Hitachi Virtual Storage Platform E990

Hitachi Virtual Storage Platform G130, G/F350, G/F370, G/F700, G/F900

Hitachi Virtual Storage Platform G200, G/F400, G/F600, G/F800

Hitachi Virtual Storage Platform N400, N600, N800

Service Processor 3 (SVP3) Technical Reference

This guide is intended for system administrators, Hitachi Vantara representatives, and authorized service providers and provides information about setting up, configuring, and maintaining both physical and virtual service processors.

Disposal

This symbol on the product or on its packaging means that your electrical and electronic equipment should be disposed at the end of life separately from your household wastes.

There are separate collection systems for recycling in the European Union. For more information, contact the local authority or the dealer where you purchased the product.

Recycling

A nickel-metal hydride battery is used in the Cache Backup Battery.

A nickel-metal hydride battery is a resource that can be recycled. When you want to replace the Cache Backup Battery, call the service personnel. They will dispose of it for you. This nickel-metal hydride battery, which is designated as recycling product by a recycling promotion low, must be recycled.

The mark posted on the Cache Backup Battery is a three-arrow mark that indicates a recyclable part.

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Preface

Intended audience

This document is intended for Hitachi Vantara representatives, system administrators, authorized service providers, or customers who install, configure, and operate the VSP E990, G130, G/F350, G/F370, G/F700, G/F900, G200, G/F400, G/F600, G/F800, and N400, N600, N800.

Readers of this document should be familiar with the following:

- Data processing and RAID storage systems and their basic functions
- RAID storage system hardware components and operational specifications

Document conventions

This document uses the following typographic conventions:

Convention	Description
Bold	- Indicates text in a window, including window titles, menus, menu options, buttons, fields, and labels. Example: Click **OK**. - Indicates emphasized words in list items.
Italic	- Indicates a document title or emphasized words in text. - Indicates a variable, which is a placeholder for actual text provided by the user or for output by the system. Example: `pairdisplay -g `*`group`* (For exceptions to this convention for variables, see the entry for angle brackets.)
`Monospace`	Indicates text that is displayed on screen or entered by the user. Example: `pairdisplay -g oradb`

Convention	Description
< > angle brackets	Indicates variables in the following scenarios: ▪ Variables are not clearly separated from the surrounding text or from other variables. Example: `Status-<report-name><file-version>.csv` ▪ Variables in headings.
[ ] square brackets	Indicates optional values. Example: [a | b] indicates that you can choose a, b, or nothing.
{ } braces	Indicates required or expected values. Example: { a | b } indicates that you must choose either a or b.
| vertical bar	Indicates that you have a choice between two or more options or arguments. Examples: [a | b] indicates that you can choose a, b, or nothing. { a | b } indicates that you must choose either a or b.

This document uses the following icons to draw attention to information:

Icon	Label	Description
	Note	Calls attention to important or additional information.
	Tip	Provides helpful information, guidelines, or suggestions for performing tasks more effectively.
	Caution	Warns the user of adverse conditions and/or consequences (for example, disruptive operations, data loss, or a system crash).
	WARNING	Warns the user of a hazardous situation which, if not avoided, could result in death or serious injury.

Accessing product documentation

Product user documentation is available on Hitachi Vantara Support Connect: https://knowledge.hitachivantara.com/Documents. Check this site for the most current documentation, including important updates that may have been made after the release of the product.

Getting help

Hitachi Vantara Support Connect is the destination for technical support of products and solutions sold by Hitachi Vantara. To contact technical support, log on to Hitachi Vantara Support Connect for contact information: https://support.hitachivantara.com/en_us/contact-us.html.

Hitachi Vantara Community is a global online community for Hitachi Vantara customers, partners, independent software vendors, employees, and prospects. It is the destination to get answers, discover insights, and make connections. **Join the conversation today!** Go to community.hitachivantara.com, register, and complete your profile.

Comments

Please send us your comments on this document to doc.comments@hitachivantara.com. Include the document title and number, including the revision level (for example, -07), and refer to specific sections and paragraphs whenever possible. All comments become the property of Hitachi Vantara LLC.

Thank you!

Chapter 1: Overview

The service processor (SVP) for your storage system provides out-of-band configuration and management of the storage system, and collects performance data for key components to enable diagnostic testing and analysis. The SVP runs the Windows operating system and is physically installed above the controller and drive trays in the rack.

The SVP enables the Hitachi Vantara representative or authorized service provider to configure, maintain, service, and upgrade the storage system. The SVP also hosts the Hitachi Device Manager - Storage Navigator software, and it collects performance data for key components to enable diagnostic testing and analysis.

SVP3 installation

The Hitachi Vantara-provided SVP3 is a management server requiring a 1U of rack space. Customers may also choose to provide their own physical or virtual server upon which the 64-bit software application may be installed. For the latest SVP versions and platforms supported, see https://support.hitachivantara.com/en/user/answers/interoperability.html.

Workflow of SVP3 installation

1. Install the SVP3 into the rack.
2. Connect the SVP3 to the storage system and management LAN.
3. Install the SVP3 software.
4. Register the storage system on the Storage Device List.

When SVP3 installation is complete, the storage system is ready for initial setup and configuration using the management software. For information and instructions, see the *System Administrator Guide* for your storage system.

Chapter 2: Hardware description

The physical SVP3 with Windows 10 Enterprise operating system is provided by Hitachi Vantara. The physical SVP3 is a 1U management server that attaches to each disk controller (DKC) of the storage system. The following sections describe the front and rear panels of the Hitachi Vantara-supplied physical SVP3 and provide the physical, electrical, and environmental specifications.

Front panel
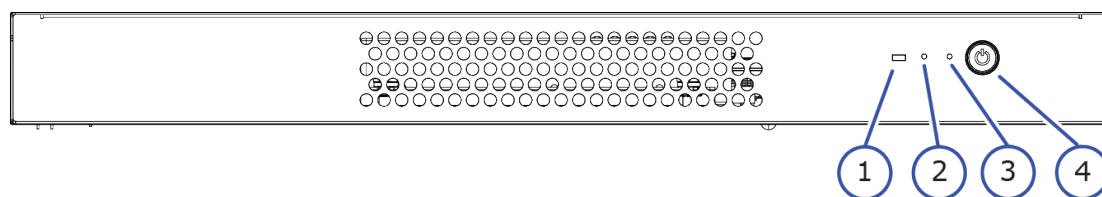
Item	Name	Description
1	SVP3 drive	Orange flashing LED indicates that the drive is busy.
2	HUB reset button	Restarts LAN2, LAN3, and LAN4 connected to the internal HUB. The SVP3 will not restart, and LAN1 will not be reset.
3	MB reset button	Restarts the SVP3 motherboard and LAN1. This will cause the Windows OS and all applications running on the operating system to reboot. LAN2, LAN3, and LAN4 will not be reset.
4	Power button	Press the button for about 1 second to power on and power off the SVP3. To forcibly power down the SVP3, press and hold the button for at least 5 seconds.

Item	Name	Description
		LED: ▪ Green: SVP3 is powered on. ▪ Flashing green: SVP3 is in a sleep state. ▪ Off: SVP3 is off.

Back panel
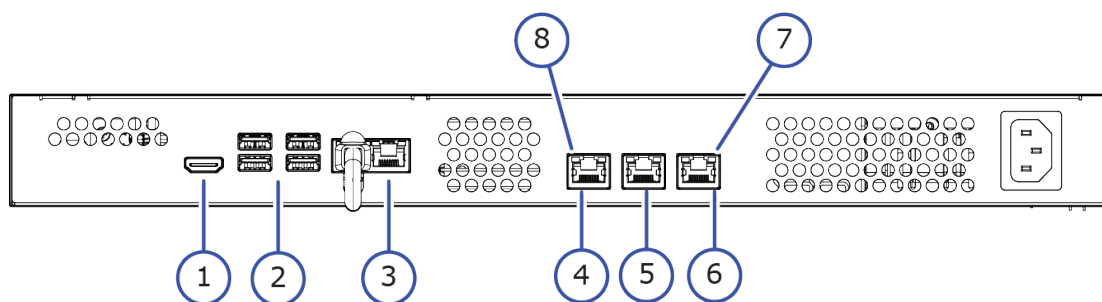
Item	Name	Description
1	HDMI	Not used
2	USB	Not used
3	LAN1	Connects to Maintenance PC
4	LAN2	Connects to CTL1
5	LAN3	Connects to CTL2
6	LAN4	Connects to management network
7	Link/Activity LED	▪ Orange: Indicates link is up. ▪ Orange flashing: Indicates network activity
8	Speed LED	▪ Yellow: Indicates communication speed of 1000 Mbps. ▪ Green: Indicates communication speed of 100 Mbps. ▪ Off: Indicates communication speed of 10 Mbps.

Chapter 2: Hardware description

Voltage selector switch

The power supply in the SVP3 has a manual voltage selector switch that must be set to either 115V or 230V (default - 230V). To prevent any damage to the power supply, you must set the voltage selector switch to the correct voltage for your system environment.

> ⚠ **Caution:** The manual voltage selector switch must set to the correct voltage before installing the rail kit to the SVP3.
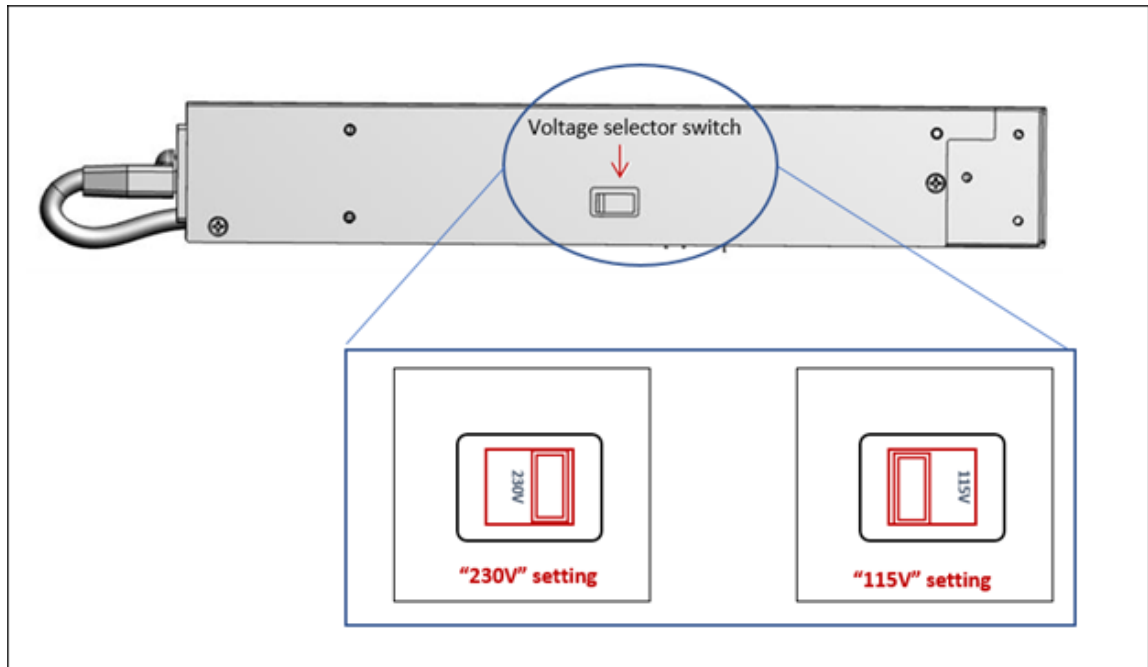
The SVP3 has a tamper-proof label covering the voltage selector switch which is set to the default 230V setting. If this label has been removed, you must confirm the switch setting before installing the rail kit.

Hardware specification

Chapter 2: Hardware description

Item	Specification
Model Number	DW-F850-SVP3
Dimensions	Height: 43.8 mm (1.7 inches) Width: 435.2 mm (17.1 inches) Depth: 270 mm (10.6 inches) Weight: 4 kg (8.8 lbs)
Processor	Skylake Core i3 family, Core i3-6100U, 2.3GHz
Memory	8GB, SO-DIMM 2133MT/s DDR4, None ECC
Storage media	1 TB 7200 RPM SATA HDD
Network interface card	4 x Gigabit Ethernet ports (NIC:x2 ports (on-board NIC), 1 port is branched to 3 ports by HUB located within the SVP3 server.)
Maximum temperature	Up to 40°C (104°F) The SVP3 is supported in high-temperature environments. Do not operate in any location with temperatures above 40°C (104°F).

Electrical specification

Item	Specification
Rated AC voltage	100-120V / 200-240V 50-50 Hz, 2.1A / 1.2A
Power supply	200 W AC power supply
Power supply safety / EMC	▪ UL/CSA: UL/cUL+CB standard: ▪ UL/cUL 62368/ IEC 62368 + IEC 60950-1 ▪ CCC: CCC GB4943.1-2011 ▪ FCC/ICES: FCC/ICES/VCCI Class A ▪ VCCI: VCCI Class A ▪ CCC: CCC CB9254 2008(Class A), GB17625.1 2003

Environmental specification

Chapter 2: Hardware description

Item	Specification
Operating temperature	10°C ~ 40°C (50°F ~ 104°F)
Non-operating temperature range	-10°C ~ 50°C (14°F ~ 122°F)
Operating relative humidity range	8% ~ 90% (non-condensing)
Non-operating relative humidity range	8% - 90% (non-condensing)

Chapter 3: Installing the SVP3

The physical SVP3 is installed in the rack above the controller and drive trays using a rail kit, brackets, and a bezel. The brackets are installed on the vertical struts of the rack, and then the bezel is attached/wedged around these brackets.

> ⚠ **Caution:** The manual voltage selector switch must set to the correct voltage before installing the rail kit to the SVP3.

SVP3 mounting considerations

Mounting the physical SVP3 appropriately in the rack is important to ensure optimum performance.

When mounting the SVP3, consider the following:

- Installing the SVP3 in the top bay of the rack or as close to the top bay as possible.
- Leaving approximately 25 inches in front of the rack to enable you to open the front bezel.
- Leaving approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease in servicing.

Setting the voltage selector switch

To prevent damage to the SVP3 power supply, you must set the voltage selector switch to the correct voltage (115V or 230V) before you install the rack kit on the SVP3.

Before you begin

- Verify the onsite supply voltage that will be connected to the storage system and SVP3.

Procedure

1. Remove the yellow voltage confirmation label that covers the power cord inlet on the SVP3.

2. Set the voltage selector switch to appropriate setting based on the onsite supply voltage connected to the storage system and SVP3.

   - If the onsite supply voltage is 200V-240V, there is no need to remove the tamper-proof label as the default setting for the voltage selector switch is 240V. If the tamper-proof label has been removed, confirm the voltage selector switch before installing the rail kit.

   - If the onsite supply voltage is 100V-115V, remove the tamper-proof label and set the voltage selector switch to 115V before installing the rail kit.

   ⚠️ **Caution:** The voltage selector switch has a tamper-proof label covering the switch set to the default 230V setting. If this label has been removed, you must confirm the switch setting before installing the rail kit.

Installing the inner rail extension

The SVP3 contains a rack rail assembly that must be separated into inner and outer rail extensions. The inner rail extension attaches directly to the SVP3 while the outer rail extension attaches directly to the rack.

Before you begin

- Confirm that the voltage selector switch is set to the same voltage as the onsite supply voltage connected to the storage system.

Procedure

1. Remove the eight screws on the right and left rail extensions, and then separate the inner and outer rail extensions on both sides.

2. Find the **Front** marking on the rails, and orient the rails for attaching to the SVP3 chassis.

3. Screw the internal racks onto the SVP3 chassis using the four screws.

Repeat step 2 and step 3 for both sides of the SVP3.

Installing the outer rails to the rack

The outer rail extension of the SVP3 attaches directly to the rack so the inner rail extension can be slid into place to secure the SVP3 to the rack.

Before you begin

Confirm that the inner rail extension is installed.

Procedure

1. Using the directions on the rail, orient the outer rail extension so the front of the rail faces the front of the rack.

2. Adjust the short rail and long rail to the proper distance so that they fit snugly into the rack.

3. Insert two screws into the threaded holes in the slide area on the rail to prevent the rail from moving.
4. Secure the long outer rail to the vertical rail at the front of the rack using a washer and a screw on one side of the rail and a safety nut on the other side.
5. Connect the short outer rail to the vertical rail at the rear of the rack using another washer and screw.

Repeat step 3 through step 5 on both sides of the rack.

Installing the SVP3 into the rack

After the inner rail extensions are attached to the SVP3 chassis and the outer rail extensions are attached to the rack, the SVP3 can be installed in the rack.

Procedure

1. Align the SVP3 inner rails with the front of the horizontal outer rails on the rack.
2. Slide the SVP3 inner rails into the outer rails on the rack, keeping the pressure even on both sides.
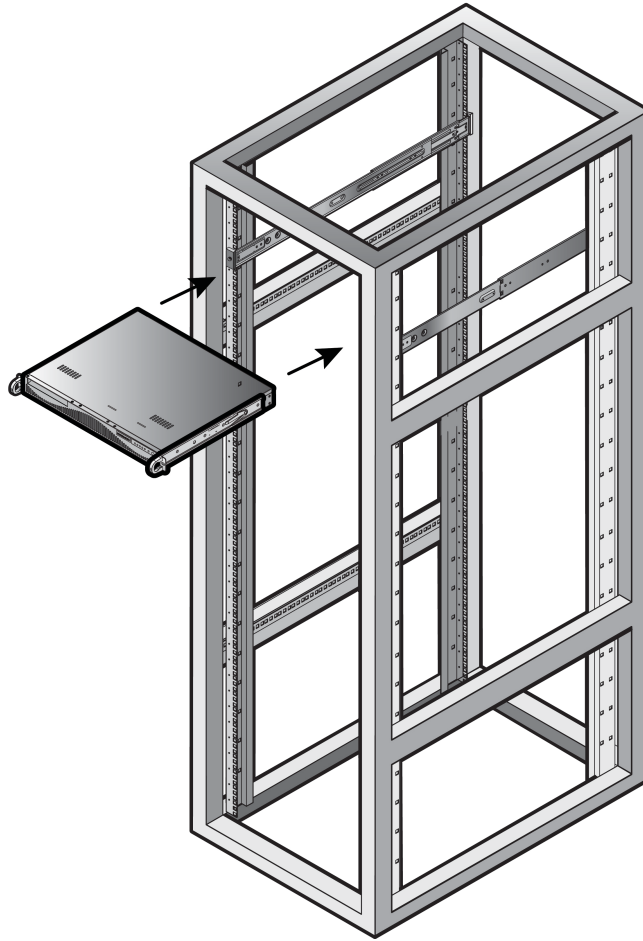
Installing the front bezel

The SVP3 comes with a front bezel that is attached to the SVP3 and rack using rail brackets.

Before you begin

Confirm the SVP3 is secure in the rack.

Procedure

1. Attach lock to right bracket using a screw, and then set aside.

2. With the SVP3 at the installation position, attach a washer and screw on each side of the rack leaving it unscrewed enough to attach the brackets.

3. Slide the left and right bracket into position behind the washers.

4. Attach the extrusion behind each bracket and into each bottom slot. Ensure brackets are aligned vertically before tightening the screws.

5. Align the front and back rails on each side of the rack and install two screws on each side.

6. Align the left side of the bezel at approximately a 25° angle and snap the top-right corner of the bezel into place.

Connecting to the physical SVP3

All port connections to the SVP3 are located at the rear of the SVP3.

The SVP3 has a built-in, unmanaged network switch to connect to the LAN ports of the storage system's controller. The LAN ports of the SVP3 are compatible with all network infrastructures.

The management console must be able to access the SVP3. Use Category 5 or higher Ethernet cables to connect the management console to the LAN port of the SVP3.

Procedure

1. Connect the **LAN1** port to a maintenance/service PC.

2. Connect the **LAN4** port to a management console PC.

   Typically, this is a notebook PC.

3. Connect the **LAN2** port to the user LAN port on storage system controller 1.

4. Connect the **LAN3** port to the user LAN port on storage system controller 2.

Default IP address settings

The SVP3 is pre-configured with a default IP for the LAN port 1 and port 4.

Connect to the SVP3 using the IP address 192.168.0.15 for the LAN port 4 (management) or 10.0.0.100 for LAN port 1 (maintenance).
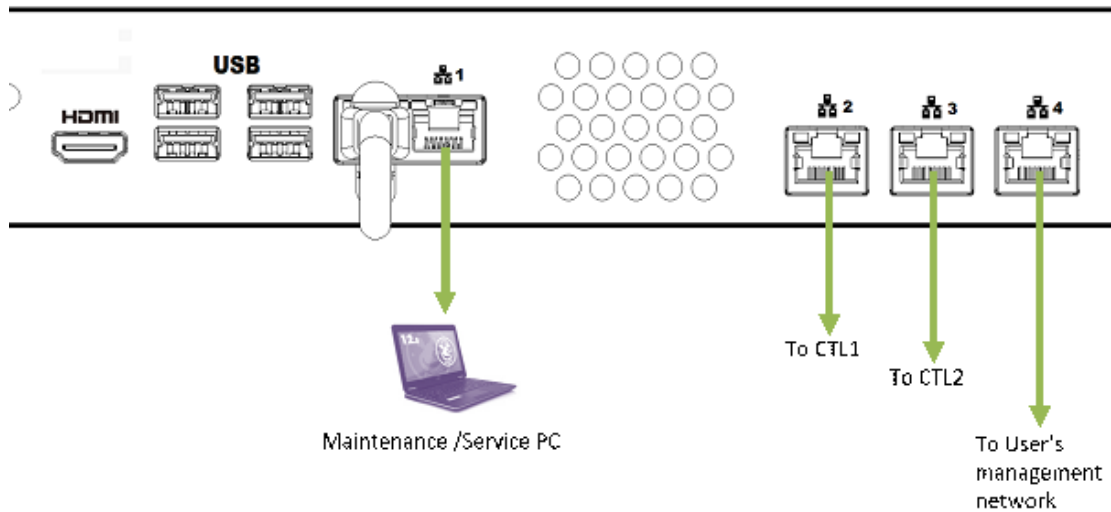
Port	Connected to	Default IP address
LAN1	Maintenance PC	10.0.0.100
LAN2	DKC CTL1	-
LAN3	DKC CTL2	-
LAN4	Management network	192.168.0.15

Turning on power to the physical SVP3

When turning on the power to the physical SVP3, use only the power cable supplied with the SVP3. Do not use a power cable designed for another device.

Procedure

1. Insert the cable binder to the back of the SVP3 using the snap fastener.
2. Pass the supplied power cable through the cable binder to fix it in place.
3. Attach the power cable to the power socket on the rear panel of the SVP3.
4. Plug the other end of the power cable into an AC power source.

Chapter 4: Installing the SVP software

The SVP software provides out-of-band configuration and management of the storage system and collects performance data for key components to enable diagnostic testing and analysis.

The SVP software can be installed on the SVP3, customer-supplied server, or on a virtual server.

Minimum requirements for installing the SVP software on a customer-supplied server

You can install the SVP software to be installed on customer-supplied servers or virtual servers that meet the following minimum requirements:

- Processor:
  - One core with hyper-threading, two cores without hyper-threading
  - Processor performance comparable to Celeron 1.6 GHz
- Random-access memory: 3.5 GB per storage system
- Hard drive: 120 GB per storage system
- LAN connection: one 1000Base-T
- Windows 10 Enterprise (64-bit)

> **Note:** The customer-supplied server running the Windows operating system cannot be used with the storage system if it belongs to different subnets, and if a router or a firewall is filtering packets according to a defined condition. There is not a limit for distance between the server running the SVP application and storage array being managed if they belong to the same subnet.

Configuring the operating system

Certain settings in Windows 10 IoT Enterprise 2019 LTSC must be configured before installing the SVP software.

Use Remote Desktop Connection to log on to the designated Windows server as the user who was specified during the Windows installation (for example, `Administrator`). For detailed information about configuring these settings, refer to the documentation for your Windows operating system.

Setting	Requirement
SVP locale	▪ The SVP and storage management software support the English and Japanese languages. ▪ To install the SVP software using a language other than English and Japanese, change the SVP's locale setting to reflect the appropriate language.
Desktop configuration	▪ Set the screen saver to blank. ▪ Set the wait time to 60 minutes.
Taskbar and Start menu properties	▪ Always show all icons and notifications on the taskbar. ▪ Open the **Taskbar and Start Menu Properties** window. Click **Customize** in the **Start Menu** tab. Check **Run Command** and **Display** on the **All Programs** menu and the **Start** menu. Under **Music**, check **Don't display this item**.
Time settings	▪ Configure the SVP for Universal Coordinated Time. ▪ Configure the SVP to not synchronize with an Internet time server.
Region settings	▪ Hide the language bar. ▪ Using **System Locale,** select the language for your region or preference, and then restart the server. ▪ In the **Text Services and Input Language** box, check whether **Japanese(Japan)** appears under **Installed services**. If it does, click the current selection, and then click **Remove**.
Power management settings	▪ Configure the high-performance power options to never turn off the display. ▪ Change the advanced power settings to never turn off the hard disk. ▪ Set the **Minimum processor state** percentage to 5.

Chapter 4: Installing the SVP software

Setting	Requirement
Change Action Center settings	Clear all items in the **Change Action Center** window.
Troubleshooting settings	In the **Change settings** window, set **Computer Maintenance** to **Off**, and clear all configuration options below **Other settings**.
Remote Desktop settings	• Clear **Allow Remote Assistance connections to this computer**, and check **Allow connections only from computers running Remote Desktop with Network Level Authentication (more secure)**. • Select **Remote Desktop** and **Remote Desktop - RemoteFX** for both Home/Work (Private) and Public.
Internet Explorer settings	• Select **Allow active content to run in files on My Computer**. • Clear **SSL 2.0**, and select **Use TLS 1.2**. • In the **Turn on Suggested Sites** window, click **No, don't turn on**, and then click **Next**. In the **Choose your settings** window, click **Use express settings**, and then click **Finish**.

Auto-execute settings	• Turn off the Windows AutoPlay feature.
	
	   ◦ In the **Property** window, click **Enabled** and select **All drives**, and then click **OK**.
	
	   ◦ Clear **Use Autoplay for all media and devices**.

Setting	Requirement
Registry settings	Using Regedit: ▪ Set HKEY_LOCAL_MACHINE\SYSTEM \CurrentControlSet\Control \Lsa > restrictanonymousto 1 and confirm that **Hexadecimal** is selected. ▪ Go to `HKEY_LOCAL_MACHINE\System \CurrentControlSet\Control \Terminal Server`. In the **Edit** menu, click New > DWORD (32-bit) Value. Type `DisableBeep`, and then double-click it and set the value to 1. Confirm that **Hexadecimal** is selected. ▪ Go to `HKEY_LOCAL_MACHINE\System \CurrentControlSet\Control \Terminal Server HKEY_LOCAL_MACHINE\SOFTWARE \Policies\Microsoft\Windows NT \Terminal Services`. In the **Edit** menu, click New > DWORD (32-bit) Value. Type `fPromptForPassword`, and then double-click it and set the value to 1. Confirm that **Hexadecimal** is selected. ▪ In the **Edit** menu, click New > DWORD (32-bit) Value. Type `SecurityLayer`. ▪ Restart the server.
ICMP reply settings	Click the following inbound rules, and then right-click and click **Enable Rules**. ▪ File and Printer Sharing (Echo Request - ICMPv4-In) (Profile=Domain) ▪ File and Printer Sharing (Echo Request - ICMPv4-In) (Profile=Private) ▪ File and Printer Sharing (Echo Request - ICMPv6-In) (Profile=Domain) ▪ File and Printer Sharing (Echo Request - ICMPv6-In) (Profile=Private)
Computer name	Change the computer name to `SVP-PC`. **Note**: The computer name, `SVP-PC`, can be changed either before or after initial configuration.

Chapter 4: Installing the SVP software

Setting	Requirement
Account name	Change the account name to `SVP`. Then open the **Local Users and Groups** window and rename the user to `SVP`.
Password settings	▪ Change the Windows administrator password to `raid-login`. ▪ Change the password for the Windows operating system running on the SVP to `raid-login`.
Internet Information Services (IIS) settings. IIS is an extensible web server created by Microsoft for use with Windows operating systems.	▪ Open and expand **Internet Information Services**, and then check the following check boxes: 　• **FTP Server** 　• **FTP Extensibility FTP Service** 　• **Web Management Tools** 　• **IIS 6 Management Compatibility** 　• **IIS 6 Scripting Tools** 　• **IIS 6 WMI Compatibility** 　• **IIS Metabase and IIS 6 configuration compatibility** 　• **IIS Management Console** 　• **IIS Management Scripts and Tools** 　• **IIS Management Service** ▪ Uncheck **World Wide Web Services**.

Installing the SVP software

You install the SVP software from the SVP installation media for your storage system. The installation media is part of the microcode distribution set and has the file name **HX-SVP-XXX-XX.iso**.

Before you begin

▪ Configure the operating system.

▪ Log in to the Windows server with your SVP credentials and password.

Procedure

1. Go to https://support.hitachivantara.com/en/user/answers/downloads.html

2. Click **HARDWARE DOWNLOAD**.

3. Click the name of your storage system to navigate to the download page.

4. In the **Components** drop down menu, select the current microcode for your storage system.

5. Click the **Download** icon for the `Microcode for SVP` to open the **End User License Agreement** window.

6. On the **End User License Agreement** window, click **CONTINUE** to start the download of the .iso file.

7. In your downloads folder, double click the .iso file to open the SVP installation media folder.

8. Right-click **Setup** and choose **Run as Administrator** to launch the installation media.

9. Click on **Yes** when prompted to allow the app to make changes to your device.

10. In the **Choose Server Language** window, select a language and click **Next**.

11. Click **Next** to confirm setting.

12. On the **License Agreement** window select **I Accept** and click **Next**.

13. In the **Choose Destination Location** window, leave the destination folder as the default, click **OK**.

14. Select either to start services now or later and click **Finish**.

Chapter 5: Registering the storage system on the Storage Device List

After the SVP media is installed, you must connect the SVP to the storage system by registering the storage system on the Storage Device List.

Adding the storage system to the Storage Device List

After installing the SVP software, you must add the storage system to the Storage Device List.

Procedure

1. Log in to the Windows server with your SVP credentials and password.
2. Double Click **StorageDeviceList** on the Windows desktop.
3. Change the SVP IP address to *192.168.0.15* if not set by default and click **Apply**.
4. Select the "+" icon to open the **Add System** window.

5. In the **Add System** window, click **Browse** and select `d:\software`
   `\productname.inf` from the SVP installation media .iso file.

6. In the **Add System** window, select **Auto Discovery** if the storage system is READY or
   Manual to fill in the storage system information manually.

   If using **Auto Discovery**, skip to step 7.

7. In the **Add System** window, complete the fields and click **Apply**.

Field	Description
Software Selection	Browse local hard drive for installation media files.

Field	Description
System Selection[1]	Select one of the following methods to discover the storage system. ▪ **Auto Discovery**: Acquire the storage system information automatically. (default) ▪ **Manual**: Specify the storage system manually.
CTL 1	Enter the IP address for controller 1. Accept the default **IPv4** setting or click **IPv6**, and then enter the IP address in the appropriate format for the addressing method selected.
CTL 2	Enter the IP address for controller 2. Accept the default **IPv4** setting or select **IPv6**, and then click the IP address in the appropriate format for the addressing method selected.
System Name	Enter the display name of the storage system, up to 180 characters. Permitted characters are one-byte alphanumeric characters and symbols (# $ % & ' * + - . / = ? @ ^ _ ` { | } ~). You cannot use one-byte spaces.
Description	Enter the description of the storage system, up to 180 characters.
User Name	Enter a user name. Permitted characters are one-byte alphanumeric characters and symbols (# $ % & ' * + - . / = ? @ ^ _ ` { | } ~). The GUI includes a 256-character limit.
Password	Enter a password. The GUI includes a 256-character limit.
Do not start service after addition immediately[2]	Select if you do not want to start service after adding the storage system. (Default is unchecked.)
Notes:	

1. Service personnel set the storage system information manually. User should not select **Manual** to set it.

Field	Description
2. To register multiple storage systems, best practice is to check this check box for the settings so that they do not start services while they are added.	

8. Wait 10 to 15 minutes for all the services to start. The storage system status will show up as *Processing* while the services are starting up and *Ready* when the storage system is available.

Next steps

Before users can log in to and start using the storage system, the system administrator must complete the following setup and configuration tasks:

- Configure the management client.

- Configure the management software.

- Configure the storage system.

- (Optional) Set up SSL communications.

- Set up the user accounts.

For details about these tasks and instructions for performing them, see the *System Administrator Guide* for your storage system.