBM Systems Director Management Console (SDMC), you can ensure that your system plan provides you with the most valuable information possible.

Setting up your system to optimize the hardware information that you capture in a system plan also ensures that you have the most usable configuration information possible when you convert the system plan for use in the System Planning Tool.

To ensure that you get the most detailed and complete data in your system plans, after you place all the hardware in the system and verify that any internal-drive bay cabling and external SCSI cabling is correct, maximize the amount of data in the inventory cache and keep the inventory cache current on the managed host. You can perform this action in one of following ways:

- Power on your system with the **Hardware Discovery** option selected. Perform this action when you initially power on the system and whenever you add, remove, or move hardware on your system when making such a change requires that you power down the system to do so.
- You can also use the `smcli psm mksysplan` command from the SDMC command-line interface to perform hardware discovery. When you run the `smcli psm mksysplan` command, the hardware inventory cache is updated with information about the hardware assigned to the inactive virtual servers and the unassigned hardware on the system. When you move or replace hardware, run the `smcli psm mksysplan` command from the SDMC command-line interface to update the hardware inventory cache with the current information.
- When you add, remove, or move hardware and such a change does not require that you power off the system to do so, update the cache by creating a system plan with the **Retrieve inactive and unallocated hardware resources** option selected. Create the system plan when the affected virtual servers are inactive.

Troubleshooting system plan creation:

Use this information to help resolve problems that you might encounter when you create a system plan by using the IBM Systems Director Management Console (SDMC).

Use the SDMC to create system plans to capture the highest quality and quantity of data from the managed host.

The system plan creation process writes any messages, including error messages, to the /var/hsc/log/mksysplan.log log. Use the information provided in this table to determine the type of problem you have and potential solutions for resolving the problem.

The following table contains information about resolving various errors that you might encounter when you create a system plan.

Table 28. Problems and solutions for system plan creation

Problem description	Corrective actions
The system plan that I created on the SDMC for my POWER processor-based server does not contain any VIOS provisioning information for the virtual servers.	You cannot create a system plan with this type of information on the SDMC.
My system plan creation on the SDMC fails with an error message similar to the following example: `A system plan cannot be created from or deployed on the system when the system has its power off policy set to power off the system after all the virtual servers are powered off. Set the properties for this system to not power off after all the virtual servers are powered off to create or deploy the system plan.` This type of failure occurs during system plan creation on a POWER7 processor-based server because the attribute of **Power off the system after all the virtual servers are powered off** is selected on the **General** page in the Edit Host window.	To successfully use the hardware discovery process to create a system plan, ensure that the **Power off the system after all the virtual servers are powered off** attribute for the managed host is not selected. To verify this system attribute, complete the following steps: 1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed. 2. Expand **Hosts**, and select the managed host. 3. Click **Actions**, and select **System Configuration → Edit Host**. 4. In the Edit Host window, click the **General** tab, and verify that the **Power off the system after all the virtual servers are powered off** option is not selected. 5. Click **OK**.
After I created my system plan, a virtual server that I did not create, with the name IOR Collection LP, exists on my system. How did this virtual server get on my system and can I delete it? During the hardware discovery process, a new virtual server named IOR Collection LP is created temporarily. This virtual server is typically deleted by the hardware discovery process just before the `smcli psm mksysplan` command is completed. If the `smcli psm mksysplan` command or creating the system plan in the SDMC completed, and the IOR Collection LP continues to exist after waiting several minutes, report the problem to the SDMC technical support.	Contact IBM support, and additionally complete the following steps to delete the IOR Collection LP virtual server: 1. Write down the virtual server ID from the virtual server view of the system on the SDMC. 2. Open a terminal connection to the SDMC, either on the SDMC console or remotely. 3. Enter this command: `smcli psm rmsyscfg -r lpar -m <managed system name> --id <virtual server id>` 4. For more information, enter `smcli psm rmsyscfg --help` for help about this command.

Related concepts

"Requirements for creating a system plan" on page 128
To use the IBM Systems Director Management Console (SDMC) to create a system plan successfully, ensure that your system meets the prerequisite conditions.

Importing a system plan

You can import a system-plan file into a IBM Systems Director Management Console (SDMC) from a remote FTP site or to the computer from which you remotely access the SDMC. You can then deploy the imported system plan to a system that the SDMC manages.

You can import a `system-plan` file into the SDMC from any of the following locations:
- From the computer on which you remotely access the SDMC.
- From a remote site by using FTP. To use this option, the following requirements must be met:
  - The SDMC must have a network connection to the remote site.
  - An FTP server must be active on the remote site.
  - Port 21 must be open on the remote site.

Note: You cannot import a system plan that has an identical name to any system plan that is available on the SDMC.

To import a `system-plan` file, you must be a super administrator.

To import a `system-plan` file, complete the following steps by using the SDMC:
1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Click **Actions**, and select **System Configuration** → **Manage System Plans**.
3. In the Manage System Plans window, select **Actions** → **Import**.
4. In the Import System Plan window, select the source of the `system-plan` file that you want to import. The following table describes the appropriate steps to be completed for importing the system plan from the selected source location of the file.

Source of the system plan to import	Complete the following steps:
This computer	1. Select **Import from this computer to the management console**. 2. Click **Import** → **Browse**. 3. Select the `system-plan` file that you want to import and click **Open**. 4. Click **OK** to upload the file.
Remote FTP site	1. Select **Import from a remote FTP site**. 2. In the **System plan file name** field, enter the name of the system-plan file. **Note:** The name of the `system-plan` file must end with the `.sysplan` file name suffix and must use alphanumeric characters only. 3. In the **Remote site hostname** field, enter the host name or IP address of the remote FTP site. 4. In the **User ID** field, enter the user ID to use to access the remote FTP site. 5. In the **Password** field, enter the password to use to access the remote FTP site. 6. In the **Remote directory** field, enter the path in which the `system-plan` file is located on the remote FTP site. If you do not enter a path, the SDMC uses the default path specified on the remote FTP site.

5. Click **Import**. If the SDMC returns an error, return to the Import System Plan window and verify that the information you entered is correct. If necessary, click **Cancel**, return to step 3, and perform the procedure again, ensuring that the information you specify at each step is correct.

Alternative method: As an alternative to the SDMC web interface, you can run the `smcli psm cpsysplan` command on the SDMC command-line interface to import a system plan.

When you complete the process of importing the `system-plan` file, you can deploy the system plan in the `system-plan` file to a system that the SDMC manages.

Related concepts

"System plans" on page 124
You can use system plans with the IBM Systems Director Management Console (SDMC) to perform a number of system management tasks.

Related tasks

"Creating a system plan" on page 127
You can use the IBM Systems Director Management Console (SDMC) to create a system plan, based on an existing system configuration, and then deploy that system plan to other managed hosts.

"Deploying a system plan"
You can use the IBM Systems Director Management Console (SDMC) to deploy all or part of a system plan to a managed host.

"Exporting a system plan" on page 141
You can export a `system-plan` file from the IBM Systems Director Management Console (SDMC) to a remote FTP site or to the computer from which you remotely access the SDMC.

"Viewing a system plan" on page 142
You can use the System Plan Viewer on the IBM Systems Director Management Console (SDMC) to view a system plan.

"Deleting a system plan" on page 143
Removing a system plan from the IBM Systems Director Management Console (SDMC) does not undo any virtual server or hardware configuration changes that occurred if the specified system plan was deployed to a managed host.

Deploying a system plan

You can use the IBM Systems Director Management Console (SDMC) to deploy all or part of a system plan to a managed host.

When you deploy a system plan, the SDMC creates virtual servers on the managed host according to the specifications in the system plan.

You do not have to deploy a system plan in its entirety. Instead, you can partially deploy a system plan on the target system by selecting the virtual servers in the plan to deploy. You can run the Deploy System Plan wizard again at another time to deploy the remainder of the virtual servers in the system plan.

Note: The SDMC does not support VIOS provisioning and operating environment installation when you deploy a system plan.

Before you deploy a system plan, complete the following tasks:

- Ensure that the `system-plan` file exists on the SDMC. If the `system-plan` file does not exist on the SDMC, you must import the `system-plan` file into the SDMC. For instructions, see "Importing a system plan" on page 134.
- Ensure that you meet all the appropriate requirements for deploying the system plan. See "Requirements for deploying a system plan" on page 137 for more information.

To deploy a system plan on a managed host, complete the following steps by using the SDMC:

1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Click **Actions**, and select **System Configuration** → **Manage System Plans**.
3. In the Manage System Plans window, select the system plan that you want to deploy.
4. Select **Actions** → **Deploy**.
5. On the Deploy System Plan wizard, complete the following steps:
   a. Select the `system-plan` file that contains the system plan that you want to deploy.

b. Select the managed host to which you want to deploy the system plan and click **Next**. If the system plan does not match the managed host to which you want to deploy the plan, the wizard displays a window with this information. Click **OK** to continue, or **Cancel** to select a different system plan.

   Note: If the `system-plan` file contains multiple system plans, the wizard provides a step so that you can select a specific system plan from the file. The wizard does not provide this step unless more than one system plan is in the specified file.

6. On the Validation page, complete the following steps:

   a. Wait for the wizard to validate the managed host and its hardware against the system plan. The validation process can take several minutes.

   b. If the validation process completes successfully, click **Next**.

   c. If the validation process fails, click **Cancel** to exit the wizard. Correct the problems that the error messages indicate and restart this procedure from the beginning. To help you correct any validation problems, you might want to create a system plan that is based on the current configuration of the managed host. By using such a system plan, you can compare the system plan that you want to deploy with the current configuration of the managed host. You can do this by creating the system plan in the SDMC or by running the following command from the SDMC command-line interface:

   `smcli psm mksysplan -m name_of_managed_system -f name_of_new_system_plan.sysplan`

7. Optional: On the Virtual Server Deployment page, select the virtual server plan actions to deploy to the managed host and click **Next**. Virtual serial adapters are required in virtual slots 0 and 1 for each virtual server. You cannot create the virtual server unless you create these virtual serial adapters.

8. On the Summary page, review the system deployment step order and click **Deploy**. The SDMC uses the system plan to create the specified virtual servers. This process can take several minutes.

After you finish the deployment of the system plan, you can install operating environments and software on the virtual servers.

Related concepts

"System plans" on page 124
You can use system plans with the IBM Systems Director Management Console (SDMC) to perform a number of system management tasks.

Related tasks

"Creating a system plan" on page 127
You can use the IBM Systems Director Management Console (SDMC) to create a system plan, based on an existing system configuration, and then deploy that system plan to other managed hosts.

"Importing a system plan" on page 134
You can import a `system-plan` file into a IBM Systems Director Management Console (SDMC) from a remote FTP site or to the computer from which you remotely access the SDMC. You can then deploy the imported system plan to a system that the SDMC manages.

"Exporting a system plan" on page 141
You can export a `system-plan` file from the IBM Systems Director Management Console (SDMC) to a remote FTP site or to the computer from which you remotely access the SDMC.

"Viewing a system plan" on page 142
You can use the System Plan Viewer on the IBM Systems Director Management Console (SDMC) to view a system plan.

"Deleting a system plan" on page 143
Removing a system plan from the IBM Systems Director Management Console (SDMC) does not undo any virtual server or hardware configuration changes that occurred if the specified system plan was deployed to a managed host.

Requirements for deploying a system plan:

To use the IBM Systems Director Management Console (SDMC) to deploy a system plan successfully, you must ensure that your system meets the prerequisite conditions.

To deploy or to create a system plan successfully, ensure that your system meets the requirements listed in the following table.

Table 29. Hardware validation prerequisites for system plan deployment

Prerequisite	Description
System setup	Delete the virtual server that was provided with your server, and delete any other virtual server that is not in the system plan. For instructions, see Deleting a virtual server. The name of the virtual server that was provided with the server is the serial number of the managed host, and the name of the virtual server profile is default_profile.
Requirements for physical disk I/O adapter	Locate the physical disk I/O adapters that belong to each virtual server. Verify that the disk drives that are attached to these physical I/O adapters support the configuration for each virtual server that you want. The Deploy System Plan wizard only validates that the physical disk I/O adapters match the system plan. It does not validate that the disk drives are configured for the physical disk I/O adapters. If you are deploying a system plan that you created in the System Planning Tool (SPT), verify that all hardware is in the correct location, and that internal drive bays and external SCSI cables are cabled according to SPT instructions. If you are deploying a system plan that you created by using the SDMC, verify that the hardware and cabling on the target system is identical to that on the source system. If the system plan includes a storage area network (SAN) or fibre channel adapters, ensure that the adapters are cabled and that the SAN is configured.

If you meet all the listed prerequisite conditions and system plan deployment is failing with a specific type of problem, troubleshoot the possible nature of the problem and determine the potential actions that you can take to resolve the problem.

Related concepts

"Troubleshooting system plan deployment" on page 140
Use the following information to help resolve problems that you might encounter when deploying a system plan with the IBM Systems Director Management Console (SDMC).

System plan validation:

You can deploy a system plan to a system that is managed by a IBM Systems Director Management Console (SDMC) managed host by using the System Plan Deployment wizard. The wizard validates the information in the system plan against the configuration of the managed host before beginning the deployment process.

The Deploy System Plan wizard validates the system plan before deployment to ensure that it can be deployed successfully. The wizard validates the system plan in two phases. The first phase of the validation process is hardware validation. During this phase, the wizard validates that the processors, memory, and I/O adapters that are available on the managed host match or exceed those that the system plan specifies. The wizard also validates that the hardware placement on the managed host matches the hardware placement that the system plan specifies.

The second phase of the validation process is virtual server validation. During this phase, the wizard validates that the virtual servers on the managed host match the virtual servers in the system plan.

If any step in the virtual server validation process fails for the system plan, validation of the entire system plan fails.

Related concepts

"System plan conversion" on page 117
You can convert a `system-plan` file that you have created, by using the IBM Systems Director Management Console (SDMC), into the format that the System Planning Tool (SPT) uses.

"System plans" on page 124
You can use system plans with the IBM Systems Director Management Console (SDMC) to perform a number of system management tasks.

"Troubleshooting system plan deployment" on page 140
Use the following information to help resolve problems that you might encounter when deploying a system plan with the IBM Systems Director Management Console (SDMC).

Hardware validation:

During the hardware validation process, the IBM Systems Director Management Console (SDMC) compares the hardware information in the system plan with the hardware available on the managed host to ensure that the system plan can deploy successfully to the target managed host.

When validating the hardware on the managed host, the SDMC compares the following information from the system plan with the hardware available on the managed host:

- Processor and memory amounts, including 5250 commercial processing workload (5250 CPW) where applicable
- Physical I/O adapter placement

The hardware described in the system plan passes validation if it matches the hardware specified by the managed host. The hardware on the managed host can contain resources in addition to those resources specified in the system plan and still pass validation. However, the hardware on the managed host must at least match the hardware specified in the system plan.

For example, a system plan specifies a server with two processors, 8 GB of memory, and a specific placement of physical I/O adapters within the system. A server that contains two processors, 16 GB of memory, a matching placement of physical I/O adapters within the system, and an expansion unit with additional physical I/O adapters would allow the system to pass validation. A server that contains 4 GB of memory can cause the system to fail validation. A system plan can also fail validation if the system plan specifies one type of physical I/O adapter in a slot but the actual system has a different type of physical I/O adapter in that slot. However, if the system plan specifies an empty slot, the validation allows any type of physical I/O adapter to be in that slot on the actual system.

The SDMC does not validate the disk drives that are attached to physical I/O adapters against the disk drives specified in the system plan. You must ensure that the disk drives installed in the managed host support the virtual server configuration that you want. The SDMC also does not validate the internal-drive bay cabling and external SCSI cabling with what is specified in a system plan, which was created in the System Planning Tool (SPT). You must validate these items manually before you deploy the system plan. Embedded devices automatically pass hardware validation because they are embedded into the system and cannot be removed.

Virtual server validation:

During the virtual server validation process, the IBM Systems Director Management Console (SDMC) compares the virtual server information in the system plan with any existing virtual servers on the managed host to ensure that the system plan can deploy successfully to the target managed host.

Any existing virtual server found on the managed host must appear in the system plan and must match the system plan as it appears on the managed host. For example, hardware on the managed host that is

referenced by the actual virtual server must at least match the hardware referenced by that same virtual server in the system plan. When validating an existing virtual server, the SDMC validates the following items for that virtual server:

1. Whether a virtual server in the system plan has the same virtual server ID and name as the existing virtual server specified in the system default configuration.
2. Whether an existing virtual server has virtual server profiles that match each virtual server profile specified for the virtual server in the system plan.
3. Whether the virtual server profiles for any existing virtual servers contain the resources specified in the corresponding virtual server profiles in the system plan.
4. Whether the virtual server on the managed host has only those same virtual adapters and adapter types (and that they use the same adapter ports) as those specified for the virtual server in the system plan.

For example, if the server has an existing virtual server with a virtual server ID of 1, the SDMC examines the virtual server in the system plan that has a virtual server ID of 1. If this virtual server exists and has a virtual server profile that is named SUPPORT, the SDMC looks at the existing virtual server to determine whether it also has a virtual server profile that is named SUPPORT. If so, the SDMC verifies that the resources specified in the SUPPORT virtual server profile in the system plan are contained in the SUPPORT virtual server profile in the existing virtual server.

When the SDMC validates virtual server profiles, it compares the following resources in the virtual server profiles:

- Processor and memory amounts, including 5250 commercial processing workload (5250 CPW) where applicable
- Physical I/O slot assignments

The following examples illustrate how the SDMC compares resources in the virtual server profiles during the validation process to determine whether the system plan is valid for a managed host:

- If the SUPPORT virtual server profile in the system plan specifies 2 GB of memory and the SUPPORT virtual server profile for the existing virtual server specifies 3 GB of memory, the amount of memory is valid.
- If the SUPPORT virtual server profile in the system plan specifies 4 GB of memory and the SUPPORT virtual server profile for the existing virtual server specifies 3 GB of memory, the amount of memory is not valid.
- If physical I/O slot P1 is assigned to the SUPPORT virtual server profile in the system plan but not to the SUPPORT virtual server profile for the existing virtual server, the physical slot assignment is not valid.
- If physical I/O slot P2 is not assigned to the SUPPORT virtual server profile in the system plan, it does not matter whether slot P2 is assigned to the SUPPORT virtual server profile for the existing virtual server.

Troubleshooting system plan deployment:

Use the following information to help resolve problems that you might encounter when deploying a system plan with the IBM Systems Director Management Console (SDMC).

The system plan deployment process writes any messages, including error messages, to the `/var/hsc/log/iqzdtrac.trm` file or to the `/var/hsc/log/deploy_validation.log` file if there are validation errors.

When you deploy a system plan, the validation process checks the information in the system plan with the configuration of the managed host. Some differences between the plan and the system can result in either hardware or virtual server validation errors. To deploy the system plan successfully, you must either change the system plan or change the target managed host.

Related concepts

"Requirements for deploying a system plan" on page 137
To use the IBM Systems Director Management Console (SDMC) to deploy a system plan successfully, you must ensure that your system meets the prerequisite conditions.

"System plan validation" on page 138
You can deploy a system plan to a system that is managed by a IBM Systems Director Management Console (SDMC) managed host by using the System Plan Deployment wizard. The wizard validates the information in the system plan against the configuration of the managed host before beginning the deployment process.

Exporting a system plan

You can export a `system-plan` file from the IBM Systems Director Management Console (SDMC) to a remote FTP site or to the computer from which you remotely access the SDMC.

You can export a `system-plan` file from the SDMC to any of the following locations:

- To the computer on which you remotely access the SDMC.
- To a remote site by using FTP. This allows you to import the `system-plan` file into a different SDMC and deploy the system plan to a managed host with identical hardware. To use this option, you must fulfill the following requirements:
  - The SDMC must have a network connection to the remote site.
  - An FTP server must be active on the remote site.
  - Port 21 must be open on the remote site.

To export a `system-plan` file, you must be a super administrator.

To export a `system-plan` file that is stored on the SDMC, complete the following steps by using the SDMC:

1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Click **Actions**, and select **System Configuration** → **Manage System Plans**.
3. In the Manage System Plans window, select the `system-plan` file that you want to export.
4. Select **Actions** → **Export**.
5. In the Export System Plan window, select the export destination for the system plan. The following table describes the appropriate steps to be completed for exporting the system plan to the selected destination location of the file.

Export destination for the system plan	Complete the following steps:
This computer	1. Select **Export to this computer from the management console by clicking the following link**. 2. Click the file name link and use the save file function of your browser to save the file to a location on your local file system. 3. Click **OK** to close the window after you have saved the file.

Export destination for the system plan	Complete the following steps:
Remote FTP site	1. Select **Export to a remote site**. 2. Enter the host name or IP address of the remote FTP site into the **Remote site hostname** field. 3. Enter the user ID to use to access the remote FTP site into the **User ID** field. 4. Enter the password to use to access the remote FTP site into the **Password** field. 5. Enter the path to which you want to export the `system-plan` file into the **Remote directory** field. If you do not enter a path, the SDMC exports the `system-plan` file to the default path specified on the remote FTP site.

6. Click **Export**. If the SDMC returns an error, verify that the information you entered in this window is correct. If necessary, click **Cancel**, return to step 4 on page 141, and perform the procedure again, ensuring that the information you specify at each step is correct.

Alternative method: As an alternative to the SDMC web interface, you can use the `smcli psm cpsysplan` command from the SDMC command-line interface to export a system plan.

Related concepts

"System plans" on page 124
You can use system plans with the IBM Systems Director Management Console (SDMC) to perform a number of system management tasks.

Related tasks

"Creating a system plan" on page 127
You can use the IBM Systems Director Management Console (SDMC) to create a system plan, based on an existing system configuration, and then deploy that system plan to other managed hosts.

"Importing a system plan" on page 134
You can import a `system-plan` file into a IBM Systems Director Management Console (SDMC) from a remote FTP site or to the computer from which you remotely access the SDMC. You can then deploy the imported system plan to a system that the SDMC manages.

"Deploying a system plan" on page 136
You can use the IBM Systems Director Management Console (SDMC) to deploy all or part of a system plan to a managed host.

"Viewing a system plan"
You can use the System Plan Viewer on the IBM Systems Director Management Console (SDMC) to view a system plan.

"Deleting a system plan" on page 143
Removing a system plan from the IBM Systems Director Management Console (SDMC) does not undo any virtual server or hardware configuration changes that occurred if the specified system plan was deployed to a managed host.

Viewing a system plan

You can use the System Plan Viewer on the IBM Systems Director Management Console (SDMC) to view a system plan.

The System Plan Viewer uses a navigation tree and tables to display the information in a `system-plan` file. The viewer includes the column sorting function. The System Plan Viewer is included with the SDMC so that it can be accessed from the SDMC. However, you must re-enter your user ID and password before you can view the system plan.

Note: Some messages, such as internal-drive bay cabling instructions, are viewable only when using the System Plan Viewer in the System Planning Tool (SPT).

To view a system plan, complete the following steps by using the SDMC:

1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Click **Actions**, and select **System Configuration** → **Manage System Plans**.
3. In the Manage System Plans window, select the system plan that you want to view.
4. Select **Actions** → **View**. The System Plan Viewer opens in a separate browser window.

   Note: You can also open the system plan in the System Plan Viewer by clicking the name of the system plan.

5. Enter your SDMC **Username** and **Password** to log in to the System Plan Viewer.

Related concepts

"System plans" on page 124
You can use system plans with the IBM Systems Director Management Console (SDMC) to perform a number of system management tasks.

Related tasks

"Creating a system plan" on page 127
You can use the IBM Systems Director Management Console (SDMC) to create a system plan, based on an existing system configuration, and then deploy that system plan to other managed hosts.

"Importing a system plan" on page 134
You can import a `system-plan` file into a IBM Systems Director Management Console (SDMC) from a remote FTP site or to the computer from which you remotely access the SDMC. You can then deploy the imported system plan to a system that the SDMC manages.

"Deploying a system plan" on page 136
You can use the IBM Systems Director Management Console (SDMC) to deploy all or part of a system plan to a managed host.

"Exporting a system plan" on page 141
You can export a `system-plan` file from the IBM Systems Director Management Console (SDMC) to a remote FTP site or to the computer from which you remotely access the SDMC.

"Deleting a system plan"
Removing a system plan from the IBM Systems Director Management Console (SDMC) does not undo any virtual server or hardware configuration changes that occurred if the specified system plan was deployed to a managed host.

Deleting a system plan

Removing a system plan from the IBM Systems Director Management Console (SDMC) does not undo any virtual server or hardware configuration changes that occurred if the specified system plan was deployed to a managed host.

To remove a system plan, complete the following steps by using the SDMC:

1. On the Welcome page, click the **Resources** tab. The Power Systems Resources pane is displayed.
2. Click **Actions**, and select **System Configuration** → **Manage System Plans**.
3. In the Manage System Plans window, select the system plan that you want to delete.
4. Select **Actions** → **Remove**.
5. In the Remove System Plans window, confirm that the system plan is the one that you want to remove and click **Remove System Plan** to delete the system plan.

Related concepts

"System plans" on page 124
You can use system plans with the IBM Systems Director Management Console (SDMC) to perform a number of system management tasks.

Related tasks

"Creating a system plan" on page 127
You can use the IBM Systems Director Management Console (SDMC) to create a system plan, based on an existing system configuration, and then deploy that system plan to other managed hosts.

"Importing a system plan" on page 134
You can import a `system-plan` file into a IBM Systems Director Management Console (SDMC) from a remote FTP site or to the computer from which you remotely access the SDMC. You can then deploy the imported system plan to a system that the SDMC manages.

"Deploying a system plan" on page 136
You can use the IBM Systems Director Management Console (SDMC) to deploy all or part of a system plan to a managed host.

"Exporting a system plan" on page 141
You can export a `system-plan` file from the IBM Systems Director Management Console (SDMC) to a remote FTP site or to the computer from which you remotely access the SDMC.

"Viewing a system plan" on page 142
You can use the System Plan Viewer on the IBM Systems Director Management Console (SDMC) to view a system plan.

Notices

This information was developed for products and services offered in the U.S.A.

The manufacturer may not offer the products, services, or features discussed in this document in other countries. Consult the manufacturer's representative for information on the products and services currently available in your area. Any reference to the manufacturer's product, program, or service is not intended to state or imply that only that product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any intellectual property right of the manufacturer may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any product, program, or service.

The manufacturer may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not grant you any license to these patents. You can send license inquiries, in writing, to the manufacturer.

For license inquiries regarding double-byte character set (DBCS) information, contact the Intellectual Property Department in your country or send inquiries, in writing, to the manufacturer.

The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law: THIS INFORMATION IS PROVIDED "AS IS " WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. The manufacturer may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to websites not owned by the manufacturer are provided for convenience only and do not in any manner serve as an endorsement of those websites. The materials at those websites are not part of the materials for this product and use of those websites is at your own risk.

The manufacturer may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Licensees of this program who wish to have information about it for the purpose of enabling: (i) the exchange of information between independently created programs and other programs (including this one) and (ii) the mutual use of the information which has been exchanged, should contact the manufacturer.

Such information may be available, subject to appropriate terms and conditions, including in some cases, payment of a fee.

The licensed program described in this document and all licensed material available for it are provided by IBM under terms of the IBM Customer Agreement, IBM International Program License Agreement, IBM License Agreement for Machine Code, or any equivalent agreement between us.

Any performance data contained herein was determined in a controlled environment. Therefore, the results obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the

same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

Information concerning products not produced by this manufacturer was obtained from the suppliers of those products, their published announcements or other publicly available sources. This manufacturer has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to products not produced by this manufacturer. Questions on the capabilities of products not produced by this manufacturer should be addressed to the suppliers of those products.

All statements regarding the manufacturer's future direction or intent are subject to change or withdrawal without notice, and represent goals and objectives only.

The manufacturer's prices shown are the manufacturer's suggested retail prices, are current and are subject to change without notice. Dealer prices may vary.

This information is for planning purposes only. The information herein is subject to change before the products described become available.

This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

COPYRIGHT LICENSE:

This information contains sample application programs in source language, which illustrate programming techniques on various operating platforms. You may copy, modify, and distribute these sample programs in any form without payment to the manufacturer, for the purposes of developing, using, marketing or distributing application programs conforming to the application programming interface for the operating platform for which the sample programs are written. These examples have not been thoroughly tested under all conditions. The manufacturer, therefore, cannot guarantee or imply reliability, serviceability, or function of these programs. The sample programs are provided "AS IS", without warranty of any kind. The manufacturer shall not be liable for any damages arising out of your use of the sample programs.

Each copy or any portion of these sample programs or any derivative work, must include a copyright notice as follows:

© (your company name) (year). Portions of this code are derived from IBM Corp. Sample Programs. © Copyright IBM Corp. _enter the year or years_.

If you are viewing this information in softcopy, the photographs and color illustrations may not appear.

Programming interface information

This Managing system resources using the SDMC publication documents intended Programming Interfaces that allow the customer to write programs to obtain the services of IBM Systems Director Management Console Version 6 Release 730.

Trademarks

IBM, the IBM logo, and ibm.com are trademarks or registered trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the Web at Copyright and trademark information at www.ibm.com/legal/copytrade.shtml.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

Red Hat, the Red Hat "Shadow Man" logo, and all Red Hat-based trademarks and logos are trademarks or registered trademarks of Red Hat, Inc., in the United States and other countries.

Other product and service names might be trademarks of IBM or other companies.

Terms and conditions

Permissions for the use of these publications is granted subject to the following terms and conditions.

Personal Use: You may reproduce these publications for your personal, noncommercial use provided that all proprietary notices are preserved. You may not distribute, display or make derivative works of these publications, or any portion thereof, without the express consent of the manufacturer.

Commercial Use: You may reproduce, distribute and display these publications solely within your enterprise provided that all proprietary notices are preserved. You may not make derivative works of these publications, or reproduce, distribute or display these publications or any portion thereof outside your enterprise, without the express consent of the manufacturer.

Except as expressly granted in this permission, no other permissions, licenses or rights are granted, either express or implied, to the publications or any information, data, software or other intellectual property contained therein.

The manufacturer reserves the right to withdraw the permissions granted herein whenever, in its discretion, the use of the publications is detrimental to its interest or, as determined by the manufacturer, the above instructions are not being properly followed.

You may not download, export or re-export this information except in full compliance with all applicable laws and regulations, including all United States export laws and regulations.

THE MANUFACTURER MAKES NO GUARANTEE ABOUT THE CONTENT OF THESE PUBLICATIONS. THESE PUBLICATIONS ARE PROVIDED "AS-IS" AND WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY, NON-INFRINGEMENT, AND FITNESS FOR A PARTICULAR PURPOSE.