

HP Server Automation

for the HP-UX, IBM AIX, Red Hat Enterprise Linux, Solaris, SUSE Linux Enterprise Server, VMware, and Windows® operating systems

Software Versions: 9.04 and later, 9.11 and later

User Guide: Managing HP-UX Virtual Servers Using Server Automation

Document Release Date: March 2012

Software Release Date: June 2011



Legal Notices

Warranty

The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

The information contained herein is subject to change without notice.

Restricted Rights Legend

Confidential computer software. Valid license from HP required for possession, use or copying. Consistent with FAR 12.211 and 12.212, Commercial Computer Software, Computer Software Documentation, and Technical Data for Commercial Items are licensed to the U.S. Government under vendor's standard commercial license.

Copyright Notices

© Copyright 2011 Hewlett-Packard Development Company, L.P.

Trademark Notices

Adobe® is a trademark of Adobe Systems Incorporated.

Intel® and Itanium® are trademarks of Intel Corporation in the U.S. and other countries.

Microsoft®, Windows®, Windows® XP are U.S. registered trademarks of Microsoft Corporation.

Oracle and Java are registered trademarks of Oracle and/or its affiliates.

UNIX® is a registered trademark of The Open Group.

Documentation Updates

To check for recent updates or to verify that you are using the most recent edition of a document, go to:

<http://support.openview.hp.com/selfsolve/manuals>

This site requires that you register for an HP Passport and sign in. To register for an HP Passport ID, click the **New users - please register** link on the HP Passport login page.

You will also receive updated or new editions if you subscribe to the appropriate product support service. Contact your HP sales representative for details.

Support

Visit the HP Software Support Online web site at **<http://www.hp.com/go/hpsoftwaresupport>**

This web site provides contact information and details about the products, services, and support that HP Software offers. HP Software online support provides customer self-solve capabilities. It provides a fast and efficient way to access interactive technical support tools needed to manage your business. As a valued support customer, you can benefit by using the support web site to:

- Search for knowledge documents of interest
- Submit and track support cases and enhancement requests
- Download software patches

- Manage support contracts
- Look up HP support contacts
- Review information about available services
- Enter into discussions with other software customers
- Research and register for software training

Most of the support areas require that you register as an HP Passport user and sign in. Many also require a support contract. To register for an HP Passport ID, go to:

<http://h20229.www2.hp.com/passport-registration.html>

To find more information about access levels, go to:

http://h20230.www2.hp.com/new_access_levels.jsp

Contents

1	Managing HP-UX Virtual Servers Using Server Automation	3
	Introduction	3
	Managing vPars Containers	16
	Managing HPVM Hypervisors	21
	Managing vSwitches	27
	Troubleshooting	29

1 Managing HP-UX Virtual Servers Using Server Automation

The chapter has the following sections:

- [Introduction](#)
- [Viewing Summary, Hardware, and ioScan Information](#)
- [Configuring Server Timeouts](#)
- [Managing vPars Containers](#)
- [Managing HPVM Hypervisors](#)
- [Managing vSwitches](#)
- [Troubleshooting](#)

Introduction

SA provides a web extension to create and manage virtual HP-UX machines (HP-UX Virtual partitions and HP Integrity Virtual machines) through SA. This extension is described in this user guide.

For more information on virtual machines and related topics, see the SA documentation at: <http://support.openview.hp.com/selfsolve/manuals>

Definitions

- **HP-UX Virtual Partitions (vPars containers)** - vPars containers enables you to run multiple instances of HP-UX simultaneously on one hard partition by dividing that hard partition further into virtual partitions. Each virtual partition is assigned its own subset of hardware, runs a separate instance of HP-UX, and hosts its own set of applications. Because each instance of HP-UX is isolated from all other instances, vPars provides application and operating system (OS) fault isolation. Each instance of HP-UX can have different patches and a different kernel.
- **HPVM Hypervisors** - HPVM hypervisors are soft partitioning and virtualization technologies that provides operating system isolation, with sub-CPU allocation granularity and shared I/O. HPVM hypervisors can be installed on an Integrity server, Integrity server blade, or hardware partition (nPartition) running HP-UX. The HPVM hypervisor environment consists of two types of components:
 - HPVM Host
 - Virtual machines (also called guests)
- **HPVM Hypervisor Host (Host)** - The HPVM hypervisor host virtualizes physical processors, memory, and I/O devices, allowing you to allocate them as virtual resources to each virtual machine.

- **HPVM** - Individual virtual machines, components of the HPVM Hypervisor.
- **vPars** - Individual vPars, components of the vPars Container.
- **vSwitches** - Virtual switches.

Audience

This document is written for system administrators who use Server Automation to manage HP-UX virtual servers.

Requirements

The following are requirements for this feature:

- For both vPars and HPVM hypervisors:
 - Make all host servers (HP-UX servers) managed servers on HP Server Automation.
- For vPars:
 - Install the Virtual Partitions product on the host server. See “Virtual Partitions” in: <http://docs.hp.com/hpux/11iv3>.
- For HPVM hypervisors:
 - Install the HP Integrity Virtual Machine product on the host server. See “HP Integrity Virtual Machines and Online VM Migration” in: <http://docs.hp.com/hpux/11iv3>.

Supported Platforms and Configurations

Managing HP-UX virtual servers using SA supports the following platforms and configurations:

Table 1 Supported Platforms and Configurations

Platform or Configuration	Support
Virtualization Platforms	vPars A.5.06 and later versions HPVM hypervisors 4.2 and later versions
HP-UX guest OS	11iV3
HP-UX Host OS for IVM and first vPars on physical server	11iV3
Processor Architecture	Itanium
SA Version	9.04 CORD release
SA platform	RHEL AS4 – 64bit
Satellite and Multi-master support	RHEL AS4 – 64bit
Integrity platform support	As defined by the vPars and HPVM support matrix.

Features that are Not Supported

Cloning and migration of virtual machines are not supported by the HPUX Virtualization Manager. However, they are supported by HP Integrity Virtual Machines.

SA Permissions Required

The following SA permissions are required to manage vPars containers and HPUX hypervisors. For complete information on permissions, see the *SA Administration Guide*.

Action/Feature Permissions Required

To manage HP-UX virtual machines, your SA user must either belong to an SA user group that has the following action/feature permissions or have the permissions:

Table 2 Action/Feature Permissions Required for Managing HP-UX virtual servers using SA

Permission	Setting	User Action Enabled
Feature tab: Managed Servers and Groups	Yes	View managed servers and device groups
Client Features tab: View Virtual Servers	Yes	View HPVM hypervisors, HPVMs, vPars containers, vPars, and vSwitches Discover and refresh HPVM hypervisors
Client Features tab: Manage Virtual Servers	Yes	Create, modify, and remove HPVM hypervisors, vPars containers, vPars, vSwitches, and HPVMs
Client Features tab: Administer Virtual Servers	Yes	Shut down, halt, and start HPVMs, vPars, and vSwitches

Folder Permissions Required

You need access to the SA Library folder containing the HP-UX Virtualization Manager web extension to manage HP-UX virtual machines and run the web extension. This web extension is located in the SA Library folder `/Opware/Tools/Virtualization Programs`. For complete information on folder permissions, refer to the *SA Administration Guide*.

Use the following procedure to assign the required folder permissions to a user:

- 1 Log in to the SA Client as an administrative user that has permission to set folder permissions.
- 2 In the SA Client, select the Library tab.
- 3 Select the By Folder tab to display the SA Library folder structure.
- 4 Navigate to the folder: `/Opware/Tools/Virtualization Programs`.
- 5 Right click Virtualization Programs and select the Folder Properties menu. This displays the Folder Properties window.

- 6 In the Folder Properties window, select the Permissions tab. This displays the user groups that have some permissions to the folder.
- 7 Select the user group you want to grant access to. If the user group does not appear, select the Add button to add it.
- 8 Select Execute Objects Within Folder.
- 9 Select OK.

Resource Permissions Required

As with all server management tasks, you need access to the HP-UX servers. Grant access to the facility, customer and at least one device group of your HP-UX managed servers. For complete information on resource permissions, see the *SA Administration Guide*.

Server and Switch Status Icons

This section describes the icons associated with HPVM hypervisors and vPars containers.

Table 3 describes the vPar container and HPVM hypervisor status icons (displayed in the HP-UX Virtualization Manager web extension) and their meaning:

Table 3 Status Icons







Icon	Icon Meaning for vPars Containers	Icon Meaning for HPVM Hypervisor
	Managed 1 or more vPars reachable	Managed and reachable
	Managed Unreachable	Managed, but unreachable
	Unmanaged (or HP-UX Virtualization Manager web extension not run while the server in nPars mode) 1 or more vPars reachable	Not applicable
	Unmanaged (or HP-UX Virtualization Manager web extension not run while the server in nPars mode) Unreachable	Not applicable

Table 4 shows the vSwitch icons displayed in the HP-UX Virtualization Manager web extension and their meanings.

Table 4 vSwitch Icons

Icon	Icon Meaning for vSwitches
	Status is Up
	Status is not Up

Quick Start vPars, HPVMs, and vSwitches

This section describes prerequisites.

Prerequisites for using HP-UX Virtualization Manager web extensions:

- 1 Make sure that:
 - a HP-UX servers are managed by SA and visible in the SA client under Devices > All Managed Servers. For more information, see the *SA User Guide: Server Automation*.
 - b SA user has adequate permissions. For details, see [SA Permissions Required](#) on page 5.

Prerequisites for managing vPars, HPVMs, or vSwitches:

- 1 Manage your vPars as described in [Managing vPars Containers](#) on page 16.
- 2 Manage your HPVMs as described in [Managing HPVM Hypervisors](#) on page 21.
- 3 Manage your vSwitches as described in [Managing vSwitches](#) on page 27.

Launching the HP-UX Virtualization Manager

To launch the HPVM manager:

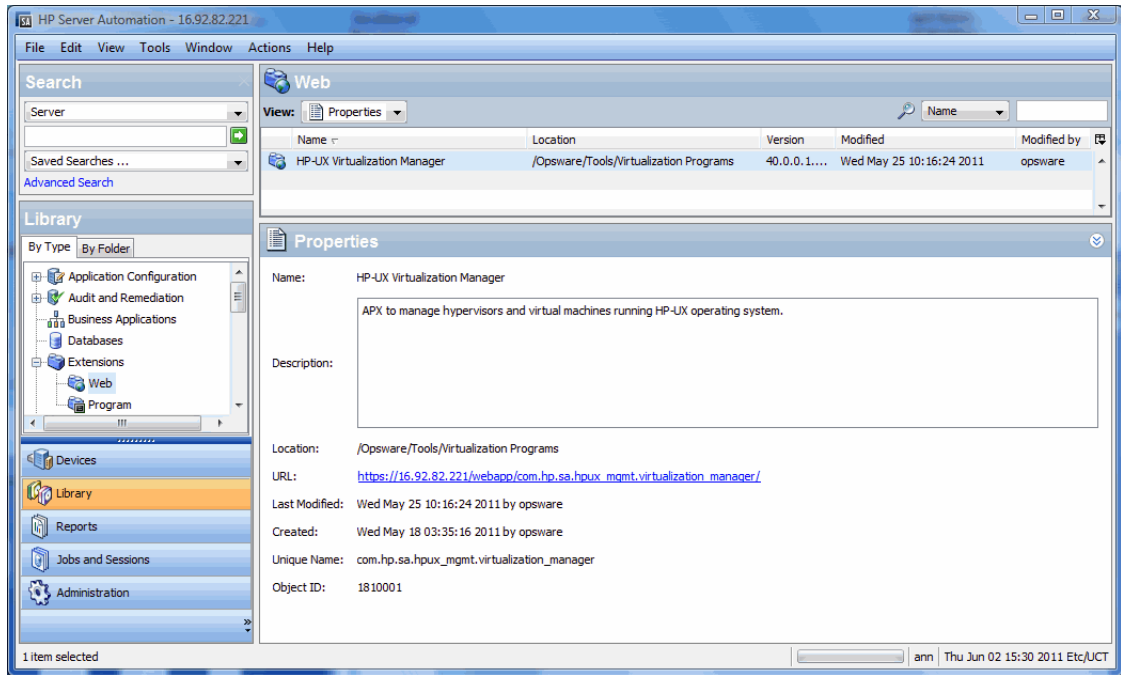
- 1 In the SA Client, in the left panel, choose Library > Extensions > Web.
- 2 In the Web panel, double-click the HP-UX Virtualization Manager icon to display the HP-UX Virtual Servers window, which lists HPVM hypervisors and vPars containers.

Viewing Summary, Hardware, and ioScan Information

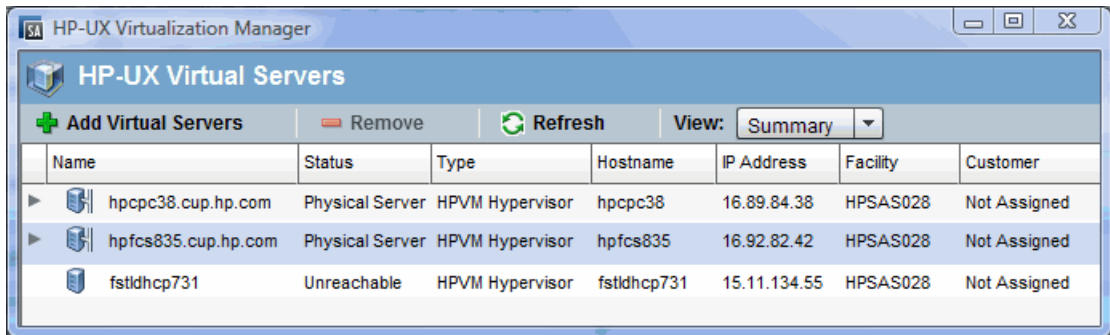
This section describes how to view information for HPVM hypervisors/vPars containers/HPVMs/vPars, and vSwitches.

To view information:

- 1 Follow the steps in [Launching the HP-UX Virtualization Manager](#) on page 7 to display the HP-UX Virtual Servers window.



- 2 Double-click HP-UX Virtualization Manager to display the HP-UX Virtual Servers window, which contains a list of HPVM hypervisors/vPars containers associated with that manager.



To view individual HPVMs/vPars/vSwitches, click the arrow to the left of the HPVM hypervisor/vPars container associated with that individual component.

Table 5 HPVM Hypervisor/vPars Containers/HPVMs/vPars/vSwitches Information

Property	Description
Name	Name, as designated when the HPVM hypervisor/vPars container was added to the HP-UX Virtualization Manager
Status	<p>Status (whether the HPVM hypervisor/vPars container is reachable from the SA Client core or not)</p> <p>Status = Unreachable or</p> <p>Status = vPars (for vPars mode); Physical Server (for nPars mode or HPVM)</p> <p>For individual vPars and vSwitches, status = Up/Down</p> <p>For individual HPVMs, status = On/Off</p>
Type	Whether the HPVM hypervisor or vPars container is running the vPars or HPVM software
Hostname	<p>Hostname of:</p> <ul style="list-style-type: none"> — HPVM hypervisor or vPars container — HPVM or vPars that has become a managed server in the SA Client <p>Note: Hostname = - (dash) if HPVM or vPars is not a managed server</p>
IP Address	<p>Individual HPVM hypervisor/vPars container /HPVM/vPars IP address</p> <p>Note: Value is blank if HPVM is not an SA-managed server</p>
Facility	Physical location of the HPVM hypervisor/vPars container host machine
Customer	Assigned customer

- To display summary information for a selected HPVM hypervisor/vPars container/HPVM/vPars/vSwitch, choose View > Summary and then select the HPVM hypervisor/vPars container/HPVM/vPars/vSwitch to display its summary information in the bottom summary panel.

HP-UX Virtual Servers							
+ Add Virtual Servers		- Remove		Refresh		View: Summary	
Name	Status	Type	Hostname	IP Address	Facility	Customer	
hpcpc38.cup.hp.com	Physical Server	HPVM Hypervisor	hpcpc38	16.89.84.38	HPSAS028	Not Assigned	
hpfcs835.cup.hp.com	Physical Server	HPVM Hypervisor	hpfcs835	16.92.82.42	HPSAS028	Not Assigned	
fstdhcp731	Unreachable	HPVM Hypervisor	fstdhcp731	15.11.134.55	HPSAS028	Not Assigned	

Summary	
ID:	350001
Status:	Physical Server
Lifecycle:	MANAGED
Manufacturer:	HP
Model:	IA64 HP SERVER RX8600
OS Version:	HP-UX 11.31
Serial:	USE4720HWW

Summary information includes:

Table 6 Summary Information

Property	Description
ID	Identification number in the SA Client
Status	Status (whether the HPVM hypervisor/vPars container/HPVM/vPars/vSwitch is reachable from the SA Client core or not) Status = Unreachable or Status = vPars (for vPars mode); Physical Server (for nPars mode or HPVM) For individual vPars and vSwitches, status = Up/Down For individual HPVMs, status = On/Off
Lifecycle	Managed by the SA Client or not
Manufacturer	Name of the manufacturer
OS Version	Version
Serial	Serial number

- To display hardware information for a selected HPVM hypervisor/vPars container/HPVMs/vPars, choose View > Hardware.

HP-UX Virtual Servers							
+ Add Virtual Servers		- Remove		Refresh		View: Summary	
Name	Status	Type	Hostname	IP Address	Facility	Customer	
hpcpc38.cup.hp.com	Physical Server	HPVM Hypervisor	hpcpc38	16.89.84.38	HPSAS028	Not Assigned	
hpfc835.cup.hp.com	Physical Server	HPVM Hypervisor	hpfc835	16.92.82.42	HPSAS028	Not Assigned	
fstldhcp731	Unreachable	HPVM Hypervisor	fstldhcp731	15.11.134.55	HPSAS028	Not Assigned	

Hardware	
Available CPUs:	8
Available CPU speed for a VM:	1595 MHZ
Total Physical Memory:	65504 MB
Available memory for a VM:	52226 MB

Hardware information includes:

Table 7 HPVM Hypervisor Hardware Information

Property	Description
Available CPUs	Number of CPUs assigned
Available CPU speed for an HPVM	CPU speed available for HPVMs associated with that HPVM hypervisor/vPars container
Total Physical Memory	Total physical memory associated with the HPVM hypervisors/vPars container
Available memory for a HPVM	Memory available for a particular HPVM associated with the HPVM hypervisors/vPars container

Table 8 vPars Container Hardware Information

Property	Description
Available CPUs	Number of CPUs assigned
Available Interleaved Memory	Amount of non-cached memory available to the vPars container
Available Cell - Memory	Amount of memory available per cell (series of comma-separated <cell number>:<memory size>)
Available Cell - CPU	Indicates the number of CPUs available per cell (a series of comma-separated <cell number>:<number of CPUs>)

Table 9 vPars Hardware Information

Property	Description
Assigned CPUs	Number of CPUs assigned to vPars
Assigned Total Memory	Amount of assigned memory for vPars
Cell - CPU	Number of available cell CPUs
Cell - Memory	Amount of cell memory available
Primary Boot Disk	Name of the primary boot disk
Alternate Boot Disk	Name of the alternate boot disk
Number of Local Bus Adapter(s)	Number of local bus adapters for vPar
Local Bus Adapter(s)	Name of the local bus adapters

Table 10 HPVM Hardware Information

Property	Description
Assigned CPUs	Number of CPUs assigned to HPVM
Assigned Memory	Amount of memory assigned to HPVM
Assigned vSwitches	vSwitches assigned to HPVM, in a list of comma-separated <port> - <HPVM> associated with the vSwitch
Assigned Storage	Amount of storage assigned to the HPVM

Table 11 vSwitch Hardware Information

Property	Description
Assigned LAN interface	LAN interface assigned to the vSwitch
Assigned Ports	Ports assigned exclusively to the vSwitch

- 5 To display information about the devices connected to a selected HPVM hypervisors/vPars container/HPVM/vPars machine, such as storage, disk, memory, and processor information, choose View > IO Scan.

The IO Scan view shows the output from the HP-UX ioscan(1M) command for the selected vPars container or HPVM.

To rearrange ioScan output columns, drag and drop them. To sort by column, select the column header. To sort by additional columns, hold down the Ctrl key while selecting the column header.

The screenshot shows the HP-UX Virtualization Manager interface. At the top, there's a title bar 'HP-UX Virtual Servers' with buttons for 'Add Virtual Servers', 'Remove', and 'Refresh'. A 'View:' dropdown is set to 'IO Scan'. Below this is a table of virtual servers:

Name	Status	Type	Hostname	IP Address	Facility	Customer
hpcpc38.cup.hp.com	Physical Server	HPVM Hypervisor	hpcpc38	16.89.84.38	HPSAS028	Not Assigned
hpfc835.cup.hp.com	Physical Server	HPVM Hypervisor	hpfc835	16.92.82.42	HPSAS028	Not Assigned
fstldhcp731	Unreachable	HPVM Hypervisor	fstldhcp731	15.11.134.55	HPSAS028	Not Assigned

Below the server list is an 'IO Scan' table:

Class	Instance	Hardware Path	Driver	Software State	Description	Device Special Files
root	0		root	CLAIMED		
ioa	0	0	sba	CLAIMED	System Bus	
ba	0	0/0	lba_adapter	CLAIMED	Local PCI-X Bus	
tty	0	0/0/1/0	rmp3f01	CLAIMED	PCI class(255,0)	
tty	1	0/0/1/1	rmp3f01	CLAIMED	PCI SimpleComm	
target	172	0/4/1/0.1.214.0.0.0	tgt	NO_HW		
disk	172	0/4/1/0.1.214.0.0.0	sdisk	NO_HW	HP HSV210	/dev/dsk/c172t0d1, /dev/rdisk/c172t0d1
ext_bus	171	0/4/1/0.1.214.255.0	fcpdev	NO_HW	FCP Device	
target	171	0/4/1/0.1.214.255.0	tgt	NO_HW		
slot	1	0/1/2	pci_slot	CLAIMED	PCI Slot	

- 6 IO Scan information (which is applicable only to HPVM hypervisors and vPars containers) includes:

Table 12 IO Scan Information

Property	Description
Class	Device class
Instance	Instance
Hardware Path	Hardware path to the device
Driver	Driver associated with the device
Software State (of devices attached to the machine)	CLAIMED = device software bound successfully NO-HW = device hardware is no longer responding
Description	Device description (for example, whether it is an adapter or processor)
Device Special Files	Device filename (as identified by the system)

Saving ioscan Output

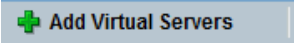
For vPars, `ioscan` output can only be obtained when the nPar or physical server is in nPars mode.

The following procedure saves a copy of the `ioscan` output, makes the output viewable, and simplifies the process of creating and modifying vPars. You will need to repeat these steps to refresh the `ioscan` output if you add or remove input/output information.

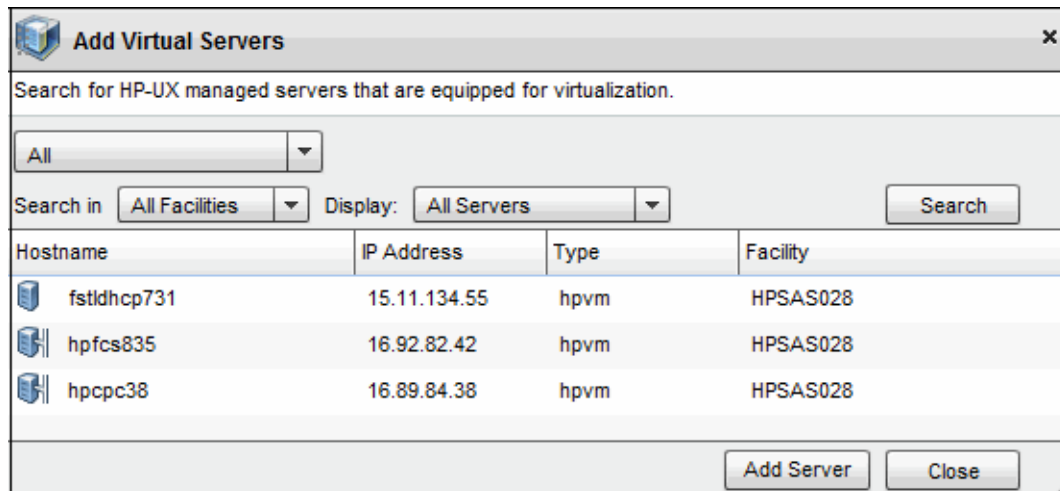
- 1 Boot the server to nPars mode.
- 2 Follow the steps in [Launching the HP-UX Virtualization Manager](#) on page 7 to display the HP-UX Virtual Servers window.
- 3 If the server is already displayed on the main page, the `ioscan` output has been saved.
- 4 If the server is not displayed, add the server to the main page (see [Adding an HPVM Hypervisor/vPars Container](#) on page 14).

Adding an HPVM Hypervisor/vPars Container

To add an HPVM hypervisor or vPars container to HP-UX Virtualization Manager management:

- 1 Follow the instructions in [Launching the HP-UX Virtualization Manager](#) to display the HP-UX Virtual Servers window.
- 2 In the HP-UX Virtual Servers window, select the HPVM hypervisor to associate with the new HPVM.
- 3 Click .

The Add Virtual Servers window is displayed.



- In the Virtual Servers window, choose the following HPVM search criteria (you can use wildcards to search):

Table 13 Add Virtual Servers Search

Field	Choice	Displays
Main field		
	All	All servers (including managed and virtual)
	Explicit IPs/Hostname	HPVM hypervisors by their IP address or hostname
	Supply IP Address Range	HPVMs within an IP address range
Search in	All Facilities	HPVMs at all facilities
	<specific facility choice>	HPVMs at the specified facility
Display	Virtual Servers only	Only HPVMs
	All Servers	

- Click Search.
- In the results field, select the HPVM(s) to be added.
- Click Add Server to add the HPVM.

The new HPVM is added as a managed server in the list below its associated HPVM hypervisor/vPars container.

Configuring Server Timeouts

SA verifies connectivity with HP-UX virtual servers by pinging them. If a server is offline, the ping will time out and the server will be considered offline. By default the ping timeout value is 15 seconds. You can reduce the ping timeout and improve responsiveness on networks with low latency by setting the value of the custom attribute `hpux_v12n_timeout`.

You can configure the timeout value by setting a custom attribute named `hpux_v12n_timeout`. The default value is 15 seconds. You can set it to any integer from 1 to 120.

For each server, SA searches the following objects in order for the custom attribute:

- Server
- Device group
- Customer
- Realm
- Facility
- OS
- Software policy

For example, if you add the `hpux_v12n_timeout` custom attribute to the device group named “HP-UX 11.31”, all HP-UX 11.31 servers inherit that timeout value, unless they explicitly set the custom attribute at the server level.

Or to change the timeout value for all the servers that reside in a particular facility, add the custom attribute to that facility.

For more information on custom attributes, see the *SA User Guide: Server Automation*.

Custom Attributes that HP-UX Virtualization Manager Creates

The HP-UX Virtualization Manager creates the following custom attributes for internal management:

Table 14 HP-UX Virtualization Manager Custom Attributes

vPars/HPVM	Attribute	Value	Description
vPars	<code>ioscan</code>	String (JSON format)	<code>ioscan</code> command output (enables server to be displayed in vPars mode)
vPars	<code>nPar</code>	True	True = server reboots while in nPars mode
vPars HPVM	<code>partition_ident:</code> <value>	True	Partition identifier (identifies which servers are on the same partition)
vPars	<code>sa_vPars_hypervisor</code>	True	True = server displayed on the HP-UX Virtualization Manager main page
vPars	<code>vpar_name</code>	String	Server’s vPars name.

Managing vPars Containers

You can only create, use, and manage vPars containers on managed servers. See the *SA User Guide: Server Automation* for instructions on how to make a server a managed SA server.

Your HP-UX server must be in nPars mode or in vPars mode to use the HP-UX Virtualization Manager. You must use HP-UX commands and tools to switch between nPars mode and vPars mode. For more information, see the HP-UX Virtual Partitions documentation.

The following sections describe how to manage HP-UX virtual partitions. You can perform any of these operations on any vPars as long as at least one vPar in the vPar container is a managed server and is online.

Switching between nPars and vPars modes

To switch between nPars and vPars from the HP-UX shell:

Set the mode for the next nPartition reboot:

```
# vparenv [-m mode]
```

Where mode has the value of either vPars or nPars. This action might take a few minutes to process.

For example:

- ❑ Set the mode:

```
# vparenv -m vPars
```
- ❑ Manually reboot the nPartition:

```
# shutdown -r
...
Shell> fs0:
fs0:\> hpux/stand/vpmon
...
MON>
```

To switch between nPars and vPars from the vPars monitor:

Reboot the nPartition into the *mode* mode:

```
reboot [mode]
```

Where mode is either vPars or nPars.

If any virtual partitions are up, issuing this command will cause them to be shutdown ungracefully.

To switch from the EFI, issue the following command:

```
Shell> fs0:
fs0:\. vparconfig reboot [mode]
```

Where mode is either vPars or nPars.

Creating a vPar

To create an HP-UX vPars virtual partition, perform the following steps.

- 1 Run the HP-UX Virtualization Manager as described in [Launching the HP-UX Virtualization Manager](#) on page 7.
- 2 Select an HP-UX server that is a vPars Container.
- 3 Right click on the HP-UX server and select Create vPar. This displays the Create Virtual Partition window as shown below.

Figure 1 Create Virtual Partition Screen

Create Virtual Partition

General CPU Memory Input/Output

Name

vPar Name:

When the host powers up, the virtual machine should boot: ▼

Use Primary boot disk only.

Use Primary boot disk. If it fails, use alternate boot disk.

Advanced Settings

- 4 Select the General tab and enter the vPars General settings:

Table 15 vPars General Settings

Property	Description
vPars name	Name, as designated when the vPars container was added to the HP-UX Virtualization Manager
vPar Boot Disk Setting	Setting to automatically or manually boot the disk Use the primary boot only or have alternate boot available.
Advanced Settings - Kernel path and Kernel Boot Options	Full kernel path and kernel boot options (optional)

- 5 Select the CPU tab and enter the CPU settings:

Table 16 vPars CPU Settings

Property	Description
CPU	<p>Number of CPUs to be allocated to the vPars</p> <p>If the server is in nPars mode, the total available CPUs, remaining CPUs, number of cells and the default maximum number of CPUs are unknown.</p> <p>The number of allocated CPUs must fall within the 'CPU Minimum'/'CPU Maximum' range.</p> <p>A total of 16 cells will always be displayed in the table.</p>
Minimum Number of CPUs	Minimum number of CPUs to allocate to the vPars
Maximum Number of CPUs	Maximum number of CPUs to allocate to the vPars (default: 256)

Select the Memory tab and enter the memory settings:

Table 17 vPars Memory Settings

Property	Description
Base Memory	<p>Amount of base memory to allocate to the vPars</p> <p>If the server is in nPars mode, the Remaining Available memory and the number of cells are unknown.</p> <p>A total of 16 cells will always be displayed in the table.</p>
Floating Memory	Amount of floating memory to allocate to the vPars
Cell Local Memory	Amount of cell local memory to allocate to the first vPars (optional)
Inter Leaved Memory	Amount of inter-leaved memory to allocate to the first vPars (optional)

Select the Input/Output tab and set the I/O settings for the vPar:

Table 18 vPars Input-Output Settings

Property	Description
Primary boot disk	Path to the primary boot disk (You must type in the full hardware path of the disk or logical box (LBA).)
Alternate boot disk	Path to the alternate boot disk (optional) (You must type in the full hardware path of the disk or logical box (LBA)).
Local bus adapter	Name of the local bus adapter
Advanced setting: Kernel Path	Kernel path
Advanced setting: Kernel Boot	Kernel boot options

If ioScan data is not available, the Available Hardware Inventory panel will be blank.

- 6 Click Submit to create the vPar virtual partition.

Modifying a vPar

To modify a vPar, right click on a vPar and select Modify vPar. The Modify vPar window is generally the same as the Create vPar except that the current values of the vPar are filled in, and the memory and I/O settings cannot be modified if the vPar's status is Up.



This APX will make multiple calls to the `vparmodify` command to modify the vPar as needed. So while the `vparmodify` command has restrictions on the number of things that can be modified per command invocation, this APX does not.

Starting a vPar

To start a vPar, right click on the vPar and select Start vPar. (Starting a vPar invokes the `vparboot` command, which always attempts to boot an OS from the primary boot disk regardless of the autoboot settings.)

Shutting Down a vPar

To gracefully shut down a vPar, right click the vPar and select Shutdown vPar. This runs the HP-UX `shutdown(1M)` command on the vPar. This operation is only available when the vPar is an SA managed server and the status is Up.

Halting a vPar

To forcefully halt a vPar, right click the vPar and select Halt vPar. This runs the HP-UX `vparreset -f -h` command to halt the vPar. This operation is only available when the vPar status is Up.

Deleting a vPar

A vPar that is not in Up status can be deleted. To delete a vPar, right click on the vPar and select Delete vPar. This option is also available on the right click menu of a vPar.

Managing HPVM Hypervisors

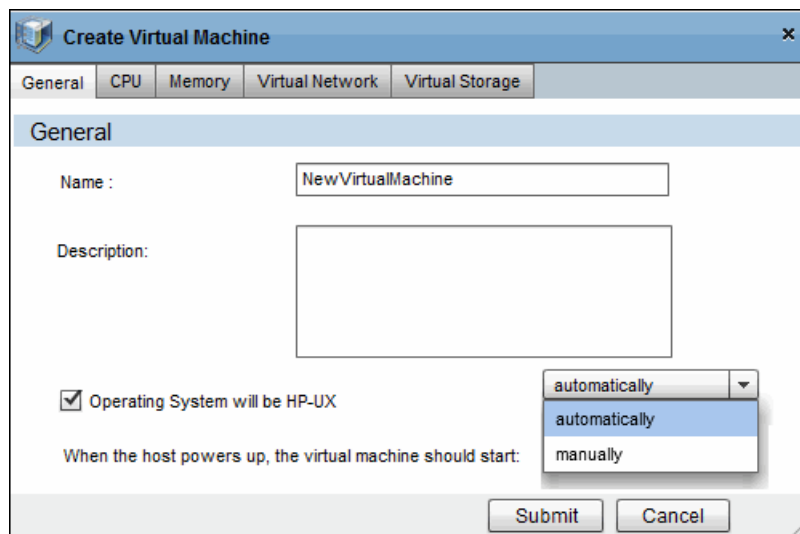
This section describes how to create, add, delete, and modify HPVM hypervisors and HPVMs using the HP-UX Virtualization Manager.

To manage HPVMs using the web-extension, the HPVM host must be a managed server in Server Automation. For instructions on how to convert HPVMs into managed servers, see the *SA User Guide: Server Automation*.

Creating an HPVM

To create an HPVM:

- 1 Follow the instructions in [Launching the HP-UX Virtualization Manager](#).
- 1 In the HP-UX Virtual Servers window, right-click an HPVM hypervisor.
- 2 Choose Create VM to display the Create Virtual Machine window.



The screenshot shows the 'Create Virtual Machine' dialog box with the following details:

- Title Bar:** Create Virtual Machine
- Tabs:** General (selected), CPU, Memory, Virtual Network, Virtual Storage
- General Tab Content:**
 - Name:** NewVirtualMachine
 - Description:** (empty text area)
 - Operating System will be HP-UX
 - When the host powers up, the virtual machine should start:** automatically (dropdown menu is open showing 'automatically' and 'manually')
- Buttons:** Submit, Cancel

- 3 Enter the following information for the new HPVM (You can create a new HPVM by just entering a name and accepting the defaults.):

Table 19 Create VM

Tab and Section	Field or Button	Choice	Description and Default Setting
General			
General	Name		HPVM name (Can include up to 256 upper or lower case alphanumeric characters; dash (—); underscore (_), and period (.)) Note: Cannot <i>start</i> with a dash (Required) Default: NewVirtualMachine.
	Description		HPVM description. (Can include up to 256 upper or lower case alphanumeric characters; dash (—); underscore (_), and period (.))
	Operating System will be HP-UX		Whether the HP-UX operating system be installed on this VM Note: Installing the HP-UX operating system is not part of creating an HPVM. Default: Not selected.
	When the host machine powers up, the HPVM should start:	Automatically	Starts when host powers up Default: Automatically.
		Manually	Start HPVM manually
CPU			
Desired CPUs	Number of CPUs	1 - 256	Number of CPUs dedicated to the HPVM Default: 1

Table 19 Create VM



Tab and Section	Field or Button	Choice	Description and Default Setting
Entitlement (click  to display choices)	Specify Processing Power	%Utilization: <ul style="list-style-type: none"> • Minimum • Maximum 	% of each CPU to be used for the HPVM % Utilization maximum must be >= % utilization minimum Defaults: Minimum: 10; Maximum: 100
		CPU Cycles <ul style="list-style-type: none"> • Minimum • Maximum 	Number of CPU cycles (Mega Hertz or Giga Hertz) Minimum number cannot be > maximum number Maximum number cannot > CPU cycles available on system
Memory			
Desired Memory	Memory		MegaBytes (MB) of memory allocated to HPVM Default: 512
Dynamic Memory Control (click  to display choices)	Use dynamic memory control		Required: Checked Dynamic Memory Control box Default: Disabled.
	Initial Target Memory Size		Initial memory that dynamic memory driver tries to access when guest starts Required: Checked Dynamic Memory Control box
	Minimum Memory Size		Minimum memory available to be dynamically allocated to guest Required: Checked Dynamic Memory Control box
	Maximum Memory Size		Maximum memory available to be dynamically allocated to guest Required: Checked Dynamic Memory Control box

Table 19 Create VM

Tab and Section	Field or Button	Choice	Description and Default Setting
Virtual Networks			List of vSwitches associated with HPVM
Defined Virtual Network - Add Virtual Switch (click Add Virtual Switch to display choices)			vSwitch information for existing vSwitches
	Network Adapter Type	LAN AVIO-LAN	LAN or AVIO-LAN to associate with the vSwitch Default: LAN
	Network Interface Card	Any available PCI Bus (0 - 7) PCI Device (0-7)	Type of interface card to associate with the vSwitch Default: Any available PCI bus or device (recommended choice)
	Select a vSwitch		vSwitches available to associate with the HPVM Note: Select the switch and click Done to add the switch to the list.
vSwitch Display Columns (these criteria are for display purposes only)			
	Name		vSwitch name
	Status		vSwitch status (Up or Down)
	Type	Shared or Exclusive	vSwitch type (shared with another HPVM or exclusive)
	Number of HPVMs using vSwitch		Number of HPVMs that share the vSwitch
	Network Adapter Type	LAN AVIO-LAN	LAN AVIO-LAN
	PCI Bus		Peripheral Component Interconnect Bus (PCI Bus) associated with the vSwitch

Table 19 Create VM

Tab and Section	Field or Button	Choice	Description and Default Setting
	PCI Device		Peripheral Component Interconnect Device (PCI Device) associated with the vSwitch
Virtual Storage			
Virtual Storage (click <input type="button" value="Add..."/> to display choices)			Information about virtual storage associated with the HPVM
Add Virtual Storage	Storage Type	Emulated Small Computer System Interface (SCSI) AVIO Storage	Type of storage to associate with HPVM Default: Emulated SCSI
	Virtual Device	Disk Dvd	Virtual device to associate with HPVM Default: Disk
	Backing Store	Disk Logical Volume File System	Type of backing store to associate with the HPVM Default: Disk
	Device Special File (DSF) Addressing (for disk backing only)	Agile Legacy	Type of storage device file addressing Default: Agile
	Select a Device (for disk backing only)	Device File/ Logical Volume	Type of Device Note: Select a device from the list and click Done to add the device to the list.

- 4 Click Submit to create the HPVM and add it to the list.

Modifying HPVMs

To modify HPVM information:

- 1 Follow the instructions in [Launching the HP-UX Virtualization Manager](#).
- 2 In the HP-UX Virtual Servers window, right-click an HPVM.
- 3 Choose Modify VM.

- 4 Change HPVM settings (see [Creating an HPVM](#) for more information on the settings).
Note: Modify VM has a setting that is not available in the Creating HPVM function:
Advance Settings > Forced Configuration.
Choosing this setting will force the system to make configuration changes and suppress all resource conflict checks and associated warning messages.
Note: If you choose this setting, there will be no notification of potential resource problems for a virtual machine that is modified with this option.
- 5 Click Submit to save the modifications.

Starting an HPVM

To start an HPVM:

- 1 Follow the instructions in [Launching the HP-UX Virtualization Manager](#).
- 2 In the HP-UX Virtual Servers window, right-click an HPVM.
- 3 Choose Start VM.



For information about operating system installation, go to the *HP Integrity Virtual Machines Installation, Configuration, Administration Guide* at: <http://docs.hp.com/hpux/11iv3>, then choose: HP Virtualization Software > HP Integrity Virtual Machines and Online VM Migration.

Halting an HPVM

To halt an HPVM:

- 1 Follow the instructions in [Launching the HP-UX Virtualization Manager](#).
- 2 In the HP-UX Virtual Servers window, right-click an HPVM.
- 3 Choose Halt VM.



Note: Halting an HPVM temporarily stops it from performing its functions and allows the manager to reallocate resources assigned to it.

Shutting Down an HPVM

- 1 Follow the instructions in [Launching the HP-UX Virtualization Manager](#).
- 2 In the HP-UX Virtual Servers window, right-click an HPVM.
- 3 Choose Shutdown HPVM.

Choosing shutdown means that the HPVM shuts down within 30 seconds. If the time-out period expires before the shutdown occurs, a hard stop occurs.



Note: Shutting down an HPVM takes the machine offline and allows the manager to reallocate resources assigned to it.

Removing or Deleting an HPVM

To remove or delete an HPVM from HP-UX Virtualization Manager control:

- 1 Follow the instructions in [Launching the HP-UX Virtualization Manager](#).
- 2 In the HP-UX Virtual Servers window, right-click an HPVMs to delete.
- 3 Choose Delete VM, and click OK when asked to confirm the deletion.
- 4 The HPVM is deleted from the list of managed servers.

Managing vSwitches

This section describes how to create, modify, and delete a vSwitch.



Note: HP-UX Virtualization Manager manages vSwitches. To view HPVM/vSwitch settings, go to the *HP Integrity Virtual Machines Installation, Configuration, Administration Guide* at: <http://docs.hp.com/hpux/11iv3>, then choose: HP Virtualization Software > HP Integrity Virtual Machines and Online VM Migration. For instructions on how to configure LANs and VLANs, see LAN/VLAN documentation.

Creating a vSwitch

To create a vSwitch:

- 1 Follow the instructions in [Launching the HP-UX Virtualization Manager](#).
- 2 In the HP-UX Virtual Servers window, right-click an HPVM hypervisor.
- 3 Choose Create vSwitch to display the Create vSwitch window.

LAN Interface	Number of vSwitches already using	Hardware Path	Status
lan0	0	0/0/3/0	UP
lan1	0	0/1/2/0	DOWN
lan900	1		DOWN
lan901	1		DOWN
lan902	0		DOWN

- 4 Enter the following information for the new vSwitch:

Table 20 Create vSwitch

Field/Button	Description
Name	Choose a name for the vSwitch that does not exceed eight (8) characters. Default: Switch1
Type	Sharable (shared with other HPVMs) or dedicated (associated only with this HPVM) Default: Shareable
Create a local virtual switch, OR Select a LAN interface to connect to (must select the LAN from the list)	Local switch that is not connected to another device. LAN to connect to (Default)
Start the virtual switch after creating	Starts the vSwitch immediately after it is created. Default: Not selected

Modifying a vSwitch

To modify vSwitch information:

- 1 Follow the instructions in [Launching the HP-UX Virtualization Manager](#) to access the HP-UX Virtual Servers window.
- 2 In the HP-UX Virtual Servers window, right-click a vSwitch.
- 3 Choose Modify vSwitch.
- 4 Change vSwitch settings.

The fields that cannot be modified will not be enabled.

Starting a vSwitch

To start a vSwitch:

- 1 Follow the instructions in [Launching the HP-UX Virtualization Manager](#) to access the HP-UX Virtual Servers window.
- 2 In the HP-UX Virtual Servers window, right-click a vSwitch.
- 3 Choose Start vSwitch.

Stopping a vSwitch

To stop/halt a vSwitch:

- 1 Follow the instructions in [Launching the HP-UX Virtualization Manager](#) to access the HP-UX Virtual Servers window.
- 2 In the HP-UX Virtual Servers window, right-click a vSwitch.
- 3 Choose Stop vSwitch.



Note: Halting or stopping a vSwitch temporarily stops it from performing its functions and allows the manager to reallocate resources assigned to it.

Removing or Deleting a vSwitch

To remove or delete a vSwitch from HP-UX Virtualization Manager control:

- 1 Follow the instructions in [Launching the HP-UX Virtualization Manager](#) to access the HP-UX Virtual Servers window.
- 2 In the HP-UX Virtual Servers window, right-click a vSwitch to delete.
- 3 Choose Delete vSwitch, and click OK when asked to confirm the deletion.

Configuring vLAN Connections

To configure vLAN connections:

- 1 Follow the instructions in [Launching the HP-UX Virtualization Manager](#).
- 2 In the HP-UX Virtual Servers window, right-click a vSwitch.
- 3 Choose Configure VLAN.
- 4 For each HPVM, choose the corresponding VLAN ID.

Troubleshooting

This section explains how to troubleshoot your HP-UX virtualization feature.

The HP Support web site provides contact information and details about the products, services, and support that HP Software offers.

For more information or to get help with your issue, contact HP Support:

<http://www.hp.com/managementsoftware/support>

Troubleshooting Issues

Problem: The HP-UX Virtualization Manager extension is not displayed in the SA Library.

- Make sure your user has permission to view and execute the web extension. For details, see [Folder Permissions Required](#) on page 5.

Problem: When adding virtual servers, an HP-UX server does not appear in the search results. Or, when searching all servers, the server displays but when searching for specific IP addresses, it does not.

- Set the Display drop-down list to All Servers and search again.
- Ensure the server is a managed server. For more information, see the *SA User Guide: Server Automation*.
- Perform a hardware registration. On the managed server, run the following SA command:

```
/opt/opsware/agent/pylibs/cog/bs_hardware
```

Problem: When adding virtual servers, a particular server only shows in the results when display is set to All Servers.

- Ensure either Virtual Partition or HP VM software is installed on the server
- Perform a software registration. On the managed server, run the following SA command:

```
/opt/opsware/agent/pylibs/cog/bs_software
```

Problem: The Summary view for a server does not display all information about the server.

- If the server is not managed by SA, some information may not be displayed. Bring the server under SA management. For instructions, see the *SA User Guide: Server Automation*.
- If the server is a managed server, perform a hardware registration. On the managed server, run the following SA command:

```
/opt/opsware/agent/pylibs/cog/bs_hardware
```

Checking Log Files

Log files are stored in the user's `/tmp` directory in the Global File System (OGFS). To access them, log in to the OGS and change directory to `/tmp`.

The name of the log file for HP-UX virtualization is `hpuxvirtlog`. This is a rotating log file, so over time you will see `hpuxvirtlog.1` and `hpuxvirtlog.2` up to a maximum of 3 log files. The current log file is always `hpuxvirtlog`. The file rotates when the size reaches 5Mb.

The log file shows informative messages, warnings and errors. The informative messages show the vPars and HP VM commands that are executed on the managed servers.

Nearly all errors and warnings are displayed in the HP-UX Virtualization manager, so checking the log files is usually not necessary.

Example Log Messages

Here are example log messages:

```
2011-05-31 10:53:59 INFO HPUX-V12N(127): Requested operation: modify_virtual_machine
```

```
2011-05-31 10:54:00 INFO HPUX-V12N.vpar(416): dhcp-184-241: scanning
```

```
2011-05-31 10:54:03 INFO HPUX-V12N.vpar(462): /usr/sbin/vparmodify -p vpar2 -m  
cell:1:cpu::1
```

```
Returned: 0
```

```
2011-05-31 10:54:03 INFO HPUX-V12N.vpar(462): /usr/sbin/vparmodify -p vpar2 -B search
```

```
Returned: 0
```

The messages include the date, time, log level (INFO), module (HPUX-V12N and HPUX-V12N.vpar), and the message text. The lines above show a modify operation performed on a vPar (vpar2). The modify commands were executed on server dhcp-184-241 and both commands returned 0, meaning they were successful.

