

HVM Management Command (HvmSh) Operation Guide

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Preface

This document describes how to use the Compute Blade. (The introduction of the preface states the purpose of the document, briefly introduces the subject of the document, and provides links to the sections of the preface.)

This preface includes the following information:

- ☐ [Intended audience](#)
- ☐ [Product version](#)
- ☐ [Release notes](#)
- ☐ [Referenced documents](#)
- ☐ [Document organization](#)
- ☐ [Document conventions](#)
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Intended audience

This document is intended for the personnel who are involved in planning, managing, and performing the tasks to prepare your site for Compute Blade installation and to install the same.

This document assumes the following:

- The reader has a background in hardware installation of computer systems.
- The reader is familiar with the location where the Compute Blade will be installed, including knowledge of physical characteristics, power systems and specifications, and environmental specifications.

Product version

This document revision applies to HvmSh version 10.3

Release notes

Read the release notes before installing and using this product. They may contain requirements or restrictions that are not fully described in this document or updates or corrections to this document.

Referenced documents

- BladeSymphony 1000 USER'S GUIDE
- HitachiCompute Blade 2000 USER'S GUIDE
- Hitachi Compute Blade 320 USER'S GUIDE
- Hitachi Compute Blade 500 Series Logical partitioning manager User's Guide, MK-91CB500068
- Hitachi Compute Blade 2500 Series Logical partitioning manager UserGuide, MK-99CB2500006

Document organization

The table below provides an overview of the contents and organization of this document. Click the chapter title in the left column to go to that chapter. The first page of each chapter provides links to the sections in that chapter.

Chapter	Description
Chapter 1, HvmSh command	Overviews HvmSh and how to use it.
Chapter 2, HVM Interfaces	Describes the details of HVM interfaces
Chapter 3, Support matrix	Describes the first versions of HvmSh command and HVM supporting each HVM interface.
Chapter 4, Example of use	Describes the examples of uses of interfaces.
Chapter 5, Notes	Describes the notes on usage.
Chapter 6, BS1000, CB2000, or CB320	Provides descriptions for BS1000, CB2000, or CB320.

Document conventions





This term "Compute Blade" See all the models of the Compute Blade, unless otherwise noted.

The Hitachi Virtualization Manager (HVM) name has been changed to Hitachi logical partitioning manager (LPAR manager, or LP). If you are using HVM-based logical partitioning function, substitute references to Hitachi logical partitioning manager (LPAR manager, or LP) with those to HVM.

This document uses the following typographic conventions:

Convention	Description
Regular text bold	In text: keyboard key, parameter name, property name, hardware labels, hardware button, hardware switch. In a procedure: user interface item
<i>Italic</i>	Variable, emphasis, reference to document title, called-out term
Screen text	Command name and option, drive name, file name, folder name, directory name, code, file content, system and application output, user input
< > (angled brackets)	Variable (used when italic is not enough to identify variable).
[] (square bracket)	Optional values
{ } braces	Required or expected value
vertical bar	Choice between two or more options or arguments
_ (underline)	Default value, for example, [<u>a</u>] b]

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

Icon	Meaning	Description
	WARNING	This indicates the presence of a potential risk that might cause death or severe injury.
	CAUTION	This indicates the presence of a potential risk that might cause relatively mild or moderate injury.
NOTICE	NOTICE	This indicates the presence of a potential risk that might cause severe damage to the equipment and/or damage to surrounding properties.
	Note	This indicates notes not directly related to injury or severe damage to equipment.
	Tip	This indicates advice on how to make the best use of the equipment.

Convention for storage capacity values

Physical storage capacity values (for example, disk drive capacity) are calculated based on the following values:

Physical capacity unit	Value
1 kilobyte (KB)	1,000(10^3) bytes
1 megabyte (MB)	1,000 KB or $1,000^2$ bytes
1 gigabyte (GB)	1,000 MB or $1,000^3$ bytes
1 terabyte (TB)	1,000 GB or $1,000^4$ bytes
1 petabyte (PB)	1,000 TB or $1,000^5$ bytes
1 exabyte (EB)	1,000 PB or $1,000^6$ bytes

Logical storage capacity values (for example, logical device capacity) are calculated based on the following values:

Logical capacity unit	Value
1 block	512 bytes
1 KB	1,024 (2^{10}) bytes
1 MB	1,024 KB or $1,024^2$ bytes
1 GB	1,024 MB or $1,024^3$ bytes
1 TB	1,024 GB or $1,024^4$ bytes
1 PB	1,024 TB or $1,024^5$ bytes
1 EB	1,024 PB or $1,024^6$ bytes

Getting help

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Comments

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HvmSh command

This chapter describes HvmSh and how to use it.

- [Overview](#)
- [Operating environment](#)
- [Installing/uninstalling HvmSh](#)
- [Communication method](#)
- [Rules of command execution](#)
- [HvmSh user authentication](#)

Overview

HvmSh commands enable you to operate an HVM through the command line interface of Windows or Linux on the management server.

HvmSh commands also enable you to acquire HVM system information or set up LPAR configurations from the remote system.

Settings that have been changed with HvmSh commands are not automatically reflected in the HVM configuration files. To start the HVM with the setting changes reflected in the HVM configuration files, save the HVM configuration before you shut down the HVM.

HvmSh commands end their operation after recording their operation results on the standard output or the standard error output.

Operating environment

To operate HVMs by HvmSh commands, the management server requires any of the Windows or Linux OSs listed on the table below is installed. This document uses the term "HvmSh for Windows" or "HvmSh for Linux", when necessary, for clarity.

You can execute HvmSh commands for virtual servers.

An HvmSh command require up to 8Mb of memory.

Memory usage varies depending on the configuration of the target HVM and HVM interface.

Table 1-1 OSs supported for HvmSh

HvmSh version	Windows	Linux
V6.X or earlier	Windows Server ® 2008 Windows Server ® 2003 Windows VISTA ® Windows XP ®	N/A
V7.0 or higher	Windows Server ® 2012 Windows Server ® 2008 Windows Server ® 2003 Windows VISTA ® Windows XP ®	Red Hat ® Enterprise Linux ® 6.2 (x86, x86_64) ¹ Red Hat ® Enterprise Linux ® 5.7 (x86, x86_64)
V8.0 or higher	Windows Server ® 2012 R2 Windows Server ® 2012 Windows Server ® 2008 R2 Windows Server ® 2008 R2 SP1 Windows Server ® 2008 Windows Server ® 2003 Windows VISTA ®	Red Hat ® Enterprise Linux ® 6.2 (x86, x86_64) ¹ Red Hat ® Enterprise Linux ® 5.7 (x86, x86_64)
V8.4 or higher	Windows Server ® 2012 R2 Windows Server ® 2012 Windows Server ® 2008 R2 Windows Server ® 2008 R2 SP1 Windows Server ® 2008 Windows Server ® 2003 Windows VISTA ®	Red Hat ® Enterprise Linux ® 6.4 ¹ Red Hat ® Enterprise Linux ® 6.2 (x86, x86_64) ¹ Red Hat ® Enterprise Linux ® 5.7 (x86, x86_64)
V8.6 or higher	Windows Server ® 2012 R2 Windows Server ® 2012 Windows Server ® 2008 R2 Windows Server ® 2008 R2 SP1 Windows Server ® 2008 Windows Server ® 2003 Windows VISTA ®	Red Hat ® Enterprise Linux ® 6.6 ¹ Red Hat ® Enterprise Linux ® 6.5 ¹ Red Hat ® Enterprise Linux ® 6.4 ¹ Red Hat ® Enterprise Linux ® 6.2 (x86, x86_64) ¹ Red Hat ® Enterprise Linux ® 5.7 (x86, x86_64)
V9.0 or higher	Windows Server ® 2012 R2 Windows Server ® 2012 Windows Server ® 2008 R2 Windows Server ® 2008 R2 SP1 Windows Server ® 2008 Windows Server ® 2003 Windows VISTA ®	Red Hat ® Enterprise Linux ® 7.1 ¹ Red Hat ® Enterprise Linux ® 6.6 ¹ Red Hat ® Enterprise Linux ® 6.5 ¹ Red Hat ® Enterprise Linux ® 6.4 ¹ Red Hat ® Enterprise Linux ® 6.2 (x86, x86_64) ¹ Red Hat ® Enterprise Linux ® 5.7 (x86, x86_64)

HvmSh version	Windows	Linux
V9.3 or higher	Windows Server ® 2012 R2 Windows Server ® 2012 Windows Server ® 2008 R2 Windows Server ® 2008 R2 SP1 Windows Server ® 2008 Windows Server ® 2003 Windows VISTA ®	Red Hat ® Enterprise Linux ® 7.2 ¹ Red Hat ® Enterprise Linux ® 7.1 ¹ Red Hat ® Enterprise Linux ® 6.6 ¹ Red Hat ® Enterprise Linux ® 6.5 ¹ Red Hat ® Enterprise Linux ® 6.4 ¹ Red Hat ® Enterprise Linux ® 6.2 (x86, x86_64) ¹ Red Hat ® Enterprise Linux ® 5.7 (x86, x86_64)
V9.5 or higher	Windows Server ® 2012 R2 Windows Server ® 2012 Windows Server ® 2008 R2 Windows Server ® 2008 R2 SP1 Windows Server ® 2008 Windows Server ® 2003 Windows VISTA ®	Red Hat ® Enterprise Linux ® 7.2 ¹ Red Hat ® Enterprise Linux ® 7.1 ¹ Red Hat ® Enterprise Linux ® 6.8 ¹ Red Hat ® Enterprise Linux ® 6.6 ¹ Red Hat ® Enterprise Linux ® 6.5 ¹ Red Hat ® Enterprise Linux ® 6.4 ¹ Red Hat ® Enterprise Linux ® 6.2 (x86, x86_64) ¹ Red Hat ® Enterprise Linux ® 5.7 (x86, x86_64)
V9.6 or higher	Windows Server ® 2016 Windows Server ® 2012 R2 Windows Server ® 2012 Windows Server ® 2008 R2 Windows Server ® 2008 R2 SP1 Windows Server ® 2008 Windows Server ® 2003 Windows VISTA ®	Red Hat ® Enterprise Linux ® 7.2 ¹ Red Hat ® Enterprise Linux ® 7.1 ¹ Red Hat ® Enterprise Linux ® 6.8 ¹ Red Hat ® Enterprise Linux ® 6.6 ¹ Red Hat ® Enterprise Linux ® 6.5 ¹ Red Hat ® Enterprise Linux ® 6.4 ¹ Red Hat ® Enterprise Linux ® 6.2 (x86, x86_64) ¹ Red Hat ® Enterprise Linux ® 5.7 (x86, x86_64)
V9.9 or higher	Windows Server ® 2016 Windows Server ® 2012 R2 Windows Server ® 2012 Windows Server ® 2008 R2 Windows Server ® 2008 R2 SP1 Windows Server ® 2008 Windows Server ® 2003 Windows VISTA ®	Red Hat ® Enterprise Linux ® 7.4 ¹ Red Hat ® Enterprise Linux ® 7.3 ¹ Red Hat ® Enterprise Linux ® 7.2 ¹ Red Hat ® Enterprise Linux ® 7.1 ¹ Red Hat ® Enterprise Linux ® 6.9 ¹ Red Hat ® Enterprise Linux ® 6.8 ¹ Red Hat ® Enterprise Linux ® 6.6 ¹ Red Hat ® Enterprise Linux ® 6.5 ¹ Red Hat ® Enterprise Linux ® 6.4 ¹ Red Hat ® Enterprise Linux ® 6.2 (x86, x86_64) ¹ Red Hat ® Enterprise Linux ® 5.7 (x86, x86_64)
V10.1 or higher	Windows Server ® 2016 Windows Server ® 2012 R2 Windows Server ® 2012 Windows Server ® 2008 R2 Windows Server ® 2008 R2 SP1 Windows Server ® 2008 Windows Server ® 2003 Windows VISTA ®	Red Hat ® Enterprise Linux ® 7.5 ¹ Red Hat ® Enterprise Linux ® 7.4 ¹ Red Hat ® Enterprise Linux ® 7.3 ¹ Red Hat ® Enterprise Linux ® 7.2 ¹ Red Hat ® Enterprise Linux ® 7.1 ¹ Red Hat ® Enterprise Linux ® 6.9 ¹ Red Hat ® Enterprise Linux ® 6.8 ¹ Red Hat ® Enterprise Linux ® 6.6 ¹ Red Hat ® Enterprise Linux ® 6.5 ¹ Red Hat ® Enterprise Linux ® 6.4 ¹ Red Hat ® Enterprise Linux ® 6.2 (x86, x86_64) ¹ Red Hat ® Enterprise Linux ® 5.7 (x86, x86_64)

HvmSh version	Windows	Linux
V10.2 or higher	Windows® 10 Enterprise Windows Server ® 2016 Windows Server ® 2012 R2 Windows Server ® 2012 Windows Server ® 2008 R2 Windows Server ® 2008 R2 SP1 Windows Server ® 2008 Windows Server ® 2003 Windows VISTA ®	Red Hat ® Enterprise Linux ® 7.5 ¹ Red Hat ® Enterprise Linux ® 7.4 ¹ Red Hat ® Enterprise Linux ® 7.3 ¹ Red Hat ® Enterprise Linux ® 7.2 ¹ Red Hat ® Enterprise Linux ® 7.1 ¹ Red Hat ® Enterprise Linux ® 6.10 ¹ Red Hat ® Enterprise Linux ® 6.9 ¹ Red Hat ® Enterprise Linux ® 6.8 ¹ Red Hat ® Enterprise Linux ® 6.6 ¹ Red Hat ® Enterprise Linux ® 6.5 ¹ Red Hat ® Enterprise Linux ® 6.4 ¹ Red Hat ® Enterprise Linux ® 6.2 (x86, x86_64) ¹ Red Hat ® Enterprise Linux ® 5.7 (x86, x86_64)
V10.3 or higher	Windows® 10 Enterprise Windows Server ® 2016 Windows Server ® 2012 R2 Windows Server ® 2012 Windows Server ® 2008 R2 Windows Server ® 2008 R2 SP1 Windows Server ® 2008 Windows Server ® 2003 Windows VISTA ®	Red Hat ® Enterprise Linux ® 7.7 ¹ Red Hat ® Enterprise Linux ® 7.6 ¹ Red Hat ® Enterprise Linux ® 7.5 ¹ Red Hat ® Enterprise Linux ® 7.4 ¹ Red Hat ® Enterprise Linux ® 7.3 ¹ Red Hat ® Enterprise Linux ® 7.2 ¹ Red Hat ® Enterprise Linux ® 7.1 ¹ Red Hat ® Enterprise Linux ® 6.10 ¹ Red Hat ® Enterprise Linux ® 6.9 ¹ Red Hat ® Enterprise Linux ® 6.8 ¹ Red Hat ® Enterprise Linux ® 6.6 ¹ Red Hat ® Enterprise Linux ® 6.5 ¹ Red Hat ® Enterprise Linux ® 6.4 ¹ Red Hat ® Enterprise Linux ® 6.2 (x86, x86_64) ¹ Red Hat ® Enterprise Linux ® 5.7 (x86, x86_64)
<p>Notes:</p> <p>1. To use HvmSh for Linux on Red Hat Enterprise Linux 6.x x86_64 (64 bit) or Red Hat Enterprise Linux 7.x x86_64 (64 bit), install the 32 bit library "libstdc++-x.x.x-i686" because the library is not installed by default. Executing an HvmSh command for Linux without installing the library fails with the following error message or other similar messages.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>error while loading shared libraries: libstdc++.so.6: cannot open shared object file: No such file or directory</p> </div> <p>When you encounter the error, install the library "libstdc++-x.x.x-i686".</p>		

Installing/uninstalling HvmSh

HvmSh is supplied in a format executable through the Windows command prompt or from Linux command lines, as a HVM Utility CD. Copy the HvmSh command file in the execution path in the management server.

Installing HvmSh for Windows

Copy the HvmSh command file in an execution path in a management server.

Installing HvmSh for Linux

The file extension of the HvmSh command file for Linux is tar.gz. Extract the HvmSh command file for Linux and then copy the extracted file in an execution path in a management server.

Uninstalling HvmSh

Remove the executable HvmSh file from a management server.

Network configuration for HvmSh

HvmSh commands are available on management servers with IP addresses registered to the following parameters in the System Configuration screen.

- BSMn IP address (n=1-4)
- HVM CLIn IP address (n=1-8)
- HVM CLIn IP address_v6 (n=1-8)

HVMs ignore HvmSh commands from the management server without IP addresses registered to the parameters.

When the HVM version is any of the following and an IP address of a management server is registered in the HCSM Servers tab of the management module screen, you can also execute HvmSh commands from the management server:

- CB2000: 59-40/79-40 or higher
- CB500: 01-51 or higher
- CB2500: Any

It is, however, recommended that HvmSh commands be executed after registering an IP address of a management server explicitly in an HVM CLIn IP address (n=1-8) or HVM CLIn IP address_v6 (n=1-8).

It is also recommended that SC/BSM be running on a management server, if you register an IP address of the management server in BSMn IP address (n=1-4). Do not run SC/BSM on the management server without doing so.

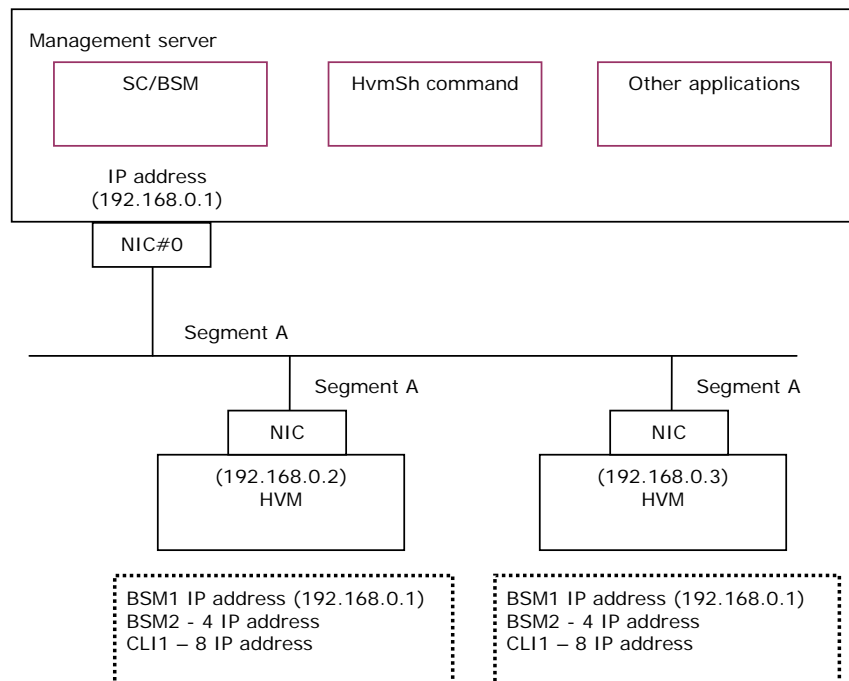


Figure 1-1 Recommended network with a management server and HVMs

When a management server is connected to multiple segments, specify the IP address of a NIC port on a management server in the option "-srcip=" of the HvmSh command. Alternatively, you may use the routing function of Windows or Linux. In such a case, however, register as many routes as the number of HVMs.

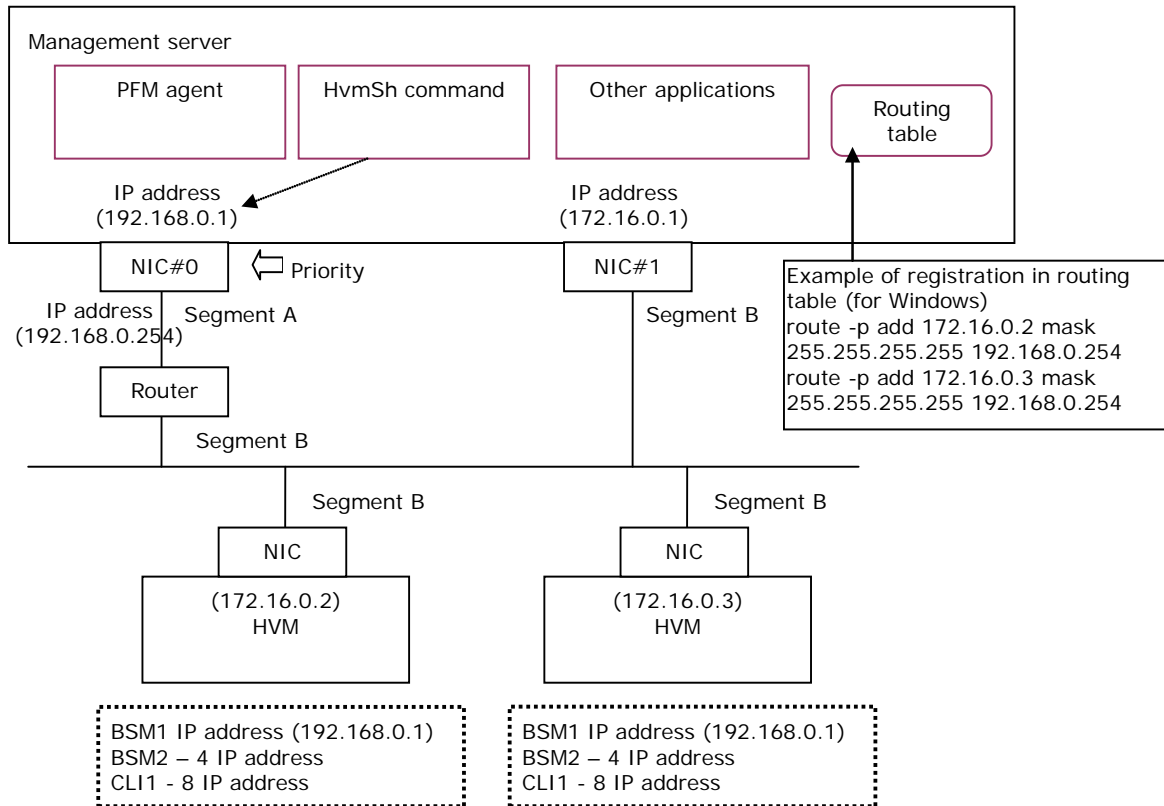


Figure 1-2 Network with a management server and HVMs

Communication method

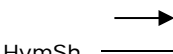

Communication protocol

The following table lists protocols and port numbers for communication between HVM and HvmSh.

Table 1-2 Communication protocol and port number

Protocol	UDP	TCP	
Port number*	623	23250	20670
Communication type	Unicast	Unicast	Unicast
Encryption	Not used	Not used	Used (TLS)
*: You are required to exclusively assign a port on a management server to your HvmSh. When you desire to assign a port that has already been assigned to other programs to your HvmSh, release the other programs from the port in advance.			

Table 1-3 Communication direction and port number

Communication direction	Source port number	Destination port number
	Any	623(UDP) 23250(TCP) 20670 (TLS)
	623(UDP) 23250(TCP) 20670 (TLS)	Any

Note that this operation guide defines TCP protocol with no encryption algorithm as TCP and TCP protocol with encryption algorithm as TLS.

HvmSh for Linux communicate with an HVM using TCP or TLS protocol depending on the combination of HvmSh version, the value of an HvmSh command option, and the value of the option (-prot) in the default file.

HvmSh for Windows communicate with an HVM using UDP, TCP, or TLS protocol depending on the combination of HvmSh version, the value of an HvmSh command option, and the value of the option (-prot) in the default file. Note, however, that some HvmSh commands do not work with the UDP protocol. Using any of TCP or TLS protocol is recommended when both of HVM and HvmSh support the protocol.

When you enable the HvmSh user authentication mode or you use IPv6, communication with UDP protocol is rejected.

Support matrix for communication system

The following tables list communication protocols supported for each combination of HvmSh version and the value of the HvmSh command option (-prot). For communication protocols supported for V7.x or lower of HvmSh, see Rev. 7.40 or lower of the *HVM Management Command (HvmSh) Operation Guide*. Also, for communication protocols for BS1000, CB2000, or CB320, see Rev. 7.40 or lower of the *HVM Management Command (HvmSh) Operation Guide*.

Table 1-4 Support matrix of communication protocols (HvmSh for Linux)

HvmSh version	"-prot" option		HVM firmware version	
	Command option	Default file	CB500 01-00 or higher CB2500 (None)	CB500 01-80 or higher CB2500 02-00 or higher
V8.0 or lower	Not set	Not set	TCP	TCP
		-prot=auto	TCP	TCP/TLS
		-prot=tls	Not communicatable [*]	TLS (Recommended)
	-prot=tls	[Invalid]	Not communicatable [*]	TLS (Recommended)
[*] : An HvmSh command fails to communicate with an HVM (Return: 0x10020001). Those option "-prot=tcp", confirm that "SecureComm" of the command "get HvmFacilityMap" is set to a value of "ON". Note that "SecureComm" is the function of encrypted communication between an HVM and a server management program.				

Table 1-5 Support matrix of communication protocols (HvmSh for Windows)

HvmSh version	"-prot" option		HVM firmware version	
	Command option	Default file	CB500 01-00 or higher CB2500 (None)	CB500 01-80 or higher CB2500 02-00 or higher
V8.0 or lower	Not set	Not set	UDP/TCP ²	UDP/TCP/TLS ²
		-prot=auto	UDP/TCP ³	UDP/TCP/TLS ³
		-prot=udp	UDP/TCP ²	UDP/TCP/TLS ²
		-prot=tcp	TCP (Recommended)	TCP ⁴
		-prot=tls	Not communicatable ¹	TLS (Recommended)
	-prot=udp	[Invalid]	UDP/TCP ²	UDP/TCP/TLS ²
	-prot=tcp	[Invalid]	TCP (Recommended)	TCP ⁴
	-prot=tls	[Invalid]	Not communicatable ¹	TLS (Recommended)
¹ : An HvmSh command fails to communicate within HVM (Return: 0x10020001). Those option "-prot=tcp", confirm that "SecureComm" of the command "get HvmFacilityMap" is set to a value of "ON". Note that "SecureComm" is the function of encrypted communication between an HVM and a server management program. ² : When you use an HVM interface supported in V7.0 or lower of HvmSh for the first time or you use the IPv4 format, the UDP protocol is automatically applied. (When the security strength level of an HVM is set to "High", HvmSh cannot communicate with the HVM.) Whereas, when you use an HVM interface supported in V7.1 or higher for the first time or you use the IPv6 format, HvmSh works in the same way as when "-prot=auto" is set. ³ : The HvmSh commands supported in V7.1 or higher of HvmSh for the first time attempt to communicate with an HVM with TLS protocol, first. Then, when the communication with TLS protocol fails, the HvmSh commands attempt to communicate with an HVM with TCP protocol. Whereas, the HvmSh commands supported in V7.0 or lower of HvmSh for the first time in IPv4 communication attempts to communicate with an HVM with UDP protocol even when both of communication with TLS protocol and that with TCP protocol fail. ⁴ : When the HVM security strength level of an HVM is set to "High", HvmSh commands fail to communicate with the HVM.				

Retry

The following tables list the retry process that HvmSh commands perform when packets lose in communication between an HVM and an HvmSh command, by a combination of communication protocol and command type.

Table 1-6 Retry process by HvmSh

Communication protocol	Command type	Retry by HvmSh command
TCP/TLS	-	None HvmSh commands do not perform any retry process. The third and lower layers (The transport and lower layers) control retransmission, that is, retry processes.
UDP	(Get)	Once HvmSh transmits a request to an HVM, HvmSh waits for a response from the HVM for a timeout period (To)that can be calculated with the following formula. When a timeout occurs, the series of process is repeated. To = Min(Tr , Max(Tp/3, 5)) Tp: Time specified at the option "-timeout" Tr: Tp - (Time has elapsed since activation of HvmSh)= Remaining time Min(A,B): smaller value of A and B Max(A,B): smaller value of A and B The relation of the time specified at the option "-timeout" and the maximum retry count is as follows. -timeout=0 to 5 ->Maximum retry count 0 -timeout=6 to14 ->Maximum retry count 1 -timeout=15 and more->Maximum retry count 2 It is recommended to specify 15 or more at the option "-timeout=", to make retry effective.
	Setting (set/opr)	None No retry process is performed. When a timeout occurs, retrieve and confirm the configuration of the target HVM. Then, try again.

IPv6

V8.6 or higher of HvmSh supports IPv6. You can use IPv6 addresses for the versions of HVM listed in the table below with V8.6 or higher of HvmSh. "IP address" with no version expression indicates IPv4 address hereinafter.

To use an IPv6 address, specify the IPv6 address in "-host=" or "-srcip=" option. Mixed uses of IPv6 and IPv4 addresses in the options "-host=" and "-srcip=" are not allowed.

HvmSh does not support UDP communication using IPv6 addresses. For details, see [Communication protocol](#).

Table 1-7 Combinations of IPv6 supported versions

HvmSh version	HVM version	
	BS1000 (all versions)	-
	CB2000 (all versions)	-
	CB320 (all versions)	-
	CB500 (02-20 or lower)	CB500 (02-25 or lower)
	CB2500 (02-20 or lower)	CB2500 (02-25 or lower)
V8.5 or lower	- ¹	- ¹
V8.6 or higher	- ²	√
Symbols: "-": IPv6 is not supported. "√": IPv6 is supported. Notes: 1. Using IPv6 addresses causes the error "Return:0x10010000". 2. Using IPv6 addresses causes the error "Return:0x10020001" or the error "Return:0x10030003".		

Verification of certificates

You can enable or disable the certificate verification function with the option "-verify=" in communication with TLS protocol. The certificate verification function enables to verify whether an HVM server certificate matches the certificates registered in the certificate installation folder for HvmSh.

Table 1-8 Specifying "-verify=" and verifying HVM server certificate

		Command option		
		No specified	Yes	No
Default file	No specified	√	√	-
	Yes	√	√	-
	No	-	√	-
√: Certificate is verified -: Certificate is not verified				

When you desire to verify HVM server certificates, configure an environment seeing "[Example workflow of preparing certificates for TLS communication](#)".

Rules of command execution

Command syntax

HvmSh commands are executed in the following methods through the command line interface of Windows or Linux. Note that you must put a blank between the elements of a command.

[In use of HVM interface]

```
HvmSh {host=IP address [-srcip=IP address] [-timeout=timeout seconds]
[-prot={udp|tcp|tls} -verify={Disable|Enable} {fileuser=authentication file
name}]HVM interface [ HVM interface option ]
```

[In not use HVM interface]

```
HvmSh { -list[={opr|get|set|cert } ] | -ver }
```

[Articles in execution format]

The articles in the execution format, which are used in this operation guide, are listed in the following table.

Table 1-9 Articles in execution format

Articles in execution format	Description
	This indicates one or more space characters that must be typed. There may be a space in a command example not expressed by a triangle, in which case such editorial spaces are only meant to improve readability of command examples and not to be typed in actual specifying of command strings.
{ } (Curly brackets and vertical bar)	You are required to specify one of the option settings surrounded by a pair of curly brackets. You cannot select multiple option settings. Note that a vertical bar is a separator that segments two option settings. (Example) -prot={udp tcp tls} In this case, you are required to specify one of udp, tcp, or tls for the option "-prot".
[] (Pair of square brackets)	You are allowed not to select any of the option settings surrounded by [].
[...] (Square brackets and three consecutive periods)	These indicate that one or more option settings are omitted in a pair of square brackets. You are allowed to specify option settings in any order. Note that, for multiple option settings for one option, the last setting is applied to the option.

You are required to specify a command option and an interface option in the method of "option name=setting value". For the details of the command options, see [Command option](#). Also, for the details of the interface options, see [Interfaces between HvmSh and HVM](#).

The interface names and the option names are not case sensitive.

When you desire to specify character strings such as name through a command line interface, you are required to specify an escape character proper for the platform.

(Example)

When you specify HVM^^ as a name through the MS-DOS prompt, input HVM"^^".

Note that, here in after, "interface" is occasionally called "command", instead.

Command option

Table 1-10 Command options

Option	Description
-host= IP address	Specifies the HVM IP address of an HVM to operate. This is a requisite parameter. To use IPv4, specify an IP address in decimal numbers delimited by periods ("."). Example: 192.168.0.22 To use IPv6, specify an IP address in hexadecimal numbers delimited by colons (":"). Example: fe80::1ce:c0ff:ee
-srcip= IP address (V4.0 or higher)	Specifies the IP address of a management server (source IP address) for communication with an HVM. This option is required when you desire to assign a fixed IP address to a management server connected to multiple network segments.
-timeout= Timeout Seconds	Specifies the period from command issuing until a timeout between 1 and 3600 seconds by 1 second. When no value is set, the timeout period is automatically set to 30 (seconds). When 0 is set, a timeout error is detected in an extremely short time between tens of milliseconds and hundreds of milliseconds. Therefore, we do not recommend that you set the timeout period to 0.
-prot={udp tcp tls} ([prot=tls]: V8.0 or higher, The others: V4.0 or higher)	Specifies the protocol (UDP TCP TLS) for communication with anHVM.
-verify={Yes No} (V8.0 or higher)	Specifies whether an HvmSh commandverifies a certificate when the HvmSh command communicates with an HVM withTLS protocol. When you do not set a value at this option, the option is set to "Yes".
-fileuser= authentication file name (V8.4 or higher)	When the HvmSh user authentication mode for HVM is enabled, specifies the authentication file in which the authentication information authenticated with the login command is stored. Note that, at the first attempt, specify a file name for a new file. Also, be sure not to edit authentication information input by HvmSh. For details, see Methods to specifyauthentication fileinHvmSh user authentication .
-list= cert (V8.0 or higher)	Outputs a list of approved certificates that an HvmSh command uses for certificate authentication inTLS communication with an HVM. This output form is the same as CERTIFICATE_HVMSSH_APPROVED record of get HvmSecureCmmConfig command.
-list [= {opr get set}]	Outputs a list of HVMinterfaces of HvmSh by HvmSh version. When one of {opr get set} for HVM interface is specified as an argument, only information for the specified items output. Note that the option "-list" cannot be specified with any other option.
-ver	Outputs the HvmSh version. The option "-ver" cannot be simultaneously specified together with another option.

default file

Version 6.0 or higher of HvmSh supports the function that automatically specify command options for HvmSh with the default file (HvmSh.ini) stored in the same directory in which the execution file of HvmSh is stored. When an option defined in "HvmSh.ini" is specified with the activation command, for an HvmSh, the value of the activation command is applied to the HvmSh.

(Example) -prot =udp is applied in the following case.
Default file -prot =auto
>HvmSh -prot=udp-host=xx xx xx xx get System Config

Edit the default file with a text editor. Describe one option per line in specified formats. Be sure to add a return code at the end of each option. The options of the default file are listed in the following table.

Table 1-11 Default file option

Option	Description	HvmShversion
-prot={auto udp tcp tls }	Specify one of (UDP TCP TLS) to use in communication with HVM.	[-prot=tls] V8.0 or higher [others] V6.0 or higher
-verify={ Yes No}	Specifies whether to verify a certificate when HvmSh uses TLS protocol in communication with HVM. When you do not set a value at this option, the option is set to "Yes".	V8.0 or higher
-certificate= certificate installationfolder name	Specify a folder with certificates for communication with TLS protocol when you desire HvmSh to verify certificates in communication with HVM with TLS protocol. However, when you specify the option "install=" in the command "get HvmServerCertificate" or "opr CACertificateRegis" options, the folder name specified at the option is automatically replaced to that specified at the option "-certificate=" of the command.	V8.0 or higher
-perf= { cnfchg_nodata,0 cnfchg_nodata,1 }	This is an option for the operation of the command "get HvmPerfMon" (Get HVM statistical information command) after changes of HVM configuration or LPAR status. This is intended for application tool for management of HVM, such as HVM Navigator, ServerConductor, and so on, which cooperates with HvmSh. See "Specifies the behavior in the case which configuration or LPAR status changes" Table 2-103 Operation after configuration or LPAR status changes in the HVM interface, for further details.	V6.4 or higher
Note that any description other than the options listed in this table does not work. Also, you should set options carefully because no error occurs even if you make a mistake.		

Output format

Upon completion of each command execution, the HvmSh command outputs a message, which includes a return code, in the formats below. Such results are directed to the standard output. If an error occurs during command execution, the first line of the execution result is also directed to the standard error output.

Message formats:

Line 1	HvmSh[(HvmSh version)] result type date and time of HvmSh command execution Return: return code [Msg: message]
Line 2	[HVM command HVM command version date and time of HVM command reception]
≥ Line 3	[HVM interface-dependent information]

- **HvmSh version**

The version of an HvmSh is output.

Note that Version 3.0 or lower of HvmSh does not support this output.

- **Result type**

One of "Complete", "Accepted", or "Failed" is output.

For each result type, one of the following execution result messages is output.

The output sample below shows a result of Completed. (normal end)

Line 1	HvmSh(Version 9.0)Completed.2015/12/0416:33:53Return:0x00000000
Line 2	GetLparConfigVer.1 2015/12/0416:33:53GMT+09:00
Line 3	lparname=L5U3x86-100

The output sample below shows a result of Accepted for an LPAR activation task that an HVM has accepted.

Line 1	HvmSh(Version 9.0)Accepted.2015/12/0416:40:30Return:0x00000019
Line 2	ActivateVer.12015/12/0416:40:30GMT+09:00
Line 3	accept=25

The output sample below shows a result of Failed when you set unsupported characters in an LPAR name.

Line 1	HvmSh(Version 9.0)Failed.2015/12/0417:09:24Return:0x01030000Msg: InvalidInputData
Line 2	(Name)
Line 3	SetLparConfigVer.12015/12/0417:09:24GMT+09:00

The output sample below shows a result of Failed owing to a timeout detected during communication with an HVM.

```
Line 1 HvmSh(Version 9.0)Failed.2015/12/0416:38:29Return:  
0x10020001Msg:ResponseTimeout.
```

The Result type "Accepted" indicates that an HVM receives a request and execute the request asynchronously. In this case, the end code is a 16-digit expression of "operation No.", which follows the situation-dependent message "accept=". You can get the result of the request with the command "getResult" as a status code.

-
- **Date and time of HvmSh command execution**

The date and time at which you execute an HvmSh command is output in the format "YYYY/MM/DDHH:MM:SS".

- **Return code**

The return code is the end status of HvmSh commands. When you execute an HvmSh command through a batch file or a shell script, you can see the return code at "%ERRORLEVEL%" in a batch file of Windows or at "\$?" in a shell script of Linux.

The return codes are categorized into the values listed in the following table.

Table 1-12 Return code classification

Code	Description
0x00000000	Normal end
0x00000001 to 0x0000FFFF	Operation numbers for asynchronous requests
0x00010000 to 0x00FFFFFF	HVM interface status codes for asynchronous requests
0x01000000 to 0x0FFFFFFF	HVM interface error codes that an HVM can detect
0x10000000 to 0xFFFFFFFF	HvmSh command error codes that an HvmSh command can detect

- **Message**

The detail of an error detected is output. For the messages, see [Error messages](#).

- **HVM command/HVM command version**

The name of an HVM command that an HVM execute and the command version are output. You can get the HVM command names with the command "get Versions".

- **date and time of HVM command reception**

The date and time in which an HVM receives an HVM command is output in the format "YYY/MM/DD HH:MM:SS GMT+HH:MM".

Status code

A status code is a return code of the command "getResult" for result retrieval allowed to be used when the result type is "Accepted". When the last four of hexadecimal eight digits are "0000", the status code shows a normal end. Whereas, when the last four of hexadecimal eight digits are "0001", the status code shows a status of "Not completed".

Table 1-13 Status codes

HVM interface	Status code	Description
set SystemInfo opr SystemConfig	0x00030000	Normal end.
	0x00030001	Not completed.
	0x00030002	Error end.
opr Activate (a) (Case of option parameter had not set. Status code 0x00090001 or higher are not displayed)	0x00090000	Normal end.
	0x00090001	Not completed.
	0x00090002	Error end. Limit number of LPARs are already activated. Or the segment/port's number of the assigned VF NICs in the same NIC is exceeded the maximum. Or activation Inhibit may be set to yes for the specified LPAR.
	0x00090003	Wait for a while and retry later.
	0x00090004	Reduce the amount of memory allocated, or deactivate one or more activated LPARs, and then retry activating the LPAR.
	0x00090005	Memory allocation failed due to fragmentation. Reduce the amount of memory allocated, or deactivate one or more activated LPARs, and then retry to activate the LPAR.
	0x00090006	Since the memory size is equal to zero, the LPAR cannot be activated. Set an appropriate memory size and activate the LPAR.
	0x00090007	Activation had failed because of that logical processor number of the LPAR was zero, or physical processor could not assign to the LPAR. Changes the number of processors assigned or deactivates one or more activated LPARs and then retry activating the LPAR.
	0x00090008	Available memory size for LPAR ("assigned memory size"-"memory size for use in system") is deficient. Increase memory size, and then activate the LPAR.
	0x00090009	The number of "VF NICs" that can be assigned to physical NIC ports is exceeding the upper-limit. Perform activation after changing to assign VF NIC.
	0x0009000C	Memory allocation failed due to the following. -Guest NUMA function is enabled, and the memory allocation size for each node is not a multiple of 1GB. -Guest NUMA is disabled, and the memory allocation size for each LPAR is not a multiple of 1GB.
	0x0009000D	You cannot activate the HVM, because it is in the safe mode. Check the NIC configuration and set the safe mode to "OFF", then retry Activate.
	0x0009000E	Invalid VfcID of the FC port, for which the HBA core dedicated mode is enabled. Set a new VfcID, then retry Activating the LPAR.
	0x0009000F	The HVM license expired. HVM cannot activate LPAR.
	0x00090010	You cannot activate the LPAR because the conditions to use the guest NUMA function are not satisfied. Please confirm the LPAR configuration.
	0x00090011	The LPAR failed to be activated owing to no available COS entries.
	0x00090012	The scheduling mode for an LPAR must be dedicated mode when the CBM of the LPAR is not the default value.

HVM interface	Status code	Description
opr Activate (b) (Case of option parameters had set. Status code 0x00090000 or higher are also displayed)	0x00090101	Activation is in progress with obeying option commands.
	0x00090102	Error end. HVM internal error had occurred.
	0x00090103	The target LPAR had not matched between "set BootOrder" command and "opr Activate opr=SetBootOrder" command. "Set BootOrder lpar=m" command was not executed to the target LPAR or it was re-executed to the different LPAR from target.
	0x00090104	Could not get the device information of boot priority by executing the command with "opt=SetBootOrder" option. "opr Activate lpar=n opt=SetBootOrder" command might be executed without executing "set BootOrder lpar=n" command. Please confirm the command parameters.
	0x00090105	Error end. HVM internal error had occurred.
	0x00090106	Un-bootable device was assigned by "opr Activate opt=SetBootOrder" command. Please confirm the command parameters.
	0x00090107	Error end. HVM internal error had occurred.
	0x00090108	Error end. HVM internal error had occurred.
	0x00090109	Error end. HVM internal error had occurred.
	0x0009010A	The target LPAR was deactivated in the activating process.
opr Deactivate	0x000A0000	Normal end.
	0x000A0001	Not completed.
	0x000A0002	Error end.
opr SaveConfig	0x000B0000	Normal end.
	0x000B0001	Not completed.
	0x000B0002	Error end.
	0x000B0003	Wait for a while and retry later.
	0x000B0004	An attempt to save HVM configuration information failed. Wait for a while, and retry later.
	0x000B0005	The configuration data was unable to save because the HVM was in safe mode.
opr Reactivate	0x000D0000	Normal end.
	0x000D0001	Not completed.
	0x000D0002	Error end.
	0x000D0003	The HVM license expired. HVM cannot activate LPAR.
	0x000D0004	You cannot activate the LPAR because the conditions to use the guest NUMA function are not satisfied. Please confirm the LPAR configuration.
opr TakeHvmDump	0x00190000	Normal end.
	0x00190001	Not completed.
	0x00190004	Error end. Wait for a while and retry later.
	0x00190005	Error end. Wait for a while and retry later.
	0x00190100	An HVM internal error occurred. Contact maintenance personnel.
	0x00190101	An HVM internal error occurred. Contact maintenance personnel.
	0x00190102	An HVM internal error occurred. Contact maintenance personnel.
	0x00190103	An HVM internal error occurred. Contact maintenance personnel.
	0x00190200	Error end. An attempt to connect to the FTP server failed. Check that the IP address specified for the FTP server is correct.
	0x00190201	Error end. An attempt to log in to the FTP server failed. Check that the user ID and password specified for the FTP server are correct.
	0x00190202	Error end. The specified directory path was not found on the FTP server. Check that the directory path specified for the FTP server is correct.
	0x00191000	Error end. A timeout error occurred during an attempt to communicate with the external FTP server. Check the network configuration between the HVM and the external FTP server. If the problem persists, check that the FTP software is running normally on the external FTP server. If the problem persists, contact maintenance personnel.

HVM interface	Status code	Description
	0x00191nnn	Error end. An error occurred during an attempt to transfer data to the external FTP server. "nnn" is an FTP reply code (see Notes). Check the network configuration between the HVM and the external FTP server. If the problem persists, check that the FTP software is running normally on the external FTP server. If the problem persists, contact maintenance personnel. Notes: The reply code is defined by the FTP specification (RFC 959).
opr LparActCheck	0x00200000	Normal end.
	0x00200001	Not completed.
	0x00200002	Specified amount of memory allocation failed due to memory fragmentation.
	0x00200003	Specified amount of memory allocation failed.
	0x00200004	Failed to ensure physical processor allocates for LPAR
	0x00200005	Activation inhibited information of the target LPAR had been set to "yes".
	0x00200006	Target LPAR does not exist.
	0x00200007	Target LPAR cannot activate by fatal failure.
	0x00200008	Target LPAR is already activated.
	0x00200009	Activation of target LPAR is inhibited because the LPAR is in migration process.
	0x00200010	The upper-limit VF NIC numbers that can be assigned physical NIC ports are exceeded. Perform activation after changing to assign VF NIC.
	0x0020000A	vfcWWN of shared FC is illegal value.
	0x0020000B	Number of activated LPAR is reached to limit.
	0x0020000C	HVM is running the shutdown process.
	0x0020000D	Memory size of target LPAR is zero.
	0x0020000F	Memory assigned to LPAR is deficient.
	0x00200010	The number of "VF NICs" that can be assigned to physical NIC ports is exceeding the upper-limit. Perform activation after changing to assign VF NIC.
	0x00200011	Guest NUMA is activated, and shared mode or physical processor is specified automatic allocation function.
	0x00200012	An invalid device is allocated.
	0x00200016	Safe Mode is selected for the HVM.
	0x00200017	Invalid VfcID of the FC port, for which the HBA core dedicated mode is enabled.
	0x00200018	The HVM license expired. HVM cannot activate LPAR.
	0x00200019	You cannot activate the LPAR because the conditions to use the guest NUMA function are not satisfied.
	0x00200020	The LPAR cannot be activated because no COS entries are available.
	0x00200021	The scheduling mode of the LPAR must be dedicated mode when the CBM of the LPAR is not the default value.
	0x0020000E	Target LPAR cannot activate by other reason.
opr ProcGroupAdd	0x00210000	Normal end.
	0x00210001	Not completed.
	0x00210002	Error end. Specified processor group No. already exists. Check the parameter and retry.
opr ProcGroupRemove	0x00220000	Normal end.
	0x00220001	Not completed.
	0x00220003	Error end. Could not find the processor group of specified No. Check the parameter and retry.
	0x00220004	Error end. Active LPAR in the processor group of specified No. Move the LPAR to other group and retry.
	0x00220005	Error end. Could not remove processor group 0. Check the parameter and retry.

HVM interface	Status code	Description
opr ProcGroupPproc	0x00240000	Normal end.
	0x00240001	Not completed.
	0x00240002	Error end. Could not find the processor core of specified No. Check the parameter and retry.
	0x00240003	Error end. Could not find the processor group of specified No. Check the parameter and retry.
	0x00240004	Error end. Specified physical processor on dedicated mode. Change the scheduling mode of the LPAR to shared mode and retry.
	0x00240005	Error end. Could not change the group No. of last physical processor core. Check the parameter and retry.
opr ProcGroupLpar	0x00250000	Normal end.
	0x00250001	Not completed.
	0x00250002	Error end. The LPAR of specified No. no longer exists. Check the parameter and retry.
	0x00250003	Error end. The processor group of specified No. no longer exists. Check the parameter and retry.
	0x00250004	Error end. Specified LPAR on dedicated mode. Change the scheduling mode of the LPAR to shared mode and retry.
	0x00250005	Error end. No shared mode processor core on specified processor group. Change the group No. of physical processor core and retry.
opr LPARSched	0x00260000	Normal end.
	0x00260001	Not completed.
	0x00260002	Error end. The LPAR of specified No. no longer exists. Check the parameter and retry.
	0x00260005	Error end. Failed to change the scheduling mode due to insufficient resources of physical processor. Check the parameter and retry.
	0x00260006	Error end. Operation conflicts to LPAR of specified No. Check the LPAR configuration and retry.
	0x00260008	The LPAR failed to be activated because no COS entries were available.
	0x00260009	The scheduling mode for the LPAR must be dedicated mode when the CBM of the LPAR is not the default value.
	0x00260007	The other errors.
opr HvmShutdown	0x002C0000	Normal end.
	0x002C0001	Not completed.
	0x002C0002	Error end. Could not execute due to active LPAR is exists. Wait for a while and retry later.
	0x002C0003	Error end. Could not execute due to updating the HVM firmware. Wait for a while and retry later.
	0x002C0004	Error end. Could not execute due to migrating LPAR. Wait for a while and retry later.
	0x002C0005	Error end. Failed to shutdown. Wait for a while and retry later.
	0x002C0006	Error end other than the above.
opr ForceRecovery	0x002D0000	Normal end.
	0x002D0001	Not completed.
	0x002D0002	Error end other than the above.

HVM interface	Status code	Description
opr SystemPProc	0x002E0000	Normal end.
	0x002E0001	Not completed.
	0x002E0002	Error end. Could not execute due to the state of physical processor core is not "WRN." Check the parameter and retry.
	0x002E0003	Error end. The physical processor core no longer exists. Check the parameter and retry.
	0x002E0004	Error end. Could not execute because the lack of physical processor core license is not occurred. Check the parameter and retry.
	0x002E0005	Error end. Could not execute d because the status of physical processor core is not "ACT." Check the parameter and retry.
	0x002E0006	Error end. Could not execute because the physical processor core is dedicated mode. Check the parameter and retry.
	0x002E0007	Error end. Could not change the last physical processor core in a processor group which active LPAR exists. Check the parameter and retry.
	0x002E0008	Error end other than the above.
opr LPARTimeAdjust	0x002F0000	Normal end.
	0x002F0001	Not completed.
	0x002F0002	Error end.
opr LPARNvram	0x00300000	Normal end.
	0x00300001	Not completed.
	0x00300002	Error end other than the above.
opr LPARFrontPanelDump	0x00310000	Normal end.
	0x00310001	Not completed.
	0x00310002	Error end.
opr HvmDumpToSvp opr HvmDumpToSystem opr HvmDumpToSystem Compress	0x00340000	Normal end.
	0x00340001	Not completed.
	0x00340002	Error end. Could not execute due to dump retrieval. Wait for a while and retry later.
	0x00340004	Error end. Wait for a while and retry later.
	0x00340005	Error end. Wait for a while and retry later.
	0x00340100	An HVM internal error occurred. Contact maintenance personnel.
	0x00340101	An HVM internal error occurred. Contact maintenance personnel.
	0x00340102	An HVM internal error occurred. Contact maintenance personnel.
	0x00340103	An HVM internal error occurred. Contact maintenance personnel.
	0x00340200	Error end. Could not execute due to get the dump. Wait for a while and retry later.
opr LPARConsoleLogErase	0x00360000	Normal end.
	0x00360001	Not completed.
	0x00360002	Error end. Erase of console log had failed.
	0x00360003	Error end. Console log has not existed.
	0x00360004	Error end other than the above.
opr SystemTimeCtrl	0x00380000	Normal end.
	0x00380001	Not completed.
	0x00380002	Error end. Cannot get information from SVP / BMC which do not support this command.
	0x00380003	Error end. Getting information from SVP / BMC has failed.
	0x00380004	Error end. HVM cannot operate this command now. Wait for a while and retry later.
	0x00380005	Error end other than the above.

HVM interface	Status code	Description
opr FcBootFunction	0x003A0000	Normal end.
	0x003A0001	Not completed.
	0x003A0002	Error end. Changes to ConnectionType, MultiplePortID, and DataRate are suspended because some LPARs are still being activated. Deactivate all the LPARs, then retry.
	0x003A0003	Error end other than the above.
opr HvmOperatingMode	0x003E0000	Normal end.
	0x003E0001	Not completed.
	0x003E0002	Error end. Configuration information saving has failed.
opr HvmRestart	0x003F0000	Normal end. *
	0x003F0001	Not completed.
	0x003F0002	Error end. Command cannot be executed because activated LPAR exist.
	0x003F0003	Error end. Command cannot be executed because the HVM is in progress of firmware updating.
	0x003F0004	Error end. Command cannot be executed because a LPAR migration is in progress.
	0x003F0005	Error end. HVM restart operation has failed. Wait for a while and retry later.
	0x003F0006	Error end other than the above.
opr MgmtStandbyPortDiagnosis opr SystemConfigDNS opr HvmScdOptions opr MgmtPathSwitch opr HvmSys2Dump	0x00470000	Normal end.
	0x00470001	Not completed.
	0x00470002	Error end.
	0x00470003	The command "opr MgmtPathSwitch" does not work because the port of the ID specified at the option "active" is not standby. Check the status of the port.
	0x00470004	Enabling the function to collect SYS2 dumps failed.
	0x00470005	Disabling the function to collect SYS2 dumps failed.
	0x0047000F	Error end other than the above.
Opr TimerCounterBase	0x00520000	Normal end.
	0x00520001	Not completed.
	0x00520002	Error end. Configuration information saving has failed.
	0x0052000F	Error end other than the above.
opr HvmIfSecureLevel opr HvmIfSecureVerify opr HvmIfCertificateType opr HvmServerCertificate opr HvmCACertificateRegister opr HvmClientCertificateRegister opr HvmClientCertificateRemove	0x00590000	Normal end.
	0x00590001	Not completed.
	0x00590002	Error end. Verification certificate capture failed because verification certificates 1 to 10 are in use.
	0x00590003	Error end. Security information capture failed. Security information may not match in HVM.
	0x00590004	Error end. In deletion of verification certificate, a certificate that corresponds with a specified parameter does not exist.
	0x00590005	Error end. HVM cannot update user authentication information.
	0x00590006	Error end. A timeout occurred in update of security information.
	0x00590011	Error end. Security information capture failed. Security information may not match in HVM.
	0x0059000F	Error end other than the above.

HVM interface	Status code	Description
opr VCConnectType	0x00590000	Normal end.
opr HvmIfAuthentication	0x00590001	Not completed.
opr HvmPasswdExpiry	0x00590005	Error end. HVM cannot execute update user authentication configuration.
opr HvmUserAdd	0x00590006	Error end A timeout occurred in update of security information.
opr HvmUserRemove	0x00590100	Error end. HVM cannot execute due to operating LPAR migration. Retry later.
opr HvmPasswd	0x00590101	Error end. HVM cannot execute update user authentication configuration.
opr HvmShLoginValidTime	0x00590104	Error end. Connection mode of virtual COM or user authentication configuration of virtual COM fail to change, because there is no console port of virtual COM in the effective range. Change console port of virtual COM and retry.
opr AuditLogConfig	0x00590105	Error end. Authentication mode of virtual COM cannot be changed when connection mode of virtual COM is SSH.
opr ExternalAuthentication	0x00590106	Error end. HVM IPv4 address is not set, so changing the virtual COM connection mode or changing the virtual COM user authentication configuration failed. Set an HVM IPv4 address and retry.
opr LdapConfig	0x00590107	Error end. Command cannot be executed. The information on security is locked due to data access from another. Wait for a while and retry later.
opr LdapPasswd	0x00590108	Error end. The role assigned to the Management Module User does not have the HVM security permission.
opr RadiusConfig	0x00590110	Error end. Invalid characters used for user name. Check parameter and retry.
opr RadiusConnectivityVerify	0x00590112	Error end. Invalid characters used for password. Check parameter and retry.
opr RoleConfig	0x00590114	Error end. Invalid value set for the validity period of the password or the role number. Check parameter and retry.
opr HvmUserConfig	0x00590120	Error end. The user name specified already exists. Check parameter and retry.
opr ManagementModuleUserRole	0x00590121	Error end. The user name specified is not registered. Check parameter and retry.
opr HvmPasswdRecovery	0x00590122	Error end. The number of registered users reaches the registration limit. Delete unneeded registered users and retry.
	0x00590123	Error end. When a single user is registered in HVM, the user cannot be deleted.
	0x00590124	Error end. Command cannot be executed because this command with the current settings would make no user with the Administrators role exist.
	0x00590130	Error end. A reserved user name of HVM is specified. Check parameter and retry.
	0x00590131	Error end. Current password cannot be specified when changing a user's password. Check parameter and retry.
	0x0059013F	Error end other than the above.
opr RadiusConnectivityVerify	0x00590000	Normal end.
	0x00590001	Not completed.
	0x00590005	Error end. HVM cannot execute update user authentication configuration.
	0x00590006	Error end. A timeout occurred in update of security information.
	0x00590140	Error end. The user authentication failed though the HVM successfully communicated with a RADIUS server.
	0x00590141	Error end. The HVM failed to communicate with the RADIUS servers.

HVM interface	Status code	Description
	0x00590142	Error end. The specified RADIUS server has not been set yet.

opr LparCatCbm	0x005D0000	Normal end.
	0x005D0001	Not completed.
	0x005D0002	The LPAR failed to be activated because no COS entries were available.
	0x005D0005	Retry after a while.
	0x005D000F	The other errors.
*: When the last four digits of a status code changes from "0001" (Not completed) to "0000" (Normal end), the target HVM immediately starts to be shut down and HvmSh commands cannot be delivered to the HVM. At that moment, mostly, the status code of the command "getResult" does not show a normal end. In this case, regard the status as a normal end with a status code of "Not completed".		

Error messages

Table 1-14 Error messages

Code	Message	Description	Recommended action
0x01000000	Illegal HVM interface was requested.	The requested HVM interface is not supported.	Make sure the HVM interface is supported by the connecting HVM.
0x01010000	The specified parameter (data) is invalid.	The specified parameter is invalid.	Enter the parameters correctly.
0x01010001	Invalid HVM interface Version	The requested interface is not supported by the HVM.	Check the HVM interface. The version of the host HVM for the specified HVM interface may be old.
0x01020000	Invalid Input Data. (data)	The specified parameter value is not a decimal number, or its number of digits is invalid.	Check if the parameter value is decimal and the number of digits is valid. Then, retry with a valid parameter value.
0x01030000	Invalid Input Data. (data)	The specified parameter value is not in the valid range.	Check if the parameter value is in the valid range. Then, retry with a valid parameter value.
0x01040000	The combination of parameters is invalid.	The specified parameter value cannot be set in the existing LPAR configuration.	Check the LPAR configuration and its state. See Tip below this table.
0x01040001	A required parameter is missing.	A required parameter is not specified.	Enter the required parameter.
0x01040005	The specified device is not existing.	The boot information of the opr SetBoorOrder command, namely, the values of Bus., Dev., and Func. do not match with those of the devices in the server blade.	Retrieve the latest information with the command "get BootDevice" and then retry.
0x01040006	The specified device is not existing.	The port corresponding to the boot information of the opr SetBoorOrder command, namely, the values of Bus., Dev., and Func. does not exist in the device.	Retrieve the latest information with the command "get BootDevice" and then retry.
0x011A0000	Illegal parameter. The specified LPAR Number is out of a range.	Illegal parameter. The specified LPAR number is not in the valid range.	Check the specified LPAR number and then retry with a correct LPAR number.
0x011B0000	Illegal parameter. The specified LPAR Number is out of a range.	Illegal parameter. The specified LPAR number is not in the valid range.	Check if the specified LPAR number matches the LPAR subject to cancellation of guest memory dump. Then, retry with a correct LPAR number.
0x04000000	Target LPAR is undefined.	The target LPAR specified for LPAR operation is not defined.	Define the LPAR and then retry.
0x04000001	The accept number is invalid.	The specified operation number does not exist.	Check if the HVM specified by "-host=IP address" is the target host HVM. Also make sure to specify the correct operation code returned from the host HVM.
0x04000002	The generation number is invalid.	The specified generation number does not match.	Check the latest LPAR definition. When specifying a generation number, enter the newest one.
0x04010000	The target LPAR is being operated.	The specified LPAR is currently in operation. No operation request can be accepted.	Wait for a while and retry higher.
0x04010001	Target LPAR is active.	The target LPAR cannot be set, because it is activated.	Deactivate the LPAR and then set it.
	Active LPARs exist.	The specified operation cannot be performed while active LPARs exist.	Retry the command after all LPARs on the target HVM are deactivated.

Code	Message	Description	Recommended action
0x04010002	Target LPAR is not active.	An attempt to deactivate an LPAR was made, but the target LPAR has already been deactivated.	Ensure the target HVM and LPAR and specify the command to an activated LPAR.
0x04010003	The specified LPAR has already been defined.	The specified LPAR has already been defined.	Specify an unused LPAR number to add an LPAR. Or, add an LPAR without specifying an LPAR number.
0x04020000	Target LPAR or shared FC port was migrated.	Target LPAR and shared FC port not exist because those had migrated.	Confirm the target LPAR and shared FC port.
0x04030000	This request has been cancelled because the guest NUMA function is set to disable.	This interface cannot be used because the guest NUMA function is disabled in the target LPAR.	Confirm the target LPAR.
0x04030001	This request has been cancelled because the guest NUMA function is set to enable.	This interface cannot be used because the guest NUMA function is enabled in the target LPAR.	Confirm the target LPAR.
0x04030002	This request has been cancelled because the guest NUMA function isn't supported.	The guest NUMA cannot be enabled because the guest NUMA is not supported.	Confirm the BIOS configuration.
0x04030003	This request has been cancelled because the specified LPAR is activated and the guest NUMA function is set to enable.	This interface cannot be used because the specified LPAR is activated and the guest NUMA function is set to enable.	Confirm the target LPAR.
0x04030004	The specified LPAR cannot be activated because the guest NUMA function is enabled and one of the following conditions is fulfilled. - The scheduling mode for processor is set to share. - The function to assign physical processors automatically is enabled.	The specified LPAR cannot be activated because the guest NUMA function is enabled and one of the following conditions is fulfilled. - The scheduling mode for processor is set to share. - The function to assign physical processors automatically is enabled.	Set the scheduling mode for LPAR to dedicate and assign logical processors to physical processors.
0x04030005	This request has been cancelled. The logical processor topology setting mode for the guest NUMA is set to the Physical NUMA Node Binding Mode.	The logical processor topology setting mode for a guest NUMA is enabled, so this interface cannot be processed.	Check the LPAR configuration.
0x04030006	You cannot activate the LPAR. The guest NUMA is enabled and the scheduling mode of processor is set to a value of shared mode.	The guest NUMA for the specified LPAR is enabled and the scheduling mode of processor for the LPAR is set to a value of shared mode.	Check the LPAR configuration.

Code	Message	Description	Recommended action
0x04030007	This request has been cancelled. The logical processor topology setting mode for the guest NUMA is set to the Physical Processor Binding Mode.	The HVM or the LPAR does not support the logical processor topology setting mode for the guest NUMA.	Check the LPAR configuration.
0x04030008	The sum of logical processors exceeds the maximum number of logical processors assignable to an LPAR.	The number of logical processors assigned to the LPAR exceeds the maximum number of logical processors assignable to an LPAR.	Check the LPAR configuration.
0x04040001	The following settings cannot be fulfilled simultaneously. - The scheduling mode for processor is set to share. - The guest idle mode is set to MWAIT.	The following settings cannot be fulfilled simultaneously. - The scheduling mode for processor is set to share. - The guest idle mode is set to MWAIT.	Confirm the target LPAR.
0x04040002	This request has been cancelled because the specified LPAR is activated and the guest idle mode is set to MWAIT.	This interface cannot be used because the specified LPAR is activated and the guest idle mode is set to enable.	Confirm the target LPAR.
0x04040003	The guest idle mode isn't available because the logical processor idle detection function is set to enable.	The guest idle mode isn't available because the logical processor idle detection function is set to enable.	Confirm the target LPAR.
0x04040004	The guest idle mode cannot be changed from MWAIT to another and vice versa because the specified LPAR is activated	The guest idle mode cannot be changed from MWAIT to another and vice versa because the specified LPAR is activated	Confirm the target LPAR.
0x04050005	Processor scheduling mode of the LPAR cannot be changed.(L3 cache allocation function is available only for LPARs with dedicated processors.)	The processor scheduling mode of an activated LPAR with its CBM set to the default value cannot be changed.	Confirm the target LPAR.
0x041B0000	A guest memory dump for the target LPAR is not in progress.	No guest memory dump is being taken in the specified LPAR.	A Cancel operation is allowed only while a guest memory dump is being taken. You can use the "get GuestDumpProgress" command to check whether a guest memory dump is being taken in the specified LPAR.
0x08000000	HVM is not executable condition for this request.	The HVM system is not ready to execute the request.	Wait for a while and retry higher. Check that an HVM sub-screen for a set operation is not already open.
0x08000001	Save Configuration request is already accepted. Please wait.	A request to save the HVM configuration has already been received.	Wait until the HVM configuration starts to be saved.

Code	Message	Description	Recommended action
0x08010000	Count Over Shared NIC Config.	The scheduling mode for the specified NIC cannot be changed to share because the maximum allowable number of shared NICs (six shared NICs) already exists.	Change the scheduling mode for one of the existing shared NICs to dedicated and retry the operation. Alternatively, review and change the system configuration.
0x08010001	Select Device is Single Port NIC. Cannot change Management Path.	You cannot select the NIC for management paths due to the single path configuration.	Reconfigure the system.
0x08010002	Not Changed!! Select Device is Management Path.	You cannot change the NIC because it is used for a management path.	Reconfigure the system.
0x08010003	Cannot set port ded to off because the scheduling modes of the ports are unmatched.	In the specified device, some ports are in shared mode and the ports are in dedicated mode.	Match the scheduling modes of the ports in the specified device.
0x08020000	The name (LPAR_name) is used for other LPAR.	An attempt to set an LPAR name was made, but an LPAR with the same name already exists.	Check if the specified LPAR name does not already exist in the system. Specify a unique LPAR name.
0x08020001	The specified value is already used for other field.	The specified value was not accepted because it is already being used for another field.	Specify a different value.
0x08020004	<i>The name (group name) is used for other group.</i>	<i>An attempt to set a processor group name was made, but a processor group with the same name already exists.</i>	Check if the specified processor group name does not already exist in the system. Specify a unique processor group name.
0x08020005	The specified group does not exist	Could not operate because the specified group does not exist.	Specify a different value.
0x08030000	Change VNIC System No	You need to change the VNIC system number to a number other than 0.	Change the VNIC system number.
0x08040000	VfcWWN cannot be changed. It is necessary to set vfcd unchanged.	Changing VfcWWN is not allowed because changing of the specified VfcID is enabled.	Disable VfcID changing and then retry.
0x08190001	HVM dump process is busy. (Other dump was in generating process.) Please retry the command higher.	The dump could not be taken because another dump is being generated.	Wait for a while and retry higher.
0x08190002	HVM dump process is busy. (Other dump was in transferring process.) Please retry the command higher.	The dump could not be taken because another dump is being transferred.	Wait for a while and retry higher.
0x08191001	HVM internal error occurred. Dump generation failed.(Null pointer error)	An HVM internal error occurred. Generating dump data failed due to a null pointer.	Contact maintenance personnel.

Code	Message	Description	Recommended action
0x08191002	[HvmSh Ver 8.4 or lower] HVM internal error occurred. Dump generation failed. (Dump table error) [HvmSh Ver 8.5 or higher] HVM dump has been overwritten.	An HVM internal error occurred. An attempt to generate a dump failed due to a dump table error.	Dump data was overwritten while collecting dump data by "get HvmDumpData" or "get HvmDumpDataCompress" command. Retry after a while.
0x08191003	HVM internal error occurred. Dump generation failed. (Max dump size over)	An HVM internal error occurred. An attempt to generate a dump failed because the dump was over the maximum size.	Contact maintenance personnel.
0x081A0001	A previous guest memory dump is in progress. Please retry the command higher.	The dump could not be taken because a guest memory dump is being taken.	Wait until the previous guest memory dump request is complete and then retry the command.
0x081B0001	Updating HVM firmware, Please retry the command higher.	Could not execute due to updating the HVM firmware version.	Wait for a while and retry higher.
0x081B0002	Executing LPAR migration, Please retry the command higher.	Could not execute due to migrating an LPAR.	Wait for a while and retry higher.
0x081B0003	HVM System Logs process is busy. (HVM System Logs was in generating process.) Please retry the command higher.	Could not execute due to HVM was registering logs.	Wait for a while and retry higher.
0x081C0001	Other LPAR uses the specified FC	Specified FC is using by other LPAR.	Deactivate the LPAR which is using specified FC before executing the command again.
0x081C0002	Target FC is not supported	Specified FC is not supported by the command.	Confirm the type of FC card.
0x081C0003	This Command is not supported.	The command is not supported on the target Blade.	Confirm Blade type which is operating HVM.
0x081C0005	This Command is not available on 64UEFI(PB).	The target command cannot use because the PB setting of LPAR is set to 64UEFI.	Set the PB setting of LPAR in the EFI screen in LPAR.
0x081C0006	The selected FC port which is in the HBA Core Dedicated Mode cannot be set in the Connection Type is FC-AL and Multiple PortID is Enable.	The selected FC port is in the HBA core dedicated mode, so setting both ConnectionType=FC-AL and MultiplePortID=Enable is not allowed.	Check the settings.
0x081C0007	The selected FC port, which is dedicated, cannot be set in the HBA Core Dedicated Mode.	The schedule mode of the designated FC port is "dedicated", so enabling the HBA core dedicated mode is not allowed.	Check the settings.
0x081C0008	LPARs with the selected FC port, which are activated, cannot be set in the HBA Core Dedicated Mode.	While any of the LPARs are in the activated state, changing the HBA core dedicated mode is not allowed.	Deactivate the LPAR, then retry.

Code	Message	Description	Recommended action
0x081C0009	The selected FC port, which is in Connection Type is FC-AL and Multiple PortID is Enable, cannot be set in the HBA Core Dedicated Mode.	The setting for the specified FC port includes ConnectionType=FC-AL and MultiplePortID=Enable, so enabling the HBA core dedicated mode is not allowed.	Check the settings.
0x08200000	Cannot change HVM System Time due to NTP enabled.	HVM system time cannot be set because NTP is enabled.	Confirm NTP configurations.
0x08200001	Cannot change timezone of HVM System Time due to NTP enabled.	Time Zone of HVM system time cannot be set because NTP is enabled.	Confirm NTP configurations.
0x08200002	NTP server is not set.	NTP Server ID cannot be disabled because NTP is enabled.	Confirm NTP configurations.
0x08200003	IP address of NTP server is needed.	Specified NTP Server ID is invalid.	Specify correct ID.
0x08400000	The HVM license expired. HVM cannot activate LPAR.	HVM cannot activate LPAR due to the HVM license expiration.	Update the HVM license and try again.
0x0C000001	Target LPAR is Failure	The target LPAR is not currently available due to an unrecoverable failure.	Contact maintenance personnel.
0x0E000000	You don't have permission to execute the command.	The user is not allowed to execute the command.	Confirm whether the user has the HVM security permission. Note that this error indicates that the user specified at the option "-user " does not have the HVM security permission for the HVM. Log into the HVM with a user with the HVM security permission for the HVM and then change the password with the command "opr HvmPasswd".
0x10010000	Invalid Option.	An invalid option is specified.	Check the option.
0x10010001	Both of IPv4, IPv6 address are specified.	Both IPv4 and IPv6 addresses are used in "-host=" and "-srcip=" options.	Use either IPv4 addresses or IPv6 addresses.
0x10020000	Target Host Unreachable.	The target host was not found.	Check whether the specified address is correct. Check that the specified target host is up and running normally.
0x10020001	Response Timeout.	There was no response from the target host.	(1) When the security strength is set to "High ", reset the security strength to "AUTO" or "TLS". (2) The HVM interfaces supported only in V7.1 or higher of HVM do not work for HVMs not supporting TCP protocol. Confirm the support map. (3) In other cases, check that the target host (HVM) is running normally and the IP address of a server in which you operate your HvmSh, as a CLI IP address. When you do not find any of the above, retry.

Code	Message	Description	Recommended action
	Response Timeout(UDP)	There was no response from the target host.	(1) When the security strength is set to "High", reset the security strength to "AUTO" or "TLS". (2) In other cases, check that the target host (HVM) is running normally and the IP address of a server in which you operate your HvmSh, as a CLI IP address. When you do not find any of the above, retry.
0x10030000	Unknown Data Received.	Unexpected data was received.	Check that the specified target host is up and running normally.
0x10030001	Failed to bind.	Binding failed.	Check the communication settings.
0x10030002	Failed to activate session.	Establishing a session failed.	Check that the specified target host is up and running normally. Check the number of sessions.
0x10031yzz	There is an error report from HVM regarding message transmission.	An error was reported during message exchange with HVM. The last three digits "yzz" in the code identify the HvmSh command and an HVM internal code in hexadecimal format.	Ensure that the specified target (host HVM) is operating normally.
0x10080001	Blade does not support PCID function.	Unable to change the guest PCID (the capability of PCID function for LPAR) because the server blade does not support this function.	Check the server blade on which the target HVM is running.
0x10080002	HVM does not support guest PCID capability change.	Unable to change the guest PCID (the capability of PCID function for LPAR) because the HVM does not support this function.	Check the server blade on which the target HVM is running and the HVM firmware version.
0x10080003	Blade does not support IBRS/IBPB function.	Unable to change the guest IBRS/IBPB (the capability of IBRS/IBPB function for LPAR) because the server blade does not support this function.	Check the server blade on which the target HVM is running.
0x10080004	HVM does not support guest IBRS/IBPB capability change.	Unable to change the guest IBRS/IBPB (the capability of IBRS/IBPB function for LPAR) because HVM does not support this function.	Check the HVM firmware version.
0x10080005	Blade does not support SSBD function.	Unable to change the option setting (enable or disable) for use of the guest SSBD function because the server blade does not support this function.	Check the server blade on which the target HVM is running.
0x10080006	HVM does not support guest SSBD capability change.	Unable to change the option setting (enable or disable) for use of the guest SSBD function because the HVM does not support this function.	Check the HVM firmware version.
0x10080007	Blade does not support MDClear function.	Unable to change the option setting (enable or disable) for use of the guest MDClear function because the server blade does not support this function.	Check the server blade on which the target HVM is running.
0x10080008	HVM does not support guest MDClear capability change.	Unable to change the option setting (enable or disable) for use of the guest MDClear function because the HVM does not support this function.	Check the HVM firmware version.

Code	Message	Description	Recommended action
0x10190001	Illegal parameter. FTP IP Address input form is xxx.xxx.xxx.xxx (xxx : decimal number, the range : 0.0.0.0 - 255.255.255.254).	Illegal parameter. The IP address of the external FTP server must be in the "xxx.xxx.xxx.xxx." format (where xxx is a decimal number and xxx.xxx.xxx.xxx is in the range from 0.0.0.0 to 255.255.255.254.)	Check if a correct parameter value is specified for the IP address of the external FTP server that is the destination of transmitting and storing the HVM dump.
0x10190002	Illegal parameter. Input FTP User ID in less than 16 characters or equal.	Illegal parameter. A user ID for the external FTP server must be 16 characters or less.	Check if a correct parameter value is specified for the user ID for the external FTP server that is the destination of transmitting and storing the HVM dump.
0x10190003	Illegal parameter. Input FTP Password in less than 16 characters or equal.	Illegal parameter. A password for the external FTP server must be 16 characters or less	Check if a correct parameter value is specified for the password for the external FTP server that is the destination of transmitting and storing the HVM dump.
0x10190004	Illegal parameter. Input FTP Directory Path in less than 49 characters or equal.	Illegal parameter. A directory path string for the external FTP server must be 49 characters or less.	Check if a correct parameter value is specified for the directory path for the external FTP server that is the destination of transmitting and storing the HVM dump.
0x101A0001	Illegal parameter. FTP IP Address input form is xxx.xxx.xxx.xxx (xxx : decimal number, the range : 0.0.0.0 - 255.255.255.254).	Illegal parameter. The IP address of the external FTP server must be in the "xxx.xxx.xxx.xxx." format (where xxx is a decimal number and xxx.xxx.xxx.xxx is in the range from 0.0.0.0 to 255.255.255.254.)	Check if a correct parameter value is specified for the IP address of the external FTP server that is the destination of transmitting and storing the guest memory dump.
0x101A0002	Illegal parameter. Input FTP User ID in less than 16 characters or equal.	Illegal parameter. A user ID for the external FTP server must be 16 characters or less.	Check if a correct parameter value is specified for the user ID for the external FTP server that is the destination of transmitting and storing the guest memory dump.
0x101A0003	Illegal parameter. Input FTP Password in less than 16 characters or equal.	Illegal parameter. A password for the external FTP server must be 16 characters or less.	Check if a correct parameter value is specified for the password for the external FTP server that is the destination of transmitting and storing the guest memory dump.
0x101A0004	Illegal parameter. Input FTP Directory Path in less than 49 characters or equal.	Illegal parameter. A directory path string for the external FTP server must be 49 characters or less.	Check if a correct parameter value is specified for the directory path for the external FTP server that is the destination of transmitting and storing the guest memory dump.
0x101A0005	Illegal parameter. The specified LPAR Number is out of a range.	Illegal parameter. The specified LPAR number is not in the valid range.	Check if the specified LPAR number matches the LPAR under HVM subject to guest memory dump. Then, retry with a valid LPAR number.
0x101B0005	Illegal parameter. The specified LPAR Number is out of a range.	Illegal parameter. The specified LPAR number is not in the valid range.	Check if the specified LPAR number matches the LPAR under HVM subject to cancellation of guest memory dump. Then, retry with a valid LPAR number.
0x101B0006	Illegal parameter. LPAR Number was not specified.	Illegal parameter. No LPAR number was specified.	Specify an LPAR number.
0x101F0001	The temporary file specified in "filename=" option does not exist.	HVM statistical information was not obtained because "get HvmPerfMon" HVM interface was executed for the first time.	Execute "get HvmPerfMon" again.
0x101F0002	The content of temporary file specified in "filename=" option is now invalid.	Execution of "get HvmPerfMon" HVM interface was attempted more than 10 minutes higher than its last execution.	Execute "get HvmPerfMon" again.

Code	Message	Description	Recommended action
0x10590000	file busy at get HvmServerCertificate	Writing to the target file or folder is competed when the "get HvmServerCertificate" command is executed.	Retry after completion of access to a file or folder.
0x10590001	The folder name specified in "install=" option is invalid	You cannot create/access the folder name specified in "install=" option using the "get HvmServerCertificate/opr CACertificateRegist" command.	Review specifying the "install=" option.
0x1059001x	HVM's security certificate is not trusted	Error occurred when verifying HVM server certificate in communication with TLS protocol.	Confirm the following items: <ul style="list-style-type: none"> ● HVM server certificate is registered in a certificate installation folder of HvmSh command. ● The validity term of the certificate expires is available. HVM self signed certificate that is the same as the subject is not exist.
0x10590020	Illegal parameter (user/password).	User name and password is invalid.	Check whether that max characters, specifying user name, and specifying password are correct.
0x10590021	"opr login" or "opr logout" is not supported.	The HVM does not support the user authentication.	Do not execute "opr login" and "opr logout".
0x10590022	The number of login users has reached the maximum.	The number of login users has reached to the maximum number of users that are allowed to log into an HVM simultaneously.	Execute "opr logout", and then retry.
0x10590023	Error occurred at authentication file access.	Error occurred at authentication file access.	Revise specified values of "-fileuser=option" or "environment variable: HVMSH_HOME".
0x10590024	No valid authentication info.	No valid authentication information. It may not be logged in. Or login timeout may occur.	Execute login command and retry.
0x10590025	Authentication is disabled.	Authentication user for HvmSh command is disabled.	Enable authentication user and retry after executing login command.
0x10590026	Already logged in.	Already logged in.	Execute "opr logout", and then retry.
0x10590027	Already logged out.	You have already logged out.	No action is required.
0x10590028	Illegal parameter(secret).	The shared secret key for the RADIUS server is corrupt.	Confirm each character of the shared secret key and the number of characters.
0x10590030 0x10590031	Failed to authenticate user.	Failed to authenticate user.	Execute login command using valid user name/password and retry.
0x105A0006 0x105A0007	HVM is not executable condition due to management path failover. Please retry the command later.	Nonexecutable due to the management LAN port is switched.	Retry after a while.
0x105A00F0	ManagePathChangeVer2 is not supported or standby port is not defined.	Nonexecutable due to the unsupported ManagePathChangeVer2 or the undefined Management Path Standby port.	Do not use the command with the configuration.
0x105A0002 0x105A0003 0x105A0004 0x105A0005 0x105A00F1 0x105A00F2	HVM internal error occurred.	An HVM internal error occurred in the "get MgmtStandbyPortStatus" command.	Follow your maintenance procedure; for example, contact maintenance personnel.

Code	Message	Description	Recommended action
0x101F001x	Access error occurred for temporary file specified in "filename=" option	An error occurred while reading or writing the temporary file specified in "filename=" option of "get HvmPerfMon" HVM interface. The last digit "x" is a hexadecimal number for an internal code of HvmSh command.	Check if the filename specified in "filename=" option is valid, and then retry with a valid filename. If the error persists, delete the corresponding temporary file, and then execute "get HvmPerfMon" again.
0x101F002x	The content of temporary file specified in "filename=" option is invalid.	The content of the temporary file specified in "filename=" option of "get HvmPerfMon" HVM interface was found invalid. The last digit "x" is a hexadecimal number for an internal code of HvmSh command. Note: This error code will occur by the reboot of the Guest OS because the LPAR status changes in HVM internal such as "activate->deactivate->activate".	Check if the filename specified in "filename=" option is valid, and then retry with a valid filename. If the error persists, delete the corresponding temporary file, and then execute "get HvmPerfMon" again.
0x11000000	Illegal HVM interface was requested.	An invalid HVM interface was specified or a necessary HVM interface was not specified.	Check the specified HVM interface.
0x1100001x ("x" is internal code HvmSh)	Access error occurred for a file specified in "filename=" option.	Error occurred when reading or writing the file which was specified by "filename=" option.	Confirm "filename=" option.
0x1100002x ("x" is internal code HvmSh)	The content of file specified in "filename=" option is invalid.	Illegal description exists in the file which was specified by "filename=" option.	Confirm contents of specified file. For details, see File format for controlling LPAR boot information .
0x1100003x 0x1100004x ("x" is internal code HvmSh)	The content of file specified in "filename=" option is invalid.	Illegal description exists in the file which was specified by "filename=" option.	Confirm contents of specified file.
0x1100005x ("x" is internal code HvmSh)	Socket error occurred.	Error occurred in the TCP protocol communication between HVM and HvmSh.	Confirm that the specified host (target HVM) is operating normally. Retry when the HVM is operating normally.
0x11000060	The size of file specified in "filename=" option is invalid.	File size of the folder name specified in "install=" option is 0 GB or over when using the "get HvmServerCertificate/opr CACertificateRegist" command.	Confirm "filename=" option.
0x11000060	The size of file specified in "filename=" option is invalid.	File size of the folder name specified in "install=" option is 0 GB or over when using the "get HvmServerCertificate/opr CACertificateRegist" command.	Confirm "filename=" option.
0x20030000	Error occurred at the operation about certificate.	Error occurred for the specified parameters when creating HVM server certificate (specified by the user) or CSR.	Confirm parameters and try again.
0x20030001	The certificate doesn't match private key.	Certificate and private key are not consistent when registering HVM server certificate (signed by certificate authority).	Create CSR again. Register the certificate signed by certificate authority that got from the certificate authority after sending CSR to the certificate authority.

Code	Message	Description	Recommended action
0x20030003	Error occurred at the "open-SSL" command.	The "open SSL" command is failed.	Confirm parameters and try again.
0x2003000F	Error occurred at the operation about certificate.	Error other than the above occurs about certificate or CSR operation.	Confirm parameters and try again.
0x20030010	Connection with the RADIUS server is being tested.	Connection with the RADIUS server is being tested.	Retry this operation after the connection test completes.
0x20040000	HVM internal error occurred. Getting authenticationLogs failed. (Memory allocation error).	HVM internal error occurred. Getting authenticationLogs failed. (Memory allocation error).	Wait for a while and retry.
0x20040001	HVM internal error occurred. Getting authenticationLogs failed. (Library error)	HVM internal error occurred. Getting authenticationLogs failed. (Library error)	Wait for a while and retry.
0x20040002	HVM internal error occurred. Getting authenticationLogs failed. (Null pointer error)	HVM internal error occurred. Getting authenticationLogs failed. (Null pointer error)	Wait for a while and retry.
0x20040003	HVM internal error occurred. Getting authenticationLogs failed. (Data offset error)	HVM internal error occurred. Getting authenticationLogs failed. (Data offset error)	Wait for a while and retry.
0x20040010	Multiple HvmSh execute the "get HvmAuthenticationLogs" command at the same time.	Multiple HvmSh execute the "get HvmAuthenticationLogs" command at the same time.	Wait for a while and retry.
0x200400FF	HVM internal error occurred.	An HVM internal error occurred.	Wait for a while and retry.
0x21000000	No CLI dump.	The "LPAR Dump Collection " command (Syntax3) is failed due to no LPAR Dump data.	Execute the "LPAR Dump Collection " command (system area) (Syntax2), and retry the "LPAR Dump Collection" command (Syntax3).
0x21000001 0x21000002	CLI dump is busy.	The "LPAR Dump Collection " command (Syntax3) is failed due to updating or reading the LPAR Dump data.	Retry the "LPAR Dump Collection" command (Syntax3).
0x21000003	No SYS2 dump.	The SYS2 dump collection command failed due to no SYS2 dump data.	Check whether there is SYS2 dump data.
0xFFFFFFFF	Unexpected Exception was raised.	An internal error or an error in the HVM occurred.	The host HVM may be encountering a severe error. Contact maintenance personnel.

If you receive Return: 0x01040000 together with the message "The combination of parameters is invalid", check that you have not specified any of the following:

- set LPARSrv for a dedicated mode LPAR
 - set LPARPB for a non-Xeon HVM
 - set LPARLProc for a shared mode LPAR
 - set LPARLProc with a physical processor number higher than the number of dedicated logical processors
 - set LPARLProc with a logical processor number higher than the number of dedicated logical processors
 - set LPARLProc with a duplicate logical processor number that is within an LPAR
 - set LPARPCI with a specification of Attach, Detach or Specify for an unassigned PCI device number
 - set LPARPCI with a specification of Attach, Detach or Specify for a non-exclusive shared mode PCI device number
 - set LPARPCI with a specification of Attach or Detach for an LPAR which is not activated
 - set LPARPCI with a specification of Detach for an already Detached LPAR which is activated
 - set LPARPCI with a specification of Attach for an already Attached LPAR which is activated
 - set LPARPCI with a specification of Specify when usbautoalloc in the getLPOption is Enable.
 - set LPARPCI with a specification of Attach for an already attached LPAR which is activated
 - set LPARVNICID, LPARVNICMac, or LPARVNICVlan with a non-existing shared NIC network segment identifier
 - set LPARVNICID, LPARVNICMac, or LPARVNICVlan with a duplicate shared NIC network segment identifier
 - set LPARVNICID for a two-port shared NIC, without specifying both ports (for example, 1a and 1b)
 - set LPARVNICMac with a duplicate MAC address of range of virtual NIC's MAC address which automatically generated by the HVM.
 - set LPARVNICVlan with both vlanmode=UnTag and vlanid=ALL
 - set LPARVNICVlan with vlanmode=UnTag and multiple Vlan IDs for vlanid
 - set LPARSFC with a non-existing PCI (due to a wrong slot or port number) to which SfcVfcID is to be assigned
 - set LPARSFC with an SfcVfcID already set for a different LPAR with the same slot and port numbers
 - set LPARSFC requesting change of assigned VfcID for an LPAR on which change of assigned VfcID is not allowed
- get BootDevice requesting "opr Activate" command without specifying "opr=GetBootDevice" option.

HvmSh user authentication

Overview of user authentication

The user authentication function through HvmSh uses a set of user name and password registered in HVMs or LDAP servers. When HvmSh user authentication mode for HVM is enabled, set a user name and a password and then login to an HVM. At that time, you can execute HVM interfaces. Finally, log out from the HVM.

You can execute HVM interfaces after login. Also when HvmSh user authentication mode for HVM is enabled, UDP protocol communication is rejected, and a timeout (Return code: 0x10020001) occurs.

- | | |
|-----------------------------------|----------------------------------|
| (1) Executing the login command. | |
| (2) Executing HVM interfaces. | |
| | Multiple executions are allowed. |
| Executing HVM interfaces. | |
| (3) Executing the logout command. | |

Figure 1-3 Availability of HVM interfaces when user authentication is enabled

Login

Up to 70 users are allowed to access an HVM at the same time.

A user of a management server is not allowed to access an HVM as two or more HVM users at the same time. When HVM user A has already logged into an HVM, HVM user B is not allowed to log into the HVM and the error "Return: 0x10590026" occurs. Also, when HVM user A attempts to log into an HVM after the HVM user A has already logged into the HVM, the error "Return: 0x10590026" occurs.

A user of a management server is allowed to log into different HVMs at the same time.

Two or more users of a management server are allowed to log into an HVM as the same HVM user.

It may take about 35 seconds to log into an HVM in which LDAP authentication is enabled. You should set the timeout period to 40 or more seconds for HVMs in which LDAP authentication is enabled.

It may take about 120 seconds to log into an HVM in which RADIUS authentication is enabled. You should set the timeout period to 120 seconds or more seconds for HVMs in which RADIUS authentication is enabled.

Authentication file

HvmSh stores authentication information in a specified file (hereinafter referred to as "authentication file") after successful login. An authentication file is created for each user of a management server on which an HvmSh is installed. Manage all authentication files so that a user does not modify the file for another user.

After you log into an HVM with the user authentication function enabled, when the user authentication function is disabled owing to version or revision downgrade, HvmSh commands are not performed and a timeout (Return code: 0x10020001) occurs. In this case, delete the authentication file for the HVM and then retry.

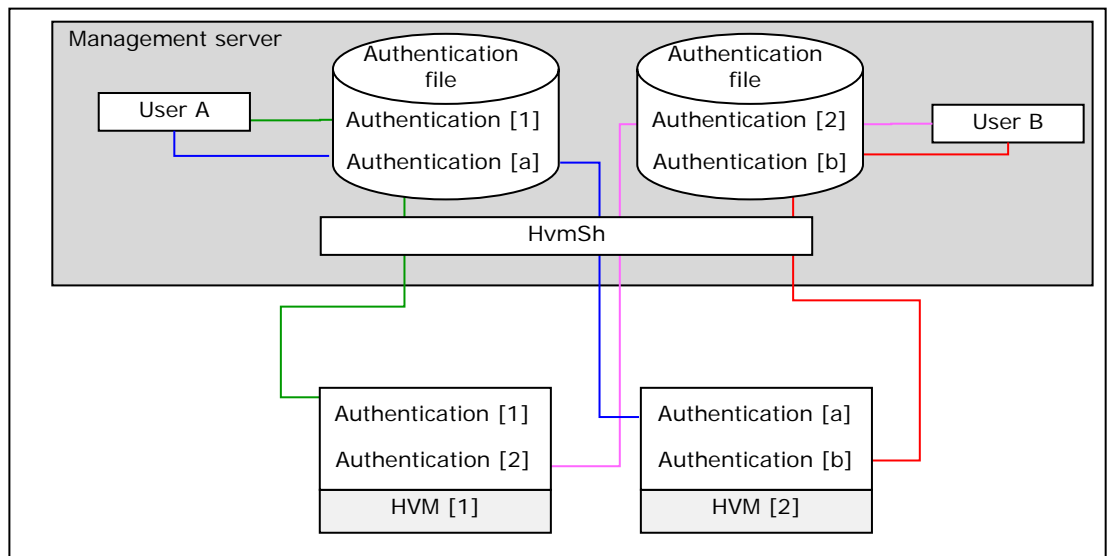


Figure 1-4 Example of authentication file

Methods of specifying authentication file

There are two methods of specifying an authentication file listed in the following table. When you specify an authentication file respectively in both two methods, a file specified at the option "-fileuser" functions as the authentication file.

Table 1-15 Method of specifying authentication file

No.	Method of specifying authentication file
1	A file set at the option "-filename=" functions as the authentication file. Note that you are required to set the same file name for other HVM interfaces for authentication.
2	The file "HvmShUser.dat" in a folder registered as an environment variable "HVMSH_HOME" functions as the authentication file. Note that you are required to register an environment variable "HVMSH_HOME" for each user.

Note that, for each user, consistently apply one of the methods listed in the above table, that is, do not apply both methods. Otherwise, any of the errors on user authentication, such as 0x10590022 to 0x10590026, 0x10590030, and 0x10590031, may occur. As a result, some commands including the login command and the logout command may not function. In this case, delete both 2 files and then specify a file as an authentication file again.

HVM Interfaces

This chapter describes the details of HVM interfaces.

- ☐ [Getting result of asynchronous command](#)
- ☐ [LPAR configuration](#)
- ☐ [LPAR manager](#)
- ☐ [Security](#)
- ☐ [HVM dump/log files](#)
- ☐ [Getting all data of HVM configuration](#)
- ☐ [HVM statistics information](#)

Getting result of asynchronous command

This section introduces the command for getting the result of an asynchronous command.

getResult

Overview

This command returns the execution result, that is, the status code of the HVM interface corresponding to a set operation number.

Syntax

getResultaccept=**operation No.**

Option

You are required to set an operation number. For the method of executing this command, see [Example of batch processing of asynchronous HVM interfaces](#).

Related function

None

Required authority

None

Response message

The HVM interface corresponding to a set operation number and a date and time at which the HVM receives the HVM interface. The example is as follows.

Activate2007/05/0112:10:12GMT+09:00

Notes

None

LPAR configuration

This section introduces the commands for configuring LPARs.

opr LPARAdd

Overview

This command adds the LPAR with a specified LPAR number.

Syntax

opr LPARAdd lpar=**LPAR No.**

Option

None

Related function

None

Required authority

None

Response message

None

Notes

None

opr LPARRemove

Overview

This command removes the LPAR with a specified LPAR number.

Syntax

opr LPARRemove lpar=**LPAR No.** [generation=**generation No.**]

Option

None

Related function

None

Required authority

None

Response message

None

Notes

None

opr Activate

Overview

[For Syntax 1]

This command activates the LPAR with a specified LPAR number.

[For Syntax 2]

This command temporarily activates the LPAR with a specified LPAR number. Then, the command retrieves the boot device information and sets the boot order. Finally, the command deactivates the LPAR. For the detail, see [Control of LPAR boot information](#).

Syntax

[Syntax 1]

opr Activate lpar=**LPAR No.**

[Syntax 2]

opr Activate lpar=**LPAR No.** [opt={**GetBootDevice** | **SetBootOrder**}]

Option

[Syntax 1]

None

[Syntax 2]

opt=GetBootDevice: This command gets the boot device information.

opt=SetBootOrder: This command sets the boot order.

Related function

[Syntax 1]

None

[Syntax 2]

EfiBootSetting (the EFI boot setting function)

Required authority

None

Response message

An operation number that an HVM has received is output in the decimal system.

accept=**operation No.**

Notes

- The HVM internal buffer stores the boot device information for 30 seconds by executing a command with the option "opt=GetBootDevice". When another command with the option "opt=GetBootDevice" is requested within 30 seconds since the first command, the second command waits to be executed by the time 30 seconds have passed since the first command. For the detail, see Notes on conflict of controlling boot information of LPAR.
- When the option "opt=SetBootOrder" is specified, the command activates an LPAR and then sets the boot order information stored in the HVM internal buffer in the logical EFI. Finally, the command deactivates the LPAR. For the detail, see Control of LPAR boot information.

opr Deactivate

Overview

This command deactivates the LPAR with a specified LPAR number.

Syntax

opr Deactivate lpar=**LPAR No.**

Option

None

Related function

None

Required authority

None

Response message

An operation number that an HVM has received is output in the decimal system.

accept=**operation No.**

Notes

None

opr Reactivate

Overview

This command reactivates the LPAR with a specified LPAR number.

Syntax

opr Reactivate lpar=**LPAR No.**

Option

None

Related function

None

Required authority

None

Response message

An operation number that an HVM has received is output in the decimal system.

accept=**operation No.**

Notes

None

get LPARName

Overview

This command gets the name of the LPAR with a specified LPAR number.

Syntax

get LPARName lpar=**LPAR No.**

Option

None

Related function

None

Required authority

None

Response message

lparname=**LPAR name**

Notes

None

set LPARName

Overview

This command sets or resets the name of the LPAR with a specified LPAR number.

Syntax

```
set LPARName lpar=LPAR No. lparname=LPAR name  
[generation=generation No.]
```

Option

You are required to set an LPAR name with 1 to 31 of characters.

Related function

None

Required authority

None

Response message

None

Notes

None

get LPARStatus

Overview

This command gets the status of the LPAR with a specified LPAR number.

Syntax

get LPARStatus lpar=**LPAR No.**

Option

None

Related function

None

Required authority

None

Response message

status={ Activated | Deactivated | Failure}

Notes

None

get LPARShrProc

Overview

This command gets the number of logical processors in shared mode assigned to the LPAR with a specified LPAR number.

Syntax

get LPARShrProc lpar=**LPAR No.**

Option

None

Related function

None

Required authority

None

Response message

shrproc=number of logical processors in shared mode

Notes

None

set LPARShrProc

Overview

This command sets the number of logical processors in shared mode to be assigned to the LPAR with a specified LPAR number.

Syntax

```
set LPARShrProc  
  lpar=LPAR No.  
  shrproc=number of shared mode logical processors  
  [generation=generation No.]
```

Option

You are required to set a decimal number between 0 and the maximum number of logical processors in shared mode.

Related function

None

Required authority

None

Response message

None

Notes

None

get LPARDedProc

Overview

This command gets the number of logical processors in dedicated mode assigned to the LPAR with a specified LPAR number.

Syntax

get LPARDedProc lpar=**LPAR No.**

Option

None

Related function

None

Required authority

None

Response message

dedproc=number of logical processors in dedicated mode

Notes

None

set LPARDedProc

Overview

This command sets the number of logical processors in dedicated mode to be assigned to the LPAR with a specified LPAR number.

Syntax

```
set LPARDedProc  
  lpar=LPAR No.  
  dedproc=number of dedicated mode logical processors  
  [generation=generation No.]
```

Option

You are required to set a decimal number between 0 and the maximum number of logical processors in dedicated mode.

Related function

None

Required authority

None

Response message

None

Notes

None

get LPARSrv

Overview

This command gets the service ratio of the LPAR with a specified LPAR number.

Syntax

get LPARSrv lpar=**LPAR No.**

Option

None

Related function

None

Required authority

None

Response message

lparsrv=service ratio of LPAR

Notes

- When the processor scheduling mode of the target LPAR, "lparsrv" shows "-".
- When you change the scheduling mode of an LPAR from dedicated mode to shared mode, the service ratio set before the change or the default value "100" is automatically set. Therefore, when you set the scheduling mode for an LPAR to shared mode, confirm the service ratio of the LPAR.

set LPARSrv

Overview

This command sets the service ratio of the LPAR with a specified LPAR number.

Syntax

```
set LPARSrv lpar=LPAR No. lparsrv=service ratio  
[generation=generation No.]
```

Option

You are allowed to set a decimal number between 0 and the maximum number of logical processors in dedicated mode.

Related function

None

Required authority

None

Response message

lparsrv=service ratio of LPAR

Notes

None

get LPARMem

Overview

This command gets the memory size allocated to the LPAR with a specified LPAR number.

Syntax

get LPARMem lpar=**LPAR No.**

Option

None

Related function

None

Required authority

None

Response message

lparmem=memory size allocated to LPAR (MB)

Notes

None

set LPARMem

Overview

This command sets the memory size to be allocated to the LPAR with a specified LPAR number.

Syntax

set LPARMem lpar=**LPAR No.**

Option

You are allowed to set a multiple of 256 (MB) of memory size between 256MB and the maximum available memory size in the decimal system.

Related function

None

Required authority

None

Response message

None

Notes

When the guest NUMA function is enabled for an LPAR, this command ends with the error "Return: 0x04030001".

get LPARID

Overview

This command gets the setting of the idle detection function for logical processors allocated to the LPAR with a specified LPAR number (enabled/disabled).

Syntax

get LPARID lpar=**LPAR No.**

Option

None

Related function

None

Required authority

None

Response message

lparid={Yes | No}

Notes

None

set LPARID

Overview

This command sets the idle detection function for logical processors allocated to the LPAR with a specified LPAR number, to a value of "enabled" or that of "disabled".

Syntax

```
set LPARID lpar=LPAR No. lparid={Yes | No}  
[generation=generation No.]
```

Option

None

Related function

None

Required authority

None

Response message

None

Notes

- Guest Idle Mode is disabled when you change the logical processor idle detection function from "No" to "Yes".
- When you change the logical processor idle detection function with a target LPAR activated and with the guest idle mode for the target LPAR set to "MWAIT", this command ends with the error "Return: 0x04040002".

get LPARAA

Overview

This command gets the option showing whether the LPAR with a specified LPAR number is automatically activated when the HVM starts.

Syntax

get LPARAA lpar=**LPAR No.**

Option

None

Related function

None

Required authority

None

Response message

lparaa=automatic activate setting {a decimal number | *}

"a decimal number": This corresponds to a number in ascending order for automatic activation for LPARs.

"*": This shows that the LPAR is not automatically activated.

Notes

None

set LPARAA

Overview

This command sets the option showing whether the LPAR with a specified LPAR number is automatically activated when the HVM starts.

Syntax

```
set LPARAA lpar=LPAR No.  
          lparaa=automatic activate setting {a decimal number | *}  
          [generation=generation No.]
```

Option

None

Related function

None

Required authority

None

Response message

"a decimal number": This corresponds to a number in ascending order for automatic activation for LPARs.

"*": This shows that the LPAR is not automatically activated.

Notes

None

get LPARAC

Overview

This command gets the option showing whether the automatic logical SEL clearance function for the LPAR with a specified LPAR number is enabled or disabled when the HVM starts.

Syntax

get LPARAC lpar=**LPAR No.**

Option

None

Related function

None

Required authority

None

Response message

lparac={ Yes | No }

Notes

None

set LPARAC

Overview

This command sets the option showing whether the automatic logical SEL clearance function for the LPAR with a specified LPAR number is enabled or disabled when the HVM starts.

Syntax

```
set LPARAC lpar=LPAR No. lparac={Yes | No}  
[generation=generation No.]
```

Option

None

Related function

None

Required authority

None

Response message

None

Notes

None

get LPARPC

Overview

This command gets the option showing whether the processor capping function for the LPAR with a specified LPAR number is enabled or disabled.

Syntax

get LPARPC lpar=**LPAR No.**

Option

None

Related function

None

Required authority

None

Response message

lparac={ Yes | No }

Notes

"*" (the processor capping function is disabled) is displayed when the processors assigned to an LPAR is in dedicated mode.

set LPARPC

Overview

This command sets the processor capping function to a value of "enabled" or that of "disabled" for the LPAR with a specified LPAR number.

Syntax

```
set LPARPC lpar=LPAR No. lparpc={ Yes | No }  
[generation=generation No.]
```

Option

None

Related function

None

Required authority

None

Response message

```
lparac={ Yes | No }
```

Notes

You are allowed to configure the setting of the processor capping function even for LPARs with processors in dedicated mode. However, when you issue this command for such LPARs, "*" (the processor capping function is disabled) is returned. Changing the processor scheduling mode to shared mode enables the settings of this command.

get LPARPB

Overview

This command gets the information on the Pre-boot firmware, which works for LPAR activation.

Syntax

get LPARPB lpar=**LPAR No.**

Option

None

Related function

Efi64Boot (the function that boots the guest OS of an LPAR with 64UEFI)

Required authority

None

Response message

lparpb={ BIOS | 64UEFI }

Notes

When "BIOS2" is set as the Pre-boot firmware for BS1000, the response message shows "lparpb=-".

set LPARPB

Overview

This command selects the Pre-boot firmware, which works for LPAR activation.

Syntax

```
set LPARPB lpar=LPAR No. lparpb={BIOS | 64UEFI}  
[generation=generation No.]
```

Option

None

Related function

Efi64Boot (the function that boots the guest OS of an LPAR with 64UEFI)

Required authority

None

Response message

None

Notes

- When an HVM does not support 64UEFI, specifying 64UEFI generates an HVM error.
- You are allowed to specify "BIOS2" as the Pre-boot firmware for BS1000 through the HVM screen.

get LPARSchd

Overview

This command gets the scheduling mode of logical processors assigned to the LPAR with a specified LPAR number.

Syntax

get LPARSchd lpar=**LPAR No.**

Option

None

Related function

None

Required authority

None

Response message

lparschd={ D | S }

Notes

- "lparschd=S": The logical processors assigned to the LPAR with a specified LPAR number is in shared mode.
- "lparschd=D": The logical processors assigned to the LPAR with a specified LPAR number is in dedicated mode.

opr LPARSchd

Overview

This command sets the scheduling mode of logical processors assigned to the LPAR with a specified LPAR number.

Syntax

```
opr LPARSchd lpar=LPAR No. lparschd={ D | S }  
[generation=generation No.]
```

Option

None

Related function

None

Required authority

None

Response message

An operation number that an HVM assigns when the HVM receives this command is output in the decimal system.

accept=**operation No.**

Notes

- Executing this command for an LPAR to which processors in a processor group are assigned changes the scheduling modes of the physical processors in the processor group.
- When an LPAR is activated and the guest NUMA function is enabled for the LPAR, this command ends with the error "Return: 0x04030003".
- When you change the processor scheduling mode for an LPAR to shared mode with "Guest Idle Mode" for the LPAR set to "MWAIT", this command ends with the error "Return: 0x04040001".
- When you change the processor scheduling mode with the "opr LparSchd" command for an activated LPAR with its CBM set to a desired value, this command ends with the error "Return: 0x04050005".

get LPARRVC

Overview

This command gets the option showing whether the virtual COM console function for the LPAR with a specified LPAR number is enabled or disabled.

Syntax

```
get LPARVC [lpar=LPAR No.]
```

Option

None

Related function

None

Required authority

None

Response message

- When the option "lpar=LPAR No." is specified

lparvc={ Yes | No | virtual COM No. }

lparvcport={ none | TCP Port No. }

- When the option "lpar=LPAR No." is not specified

LPAR Virtual COM Console

TCP_Port	Lpar#	Name
1 :20801	*	*
2 :20802	2	W2K8X86-L2
3 :20803	*	*
4 :20804	4	W2K8X64-L4
5 :20805	*	*
6 :20806	6	RL51X64-L6
7 :20807	*	*
8 :20808	8	NO_NAME
9 :20809	*	*
10:20810	10	NO_NAME
11:20811	*	*
12:20812	12	RL47X86-L12
13:20813	*	*
14:20814	14	RL54X64-L14
15:20815	*	*
16:20816	16	NO_NAME

Lpar#	TCP_Port	Name
1	*	W2K8Xxx-001
2	1 :20802	W2K8X86-L2
3	*	W2K3X86-L3
4	3 :20804	W2K8X64-L4
5	*	W2K8X86-L5
6	5 :20806	RL51X64-L6
7	*	RL52X64-L7
8	7 :20808	NO_NAME
9	*	NO_NAME
10	9 :20810	NO_NAME
11	*	RL47X86-L11
12	11:20812	RL47X86-L12
13	*	RL54X86-L13
14	13:20814	RL54X64-L14
15	*	RL47X64-L15
16	15:20816	NO_NAME

Notes

None

set LPARRVC

Overview

This command sets the option showing whether the virtual COM console function for the LPAR with a specified LPAR number is enabled or disabled.

Syntax

```
set LPARRVC lpar=LPAR No. lparvc={Yes | No | virtual COM No.}  
[generation=generation No.]
```

Option

None

Related function

None

Required authority

None

Response message

None

Notes

None

set LPARMN

Overview

This command sets the number of a memory node assigned to the LPAR with a specified LPAR number.

Syntax

```
set LPARMN lpar=LPAR No. lparmn={A|Node number}  
[generation=generation No.]
```

Option

- lparmn=A: This command applies the Automatic memory allocation to an LPAR.
- lparmn=Node number: This command specifies the number of a memory node to be assigned to an LPAR.

Related function

None

Required authority

None

Response message

None

Notes

- When a specified node number of memory area is not able to be allocated to an LPAR, the LPAR fails to be activated.
- This command does not work for activated LPARs.
- Even though NUMA is disabled, when you specify "lparmn=A", this command ends normally.
- When the guest NUMA function is enabled for an LPAR, this command ends with the error "Return: 0x04030001".

set LPARVTX

Overview

This command sets the VT-x function to a value of "enabled" or that of "disabled" for the LPAR with a specified LPAR number.

Syntax

```
set LPARVTX lpar=LPAR No. lparvtx={ Yes | No }  
[generation=generation No.]
```

Option

None

Related function

LparVTx (Intel(R) Virtualization Technology is supported.)

Required authority

None

Response message

None

Notes

- This command does not work for activated LPARs.

set LPAROsType

Overview

This command selects an OS type to boot on the LPAR with a specified LPAR number.

Syntax

```
set LPAROsType lpar=LPAR No. lparostype={ Default | Solaris }  
[generation=generation No.]
```

Option

None

Related function

None

Required authority

None

Response message

None

Notes

- This command does not work for activated LPARs.

set LPARMshyp

Overview

This command sets the "Microsoft Hypervisor Interface : Partition Reference Time Enlightenment function" to a value of "enabled" or that of "disabled" for the LPAR with a specified LPAR number.

Syntax

```
set LPARMshyp lpar= LPAR No. prte={ Yes | No }  
[generation= generation No.]
```

Option

None

Related function

None

Required authority

None

Response message

None

Notes

- This command does not work for activated LPARs.

set LPARGuestNuma

Overview

This command sets the guest NUMA function to a value of "enabled" or that of "disabled" for the LPAR with a specified LPAR number.

Syntax

```
set LPARMshyp lpar= LPAR No. prte={ Yes | No }  
[generation= generation No.]
```

Option

None

Related function

The guest NUMA function (The function having the guest OS on an LPAR recognize physical NUMA configurations with memory and processors)

Required authority

None

Response message

None

Notes

- This command does not work for activated LPARs.
- When NUMA is disabled in the EFI on a server blade, this command ends with the error "Return: 0x11000000".

get LPARNodeMem

Overview

This command gets the memory sizes of the NUMA nodes assigned to an LPAR.

Syntax

get LPARNodeMem lpar=**LPAR No.**

Option

None

Related function

The guest NUMA function (The function having the guest OS on an LPAR recognize a physical NUMA configuration with memory and processors)

Required authority

None

Response message

lpar= LPAR No.

nodemem=node No., memory capacity(MB)

...

nodemem=node No., memory capacity(MB)

Notes

- The same number of the lines "nodemem=node No., memory capacity(MB)" as that of memory nodes assigned to an LPAR are output. Also, when no memory area is assigned to a node, the memory capacity part in the row for the node shows 0.
- When the guest NUMA function is disabled for an LPAR, this command ends with the error "Return: 0x04030000".
- When NUMA is disabled in the EFI on a server blade, this command ends with the error "Return: 0x11000000".

set LPARNodeMem

Overview

This command sets the memory sizes of the NUMA nodes to be assigned to an LPAR.

Syntax

[Syntax 1]

```
set LPARNodeMem lpar=LPAR No.  
    nodemem=node No.,memory size(MB)  
    [...nodemem=node No.,memory size(MB)]  
    [generation=generation No.]
```

[Syntax 2]

```
set LPARNodeMem filename=File name
```

Option

[For Syntax 1]

- You are required to specify a physical NUMA node number and the memory size to be allocated to the NUMA node with a comma located between these two, at the option "nodemem".
- When you set memory sizes for multiple NUMA nodes at an attempt of this command, you are required to specify all the NUMA nodes and the memory sizes for this command. Note that, when you do not specify a memory size for a NUMA node, the memory size in the NUMA node is 0.
- You are allowed to set a multiple of 256 (MB) of memory size between 256MB and the maximum available memory size in the decimal system for a NUMA node.

(Example)

In assignments of 512MB, 1024MB, and 768MB to node 0, 1, and 3 respectively, set the options as follows:

```
set LPARNodeMem lpar=1 nodemem=0,512 nodemem=1,1024  
nodemem=3,768
```

[For Syntax 2]

- You are required to specify a file with the options "lpar=LPAR No." and "nodemem=node No.,memory capacity(MB)". Describe one setting per row from the most left column. Note that redundant descriptions for one NUMA node number generates the error "Return: 0x11000000".

(Example)

In assignments of 512MB, 1024MB, and 768MB to node 0, 1, and 3 respectively, set the options as follows:

lpar=1

nodemem=0,512

nodemem=1,1024

nodemem=3,768

Related function

The guest NUMA function (The function having the guest OS on an LPAR recognize a physical NUMA configuration with memory and processors)

Required authority

None

Response message

None

Notes

- When the guest NUMA function is disabled for an LPAR, this command ends with the error "Return: 0x04030000".
- When NUMA is disabled in the EFI on a server blade, this command ends with the error "Return: 0x11000000".
- When you set node number not to exist, this command ends with the error Return: 0x11000000.
- When you set a node number multiple times at an attempt, this command ends with the error "Return: 0x11000000".

set LPARGuestNumaBindLproc

Overview

This command sets Physical NUMA Node Binding Mode to a value of "enabled" or that of "disabled" for the LPAR with a specified LPAR number.

Syntax

```
set LPARGuestNumaBindLproc lpar=LPAR No. numabind={ Yes|No }  
[generation=generation number]
```

Option

None

Related function

NumaBindLproc(Physical NUMA Node Binding Mode)

Required authority

None

Response message

None

Notes

- When the HVM does not support Physical NUMA Node Binding Mode, this command ends with the error "Return: 0x04030007".
- The logical processor topology setting mode for a guest NUMA is set to Physical NUMA Node Binding Mode when "numabind" is set to "Yes". Whereas, the logical processor topology setting mode for a guest NUMA is set to Physical Processor Binding Mode when "numabind" is set to "No".
- You are allowed to enable Physical NUMA Node Binding Mode for an LPAR only when the guest NUMA function for the LPAR is enabled. Whereas, if you attempt to set "numabind" to "Yes" for an LPAR when the guest NUMA function for the LPAR is disabled, this command ends with the error "Return: 0x04030000".
- When you disable the guest NUMA function, Physical NUMA Node Binding Mode is also disabled.
- The following HVM interfaces end with the error "Return: 0x04030005" for LPARs for which Physical NUMA Node Binding Mode is enabled.
 - set LparShrProc
 - set LPARDedProc
 - set LparLproc

set LPARNodeLproc

Overview

This command sets the number of logical processors in each physical NUMA node to be assigned to the LPAR with a specified LPAR number.

Syntax

```
set LPARNodeLproc lpar=LPAR No.  
    node|proc=node No.,number of logical processors  
    [... node|proc=node No.,number of logical processrs]  
    [generation=generation number]
```

Option

None

Related function

NumaBindLproc (Physical NUMA Node Binding Mode)

Required authority

None

Response message

None

Notes

- When the HVM does not support **Physical NUMA Node Binding Mode**, this command ends with the error "Return: 0x04030007".
- You are required to specify a physical NUMA node number and the number of logical processors to be assigned to the NUMA node with a comma located between these two, at the option "node1proc".
- When you set the numbers of processors to be assigned to multiple NUMA nodes at an attempt of this command, you are required to specify all the NUMA nodes and the numbers of processors for this command. Note that, when you do not specify a memory size for a NUMA node, the number of logical processors in the NUMA node is 0.
- When you set node number not to exist, this command ends with the error "Return: 0x11000000".
- When you set a node number multiple times at an attempt, this command ends with the error "Return: 0x11000000".

get LPARLProc

Overview

This command gets the physical processor numbers of the physical processors assigned to logical processors.

Syntax

get LPARLProc lpar=**LPAR No.** lprocno=**logical processor No.**

Option

None

Related function

None

Required authority

None

Response message

lproctype={ * | A | **physical processor No.**}

- "lproctype=*": This indicates a status of "unassigned", that is, a status of "off-line"
- "lproctype=A": This indicates automatic assignment of physical processors
- Note that, for LPARs in dedicated mode, this is applied to the LPARs only when the LPARs are not activated.
- "lproctype= physical processor No.": This indicates physical processors numbers for an LPAR with the physical processors in dedicated mode.

Notes

- For BS1000, CB2000, and CB320, "lproctype={ * | S | D | **physical processor No.**}" is output depending on the combination of HVM firmware version and HvmSh version. For the details, see [Response message of "get LPARLProc"](#).

set LPARLProc

Overview

[For Syntax 1]

This command specifies physical processors to be assigned to logical processors.

[For Syntax 2]

This command resets the number of logical processors to be assigned to the LPAR with a specified LPAR number.

Syntax

[Syntax 1]

```
set LPARLProc lpar=LPAR No. lprocno=logical processor No.  
    lproctype={ D | A | physical processor No. }  
    [generation=generation No.]
```

[Syntax 2]

```
set LPARLProc lpar=LPAR No. lprocno=logical processor No.  
    [generation=generation No.]
```

Option

None

Related function

None

Required authority

None

Response message

None

Notes

For BS1000, CB2000, and CB320, "lproctype={D |**physical processor No.**}" is output depending on the combination of HVM firmware version and HvmSh version. For the details, see [Response message of "get LPARLProc"](#).

get LPARPCI

Overview

This command gets information on PCI devices assigned to the LPAR with a specified LPAR number.

Syntax

[Syntax 1]

get LPARPCI lpar=**LPAR No.** pcino=**PCI device No.**

[Syntax 2]

get LPARPCI lpar=**LPAR No.** slot=**device location** portno={**port No.** | *}

Option

- PCI device No. is a decimal number that is assigned to each PCI device so that the PCI device can be identified.
- For the method of specifying the option "slot" and the description of values allowed to be set, see [Description format for device location](#).
- For devices with no port numbers, set the "portno" option to "portno=*".
(Example)

HvmSh -host=xx.xx.xx.xx get LPARPCI lpar=1 slot=U2 portno=*

Related function

None

Required authority

None

Response message

pcitype={ S | N | F | U | - }

pcischd={ S | D | E | - }

pciassign={ * | A | R | - } (*1)

Notes

- You can get the same information as the statuses of USB assignments to LPARs in the PCI Device Assignment screen by seeing the field "STATUS_EX" in the record "PHYSICAL_IO_ASSIGN_INFORMATION" in the "get ConfigAll" command.

set LPARPCI

Overview

This command assigns PCI devices to the LPAR with a specified LPAR number.

Syntax

[Syntax 1]

```
set LPARPCI lpar=LPAR No. pcino=PCI device No.  
pciassign={ Assign | Attach | Detach | Specify | *}  
[generation=generation No.]
```

[Syntax 2]

```
set LPARPCI lpar=LPAR No. slot=device location portno={ port No. | *}  
pciassign={ Assign | Attach | Detach | Specify | *}  
[generation=generation No.]
```

Option

- PCI device No. is a decimal number that is assigned to each PCI device so that the PCI device can be identified.
- "pciassign=Assign": Assigns a USB device, or a NIC device or an HBA device in dedicated mode to a deactivated LPAR.
- "pciassign=Attach": Attaches a USB device to an activated LPAR.
- "pciassign=Detach": Detaches a USB device from a deactivated LPAR.
- "pciassign=*": Remove a USB device, a NIC device or an HBA device in dedicated mode from a dedicated LPAR.
- "pciassign=Specify": Assigns a specified USB device.
- For the method of specifying the option "slot" and the description of values allowed to be set, see [Description format for device location](#).
- For devices with no port numbers, set the "portno" option to "portno=*".

Related function

None

Required authority

None

Response message

None

Notes

- The value "pciassign=Specify" synchronizes with the value of "usbautoalloc" in the "get HvmOptions" command.
"pciassign=Specify" is enabled only for USB devices with "usbautoalloc" disabled and it sets # for the LPAR with a specified LPAR number, that is, it assigns a specified USB device to the LPAR or removes a specified USB device from the LPAR.
Note that you are allowed to set # only for one LPAR. When you set # for an LPAR with # set for another LPAR, # is removed from the latter and assigned to the former.

Table 2-1 Operations for changing assignment of USB device

		Status after operation				
		A	R	#A	#R	*
Status before operation	A	-	Attach (activate) (*1)	Specify	-	*
	R	Detach (deactivate) (reactivate) (*2)	-	-	Specify	-
	#A	Specify	-	-	Attach (activate)	*
	#R	-	Specify	Detach (deactivate)	-	-
	*	Assign	-	-	-	-
(): Operations with one of the commands except the "set LPARPci" command. -: No operation *1: When "usbautoalloc" is disabled in the HVMOptions screen, activating an LPAR does not change the status of the LPAR. *2: Only when "usbautoalloc" is disabled, reactivating an LPAR changes the status of the LPAR from "R" to "A".						

get LPARVNICCount

Overview

This command gets the number of virtual NICs assigned to the LPAR with a specified LPAR number.

Syntax

get LPARVNICCount lpar=**LPAR No.**

Option

None

Related function

None

Required authority

None

Response message

vniccount=**No. of virtual NICs**

Notes

None

get LPARVNICID

Overview

This command gets the information on the network segment of a shared NIC, a virtual NIC, or a VF NIC assigned to the LPAR with a specified LPAR number.

Syntax

get LPARVNICID lpar=**LPAR No.** vnicno=**VNIC No.**

Option

For **VNIC No.**, specify a decimal number between 0 and 7 (BS1000), 0 and 7 (Standard HVM operating mode, CB2000/CB320), 0 and 15 (Expansion HVM operating mode, CB2000/CB320), or 0 and 15 (CB500/CB2500).

Related function

VF NIC: VfVnic (The function for assigning VF NICs to network cards supporting SR-IOV)

Required authority

None

Response message

[Syntax]

vnicno=VNIC No., network segment ID

[Items]

The identifiers of the network segments of {virtual NIC | shared NIC | VF NIC} are as follows:

- {Va | Vb..1a | 1b..} for HvmSh V7.2 or lower
- {Va | Vb..1a|1b...1av | 1bv...} for HvmSh V7.3 or higher

Notes

When no NIC is assigned to a VNIC No., The identifier shows "*".

(Example)

vnicno=5,*

set LPARVNICID

Overview

This command the network segments of shared NICs, virtual NICs, or VF NICs to be assigned to the LPAR with a specified LPAR number.

Syntax

```
set LPARVNICID lpar=LPAR No.  
    vnicno=VNIC No., { network segment ID | * }  
    [... vnicno=VNIC No., { network segment ID | * } ]  
    [generation=generation No.]
```

Option

- You are allowed to set the option "vnicno=" for multiple network segments at an attempt of this command.
- For VNIC No., specify a decimal number between 0 and 7 (BS1000), 0 and 7 (Standard HVM operating mode, CB2000/CB320), 0 and 15 (Expansion HVM operating mode, CB2000/CB320), or 0 and 15 (CB500/CB2500).
- Identifiers of network segments of {virtual NIC | shared NIC | VF NIC} are as follows:
 - {Va | Vb..1a | 1b..} for HvmSh V7.2 or lower
 - {Va | Vb..1a|1b...1av | 1bv...} for HvmSh V7.3 or higher

Related function

VF NIC: VfVnic (The function for assigning VF NICs to network cards supporting SR-IOV)

Required authority

None

Response message

None

Example of use

In assignment of Va to VNIC number 0:

```
set LPARVNICID lpar=1 vnicno=0,Va
```

In assignment of 1a to VNIC number 1 and assignment of 1b to VNIC number 2:

```
set LPARVNICID lpar=1 vnicno=1,1a vnicno=2,1b
```

Notes

- The number of VNICs to be assigned depends on the number of physical ports.
- Specify two "vnicno" options with 1a and 1b when you desire to assign 2 ports of NIC in shared mode to LPARs on an HVM not supporting Port Separate Assignment.
- When you set multiple segments for an LPAR with some of the segments already set for the LPAR, "*" (undefined) is set for the VNIC numbers for which you attempt to set the segments already set for the LPAR.

(Example)

#	Name	Sta	#VNIC	0	1	2	3	4	5	6	7
3	LPAR3	Dea	8	1a	1b	2a	2b	Va	Vb	Vc	Vd
	set	LPARVNICID	lpar=3	vnicno=2,3a		vnicno=3,3b		vnicno=4,4a		vnicno=5,4b	
vnicno=6,2a				vnicno=7,2b							
#	Name	Sta	#VNIC	0	1	2	3	4	5	6	7
3	LPAR3	Dea	6	1a	1b	3a	3b	4a	4b	*	*

To avoid this, set one by one, or set all the VNIC numbers to "*" (undefined)" and then configure settings that you desire.

- You are allowed to set network segments of VF NIC {1av | 1bv...} when SR-IOV is set to a value of "enabled" in the corresponding physical NIC. Also, in CB2000 server blades, you are required to set HVM Operating Mode to "Expansion".

get LPARVNICMac

Overview

This command gets the information on the MAC addresses for shared NICs, VNICs, or VF NICs assigned to the LPAR with a specified LPAR number.

Syntax

[Syntax 1]

get LPARVNICMac lpar=**LPAR No.** vnicno=**VNIC No.**

[Syntax 2]

get LPARVNICMac lpar=**all**

Option

For **VNIC No.**, specify a decimal number between 0 and 7 (BS1000), 0 and 7 (Standard HVM operating mode, CB2000/CB320), 0 and 15 (Expansion HVM operating mode, CB2000/CB320), or 0 and 15 (CB500/CB2500).

Related function

None

Required authority

None

Response message

[For Syntax 1]

mac=**MAC address**

[For Syntax 2]

[LPAR_VNIC_MACADDRESS]

L#	VNIC#	MAC
1	0	00:00:87:62:cb:00
1	1	00:00:87:62:cb:01
....		
16	14	00:00:87:38:91:7e
16	15	00:00:87:38:91:7f

Notes

[For Syntax 1]

- When no network segment is assigned to a VNIC number, no MAC address is output. The response message shows "mac=-".

[For Syntax 2]

- This command in Syntax 2 gets the information on the VNIC numbers of all LPARs including undefined LPARs. Note that this command outputs the MAC addresses for VNIC numbers with no network segment, too.
- L#, VNIC# and MAC are segmented with a tab.

set LPARVNICMac

Overview

This command sets MAC addresses for shared NICs, VNICs, or VF NICs assigned to the LPAR with a specified LPAR number.

Syntax

```
set LPARVNICMac lpar=LPAR No.  
                vnicno=VNIC No., network segment ID  
                mac=MAC address  
                [generation=generation No.]
```

Option

- Identifiers of network segments of {virtual NIC | shared NIC | VF NIC} are as follows:
 - {Va | Vb..1a | 1b..} for HvmSh V7.2 or lower
 - {Va | Vb..1a|1b...1av | 1bv...} for HvmSh V7.3 or higher
- MAC address: XX:XX:XX:YY:YY:ZZ
 - XX:XX:XX: Range from 00:00:00 to FF:FF:FF
 - YY:YY: Range from 00:00 to FF:FF (See in Notes.)
 - ZZ: Range from 00 to FF

Related function

VF NIC: VfVnic (The function for assigning VF NICs to network cards supporting SR-IOV)

Required authority

None

Response message

None

Notes

- You are not allowed to set YY:YY to the same value as the part of the MAC address of virtual NICs that HVM automatically generates. For the details, see the user's guide for the model of your server blade.
- For HVM firmware version 59-51/79-51 or lower for CB2000, or 01-60 or lower for CB500, you are allowed to assign network segments with the "set LPARVNICID" command. However, for HVM firmware version 59-58/79-58 or higher for CB2000, 01-70 or higher for CB500, or 02-00 or higher for CB2500, you are not allowed to assign network segments. When you attempt to change the settings of network segments, this command ends with the error "Return: 0x11000000".
- Whether you are allowed to change the MAC addresses of VF NICs, 1av, 1bv, and so on, depends on physical NIC device. See the field "VF_MAC" in the "PHYSICAL_IO_CONFIGURATION" record in the "get ConfigAll" command to identify the physical NIC devices corresponding to VF NICs.

get LPARVNICVlan

Overview

This command gets the information on the VLANIDs of shared NICs, VNICs, and VF NICs assigned to the LPAR with a specified LPAR number.

Syntax

get LPARVNICVlan lpar=**LPAR No.** vnicno=**VNIC No.**

Option

For VNIC No., specify a decimal number between 0 and 7 (BS1000), 0 and 7 (Standard HVM operating mode, CB2000/CB320), 0 and 15 (Expansion HVM operating mode, CB2000/CB320), or 0 and 15 (CB500/CB2500).

Related function

VF NIC: VfVnic (The function for assigning VF NICs to network cards supporting SR-IOV)

Required authority

None

Response message

vlanmode={ Tag | UnTag | Undef} vlanid=**VlanId**[,...,**VlanId**]

Notes

None

set LPARVNICVlan

Overview

This command sets the VLANIDs of shared NICs, VNICs, and VF NICs to be assigned to the LPAR with a specified LPAR number.

Syntax

```
set LPARVNICVlan lpar=LPAR No.  
    vnicno=VNIC No., network segment ID  
    vlanmode={ Tag | UnTag | Undef }  
    [vlanid=VlanId, ... ,VlanId]  
    [generation=generation No.]
```

Option

- For VNIC No., specify a decimal number between 0 and 7 (BS1000), 0 and 7 (Standard HVM operating mode, CB2000/CB320), 0 and 15 (Expansion HVM operating mode, CB2000/CB320), or 0 and 15 (CB500/CB2500).
- For VlanId, specify a decimal number between 1 and 4094 or "All". When you specify "All", this command outputs all VLANIDs.
- You are not allowed to set the option "vlanid=" to "All" with the option "vlanmode=" set to "UnTag".
- You are not allowed to set the option "vlanid" with the option "vlanmode=" set to "Undef".

Related function

VF NIC: VfVnic (The function for assigning VF NICs to network cards supporting SR-IOV)

Required authority

None

Response message

None

Notes

- For HVM firmware version 59-51/79-51 or lower for CB2000, or 01-60 or lower for CB500, you are allowed to assign network segments with the "set LPARVNICID" command. However, for HVM firmware version 59-58/79-58 or higher for CB2000, 01-70 or higher for CB500, or 02-00 or higher for CB2500, you are not allowed to assign network segments. When you attempt to change the settings of network segments, this command ends with the error "Return: 0x11000000".
- Whether you are allowed to change the MAC addresses of VF NICs, 1av, 1bv, and so on, depends on physical NIC device. See the field "VF_MAC" in the "PHYSICAL_IO_CONFIGURATION" record in the "get ConfigAll" command to identify the physical NIC devices corresponding to VF NICs.
- You are allowed to set VLAN IDs for an LPAR with the LPAR activated. However, when you attempt to change the assignments of VNIC network segments, one of the following errors occurs.
 - Return: 0x0104000 The combination of parameters is invalid.
 - Return: 0x04010001 Active LPARs exist.
 - Return: 0x01030000 Invalid Input Data.(VNIC)

(Example)

```
+-----  
|+- Virtual NIC Assignment -----  
|                               Virtual NIC Number  
|| # Name   Sta #VNIC Device 0  1  2  3  4  
|| 1 LPAR1  Act  2 NIC1  1a 1b  *  *  *  
||  
>hvmsh -host=172.16.16.120 set LPARVNICVlan lpar=1 vnicno=0,1a  
vlanmode=tag vlanid=100,200  
HvmSh(Version 6.2) Completed. 2012/04/02 19:11:12 Return: 0x00000000  
SetLparConfig Ver.2 2012/04/02 19:11:16 GMT+00:00  
  
>hvmsh-host=172.16.16.120 set LPARVNICVlan lpar=1 vnicno=0,2a  
vlanmode=tag vlanid=100,200  
HvmSh(Version 6.2) Failed. 2012/04/02 19:11:27 Return: 0x01030000  
Msg: Invalid Input Data.(VNIC)
```

get LPARVNICPrm

Overview

This command gets the information on Promiscuous Mode for shared NICs, VNICs, or VF NICs assigned to the LPAR with a specified LPAR number.

Syntax

get LPARVNICPrm lpar=**LPAR No.** vnicno=**VNIC No.**

Option

For VNIC No., specify a decimal number between 0 and 7 (BS1000), 0 and 7 (Standard HVM operating mode, CB2000/CB320), 0 and 15 (Expansion HVM operating mode, CB2000/CB320), or 0 and 15 (CB500/CB2500).

Related function

VF NIC: VfVnic (The function for assigning VF NICs to network cards supporting SR-IOV)

Required authority

None

Response message

vnicprm={Restricted | Through|*}

Notes

When no shared NIC, VNIC, or VF NIC is assigned to a VNIC number, "*" is output for the VNIC number.

set LPARVNICPrm

Overview

This command sets Promiscuous Mode for shared NICs, VNICs, or VF NICs to be assigned to the LPAR with a specified LPAR number.

Syntax

```
set LPARVNICPrm lpar=LPAR No.  
vnicno=VNIC No., network segment ID  
vnicprm={Restricted|Through}  
[generation=generation No.]
```

Option

For **VNIC No.**, specify a decimal number between 0 and 7 (BS1000), 0 and 7 (Standard HVM operating mode, CB2000/CB320), 0 and 15 (Expansion HVM operating mode, CB2000/CB320), or 0 and 15 (CB500/CB2500).

Related function

VF NIC: VfVnic (The function for assigning VF NICs to network cards supporting SR-IOV)

Required authority

None

Response message

None

Notes

- For HVM firmware version 59-51/79-51 or lower for CB2000, or 01-60 or lower for CB500, you are allowed to assign network segments with the "set LPARVNICID" command. However, for HVM firmware version 59-58/79-58 or higher for CB2000, 01-70 or higher for CB500, or 02-00 or higher for CB2500, you are not allowed to assign network segments. When you attempt to change the settings of network segments, this command ends with the error "Return: 0x11000000".
- Whether you are allowed to change the MAC addresses of VF NICs, 1av, 1bv, and so on, depends on physical NIC device. See the field "VF_MAC" in the "PHYSICAL_IO_CONFIGURATION" record in the "get ConfigAll" command to identify the physical NIC devices corresponding to VF NICs.
- You are allowed to set Promiscuous Modes for an LPAR with the LPAR activated. However, when you attempt to change the assignments of VNIC network segments, one of the following errors occurs.
 - Return: 0x0104000 The combination of parameters is invalid.
 - Return: 0x04010001 Active LPARs exist.
 - Return: 0x01030000 Invalid Input Data.(VNIC)

(Example)

```
+-----  
|+- Virtual NIC Assignment -----  
||                               Virtual NIC Number  
|| # Name   Sta #VNIC Device 0  1  2  3  4  
|| 1 LPAR1  Act   2 NIC1  1a 1b  *  *  *  
  
>hvmsh -host=172.16.16.120 set LPARVNICPrm lpar=1 vnicno=0,1a  
vnicprm=Restricted  
HvmSh(Version 6.2) Completed. 2012/04/02 19:11:12 Return: 0x00000000  
SetLparConfig Ver.2 2012/04/02 19:11:16 GMT+00:00  
  
>hvmsh-host=172.16.16.120 set LPARVNICPrm lpar=1 vnicno=0,2a  
vnicprm=Restricted  
HvmSh(Version 6.2) Failed.   2012/04/02 19:11:27 Return: 0x01030000  
Msg: Invalid Input Data.(VNIC)
```

get LPARVfVNIC

Overview

This command gets the information on the VF NICs assigned to the LPAR with a specified LPAR number.

Syntax

get LPARVfVNIC lpar=**LPAR No.** vnicno=**VNIC No.**

Option

For **VNIC No.**, specify a decimal number between 0 and 7 (BS1000), 0 and 7 (Standard HVM operating mode, CB2000/CB320), 0 and 15 (Expansion HVM operating mode, CB2000/CB320), or 0 and 15 (CB500/CB2500).

Related function

VF NIC: VfVnic (The function for assigning VF NICs to network cards supporting SR-IOV)

Required authority

None

Response message

vnicprm={Restricted | Through|*}

vnicno=VNIC No., SEG_ID

mac=MAC address

vlanmode={Tag|UnTag|Undef|*}

vlanid={VlanId[, ... ,VlanId] |*} For VF NIC: vlanid={VlanId |*}

vnicprm={Restricted|Through|*} For VF NIC: vnicprm=Restricted

vnicpcp={Priority Code Point|*}

txrate={Maximum throughput|*}

Notes

- You are allowed to set the option "vnicno=" for multiple network segments at an attempt of this command.
- Identifiers of network segments of {virtual NIC | shared NIC | VF NIC} are as follows:
- {Va | Vb..1a | 1b..} for HvmSh V7.2 or lower
- {Va | Vb..1a|1b...1av | 1bv...} for HvmSh V7.3 or higher
- When no network segment is assigned to a VNIC number, "*" is output for the VNIC number as an identifier.
- mac, vlanmode, vlanid, vnicprm: When no network segment is assigned to a VNIC number, "-" is output.
- Vnicpcp: When no network segment of VF NIC is assigned to a VNIC number, "-" is output.
- txrate: When no network segment of VF NIC is assigned to a VNIC number, "-" is output. Also, when you are not allowed to change the value of "txrate" for a VNIC number to which a network segment of VF NIC is assigned, "-" is output.

set LPARVfVNIC

Overview

This command sets the maximum throughput availability (Mbps) of a VFNIC assigned to the LPAR with a specified LPAR number.

Syntax

```
set LPARVfVNIC lpar=LPAR No. vnicno=VNIC No., network segment ID  
txrate= Maximum aggregate throughput
```

Option

For **VNIC No.**, specify a decimal number between 0 and 7 (BS1000), 0 and 7 (Standard HVM operating mode, CB2000/CB320), 0 and 15 (Expansion HVM operating mode, CB2000/CB320), or 0 and 15 (CB500/CB2500).

Related function

VF NIC: VfVnic (The function for assigning VF NICs to network cards supporting SR-IOV)

Required authority

None

Response message

None

Notes

- You are allowed to confirm the settable range of the maximum throughput for a VF NIC by seeing "TXRATE_MAX", "TXRATE_MIN", "TXRATE_STEP" in the "PHYSICAL_IO_CONFIGURATION" record in the "get ConfigAll" command.

get LPARVNICDev

Overview

This command gets the device type of a VFNIC assigned to the LPAR with a specified LPAR number.

Syntax

get LPARVNICDev lpar=**LPAR No.**

Option

None

Related function

VnicDeviceChange

Required authority

None

Response message

vnicdev={NIC1 | NIC2 | *}

Notes

- "vnicdev=*" indicates that an HVM does not support the Related function.

set LPARVNICDev

Overview

This command sets the device type of a shared NIC, a VFNIC, or a virtual NIC assigned to the LPAR with a specified LPAR number.

Syntax

```
set LPARVNICDev lpar=LPAR No. vnicdev={ NIC1 | NIC2}
```

Option

None

Related function

VnicDeviceChange (The function for changing the device type of a shared NIC, a VFNIC, or a virtual NIC)

Required authority

None

Response message

None

Notes

None

get LPARSFC

Overview

This command gets the device type of a VFNIC assigned to the LPAR with a specified LPAR number.

Syntax

get LPARSFC lpar=**LPAR No.** sfcno=**shared FC No.**

Option

You are required to set a shared FC number between 0 and the maximum number.

Related function

None

Required authority

None

Response message

slotno=device location

portno=port No.

vfcid=VfcID

wwpn=FC WWPN

wwnn=FC WWN

bus=PCI configuration space bus No. of FC-installed PCI (hex)

dev= PCI configuration space device No. of FC-installed PCI (hex)

func= PCI configuration space function No. of FC-installed PCI (hex)

Notes

- For the output of "slotno=" and the description of the output, see [Description format for device location](#).

set LPARSFC

Overview

This command sets the vfcID a shared FC assigned to the LPAR with a specified LPAR number.

Syntax

set LPARSFC lpar=**LPAR No.** slotno=**device location** portno=**port No.**
vfcid=**SfcVfcID** [generation=**generation No.**]

Option

- For the output of "slotno=" and the description of the output, see [Description format for device location](#).
- You are required to set a decimal number at the options "portno=" and "vfcID=".
- To remove an assignment for "vfcID=", set "*" for "vfcID=".

Related function

None

Required authority

None

Response message

None

Notes

None

get LPARDedFC

Overview

This command gets dedicated FC assigned to the LPAR with a specified LPAR number.

Syntax

get LPARDedFC lpar=**LPAR No.**

Option

None

Related function

None

Required authority

None

Response message

slotno=device location portno=port No. wwpn=WWPN wwnn=WWNN

Notes

- For the output of "slotno=" and the description of the output, see [Description format for device location](#).
- When no dedicated FC is assigned to an LPAR, no message is output.

get LPARSelTime

Overview

This command gets dedicated FCs assigned to the LPAR with a specified LPAR number.

Syntax

get LPARSelTime lpar=**LPAR No.**

Option

None

Related function

None

Required authority

None

Response message

seltime=SEL date and time

mode={ GMT | local-Time}

zone=time zone

(Example)

seltime=2016/01/12 15:14:25

mode=Local-Time

zone= +9

Notes

None

set LPARSelTime

Overview

This command sets the SEL (System Event Log) time of the LPAR with a specified LPAR number.

Syntax

```
set LPARSelTime lpar=LPAR No. [seltime=SEL date and time]  
[mode={GMT | Local-Time}] [zone=time zone]  
[generation=generation No.]
```

Option

SEL time: You are required to set this in the format "YYYY/MM/DD-hh:mm:ss ". Note that you are required to set the part "hh" in 24-hour notation.

time zone: You are allowed to set the timezone of an LPAR to a value between -12 (hours) and +14 (hours) by the hour.

Related function

None

Required authority

None

Response message

None

Notes

- When you set the options "seltime=" and "mode=", "seltime=" is set, first. Then, "seltime" is reset with the values of "mode=" and "zone=".
- For HVMs on which the supported range of time zone is between -12 (hours) and +12 (hours), this command ends with the error "Return: 0x01030000 Msg: Invalid Input Data".

get LPARTime

Overview

This command gets the LPAR time of the LPAR with a specified LPAR number or the LPAR times of an HVM.

Syntax

```
get LparTime [lpar=LPAR No.]
```

Option

When you do not set the option "lpar=", the LPAR times of the LPARs defined on an HVM and the HVM system time of the HVM.

Related function

None

Required authority

None

Response message

[Output of this command with the lpar option]

(Example)

HvmSh(Version 5.3) Completed. 2015/01/28 20:46:42 Return:
0x00000000

GetLPARDateAndTime Ver.1 2015/01/28 20:45:15 GMT+00:00

L#=1

NAME=LPAR1111

STATUS=ACT

RTC_TIME=2015/01/28 20:45:15

SEL_TIME=2015/01/28 20:45:15

SEL_TIME_MODE=Local-Time

SEL_TIME_ZONE=+0

LAST_ACTIVATED=2015/01/28 20:45:12

LAST_DEACTIVATED=2015/01/28 20:44:53

RTC_LAST_MODIFIED=2015/01/28 20:45:12

INIT_RTCNot=0

RTC_LAST_MOD_SYS=2015/01/28 20:45:12

RTC_DIFF=0

[Output of this command without the lpar option]

[DATE_TIME_INFORMATION]<CRLF>

<tab>Field name<tab>Field name<tab>...<CRLF>

<tab>Field value<tab>Field value<tab>...<CRLF>

Field	Contents	Data type	Max. digits
L#	LPAR No. The data means HVM system if "L#" is zero. And only data of "SET_TIME" and "SET_TIME_ZONE" become valid.	Numeric	2
NAME	LPAR Name "HVM SYSTEM" is displayed when the LPAR No. is zero.	Character	31
STATUS	LPAR Status (Asterisk ("*") is displayed when the LPAR No. is zero)	Character	10
RTC_TIME	RTC Time (yyyy/mm/dd hh:mm:ss) (Asterisk ("*") is displayed when the data could not get)	Character	20
SEL_TIME	SEL Time (yyyy/mm/dd hh:mm:ss) The data means HVM system time if "L#" is zero. (Asterisk ("*") is displayed when the data could not get)	Character	20
SEL_TIME_MODE	SEL Time Mode {GMT Local-Time} (Asterisk ("*") is displayed when the data could not get)	Character	16
SEL_TIME_ZONE	SEL Time Zone (-12-+14) The data means time zone of HVM system time if "L#" is zero. (Asterisk ("*") is displayed when the data could not get)	Character	4
LAST_ACTIVATED	Last Activated RTC Time of LPAR (yyyy/mm/dd hh:mm:ss) (Asterisk ("*") is displayed when the data could not get)	Character	20
LAST_DEACTIVATED	Last Deactivated RTC Time of LPAR (yyyy/mm/dd hh:mm:ss) (Asterisk ("*") is displayed when the data could not get)	Character	20
RTC_LAST_MODIFIED	RTC Last Modified RTC Time of LPAR (yyyy/mm/dd hh:mm:ss) (Asterisk ("*") is displayed when the data could not get)	Character	20
INIT_RTC	Difference between LPAR RTC Time and System Time (Asterisk ("*") is displayed when the data could not get)	Numeric	12
RTC_LAST_MOD_SYS	HVM system time of last modifying LPAR RTC. (yyyy/mm/dd hh:mm:ss) This field is supported by HvmSh Ver.5.5 or higher. And requires the HVM firmware which supports this function. ("*" is indicated if using the HVM firmware which does not support this function) Details of them refer to <i>Compute Blade CB2000 / CB320 User's Guide</i> .	Character	20
RTC_DIFF	Difference (seconds) between the LPAR RTC Time and the System time. (Asterisk ("*") is displayed when the data cannot be acquired) This field is effective with the HVM versions, CB2000 59-00/79-00 or higher, CB320 17-86 or higher. With the HVM versions lower than the above, * is always displayed.	Numeric	12

Notes

None

opr LPARTimeAdjust

Overview

This command synchronizes the SEL time and the RTC time of the LPAR with a specified LPAR number, with the HVM system time.

Syntax

```
opr LPARTimeAdjust [lpar=LPAR No. | lpar=all]  
[src={ HVMSYS|ZONE|UTC }] [zone=timezone]  
[generation=Generation No.]
```

Option

- When you set the option "lpar=" to "all", this command synchronizes the SEL time and the RTC time of the LPARs defined on an HVM.
- You should set the option "src=". When you do not set the option "src=", the HVM system time is the source.

Related function

LparTimeAdjustSrc (The function for selecting the source time)

Required authority

None

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

- When you set the option "lpar=" to "all", you are not allowed to execute this command with the option "generation" set. If you set the option "generation" with the "lpar=" set to "all", this command ends with "Return: 0x11000000".
- You are allowed to set the option "zone=" only when you set "src=" to "ZONE".

set LPARHpet

Overview

This command sets the method to assign the logical HPET.

Syntax

set LPARHpet lpar=LPAR No. hpet={ Auto|Enable|Disable }

Option

hpet: Method to assign the logical HPET

Table 2-2 Method to assign logical HPET

hpet option	Guest OS	Method
Auto	Windows	Not assign the logical HPET
	Linux	Assign the logical HPET
Enable	Windows & Linux	Assign the logical HPET
Disable	Windows & Linux	Not assign the logical HPET

Related function

LparHpetAllocMode (The function for setting the method for logical HPET assignment)

Required authority

None

Response message

None

Notes

None

opr LparNvramClear

Overview

This command initializes the NVRAM of the LPAR with a specified LPAR number, with the HVM system time.

Syntax

opr LparNvramClear lpar=**LPAR No.**

Option

None

Related function

None

Required authority

None

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

None

opr LparNvramCopy

Overview

This command copies the NVRAM of the LPAR with a specified LPAR number from the LPAR to the other specified LPAR.

Syntax

opr LparNvramCopy from=**source LPAR No.** to=**destination LPAR No.**

Option

None

Related function

None

Required authority

None

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

You are not allowed to set the same LPAR number for the options "from" and "to ". When you set the same LPAR number for the options, this command ends with the error "Return: 0x11000000".

get LPARGeneration

Overview

This command gets the generation number of the LPAR with a specified LPAR number.

Syntax

get LPARGeneration lpar=**LPAR No.**

Option

None

Related function

None

Required authority

None

Response message

generation=generation No.

Notes

None

opr ProcGroupLpar

Overview

This command changes the numbers of processor groups assigned to the LPAR with a specified LPAR number.

Syntax

```
opr ProcGroupLpar group=group No. lpar=LPAR No.  
[generation=generation No.]
```

Option

None

Related function

None

Required authority

None

Response message

An operation number that an HVM has received is output in the decimal system.

```
accept=operation No.
```

Notes

None

opr LparActCheck

Overview

This command judges whether the LPAR with a specified LPAR number can be activated.

Syntax

opr LparActCheck lpar=**LPAR No.**

Option

None

Related function

None

Required authority

None

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

- The following three items are possible causes of activation failure. This command outputs the causes of an activation failure in order or priority.
 - Specified amount of memory allocation failed due to memory fragmentation.
 - Specified amount of memory allocation failed.
 - Failed to ensure physical processor allocates for LPAR.
- The end code of the "getResult" command shows whether an LPAR can be activated. However, you cannot confirm whether configuration changes to the other LPARs including activation and deactivation affect whether an LPAR can be activated.

opr LparAddAndSet

Overview

This command adds an LPAR with a specified LPAR configuration.

Syntax

```
opr LPARaddAndSet lpar=LPAR No.
  [lparname=LPAR name]
  [lparmem=amount of memory allocate to LPAR (MB)]
  [lparsrv=LPAR service time allocation]
  [shrproc=No. of logical processor in shared mode | dedproc= No.
of logical processor in dedicated mode]
  [vnicno=VNIC No.{ network segment identifier of virtual
NIC/shared NIC|*}]
  [slotno=device location portno=port No. vfcid=SfcVfcID]
```

Option

Confirm the options seeing the descriptions of the following commands.

- "set LPARName"
- "set LPARMem"
- "set LPARSrv"
- "set LPARShrProc"
- "set LPARDedProc"
- "set LPARVNICID"
- "set LPARSFC"

Related function

None

Required authority

None

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

- When you do not set the option "lparname", the LPAR name is "NO_NAME".
- You are required to set the option "shrproc" to set the option "lparsrv".
- You are not allowed to set network segments of VF NIC {1av | 1bv | ...} at the option "vnicno".

get FcBootFunction

Overview

This command gets the options of FC drivers.

Syntax

[Syntax 1]

```
get FcBootFunction slot=HBA physical device location  
portno=HBA port No. {lpar=lparNo. |vfcid=VfcID}
```

[Syntax 2]

```
get FcBootFunction slot=HBA physical device location  
portno=HBA port No. vfcid=all
```

[Syntax 3]

```
get FcBootFunction slot=all
```

Option

- For the output of "slotno=" and the description of the output, see [Description format for device location](#).

Related function

- EfiBootSetting (The function for setting EFI boot)
- Efi64BootSetting (The function for setting EFI boot for EFI64)

Required authority

None

Response message

[For Syntax 1]

```
bootfunc={ Enabled | Disable}
ConnectionType={ { Auto|PointToPoint|Loop} |{ Auto|PointToPoint|FC-AL} }
MultiplePortID={ Enable|Disable|*}
    #Added by HvmSh Ver8.5 or higher.
DataRate={ Auto|1G|2G|4G|8G| 16G}
SpinupDelay={ 10 - 2550|Disable}
LoginDelayTime=3 - 60
PersistentBindings={ Enable|Disable}
ForceDefaultParameter={ Enable|Disable}
SelectBootDevice={ Enable|Disable}
LuidScanMode={ Enable | Disable | *}          *: HvmSh Ver.9.0 or higher
<<BootDeviceList>>(LUN:decimal)
1-WWPN: 50060E801025A260-LUN: 0000
2-WWPN: 0000000000000000-LUN: 0000
3-WWPN: 0000000000000000-LUN: 0000
4-WWPN: 0000000000000000-LUN: 0000
5-WWPN: 0000000000000000-LUN: 0000
6-WWPN: 0000000000000000-LUN: 0000
7-WWPN: 0000000000000000-LUN: 0000
8-WWPN: 0000000000000000-LUN: 0000
    *: HvmSh Ver.9.0 or higher
1-LUID: { Type3|Type1|Invalid|Error|*}-
{010203040506070809101112131415010203040506070809101112131415|Error|*}
2-LUID: { Type3|Type1|Invalid|Error|*}-
{0000000000000000000000000000000000000000000000000000000000000000|Error|*}
3-LUID: { Type3|Type1|Invalid|Error|*}-
{0000000000000000000000000000000000000000000000000000000000000000|Error|*}
4-LUID: { Type3|Type1|Invalid|Error|*}-
{0000000000000000000000000000000000000000000000000000000000000000|Error|*}
5-LUID: { Type3|Type1|Invalid|Error|*}-
{0000000000000000000000000000000000000000000000000000000000000000|Error|*}
6-LUID: { Type3|Type1|Invalid|Error|*}-
{0000000000000000000000000000000000000000000000000000000000000000|Error|*}
7-LUID: { Type3|Type1|Invalid|Error|*}-
{0000000000000000000000000000000000000000000000000000000000000000|Error|*}
8-LUID: { Type3|Type1|Invalid|Error|*}-
{0000000000000000000000000000000000000000000000000000000000000000|Error|*}
```

[For Syntax 2 & 3]

[FC_BOOT_FUNCTION(device location, port No.)]<CRLF> *: the part (device location, port No.) can be applied to only Syntax 3.

<tab>Field Name<tab>Field Name<tab>...<CRLF>

<tab>Field Data<tab>Field Data<tab>...<CRLF>

...

The following table lists the field names in the "FC_BOOT_FUNCTION" record. For the actual fields to be displayed, see the response message of this command in Syntax 1.

Table 2-3 Fields in FC BOOT FUNCTION record

Field	Contents	Data type	Max. digits
ID	VfcId (1 through the largest number of vfcID)	Numeric	2
FUNC	bootfunc	Character	8
TYPE	ConnectionType	Character	12
RATE	DataRate	Character	8
SDELAY	SpinupDelay	Character	8
LDELAY	LoginDelayTime	Character	8
BINDINGS	PresistentBindings	Character	8
PARAM	ForceDefaultParameter	Character	8
SELECT	SelectBootDevice	Character	8
WWPN1	WWPN1	Character	16
LUN1	LUN1	Character	4
WWPN2	WWPN2	Character	16
LUN2	LUN2	Character	4
WWPN3	WWPN3	Character	16
LUN3	LUN3	Character	4
WWPN4	WWPN4	Character	16
LUN4	LUN4	Character	4
WWPN5	WWPN5	Character	16
LUN5	LUN5	Character	4
WWPN6	WWPN6	Character	16
LUN6	LUN6	Character	4
WWPN7	WWPN7	Character	16
LUN7	LUN7	Character	4
WWPN8	WWPN8	Character	16
LUN8	LUN8	Character	4

When you execute this command in Syntax 3, the items listed in the following table are included in the response message.

Table 2-4 Fields only for Syntax 3 in FC BOOT FUNCTION record

Field Title	Content	Data Type	Max. Digits
Location	PCI mounting position Note: For details, see Description Format for Device Location .	Character	6
PORT#	Port number	Numeric	2
L#	LPAR number "*" is indicated when the network segment is not assigned to the LPAR.	Numeric	2

When you execute this command in Syntax 2 or 3, the items listed in the following table are included in the response message.

Table 2-5 Fields only for Syntax 2 or 3 in FC BOOT FUNCTION record

Field title	Content	Data type	Max. digits
MULTI_PORT_ID	MultiplePortID	Character	16
PEND_TYPE	ConnectionType is displayed when change is suspended. "*" is displayed when not suspended.	Character	12
PEND_MULTI_P ORT_ID	MultiplePortID is displayed when change is suspended. "*" is displayed when not suspended.	Character	16
PEND_RATE	DataRate is displayed when change is suspended. "*" is displayed when not suspended.	Character	8
LUID_SCAN	Luid Scan Mode	Character	8
LUID1_TYPE	TYPE1	Character	8
LUID1_DATA	LUID1	Character	60
LUID2_TYPE	TYPE2	Character	8
LUID2_DATA	LUID2	Character	60
LUID3_TYPE	TYPE3	Character	8
LUID3_DATA	LUID3	Character	60
LUID4_TYPE	TYPE4	Character	8
LUID4_DATA	LUID4	Character	60
LUID5_TYPE	TYPE5	Character	8
LUID5_DATA	LUID5	Character	60
LUID6_TYPE	TYPE6	Character	8
LUID6_DATA	LUID6	Character	60
LUID7_TYPE	TYPE7	Character	8
LUID7_DATA	LUID7	Character	60
LUID8_TYPE	TYPE8	Character	8
LUID8_DATA	LUID8	Character	60
The fields "MULTI_PORT_ID" to "PEND_RATE" are included in this command of HvmSh Ver. 8.5 or higher. Also, the fields "LUID_SCAN" to "LUID8_DATA" are included in this command of HvmSh Ver. 9.0 or higher.			

Notes

- When an HBA is in dedicated mode, the options "lpar=" and "vfcid=" are not required. When you desire to set the options, set "par=LPAR No. to which a dedicated HBA is assigned" or "vfcid=1".
- When an HBA is in shared mode, set either "lpar=" or "vfcid=".
- The command failure with the error "0x0103 0000 (Invalid Input Data/LPAR)" indicates that a specified LPAR number is invalid, or a VfcId cannot be assigned to an LPAR.
- Specifying an FC that is not HBA ends with the error "0x081C0002".
- The "MultiplePortID" shows {Enable|Disable} only for 16Gbps FC HBAs; however, it shows an asterisk (*) for other HBAs.
- The "ConnectionType" shows {Auto|PointToPoint|FC-AL} for 16Gbps FC HBAs; however, it shows {Auto|PointToPoint|LOOP} for other HBAs.
- You are allowed to confirm the performance of a 16Gbps FC HBA at the field "DataRate".

set FcBootFunction

Overview

This command sets the options of an FC driver in the optional ROM of an FC port. This corresponds to the EFI driver setting.

Syntax

```
set FcBootFunction slot=HBA device location
portno=HBA port No.
lpar=LPAR No.
[opt=clear]
[bootfunc={ Enable | Disable}]
[wwn=CTL/Port WWN of storage lu=LU No.]
[ConnectionType={ Auto | PointToPoint | Loop | FC-AL}] (*1)
[MultiplePortID={ Enable | Disable}] (*1)
[DataRate={ Auto | 1G | 2G | 4G | 8G | 16G}] (*1)
[SpinupDelay={ Disable | 10 through 2,550 }][LoginDelayTime={ 0 | 3 through 60}]
[PresistentBndings={ Enable | Disable}
[ForceDefaultParameter={ Enable | Disable}]
[SelectBootDevice={ Enable | Disable}]
[BootDeviceList={ WWN_LU, WWN_LU, ..., WWN_LU}]
[LuidScanMode={ Enable | Disable}] (*2)
[generation=generation No.]
```

Option

- For the output of "slotno=" and the description of the output, see [Description format for device location](#).
- When you set the option "opt=clear", you are not allowed to set the other options.
- The values allowed to be set at the option "DataRate" varies depending on the kind of Fibre Channel.
 - For 16 Gbps of Fibre Channel, DataRate={Auto | 4G | 8G | 16G}
 - For 8 Gbps of Fibre Channel, DataRate={Auto | 2G | 4G | 8G}
 - For 4 Gbps of Fibre Channel, DataRate={Auto | 1G | 2G | 4G}

Related function

- EfiBootSetting (The function for setting EFI boot)
- Efi64BootSetting (The function for setting EFI boot for EFI64)

Required authority

None

Response message

None

[Default values of Boot Function]

```
bootfunc=Disable
ConnectionType=Auto      (*)
MultiplePortID=Disable   (*)
DataRate=Auto            (*)
SpinupDelay=Disable
LoginDelayTime=3sec
PersistentBindings=Enable
ForceDefaultParameter=Disable
SelectBootDevice=Disable
<<BootDeviceList>>(LUN: decimal)
1-WWPN: 0000000000000000-LUN: 0000
2-WWPN: 0000000000000000-LUN: 0000
3-WWPN: 0000000000000000-LUN: 0000
4-WWPN: 0000000000000000-LUN: 0000
5-WWPN: 0000000000000000-LUN: 0000
6-WWPN: 0000000000000000-LUN: 0000
7-WWPN: 0000000000000000-LUN: 0000
8-WWPN: 0000000000000000-LUN: 0000
```

*: When you set the option "opt=" to "clear" for a shared HBA with the "set FcBootFunction" command.

Notes

- You can execute this command only when an LPAR is deactivated.
- You are allowed to set the parameters "ConnectionType", "MultiplePortID", and "DataRate" when an HVM is in dedicated mode, whereas, you are not allowed to set the parameters when an HVM is in shared mode.
- When you set "opt=" to "clear", this command performs a different operation depending on the scheduling mode of an HBA.

[In dedicated mode]

The default settings are configured for all settings of BootFunction.

[In shared mode]

The default settings are configured for the settings of BootFunction except the options "ConnectionType", "MultiplePortID", and "DataRate".

The following are also applied for the "opr FcBootFunction" command:

- You are required to set both of the options "wwn=" and "lu=" when you desire to set one of the options. You are not allowed to set either of the options.

- The options "wwn=" and "lu=" " are displayed at the top of the option "BootDeviceList ".
- You are allowed to set up to eight combinations of WWN and LUN at the option "BootDeviceList ".
- You are not allowed to set the options "wwn=", lu=" together with the option "BootDeviceList=" simultaneously, whereas, you are allowed to set one combination of WWN and LUN at the option "BootDeviceList=".
- When you set a value at the options "wwn=" and "lu=", and no value at the option "SelectBootDevice", the value of the option "SelectBootDevice" is set to "Enable ".
- The settable range of "wwn" is 0x0000 0000 0000 0000 through 0xFFFF FFFF FFFF FFFE. You are not allowed to set 0xFFFF FFFF FFFF FFFF though you are allowed to set the value with the EFI command.
- The setting with this command is stored to the optional ROM of an FC port. Any setting changes are reflected even after LPAR activation or changing of HBA assignments.
- The error "0x01030000 Invalid Input Data.(LPAR) " indicates that a specified LPAR number is invalid, no vfcID is assigned to an LPAR, or no dedicated HBA port is assigned to an LPAR.
- When you do not use any setting options except the options "slot ", "portno", or "lpar generation", this command does not change anything though this command completes with the return code "0x00000000", which indicates a normal end.
- When you set the option "LoginDelayTime=" to "0", the value of the option is set to "3 (seconds)", which is a default value.
- When you specify an FC port that is not an HBA port, this command ends with the error "Return: 0x081C0002".
- You are allowed to confirm the performance of a 16Gbps FC HBA at the field "DataRate".
- When you set the option "LuidScanMode" for devices that does not support setting or displaying LUID Scan Mode, this command ends with the error "Return: 0x01030000".

opr FcBootFunction

Overview

This command stores the option of HBA FC driver in the option ROM of an FC port. This command in Syntax 1 configures the settings of the options "ConnectionType", "MultiplePortID", and "DataRate" for shared HBA ports and outputs an operation number in a response message. This differs from the command "set FcBootFunction" introduced in "[set FcBootFunction](#)".

Syntax

[Syntax 1]

```
opr FcBootFunction [pending=yes]
```

The other options are the same as the command "set FcBootFunction" introduced in "[set FcBootFunction](#)".

[Syntax 2]

```
opr FcBootFunction pending={commit|cancel}
```

Option

- When you use the option {pending=**yes**}, this command does not reflect change of "ConnectionType", "MultiplePortID", or "DataRate" to an HVM. You are allowed to reflect change of "ConnectionType", "MultiplePortID", or "DataRate" to an HVM with the option {pending=commit}.
- When you use the option {pending=commit}, this command reflects change of "ConnectionType", "MultiplePortID", or "DataRate" to an HVM. Note that you are allowed to reflect multiple setting changes at an attempt of this command.
- When you use the option {pending=cancel}, this command discards change of "ConnectionType", "MultiplePortID", or "DataRate".

Related function

- EfiBootSetting (The function for setting EFI boot)
- Efi64BootSetting (The function for setting EFI boot for EFI64)
- EfiBootSettingVer2 (Version 2 of the function for setting EFI boot)

Required authority

None

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

- You can execute this command only when an LPAR is deactivated.
- Setting change of the parameter "ConnectionType", "MultiplePortID", or "DataRate" is reflected to a physical HBA port. The setting change affects all LPARs that share the physical HBA port.
- This command in Syntax 2 ends normally even when the settings of the options "ConnectionType", "MultiplePortID", and "DataRate" have been changed.
- Remember the following notes when an HBA is in shared mode and you set options that change the parameter "ConnectionType", "MultiplePortID", or "DataRate", including the options "opt=clear" and "pending=commit".
 - (1) When an LPAR is activated regardless of an HBA port is assigned to the LPAR, you are not allowed to change the values of the parameters "ConnectionType", "MultiplePortID", or "DataRate", whereas, you are allowed to set the other parameters. When this command ends with the error "0x003A0002", you are required to execute this command with the option "pending=commit"
 - (2) Basically, it takes 2 to 3 minutes for this command to reflect setting changes to an HVM. This command ends with the error "Return:0x10020001 Response Timeout." or "Return:0x10030000 Unknown Data Received" during the time. However, when you set the option "pending=yes", this command ends normally.
- When you execute this command again and again with "pending=" set to "yes", the values set at the last attempt is reflected.
- When the HBA core dedicated mode of an HBA port is enabled, you are not allowed to change the values of ConnectionType and MultiplePortID.

Some notes for the command "set FcBootFunction" in Syntax 1 are also applied to this command. For the notes, see [set FcBootFunction](#).

get BootDevice

Overview

This command gets the boot device information of the LPAR with a specified LPAR number that has been stored in the internal buffer of HVM in LPAR activation with the option "opt=GetBootDevice". For the detail, see [Control of LPAR boot information](#).

Syntax

get BootDevice lpar=**LPAR No.** filename=**filename**

Option

For the boot device information stored in a file specified at the option "filename=", see [Control of LPAR boot information](#).

Related function

- EfiBootSetting (The function for setting EFI boot)
- Efi64BootSetting (The function for setting EFI boot for EFI64)

Required authority

None

Response message

None

Notes

- The boot device information is stored in a file specified at the option "filename=". When a file with the specified file name already exists, the contents in the file are overwritten.
- When you execute this command without LPAR activation with the option "opt=GetBootDevice" in advance, a null character is stored in the file.
- You are allowed to get HBA information when "bootfunc=" is set to "Enable" by "set FcBootFunction" command.
- A boot order set with "set BootOrder" command in advance is reflected to the actual boot order.

set BootOrder

Overview

This command sets the boot order information of the LPAR with a specified LPAR number in the internal buffer of HVM. A boot order is set in the logical EFI by LPAR activation with the option "opt=SetBootOrder" and then the boot order in the logical EFI is automatically stored in the NVRAM. For the detail, see [Control of LPAR boot information](#).

Syntax

set BootOrder lpar=**LPAR No.** filename=**filename**

Option

For the boot device information stored in a file specified at the option "filename=", see [Control of LPAR boot information](#).

Related function

- EfiBootSetting (The function for setting EFI boot)
- Efi64BootSetting (The function for setting EFI boot for EFI64)

Required authority

None

Response message

None

Notes

- You are required to describe boot order information according to "[Control of LPAR boot information](#)" in a file specified with the option "filename=". Especially, take note of the following items.
 - Do not change boot device information except boot order that is gotten with the "get BootDevice" command.
 - Determine boot devices one by one from #1 in ascending order without skipping boot order numbers.
 - Delete rows with a device that you do not desire to specify as a boot device.
 - Be sure to specify only devices with the mark "*" as a boot identifier, except "EFI-SHELL".
- The details of the errors "0x1100002x" that indicates invalid description in a file specified with the option "filename=" are listed below.
 - 0x1100 0020: The description of the first line is not "[Boot Table Device List]".
 - 0x1100 0021: The number of devices specified is zero.
 - 0x1100 0022: The number of devices specified exceeds 16.
 - 0x1100 0023: Boot devices are not determined from #1 in ascending order without skipping boot order numbers.
 - 0x1100 0024: Devices without the mark "*", which a device is bootable, except "EFI-SHELL" are listed.
 - 0x1100 0025: The format of device information is invalid.
 - 0x1100 0026: The format of "seg bus dev func" is invalid.
 - 0x1100 0027: A device is specified multiple times.
 - 0x1100 0028: Unsupported boot identifiers are included.
 - 0x1100 002F: Other errors

set LparPCID

Overview

This command enables or disables the capability of PCID (Process Context ID) function for LPARs used by guest OSs.

With Syntax 2, you can enable or disable the capabilities for the all defined LPARs, and change the default value applied to newly defined LPARs.

With Syntax 3, you can change the default value applied to newly defined LPARs.

Syntax

[Syntax 1]

```
set LparPCID lpar=LPAR No. pcid={ Enable|Disable}  
[generation=generation No.]
```

[Syntax 2]

```
set LparPCID lpar=all pcid={ Enable|Disable}
```

[Syntax 3]

```
set LparPCID default={ Enable|Disable}
```

Option

None

Related function

GuestPCID (The function for setting the capability of PCID)

Required authority

None

Response message

None

Notes

- Syntax 1 works only for a deactivated LPAR.
- Syntax 2 cannot be executed if any LPARs are activated.
- Syntax 2 changes also the default value applied to newly defined LPARs.
- You can check the settings by the get ConfigSummary summary=pcidibrs command.

set LparIBRS

Overview

This command enables or disables the capability of IBRS (Indirect Branch Restricted Speculation) function and IBPB (Indirect Branch Predictor Barrier) function for LPARs used by guest OSs. You cannot set IBRS and IBPB separately.

With Syntax 2, you can enable or disable the capabilities for the all defined LPARs, and change the default value applied to newly defined LPARs.

With Syntax 3, you can change the default value applied to newly defined LPARs.

Syntax

[Syntax 1]

```
set LparIBRS lpar=LPAR number ibrs={ Enable|Disable}  
[generation=generation No.]
```

[Syntax2]

```
set LparIBRS lpar=all ibrs={ Enable|Disable}
```

[Syntax 3]

```
set LparIBRS default={ Enable|Disable}
```

Option

None

Related function

GuestIBRS (The function for setting the capability of IBRS and IBPB)

Required authority

None

Response message

None

Notes

- Syntax 1 works only for a deactivated LPAR.
- Syntax 2 cannot be executed if any LPARs are activated.
- Syntax 2 changes also the default value applied to newly defined LPARs.
- You can check the settings by the `get ConfigSummary summary=pcidibrs` command.

set LparSSBD

Overview

This command enables or disables the capability of SSBD (Speculative Store Bypass Disable) function for LPARs used by guest OSs.

With Syntax 2, you can enable or disable the capabilities for the all defined LPARs, and change the default value applied to newly defined LPARs.

With Syntax 3, you can change the default value applied to newly defined LPARs.

Syntax

[Syntax 1]

```
set LparSSBD lpar=LPAR No. pcid={ Enable|Disable}  
[generation=generation No.]
```

[Syntax 2]

```
set LparSSBD lpar=all pcid={ Enable|Disable}
```

[Syntax 3]

```
set LparSSBD default={ Enable|Disable}
```

Option

None

Related function

GuestSSBD (The function for setting the capability of SSBD)

Required authority

None

Response message

None

Notes

- Syntax 1 works only for a deactivated LPAR.
- Syntax 2 cannot be executed if any LPARs are activated.
- Syntax 2 changes also the default value applied to newly defined LPARs.
- You can check the settings by the get ConfigSummary
summary=cpufeatures command.

set LparMDClear

Overview

This command enables or disables the capability of MDClear^{*1} function for LPARs used by guest OSs.

*1: Microarchitectural Data

With Syntax 2, you can enable or disable the capabilities for the all defined LPARs, and change the default value applied to newly defined LPARs.

With Syntax 3, you can change the default value applied to newly defined LPARs.

Syntax

[Syntax 1]

```
set LparMDClear lpar=LPAR No. mdclear={ Enable|Disable}  
[generation=generation No.]
```

[Syntax 2]

```
set LparMDClear lpar=all mdclear={ Enable|Disable}
```

[Syntax 3]

```
set LparMDClear default={ Enable|Disable}
```

Option

None

Related function

GuestMDClear (The function for setting the capability of MDClear)

Required authority

None

Response message

None

Notes

- Syntax 1 works only for a deactivated LPAR.
- Syntax 2 cannot be executed if any LPARs are activated.
- Syntax 2 changes also the default value applied to newly defined LPARs.
- You can check the settings by the get ConfigSummary
summary=cpufeatures command.

set LparCpuFeatures

Overview

This command sets the capabilities in the table below at once. Each capability can be set when the related function is enabled.

With Syntax 2, you can enable or disable the capabilities for the all defined LPARs, and change the default value applied to newly defined LPARs.

With Syntax 3, you can change the default value applied to newly defined LPARs.

capability	related function (*1)	HvmSh Version
PCID	GuestPCID	V10.0 or higher
IBRS_IBPB	GuestIBRS	V10.0 or higher
SSBD	GuestSSBD	V10.0 or higher
MDClear	GuestMDClear	V10.3 or higher

(*1) You can check if the related function is enabled or disabled by using the “get HvmFacilityMap” or “get ConfigSummary summary=cpufeatures” command.

Syntax

[Syntax 1]

```
set LparCpuFeatures lpar=LPAR No. pcid={ Enable|Disable}  
[generation=generation No.]
```

[Syntax 2]

```
set LparCpuFeatures lpar=all pcid={ Enable|Disable}
```

[Syntax 3]

```
set LparCpuFeatures default={ Enable|Disable}
```

Option

None

Related function

GuestPCID (The function for setting the capability of PCID)

GuestIBRS (The function for setting the capability of IBRS and IBPB)

GuestSSBD (The function for setting the capability of SSBD)

GuestMDClear (The function for setting the capability of MDClear)

Required authority

None

Response message

None

Notes

- Syntax 1 works only for a deactivated LPAR.
- Syntax 2 cannot be executed if any LPARs are activated.
- Syntax 2 changes also the default value applied to newly defined LPARs.
- You can check the settings by the get ConfigSummary
summary=cpufeatures command.

LPAR manager

opr SaveConfig

Overview

This command saves an HVM configuration.

Syntax

opr SaveConfig

Option

None

Related function

None

Required authority

None

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

None

get SystemMemSize

Overview

This command gets the total memory size in MB that can be allocated to LPARs.

Syntax

get SystemMemSize

Option

None

Related function

None

Required authority

None

Response message

usermem=user memory (MB)

Notes

None

get SystemMemAlloc

Overview

This command gets the memory allocation information in ascending order of memory address.

Syntax

get SystemMemAlloc

Option

None

Related function

None

Required authority

None

Response message

(Syntax)

memaddr=**start address** memsize=**memory size** name=**user name**

(Example)

memaddr=0000000000000000memsize=768name=SYS2

memaddr=0000000030000000memsize=1024name=LPAR1

memaddr=0000000070000000memsize=256name=SYS1

memaddr=0000000100000000memsize=512name=LPAR1

memaddr=0000000120000000memsize=2048name=*****

memaddr=0000000270000000memsize=256name=SYS1

(Items)

- Start address: The start address of memory in the hexadecimal system
- Memory size: The memory size in MB in the decimal system
- "name=SYS1": Usage by the kernel of an HVM
- "name=SYS2": Usage by the network communication module and the service control module of an HVM
- "name=LPARx": x shows a LPAR number. This is displayed only for activated LPARs.
- "name=ISOLATED": This indicates that a memory area is isolated owing to memory error detection.
- "name=*****": Unallocated memory area

Notes

None

get SystemPProc

Overview

This command gets the status of a physical processor and the processor configuration.

Syntax

```
get SystemPProc pprocno=physical processor No.  
[ver=output message version]
```

Option

- For the option "pprocno=", you are allowed to set a physical processor number between 0 and a maximum physical processor number.
- For the option "ver=", you are allowed to set "1" or "2".

Related function

None

Required authority

None

Response message

```
pprocblade=server module No.  
pprocdie=die No.  
pproccore=core No.  
pprocthread=thread No.  
pprocstatus={ RUN | FAI | ERR | OFF}  
pprocschd={ D | S}  
pprocstate={ ACT|DEA|WRN|DEG}
```

Notes

When you set a value unsupported for the option "ver=", the same message as that when you do not set the option "ver=" is output.

opr SystemPProc

Overview

This command de-generates a physical processor or deactivates a physical processor when the number of processors exceeds the limit defined by a core license.

Syntax

```
opr SystemPProc pprocno=Physical processor No.  
pprocstate={ DEA|DEG}
```

Option

None

Related function

None

Required authority

None

Response message

An operation number that an HVM has received is output in the decimal system.

```
accept=operation No.
```

Notes

None

get SystemConfig

Overview

This command gets the information that is displayed in the System configuration screen.

Syntax

get SystemConfig [ver=**output message version**]

Option

None

Related function

None

Required authority

None

Response message

hvmid=HVM ID(*1)	None specified output message version or Specify "ver=1"
hvmip=HVMIP address	
subnetmask=subnet mask	
defaultgateway=default gateway	
svpip=SVP IP address (*2)	
bsm1ip=BSM1 IP address (*2)	
bsm1alert=BSM1 alert port (*2)	
bsm2ip=BSM2 IP address (*2)	
bsm2alert=BSM2 alert port (*2)	
bsm3ip=BSM3 IP address (*2)	
bsm3alert=BSM3 alert port (*2)	
bsm4ip=BSM4 IP address (*2)	
bsm4alert=BSM4 alert port (*2)	
managepath=management path	
vnicsysno=VNIC system No.	
language= language mode (*2)	
connect={Unknown Success Fail} (*2)(*4)	
link={Unknown Yes No} (*2) (*4)	
port={0 1} (*2) (*4)	
vcport=Virtual COM console port	If specify "ver=2", outputs additional message in the left column.
sys2proc={Default Default(n) n}(*5)	
cli1ip=HVM CLI1 IP Address	

cli2ip=HVM CLI2 IP Address	(The addresses are shown "0.0.0.0" when specify "ver=2" to HVM which does not support the CLI IP Address)
cli3ip=HVM CLI3 IP Address	
cli4ip=HVM CLI4 IP Address	
cli5ip=HVM CLI5 IP Address	
cli6ip=HVM CLI6 IP Address	
cli7ip=HVM CLI7 IP Address	
cli8ip=HVM CLI8 IP Address	
HvmOperatingMode(curr)={ Standard Expansion} (*3)	
HvmOperatingMode(next)={ Standard Expansion} (*3)	

*1: See [Notes on HVMID](#).

*2: The following table shows the differences on the items to be displayed depending on blade server model.

*3: HvmOperatingMode means the operating mode of HVM. "curr" indicates current HVM operating mode, and "next" indicates the operating mode to be set when the HVM is rebooted next time. Maximum VNIC number, Activatable LPAR number and some vary with the HVM operating mode. See each model's User's Guide for the details, and refer to the table below for the Support map.

*4: Displays information of the management path active port when ManagePathChangeVer2 function is "ON" in Table 2-15 List of Function names.

*5: Displays the upper limit for the CPU resources used in SYS2 by the number of CPUs (n). Depending on the HvmSh and HVM FW versions, the upper limit value might be displayed as "Default(2)", which is the same as Default.

Table 2-6 Display items

Term	Compute Blade 500 HVM	Compute Blade 2500 HVM
svpip	SVP IP address	SVP IP address
bsmxip (x=1-4)	BSM IP address	Fixed value 0.0.0.0
bsmxalert (x=1-4)	BSM	Fixed value 0.
language	Language mode of BSM alert or HVM WEB system	Language mode of HVM WEB system
connect	Connection status for Management path	Connection status for Management path
link	Link status for Management path	Link status for Management path
port	Port No. for Management path	Port No. for Management path

Notes

None

opr SystemConfig

Overview

This command sets the setting information in the System Configuration screen.

Syntax

```
opr SystemConfig
[hvmid=HVM ID]
[hvmip=HVM IP address]
[subnetmask=subnet mask]
[defaultgateway=default gateway]
[bsm1ip=BSM1 IP address] [bsm1alert=BSM1 alert port]
[bsm2ip=BSM2 IP address] [bsm2alert=BSM2 alert port]
[bsm3ip=BSM3 IP address] [bsm3alert=BSM3 alert port]
[bsm4ip=BSM4 IP address] [bsm4alert=BSM4 alert port]
[cli1ip=HVM CLI 1 IP address] [cli2ip=HVM CLI 2 IP address]
[cli3ip=HVM CLI 3 IP address] [cli4ip=HVM CLI 4 IP address]
[cli5ip=HVM CLI 5 IP address] [cli6ip=HVM CLI 6 IP address]
[cli7ip=HVM CLI 7 IP address] [cli8ip=HVM CLI 8 IP address]
[managepath=management path | Default]
[vnicsysno=VNIC system No. ]
[language=alert language mode]
[vcport=Virtual COM console port]
[sys2proc={ Default | 2 | 3 }]
```

Option

- The sys2proc option can be specified in the HvmSh version 9.9 or higher and the required HVM version is CB2500/CB500 02-62 or higher.

Related function

- cli1ip to cli8ip: HvmCliIp (HVM CLI IP address)
- bsm1ip to bsm4ip, bsm1alert to bsm4alert: BsmNotSupport (Connection with BSM is unsupported.)
- Managementpath: ManagePathChange (The function for changing the setting of the management paths)
- Hvmip, subnetmask, defaultgateway: HvmIpChangeInhibit (The function for preventing the LAN configuration of an HVM from being changed.)
- sys2proc option: Sys2ProcVer2 (The enhanced version of Sys2Proc, which is a function for setting the upper limit for the CPU resources used in SYS2)

Required authority

None

Response message

An operation number that an HVM has received is output in the decimal system.

accept=**operation No.**

Notes

- It takes two to three minutes to reflect changes of HVM system configuration (*1). During the time, the HVM cannot communicate. HvmSh commands that are executed during the time ends with the error "Return: 0x10020001 Response Timeout or Return: 0x10030000 Unknown Data Received". Exceptionally, the system changes immediately if the option is bsmxip=BSMx IP address (x=1, 2, 3, 4), bsmxalert=BSMx alert port (x=1,2,3,4) or clixip=HVM CLIx IP address(x=1,2,..,8).
- When the port status of shared FC is set to "LinkDown", required time for reflecting changes of HVM system configuration increases depending on the number of ports in the state of "LinkDown". For the detail, see "Cautions"- "Shared FC Port Status" in each model's User's Guide.
- When you specify =255.255.255.255 for "hvmip", "subnetmask", "defaultgateway", "bsm1ip", "bsm2ip", "bsm3ip" or "bsm4ip ", HvmSh commands abnormally ends with "Return: 0x11000000".
- When you set the options "clixip (x: 1 to 4)", "bsmxalert (x: 1 to 4)", or "language" for an HVM in which "HvmCliIp" in Table 2-15 List of Function names is set to "OFF", this command ends with the error "Return: 0x11000000".
- When you set the options "clixip (x: 1 to 4)", "bsmxalert (x: 1 to 4) ", or "language" for an HVM in which "BsmNotSuppot" in Table 2-15 List of Function names is set to "ON", this command ends with the error "Return: 0x13000000".
- You are not allowed to change the management paths with the option "managepath" for an HVM in which "ManagePathChange" in Table 2-15 List of Function names is set to "OFF".
- The range of settable virtual COM console ports depends on the settings of the Virtual COM connection mode and the Virtual COM user authentication.

Table 2-7 Range of settable virtual COM console ports

Virtual COM connection mode	Virtual COM user authentication	Range of settable virtual COM console ports
Telnet	Disable	1024 to 65520
Telnet	Enable	1024 to 65504
SSH	- *	
*: When the virtual COM connection mode is "SSH", enabling/disabling user authentication has no effect.		

get SystemConfigIPv6

Overview

This command gets the information on IPv6 that is displayed in the System configuration screen.

Syntax

```
getSystemConfigIPv6
```

Option

None

Related function

IPv6 (The function that applies IPv6 in communication between HVM and management interfaces)

Required authority

None

Response message

static_setting={ Enable Disable}	* Enables or disables manually setting the HVM IPv6 static address
stateless_setting={ Enable Disable}	* Enables or disables manually setting the HVM IPv6 stateless address
hvmip_v6[static]=HVM IPv6 static address	
prefix_length=HVM IPv6 address subnet prefix	
defaultgateway_v6=HVM IPv6 address default gateway	
svpip_v6=SVP IPv6 address	
cli1ip_v6=HVM CLI IPv6 address	
cli2ip_v6=HVM CLI IPv6 address	
cli3ip_v6=HVM CLI IPv6 address	
cli4ip_v6=HVM CLI IPv6 address	
cli5ip_v6=HVM CLI IPv6 address	
cli6ip_v6=HVM CLI IPv6 address	
cli7ip_v6=HVM CLI IPv6 address	
cli8ip_v6=HVM CLI IPv6 address	
cli8ip=HVM CLI8 IP address	
hvmip_v6[linklocal]=HVM IPv6 link local address	
prefix_length[linklocal]= HVM IPv6 link local address subnet prefix	
hvmip_v6[stateless _n]=HVM IPv6 stateless address (n=1,2,...)	
prefix_length[stateless _n]= HVM IPv6 stateless address subnet prefix (n=1,2,...)	

Notes

When there are two or more HVM IPv6 stateless addresses, two or more sets of "hvmip_v6[stateless_n]=" and "prefix_length[stateless_n]=" appear.

opr SystemConfigIPv6

Overview

This command sets HVM IPv6 addresses in the System Configuration screen.

Syntax

```
oprSystemConfigIPv6  
[cli1ip=HVM CLI IPv6 address] [cli2ip=HVM CLI IPv6 address]  
[cli3ip=HVM CLI IPv6 address] [cli4ip=HVM CLI IPV6 address]  
[cli5ip=HVM CLI IPv6 address] [cli6ip=HVM CLI IPV6 address]  
[cli7ip=HVM CLI IPv6 address] [cli8ip=HVM CLI IPV6 address]
```

Option

None

Related function

IPv6 (The function that applies IPv6 in communication between HVM and management interfaces)

Required authority

None

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

None

opr SystemConfigDNS

Overview

This command sets the IP addresses of DNS servers.

Syntax

```
opr SystemConfigDNS  
[DNS1ip=DNS server IPv4|IPv6 address]  
[DNS2ip=DNS server IPv4|IPv6 address]  
[DNS3ip=DNS server IPv4|IPv6 address]
```

Option

None

Related function

DNSClient (The DNS client function)

Required authority

None

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

When you desire to disable IP addresses for DNS servers, specify no value, "NONE", or a blank as IP addresses.

get SystemPCI

Overview

This command gets a scheduling setting for a PCI device.

Syntax

[Syntax 1]

get SystemPCI pcino=**PCI device No.** [ver=**output message version**]

[Syntax 2]

get SystemPCI slot=**device location** portno={**port No.** | *}
[ver=**output message version**]

Option

- PCI device No. is the number that is assigned to each PCI device for identification by the HVM in decimal form.
- For output message version, specify 1 or 2.
- For setting the option "slot" and the description of the option, see [Description format for device location](#).
- For a PCI device with no port number, specify * at the option "slot" for a PCI device with no port number.

Ex.) HvmSh -host=xx.xx.xx.xx get SystemPCI slot=U2 portno=*

Related function

None

Required authority

None

Response message

pcitype=PCI device type	None specified output message version or Specify "ver=1"
pcischd=PCI device scheduling mode	
vendor=vendor name	
devname=device name	
slotno=device location	
bus=bus No. of PCI configuration space (hex)	
dev=device No. of PCI configuration space (hex)	
func=Function No. of PCI configuration space	
lpar={LPAR No. S M}	
snic={shared NIC No. -}	If specify "ver=2". Outputs additional message in the left column.
status={! Err -}	

[Parameters]

PCI device type

- S: SCSI controller
- N: Network interface Card (NIC)
- F: Fiber Channel
- U: USB controller

PCI device scheduling mode

- D: Dedicated mode
- E: Exclusively shared mode
- S: Shared mode

device location

- !: hot removed
- Err: error status
- : other status (includes available status)

For details, see [Description Format for Device Location](#).

Notes

- When an HVM does not support an interface supporting "ver=n", this command ends with the error "Return:0x01000000 Illegal HVMinterface was requested".
- "func=" shows the port number of the port with the smallest number in a PCI device regardless of a specified port number. When you desire to confirm a specified port number, see in the "PHYSICAL_IO_CONFIGURATION" record in the "get ConfigAll" command.

set SystemPCI

Overview

This command sets a scheduling setting for a PCI device.

Syntax

[Syntax 1]

set SystemPCI pcino=**PCI device No.** pcischd={**D** | **S**}

[Syntax 2]

set SystemPCI slot=**device location** portno={**port No.** | *****}
pcischd={**D** | **S**}

[Syntax 3]

set SystemPCI filename=**File name**

Option

- PCI device No. is the number that is assigned to each PCI device for identification by the HVM in decimal form.
- For setting the option "slotno" and the description of the option, see [Description format for device location](#).
- For a PCI device with no port number, specify * at the option "slot" for a PCI device with no port number.
- For File name, specify the name of a file with up to 8 combinations of PCI device No. and *pcischd*={*D/S*} option, or the name of a file with 8 combinations of device location, portno={port No. | *}, and pcischd={D | S}.

[Example of Syntax 1]

pcino=2 pcischd=D

pcino=3 pcischd=S

...

pcino=28 pcischd=S

[Example of Syntax 2]

pcino=2 pcischd=D

pcino=3 pcischd=S

...

pcino=28 pcischd=S

Related function

None

Required authority

None

Response message

An operation number that an HVM has received is output in the decimal system.

accept=**operation No.**

Notes

- When this command completes and the scheduling mode of one or more devices are changed, it takes two to three minutes to reflect changes of HVM system configuration (*1). During the time, the HVM cannot communicate. HvmSh commands that are executed during the time ends with the error "Return: 0x10020001 Response Timeout or Return: 0x10030000 Unknown Data Received".
- When the port status of shared FC is set to "LinkDown", required time for reflecting changes of HVM system configuration increases depending on the number of ports in the state of "LinkDown". For the detail, see "Cautions"- "Shared FC Port Status" in each model's User's Guide.
- Do not put file descriptions in Syntax 1 and 2 in a file.

get PciDeviceMapping

Overview

This command gets the information of mapping the correspondences of physical PCI and logical PCI.

Syntax

```
get PciDeviceMapping lpar=[LPAR No. | all] [opt=tab]
```

Option

- When you set the option "lpar=all", the "Pci Device Mapping"s for all configured LPAR are displayed in the response message.
- When you set the option "opt=tab", Items (1) to (2), and (3) to (13) are respectively segmented with a tab.

Related function

PciDeviceMapping (The PciDeviceMapping screen)

Required authority

None

Response message

[Pci Device Mapping]

[# Lparname] (1)(2)

(3) (4) (5) (6) (7) (8) (9) (10) (11) (12)(13)

Type Schd ID H_Slot H_Status H_Seg H_Bus H_Dev H_Fnc L_Slot L_Status L_Seg L_Bus L_Dev L_Fnc

Mig Diff

U	E	--	Ux		0000	00	1d	00	->	Ux		0000	00	1d	00
F	D	--	I101		0000	AA	BB	00	->	I101		0000	AA	BB	00
F	D	--	I101		0000	AA	BB	01	->	I101		0000	AA	BB	01
F	S	4	I102	!	0000	AA	BB	00	->	I508	!	0000	aa	bb	00 * *
F	S	10	I102	!	0000	AA	BB	01	->	I508	!	0000	aa	bb	01 * *
N	D	--	I103	err	0000	CC	DD	00	->	I103		0000	CC	DD	00

[Parameters]

Hxx: Physical / Lxx: Logical

(1) LPAR No.

(2) LPAR Name

(3) Type: Type of Physical PCI Device

S: SCSI Controller / RAID Controller

N: Network Interface Card (NIC)

F: Fibre Channel Adaptor

U: USB Controller

Nv: Network Interface Card (NIC: VF NIC can be assigned)

(4) Schd: Scheduling Mode of Physical PCI Device

D: Dedicated Mode

S: Shared Mode

E: Exclusive Shared Mode

-: Virtual NIC

(5) ID: LPAR ID which is displayed when the scheduling mode of physical PCI device is "Shared Mode".

Numeral: VfcId

Numeral a- Numeralh: LAN Segment of Shared NIC

Va-Vd: LAN Segment of Virtual NIC

Numeral av- Numeralhv: LAN Segment of VF NIC

(6) (9) Slot: Slot Location of Physical / Logical PCI Device

("-" is displayed when the device is virtual NIC)

(7) (10) Status: Indicates status of PCI Device.

err: Blocked (Logical PCI Device has not a status of "Blocked")

!: Hot Removed.

(8) (11) Seg Bus Dev Fnc: Segment No., Bus No. Device No. and Function No. on PCI configuration space of physical / Logical PCI device.

(12) Mig: "*" indicates that the PCI device was mapped by slot specified migration.

(13) Diff: "*" indicates that the PCI device information of physical device and logical device are not identical.

Notes

None

set PciPortDedMode

Overview

This command sets Port dedicated mode to a value of "enabled" or that of "disabled".

Syntax

```
set PciPortDedMode slot=PCI device location portno=port No.  
portded={ ON | OFF}
```

Option

- "portded=ON": Port dedicated mode is set to a value of "enabled".
- "portded=OFF": Port dedicated mode is set to a value of "disabled".
- For setting the option "slot", see [Description format for device location](#).

Related function

PciPortDed (Port dedicated mode)

Required authority

None

Response message

None

Notes

- "Force Recovery" operation is necessary to validate a change. Be sure to perform the "Force Recovery" operation after the setting by this command.
- This command can be applied to devices for which the field "PORT_DED" in the "PHYSICAL_IO_CONFIGURATION" record in the "get ConfigAll" command.
- No changes can be applied to a PCI device of which ports are assigned to activated LPARs.
- When you switch the value of Port dedicated mode, PCI # is also changed.

Example [PHYSICAL_IO_CONFIGURATION]:

PCI#	PORT#	Location	TYPE	SCH_MOD	PORT_DED		PCI#	PORT#	Location	TYPE	SCH_MOD	PORT_DED
2	0	13A	N	D	OFF		2	0	13A	N	D	ON
2	1	13A	N	D	OFF		3	1	13A	N	D	ON
2	2	13A	N	D	OFF	→	4	2	13A	N	D	ON
2	3	13A	N	D	OFF	←	5	3	13A	N	D	ON
3	0	13B	F	S	*		6	0	13B	F	S	*
4	1	13B	F	S	*		7	1	13B	F	S	*

- When you switch the value of Port dedicated mode from "ON" to "OFF", you are required to match all the scheduling modes of the ports in a controller. Otherwise, it ends with an error of "Return: 0x08010003".

Example [PHYSICAL_IO_CONFIGURATION]:

Changeable							Unchangeable					
PCI#	PORT#	Location	TYPE	SCH_MOD	PORT_DED		PCI#	PORT#	Location	TYPE	SCH_MOD	PORT_DED
2	0	13A	N	D	ON		2	0	13A	N	D	ON
3	1	13A	N	D	ON		3	1	13A	N	D	ON
4	2	13A	N	D	ON		4	2	13A	N	S	ON
5	3	13A	N	D	ON		5	3	13A	N	D	ON
6	0	13B	F	S	*		6	0	13B	F	S	*
7	1	13B	F	S	*		7	1	13B	F	S	*

get SystemSNIC

Overview

This command gets the status of a specified shared NIC port.

Syntax

get SystemSNIC segment=**shared NIC No.** portid={**a|b|c|d|e|f|g|h**}

Option

For shared NIC No., see [get LPARVNICID](#).

Related function

None

Required authority

None

Response message

snicstate={U | D | * | -}

U: Link up

D: Link down

*: Unknown ("- " is displayed in the HVM screen.)

-: Undefined or port is inexistent (A blank is displayed in the HVM screen.)

Notes

None

get SystemLANSeg

Overview

This command gets the state of a virtual LAN segment.

Syntax

```
get SystemLANSeg segment={V | shared NIC No.}  
portid={a|b|c|d|e|f|g|h}
```

Option

For shared NIC No., see [get LPARVNICID](#).

Related function

None

Required authority

None

Response message

```
lansegstate={A | S | D | -}
```

A: Active

S: Standby

D: Down

F: Fault

-: Non-shared NIC or no port (A blank is displayed in the HVM screen.)

Notes

None

get SystemVNICA

Overview

This command gets the information indicating whether the DMA engine of a specified network segment of virtual NIC is available.

Syntax

```
get SystemVNICA segment={ V | shared NIC No. } portid={ a | b | c | d }
```

Option

For **shared NIC No.**, set a number between 1 and 6.

Related function

None

Required authority

None

Response message

```
vnica={ - }
```

Notes

- "-" is output at the parameter "vnica=" in the response message because HVM does not support this command.
- For HVM firmware version 59-00/79-00 or higher for CB2000 or 17-86 or higher for CB320, you are not allowed to set a number over 6 for shared NIC No.
- You are not allowed to set "c" to "h" for the option "portid" even though the physical NIC device that a shared NIC number specified at the option "segment" indicates.

get SystemSNICFilter

Overview

This command gets the state of the packet-filtering function for a specified shared NIC port.

Syntax

```
get SystemSNICFilter segment=shared NIC No.  
portid={a | b | c | d | e | f | g | h}
```

Option

For **shared NIC No.**, set a number between 1 and 6.

Related function

None

Required authority

None

Response message

```
snicfilter={Disable | Enable | Disable (ALL) | *}
```

Notes

- When you specify "Disable(ALL)" for the option "snicfilter=" in use of HvmSh for Linux OS, enclose the value with a pair of double quotations.
- This interface cannot get the states of the packet filters for VF NIC ports. When you specify "av | bv" and so on indicating VF NIC ports for the option "portid=", the interface ends with the error "Return 0x11000000".

set SystemSNICFilter

Overview

This command sets the state of the packet-filtering function for a specified shared NIC port.

Syntax

```
set SystemSNICFilter segment=shared NIC No.  
portid = { a | b | c | d | e | f | g | h }  
snicfilter = { Disable | Enable | Disable (ALL) | * }
```

Option

For shared NIC No., see [get LPARVNICID](#).

Related function

None

Required authority

None

Response message

None

Notes

- When a segment or the LPAR to which a port assigned does not exist, this command ends with the error "Return: 0x11000000".
- When you set "Disable(ALL)" at the option "snicfilter=" in executing this command with HvmSh for Linux, make sure to enclose the characters "Disable(ALL)" with double quotation marks.
- (Example)
- `./HvmSh -host=172.16.1.1 set SystemSNICFilter segment=1 portid=a snicfilter="Disable(All)"`
- This command cannot set the state of the packet-filtering function for VF NIC ports. When you specify "av | bv" and so on indicating VF NIC ports for the option "portid=", the command ends with the error "Return: 0x11000000".

get VnicInterruptModeration

Overview

This command gets the mode for VNIC interrupt moderation.

Syntax

```
get VnicInterruptModeration
```

Option

None

Related function

VnicInterruptModeration (The function for setting the mode for VNIC interrupt moderation)

Required authority

None

Response message

type={ Guest | Guest+Host }

hostparm=Time of intervals for interrupt generation (1 to 1000 microseconds) *: This row is output only when "type=" is "Guest+Host".

Notes

None

set VnicInterruptModeration

Overview

This command sets the mode for VNIC interrupt moderation.

Syntax

[Syntax 1]

set VnicInterruptModeration type=Guest

[Syntax 2]

set VnicInterruptModeration type=Guest+Host hostparm=Time of intervals for interrupt generation (1 to 1000 microseconds)

Option

- "type=Guest": Interrupts are generated at an interrupt moderation time specified by the NIC driver of a guest OS
- "type=Guest+Host": Interrupts are generated at the sum of an interrupt moderation time specified by the NIC driver of a guest OS and a time of intervals for interrupt generation

Related function

VnicInterruptModeration (The function for setting the mode for VNIC interrupt moderation)

Required authority

None

Response message

None

Notes

"type=" is set to "Guest+Host" and "hostparm (Time of intervals for interrupt generation=" is set to "100 (microseconds)", by default.

get SystemFC

Overview

This command gets the FC adapter assignment information.

Syntax

get SystemFC

Option

For shared NIC No., see [get LPARVNICID](#).

Related function

None

Required authority

None

Response message

(Example)

lpar=1slotno=4portno=0shcmd=Svfcid=1wwpn=2301000087020000wwnn=2301000087020001portstatus=A
lpar=- slotno=4portno=0shcmd=Svfcid=2wwpn=2302000087020000wwnn=2302000087020001portstatus=D
lpar=2slotno=13portno=0shcmd=Dvfcid=- wwpn=2302000087020000wwnn=2302000087020001portstatus=C
lpar=2slotno=13portno=1shcmd=Dvfcid=- wwpn=2302000087020000wwnn=2302000087020001portstatus=E

[Notes on parameters]

- For setting the option "slotno" and the description of the option, see [Description format for device location](#).
- At the parameter "lpar=" for FC ports to which are not assigned to any LPARs, "lpar=-" is displayed.
- At the parameter "vfcID=" for dedicated FC ports, "vfcid=-" is displayed.
- At the parameter "portstatus=" for dedicated FC ports, "portstatus=-" is displayed.

Notes

- For the information on Migration WWN that is displayed on the HVM Allocated FC Information screen, get the field "MG_WWPN/MG_WWNN" in the "FC_ASSIGN_INFORMATION" record with the "get ConfigAll" command.

set FcCoreDedMode

Overview

This command sets the HBA core dedicated mode to a value of "enabled" or "disabled" for a specified FC port.

Syntax

```
setFcCoreDedMode slot=HBA device location portno=HBA port No.  
mode={ Enable | Disable}
```

Option

For setting the option "slotno" and the description of the option, see [Description format for device location](#).

Related function

None

Required authority

None

Response message

None

Notes

- To check whether an HBA supports the core dedicated mode, execute the "get ConfigAll" command, and then see the CORE_DED field in the "PHYSICAL_IO_CONFIGURATION" record.
- When an HBA is in dedicated mode, this command cannot enable the core dedicated mode for the HBA, whereas, the command can disable the mode.
- When the FC port driver option settings are "ConnectionType=FC-AL" and "MultiplePortID=Enable", this command cannot enable the HBA core dedicated mode.
- In process of changing any of the FC port driver options "ConnectionType", "MultiplePortID", and "DataRate", enabling the core dedicated mode is not allowed.
- When any of the LPARs are not deactivated, this command does not work.
- When you assign FC ports for which the core dedicated mode is enabled to LPARs, assign VfcID numbers from 1 up to the number of cores in a target FC port to the LPARs. When you assign any number exceeding the number of cores in the target FC port cores to an LPAR, the LPAR fails to be activated.
- When you set the HBA core dedicated mode from a value of "disabled" to a value of "enabled", an HBA port works in the IO connection mode set for the vfcID.
- When you set the HBA core dedicated mode from a value of "enabled" to a value of "disabled", an HBA port works in the IO connection mode set for the IO connection mode for vfcID=1 regardless of the vfcID set for the HBA port.

set FcIoConnectionMode

Overview

This command sets the IO connection mode for a specified shared FC port.

Syntax

[Syntax 1]

```
set FcIoConnectionMode slot=device location portno=HBA port No.  
mode={ AUTO|ON|OFF}
```

[Syntax 2]

```
set FcIoConnectionMode slot=device location portno=HBA port No.  
[vfcid=VfcID] mode={ AUTO|ON|OFF}
```

Option

- AUTO: Mode for automatically switching IO connection mode depending on the load
- ON: IO connection-enabled mode
- OFF: IO connection-disabled mode
- For setting the option "slotno" and the description of the option, see [Description format for device location](#).

Related function

None

Required authority

None

Response message

None

Notes

- You are allowed to set the IO connection mode for the Hitachi 16Gb 2-port fiber channel adapter. Whereas, setting the IO connection mode for other adapters ends with an error of "Return:0x01030000". At that time, "(relslot)" is displayed in the error message. It indicates a device location is improper.
- This command can work for not only deactivated LPARs but also activated LPARs. The setting of this command is immediately applied after execution.
- This command ends with the error "Return:0x01030000" when you execute the command for dedicated HBAs. For setting the IO connection mode for dedicated HBAs, see in "Hitachi Gigabit Fibre Channel Adapter USER'S GUIDE"s.
- When you apply the setting of Syntax 2 to HBAs for which the FC core dedicated-mode is disabled, this command ends with the error "Return:0x01040000".
- When you set greater than or equal to the number of FC cores of a specified HBA in Syntax 2, this command ends with the error "Return:0x01030000".
- Setting IO connection mode to "OFF" may shorten the response time of IO.
- Setting IO connection mode to "ON" may reduce the CPU usage ratios for processes of IO interrupts.
- The setting of IO connection mode is not transferred to another LPAR in migration executions in Shutdown mode or Concurrent Maintenance mode.

get SystemTime

Overview

This command gets the HVM system time.

Syntax

get SystemTime

Option

None

Related function

None

Required authority

None

Response message

time=HVM system time

zone=time zone

Notes

None

set SystemTime

Overview

This command sets the HVM system time.

Syntax

set SystemTime [time=**HVM system time**] [zone=**time zone**]

Option

- **HVM system time**: YYYY/MM/DD-hh:mm:ss
- **time zone**: -12 to +14. Any non-integer value is not allowed.

Related function

None

Required authority

None

Response message

None

Notes

- Accuracy of time adjustment by using HvmSh is not guaranteed digit of seconds. Command is delayed to reaching the specified HVM. Set HVM system time by using HVM screen if accuracy of time is required on digit of seconds.
- Accepted time of command on the HVM by using the system time is displayed before the system time is adjusted. Adjusted system time is used after this command.

(Example)

```
>hvmsh5.3 -host=172.16.18.28 set systemtime time=2080/03/01-15:30:00
```

```
HvmSh(Version 5.3) Completed. 2011/01/28 13:55:40 Return: 0x00000000
```

```
SetSystemInfo Ver.2 2011/01/28 13:55:40 GMT+00:00
```

```
>hvmsh5.3 -host=172.16.18.28 get systemtime
```

```
HvmSh(Version 5.3) Completed. 2011/01/28 13:56:05 Return: 0x00000000
```

```
GetSystemInfo Ver.1 2080/03/01 15:30:24 GMT+00:00
```

```
time=2080/03/01 15:30:24
```

```
zone=+0
```

get SystemTimeCtrl

Overview

This command gets the control information on the HVM system time.

Syntax

get SystemTimeCtrl

Option

None

Related function

NTP (The function for synchronizing the HVM system time with NTP servers)

Required authority

None

Response message

[Syntax]

TimeSync={ **Disable** | **NTP** | **SVP** }

NTPServer1={ **NTP Server 1 IP address** | **None** }

NTPServer2={ **NTP Server 2 ID** | **None** }

ImportConfig={ **None** | **SVP** | **BMC** }

[Parameters]

- The parameter "TimeSync" indicates the state of NTP.
 - **NTP** : Adjusting the HVM system time to one of the times of NTP servers that are specified with NTP server ID.
 - **SVP** : Adjusting the HVM system time to the time of the NTP server in the management module.
- The parameter "ImportConfig" indicates an import source for control information.
 - **None** : Not importing control information.
 - **SVP** : Importing control information from the management module.
 - **BMC** : Importing control information from BMC.
- The parameter "NTP Server x IP address" indicates the IP address of NTP Server X. The parameter "NTP Server x IP address" shows "None" when no NTP server is set.

Notes

None

opr SystemTimeCtrl

Overview

This command sets the control information on the HVM system time. After this setting, HVM immediately synchronizes the HVM system time to an NTP server when the NTP server operates normally.

Syntax

[Syntax 1]

```
opr SystemTimeCtrl
  [TimeSync={Disable|NTP|SVP}]
  [NTPServer1=NTP Server 1 IP address]
  [NTPServer2=NTP Server 2 IP address]
```

[Syntax 2]

```
opr SystemTimeCtrl ImportConfig={None | SVP | BMC}
```

Option

- You are required to set an IPv4 or IPv6 address at the options "NTP Server x IP address".
- You are allowed to set an IPv4 address at the option "NTP Server 1 IP address" and an IPv6 address at the option "NTP Server 2 IP address", and vice versa.
- Set "None" or " " (a blank) at the position to follow "=" to remove an IP address setting at the options "NTP Server x IP address".

Related function

NTP (The function for synchronizing the HVM system time with NTP servers)

Required authority

None

Response message

None

Notes

- You are not allowed to set the option "ImportConfig" and another option simultaneously. Doing that brings the error "Return: 0x11000000".
- You are not allowed to set the option "ImportConfig=" to "BMC" for CB320.

get OptPreState

Overview

This command gets the Pre-State Auto Activation option.

Syntax

get OptPreState

Option

None

Related function

None

Required authority

None

Response message

prestate={ Yes | No }

Notes

None

set OptPreState

Overview

This command sets the Pre-State Auto Activation option.

Syntax

```
set OptPreStateprestate={ Yes | No}
```

Option

None

Related function

None

Required authority

None

Response message

None

Notes

None

get OptAutoSd

Overview

This command gets the HVM Auto Shutdown option.

Syntax

get OptAutoSd

Option

None

Related function

None

Required authority

None

Response message

autosd={Yes | No}

Notes

None

set OptAutoSd

Overview

This command sets the HVM Auto Shutdown option.

Syntax

```
set OptAutoSd autosd={ Yes | No}
```

Option

None

Related function

None

Required authority

None

Response message

None

Notes

None

get HvmOptions

Overview

This command gets the options in the HVM options screen.

Syntax

```
get HvmOptions
```

Option

None

Related function

None

Required authority

None

Response message

```
prestate={ Yes | No}
autosd={ Yes | No}
shutdownstate={ Ready | InProgress | -}
errwatching={ Yes | No}
activateconfirm={ Yes | No}
deactivateconfirm={ Yes | No}
screenswchar= character code
pcpucstate={ Enable|Disable|*}
usbautoalloc={ Enable|Disable | *}
savechangedconfig={ Enable|Disable | *}
savetimeconfig={ Enable | Disable | *}
safemode={ ON | OFF | *}
keepconfig={ Enable | Disable | *}
```

Notes

- The response message varies depending on HVM firmware version. For the detail, see [set HvmOptions](#).
- This command outputs "*" for unsupported options.
- The combination of V9.6 or higher of HvmSh and V02-56 or higher of LPAR manager outputs the "keepconfig" parameter.

set HvmOptions

Overview

This command gets the options in the HVM options screen.

Syntax

```
set HvmOptions
[prestate={ Yes | No }][autosd={ Yes | No }]
[shutdownstate=Ready][errwatching={ Yes | No }]
[activateconfirm={ Yes | No }][deactivateconfirm={ Yes | No }]
[screenswchar= character code][pcpucstate={ Enable|Disable }]
[usbautoalloc={ Enable|Disable }]
[savechangedconfig = { Enable|Disable }]
[savetimeconfig={ Enable|Disable }][safemode=OFF]
[keepconfig= { Enable | Disable }]
```

Option

None

Related function

SaveTimeConfig (The function for automatically saving the information on the adjusted LPAR manager system time in the physical RTC and the LPAR manager configuration when the LPAR manager system time and LPAR times are adjusted)

KeepConfig (The function for protecting rewriting the LPAR manager configuration in device blockade or degradation)

Required authority

None

Response message

None

Notes

- You are allowed to set the "shutdownstate=" to "Ready" when the option "shutdownstate=" is set to "InProgress".
- This command cannot get or set some options depending on HVM firmware version. For the detail, see the following table.
- For BS1000,CB320and CB2000, see [Support matrix of HvmOptions](#).

Table 2-8 HVM Option support matrix

HVM version HvmSh Option	HvmSh ver.	CB2000DP CB2000MP					CB500		CB2500	CB500, CB2500	
		58-4x, 78-4x or lower	58-50, 78-50 or higher	59-00, 79-00 or higher	59-50, 79-50 or higher	59-79, 79-79 or higher	01-00 or higher	01-70 or higher	02-00 or higher	02-10 or higher	02-56 or higher
prestate	V5.1or higher	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
autosd	V5.1or higher	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
errwatching	V5.1or higher	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
shutdownstate	V5.1or higher	No	Yes	Yes	Yes	Yes	Yes	Yes	No (*2)	No (*2)	No
activateconfirm	V5.1or higher	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
deactivateconfirm	V5.1or higher	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
screenswitch	V5.1or higher	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
pcpucstate	V6.0 or higher	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
usbautoalloc	V6.0or higher	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
savechangedconfig	V6.0or higher	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
savetimeconfig	V7.3 or higher	No	No	No	Yes	Yes	No	Yes	Yes	Yes	Yes
safemode (*1)	V8.5 or higher	No	No	No	No	Yes	No	No	No	Yes	Yes
keepconfig	V9.6 or higher	No	No	No	No	Yes	No	No	No	No	Yes
*1: When LPAR manager is not in safe mode, you cannot change the value for "Savemode". (In this case, this command ends with the error of "Return: 0x0800000".											

opr HvmOperatingMode

Overview

This command sets the HVM operating mode to be reflected when the HVM restarts.

Syntax

opr HvmOperating Mode=[**Standard**][**Expansion**]

Option

None

Related function

Savetimeconfig (The function for automatically saving the information on the adjusted LPAR manager system time in the physical RTC and the LPAR manager configuration when the LPAR manager system time and LPAR times are adjusted)

Required authority

None

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

- This command is not supported for CB500 or CB2500. When you execute this command for CB500 or CB2500, this command ends with the error "Return: 0x081C0003".
- When you change the HVM operating mode, the HVM configuration is automatically saved. However, when you set the HVM operating mode to the same value as that already set to be reflected in the next restart of the HVM.
- You are required to restart an HVM to reflect a setting change of the HVM operating mode.
- This command works for the combinations of HvmSh version 5.5 or higher and the following HVM versions:
 - CB2000 58-71/78-71 or higher
 - CB320 17-80 or higher

get ProcGroup

Overview

This command gets the processor group information.

Syntax

get ProcGroup [group=**group No.**]

Option

None

Related function

None

Required authority

None

Response message

Group#group No.: group name (*1)							
TotalPproc=total amount of No. of dedicated/shared physical processor							
DedPproc=No. of dedicated mode physical processor							
ShrPproc=No. of shared mode physical processor							
LparNum=LPAR No.							
Physical Processor Configuration (*A)							
Processor#	Blade#	Socket#	Core#	Thread#	State	Status	Schedule
Processor	Blade	Socket	Core	Thread	{DEA ACT	{RUN	{D S}
No.	No.	No.	No.	No.	WAN DEG}	FAILURE	
						ERROR}	
Lpar Configuration (*B)							
Lpar#	Name	Status	Ded LProc		Shr LProc		
LPAR	LPAR	{ACT DEACT	No. of dedicated		No. of shared		
No.	Name	FAILURE}	logical processor		logical processor		

Notes

- When you do not set a group number, the information of all groups is output.
- When some processors belong to a processor group already removed, the information of the processors is output at the record "Group#-" (# indicates a group number).
- When you set an group not to exist, this command ends with the error "Return:0x11000000".
- When "Total Pproc=" is set to "0", the "Physical Processor Configuration" record, which is the part (*A) in the above message, is not output.
- When "Lpar Num=" is set to "0", the "Lpar Configuration" record, which is the part (*B) in the above message, is not output.

opr ProcGroupAdd

Overview

This command defines a processor group.

Syntax

opr ProcGroupAdd group=**group No.**

Option

None

Related function

None

Required authority

None

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

"NO_NAME" is set as a group name by default.

opr ProcGroupRemove

Overview

This command removes a processor group.

Syntax

opr ProcGroupRemove group=**group No.**

Option

None

Related function

None

Required authority

None

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

None

set ProcGroupName

Overview

This command resets a processor group.

Syntax

set ProcGroupName group=**group No.** name=**group name**

Option

None

Related function

None

Required authority

None

Response message

None

Notes

When you set a string with 32 or more characters as a group number, the 32 or later of characters are discard.

opr ProcGroupPproc

Overview

This command resets the group number of a physical processor core.

Syntax

oprProcGroupPprocgroup=**group No.** pprocno=**physical processor No.**

Option

None

Related function

None

Required authority

None

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

None

get MgmtStandbyPortStatus

Overview

This command gets and diagnoses the state of the inactive management path.

Syntax

```
get MgmtStandbyPortStatus [msg=all]
```

Option

When you specify "all" at the option "msg=", all the information on the management path is output. "all" for the option "msg=" works for V9.5 or higher of HvmSh.

Related function

None

Required authority

None

Response message

[Without the option "msg=all"]

RedundantNetworkState={ Standby|Error|Linkdown|Unknown}

[With the option "msg=all"]

(Example) Parameters are segmented with the "tab" key.

[MANAGEMENT_PATH]						
MGMNT#	Location	PORT#	Status	Type	SWITCH_TIME	
0	G0	0	Active	Default	0	
1	G0	1	Standby	Default	0	

(Parameters to be displayed)

See the description of the MANAGEMENT_PATH record in the "get ConfigAll" command.

Notes

None

opr MgmtStandbyPortDiagnosis

Overview

This command enables or disables the periodic diagnosis function for the inactive management path.

Syntax

```
opr MgmtStandbyPortDiagnosis diagnosis={ Enable|Disable}
```

Option

None

Related function

None

Required authority

None

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

When you enable the periodic diagnosis function, the state of the inactive management path is diagnosed.

set MgmtPathSwitchLinkDown

Overview

This command enables or disables the automatic management path switch function when link-down of the active port for the management path is detected. When you enable the automatic management path switch function, you are required to set a threshold time until link-up since link-down detection. When the set threshold time passes after link-down, the management paths are automatically switched.

Syntax

[Syntax 1]

set MgmtPathSwitchLinkDown time=**Threshold time for management path failover owing to link-down of the active port**

[Syntax 2]

set MgmtPathSwitchLinkDown switch={ **Enable**|**Disable**}

Option

- You are allowed to set one of 0, 1 to 30 [seconds] as a threshold time until link-up since link-down detection. Setting 0 disables the automatic management path switch function in link-down.
- Setting "Enable" at the option "switch=" enables the automatic management path switch function in link-down. This setting corresponds to "3" at the option "time=" in Syntax 1.
- Setting "Disable" at the option "switch=" disables the automatic management path switch function in link-down. This setting corresponds to "0" at the option "time=" in Syntax 1.

Related function

ManagePathSwitch (The function for switching the management paths in link-down)

Required authority

None

Response message

None

Notes

None

opr MgmtPathSwitch

Overview

This command switches the management paths.

Syntax

opr MgmtPathSwitch active={ 0 | 1 }

Option

- This command specifies an ID for a management path to be active after path switching with the option "active".

MGMNT#	Status	active=1 → ← active=0	MGMNT#	Status
0	Active		0	Standby
1	Standby		1	Active

Related function

ManagePathSwitch (The function for switching the management paths in link-down)

Required authority

None

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

When the management path with an ID specified at the option "active" is not "Standby", this command cannot switch the management paths.

opr TimerCounterBase

Overview

This command sets the base value for calculating the HVM timer counter.

Syntax

```
opr TimerCounterBase tc base={ TSC | CPUFrequency}
```

Option

None

Related function

TimerCounterBase (The function for selecting the base value for calculating the HVM timer counter.)

Required authority

None

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

- The HVM configuration is saved when you change the value of the HVM Timercounter Base. However, when you set the same value as that to be reflected to an HVM in the next restart of the HVM.
- You are required to restart an HVM to reflect a setting change of the base value of the HVM timer counter after a command changes the HVM Timercounter Base.
- For the setting values for the HVM Timercounter Base, see the field "TC_BASE_CURR" in the "HVM_CONFIGURATION" record in the "get ConfigAll" command.

get HvmScdOptions

Overview

This command gets the setting of the scheduling method.

Syntax

```
get HvmScdOptions
```

Option

None

Related function

CORE_SCD (The function for core scheduling)

Required authority

None

Response message

MULTI_QUEUE_SCD={ON | OFF | *}

CORE_SCD={ON | OFF | *}

- MULTI_QUEUE_SCD: The setting of forcible multiple queue scheduling.
ON: The forcible multiple queue scheduling is applied.
OFF: The scheduling mode that is automatically determined depending on server blade configuration is applied.
- CORE_SCD: The setting of core scheduling. HvmSh Version 10.2 or higher outputs this item.
ON: The core scheduling is enabled.
OFF: The core scheduling is disabled.

Notes

- "MULTI_QUEUE_SCD=*" indicates that an HVM does not support the multiple queue scheduling function.
- "CORE_SCD =*" indicates that an HVM does not support the core scheduling function.

opr HvmScdOptions

Overview

[Syntax 1]

This command sets the scheduling mode in processor shared mode.

[Syntax 2]

This command enables or disables the function for core scheduling.

Syntax

[Syntax 1]

opr HvmScdOptions MULTI_QUEUE_SCD={ **ON**|**OFF** }

[Syntax 2]

opr HvmScdOptions CORE_SCD={ **ON**|**OFF** }

Option

[Syntax 1]

MULTI_QUEUE_SCD: the setting of forcible multiple queue scheduling.

ON: The forcible multiple queue scheduling is applied.

OFF: The scheduling mode that is automatically determined depending on server blade configuration is applied.

Table 2-9 MULTI_QUEUE_SCD parameter and scheduling mode

Server blade configuration	MULTI_QUEUE_SCD	
	ON	OFF
4-blade SMP configuration	Multiple queues	Multiple queues
1 blade or 2-blade SMP configuration	Multiple queues	Single queue

[Syntax 2]

CORE_SCD: the setting of core scheduling.

ON: The core scheduling is enabled.

OFF: The core scheduling is disabled.

Related function

CORE_SCD (The function for core scheduling)

Required authority

None

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

- This command works only for HVMs on which no LPARs are activated.
- The default value of MULTI_QUEUE_SCD and CORE_SCD is "OFF".
- When MULTI_QUEUE_SCD is set to "ON", HVMs manage the scheduling queue for each processor that the HVMs recognize when MULTI_QUEUE_SCD is set to "ON". This may allow performance improvement against overhead caused by queue conflict and dispatch delay.

get HvmAlertList

Overview

This command gets the alert message list that HVM sends to HCSM.

Syntax

```
get HvmAlertList
```

Option

None

Related function

None

Required authority

None

Response message

```
Begin<tab>1.0<CRLF>
```

```
[record name]<CRLF>
```

```
<tab>field name<tab>field name<tab>....<CRLF>
```

```
<tab>field value<tab>field value<tab>....<CRLF>
```

```
.
```

```
.
```

```
.
```

```
End<CRLF>
```

Table 2-10 HCSM_ALERT_VERSION record

Field	Contents	Type	Length
ALERT_VERSION	Alert message version Example: 01-12	Character	8
ALERT_COUNT	Number of alert message	Numeric	3
LANG	Alert language mode { Japanese English }	Character	16

Table 2-11 HCSM_ALERT_LIST record

Field	Contents	Type	Length
ALERT_ID	Alert type code (hexadecimal)	Numeric	4
ALERT_LEVEL	Alert level character string { INFO WARN ERROR } "INFO": Information "WARN": Warning "ERROR": Error	Character	8
ALERT_LPAR	Whether there is LPAR information (LPAR number, UUID) or not in an alert data. "ON": Displayed LPAR information "OFF": No displayed LPAR information	Character	4
ALERT_MESSAGE	Alert message	Character	140

The "HCSM_SERVER_SETTING" record outputs the HCSM server setting information of the management module.

Table 2-12 HCSM_SERVER_SETTING record

Field	Contents	Type	Length
IP	HCSM server IPv4 or IPv6 address <IPv4 address> Format: AAA.BBB.CCC.DDD Note: Without setting an address, an "*" appears in the field. (components of the dotted / zero padding) Example: 192.168.000.001 <IPv6 address> Example: fe80::1ce:c0ff:ee:cafe	Character	15
PORT	Alert port number Note: "*" is displayed when no setting.	Numeric	5
REST	Setting / unsetting alert inhibit "ON": Setting an alert inhibit (No sending an alert) "OFF": Unsetting an alert inhibit (Sending an alert) "*": No setting	Character	4
SESSION	Connection state of SVP and HCSM "ON": Connect "OFF": Disconnect "*": No setting	Character	7
LEVEL	Alert notification level "INFO+WARN+ERROR": Information, warning, and error "WARN+ERROR": Warning and error "ERROR": Only error "NONE": No notification "*": No setting	Character	16
INTERVAL	Alert retry interval (second)	Numeric	4
DURATION	Alert retry duration (second)	Numeric	4

Notes

The character code in alert messages is UTF-8. When you cannot read an alert message in a response message, you should save an output of termination message in a file. Confirm the content with an editor with which characters in UTF-8 can be encoded.

get HvmStatus

Overview

This command gets some information and statuses of an HVM, which includes some of the statuses that are displayed in the System Service State screen.

Syntax

get HvmStatus

Option

None

Related function

None

Required authority

None

Response message

CoDLicenseShortage={ Yes|No }

CoDAvailableCoresShortage={ Yes|No }

ErrorEventDetected={ Yes|No }

SVPAccess={ Run | Stop | Error | Unknown }

BSMAccess={ Run | Stop | Error | Unknown } (*3)

HAMonitor={ Run | Stop | Error | Unknown }

BMC={ Run | Error }

InternalPathPort={ port No. | Default | * }

InternalPathConnect={ Success|Fail }

InternalPathLink={ Yes|No }

LatestSysLogNo=No. of last system log

LatestSysLogTime=Time of last system log

CoDLiceShortageCore=Shortage of licensed core number. (*1)

NTP={ NoSync | Sync | Error | Inactive |- } (*2)

Notes

- *1: This item is output when HvmSh Version is 5.3 or higher.
- *2: "-" is output for HVMs that does not support the NTPfunction. Also, "-" is output depending on the combination of HVM version and HvmSh version when NTP is set to "Inactive" in the HVM screen. See the following table for details.
- *3: For CB2500 in which BsmNotSupport function of "Get HVM Facility Map" is ON, this item corresponds to "Mgmt I/F" in the Service State screen.

Table 2-13 Response messages when NTP is set to "inactive" in the HVM screen

HVM version HvmSh version	Compute Blade 2000DP		Compute Blade 2000MP		Compute Blade 320		Compute Blade 500		Compute Blade 2500
	59-4x or lower	59-50 or higher	79-4x or lower	79-50 or higher	17-8x or lower	17-90 or higher	01-6x or lower	01-70 or higher	02-00 or higher
V7.2 or lower	(A)	-	(A)	-	(A)	-	(A)	-	-
V7.3 or higher	(A)	Inactive	(A)	Inactive	(A)	Inactive	(A)	Inactive	Inactive
(A)= {NoSync Sync Error}									

opr ForceRecovery

Overview

This command enables the Force Recovery function.

Syntax

opr ForceRecovery

Option

None

Related function

None

Required authority

None

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

- It takes two to three minutes for completion of this command and the force recovery function. However, during the operation, anyone is not allowed to communicate with the HVM. HvmSh commands issued during the operation does not work with one of the errors "Return: 0x10020001 Response Timeout" and "Return: 0x10030000 Unknown Data Received".
- When the port status of share FC is "LinkDown", the required time for this command varies depending on the number of ports with the status of "LinkDown". For the detail, see the user's guides for the blade server model of the server blade.

opr HvmShutdown

Overview

This command shuts down an HVM.

Syntax

opr HvmShutdown

Option

None

Related function

None

Required authority

None

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

During a shutdown operation of an HVM, any HvmSh commands end owing to a timeout error.

opr HvmRestart

Overview

This command restarts an HVM.

Syntax

opr HvmRestart

Option

None

Related function

HvmRestart (The function for restarting an HVM)

Required authority

None

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

During a restart operation of an HVM, anyone is not allowed to communicate with the HVM. HvmSh commands end with one of the errors "Return: 0x1002 0001 Response Timeout" and "Return: 0x1003 0000 Unknown Data Received".

get Versions

Overview

This command gets a list of HVM commands, which is for communication between HVM and HvmSh, and their versions.

Syntax

get Versions

Option

None

Related function

None

Required authority

None

Response message

(Example)

GetSystemInfoVer.1
SetSystemInfoVer.1
GetLPARConfigVer.1
SetLPARConfigVer.1
GetPerfVer.1
GetOptionVer.1
ActivateVer.1
SaveConfigVer.1
GetResultsVer.1

Notes

None

get HvmFunctionLicense

Overview

This command gets the license information for functions.

Syntax

```
get HvmFunctionLicense
```

Option

None

Related function

None

Required authority

None

Response message

Function name={ON|OFF}

- ON: The function is enabled.
- OFF: The function is disabled.
- For the function name, see the following table.

Table 2-14 List of license functions

Function name	Contents	Supported HvmSh version
HANA	HANA license	V8.4

Notes

None

get HvmFacilityMap

Overview

This command gets the HVM facility map.

Syntax

get HvmFacilityMap

Option

None

Related function

None

Required authority

None

Response message

Function name={ON|OFF}

- ON: The function is enabled.
- OFF: The function is disabled.
- For the function name, see the following table.

Table 2-15 List of Function names

Function name	Description	HvmSh support start version
VnaviScreenAssist	HVM screen function of HVM Navigator	HvmSh Ver.5.1 or higher
ManagePathChange	Management path changing function	HvmSh Ver.5.1 or higher
HvmCliIp	HVM CLI IP Address function	HvmSh Ver.5.3 or higher
EfiBootSetting	EFI boot configuration function	HvmSh Ver.5.3 or higher
PciDeviceMapping	PCI Device Mapping Screen function	HvmSh Ver.5.5 or higher
NTP	HVM System Time adjusting function by using NTP	HvmSh Ver.5.5 or higher
HvmOperatingMode	Configuration of HVM Operating Mode function (Standard / Expansion)	HvmSh Ver.5.5 or higher
VnicMultiSegment	Multi Segment / Assigning per Port Function for Shared NIC	HvmSh Ver.5.5 or higher
HvmRestart	Restarting HVM function	HvmSh Ver.5.5 or higher
VnicDeviceChange	Device type of Virtual NIC changing function	HvmSh Ver.5.6 or higher
GetHvmDumpData	Dump data collecting function on HVM memory	HvmSh Ver.5.6 or higher
CMainteMigration	LPAR Migration (Concurrent maintenance) function	HvmSh Ver.6.0 or higher
iScsiBootSetting	iSCSIboot setting function (limited-function)	HvmSh Ver.6.0 or higher
ProtocolTcp	Communication function between HVM and HvmSh by TCP protocol	HvmSh Ver.6.0 or higher
HvmIpChangeInhibit	The inhibiting function of changing an HVM system configuration (HVM_IP, Subnet Mask, Default Gateway) for LAN	HvmSh Ver.6.0 or higher
LparMigrationInfo	Getting function for LPAR Migration information *Function to cooperate with HVM Navigator	HvmSh Ver.6.4 or higher
HostNuma	Memory and processor assignment function suitable for NUMA.	HvmShVer.6.4 or higher
TimerCounterBase	TimerCounter Base select function	HvmShVer.6.5or higher
iScsiBoot	iSCSI boot setting function (without DHCP function)	HvmShVer.6.5or higher
iScsiBootDhcp	iSCSI boot setting function (with DHCP function)	HvmShVer.6.5or higher
KeylessVerUp	Version up function without version up key	HvmShVer.7.1or higher
HvmDumpCompress	Function of compressing and acquiring HVM dump *When this function is "ON", Syntax2 command of "Collecting HVM dump(to save in HVM)" and Syntax 3 command of "Saving HVM dump data in file" are executable.	HvmShVer.7.2or higher

Function name	Description	HvmSh support start version
LparVT-x	VT-x(Intel(R) Virtualization Technology) function in LPAR *When this function is "ON", VT-x function can individually be set enable or disable in each LPAR.	HvmShVer.7.3or higher
SolarisBoot	Solaris boot function in LPAR *When this function is "ON", Solaris can be selected from boot OS types in each LPAR.	HvmShVer.7.3or higher
SaveTimeConfig	Auto save function that the adjustedtime information is saved in physical RTC or HVM configuration information when HVM system time or LPAR time is adjusted. *When this function is "ON", HVM configuration auto save function can be set enable or disable while adjusting time.	HvmShVer.7.3or higher
LparTimeAdjustSrc	Select original time function when adjusting LPAR time *When this function is "ON", an original time to adjust can be specified for adjusting LPAR time using opr LparTimeAdjust command.	HvmShVer.7.3or higher
VfVnic	VF NIC assignment function for NIC corresponded to SR-IOV	HvmShVer.7.3or higher
Sys2Proc	Setting function for CPU resource limit that SYS2 uses	HvmShVer.7.3or higher
SNicOffload	Shared NIC offload setting function	HvmShVer.7.4or higher
GuestNuma	Guest NUMA function that guest OS recognize the physical NUMA configuration of allocated memory and allocated CPU in LPAR.	HvmShVer.8.0or higher
SecureComm	Encryption communications function between HVM and server management application.	HvmShVer.8.0or higher
GuestIdleMode	Guest idle mode function	HvmShVer.8.0or higher
Efi64Boot	OS boot function that the LPAR pre-boot firmware boot OS using EFI64	HvmShVer.8.0or higher
Efi64BootSetting	EFI boot function that the LPAR pre-boot firmware boot EFI using EFI64	HvmShVer.8.0or higher
Efi64IScsiBootSetting	iSCSI boot function that the LPAR pre-boot firmware boot iSCSI using EFI64	HvmShVer.8.0or higher
PrebootChange	Changing function for the LPAR pre-boot firmware settings	HvmShVer.8.0or higher
82576NIC_SR_IOV	Supported an enabling function of Intel 82576 NIC SR-IOV	HvmSh Ver.8.1or higher
BsmNotSupport	Not supported a connecting function to BSM *When this function is "ON", this connecting function is not supported.	HvmSh Ver.8.3or higher
HvmFunctionLicense	License setup function for each function of HVM	HvmSh Ver.8.4or higher
Authentication	User authentication function for HVM	HvmSh Ver.8.4or higher
VCSshConnetcion	Function for connecting to virtual COM by SSH	HvmSh Ver.8.4or higher

Function name	Description	HvmSh support start version
MigrationTLS	Function that select TLS protocol during data communication performed between HVMs when LPAR migration	HvmSh Ver.8.4or higher
ManagePathChangeVer2	Ver2 enhancement of the function to change the management path. Note: If it is ON, the web console of the system allows you designate a NIC for the HVM management path.	HvmSh Ver.8.5 or higher
EfiBootSettingVer2	Ver2 enhancement of the function to set the EFI boot. Note: If it is ON, it enables you to change the Correction type and the DataRate of the FC driver option information to the shared mode FC. For details, see FC driver option setting .	HvmSh Ver.8.5 or higher
IPv6	Allows using IPv6 network protocol for the connection between HVM and management interface.	HvmSh Ver.8.6 or higher
MSHYP_PRTE	Function to set Microsoft Hypervisor Interface : Partition Reference Time Enlightenment(PRTE) of LPAR	HvmSh Ver.8.6 or higher
PerformanceTuning	Function for setting Performance tuningoptions	HvmSh Ver.8.7 or higher
LowLatency	Function for setting LowLatency mode	HvmSh Ver.8.7 or higher
Ept1GB	Function for setting Ept1GB mode	HvmSh Ver.8.7 or higher
IoConnectionMode	Function for setting IO connection mode	HvmSh Ver.9.0 or higher
DNSClient	Function for setting DNS clients	HvmSh Ver.9.0 or higher
NumaBindLproc	Function for assigning logical processors in Physical NUMA Node Binding Mod e	HvmSh Ver.9.0 or higher
LDAPAuthentic ation	LPAR authentication	HvmSh Ver.9.0 or higher
AuditLog	Audit log	HvmSh Ver.9.0 or higher
RADIUSAuthen tication	RADIUS authentication	HvmSh Ver.9.2 or higher
RoleBasedAcce ssControl	Function for controlling access to an HVM by role	HvmSh Ver.9.2 or higher
PciPortDed	PCI port dedicated mode	HvmSh Ver.9.2 or higher
RBAC_Security	Function for enabling the HVM security permission for Role based access control	HvmSh Ver.9.2 or higher
HttpCertificateT ype	Function for updating the server certificate of an HVM Web system to a new one.	HvmSh Ver.9.3 or higher
AuditLogVer2	The enhanced audit log function (Ver. 2) Note that, when this function is set to a value of "ON", audit logs on "Authentication", "Setting changes", "Stop of LPAR boot", and "Stop of HVM start" can be retrieved. For details, see opr AuditLogConfig .	HvmSh Ver.9.5 or higher
L3CacheAllocati on	The L3 cache allocation function	HvmSh Ver.9.5 or higher
ManagePathSwi tch	The function for switching the management paths in link-down.	HvmSh Ver.9.5or higher
KeepConfig	The function for protecting rewriting the LPAR manager configuration in device blockade or degradation	HvmSh Ver.9.6 or higher
VnicInterruptM oderation	The function for setting the mode for VNIC interrupt moderation	HvmSh Ver.9.6 or higher
LparHpetAllocM ode	The function for setting the method for logical HPET assignment	HvmSh Ver.9.6 or higher
Sys2ProcVer2	The enhanced version of Sys2Proc, which is a function for setting the upper limit for the CPU resource used in SYS2	HvmSh Ver.9.9 or higher
GuestIdleMode Ver2	The enhanced guest idle mode (Ver. 2)	HvmSh Ver.10.0 or higher
Sys2Dump	SYS2 Dump function	HvmSh Ver.10.0 or higher
GuestPCID	The function for setting the capability of PCID.	HvmSh Ver.9.9 or higher

GuestIBRS	The function for setting the capability of IBRS and IBPB.	HvmSh Ver.9.9 or higher
GuestSSBD	The function for setting the capability of SSBD.	HvmSh Ver.10.0 or higher
L1D_FLUSH	The function that HVM flushes L1 data cache before dispatching it from one LPAR to another LPAR.	HvmSh Ver.10.1 or higher
CORE_SCD	The core scheduling is a function to suppress running multiple LPARs within a physical core when SMT(simultaneous multithreading) is enabled.	HvmSh Ver.10.2 or higher
GuestMDClear	The function for setting the capability of MDClear.	HvmSh Ver.10.3 or higher
MDClear_SW (*1)	The function that HVM clears MD by software before dispatching an LPAR or a logical CPU from one to another.	HvmSh Ver.10.3 or higher
MDClear_HW	The function that HVM clears MD by hardware function before dispatching an LPAR or a logical CPU from one to another.	HvmSh Ver.10.3 or higher
PciCommandFormat2	Shows whether Format 2, in which a device is specified with a device location and a port number, in PCI commands such as "get LPARPCI", "set LPARPCI", "get SystemPci", and "set SystemPci", is enabled.	HvmSh Ver.9.2 or higher
*1: This function is for the following servers. - CB2000 Standard server blade: X55A1/X55A2 models - CB2000 High-performance server blade: X57A1/X57A2 models		

Notes

The number of function names may increase whenever HVM firmware is updated.

Performance tuning options

This command sets the four options individually for an HVM where "Performance tuning options" is available.

set LPARIdleMode

Overview

This command specifies the instruction to be executed in the Guest idle mode for the LPAR.

Syntax

```
set LPARIdleMode lpar=LPAR No. idlemode={halt | mwait}  
generation=generation No.]
```

Option

halt: Executes HALT instruction when a logical processor is in Guest idle mode.

mwait: Executes MWAIT instruction when a logical processor is in Guest idle mode.

Related function

PerformanceTuning(Function for setting Performance tuning options)

Required authority

None

Response message

None

Notes

None

set LPARLowLatency

Overview

This command enables or disables LowLatency mode for the LPAR.

Syntax

```
set LPARLowLatency lpar=LPAR No. LowLatency={ Yes |  
No } [ generation= generation No.]
```

Option

Yes: Enables LowLatency mode.

No: Disables LowLatency mode.

Related function

PerformanceTuning(Function for setting Performance tuning options)

Required authority

None

Response message

None

Notes

None

set LPAREpt1GB

Overview

This command enables or disables Ept1GB mode for the LPAR.

Syntax

```
set LPAREpt1GB lpar=LPAR No. Ept1GB={ Yes | No }[ generation=  
generation No.]
```

Option

Yes: Enables Ept1GB mode. (Page size of memory control is 1GB)

No: Disables Ept1GB mode. (Page size of memory control is 2MB)

Related function

PerformanceTuning(Function for setting Performance tuning options)

Required authority

None

Response message

None

Notes

None

opr LparCatCbm

Overview

This command sets mask bits to restrict cache ways available for LPARs in dedicated mode.

Syntax

```
opr LparCatCbm lpar=LPAR number L3_CBM={ CBM value | default }  
[generation=generation number]
```

Option

- You can set CBM of an LPAR to the default value (L3_CBM=default) or a desired value (L3_CBM=[CBM value]).
- You are required use a hexadecimal value to specify CBM. Each bit of mask corresponds to a cache way number respectively.
- The default value (L3_CBM=default) is a common value to access the entire L3 cache.

Related function

L3CacheAllocation (The L3 cache allocation function)

Required authority

None

Response message

An operation number that an HVM assigns when the HVM receives this command is output in the decimal system.

accept=operation No.

Notes

- You are allowed to specify an activated LPAR also.
- When you set the CBM of the L3 cache to the default value, the register for CBM (COS) is not used even though the target LPAR is activated.
- When one or both of the following conditions are met, this command ends with the error "Return: 0x01030000".
 - Any mask bit with a bit number bigger than CBM_WIDTH (in the CACHE_ASSIGN_INFORMATION record of the get ConfigAll command) is set to 1.
 - Not contiguous "1" combinations (e.g. 0h, 1h, F00Fh, etc.).
- When you set "1" inconsecutively as mask bits, such as L3 CBM=33, this command ends with the error "Return: 0x01030000".
- When you set the scheduling mode to shared mode for an activated LPAR with its CBM set to a desired value with the "opr LparSchd" command, this command with the error "Return: 0x04050005".

Security

opr login

Overview

This command provides a user name and a password for an HVM. Then, the HVM attempts to authenticate the user. When the user passes the authentication, this command stores information in an authentication file.

Syntax

```
opr login  
  [-user=user name-passwd=password]  
  [-fileuser=authentication file name]
```

Option

- When no authentication file name is set at the "-fileuser=" option, the authentication file described in No. 2 of Table 1-15 Method of specifying authentication file is used.
- user name/password is used for user authentication for an HVM when a user connects the HVM. When you do not set the options, you are required to input them interactively.

[Example of interactive input]

>HvmSh -host=xx.xx.xx.xx opr login -fileuser=user.dat	(1) Example of command execution
user name: xxxxxx	(2) User name
password:	(3) Password

Related function

Authentication (The user authentication function)

LDAPAuthentication (The LDAP authentication function)

RADIUSAuthentication (The RADIUS authentication function)

Required authority

None

Response message

PASSWD_REMAIN=number of days left until the expiration date of password

Notes

- Logging in to an HVM that does not support user authentication ends with the error "Return: 0x10590021".
- Logging in to an HVM in which the HvmSh user authentication function is disabled ends with the error "Return: 0x10590025".
- Logging in to a once-logged-in-but-not-yet-logged-out HVM by using the same authentication file as the one used in the first logging in fails in an error "Return: 0x10590026". If any of the following three events occurs before the second logging in, the second logging in ends normally, returning the message "Return: 0x00000000". In this case, however, earlier version HvmSh logs an authentication failure when completing the second login. This inconvenience is corrected in combinations of HVM Ver 02-10 or higher and HvmSh Ver 8.5 or higher.
 - A valid login period has elapsed since the first login
 - Switching to enable/disable HvmSh user authentication
 - Restarting the HVM system
- It may take about 35 seconds to log into an HVM in which LDAP authentication is enabled. You should set the timeout period to 40 or more seconds for HVMs in which LDAP authentication is enabled.
- It may take about 120 seconds to log into an HVM in which RADIUS authentication is enabled. You should set the timeout period to 120 seconds or more seconds for HVMs in which RADIUS authentication is enabled.

opr logout

Overview

This command terminates a state in which a user is authenticated. This is generally a counterpart of the "opr login" command.

Syntax

opr logout[-fileuser=**authentication file name**]

Option

When no **authentication file name** is set at the "-fileuser=" option, the authentication file described in No. 2 of Table 1-15 Method of specifying authentication file is used.

Related function

Authentication (The user authentication function)

Required authority

None

Response message

None

Notes

- When an authentication file does not include valid certificates, this command ends with the error "Return: 0x10590024".
- The end code of this command varies depending on combination of HVM and HvmSh command option when one of the following events occurs in advance of execution of this command.
 - A valid login period has elapsed since the first login
 - Switching HvmSh user authentication from a value of "enabled" to a value of "disable", and vice versa.
 - Restarting an HVM system
- When you use a combination of HVM Ver 02-10 or higher and HvmSh Ver 8.5 or higher, this command ends with the error "Return: 0x10590027 ". In other combinations, however, the logout command ends normally with "Return: 0x00000000" and HvmSh logs an authentication failure.

get HvmSecureCmmConfig

Overview

This command gets certificates for an HVM, the security strength for the HVM, and the information on the control of access to the HVM. All of them are used in HVM encryption communication.

Syntax

```
get HvmSecureCmmConfig
```

Option

None

Related function

SecureComm (The function for an HVM to establish encrypted communication with programs for server management)

Authentication (The user authentication function)

LDAPAuthentication (The LDAP authentication function)

AuditLog (The audit log function)

RADIUSAuthentication (The RADIUS authentication function)

RoleBasedAccessControl (The function for controlling access to HVM by role)

Required authority

The HVM security permission

Response message

Begin<tab>1.0<CRLF>
[record name]<CRLF>
<tab>field name<tab>field name<tab>....<CRLF>
<tab>field value<tab>field value<tab>....<CRLF>
.
.
.
End<CRLF>

Table 2-16 Encryption communication configuration record

Field	Contents	Number of records
SEC_MODE*	Encrypted communication mode	1
CERTIFICATE *	Certificates information of encrypted communication	Max. 11
SSH_HOST_KEY*	Host key information about SSH connection of virtual COM	1
AUDIT_LOG_CONFIGURATION*	Outputs information on audit log	1
LDAP_CONFIGURATION*	Outputs information on LDAP authentication	1
AUTHENTICATION_CONFIGURATION	Outputs common information for authentication	1
CERTIFICATE_HVMSSH_APPROVED	Certificates information registered in CERTIFICATE folder for verification.	The number of certificates files
RADIUS_CONFIGURATION*	Information for RDIUS authentication	3
ROLE_CONFIGURATION*	Information for a role	The supported number of user-defined roles
*: These record contents are the same as the records in the "get ConfigAll" command. See Table 2-56 SEC_MODE record , Table 2-57 Contents in SEC_MODE record , Table 2-58 CERTIFICATE record , Table 2-59 SSH_HOST_KEY record , Table 2-60 MANAGEMENT_PATH record , Table 2-64 AUDIT_LOG_CONFIGURATION record , Table 2-65 LDAP_CONFIGURATION record , Table 2-66 RADIUS_CONFIGURATION record , & Table 2-67 ROLE_CONFIGURATION record .		

Table 2-17 AUTHENTICATION_CONFIGURATION record

Field	Contents	Type	Length
METHOD *	Method for user authentication { "LOCAL" "LOCAL+LDAP " "LOCAL+RADIUS "} <p>Note that "*" is displayed if the HVM does not support the LDAP authentication function.</p>	Character	32
LOGIN_VALID_TIME *	An accessible time for HvmSh commands to log in an LDAP server, in user authentication (LDAP authentication) [sec] [30 to 86400 Infinite] <p>Note that "*" is displayed if the HVM does not support the LDAP authentication function.</p> <p>Note that "Infinite" is displayed when the time period for login is unlimited.</p>	Numeric	5
*: The same content as AUTHENTICATION xxx (xxx indicates a field name) in the "HVM CONFIGURATION" record in the "get ConfigAll" command.			

Table 2-18 CERTIFICATE_HVMESH_APPROVED record

Field	Contents	Type	Length
FilePath	Certificate file name This file name is displayed including its path.	Character	Max. length of file path
Version	Version	Character	12
Serial_number	Serial number	Numeric (Hexadecimal)	32
Signature_Algorithm	Signature algorithm	Character	64
Public_key_algorithm	Public key algorithm	Character	32
Validity_Not_before	Validity(Not before)	Character	20
Validity_Not_after	Validity(Not after)	Character	20
Common_Name	Common Name (CN) of Issuer	Character	64
Common_Name_Subject	Common Name (CN) of Subject	Character	64
Country	Country(C) of Subject	Character	4
State_or_Province	State or province(ST) of Subject	Character	64
Locality	Locality(L) of Subject	Character	64

Notes

None

get HvmServerCertificate

Overview

This command gets a HVM server certificate and display the contents as a response message.

Syntax

```
get HvmServerCertificate  
  {filename= CertificateFilename|install=Foldername}
```

Option

- When you save the HVM server certificate information output with this command as a certificate file, specify the "filename=" option.
- When you use the obtained certificate for HVM server certificate verification in communication with HVM and HvmSh command, specify the "install=" option.
- When you do not set any options, a file is created in a folder that has been registered in the HvmSh Default file.

Related function

SecureComm (The function for an HVM to establish encrypted communication with programs for server management)

Required authority

The HVM security permission

Response message

(Example)

filename=Filename of certificate

Version=Version

Serial number= Serial number

Signature_Algorithm=Signature algorithm with a hash function

Public_key_algorithm=Public key algorithm

Validity_Not_before= Validity (Not before)

Validity_Not_after= Validity(Not after)

Common_Name= Common Name (CN) of Issuer

Subject_Country= Country(C) of Subject

State_or_province= State or province(ST) of Subject

Locality=Locality(L) of Subject

Notes

- Verification of the certificate in the communication after the registration may fail, if you register the multiple self-signed certificates which overlap the subject elements of common name (CN), country (C), state or province (ST), locality (L), organization (O), organizational unit(OU).
- When you set the "install=" option, a file with a unique name is created in a folder that has been registered in the HvmSh Default file. Whereas, when you do not set the "install=" option, a file with a unique name is created in a folder that has been registered in the HvmSh Default file.

opr HvmIfServerLevel

Overview

[Syntax 1]

This command in Syntax 1 sets encrypted security strengths of the counterpart in communication.

[Syntax 2]

This command in Syntax 2 sets communication with the http protocol to a value of "enabled" or "disabled".

[Syntax 3]

This command Syntax 3 sets the strength of communication with LDAP servers.

Syntax

[Syntax 1]

opr HvmIfSecureLevel

{ **HvmSh|BSM|HCSM|Migration** } = { **Default|High** }

*: You are allowed to set security strength to multiple interfaces simultaneously.

[Syntax 2]

opr HvmIfSecureLevel http={ **Disable|Enable** }

*: You are required to restart an HVM to reflect a setting change of enabling or disabling communication with the http protocol.

[Syntax 3]

opr HvmIfSecureLevel LDAP={ **TLS1.0|TLS1.2** }

*: The value TLS1.2 indicates TLS1.2 or higher.

Option

None

Related function

SecureComm (The function for an HVM to establish encrypted communication with programs for server management)

LDAPAuthentication (The LDAP authentication function)

Migration (The function for using the TLS protocol in data communication between HVMs in LPAR migration)

Required authority

The HVM security permission

Response message

None

Notes

- For Syntax 1

The option setting on data communication between the source and the destination HVMs during LPAR migration in Concurrent Maintenance mode "Migration=" is enabled for only HVMs for which "MigrationTLS" is set to "ON". "MigrationTLS" is an item in Table 2-15 List of Function names. When the option setting "Migration=" is set for HVMs which "MigrationTLS" is set to "OFF", this command ends with "Return: 0x11000000".

- For Syntax 2

The option "http=" is invalid for CB2000. Executing this command with the option "http=" for an HVM for CB2000 brings one of the following phenomena.

- HvmSh command V9.2 or lower: This command ends with no error, however, the value of the option "http=" is not reflected.
- HvmSh command V9.3 or higher: This command ends with the error "Return: 0x11000000".

- For Syntax 3

Syntax 3 works only when LDAPAuthentication in Table 2-15 List of Function names is set to "ON". When you select Syntax 3 for an HVM for which LDAPAuthentication is set to "OFF", this command ends with the error "Return 0x11000000".

opr HvmIfSecureVerify

Overview

This command sets server verification in encrypted communication with the counterpart when an HVM is a client to a value of "enabled" or "disabled".

Syntax

```
opr HvmIfSecureVerify {HCSM | LDAP}={Disable|Enable}
```

Option

None

Related function

SecureComm (The function for an HVM to establish encrypted communication with programs for server management)

LDAPAuthentication (The LDAP authentication function)

Required authority

The HVM security permission

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

This command works only when LDAPAuthentication in Table 2-15 List of Function names is set to "ON". When you select Syntax 3 for an HVM for which LDAPAuthentication is set to "OFF", this command ends with the error "Return 0x11000000".

opr HvmCSR

Overview

This command requests an HVM to create a CSR (Certificate Signing Request) and obtains the CSR. You are allowed to set parameters in a file or with a command.

Syntax

```
opr HvmCSR
{ paramfile=ParameterFileName|
  File_type={ PEM| DER} Subject_Country=....}
[filename=OutputFileName]
```

Option

- You are allowed to specify a parameter file with parameters for creating a CSR at the "paramfile" option. When you do not specify a parameter file at the "paramfile" option, you are required to set the parameter with this command.
- When you specify CSR parameters, describe the parameters as follows:
 - Parameter name="Specified Value"
 - Abbreviation= "Specified Value"

Make sure that you enclose a value with a pair of double quotations. See Table 2-19 CSR parameter for the details of parameters and the abbreviations.

- In parameter setting in a file, describe one parameter per row.
- You are allowed to specify a file in which to describe a created CSR at the "filename=" option. Also, the contents of the CSR are output in the response message regardless of whether you have specified a file at the "filename=" option.

Related function

SecureComm (The function for an HVM to establish encrypted communication with programs for server management)

Required authority

The HVM security permission

Response message

```
-----BEGIN CERTIFICATE REQUEST -----  
<CSR>  
-----END CERTIFICATE REQUEST -----
```

Notes

Specify the common name (CN) of Subject uniquely in all the HVMs.

Table 2-19 CSR parameter

Parameter name	Abbreviation	Contents	Format	omission
File_type	-	CSR file format	{ PEM DER }	Not allowed
Validity	-	Validity	Number of year: number of day * 1:2 (1 year: 2 days) is the same as 0: 367 (367 days). * The default is 15 years. * 0:0 is specified 31 days. * When set over 65536 days, Return:0x1100000 occur. * The base point is HVM time when creating.	allowed
Subject_Country	C	Country name of Subject	2 uppercase letters	allowed
State_or_province	ST	State or province of Subject	Up to 60 alphanumeric characters and symbols *	allowed
Locality	L	Locality of Subject	Up to 60 alphanumeric characters and symbols *	allowed
Organization	O	Organization of Subject	Up to 60 alphanumeric characters and symbols *	allowed
Organizational_Unit	OU	Organizational_Unit of Subject	Up to 60 alphanumeric characters and symbols *	allowed
Common_Name	CN	CommonName of Subject	1 to 60 alphanumeric characters, (-)dash, and period (.)	Not allowed
E-mail_address	-	E-mail_address of Subject	Max. 60 Characters of ASCII	allowed
DN_qualifier	-	DN_qualifier of Subject	Up to 60 alphanumeric characters and symbols *	allowed
Surname	-	Surname	Up to 60 alphanumeric characters and symbols *	allowed
Given_name	-	Givenname	Up to 60 alphanumeric characters and symbols *	allowed
Initials	-	Initials	Up to 60 alphanumeric characters and symbols *	allowed
Unstructure_name	-	Unstructure_name	Up to 60 alphanumeric characters and symbols *	allowed
Challenge_password	-	Challenge_password	Up to 60 alphanumeric characters and symbols *	allowed
* : Available symbols are as follows for State or province (ST), Locality (L), Organization (O), Organizational Unit (OU), DN qualifier, Surname, Given name, and Initials. () blank symbol, (') apostrophe, (-) dash, (,) comma, (=) equal, (/) slash, (()) parenthesis, (.) period, (:) colon, (+) plus, and (?) question				

opr HvmServerCertificate

Overview

This command creates the HVM self-signed certificate. You are allowed to set parameters in a file or with a command.

Syntax

```
opr HvmServerCertificate  
[paramfile=ParameterFileName | Subject_Country=····]
```

Option

- You are allowed to specify a parameter file with parameters for creating a CSR at the "paramfile" option. When you do not specify a parameter file at the "paramfile" option, you are required to set the parameter with this command.
- When you specify each parameter, describe the parameters as follows:
 - Parameter name="Specified Value"
 - Abbreviation="Specified Value"Make sure that you enclose a value with a pair of double quotations.
- In parameter setting in a file, describe one parameter per row.

Related function

SecureComm (The function for an HVM to establish encrypted communication with programs for server management)

Required authority

The HVM security permission

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

Be sure to specify the common name (CN) of Subject uniquely in all the HVMs.

Table 2-20 Parameter of self-signed certificate

Parameter name	Abbreviation	Contents/format	omission
File_type	-	CSR file format { PEM DER}	Not allowed
Validity	-	Number of year: number of day * 1:2 (1 year: 2 days) is the same as 0: 367 (367 days). * The default is 15 years. * 0:0 is specified 31 days. * When set over 65536 days, "Return:0x1100000" occur. * The base point is HVM time when creating.	allowed
Subject_Country	C	2 uppercase letters	allowed
State_or_province	ST	Up to 60 alphanumeric characters and symbols *	allowed
Locality	L	Up to 60 alphanumeric characters and symbols *	allowed
Organization	O	Up to 60 alphanumeric characters and symbols *	allowed
Organizational_Unit	OU	Up to 60 alphanumeric characters and symbols *	allowed
Common_Name	CN	1 to 60 alphanumeric characters, (-)dash, and period (.)	Not allowed
E-mail_address	-	Max. 60 Characters of ASCII	allowed
DN_qualifier	-	Up to 60 alphanumeric characters and symbols *	allowed
Surname	-	Up to 60 alphanumeric characters and symbols *	allowed
Given_name	-	Up to 60 alphanumeric characters and symbols *	allowed
Initials	-	Up to 60 alphanumeric characters and symbols *	allowed
Unstructure_name	-	Up to 60 alphanumeric characters and symbols *	allowed
Challenge_password	-	Up to 60 alphanumeric characters and symbols *	allowed
*: Available symbols are as follows for State or province (ST), Locality (L), Organization (O), Organizational Unit (OU), DN qualifier, Surname, Given name, and Initials. (o) blank symbol, (') apostrophe, (-) dash, (,) comma, (=) equal, (/) slash, (())parenthesis, (.) period, (:) colon, (+) plus, and (?) question			

opr HvmCACertificateRegist

Overview

This command registers a server certificate signed by the CA to HVM. You are allowed to register a certificate in PEM or DER.

Syntax

opr HvmCACertificateRegist filename=**CA Signed Filename**

Option

You are required to specify a file path in which to store a server certificate at the "filename" option.

Related function

SecureComm (The function for an HVM to establish encrypted communication with programs for server management)

Required authority

The HVM security permission

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

- This command ends with the error "Return:0x20030001" when the contents of the following are not matched.
 - The content of a server certificate signed by the CA
 - The content of a private key generated in creating CSR
- To access an HVM with the TLS protocol (-verify=yes), you are required to register a server certificate signed by the CA into the server certificate installation folder for HvmSh.

opr HvmClientCertificateRegist

Overview

This command registers a certificate for verification of the counterpart in communication with an HVM. You are allowed to register a certificate in PEM or DER. Also, you are allowed to register a certificate signed by the CA.

Syntax

opr HvmClientCertificateRegist filename= **certificate file name**

Option

You are required to specify a file path in which to store a server certificate at the "filename" option.

Related function

SecureComm (The function for an HVM to establish encrypted communication with programs for server management)

Required authority

The HVM security permission

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

- You are allowed to register up to 10 of certificates. This command ends with the error "Return: 0x00590002" when 10 of certificates are already registered. In this case, delete some certificates and then retry.
- "Verification of the certificate" may fail in sending the "Alert" to HCSM, after you register the multiple self-signed certificates which overlap the subject elements of common name (CN), country (C), state or province (ST), locality (L), organization (O), or organizational unit (OU).

opr HvmClientCertificateRemove

Overview

This command removes the certificate of the counterpart or a certificate signed by the CA in HVM. Make sure to confirm the content of a certificate that you remove by checking the "CERTIFICATE" record in the "get HvmSecureCmmConfig" command in advance.

Syntax

[Syntax 1]

opr HvmClientCertificateRemove CertificateNo=**Certificate No. (0 to 9)**

[Syntax 2]

opr HvmClientCertificateRemove
 { Serial_number | SN } = **Serial No.**
 { Common_name | CN } = **Common Name Of Issuer**

Option

A certificate whose serial number (SN) and common name (CN) match with the values of the "{ Serial_number | SN } =" option and the "{ Common_name | CN } =" option is removed when you execute this command in Syntax 2. Make sure that enclose the values with a pair of double quotations.

Related function

SecureComm (The function for an HVM to establish encrypted communication with programs for server management)

Required authority

The HVM security permission

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

- The "getResult" command ends with "Return: 0x00590004" when the certificate numbers of no certificates match with the "CertificateNo=" option in execution of this command in Syntax 1, or the serial number (SN) and the common name (CN) match with the "{ Serial_number | SN}=" option and the "{ Common_name | CN}" option.
- When you execute this command in Syntax 2 to remove a certificate under the condition that multiple certificates with the same serial number and the same common name as specified ones exist, a certificate with the smallest certificate number is removed.

opr HvmSecureCmmConfigSave

Overview

This command saves the information of HVM encryption communication in the HVM configuration file.

Syntax

```
opr HvmSecureCmmConfigSave
```

Option

None

Related function

SecureComm (The function for an HVM to establish encrypted communication with programs for server management)

Required authority

None (Note that no authority required.)

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

- This command saves only the information of encryption communication in the HVM configuration file, that is, this command does not save the LPAR configuration, the system configuration, and so on.
- The "opr SaveConfig" command saves all configurations including the configuration of HVM encryption communication.

opr CACertificateRegist

Overview

This command registers a self-signed certificate of the counterpart in communication with HvmSh commands or a certificate signed by CA into a certificate folder for verification for HvmSh.

Syntax

```
opr CACertificateRegist filename=Filename [install=Foldername]
```

Option

- You are allowed to specify the filename of a self-signed certificate of the counterpart in communication with HvmSh commands or a certificate signed by CA at the option "filename".
- You are allowed to specify the folder of a certificate folder for verification for HvmSh at the option "install".

Related function

SecureComm (The function for an HVM to establish encrypted communication with programs for server management)

Required authority

None

Response message

install=Created Certificate File Name

Notes

- Specifying the HVM IP address using the "-host=" option is not required in this command, since this command does not communicate with HVM.
- When you specify a value at the option "install=", this command creates a file with a unique name in a specified folder and copies the content of a certificated signed by CA. When you do not specify a folder, this command automatically creates a folder and registers the folder name at the Hvm default file.
- When you do not specify a value at the option "install=", this command registers a certificate folder for certificate installation already registered in the HvmSh default file.
- Verification of the certificate in the communication after the registration may fail, if you register the multiple self-signed certificates which overlap the subject elements of common name (CN), country (C), state or province (ST), locality (L), organization (O), organizational unit(OU).

opr VCConnectType

Overview

This command sets the mode of connecting a virtual COM.

Syntax

```
opr VCConnectType ConnectType={ Telnet|SSH}
```

Option

You are allowed to use the option "type=" instead of the option "ConnectType=" in V8.5 or higher of HvmSh.

Related function

- SecureComm (The function for an HVM to establish encrypted communication with programs for server management)
- VCSshConnetcion (The function for connecting a virtual COM with SSH)

Required authority

The HVM security permission

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

None

opr HvmIfCertificateType

Overview

This command updates the server certificate of an HVM Web system to a new one.

Syntax

```
opr HvmIfCertificateType http={CERT1|CERT2}
```

Option

None

Related function

- SecureComm (The function for an HVM to establish encrypted communication with programs for server management)
- HttpCertificateType (The function for updating the server certificate of an HVM Web system to a new one)

Required authority

The HVM security permission

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

- When you set the option "http=" to "CERT1", the HVM Web system uses an HVM built-in certificate. The SHA-1 algorithm is applied to HVM built-in certificate.
- When you set the option "http=" to "CERT2", the HVM Web system uses an HVM server certificate.
- When the web browser with which you run an HVM web system has ended supporting SHA-1, confirm that the hash algorithm of the HVM server certificate for an HVM Web system is SHA-2 and then set the option "http=" to "CERT2" with this command.

opr HvmSshHostKey

Overview

This command creates a host key for connecting a virtual COM with SSH.

Syntax

opr HvmSshHostKey

Option

None

Related function

SecureComm (The function for an HVM to establish encrypted communication with programs for server management)

VCSshConnetcion (The function for connecting a virtual COM with SSH)

Required authority

The HVM security permission

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

None

get HvmUserList

Overview

This command gets the user list for an HVM.

Syntax

```
get HvmUserList
```

Option

None

Related function

Authentication (The user authentication function)

RoleBasedAccessControl (The function for controlling access to HVM by role)

Required authority

The HVM security permission

Response message

```
Begin<tab>1.0<CRLF>
[HVM_USER_LIST]<CRLF>
<tab>field name<tab>field name<tab>.....<CRLF>
<tab>field value<tab>field value<tab>.....<CRLF>
.
.
<tab>field value<tab>field value<tab>.....<CRLF>
.
.
End<CRLF>
```

Table 2-21 HVM_USER_LIST record

Field	Contents	Type	Length
NAME	User name	Character	32
REMAIN	Number of days left until password's expiration date. <ul style="list-style-type: none">- Numerical value: number of days left (14 or more days)- Numerical value*: number of days left (less than 14 days)- "Infinite "- "Expired"- "NaN": No indication	Character	16
LOGIN_VALID_TIME	Login hours expiration for HvmSh command (seconds) { 30 to 86400 Infinite} <ul style="list-style-type: none">- When there is no limit for login hours expiration, "Infinite" is displayed.	Character	16
ROLE#	Role number to be assigned to users {0 to the supported number of user-defined roles *} (*1) Note that 0 is the role number with all permissions in an HVM.	Numeric	3
ROLE_NAME	Role name to be assigned to users (*1) Note that "Administrators " is displayed when the field "ROLE#" shows 0.	Character	32
1: When "RoleBasedAccessControl " in Table 2-15 List of Function names shows "OFF" or a user without the HVM security permission executes this command, "" is displayed.			

Notes

None

opr HvmIfAuthentication

Overview

This command sets the user authentication to a value of "Enabled" or "Disabled" for a counterpart in communication.

Syntax

```
opr HvmIfAuthentication {HvmSh|VC}={Disable|Enable}
```

Option

The left size of the equation indicates a counterpart.

Related function

Authentication (The user authentication function)

Required authority

The HVM security permission

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

None

opr HvmPasswdExpiry

Overview

This command sets a validity period for a user password.

Syntax

```
opr HvmPasswdExpiry passwd_expiry=validity period (days)
```

Option

You are required to set 0, or 1 to 365 at the option "passwd_expiry". Note that, when you set 0 at the option, the validity period is set to a value of "unlimited".

Related function

Authentication (The user authentication function)

Required authority

The HVM security permission

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

None

opr HvmUserAdd

Overview

This command adds a user for an HVM. When you issue this command in Syntax 1, you are requested to input a user name and a password interactively.

Syntax

[Syntax 1]

```
opr HvmUserAdd  
  [-LoginValidTime=accessible time after login (seconds)]  
  [role=role No.]
```

[Syntax 2]

```
opr HvmUserAdd-user=username-passwd=password  
  [-LoginValidTime=accessible time after login (seconds)]  
  [role=role No.]
```

Option

- You are allowed to 0, 30 to 86400 at the option "LoginValidTime ". No that 0 is the value showing an indefinite time.
- When you do not specify a value, a value "3600 seconds (60 minutes) " is set by default.
- The specifications of user name and password are listed in the following table.

Table 2-22 Specifications of user name and password

Item	User name	Password
No. of characters	1 to 31	1 to 31
Allowed characters	<ul style="list-style-type: none">- Alphabetical characters and numbers- . (Period)- - (hyphen)- _ (underscore)	<ul style="list-style-type: none">- Alphabetical characters and numbers- Articles except " " (Blank) (ASCII cods 0x21 to 0x7E)
Restrictions	<ul style="list-style-type: none">- The first character is required to be an alphabetical character.	None

- When "RoleBasedAccessControl" in Table 2-15 List of Function names is set to "ON", the option "role" works. When you assign a role to a user, set one of 0 to the supported number of user-defined roles for the user. Note that 0 is the role number with all permissions in an HVM. Also, when you do not set a value for the option "role", 0 is automatically set for the option "role".
- When you issue this command in Syntax 1, you are requested to input a user name and a password interactively.

[Example]

```
>HvmSh -host=xx.xx.xx.xx opr HvmUserAdd      (1) Command
user name: xxxxxx                             (2) User name
password:                                     (3) Password
    Any input value is not echoed back.
password(again):                             (4) Password
    Any input value is not echoed back.
```

Related function

Authentication (The user authentication function)

RoleBasedAccessControl (The function for controlling access to HVM by role)

Required authority

The HVM security permission

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

- When you issue this command in Syntax 2, anyone can obtain a password which you set. Therefore, you can add a user more safely with this command in Syntax 1 than with this command in Syntax 2.
- When "RoleBasedAccessControl" in Table 2-15 List of Function names is set to "ON", the option "role" works. When you desire to assign a role to a user, set one of 0 to the supported number of user-defined roles for the user. Note that 0 is the role number with all permissions in an HVM. Also, when you do not set a value for the option "role", 0 is automatically set for the option "role".

opr HvmUserRemove

Overview

This command removes a user from an HVM.

Syntax

```
opr HvmUserRemove -user=username
```

Option

None

Related function

Authentication (The user authentication function)

Required authority

The HVM security permission

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

None

opr HvmPasswd

Overview

This command updates the password for a user. When a user issues this command in Syntax 1 or 2, this command changes a password for the user. Whereas, when an administration user issues this command in Syntax 3 or 4, this command changes a password for another user. You are required to input a user name and a password interactively when you issue this command in Syntax 1 or 3.

Syntax

[Syntax 1]

```
opr HvmPasswd
```

[Syntax 2]

```
opr HvmPasswd  
  -passwd_new=new password  
  -passwd=current password
```

[Syntax 3]

```
opr HvmPasswd-user=user name
```

[Syntax 4]

```
opr HvmPasswd-user=user name-passwd=new password
```

Option

You are required to input a user name and a password interactively when you issue this command in Syntax 1 or 3.

[Example of this command in Syntax 1]

>HvmSh -host=xx.xx.xx.xx opr HvmUserPasswd	(1) Command
current password:	(2) Current Password
new password:	(3) New Password
Any input value is not echoed back.	
new password(again):	(4) New Password
Any input value is not echoed back.	

[Example of this command in Syntax 3]

>HvmSh -host=xx.xx.xx.xx opr HvmPasswd -user=xxxxxx	(1) Command
password:	(2) New password
Any input value is not echoed back.	
password(again):	(3) New password
Any input value is not echoed back.	

Related function

Authentication (The user authentication function)

Required authority

The HVM security permission

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

- V8.5 or higher of HvmSh supports the options "-new" and "-cur" in Syntax 2.
- You are not allowed to set the current password at the option "-passwd_new=".
- When you issue this command in Syntax 2 or 4, anyone can obtain set passwords. You can update a password more safely with this command in Syntax 1 or 3 than with this command in Syntax 2 or 4.
- When a password with which a user has logged in an HVM has been changed, the HVM allows the user to continue to operate the HVM as a user with the old password. However, we recommend that you log in the HVM as a user with a new password again in advance of updating the new password with this command in Syntax 1 or 2 again.

opr HvmPasswdRecovery

Overview

This command updates the password for a user of an HVM without logging into the HVM. When the passwords for all users to who the HVM security permission is assigned have expired, we recommend that you execute this command to enable the users again. In this case, the user authentication is processed with a specified user name and the current password for the user name. Whereas, the expiration of the password is not checked.

Syntax

```
opr HvmPasswdRecovery
  -user=user name
  [-cur=current password new=new password]
```

Option

When you do not specify the options "cur" or "-new", you are required to interactively input some information. The interactive method is as shown below.

[Example] Note that the passwords (2), (3), and (4) are not echoed back.

```
>HvmSh -host=xx.xx.xx.xx opr HvmPasswdRecovery -user=xxxx
```

	(1) Command execution
current password:	(2) Password in use
new password:	(3) New password
new password(again):	(4) New password

Related function

Authentication (The user authentication function)

RoleBasedAccessControl (The function for controlling access to HVM by role)

Required authority

The HVM security permission

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

This command does not work for HVMs in which the user authentication is disabled.

opr HvmShLoginValidTime

Overview

This command resets an accessible time after login by an HvmSh command. When a user issues this command in Syntax 1, this command changes an accessible time after login for the user. Whereas, when an administration user issues this command in Syntax 2, this command changes an accessible time after login for another user.

Syntax

[Syntax 1]

```
opr HvmShLoginValidTime
  -LoginValidTime=accessible time after login (seconds)
```

[Syntax 2]

```
opr HvmShLoginValidTime
  -user=user name
  -LoginValidTime=accessible time after login (seconds)
```

Option

You are allowed to 0, 30 to 86400 at the option "LoginValidTime". No that 0 is the value showing an indefinite time.

Related function

Authentication (The user authentication function)

Required authority

The HVM security permission

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

None

opr HvmAuthenticationLogs

Overview

This command gets the user authentication logs in an HVM.

Syntax

get HvmAuthenticationLogs [filename=**name of file to be output**]

Option

None

Related function

Authentication (The user authentication function)

Required authority

The HVM security permission

Response message

```
Begin<tab>1.0<CRLF>
[AUTHENTICATION_LOGS]<CRLF>
<tab>field name<tab>field name<tab>.....<CRLF>
<tab>field value<tab>field value<tab>.....<CRLF>
.
.
<tab>field value<tab>field value<tab>.....<CRLF>
.
.
End<CRLF>
```

Table 2-23 AUTHENTICATION_LOGS record

Field	Contents	Type	Length
NAME	User name	string	32
From	Source IPv4 or IPv6 address <IPv4 address> Format: AAA.BBB.CCC.DDD (dot delimited/Any blanks are filled in with 0.) Example: 192.168.000.001 <IPv6 address> Example: fe80::1ce:c0ff:ee:cafe	Character	40
Interface	Source interface { HvmSh VC http Mgmt}	Character	16
Port	Source port number "" is displayed in a failure of authentication.	Numeric	5
LPAR	LPAR number - When the interface is "VC (Virtual COM)", an LPAR No., which the virtual COM is assigned to, is displayed. - When the interface isn't "VC (Virtual COM)", * is displayed.	Numeric	2
Result	Authentication result in a connection { Success Fail } Success: Success in a connection Fail: Failure in a connection	Character	16
Login	Connection start date and time (HVM system time)	Date and time (*1)	19
Logout	Connection end date and time (HVM system time) - "Logged in" is displayed in a connection. - "" is displayed in a failure of authentication.	Date and time (*1)	19
Note	Additional data { Network shutdown - * } - "Network shutdown" is displayed when a connection has been terminated, caused by shutdown of the network management module for HVM. - "-" is displayed when there is no additional information. - "*" is displayed in the other case.	Character	32
*1: The format of Date and time: YYYY/MM/DD HH:MM:SS			

Notes

- When you issue this command with multiple HvmSh programs simultaneously, this command may end with the error "Return: 0x20040010".
- When an authentication log file includes logs in IPv6 communication, HvmSh of version 8.5 or lower cannot output the IPv6 IP addresses properly. To avoid this problem, when you desire to use IPv6 communication, use HvmSh of version 8.6 or higher.

opr AuditLogConfig

Overview

This command sets the audit log settings for on an HVM.

Syntax

```
opr AuditLogConfig
[server1=Information on audit log server 1 to be accessed]
[server2=Information on audit log server 2 to be accessed]
[port=port number on audit log servers]
[protocol={ UDP|TLS1.0|TLS1.2}]
[verify={ Disable|Enable}]
[policy={ Authenticate|Auth+Modify}]
```

Option

- You are required to specify an IPv4 address, an IPv6 address, or a host name at the option "server1=" or "server2=". When you do not use the option, set no value at the options.
- You are required to set a value at the option "policy" to select target events of audit log retrieval.

Table 2-24 Target events of audit log retrieval

Policy option	Characters allowed in option
Authenticate	"Authentication(login/logout)"
Auth+Modify	"Authentication(login/logout)", "Setting changes", "Stop of LPAR boot", and "Stop of HVM start"

Note that this option works for HVM firmware version 02-55 or higher for CB500 or 2500 with V9.5 or higher of HvmSh.

Related function

AuditLog (The audit log function)

AuditLogVer2 (The enhanced audit log function (Ver. 2))

Required authority

The HVM security permission

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

None

opr LdapConfig

Overview

This command sets the information for accessing LDAP servers.

Syntax

```
opr LdapConfig
[server1=Information on LDAP server 1 to be accessed]
[server2=Information on LDAP server 2 to be accessed]
[server3=Information on LDAP server 3 to be accessed]
[port=port number on LDAP servers]
[login_id_attribute=Login ID attribution for LDAP servers]
[base_dn=Base dn]
[anonymous_bind=whether anonymous bind is enabled or disabled]
[role=role number] (0 to the supported number of user-defined roles)
```

Option

- You are required to specify an IPv4 address, an IPv6 address, or a host name at the option "server1=" or "server2=". When you do not use the option, set no value at the options.
- When you set the option "bind passwd", it may allow another person to see the password by commands indicating the statuses of processes on a server for managing HVMs.
- When you do not use the option "server1=", "server2=", "server3=", "login_id_attribute=", or "base_dn=", set no value at the option.
- When you desire to assign a role to a user, set one of 0 to the supported number of user-defined roles for the user at the option "role=". Note that 0 is the role number with all permissions in an HVM.

Related function

Authentication (The user authentication function)

LDAPAuthentication (The LDAP authentication function)

RoleBasedAccessControl (The function for controlling access to HVM by role)

Required authority

The HVM security permission

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

- This command does not change any settings of LDAP servers.
- When you specify codes with a command line option, enclose a character string with double quotations "". When you desire to set double quotation in a character string, put a backslash before the double quotation. Whereas, in interactive operation, specify codes with the codes not enclosed with double quotations "".

Ex.) When you specify characters **abcdef\""ghi** for base_dn, set base_dn="abcdef\""ghi" as the option.

Table 2-25 Characters supported in options

Option	Characters allowed in option
LDAP server	1 to 63 of characters for a dot-separated label
Host name	Characters allowed in labels: a to z, A to Z, 0 to 9, and - (hyphen). Note that hyphen is not allowed at the beginning and the end of each label.
	Up to 255 of characters in total excluding "Null" at the end
Login id attribute	Characters allowed in labels: a to z and A to Z at the beginning, and a to z, A to Z, and 0 to 9 at the second or later
	0 to 64 of characters in total excluding "Null" at the end
base dn	Can specify ASCII codes for display
bind dn	A blank is not allowed at the beginning and the end.
	0 to 254 of characters in total excluding "Null" at the end
bind passwd	Can specify ASCII codes for display
	A blank is not allowed at the beginning and the end.
	0 to 64 of characters in total excluding "Null" at the end

opr ExternalAuthentication

Overview

This command sets "METHOD" and "LOGIN_VALID_TIME" of the information required for an HVM to access external servers, such as LDAP servers and RADIUS servers.

Syntax

```
opr ExternalAuthentication
[method={LOCAL|LOCAL+LDAP|LOCAL+RADIUS}]
[-LoginValidTime =Login available period for HvmSh commands]
```

Option

- "method=LOCAL" : The user authentication is performed.
- "method=LOCAL+LDAP" : When the user authentication fails, LDAP authentication is performed.
- "method=LOCAL+RADIUS" : When the user authentication fails, RADIUS authentication is performed.

Related function

Authentication (The user authentication function)

LDAPAuthentication (The LDAP authentication function)

RADIUSAuthentication (The RADIUS authentication function)

Required authority

The HVM security permission

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

This command does not change any settings of LDAP servers.

opr LdapPasswd

Overview

This command sets "bind_dn" and "bind_passwd" of the information for accessing LDAP servers.

Syntax

[Syntax 1]

```
opr LdapPasswd [bind_dn=bind dn]
```

[Syntax 2]

```
opr LdapPasswd bind_passwd=bind password
```

Option

You are required to input a bind dn and a password interactively when you issue this command in Syntax 1.

[Example of this command in Syntax 1]

```
>HvmSh -host=xx.xx.xx.xx opr LdapPasswd (1) Command
```

```
bind dn: xxxxxx (2) Bind dn (When no value is set)
```

```
bind passwd: (3) Bind Password
```

Any input value is not echoed back.

Related function

Authentication (The user authentication function)

LDAPAuthentication (The LDAP authentication function)

Required authority

The HVM security permission

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

- This command does not change any settings of LDAP servers.
- When you set the "bind passwd" option, it may allow another person to see the password by commands indicating the statuses of processes on a server for managing HVMs.
- When you specify codes with a command line option, enclose a character string with double quotations "". When you desire to set double quotation in a character string, put a backslash before the double quotation. Whereas, in interactive operation, specify codes with the codes not enclosed with double quotations "".

Ex.) When you specify characters **abcdef\""ghi** for base_dn, set base_dn="abcdef\""ghi" as the option.

Table 2-26 Characters supported in options

Option	Characters allowed in option
base dn bind dn	Can specify ASCII codes for display
	A blank is not allowed at the beginning and the end.
	0 to 254 of characters in total excluding "Null" at the end
bind passwd	Can specify ASCII codes for display
	A blank is not allowed at the beginning and the end.
	0 to 64 of characters in total excluding "Null" at the end

opr RadiusConfig

Overview

This command sets information required for an HVM to access RADIUS server 1, 2, and 3.

Syntax

[Syntax 1]

opr RadiusConfig { **secret1**|**secret2**|**secret3**}

[Syntax 2]

```
opr RadiusConfig
[server1=RADIUS server 1 access information]
[server2=RADIUS server 2 access information]
[server3=RADIUS server 3 access information]
[secret1=RADIUS server 1 shared secret key]
[secret2=RADIUS server 2 shared secret key]
[secret3=RADIUS server 3 shared secret key]
[port1=RADIUS server 1 port number]           (1 to 65535)
[port2=RADIUS server 2 port number]           (1 to 65535)
[port3=RADIUS server 3 port number]           (1 to 65535)
[retry1=RADIUS server 1 No. of retries]        (0 to 3)
[retry2=RADIUS server 2 No. of retries]        (0 to 3)
[retry3=RADIUS server 3 No. of retries]        (0 to 3)
[timeout1=RADIUS server 1 timeout period]      (1 to 10 seconds)
[timeout2=RADIUS server 2 timeout period]      (1 to 10 seconds)
[timeout3=RADIUS server 3 timeout period]      (1 to 10 seconds)
[method1=RADIUS server 1 Protocol]             ({PAP | CHAP | MS-CHAPv2})
[method2=RADIUS server 2 Protocol]             ({PAP| CHAP | MS-CHAPv2})
[method3=RADIUS server 3 Protocol]             ({PAP| CHAP | MS-CHAPv2})
[role=role number] (0 to the supported number of user-defined roles) *: Common setting for
RADIUS server 1, 2, and 3
```

Option

- You are required to set a shared secret key interactively when you issue this command in Syntax 1. The following shows an example for setting a secret shared key of a radius server.

[Example of this command in Syntax 1]

```
>HvmSh -host=xx.xx.xx.xx opr RadiusConfig secret1    (1) Command  
secret:                                              (2) Shared secret key
```

Any input value is not echoed back.

- You are allowed to set a role number that is applied to all users authenticated by RADIUS at the option "role". 0 is the role number with all permissions in an HVM. A role is valid for RADIUS server 1, 2, and 3.
- In Syntax 2 and 3, you are allowed to consecutively set the same parameters for RADIUS server 1, 2, and 3 in a row.

[Example]

```
"port3=333 port1=111 port2=222"
```

In this case, the port number "111" is applied to RADIUS server 1, the port number "222" is applied to RADIUS server 2, and the port number "333" is applied to RADIUS server 3.

Related function

RADIUSAuthentication (The RADIUS authentication function)

RoleBasedAccessControl (The function for controlling access to HVM by role)

Required authority

The HVM security permission

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

- When you set shared secret keys in Syntax 1, it is feared that someone obtain the passwords with functions for confirmation of the process states in management servers to which are connected to this HVM. In this point, you can configure the settings in Syntax 2 more safely.
- When you do not set any options in Syntax 2, this command ends with an error.
- Supported characters for options.

Table 2-27 Supported characters for options

Option	Supported characters and limit on No. of characters
host name for server 1 to 3	The same supported characters as those for the command "opr LdapConfig"
secret 1 to 3	<ul style="list-style-type: none">- Alphabetical and numerical characters, and printable articles (ASCII codes 0x21 to 0x7e)- Up to 64 characters or articles

opr RadiusConnectivityVerify

Overview

This command verifies connectivity with RADIUS servers. The outcome is displayed in the status code of the command "getResult".

Syntax

```
opr RadiusConnectivityVerify
{server1|server2|server3}
[-user=user name -passwd=password]
```

Option

- You are required to set RADIUS servers with which you desire to verify the connectivity at server1, server2, or server3
- When you do not set the option "-user" or "-passwd", you are required to interactively set them. The interactive method for setting the options "-user" and "-passwd" is as shown below.

[Example]

```
>HvmSh -host=xx.xx.xx.xx opr RadiusConnectivityVerify server1
```

(1) Command execution

user name: xxxxxx

(2) User name

password:

(3) Password

Any input value is not echoed back.

Related function

RADIUSAuthentication (The RADIUS authentication function)

Required authority

The HVM security permission

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

None

opr RoleConfig

Overview

This command resets the value of the HVM security permission for a user-defined role.

Syntax

```
opr RoleConfig role=Role value RBAC_Security={ ON|OFF}
```

Option

- You are required to set a user-defined role value between 1 to the supported number of user-defined roles at the option "role".
- You are required to set "ON" as a value of "enabled" of the HVM security permission or "OFF" as a value of "disabled" of the HVM security permission, at the option "RBAC_Security".

Related function

RoleBasedAccessControl (The function for controlling access to HVM by role)

Required authority

The HVM security permission

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

- When a user desires to change the permissions for the user, the changes are applied in the next login operation. When you desire to immediately apply changes to a user after changing, log out from an HVM and then log in to the HVM.
- When you set only the option "role" without setting the other options, it ends with the error "Return: 0x11000000".

opr HvmUserConfig

Overview

This command resets the role for a user.

Syntax

```
opr HvmUserConfig -user=user name role=role number
```

Option

- You are required to set a user name for which to change the role at the option "-user".
- You are required to set a role value between 0 to the supported number of user-defined roles. 0 is the role number with all permissions in an HVM.

Related function

RoleBasedAccessControl (The function for controlling access to HVM by role)

Required authority

The HVM security permission

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

None

opr ManagementModuleUserRole

Overview

This command resets the role for the Management Module User that has not logged into the target HVM.

Syntax

```
opr ManagementModuleUserRole role=role number
```

Option

You are required to set a role value between 0 to the supported number of user-defined roles. 0 is the role number with all permissions in an HVM.

Related function

RoleBasedAccessControl (The function for controlling access to HVM by role)

Required authority

The HVM security permission

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

None

HVM dump/log files

get LPARLcd

Overview

This command gets the LCD information of an LPAR.

Syntax

get LPARLcd [lpar=**LPAR No.**]

Option

This command gets the LCD information of all LPARs when you do not specify any LPARs.

Related function

None

Required authority

None

Response message

[With an LPAR No.]
L#=1
NAME=LPAR1111
STATUS=ACT
LCD=S0001 Active

[With no LPAR No.]
[LPAR_LCD_INFORMATION]<CRLF>
<tab>Field name<tab>Field name<tab>...<CRLF>
<tab>Field value<tab>Field value<tab>...<CRLF>

Table 2-28 LCD information record

Field	Contents	Type	Length
L#	LPAR No.	Numeric	2
NAME	LPAR name	Character	31
LCD	LPAR status Example: "S0001 Active " "B0002 System Power-off"	Character	32

Notes

- When you specify an undefined LPAR at the option "lpar=", this command ends with the error "Return: 0x1100 0000".

opr LPARFrontPanelDump

Overview

This command gets the guest OS dump of a specified LPAR.

Syntax

opr LPARFrontPanelDump lpar=**LPAR No.**

Option

None

Related function

None

Required authority

None

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

- The end code "Return: 0x00310000" of the "getResult" command indicates that the command has been delivered properly and does not indicate that collecting guest OS dump has been completed.

get LPARConsoleLog

Overview

This command gets the log data of a console for a specified LPAR.

Syntax

```
opr LPARConsoleLog lpar=LPAR No. [finename=filename]
```

Option

None

Related function

None

Required authority

None

Response message

The log data is output, converted from Unicode UCS-2 to Unicode UTF8. However, when you set a value at the option "filename", the log data is output in a specified file.

Notes

None

opr LPARConsoleLogErase

Overview

This command erases the log data of a console for a specified LPAR.

Syntax

opr LPARConsoleLogErase lpar=**LPAR No.**

Option

None

Related function

None

Required authority

None

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

None

opr StartGuestDump

Overview

This command gets the guest memory dump of a specified LPAR and transfers the guest memory dump to an external FTP server.

Syntax

opr StartGuestDump

Option

You are required to input some parameters interactively.

Line 1	> <input type="text" value="HvmSh-host=xxx.xxx.xxx.xxxoprStartGuestDump"/>
2	LPARNumber: <input type="text" value="xx"/>
3	FTPIPAddress: <input type="text" value="xxx.xxx.xxx.xxx"/>
4	FTPUserID: <input type="text" value="xxxxxxxx"/>
5	FTPPassword: <input type="password" value="*****"/>
6	FTPDDirectoryPath: <input type="text" value="xxx/xxx/"/>
7	LPARNumber: xx
8	FTPIPAddress: xxx.xxx.xxx.xxx
9	FTPUserID: xxxxxxxx
10	FTPPassword:
11	FTPDDirectoryPath: xxx/xxx/
12	Confirm?(Y/[N]): <input checked="" type="checkbox"/>

Line 1:

This is an example of this command. For the "-host" parameter, set the IP address of the HVM that a target LPAR is running. For example, -host=192.168.0.22.

Line 2:

Input the LPAR number of a target LPAR.

Line 3:

Input the IP address of an external FTP server. Example) 10.206.12.164.

Line 4:

Input your user ID for the external FTP server with up to 16 characters.

Line 5:

Input your password for the external FTP server. "*" is output instead of the input password with up to 16 characters.

Line 6:

Input the directory path of the external FTP server with up to 49 characters.

Lines 7 to 11:

The data input in Line 2 to 6 is output except the password entered in Line 5.

Line 12:

Check that the entered information is correct. Input "Y" to proceed to the guest memory dump operation. Input "N" to cancel the guest memory dump operation.

Related function

None

Required authority

None

Response message

None

Notes

You are allowed to confirm the progress of collecting a guest memory dump with the "[get GuestDumpProgress](#)" command after completion of this command.

opr CancelGuestDump

Overview

This command cancels collecting a guest memory dump in an LPAR with a specified LPAR number.

Syntax

opr CancelGuestDump lpar=**LPAR No.**

Option

None

Related function

None

Required authority

None

Response message

None

Notes

- You are allowed to confirm the progress of collecting a guest memory dump with the "[get GuestDumpProgress](#)" command after completion of this command.

get GuestDumpProgress

Overview

This command gets the progress of collecting a guest memory dump.

Syntax

```
get GuestDumpProgress
```

Option

None

Related function

None

Required authority

None

Response message

(Syntax)

condition=**state (LPAR No.)**
status=**status (message)**
totalsize=**total size**
finishedsize=**amount transferred (% transferred)**

(Example)

condition= Executing (lpar2)
status = 0x00000001 (Not Completed.)
total size = 991(MB)
finished size = 368(MB) (37%)

Table 2-29 state (LPAR No.)

state (LPAR No.)	Description
No executing (no LPAR No.)	No guest memory dump operation is being performed on any LPAR.
Executing (LparNN)	A guest memory dump operation is in progress on the LPAR with an LPAR number indicated in parentheses.
Completed (LparNN)	A guest memory dump operation has been completed on the LPAR with an LPAR number indicated in parentheses.
Cancelled (LparNN)	A guest memory dump operation has been cancelled on the LPAR with an LPAR number indicated in parentheses.
Failed (LparNN)	A guest memory dump operation has failed on the LPAR with an LPAR number indicated in parentheses.

Table 2-30 Status codes and messages

Code	Message	Description	Recommended action
0x00000000	Normal Completed. Guest dump transferred successfully.	Guest memory dump operation completed successfully.	This is normal so nothing special needs to be done.
0x00000001	Not Completed.	Guest memory dump operation has not completed.	Wait until the guest memory dump operation is complete.
0x00000002	Guest dump was cancelled.	Guest memory dump operation was cancelled by a user.	This is normal so nothing special needs to be done.
0x00000004	Inhibit Guest dump request. (HVM Assist not ready)	Guest memory dump request was rejected.	Wait for a while and retry higher.
0x00000005	Inhibit Guest dump request. (Inhibit ICV request)	Guest memory dump request was rejected.	Wait for a while and retry higher.
0x00000100	Guest dump failed. HVM internal timeout occurred. (ICV completion timeout)	Error end. An HVM internal error occurred.	Contact maintenance personnel.
0x00000102	Guest dump failed. HVM internal error occurred. (HVM Assist panic occurred.)	Error end. An HVM internal error occurred.	Contact maintenance personnel.
0x00000103	Guest dump failed. HVM internal error occurred. (HVM Assist hang occurred.)	Error end. An HVM internal error occurred.	Contact maintenance personnel.
0x00000110	Guest dump failed. HVM internal error occurred. (Guest dump initiation failed.)	Error end. An HVM internal error occurred.	Contact maintenance personnel.
0x00000111	Guest dump failed. HVM internal error occurred. (Guest dump hang occurred.)	Error end. An HVM internal error occurred.	Contact maintenance personnel.
0x00000120	Guest dump failed. HVM Assist changed to not ready status.	Error end. HVM Assist is not ready.	Wait for a while and retry higher.
0x00000121	Guest dump failed. Target LPAR was deactivated.	Error end. The target LPAR was deactivated. Data on the guest memory no longer exists.	Do not deactivate the target LPAR during guest memory dump operation.
0x00000122	Guest dump failed. The stop of all logical CPU of the target LPAR failed.	Error end. An HVM internal error occurred.	Contact maintenance personnel.
0x00000123	Guest dump failed. Guest register dump generation failed.	Error end. An HVM internal error occurred.	Contact maintenance personnel.
0x00000200	FTP connection failed. Confirm specified FTP IP Address.	Error end. An attempt to connect to the external FTP server failed.	Check that the specified IP address of the FTP server is correct.
0x00000201	FTP Login failed. Confirm specified FTP UserID and Password.	Error end. An attempt to log in to the external FTP server failed.	Check that the specified user ID and password for the FTP server are correct.
0x00000202	FTP Directory Path is not found. Confirm specified FTP Directory Path.	Error end. The specified directory path was not found on the external FTP server.	Check that the specified directory path on the FTP server is correct.

Code	Message	Description	Recommended action
0x00000202	FTP Directory Path is not found. Confirm specified FTP Directory Path.	Error end. The specified directory path was not found on the external FTP server.	Check that the specified directory path on the FTP server is correct.
0x00000300	Guest dump failed. HVM internal error occurred. (Guest dump internal error)	Error end. An HVM internal error occurred.	Contact maintenance personnel.
0x00001000	Guest dump failed. FTP network timeout occurred.	Error end. A timeout error occurred during an attempt to communicate with the external FTP server.	Check the network configuration between the HVM and the external FTP server. If the problem persists, make sure the FTP software is running normally on the external FTP server. If the problem still persists, contact maintenance personnel.
0x00001nnn	Guest dump failed. FTP error occurred. (nnn: FTP reply code)	Error end. An error occurred during an attempt to transfer data to the external FTP server, where nnn is an FTP reply code defined by the FTP specification (RFC 959).	Check the network configuration between the HVM and the external FTP server. If the problem persists, make sure the FTP software is running normally on the external FTP server. If the problem still persists, contact maintenance personnel.
0x0000FFFF	No executing condition of any Guest dump.	No guest memory dump operation is being performed on any LPAR.	This is normal so nothing special needs to be done.
Others	This status is unknown.	The status could not be determined.	Contact maintenance personnel.
Others	This status is unknown.	The status could not be determined.	Contact maintenance personnel.

Notes

None

opr TakeHvmDump

Overview

This command gets the HVM dump, transfers the HVM dump to an external FTP server, and save the HVM dump in the external FTP server.

Syntax

opr TakeHvmDump

Option

You are required to input some parameters interactively.

Line 1	>HvmSh-host=xxx.xxx.xxx.xxxoprTakeHvmDump
2	FTPIPAddress:xxx.xxx.xxx.xxx
3	FTPUserID:xxxxxxxx
4	FTPPassword:*****
5	FTPDirectoryPath:xxx/xxx/
6	FTPIPAddress:xxx.xxx.xxx.xxx
7	FTPUserID:xxxxxxxx
8	FTPPassword:
9	FTPDirectoryPath:xxx/xxx/
10	Confirm?(Y/[N]): Y

Line 1:

This is an example of this command. For the "-host" parameter, set the IP address of the HVM that a target LPAR is running. For example, -host=192.168.0.22.

Line 2:

Input the IP address of an external FTP server. Example) 10.206.12.164.

Line 3:

Input your user ID for the external FTP server with up to 16 characters.

Line 4:

Input your password for the external FTP server. "*" is output instead of the input password with up to 16 characters.

Line 5:

Input the directory path of the external FTP server with up to 49 characters.

Lines 6:

The data input in Line 2 to 5 is output except the password entered in Line 5.

Line 7:

Check that the entered information is correct. Input "Y" to proceed to the

guest memory dump operation. Input "N" to cancel the HVM memory dump operation.

Related function

None

Required authority

None

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

None

opr HvmDumpToSvp

Overview

This command gets the HVM dump, transfers the HVM dump to the management module, and save the HVM dump in the management module.

Syntax

opr HvmDumpToSvp

Option

None

Related function

None

Required authority

None

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

None

opr HvmDumpToSystem

Overview

This command gets the HVM dump. Its action is different from the `opr HvmDumpToSvp` command.

The "opr HvmDumpToSystem" command does not transfer the dump data to the management module, but leaves it only in the HVM system domain. This command allows you to use the dump function of HVM without overwriting important dump data (e.g., dumps automatically collected by HVM and then transferred to the management module), and therefore can be used to check the action of HVM in performance analysis. To retrieve the dump data, execute the `get HvmDumpData` command.

Syntax

`opr HvmDumpToSystem`

Option

None

Related function

`GetHvmDumpData` (The function for collecting the HVM dump data in the memory modules)

Required authority

None

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

- When an HVM does not support this command, this command ends with the error "Return: 0x01010001" or "Return: 0x11000000".
- The operation of this command is not logged in the HVM system log.
- An HVM dump collected with this command is titled "CLI HvmDumpToSys".

get HvmDumpData

Overview

This command gets the dump data in the HVM dump memory area and then overwrites the content of a file specified at the option "filename" with the dump data, which is a binary data.

Syntax

get HvmDumpData filename=**Filename**

Option

None

Related function

GetHvmDumpData (The function for collecting the HVM dump data in the memory modules)

Required authority

None

Response message

(Syntax)

dumpno=0

dumpsizesize of HVM dump data 0

offset= 0

size=size of data 0 written in file

dumpno=1

dumpsizesize of HVM dump data 1

offset= 0

size=size of data 1 written in file

Notes

- This command collects the dump data in both of Bank 1 and 2 by issuing a command to collect a dump data of 14336B (14kB). We recommend that you set a timeout period enough to execute commands { (Dump data size / 14k) * 2 } times. When an error occurs in process of this command, this command ends with an error. At that time, some of the dump data has written in a specified file.
- This command in Syntax 2 creates the following two files with the file name including "_01" or "_02".
 - When file name includes ".", add "_01" or "_02" before ".".
(Example)
filename=HvmDump.bin -> HvmDump_01.bin , HvmDump_02.bin
 - When file name does not include ".", add "_01" or "_02" at the end of file name.
(Example)
filename=HvmDump -> HvmDump_01, HvmDump_02
- When this command detects that the HVM dump data has been overwritten with a new data while this command collects the HVM dump data from "offset=0 ", collecting the HVM dump is completed though this command ends with the error "Return: 0x08191002".

get HvmDumpToSystemCompress

Overview

This command gets the HVM dump. After that, this command compresses the HVM dump in advance of saving the HVM dump in the HVM system. This is not included in the functionality of the "opr HvmDumpToSystem" command.

Syntax

get HvmAlertList

Option

None

Related function

HvmDumpCompress (The function for collecting and compressing the HVM dump)

Required authority

None

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

- When an HVM does not support this command, this command ends with the error "Return: 0x01010001".
- The operation of this command is not logged in the HVM system log.
- An HVM dump collected with this command is titled "CLI HvmDumpToSys".

get HvmDumpDataCompress

Overview

This command gets the HVM dump in the HVM dump area and overwrites the dump data in a file specified at the option "filename". Use this command together with the option "HvmDumpToSystemCompress". For the detail, see [Example of batch processing for getting HVM dump](#) and Collecting HVM dump (to save in HVM).

Syntax

get HvmDumpDataCompress filename=**Filename**

Option

None

Related function

HvmDumpCompress (The function for collecting and compressing the HVM dump)

Required authority

None

Response message

dumpsize=Size of HVM dump data
offset= off set of HVM dump data
size=size of data written in file

Notes

- This command collects the dump data in both of Bank 1 and 2 by issuing a command to collect a dump data of 14336B (14kB). We recommend that you set a timeout period enough to execute commands { (Dump data size / 14k) * 2 } times. When an error occurs in process of this command, this command ends with an error. At that time, some of the dump data has written in a specified file.
- This command in Syntax 2 creates the following two files with the file name including "_01" or "_02".
 - When file name includes ".", add "_01" or "_02" before ".".
(Example)
filename=HvmDump.bin -> HvmDump_01.bin , HvmDump_02.bin
 - When file name does not include ".", add "_01" or "_02" at the end of file name.
(Example)
filename=HvmDump -> HvmDump_01, HvmDump_02
- When this command detects that the HVM dump data has been overwritten with a new data while this command collects the HVM dump data from "offset=0", collecting the HVM dump is completed though this command ends with the error "Return: 0x08191002".

get HvmSystemLogs

Overview

This command gets the latest HVM system log, which the HVM holds in the memory.

Syntax

```
get HvmSystemLogs type=sys [notag]
```

Option

None

Related function

None

Required authority

None

Response message

[With the option "notag"]

```
<SysLog>
<Number>
0
</Number>
<Time>
2015/12/24 22:13:52
</Time>
<Level>
Info
</Level>
<Title>
HVM detected available Shared FC Link.
</Title>
<Contents>
Shared FC Link is Available. (Slot= 10A, Port= 0)
</Contents>
</SysLog>
```

[Without the option "notag"]

```
<SysLog>
No. Date      Time      Level   Event
0  2015/12/24 22:13:52 Info    HVM detected available Shared FC Link.
Shared FC Link is Available. (Slot= 10A, Port= 0)
```

The records are output in the order in which the HVM has logged.

Notes

None

get HvmControlSetting

Overview

This command gets information about control settings for the HVM dump overwrite suppression function. This function rejects HVM dump requests until the elapsed time from the last accepted exceeds the threshold.

Syntax

get HvmControlSetting

Option

None

Related function

None

Required authority

None

Response message

(Syntax)

[Hvm Control Setting] <CRLF>

HVM_CONTROL<tab>INDEX#/TIME<tab>SETTING<tab>THRESHOLD<tab>ACTION<CRLF>

DumpOwInh<tab>* <tab>{ Disable|Enable} <tab> threshold (minutes)<tab>*

Notes

If the HVM does not support the HVM dump overwrite suppression function, the error code "0x11000000" is returned.

set HvmControlSetting

Overview

This command sets the control settings for the HVM dump overwrite suppression function. This function rejects HVM dump requests until the elapsed time from the last accepted exceeds the threshold.

Syntax

```
set HvmControlSetting DumpOwInh={ Disable|Enable|Keep} [threshold  
(minutes)]
```

Option

- **DumpOwInh** : Sets the "Enable" or "Disable" option for the HVM dump overwrite suppression function. The default is "Disable".
- **threshold** : A value between 1 to 1440 can be specified. The default is 60.

Related function

None

Required authority

None

Response message

None

Notes

- Restarting the HVM restores the default values. Therefore, after the restart, set the option values again.
- If the HVM does not support the HVM dump overwrite suppression function, the error code "0x11000000" is returned.
- The HVM dump overwrite suppression applies only to the dumps the HVM automatically collects. The dumps manually collected by the request from HVM screen, Web Console, HCSM, Virtage Navigator, or HvmSh are not subject to the overwrite suppression.
- If you specify "Keep", you can change the threshold value while keeping the Enable or Disable setting.
- You can see the records of the HVM dump requests discarded by the HVM dump overwrite suppression function on the System Logs screen.

Example of the SystemLogs screen)

Warn. 2017/10/11 05:46:41 HVM dump generation inhibited.

Error 2017/10/11 05:46:41 LPAR damage occurred.

Info. 2017/10/11 05:45:47 HVM dump transfer succeeded.

Info. 2017/10/11 05:45:38 HVM dump generation succeeded.

Error 2017/10/11 05:45:38 LPAR damage occurred.

opr HvmSys2Dump

Overview

This command enables or disables the SYS2 Dump. The SYS2 Dump is the function to collect more detailed dumps for SYS2 failures.

Syntax

```
opr HvmSys2Dump sys2dump={Disable|Enable}
```

Option

None

Related function

Sys2Dump (SYS2 Dump function)

Required authority

None

Response message

An operation number that an HVM has received is output in the decimal system.

accept=operation No.

Notes

- The SYS2 Dump is disabled by default. Enable the SYS2 Dump only when instructed by your maintenance personnel.

get HvmSys2Dump

Overview

This command gets the setting(Enable or Disable) of SYS2 Dump and the HVM internal status regarding the SYS2 Dump.

Syntax

get HvmSys2Dump

Option

None

Related function

Sys2Dump (SYS2 Dump function)

Required authority

None

Response message

(Syntax)

setting= {Enable Disable}	
status= Character string that indicates the status	(※1)
time= {YYYYMMDD hhmmss * }	(※2)
size= {nn (MB) * }	(※3)

(※1)The character strings that indicate the status are as follows:

- Service started
- Service stopped
- Service failed to start
- Service failed to stop

(※2)Indicates the dump collection time when there is dump data.

(※3)Indicates the size of dump data when there is dump data.

Notes

None

get HvmSys2DumpData

Overview

This command gets the SYS2 dump data and writes the dump data to a file specified by the option "filename". The dump data is binary data.

Syntax

```
get HvmSys2DumpData filename=Filename
```

Option

None

Related function

Sys2Dump (SYS2 Dump function)

Required authority

None

Response message

The display is updated in real time in the following format.

(Syntax)

2017/12/05 14:23:35 13.8/27.6 (MB) (50.0 %)

Notes

- For HVM that does not supports SYS2 dump data, the command ends with the error code shown below.
 - BS500/BS2500 HVM Ver 02-63 or higher: "Return: 0x21000003"
 - BS500/BS2500 HVM Ver 02-62 or lower: "Return: 0x01000000"
- If there is no SYS2 dump data, the command ends with the error "Return: 0x21000003".
- Specify a time-out period long enough to execute the HvmSh command (-timeout=100, approximately).

Getting all data of HVM configuration

get ConfigAll

Overview

This command gets all the HVM configuration.

Syntax

get ConfigAll

Option

None

Related function

None

Required authority

None

Response message

(Syntax)

Begin<tab>1.0<CRLF>

[RECORD_NAME]<CRLF>

<tab>FIELD_NAME<tab>FIELD_NAME<tab>...<CRLF>

<tab>FIELD_VALUE<tab>FIELD_VALUE<tab>...<CRLF>

:

End<CRLF>

Notes

- "*" is output in the fields for functions that the HVM does not support.

Table 2-31 Summary of HVM configuration information records

Record name	Content	Number of records
HVM_INFORMATION	Information on HVM information obtaining.	1
CHASSIE_CONFIGURATION	Chassis configuration information.	1
BLADE_CONFIGURATION	Server blade configuration information.	1
HVM_CONFIGURATION	HVM configuration information.	1
GROUP CONFIGURATION (*2)	Processor group configuration information.	No. of defined processor group
LPAR_CONFIGURATION	LPAR configuration information.	Max. No. of definable LPARs
BSM_CONFIGURATION	SC/BSM configuration information.	4
FW_VERSION_INFORMATION	HVM firmware version	1
PHYSICAL_CPU_CONFIGURATION	Configuration information of physical CPU	No. of physical CPU threads
VNIC_SEGMENT_INFORMATION	Segment condition of virtual NIC.	No. of VNIC segment
PHYSICAL_IO_CONFIGURATION	Configuration information of physical IO devices.	No. of PCI ports
PHYSICAL_IO_ASSIGN_INFORMATION	Assignment information of physical IO devices.	No. of defined LPARs x No. of PCI
VFC_ASSIGN_INFORMATION	Assignment information of VFC.	Total of Max. No. of Vfcld per physical FC adapter port
VNIC_ASSIGN_INFORMATION	Assignment information of VNIC.	No. of defined LPARs x No. of defined VNIC
LOGICAL_CPU_CONFIGURATION	Configuration information of logical CPU	No. of defined LPARs x No. of physical CPUs
MEMORY_ASSIGN_INFORMATION (*3)	Assignment information of memory.	Max. No. of assigned memory block
VCOM_ASSIGN_INFORMATION (*3)	Assignment information of VCOM.	Max. No. of VCOM
MAX_VALUE_INFORMATION (*3)	Max. value information of HVM.	Max. No. of information
HVM_FACILITY_INFORMATION (*3)	Facility information of HVM.	Max. No. of information
LPAR_INITIAL_INFORMATION (*3)	The configuration information initial value of LPAR is displayed	1
LOGICAL_CPUID_INFORMATION (*3)	Logical CPUID information of LPAR is output.	Max. No. of definable LPARs
AVAILABLE_LIST (*3)	Available configuration list	2
LPAR_NUMA_MEMORY_ASSIGN_INFORMATION (*3)	Assignment information of memory of LPAR whose guest NUMA is available.	No. of LPARs whose guest NUMA is available x No. of memory nodes
LPAR_NUMA_CPU_ASSIGN_INFORMATION (*8)	Information regarding the logical processors assigned to LPARs for which the logical processor topology setting mode for a guest NUMA is enabled.	No. of LPARs for which the logical processor topology setting mode for a guest NUMA is enabled x No. of processor nodes
SEC_MODE (*3)	Mode for encryption communication	1
CERTIFICATE (*3)	Certificates information for encryption communication	Max. 11
SSH_HOST_KEY (*3)	Host key information for SSH communication of virtual COM	1
AUDIT_LOG_CONFIGURATION (*8)	Information on audit logs	1
LDAP_CONFIGURATION (*9)	Information on LDAP authentication	1
RADIUS_CONFIGURATION (*10)	Information on RADIUS authentication	3
ROLE_CONFIGURATION (*11)	Information on the user-defined roles	The supported number of user-defined roles
CURRENT_PERMISSION (*11)	Permissions of the current login user	1
MANAGEMENT_PATH (*4)	Management path information	1

Record name	Content	Number of records
IPV6_CONFIGURATION (*5)	Outputs information regarding the HVM IPv6.	5
NETWORK_PORT_INFORMATION (*6)	Outputs information regarding the HVM network port.	5
DNS_CONFIGURATION (*7)	Outputs information regarding DNS servers	3
CACHE_ASSIGN_INFORMATION	Outputs information regarding cache allocation	The maximum number of sockets x the maximum number of COSs
MIGRATED_VNIC_INFORMATION (*12)	Outputs VNIC MAC address seed information exchanged for LPAR migration.	The maximum number of exchanged MAC address seed.
MIGRATED_VFC_INFORMATION (*12)	Outputs VFC WWPN information exchanged for LPAR migration.	The maximum number of exchanged WWPN.
LPAR_ACPI_SETTING (*13)	Outputs information regarding the setting of the virtual PCI bridge definition of guest ACPI.	Max. No. of definable LPARs

*1,*2,*3: You cannot get the target record of the HVM which does not support the interfaces to get the record.

*4: If the ManagePathChangeVer2 function in Table 2-15 List of Function names is "Off", this record does not exist.

*5: This record is not displayed if HVM does not support IPv6.

*6: This record is not displayed if HVM does not support network port change.

*7: This record is not displayed if HVM does not support the DNS client function.

*8: This record is not displayed if HVM does not support the audit log function.

*9: This record is not displayed if HVM does not support the LDAP authentication function.

*10: This record is not displayed if HVM does not support the RADIUS authentication function.

*11: This record is not displayed if HVM does not support the RBACfunction.

*12: This record is not displayed if HVM FW version is 02-62 or lower.

*13: This record is not displayed if HVM FW version is 02-66 or lower.

Note that, when a user without the HVM security permission executes this command, (1) to (7) of the following records on security information are not output.

(1) SEC_MODE	(2) CERTIFICATE
(3) SSH_HOST_KEY	(4) AUDIT_LOG_CONFIGURATION
(5) LDAP_CONFIGURATION	(6) RADIUS_CONFIGURATION
(7) ROLE_CONFIGURATION	

Table 2-32 HVM_INFORMATION record

Field	Content	Data type	Max. digits
HVM_ID	HVM identifier. *: Refer to "Notes for HVM ID" - "Notes for situation-dependent message".	Character	16
HVM_IP	HVM IP address. Format: AAA.BBB.CCC.DDD (Dot delimited. Fill up unspecified values with zero) e.g. 192.168.000.001	Character	15
HVM_SN	HVM serial number.	Character	8
PRODUCT	Product name e.g. "HVM 57-30(00-00)".	Character	64
CURR_DATE_TIME	Date and time when HVM configuration information is created by ConfigAll. Equivalent of HVM system time.	Date and time (*)	29
*: YYYY/MM/DDHH:MM:SSGMT+hh:mm			

Table 2-33 CHASSIS_CONFIGURATION record

Field	Content	Data type	Max. digits
CHA_SN	Chassis serial number.	Character	20
ID	Available chassis ID for SVP. Note: Chassis ID is default value at the time of HVM activation. The value in this field does not change even if the chassis ID has changed after HVM activation.	Character	20
TYPE	Chassis type (CB2000/ CB320/ CB500/ CB2500)	Character	10
SVP_IP	SVP IP address Format: AAA.BBB.CCC.DDD (Dot delimited. Fill up unspecified values with zero) e.g. 192.168.000.001	Character	15
MAX_BLADE_CNT	Max. No. of mountable blade for the chassis	Numeric	2
SVP_IPv6	{SVPIIPv6 static address *} e.g. fe80::1ce:c0ff:ee:cafe *: "*" appears if the HVM does not support IPv6.	Character	40

Table 2-34 BLADE_CONFIGURATION record

Field	Content	Data type	Max. digits
BLADE_SN	Server blade serial number.	Character	20
CHA_SN	Chassis serial number.	Character	20
TYPE	Server blade type (CB2000-DP/ CB2000-MP/CB320/ CB500-EP/ CB500-EN/ CB500-EP4S/ CB520X /CB2500-EX/ CB2500-EP)	Character	10
LOCATION	Location of server blade	Numeric	2
NUMA	NUMA or Non-NUMA (ON/OFF/*) "*" is displayed when NUMA is not supported on HVM.	Character	3

PRODUCT_NAME	Product name of blade example: 520XA1 "" is displayed when GET IF is not supported on HVM.	Character	32
PCID	Displays whether the PCID function is supported by the server blade. {ON OFF}	Character	3
IBRS_IBPB	Displays whether the IBRS/IBPB function is supported by the server blade. {ON OFF}	Character	3
SSBD	Displays whether the SSBD function is supported by the server blade. {ON OFF}	Character	3
MDClear	Displays whether the MDClear function is supported by the server blade. {ON OFF}	Character	3
Note that the information of the primary server blade is output for an SMP configuration.			

Table 2-35 HVM_CONFIGURATION record

Field	Content	Data type	Max. digits
HVM_SN	HVM serial number.	Character	8
CHA_SN	Chassis serial number.	Character	20
BLADE_SN	Server blade serial number.	Character	20
HVM_IP	HVM IP address. Format: AAA.BBB.CCC.DDD (Dot delimited. Fill up unspecified values with zero) e.g. 192.168.000.001	Character	15
SUB_MASK	Subnet mask of HVM IP address. Format: AAA.BBB.CCC.DDD (Dot delimited. Fill up unspecified values with zero) e.g. 255.255.255.000	Character	15
DEF_GW	Default gateway for HVM. Format: AAA.BBB.CCC.DDD (Dot delimited. Fill up unspecified values with zero) e.g. 192.168.000.001	Character	15
VNIC_SYSTEM_NO	VNIC system number.	Numeric	3
BLADE_CNT	Number of blades which configuring SMP. Shows "1" if not configured SMP.	Numeric	2
MAXLPARCOUNT	Maximum Number of definable LPARs.	Numeric	2
CPU	No. of physical CPUs allocable to LPARs. The quantity depends on whether SMT (simultaneous multithreading) is enabled or not. When SMT is enabled: No. of threads. When SMT is disabled: No. of cores.	Numeric	3
TOTAL_MEM	Total amount of memory.	Numeric (MB)	6
SYS_MEM	Amount of memory used by HVM.	Numeric (MB)	6
USER_MEM	Amount of memory allocable to LPARs.	Numeric (MB)	6
AUTOSHUTDOWN	Auto-shutdown function setting status. (ON/OFF)	Character	3
PRESTATE	Pre-state function setting status. (ON/OFF)	Character	3
BMCIP	BMC IP address Format: AAA.BBB.CCC.DDD (Dot delimited. Fill up unspecified values with zero) e.g. 192.168.000.001	Character	15
LICENSETYPE	HVM license type. (Enterprise/Essential/Advanced)	Character	32
VALIDTHRU	Expiration day of HVM license. Format: YYYY/MM 9999/99 indicates unlimited duration. Note: When the temporary license is available, use VALIDTHRU_DD.	Date and time	29
VFC_SEED	Vfc seed information; { Vfc seed information *} "" appears for "HVM version" lower than those in Table 2-73 Supported status and versions of each field. If CB500 or CB2500 HVM_SN (hexadecimal) is greater than 0000FFFF and if the HvmSh version is 8.5 or lower, the field shows ".*"; if 8.6 or higher, it shows Vfc seed information.	Numeric	8

Field	Content	Data type	Max. digits
MANG_PATH	PCI No. of NIC for management path Default Note: PCI no. of the management path active port Default, if the ManagePathChangeVer2 function in Table 2-15 List of Function names is On.	Character	16
LANG	Alert language mode "Japanese" or "English"	Character	16
VC_PORT	TCP port address allocate for VCOM No.1. (Decimal)	Numeric	5
MANG_PATH_DF	PCI No. of NIC for management bus. (Displays PCI No. even if the management bus is default) However, the field displays "*" if the HVM does not support this function. Note: PCI no. of the management path active port, if the ManagePathChangeVer2 function in Table 2-15 List of Function names is On.	Numeric	3
IMPORT_CONFIG	Configured NTP source. (NONE / SVP / BMC) "*" is displayed if HVM does not support NTP function.	Character	8
TIME_SYNC	Configured NTP option. (OFF / NTP / SVP) "*" is displayed if HVM does not support NTP function.	Character	8
NTP1SERVER	IPv4 or IPv6 address of NTP Server 1. "NONE" is displayed if IP address is not configured. "*" is displayed if HVM does not support NTP function.	Character	256
NTP2SERVER	IPv4 or IPv6 address of NTP Server 2. "NONE" is displayed if IP address is not configured. "*" is displayed if HVM does not support NTP function.	Character	256
HVM_OPERATING_MODE_CURR (*1)	Current operating mode of HVM. (standard / expansion)	Character	16
HVM_OPERATING_MODE_NEXT (*1)	HVM operating mode after rebooting. (standard / expansion)	Character	16
PCPU_CSTATE	Corresponding to "PhyCPU C-State" displayed on the Options screen of HVM. { Disable Enable * } (*2)	Character	16
USB_AUTO_ALLOC	Corresponding to "USB Auto Allocation to LPAR" displayed on the Options screen of HVM. { Disable Enable * } (*2)	Character	16
SAVE_CHANGED_CONFIG	Corresponding to "Save Changed Config Format" displayed on the Options screen of HVM. { Disable Enable * } (*2)	Character	16
TC_BASE_CURR	Base value of Timercounter in the current HVM. { TSC CPUFrequency * } (*3) Corresponding to "HVM TimerCounter Base" displayed on the HVM Options screen.	Character	16
TC_BASE_NEXT	Base value of Timercounter when booting HVM next time. { TSC CPUFrequency * } (*3) Corresponding to "HVM Timer Counter Base" displayed on the HVM Options screen.	Character	16
ERROR_WATCHING	Detection setting of HVM hang-up state. (ON/OFF) Corresponding to "HVM Error Watching" displayed on the HVM Options screen.	Character	3

Field	Content	Data type	Max. digits
SAVE_TIME_CONFIG	When adjusting the HVM system time or the LPAR time, the adjusted time information is saved automatically in the physical RTC or the HVM configuration information. { Disable Enable *} (*4) Corresponding to "Save Time Config" displayed on the HVM Options screen.	Character	16
SYS2_PROC	Maximum CPU resource usage of SYS2. { Default Default(n) n} (*7) Corresponding to "SYS2 Processors" displayed on the System Configuration screen.	Character	16
PASSWD_EXPIRY	User password's term of validity (days). { 1 - 365 Infinite *} - When there is no limit for user password's term of validity, "Infinite" is displayed. - "*" is displayed for HVM that does not support user authentication.	Character	16
MGMT_DIAG	Regular diagnosis of the inactive management path port. { Disable Enable *} (*4)	Character	16
SAFE_MODE	HVM activation temporarily suspended. { ON OFF *} Displays "*" if SAFE mode is not supported on the HVM.	Character	8
HVM_SVP_COMMUN	The Internet protocol version for SVP-HVM communication { IPv4 IPv6 } If the HVM does not support IPv6, "*" appears.	Character	8
IPv6_STATIC	HVM IPv6 static address validity setting { ON OFF *} ON: Valid OFF: Invalid If the HVM does not support IPv6, "*" appears.	Character	8
IPv6_STATELESS	HVM IPv6 stateless address validity setting { ON OFF *} ON: Valid OFF: Invalid If the HVM does not support IPv6, "*" appears.	Character	8
VALIDTHRU_DD	Expiration date of HVM license. Format: YYYY/MM/DD 9999/99/99 indicates unlimited duration. Note: This field is displayed only when temporary HVM license is available.	Date and time	29
VALIDTHRU_EXPIRED	Status of HVM license validity { Expired NotExpired } Note: This field is displayed only when temporary HVM license is available.	Character	32
PERF_TUNING	Contents of Performance tuning options (Decimal) 0: Performance tuning options are not available. 1: Performance tuning options are available. Note: This field is displayed only when HVM license is Enterprise.	Numeric	3
MULTI_QUEUE_SCD	Multiple queue scheduling { ON OFF * } ON: Enabled OFF: Disabled Note: If the HVM does not support Multiple queue scheduling, "*" appears.	Character	8
AUTHENTICATION_METHOD	Method of user authentication (*5)(*6) { LOCAL LOCAL+LDAP LOCAL+RADIUS *} HvmSh V9.2 or higher are planned to support "LOCAL+RADIUS".	Character	32

Field	Content	Data type	Max. digits
AUTHENTICATION_LOGIN_VALID_TIME	The accessible time for HvmSh commands to log in an LDAP server (sec) { 30 to 86400 Infinite} (*5)(*6) Note: When the accessible time is unlimited, "*" appears.	Numeric	5
MMUSER_ROLE#	Role number for the Management Module User (*6) { 0 to the supported number of user-defined roles *} (3opr login) Note that 0 is the role number with all permissions in an HVM.	Numeric	3
MMUSER_ROLE_NAME	Role name for the Management Module User (*6) Note that "Administrators" is displayed when the field "MMUSER_ROLE" shows 0.	Character	32
KEEP_CONFIG	The function for protecting rewriting the LPAR manager configuration in device blockade or degradation { Disable Enable * }	Character	16
VNIC_IM	The function for setting the mode for VNIC interrupt moderation { Guest Guest +Host (Intervals for interrupt generation) * } Note that a time of intervals for interrupt generation is in a decimal number (microsecond).	Character	32
PProcProactiveFailover	The function for switching from one processor core to another proactively {Disable *}.	Character	16
SYS2_DUMP	The function to enable or disable the SYS2 Dump function. {Disable Enable * }	Character	16
L1D_FLUSH	The function that HVM flushes L1 data cache before dispatching it from one LPAR to another LPAR. {Disable Enable * }	Character	16
CORE_SCD	The setting of core scheduling. { ON OFF * } ON: The core scheduling is enabled. OFF: The core scheduling is disabled.	Character	8
<p>*1: "standard" is displayed when it is executed to an HVM version not supporting the operating mode extension for HVM of CB2000 and CB320. For CB500 and CB2500, "expansion" is displayed regardless of the version of HVM, and HvmOperatingMode cannot be changed.</p> <p>*2: The option to an HVM not supporting the HVM interfaces, "PhyCPU C-State", "USB Auto Allocation to LPAR", and "Save Changed Config Format", displays *. Refer to "HVM option support map" for the details.</p> <p>*3: "*" is displayed in the target field for the HVM that does not support the HVM interface of getting/setting "TimerCounter Base".</p> <p>*4: "*" is displayed in the target field for the HVM that does not support the HVM interface for getting/setting information.</p> <p>*5: * is displayed when LDAPAuthentication in Table 2-15 List of Function names is set to "OFF".</p> <p>*6: * is displayed when a user without the HVM security permission executes this command.</p> <p>*7: Displays the upper limit for the CPU resources used in SYS2 by the number of CPUs (n). Depending on the HvmSh and HVM firmware versions, the upper limit value might be displayed as "Default(2)", which is the same as Default.</p>			

Table 2-36 GROUP_CONFIGURATION record

Field	Content	Data type	Max. digits
GROUP#	Processor groupNo.	Numeric	3
GROUP NAME	Processor group name.	Character	31
DED CORE	No. of cores on dedicated mode in the group.	Numeric	3
SHR CORE	No. of cores on shared mode in the group.	Numeric	3

Table 2-37 LPAR_CONFIGURATION record

Field	Content	Data type	Max. digits
L#	LPAR number. If the LPAR is undefined, "*" is shown in following all fields.	Numeric	2
NAME	LPAR name.	Character	31
STATUS	LPAR status.	Character	10
MEM	Amount of memory allocated to this LPAR.	Numeric (MB)	8
DED_CPU	No. of dedicated CPU.	Numeric	3
SHR_CPU	No. of shared CPU.	Numeric	3
SRV	Service ratio. In dedicated mode, "*" is shown. (*1)	Numeric Character	3
ID	Idle detection function. (ON/OFF)	Character	3
PC	Processor capping function.(ON/OFF/*) In dedicated mode, "*" is shown.	Character	3
AA	Auto-activate setting.(OFF/Numeric)	Character	3
AC	Auto-clear function of SEL. (ON/OFF)	Character	3
PB	Pre-boot firmware setting.	Character	10
VC	Virtual COM No. or OFF.	Character	3
VC_PORT	Port No. for accessing to Virtual COM.	Numeric	5
GROUP	Processor group No.	Numeric	3
GENERATION	Generation No. (1 to 65535 decimal)	Numeric	6
VNIC_DEVTYP	Virtual NIC Device Type (NIC1/NIC2/*)	Character	8
MN_CONF	MN_CONF shows the Memory Node information specified by users for allocating memory in NUMA mode. (Node number/A/*) Node number - NUMAMemory Node numberspecified by user. of the allocating memory "A" - Automatic assignment is specified. "*" - NUMA is not supported on HVM, or Guest NUMA is available.	Character	3
PN_CONF	PN_CONF shows the Node information of the processor for assigning processor in NUMA mode. (A/*) "A" - Automatic assignment is specified. "*" - NUMA is not supported on HVM.	Character	3

Field	Content	Data type	Max. digits
MN	<p>MN shows the status of Memory Node concerning memory allocation. (Node number/M/A/*) Node number - Memory in this Node has been allocated to the LPAR.</p> <p>"M" - Memory has been allocated in multiple nodes. "A" - Memory will be allocated automatically in the activation. "*" - NUMA is not supported on HVM, or Guest NUMA is available.</p> <p>Note: MN is same as MN_CONF when the LPAR is in deactivated status.</p>	Character	3
PN	<p>PN show the status of Node concerning assigning processor. (Node number/M/A/*) Node number - Physical processors in this Node have been assigned to the LPAR.</p> <p>"M" - Physical processors in multiple nodes have been assigned. "A" - Physical processors will be assigned automatically in the activation. "*" - NUMA is not supported on HVM.</p> <p>Note: PN is same as PN_CONF when the LPAR is in deactivated status.</p>	Character	3
UUID	<p>UUID (hexadecimal, 16 bytes)</p> <p>Note: "*" is displayed when I/F to get UUID is not supported on HVM.</p>	Numeric (hexadecimal)	32
VT_X	<p>Intel(R) Virtualization Technology setting. (ON/OFF/*)</p> <p>Note: "*" is displayed when Virtual VT-x is not supported on HVM.</p>	Character	3
OS_TYPE	<p>Setting of OS type to boot in HVM. (Default/Solaris/*) "Default" - Default supported OS (Linux, Windows) "Solaris" - Oracle Solaris "*" - Other than the default supported OS is not supported on HVM.</p>	Character	16
GUEST_NUMA	<p>Setting of Guest NUMA (ON/ OFF/ *) ON - Enable OFF- Disable "*" - Guest NUMA is not supported.</p>	Character	3
IDLE_MODE	<p>Setting of Guest IDLE mode (HALT/ MWAIT/*) "*" - Guest IDLE mode is not supported, or Idle detection function (ID) is ON.</p>	Character	8
MSHYP_PRTE	<p>Hypervisor Interface: Partition Reference Time Enlightenment (ON/OFF/*) "*" appears if MSHYP_PRTE (in Function name) of the HVM is OFF.</p>	Character	3
NUMA_BIND_LPR OC (*2)	<p>Physical NUMA Node Binding Mode (ON/OF/*) Note: "*" is displayed if the HVM does not support Physical NUMA Node Binding Mode. "*" is displayed if the guest NUMA feature is disabled.</p>	Character	3
HPET	<p>The method for logical HPET assignment { Auto Enable Disable * } Note that, when the function for setting the method for logical HPET assignment is not supported, "*" is displayed.</p>	Character	8
LOW_LATENCY	<p>Setting of Low Latency mode. (ON/OFF) ON - Enable</p>	Character	8

	OFF- Disable Note: This field is displayed only when HVM license is Enterprise.		
EPT_1GB	Setting ofEPT1GB (Extended Page Table 1G) mode (ON/OFF). ON - Enable(EPT1GB) OFF- Disable(EPT 2MB) Note: This field is displayed only when HVM license is Enterprise.	Character	8
L3_CBM	The CBM to be set at COS in L3 cache. { hexadecimal Default} Note: "Default" is the default value. "bit[n]=1" in "hexadecima" indicates assignment of cache way[n]. * is displayed when L3CacheAllocation is not supported.	Numerical	10
PCID	The capability of PCID function. { Enable Disable *} (*3)	Character	8
IBRS_IBPB	The capability of IBRS function and IBPB function. { Enable Disable *} (*3)	Character	8
SSBD	The capability of SSBD function. { Enable Disable *} (*4)	Character	8
MDClear	The capability of MDClear function. { Enable Disable *} (*5)	Character	8

*1: If the HVM firmware version is 58-50 /78-50/17-60 or higher, service ratio can be displayed in dedicated mode.

*2: The mode of the logical processor topology setting mode for a guest NUMA when the guest NUMA function is enabled.

NUMA_BIND_LPROC	Function of assigning logical processors
ON	Physical NUMA Node Binding Mode
OFF	Physical Processor Node Binding Mode

3: "" is displayed if the HVM FW version is one of the following:

- CB500/CB2500 02-60 or earlier
- CB2000 59-80/79-80 or earlier
- CB320 17-94 or earlier.

4: "" is displayed if the HVM FW version is one of the following:

- CB500/CB2500 02-62 or earlier
- CB2000 59-82/79-82 or earlier
- CB320 all versions.

5: "" is displayed if the HVM FW version is one of the following:

- CB500/CB2500 02-66 or earlier
- CB2000 59-86/79-86 or earlier
- CB320 all versions.

Table 2-38 BSM_CONFIGURATION record

Field	Content	Data type	Max. digits
Name	Name (BSM1/BSM2/BSM3/BSM4/CLI1/CLI2/.../CLI8)	Character	32
IP	IP address. (*1) Format: AAA.BBB.CCC.DDD (Dot delimited. Fill up unspecified values with zero) e.g. 192.168.000.001 Name field are not displayed when the HVM is not supporting CLI IP address.	Character	15
PORT	Alert port No. (*1) Displays "*" when name field is CLIx.	Numeric	5
*1: When "HvmClip" in Table 2-15 List of Function names shows "OFF", the rows "CLIx" are not displayed. *2: When "BsmNotSupport" in Table 2-15 List of Function names shows "ON", the field "IP" for the record "BSMx " that is shown at the field "Name" shows "000.000.000.000" and the field "PORT" for the record shows "0".			

Table 2-39 FW_VERSION_INFORMATION record

Field	Content	Data type	Max. digits
Name	Firmware name	Character	64
Version	Firmware version	Character	64

Table 2-40 PHYSICAL_CPU_CONFIGURATION record

Field	Content	Data type	Max. digits
CPU#	Physical CPU No.	Numeric	3
BLADE#	Server blade No.	Numeric	2
DIE#	Die No. (Socket No.)	Numeric	2
CORE#	Core No.	Numeric	2
THREAD#	Thread No.	Numeric	1
STATUS	CPU status. (RUN/FAILURE/ERROR/*)	Character	10
SCHD	Scheduling mode. <ul style="list-style-type: none"> S: Shared. D: Dedicated. 	Character	1
GHZ	Frequency. e.g. 2.26	Numeric (GHz)	3 for integer, 2 for fraction
GROUP	Processor group No. Displays "*" when group No. is not configured. (Requires HvmSh version 5.3 or higher)	Numeric	3
STATE	CPU core status. <ul style="list-style-type: none"> DEA: Spare core for Capacity on Demand ACT: Normal operation status. WRN: A core which No. of recoverable error exceeds the threshold value. (abnormal core) DEG: degenerated processor core. "*" is displayed if "Capacity on Demand" is not supported on HVM. 	Character	3
RUN_STATUS	Additional information when CPU status is <i>RUN</i> . <ul style="list-style-type: none"> HIG: Physical CPU runs in high speed Mnn: Physical CPU runs in intermediate speed. (nn=01,02..) LOW: Physical CPU runs in low speed *: CPU status is not <i>RUN</i> .	Character	3
FREQ	Current operating frequency of Physical CPU.	Numeric (GHz)	3 for integer, 2 for fraction
NODE#	The Node number to which the Physical CPU belongs. "*" is displayed when NUMA is not supported on HVM. "*" is displayed when the configurations Non-NUMA.	Numeric	3
ALLOCATABLE	Allocable status to an LPAR. {Y/N/*} (*1) "Y": This physical CPU can be allocated to an LPAR. "N": This physical CPU can not be allocated to an LPAR.	Character	3
LPAR#	The allocated LPAR number if the scheduling mode of this physical CPU is dedicated. {Lpar no./ - /*} (*1) (*2)	Numeric	3

1: When "CORE_SCD" in Table 2-15 List of Function names shows "OFF", displays "".
 *2: When the scheduling mode of physical CPU is not "dedicated", displays "-".

Table 2-41 VNIC_SEGMENT_INFORMATION record

Field	Content	Data type	Max. digits
SEG#	Virtual LAN segment No. (1a/1b.../Va ...)(*1)	Character	3
STATUS	Virtual LAN segment status. <ul style="list-style-type: none"> • S: Standby. • D: Down • A: Active • F: Fault • *: Undefined Note: Content of this field corresponds to "VLAN Segment" on "System Service State" screen.	Character	10
PORT_STATUS	Port status. <ul style="list-style-type: none"> • U: Link Up. • D: Link Down • -: Condition is not fixed • E: unrecoverable error status • *: Others Note: Content of this field corresponds to "Shared PCI Device Port State" on "System Service State" screen.	Character	10
FILTER	Shared NIC communication packet filter status. (Disable Enable Disable(ALL) *)	Character	16
*1: VF NIC LAN segment (SEG#=1va/2av...) information is not displayed. A port status of VF virtual LAN segment is equal to a port status of virtual LAN segment. Packet filter status is fixed as "Disable".			

Table 2-42 PHYSICAL_IO_CONFIGURATION record

Field	Content	Data type	Max. digits
PCI#	PCI device No.	Numeric	3
PORT#	Port No.	Numeric	2
Location	Installed location of PCI device. Note: For details, see Description format for device location.	Character	6
PCI_SEG	Segment No. of Config address for PCI device (hex-decimal)	Numeric	2
PCI_BUS	Bus No. of Config address for PCI device (hex-decimal)	Numeric	2
PCI_DEV	Device No. of Config address for PCI device (hex-decimal)	Numeric	2
PCI_FNC	Function No. of Config address for PCI device (hex-decimal)	Numeric	1
TYPE	PCI device type. (*4) <ul style="list-style-type: none"> • S: SCSI controller. • N: Network interface Card (NIC). • F: Fibre Channel. • U: USB controller. 	Character	1
VENDOR_NAME	Vender name of PCI device.	Character	32
DEV_NAME	Device name of PCI device.	Character	64
SCH_MOD	Scheduling mode of PCI device. <ul style="list-style-type: none"> • S: Shared. • D: Dedicated. • E: Exclusively sharing *: For devices for which Port dedicated mode is enabled, the scheduling mode for each port is displayed.	Character	1
SNIC#	Shared NIC No. For NIC in dedicated or exclusively sharing mode, "***" is shown.	Character	2
PORT_ID_1	For HBA: WWPN. (*1) For NIC: MAC. (*3) For others, "***" is shown.	Character	64
PORT_ID_2	For HBA: WWNN. (*1) For NIC: MAC. (*3) For others, "***" is shown.	Character	64
FW_VER	For HBA: Firmware version. For others, "***" is shown.	Character	64
Status	PCI device status. <ul style="list-style-type: none"> • Err: Error closed. • !: Removed. • *: Others. 	Character	3
SCH_CHG	Changeable or cannot to be changed the schedule mode. <ul style="list-style-type: none"> • +: Changeable • : Cannot be changed. (space) • *: Invalid. (*2) 	Character	1
SEG#	Segment identifier of shared NIC (1a/1b/...) For others, "***" is shown.	Character	3
VENDOR_ID	Vendor ID (Hexadecimal) of PCI Device ***: Invalid (*2)	Numeric	4
DEVICE_ID	DeviceID (Hexadecimal) of PCI Device ***: Invalid (*2)	Numeric	4
REVISION_ID	Revision ID (Hexadecimal) of PCI Device ***: Invalid (*2)	Numeric	2

Field	Content	Data type	Max. digits
SUBSYSTEM_ID	Subsystem ID (Hexadecimal) of PCI Device. "": Invalid (*2)	Numeric	4
VF	Whether VF NIC can be allocated or not. • "v": Allocatable • "": Invalid	Character	3
VF_VLAN_UNDEF	For the VF NIC allocated to the PCI device, "vlanmode=undef" can be set or not. • "ON": Settable • "OFF": Unsettable • "": Invalid Note: Only enabled when the VF field is "v".	Character	8
VF_VLAN_UNTAG	For the VF NIC allocated to the PCI device, "vlanmode=untag" can be set or not. • "ON": Settable • "OFF": Unsettable • "": Invalid Note: Only enabled when the VF field is "v".	Character	8
VF_VLAN_TAG	For the VF NIC allocated to the PCI device, "vlanmode=tag" can be set or not. • "ON": Settable • "OFF": Unsettable • "": Invalid Note: Only enabled when the VF field is "v".	Character	8
VF_PRM_THROUGH	For the VF NIC allocated to the PCI device, "prm=through" can be set or not. • "ON": Settable • "OFF": Unsettable • "": Invalid Note: Only enabled when the VF field is "v".	Character	8
VF_PRM_RESTRICT	For the VF NIC allocated to the PCI device, "prm= Restricted" can be set or not. • "ON": Settable • "OFF": Unsettable • "": Invalid Note: Only enabled when the VF field is "v".	Character	8
VF_MAC	For the VF NIC allocated to the PCI device, the MAC setting can be set or not. • "ON": Settable • "OFF": Unsettable • "": Invalid Note: Only enabled when the VF field is "v".	Character	8
VF_TXRATE	For the VF NIC allocated to the PCI device, the TXRATE setting can be set or not. • "ON" ": Settable • "OFF": Unsettable • "": Invalid Note: Only enabled when the VF field is "v".	Character	8
VF_TXRATE_MAX	Maximum settable value of TXRATE of VF NIC. • "": Invalid Note: Only enabled when the VF field is "v" and the TXRATE field is "ON".	Numeric	10
VF_TXRATE_MIN	Minimum settable value of TXRATE of VF NIC. • "": Invalid Note: Only enabled when the VF field is "v" and the TXRATE field is "ON".	Numeric	10

Field	Content	Data type	Max. digits
VF_TXRATE_STEP	Increasing/decreasing width of TXRATE of VF NIC. <ul style="list-style-type: none"> "*": Invalid Note: Only enabled when the VF field is "v" and the TXRATE field is "ON".	Numeric	10
OFFLOAD	The offload setting status of shared NIC. <ul style="list-style-type: none"> "Default": Recommended settings of the system unit "Enable": Offload of NIC is enabled "Disable": Offload of NIC is disabled "*": Invalid data 	Character	8
CORE_DED	If the PCI device is an FC, the field displays whether or not it supports HBA core dedicated mode: "ON" : Supported "OFF" : Not supported "*" : Invalid (when the target PCI device is not FC, or HBA core dedicated mode is disable, etc.)	Character	8
CORE_NUM	Displays the number of cores when the PCI device supports the HBA core dedicated mode. "*" : Invalid (when the target PCI device is not FC, or HBA core dedicated mode is disable, etc.)	Numeric	2
IO_CONNECT	Displays whether the PCI device is a target to which IO connection mode is applied. "ON": The PCI device is a target. "OFF": The PCI device is not a target. Note: * is displayed if the HVM does not support IO connection mode.	Character	8
LUID_SCAN	Displays whether the fiber channel device supports setting and display of "LUID Scan Mode". "ON ": The fiber channel device supports setting and display of "LUID Scan mode". "OFF": The fiber channel device does not support setting and display of "LUID Scan mode". Note: * is displayed if the device is not a fiber channel device or the HVM does not support this function.	Character	6
PERSONALITY	Displays the personality of a PCI device. {NONE NIC FCoE iSCSI CUSTOM *} Note: * is displayed for PCI devices with no personality.	Character	16
PORT_DED	Displays the value of Port dedicated mode for a PCI device. {ON OFF *} "ON": Port dedicated mode is enabled. "OFF": Port dedicated mode is disabled, that is, the PCI device is in device dedicated mode. Note: * is displayed when the PCI device does not support Port dedicated mode.	Character	6
<p>*1: If HBA is shared, WWPN/WWNN corresponding to VfcID=0 is set. If HBA is dedicated, WWPN/WWNN corresponding to VfcID=1 is set. If HBA is not shared, "*" is set.</p> <p>*2: If execute for unsupported HVM firmware version, "*" is shown.</p> <p>*3: MAC address of PORT_ID_1 means hardware information which is written in an EEPROM. And MAC address of PORT_ID_2 means network address which is used for network accesses. Both MAC addresses become equal when the NIC is shared mode. MAC address of PORT_ID_2 is set by OS on the LPAR when the NIC is dedicated mode and enabled. And MAC address of PORT_ID_2 is displayed only when the NIC was enabled on the assigned LPAR.</p> <p>*4: The situation that "TYPE field:N" and "VF field:v" are set corresponds to "PCI Type:Nv" on "HVM screen: PCI Device Assignment".</p>			

Table 2-43 PHYSICAL_IO_ASSIGN_INFORMATION record

Field	Content	Data type	Max. digits
PCI#	PCI device No.	Numeric	3
PORT#	Port No.	Numeric	2
L#	LPAR No.	Numeric	2
STATUS	Allocation status. (*1) <ul style="list-style-type: none"> • A: Allocated (Unused). • R: Allocated (Being used) • -: Unable to allocate • *: Unallocated 	Character	1
REMOVE	Assigning status of removable logical PCI device. !: Removed *: Others Displays "*" except allocation status is "R".	Character	3
STATUS_EX	Allocation status (*2) [When the USB_AUTO_ALLOC field is Enable or *] - The same contents as STATUS Field are displayed. [When USB_AUTO_ALLOC Field is Disable] The same contents as STATUS Field are displayed except USB Device. - When USB Device "A": Allocated (Unused) "R": Allocated (Being used) "#A": Designated Allocation (Unused) "#R": Designated Allocation (Being used) "*": Unallocated	Character	3
PCI_SEG	The segment number of the Config address in a PCI device in hexadecimal notation	Numeric	2
PCI_BUS	The bus number of the Config address in a PCI device in hexadecimal notation	Numeric	2
PCI_DEV	The device number of the Config address in a PCI device in hexadecimal notation	Numeric	2
PCI_FNC	The function number of the Config address in a PCI device in hexadecimal notation	Numeric	1
*1: Characters show allocation states are same as the Device Assignment displayed on the PCI Device Assignment screen. However, when the USB_AUTO_ALLO field in USB HVM_CONFIGURATION record is Disable, "#A" and "#R" are not displayed. For allocation status containing "#A" and "#R", use the STATUS_EX. *2: When the field "USB_AUTO_ALLOC" in the "HVM_CONFIGURATION" record shows "Disable" and the target device is a USB device, the content of the field "STATUS_EX" is output. In other cases, the content of the field "STATUS" is output.			

Table 2-44 VFC_ASSIGN_INFORMATION record

Field	Content	Data type	Max. digits
PCI#	PCI device No.	Numeric	3
PORT#	Port No.	Numeric	2
VFC#	VFC ID No. "" is displayed in dedicated mode	Numeric	2
L#	LPAR No. "" is shown when VFC ID is unallocated.	Numeric	2
Location	Installed location of PCI device. Note: For details, see Description Format for Device Location.	Character	6
SCH_MOD	Scheduling mode of VFC. <ul style="list-style-type: none"> S: Shared. D: Dedicated. 	Character	1
WWPN	WWPN "" is displayed when it is not defined.	Character	64
WWNN	WWNN "" is displayed when it is not defined.	Character	64
PORT_STATUS	Port status. <ul style="list-style-type: none"> A: Available C: Config Check. D: Link Down. E: Error Check -: Condition is not fixed *: Others Always displays "" when the device is dedicated mode. Note: Content of this field corresponds to "Shared PCI Device Port State" on "System Service State" screen.	Character	1
REMOVE	Status of removable logical PCI device which is shared mode. ! : Removed * : Others Always displays "" when the device is dedicated mode.	Character	3
CORE_DED	Displays whether the HBA-core dedicated mode of the target PCI device. {Enable Enable! Disable} "Enable": enabled (No. of cores activatable >= No. of VFC ID.) "Enable!": enabled (No. of cores unactivatable < No. of VFC ID.) "Disable": disabled Note that "" is displayed if the HVM or the PCI device does not support the HBA-core dedicated mode.	Character	8
IO_CONNECT	Status of IO connection mode {AUTO ON OFF} Note that "" is displayed if the HVM or the PCI device does not support IO connection mode or the PCI device is in dedicated mode.	Character	8
MG_WWPN	WWPN used by LPAR Migration (Concurrent maintenance) "" is shown if the HVM does not support LPAR migration (concurrent maintenance).	Character	64
MG_WWNN	WWNN used by LPAR Migration (Concurrent maintenance) "" is shown if the HVM does not support LPAR migration (concurrent maintenance).	Character	64
DRV_SUPPORT	Function map of the concerned VFC driver "" is shown when the allocated LPAR is deactivated or the Driver activation is not completed. Information for the cooperation to HVM Navigator	Numeric (hexadecimal)	8

Field	Content		Data type	Max. digits
WWN_STATUS	Shows an effective wwn (HvmSh V6.4 or higher) { ORIGINAL MIGRATION UNKNOWWN * }		Data Type	10
	Information to cooperate with HVM Navigator. ORIGINAL	The values displayed in the WWPN field and the WWNN field are effective as wwn.		
	MIGRATION	The values displayed inMG_WWPN field and MG_WWNN field are effective as wwn.		
	UNKNOWN	Unknown		
	*	Unable to get information (Not supported)		
PCI_SEG	The segment number of the Config address in a PCI device in hexadecimal notation		Numeric	2
PCI_BUS	The bus number of the Config address in a PCI device in hexadecimal notation		Numeric	2
PCI_DEV	The device number of the Config address in a PCI device in hexadecimal notation		Numeric	2
PCI_FNC	The function number of the Config address in a PCI device in hexadecimal notation		Numeric	1

Table 2-45 VNIC_ASSIGN_INFORMATION record

Field	Content	Data type	Max. digits
L#	LPAR No.	Numeric	2
VNIC#	VNIC No.	Numeric	2
SEG#	Segment No. (Va/Vb/1a/...) (*2) "" is shown when VNIC is unallocated to LPAR.	Character	3
MAC	MAC address of VNIC. "" is shown when VNIC is unallocated to LPAR. (*1)	Character	17
VLAN_MODE	VLAN mode of VNIC. (Tagged/Untagged/OFF) <ul style="list-style-type: none"> OFF: Not using VLAN Tagged UnTagged "" is shown when VNIC is unallocated to LPAR.	Character	8
VLAN_IDS	VLAN ID of VNIC. (comma-delimited numeric) "" is shown when VNIC is unallocated to LPAR.	Character	128
PRM	Status of VNIC promiscuous mode. (Through /Restricted) "" is shown when VNIC is unallocated to LPAR.	Character	3
REMOVE	Status of removable virtual NIC. !: Removed *: Others	Character	3
VF	VF NIC (*2) <ul style="list-style-type: none"> "v": VF NIC "": Others 	Character	3
PCP	Priority Code Point of VF NIC (0 to 7) Note: "" is shown when the VF field is "v".	Numeric	2
TX_RATE	Maximum transfer rate of VF NIC (100 to 1000) Note: "" is shown when TXRATE setting for VF NIC is not available. Note: "" is shown when the VF field is "v".	Numeric	8
*1: If the HVM firmware version is 58-50 /78/50/17-61 or higher, MAC address is displayed even though the VNIC is unallocated. *2: The situation that "SEG# field:1a" and "VF field:v" are set corresponds to "PCI Type:1av" on "HVM screen: VNIC Assignment".			

Table 2-46 LOGICAL_CPU_CONFIGURATION record

Field	Content	Data type	Max. digits
L#	LPAR No.	Numeric	2
CPU#	Logical CPU No.	Numeric	2
STATUS (*1)	<p>Logical CPU Status.</p> <p>[Form 1]{* S D Physical processor No. }</p> <ul style="list-style-type: none"> S: Assigned in shared mode. D: Assigned in dedicated mode (Shown only when LPAR is in deactivated). physical processorNo.: Shows the No. of physical processor (in decimal) (Shown only when physical processor is specified manually, or when LPAR is in Activated) *: Unassigned (or offline) <p>[Form 2]{* A Physical processor No. }</p> <ul style="list-style-type: none"> A: Automatically assigns physical processors (Shown only when Logical CPU is in dedicated mode and LPAR is in deactivated). physical processor No.: Shows the No. of physical processor (in decimal) (Shown only when physical processor is specified manually, or when LPAR is in Activated) *: Unassigned (or offline) <p>Note: This field in Form2 is meaningless when Logical CPU is in shared mode</p>	Character	3
SETTING	<p>Shows the way of assigning physical processor numbers displayed in the STATUS field. {M A *}</p> <p>M: Manually assigns (specifying physical processor)</p> <p>A: Automatically assigns (not specifying physical processor)</p> <p>"" is displayed when this field is not supported on HVM.</p> <p>Note: This field is meaningless when Logical CPU is in shared mode</p>	Character	3
<p>*1: It may be displayed as {S No.} or {A No.} depends on the HVM and HvmSh firmware version. See the table "Form of situation-dependent message" in the command "get LPARLProc" to confirm the combination of them.</p>			

Table 2-47 MEMORY_ASSIGN_INFORMATION record

Field	Content	Data type	Max. digits
ORG_ADDR	Memory start address (4 bytes-delimited hexadecimal)	Numeric	17
SIZE	Memory size (Decimal)	Numeric	8
L#	LPAR No. which uses memory area specified by ORG_ADDR,SIZE. "" is shown when other than LPAR used or unused.	Character	3
NAME	<p>Name of the system which using memory area specified by ORG_ADDR,SIZE</p> <ul style="list-style-type: none"> ISOLATED: Isolated memory by memory failure detection. 	Character	31
NODE#	<p>The Node number to which memory belongs.</p> <p>"" is displayed when NUMA is not supported on HVM.</p> <p>"" is displayed when the configurations Non-NUMA.</p>	Numeric	3

Table 2-48 VCOM_ASSIGN_INFORMATION record

Field	Content	Data type	Max. digits
VC#	VCOM No. (1 to definable Max. VCOM No.)	Numeric	3
TCP_PORT	TCP port address assigned to VCOM (Decimal)	Numeric	5
L#	VCOM allocated LPAR No. "" is shown when VCOM is unallocated to LPAR.	Character	3
NAME	VCOM allocated LPAR name "" is shown when VCOM is unallocated to LPAR.	Character	31

Table 2-49 MAX_VALUE_INFORMATION record

Field	Content	Data type	Max. digits
NAME	Max. value name <ul style="list-style-type: none"> LPAR_DEF: No. of definable LPAR. LPAR_ACT: No. of activatable LPAR. PHY_CPU: Max. No. of physical CPU. LOG_CPU: Max. No. of logical CPU per LPAR. DEV: Max. No. of device. SFC: No. of shareable FC. SHR_NIC: No. of shareable NIC. VIR_NIC: No. of definable VNIC per LPAR. PROC_GROUP: Max. No. of processor group. VNIC_SYSTEM_NO: VNIC system No. ACCOUNT: Max. No. of account ("0" is displayed in HVMs that do not support the user authentication) "MaxUserDefRole": the supported number of user-defined roles Note that 0 is displayed in HVMs that do not support the user authentication. 	Character	31
MAX	Max. value	Numeric	8

Table 2-50 HVM_FACILITY_INFORMATION record

Field	Content	Data type	Max. digits
NAME	Function name Refer to "HVM Interface Reference: get HvmFacilityMap" for details.	Character	31
VALUE	Enable / Disable the function ON: Enable OFF: Disable	Character	8

Table 2-51 LPAR_INITIAL_INFORMATION record

Shows the default value of the LPAR configuration when adding LPAR definition.

Field	Content	Data type	Max. digits
NAME	Default value of LPAR Name	Character	31
STATUS	Default value of LPAR Status	Character	10
MEM	Default value of allocated memory capacity (MB)	Numeric	8
DED_CPU	Default value of dedicated CPU number	Numeric	3
SHR_CPU	Default value of shared CPU number	Numeric	3
SRV	Default value of service rate	Numeric Character	3
ID	Default value of idle detecting function (ON/OFF)	Character	3
PC	Default value of processor capping function (ON/OFF/*) "" when dedicated mode	Character	3
AA	Default value of automatic activation setting (OFF/ Numeric)	Character	3
AC	Default value of SEL automatic clearing function(ON/OFF)	Character	3
PB	Default value of pre-boot firmware setting	Character	10
VC	Default value of virtual COM No. "OFF " when no virtual COM allocated	Character	3
VC_PORT	Port No. to access to virtual COM	Numeric	5
GROUP	Default value of processor group No.	Numeric	3
VNIC_DEVTYP	Default value of virtual NIC device type (NIC1/NIC2/*)	Character	8
VLAN_MODE	Default value of virtual NIC VLAN mode (Tagged/Untagged/OFF)	Character	8
VLAN_IDS	Default value of virtual VLAN ID (Values divided by commas/*)	Character	128
PRM	Default value of virtual NIC in promiscuous mode (Through /Restricted)	Character	16
MN_CONF	The default value of Node number in the processor assignment. (A/*)	Character	3
PN_CONF	The default value of Node number in the memory allocation (A/*)	Character	3
PCID	The default value of the capability of PCID function. { Enable Disable * }	Character	8
IBRS_IBPB	The default value of the capability of IBRS function and IBPB finction. { Enable Disable * }	Character	8
SSBD	The default value of the capability of SSBD function. { Enable Disable * }	Character	8
MDClear	The default value of the capability of MDClear function. { Enable Disable * }	Character	8
*: This record is not displayed when HVM does not support the interface for this record.			

Table 2-52 LOGICAL_CPUID_INFORMATION record

Field	Content	Data type	Max. digits
L#	LPAR No. or "MASK"	Numeric Character	2 5
INITIAL_EAX	Value corresponding to the value set in EAX register when LPAR issues CPUID command.	Numeric (Hexadecimal)	8
EAX	[When L# field is a LPAR No.] Value corresponding to the value set in EAX register after LPAR issued CPUID command. [When L# field is "MASK"] Mask data which has the value set in EAX register with the alteration bit "1".	Numeric (Hexadecimal)	8
EBX	[When L# field is a LPAR No.] Value corresponding to the value set in EBX register after LPAR issued CPUID command. [When L# field is "MASK"] Mask data which has the value set in EBX register with the alteration bit "1".	Numeric (Hexadecimal)	8
ECX	[When L# field is a LPAR No.] Value corresponding to the value set in ECX register after LPAR issued CPUID command. [When L# field is "MASK"] Mask data which has the value set in ECX register with the alteration bit "1".	Numeric (Hexadecimal)	8
EDX	[When L# field is a LPAR No.] Value corresponding to the value set in EDX register after LPAR issued CPUID command. [When L# field is "MASK"] Mask data which has the value set in EDX register with the alteration bit "1".	Numeric (Hexadecimal)	8
*1: This record is not displayed when HVM does not support. For the bits in the fields from EAX to EDX varying with each logical CPU, the values of logical CPU#0 are displayed. *2: This record does not display all the CPUIDs which LPAR can get, and only display the CPUIDs which HVM management program needs to control.			

Table 2-53 AVAILABLE_LIST

Field	Contents	Data type	Max. digits
NAME	The name of a configuration list For details, see Table 2-54 Configuration list.	Character	32
LIST	The list of values exists for a configuration	Character	32

Table 2-54 Configuration list

Configuration list name	Contents	Data type	Max. digits
MN_CONF	The Number list of Memory Node which exists in the configuration. (The list is separated by comma)	Character	128
PN_CONF	The Node Number list of Physical CPU which exists in the configuration. (The list is separated by comma)	Character	128
OS_TYPE	List of OS type to boot on LPAR (The list is separated by comma) Example: Default,Solaris	Character	128

Table 2-55 LPAR_NUMA_CPU_ASSIGN_INFORMATION record

Field	Contents	Data type	Max. digits
L#	LPAR number	Numeric	2
NODE#	NUMA node number	Numeric	2
SIZE	The number of logical processors to be assigned to the target node	Numeric (MB)	3

Table 2-56 SEC_MODE record

Field	Contents	Data type	Max. digits
IF_NAME *1	HVM communication destination name {HvmSh BSM HCSM Migration http VC LDAP AuditLog}	Character	16
LEVEL	Communication security strength { {Default High} {Telnet SSH} {TLS1.0 TLS1.2 UDP} }	Character	8
VERIFY	Server certificate verification enabled/disabled {Enable Disable *}	Character	8
SESSTO	Session timeout (second)	Numeric	6
AUTHENTICATION	User authentication enabled/disabled {Enable Disable *}	Character	8
CERT_TYPE	Type of the server certificate for an HVM Web system {CERT1 CERT2}	Character	8
*1: The rows "LDAP" and "AuditLog" in the "IF NAME" field are displayed respectively when the HVM supports the LDAP authentication function and the audit log function.			

Table 2-57 Contents in SEC_MODE record

IF_NAME	LEVEL	VERIFY	SESSTO	AUTHENTICATION	CERT_TYPE
HvmSh	{ Default High }	{ Disable Enable }	Numeric	{ Disable Enable } *2	*
BSM	{ Default High }	{ Disable Enable }	Numeric	*	*
HCSM	{ Default High }	{ Disable Enable }	Numeric	*	*
Migration	{ Default High }	{ Disable Enable }	Numeric	*	*
http	{ Default Enable }	*	*	*	{ CERT1 CERT2 } *3
VC	Telnet	*	*	{ Disable Enable } *2	*
	SSH	*	*	*	*
LDAP	{ TLS1.0 TLS1.2 }	{ Disable Enable }	*	*	*
AuditLog	{ TLS1.0 TLS1.2 }	{ Disable Enable }	*	*	*
	UDP	*	*	*	*
<p>*2: "*" is displayed for HVMs not supporting the user authentication function.</p> <p>*3: "*" is displayed for HVMs of which the value of "HttpCertificateType" in Table 2-15 List of Function names is set to "OFF".</p>					

Table 2-58 CERTIFICATE record

Field	Contents	Data type	Max. digits
#	Certificate number that HVM manages {0 to 9 S} S: HVM server certificate 0 to 9: The management number that HVM add for the server certificate of HVM communication destination	Numeric	3
Version	Version	Character	12
Serial_number	Serial number	Numeric (Hexadecimal)	32
Signature_Algorithm	Signature algorithm	Character	64
Public_key_algorithm	Public key algorithm	Character	32
Validity_Not_before	Validity (Not before)	Character	20
Validity_Not_after	Validity (Not after)	Character	20
Common_Name	CommonName (CN) of Issuer	Character	64
Common_Name_Subject	CommonName (CN) of Subject	Character	64
Country	Country(C) of Subject	Character	4
State_or_Province	State or province(ST) of Subject	Character	64
Locality	Locality(L) of Subject	Character	64

Table 2-59 SSH_HOST_KEY record

Field	Contents	Data type	Max. digits
#	Key number of SSH host under management from HVM (fixed number)	Numeric	3
Fingerprint	Fingerprint for SSH host public key	Character	64

Table 2-60 MANAGEMENT_PATH record

Field	Contents	Data type	Max. digits
MGMNT#	The management path ID {0 1}	Character	8
Location (*1)	The location for the NIC to be installed and to be used as the management path. For the displayed output and the meaning, see Description format for device location.	Character	6
PORT# (*1)	The NIC port no. to be as the used management path	Numeric	2
Status (*1)(*2)	The status of the management path NIC port. {Active Standby Error Linkdown Unknown}	Character	16
Type	Management path setting {Default Specified} Default: Default setting Specified: User's setting	Character	16
PCI_SEG	The segment number for the Config address of a NIC port that is used as the management path. (a hexadecimal number)	Numeric	2
PCI_BUS	The bus number for the Config address of a NIC port that is used as the management path. (a hexadecimal number)	Numeric	2
PCI_DEV	The device number for the Config address of a NIC port that is used as the management path. (a hexadecimal number)	Numeric	2
PCI_FNC	The function number for the Config address of a NIC port that is used as the management path. (a hexadecimal number)	Numeric	1
SWITCH_TIME	The threshold time for switching the management paths in link-down (sec) { 0 to 30 *} Note the following items. -The management paths are not switched in link-down when you set 0 at this option. - * is output when "ManagePathSwitch" is set to "OFF". - A value of this parameter is common between the management path IDs 0 and 1.	Numeric	2
(*1): If management path redundancy is not configured, the fields output "*".			
(*2): When you desire to get the latest state, you are required to execute the "get MgmtStandbyPortStatus" command and then execute the "get ConfigAll" command.			

Table 2-61 IPV6_ CONFIGURATION record

Field	Contents	Data type	Max. digits
NAME	IP addresses of the HVM and its communication counterpart "HVM_IP": HVM IP address "DEF_GW": HVM default gateway "SVP_IP": SVP IP address "CLIn_IP": CLI IP address (n=1,2...8) "ROUTER_GW": Router default gateway detected by router searching	Character	16
METHOD	If the NAME field contains an "HVM_IP" address, this field shows the method of assigning an IP address. { STATIC STATELESS LINK_LOCAL * } If NAME field does not say "HVM_IP", this field shows " * ".	Character	16
IP	IPv6 IP address e.g. fe80::1ce:c0ff:ee:cafe	Character	40
PREFIX_LEN	If the NAME field contains an "HVM_IP" address, this field shows the length of the subnet prefix. If NAME field does not say "HVM_IP", this field shows " * ".	Numeric	3

Table 2-62 NETWORK_PORT_INFORMATION record

Field	Contents	Data type	Max. digits
NAME	HVM communication interface name { SVP1 SVP2 HVM1 HVM2 HVM3 }	Character	16
PORT	Port No.	Numeric	5

Table 2-63 DNS_CONFIGURATION record

Field	Contents	Data type	Max. digits
NAME	The names for the IP addresses of DNS servers { DNS1_IP DNS2_IP DNS3_IP }	Character	16
IP	The names for the IPv4 or IPv6 addresses of DNS servers e.g. fe80::1ce:c0ff:ee:café or 192.168.000.001 Note that "NONE" is displayed if you configure no setting.	Character	40

Table 2-64 AUDIT_LOG_CONFIGURATION record

Field	Contents	Data type	Max. digits
SERVER1	Information on Audit log server 1 to be accessed (The IPv4 address, the IPv6 address, or the host name) Note that "*" is displayed if you configure no setting.	Character	256
SERVER2	Information on Audit log server 2 to be accessed (The IPv4 address, the IPv6 address, or the host name) Note that "*" is displayed if you configure no setting.	Character	256
PORT	The port number to be used on audit log servers (one of 1 to 65535)	Numeric	5
PROTOCOL	The protocol to be used for communication with audit log servers { UDP TLS1.0 TLS1.2 }	Character	8
VERIFY	Whether verification of certificate is enabled or disabled	Character	8
POLICY	Events to be retrieved as audit log { Authentication Auth+Modify }	Character	16

Table 2-65 LDAP_CONFIGURATION record

Field	Contents	Data type	Max. digits
SERVER1	Information on LDAP server 1 (The IPv4 address, the IPv6 address, or the host name) Note that "*" is displayed if you configure no setting.	Character	256
SERVER2	Information on LDAP server 2 (The IPv4 address, the IPv6 address, or the host name) Note that "*" is displayed if you configure no setting.	Character	256
SERVER3	Information on LDAP server 3 (The IPv4 address, the IPv6 address, or the host name) Note that "*" is displayed if you configure no setting.	Character	256
PORT	Port numbers of LDAP servers (one of 1 to 65535)	Numeric	5
ANONYMOUS_BIND	Whether anonymous binding is enabled or disabled	Character	8
LOGIN_ID_ATTRIBUTE	Attribution of login ID Note that a blank is displayed if you configure no setting.	Character	64
BASE_DN	Base DN Note that a blank is displayed if you configure no setting.	Character	254
BIND_DN	BIND DN Note that a blank is displayed if you configure no setting.	Character	254
COMMON_ROLE#	Role number indicating a user authenticated by LDAP {0 to the supported number of user-defined roles *} Note the following two items. - 0 is the role number with all permissions in an HVM. - * is displayed when RoleBasedAccessControl is set to "OFF".	Numeric	3
COMMON_ROLE_NAME	Role name indicating a user authenticated by LDAP Note that "Administrators" is displayed when the field "COMMON_ROLE#" shows 0.	Character	32

Table 2-66 RADIUS_CONFIGURATION record

Field	Contents	Data type	Max. digits
#	Number of RADIUS server { 1 to 3} This number is used for HVM to manage RADUIS servers.	Numeric	1
SERVER	Network information on RADIUS server { IPv4 address IPv6 address host name} Note that "*" is displayed when no value is set.	Character	256
PORT	Port number of RADIUS server { 1 to 65535}	Numeric	5
RETRY	The times of retries in failure of communication with RADIUS servers	Numeric	3
TIMEOUT	The timeout period for determining a failure of communication with RADIUS servers { 1 to 10 seconds}	Numeric	3
METHOD	Protocol for RADIUS authentication	Character	16
COMMON_ROLE#	Role number indicating a user authenticated by RADIUS { 0 to the supported number of user-defined roles *} Note the following two items. - 0 is the role number with all permissions in an HVM. - This value is shared by all RADIUS servers.	Numeric	3
COMMON_ROLE_NAME	Role name indicating a user authenticated by LDAP Note that "Administrators" is displayed when the field "COMMON_ROLE#" shows 0.	Character	32

Table 2-67 ROLE_CONFIGURATION record

Field	Contents	Data type	Max. digits
ROLE#	Role number, which is originally equipped with HVM or is defined by a user, indicating a user { 0 to the supported number of user-defined roles *} Note that 0 is the role number with all permissions in an HVM.	Numeric	3
NAME	Role name indicating a user Note the following two items. - A blank " " is displayed when no value is set. - "Administrators" is displayed when the field "COMMON_ROLE#" shows 0.	Character	32
RBAC_Security	Whether the HVM security permission is enabled or disabled { ON OFF}	Character	3

Table 2-68 CURRENT_PERMISSION record

Field	Contents	Data type	Max. digits
NAME	Characters indicating security permissions assigned to the current login user "RBAC_Security": the HVM security permission	Character	32
VALUE	Value indicating whether a security permission is assigned to the current login user. "ON ": A security permission is assigned "OFF": A security permission is not assigned	Character	3

Table 2-69 CACHE_ASSIGN_INFORMATION record

Field	Contents	Data type	Max. digits
BLADE#	Server blade number	Numeric	2
SOCKET#	Socket number	Numeric	2
CACHE_TYPE	Cache type for the fields below (CACHE_SIZE to CBM). { L3C} Note that the number of cache types is subject to increase.	Character	8
CACHE_SIZE	Cache size (KB) per socket	Numeric	10
MAX_COS	The number of entries of COS (Class of Service) per socket	Numeric	4
CBM_WIDTH	The number of bits of CBM (Capacity Bitmask)	Numeric	4
DEFAULT_CBM	Value of CBM by default (in hexadecimal system)	Numeric	16
HOST_CBM	Value of CBM for the host (in hexadecimal system)	Numeric	16
COS#	COS entry number (0 to (MAX COS-1))	Numeric	4
COS	Value indicating the source of the CBM value at COS { LPAR number D H *} Note: "D" indicates the default value of CBM. "H" indicates the value of CBM for the host. "*" indicates the target COS is not being used.	Character	3
CBM	Value of CBM at COS { <i>hexadecimal</i> <i>Default</i> } Note: Mask bits are in hexadecimal system. "bit[n]=1" shows assignment of cache way[n]. "*" is displayed when "*" is set at COS.	Numeric	16
*: The values of the fields "CACHE_SIZE" to "DEFAULT_CBM" are common among records with the same value set at CACHE TYPE.			

Table 2-70 MIGRATED_VNIC_INFORMATION record

Field	Contents	Data type	Max. digits
L#	LPAR number	Numeric	2
SEED_SYS	VNIC system number used for creating a virtual NIC MAC	Numeric	4
SEED_LPAR	LPAR number used for creating a virtual NIC MAC	Numeric	2

Table 2-71 MIGRATED_VFC_INFORMATION record

Field	Contents	Data type	Max. digits
Location	Installed location of PCI device. Note: For details, see Description Format for Device Location .	Character	6
PORT#	Port number	Numeric	2
LOG_SLOT	Logical slot number (HVM internal information corresponding to installed location)	Numeric	3
VFC#	VFC ID	Numeric	2
WWPN	WWPN	Character	64
WWNN	WWNN	Character	64
VFC_SEED	VFC seed information	Numeric	8

Table 2-72 LPAR_ACPI_SETTING record

Field	Contents	Data type	Max. digits
L#	LPAR number	Numeric	2
NAME	LPAR name.	Character	31
VPCI_Bridge	The setting of the virtual PCI bridge definition. { Enable Disable * }	Character	10

The following table lists the HvmSh versions and the HVM firmware versions supporting each field. For the details of HvmSh V7.xor lower, see Rev. 7.40 or lower of this manual.

Table 2-73 Supported status and versions of each field

Record	Field	HvmSh command version	HVM version	
			Compute Blade	
			500	2500
HVM_INFORMATION		V7.xor lower	All	All
CHASSIE_CONFIGURATION		V7.xor lower	All for the items except the items below	All for the items except the items below
	SVP_IPv6	V8.6 or higher	02-25 or higher	02-25 or higher
BLADE_CONFIGURATION		V4.0 or higher	All	All
	PRODUCT_NAME	V8.3 or higher	01-20 or higher	All
	PCID (*2)	V10.0 or higher	02-62 or higher	02-62 or higher
	IBRS_IBPB (*2)	V10.0 or higher	02-62 or higher	02-62 or higher
	SSBD (*3)	V10.0 or higher	02-63 or higher	02-63 or higher
	MDClear (*5)	V10.3 or higher	02-67 or higher	02-67 or higher
HVM_CONFIGURATION		V4.0 or higher	All	All
	PASSWD_EXPIRY	V8.4 or higher	02-05 or higher	02-05 or higher
	HVM_SVP_COMMUN	V8.6 or higher	02-25 or higher	02-25 or higher
	IPv6_STATIC	V8.6 or higher	02-25 or higher	02-25 or higher
	IPv6_STATELESS	V8.6 or higher	02-25 or higher	02-25 or higher
	AUTHENTICATION_METHOD	V9.0 or higher	02-40 or higher	02-40 or higher
	AUTHENTICATION_LOGIN_VALID_TIME	V9.0 or higher	02-40 or higher	02-40 or higher
	KEEP_CONFIG	V9.6 or higher	02-56 or higher	02-56 or higher
	VNIC_IM	V9.6 or higher	02-56 or higher	02-56 or higher
	PProcProactiveFailover	V9.9 or higher	—	—
	SYS2_DUMP	V10.0 or higher	02-63 or higher	02-63 or higher
	L1D_FLUSH (*3)	V10.1 or higher	02-64 or higher	02-64 or higher
	CORE_SCD (*4)	V10.2 or higher	02-65 or higher	02-65 or higher
GROUP_CONFIGURATION (*1)		V5.0 or higher	All	All
LPAR_CONFIGURATION		V7.x or lower	All	All
	GUEST_NUMA	V8.0 or higher	01-80 or higher	All
	IDLE_MODE	V8.0 or higher	01-80 or higher	All
	MSHYP_PRTE	V8.6 or higher	02-25 or higher	02-25 or higher
	LOW_LATENCY	V8.7 or higher	02-27 or higher	02-27 or higher
	EPT_1GB	V8.7 or higher	02-27 or higher	02-27 or higher
	NUMA_BIND_LPROC	V9.0 or higher	02-40 or higher	02-40 or higher
	HPET	V9.6 or higher	02-56 or higher	02-56 or higher
	L3_CBM	V9.5 or higher	02-55 or higher	02-55 or higher
	PCID (*2)	V9.9 or higher	02-62 or higher	02-62 or higher
	IBRS_IBPB (*2)	V9.9 or higher	02-62 or higher	02-62 or higher
	SSBD (*3)	V10.0 or higher	02-63 or higher	02-63 or higher
	MDClear (*5)	V10.3 or higher	02-67 or higher	02-67 or higher
BSM_CONFIGURATION		V7.x or lower	All	All
FW_VERSION_INFORMATION		V7.x or lower	All	All
PHYSICAL_CPU_CONFIGURATION		V7.x or lower	All	All
	ALLOCATABLE (*4)	V10.2 or higher	02-65 or higher	02-65 or higher

Record	Field	HvmSh command version	HVM version	
			Compute Blade	
			500	2500
	LPAR# (*4)	V10.2 or higher	02-65 or higher	02-65 or higher
VNIC_SEGMENT_INFORMATION		V7.x or lower	All	All
PHYSICAL_IO_CONFIGURATION		V7.x or lower	All for the items except the items below	All for the items except the items below
	CORE_DED	V8.6 or higher	02-25 or higher	02-25 or higher
	CORE_NUM	V8.6 or higher	02-25 or higher	02-25 or higher
	IO_CONNECT	V9.0 or higher	02-40 or higher	02-40 or higher
	PERSONALITY	V9.2 or higher	02-45 or higher	02-45 or higher
	PORT_DED	V9.2 or higher	02-45 or higher	02-45 or higher
PHYSICAL_IO_ASSIGN_INFORMATION		V7.x or lower	All for the items except the items below	All for the items except the items below
	PORT_DED	V9.2 or higher	02-45 or higher	02-45 or higher
	PCI_SEG	V9.2 or higher	All	All
	PCI_BUS	V9.2 or higher	All	All
	PCI_DEV	V9.2 or higher	All	All
VFC_ASSIGN_INFORMATION		V7.x or lower	All for the items except the items below	All for the items except the items below
	CORE_DED	V8.6 or higher	02-25 or higher	02-25 or higher
	IO_CONNECT	V9.0 or higher	02-40 or higher	02-40 or higher
	LUID_SCAN	V9.0 or higher	02-40 or higher	02-40 or higher
	PORT_DED	V9.2 or higher	02-45 or higher	02-45 or higher
	PCI_SEG	V9.2 or higher	All	All
	PCI_BUS	V9.2 or higher	All	All
	PCI_DEV	V9.2 or higher	All	All
VNIC_ASSIGN_INFORMATION		V7.x or lower	All	All
LOGICAL_CPU_CONFIGURATION		V7.x or lower	All for the items except the items below	All for the items except the items below
MEMORY_ASSIGN_INFORMATION		V7.x or lower	All	All
VCOM_ASSIGN_INFORMATION (*1)		V7.x or lower	All	All
MAX_VALUE_INFORMATION (*1)		V7.x or lower	All	All
HVM_FACILITY_INFORMATION (*1)		V7.x or lower	All	All
LPAR_INITIAL_INFORMATION(*1)		V7.x or lower	All for the items except the items below	All for the items except the items below
	PCID (*2)	V9.9 or higher	02-62 or higher	02-62 or higher
	IBRS_IBPB (*2)	V9.9 or higher	02-62 or higher	02-62 or higher
	SSBD (*3)	V10.0 or higher	02-63 or higher	02-63 or higher
	MDClear (*5)	V10.3 or higher	02-67 or higher	02-67 or higher
LOGICAL_CPUID_INFORMATION (*1)		V7.x or lower	All	All
AVAILABLE_LIST (*1)		V7.x or lower	01-20 or higher	All
LPAR_NUMA_MEMORY_ASSIGN_INFORMATION (*1)		V8.0 or higher	01-80 or higher	All
LPAR_NUMA_CPU_ASSIGN_INFORMATION (*1)		V9.0 or higher	02-40 or higher	02-40 or higher

Record	Field	HvmSh command version	HVM version	
			Compute Blade	
			500	2500
SEC_MODE (*1)		V8.0 or higher	01-80 or higher for the items except the items below	All for the items except the items below
	AUTHENTICATION	V8.4 or higher	02-05 or higher	02-05 or higher
CERTIFICATE (*1)		V8.0 or higher	01-80 or higher	All
SSH_HOST_KEY (*1)		V8.4 or higher	02-05 or higher	02-05 or higher
MANAGEMENT_PATH (*1)		V8.5 or higher	02-20 or higher for the items except the items below	02-20 or higher for the items except the items below
	PCI_SEG	V9.2 or higher	02-45 or higher	02-45 or higher
	PCI_BUS	V9.2 or higher	02-45 or higher	02-45 or higher
	PCI_DEV	V9.2 or higher	02-45 or higher	02-45 or higher
	SWITCH_TIME	V9.5 or higher	02-55 or higher	02-55 or higher
IPV6_CONFIGURATION		V8.6 or higher	02-25 or higher	02-25 or higher
NETWORK_PORT_INFORMATION (*1)		V8.6 or higher	02-25 or higher	02-25 or higher
DNS_CONFIGURATIONY (*1)		V9.0 or higher	02-40 or higher	02-40 or higher
AUDIT_LOG_CONFIGURATION (*1)		V9.0 or higher	02-40 or higher	02-40 or higher
LDAP_CONFIGURATION (*1)		V9.0 or higher	02-40 or higher for the items except the items below	02-40 or higher for the items except the items below
	COMMON_ROLE#	V9.2 or higher	02-45 or higher	02-45 or higher
	COMMON_ROLE_NAME	V9.2 or higher	02-45 or higher	02-45 or higher
RADIUS_CONFIGURATION (*1)		V9.2 or higher	02-45 or higher	02-45 or higher
ROLE_CONFIGURATION (*1)		V9.2 or higher	02-45 or higher	02-45 or higher
CURRENT_PERMISSION (*1)		V9.2 or higher	02-45 or higher	02-45 or higher
CACHE_ASSIGN_INFORMATION (*1)		V9.5 or higher	02-55 or higher	02-55 or higher
MIGRATED_VNIC_INFORMATION		V10.0 or higher	02-63 or higher	02-63 or higher
MIGRATED_VFC_INFORMATION		V10.0 or higher	02-63 or higher	02-63 or higher
LPAR_ACPI_SETTING		V10.3 or higher	02-67 or higher	02-67 or higher
*1: When this field is not supported, the record is not output.				
*2: Supported by CB2000 59-82/79-82 or higher, or CB320 17-95 or higher.				
*3: Supported by CB2000 59-84/79-84 or higher.				
*4: Supported by CB2000 59-85/79-85 or higher.				
*5: Supported by CB2000 59-87/79-87 or higher.				

get ConfigSummary

Overview

This command gets the information of the PCID function, the IBRS/IBPB function, the SSBD function and the MDClear function.

Syntax

```
get ConfigSummary summary={pcidibrs|cpufeatures}
```

Option

The “summary=cpufeatures” option supports Version 10.0 or higher of HvmSh. When you use “get ConfigSummary” command, “cpufeatures” option is better than “pcidibrs” option.

Related function

GuestPCID (The function for setting the capability of PCID)

GuestIBRS (The function for setting the capability of IBRS and IBPB)

GuestSSBD (The function for setting the capability of SSBD)

GuestMDClear (The function for setting the capability of MDClear)

Required authority

None

Response message

(Syntax)

Begin<tab>1.0<CRLF>

[RECORD_NAME]<CRLF>

<tab>FIELD_NAME<tab>FIELD_NAME<tab>...<CRLF>

<tab>FIELD_VALUE<tab>FIELD_VALUE<tab>...<CRLF>

:

End<CRLF>

• Summary configuration for cpufeatures

When the summary={pcidibrs|cpufeatures} option is specified, you get records as below (Table 2-74, Table 2-75, Table 2-76).

Table 2-74 SYSTEM_SUMMARY record

[In the case "summary=pcidibrs" option is specified.]

Field	Content	Data type	Max. digits
BladeIBRS (*1)	Displays whether the IBRS/IBPB function is supported by the server blade. {ON OFF}	Character	8
GuestPCID (*1) (*2) (*3)	Displays whether the function for enabling or disabling the capability of PCID function for LPARs is supported. {ON OFF}	Character	8
GuestIBRS (*1) (*2)	Displays whether the function for enabling or disabling the capability of IBRS/IBPB function for LPARs is supported. {ON OFF}	Character	8
*1: Summary of the BLADE_CONFIGURATION record of the get ConfigAll command. *2: Summary of the information in the same field of Table 2-15 List of Function names. *3: In the following server blade, GuestPCID is "OFF" and the capability of PCID function for the LPAR is enabled. CB2500 : All blade servers except CB520Xx1 CB500 : CB520Hx3 / CB520Hx4 / CB520Xx2 / CB520Xx3			

[In the case "summary= cpufeatures" option is specified.]

Field	Content	Data type	Max. digits
BladePCID (*1)	Displays whether the PCID function is supported by the server blade. {ON OFF}	Character	8
GuestPCID (*2) (*3)	Displays whether the function for enabling or disabling the capability of PCID function for LPARs is supported. {ON OFF}	Character	8
BladeIBRS (*1)	Displays whether the IBRS/IBPB function is supported by the server blade. {ON OFF}	Character	8
GuestIBRS (*2)	Displays whether the function for enabling or disabling the capability of IBRS/IBPB function for LPARs is supported. {ON OFF}	Character	8
BladeSSBD (*1)	Displays whether the SSBD function is supported by the server blade. {ON OFF}	Character	8
GuestSSBD (*2)	Displays whether the function for enabling or disabling the capability of SSBD function for LPARs is supported. {ON OFF}	Character	8
BladeMDClear (*1) (*4)	Displays whether the MDClear function is supported by the server blade. {ON OFF}	Character	8
GuestMDClear (*2) (*4)	Displays whether the function for enabling or disabling the capability of MDClear function for LPARs is supported. {ON OFF}	Character	8
MDClear_SW (*2) (*4) (*5)	Displays whether the MDClear function by the software is supported by HVM. {ON OFF}	Character	8
MDClear_HW (*2) (*4)	Displays whether the MDClear function by the hardware is supported by HVM. {ON OFF}	Character	8

- *1: Summary of the BLADE_CONFIGURATION record of the get ConfigAll command.
- *2: Summary of the information in the same field of Table 2-15 List of Function names.
- *3: In the following server blade, GuestPCID is "OFF" and the capability of PCID function for the LPAR is enabled.
 - CB2500 : All blade servers except CB520Xx1
 - CB500 : CB520Hx3 / CB520Hx4 / CB520Xx2 / CB520Xx3
- *4: Supported by HvmSh Ver. 10.3 or higher.
- *5: This function is for the following servers.
 - CB2000 Standard server blade: X55A1/X55A2 models
 - CB2000 High-performance server blade: X57A1/X57A2 models

Table 2-75 LPAR_INITIAL_INFORMATION record

Field	Content	Data type	Max. digits
PCID (*1)	The default value of the capability of PCID function for LPARs. { Enable Disable * }	Character	8
IBRS_IBPB (*1)	The default value of the capability of IBRS/IBPB function for LPARs. { Enable Disable * }	Character	8
*1: Summary of the LPAR_INITIAL_INFORMATION record of the get ConfigAll command.			

In the case "summary= cpufeatures" option is specified, the following fields are also output.

Field	Content	Data type	Max. digits
SSBD (*1)	The default value of the capability of SSBD function for LPARs. { Enable Disable * }	Character	8
MDClear (*1) (*2)	The default value of the capability of MDClear function for LPARs. { Enable Disable * }	Character	8
*1: Summary of the LPAR_INITIAL_INFORMATION record of the get ConfigAll command.			
*2: Supported by HvmSh Ver. 10.3 or higher.			

Table 2-76 LPAR_CONFIGURATION record

Field	Content	Data type	Max. digits
L#	LPAR number	Numeric	2
NAME (*1)	LPAR name	Character	31
STATUS (*1)	LPAR status	Character	10
PCID (*1)	Displays whether the capability of PCID function for the LPAR is enabled or disabled. { Enable Disable * }	Character	8
IBRS_IBPB (*1)	Displays whether the capability of IBRS/IBPB function for the LPAR is enabled or disabled. { Enable Disable * }	Character	8
*1: Summary of the LPAR_CONFIGURATION record of the get ConfigAll command.			

In the case "summary= cpufeatures" option is specified, the following fields are also output.

Field	Content	Data type	Max. digits
SSBD (*1)	Displays whether the capability of SSBD function for the LPAR is enabled or disabled. { Enable Disable * }	Character	8
MDClear (*1) (*2)	Displays whether the capability of MDClear function for the LPAR is enabled or disabled. { Enable Disable * }	Character	8
*1: Summary of the LPAR_CONFIGURATION record of the get ConfigAll command.			
*2: Supported by HvmSh Ver. 10.3 or higher.			

Notes

—

HVM statistics information

get HvmPerfMon

Overview

This command gets HVM statistical information.

Syntax

```
get HvmPerfMon  
  filename=temporary file name  
  [noconf] [nocpu] [nomem] [nonic] [nohba] [nodetail] [excpu]  
  [exio][hvm]
```

Option

- You are required to set an absolute file path from the root directory to a target temporary filename. The file size is up to 1600KB (1.6MB) when you do not specify the options "excpu" or "HVM", whereas, the file size up to 1850KB (1.85MB) when you specify both options.
- By specifying the output extension options, you can obtain more detailed statistics information. This option is supported by the HvmSh version 6.0 or higher. It is recommended that you specify the excpu exio hvm option when using the HvmSh commands of Version 6.0 or higher.

Table 2-77 Output suppression/extension options for HvmPerfMon HVM interface

HVM statistical information	Application of output suppression options						Output extension options		
	noconf	nocpu	nomem	nonic	nohba	nodetail	excpu	exio	hvm
MONITORING_INFORMATION									
SYSTEM_CONFIGURATION	X								
LPAR_CONFIGURATION	X								
SYSTEM_USAGE_SUMMARY							O (*5)		
SYSTEM_CPU_USAGE		X					O (*4)		O (*7)
SYSTEM_MEM_USAGE			X						
LPAR_CPU_USAGE		X					O (*1)		O (*8)
PHYSICAL_CPU_USAGE		X					O (*3)		
PHYSICAL_NIC_USAGE				X				O (*3)	O (*4)
PHYSICAL_HBA_USAGE					X			O (*3)	
LOGICAL_CPU_USAGE		X					O (*6)		
LOGICAL_NIC_USAGE				X				O (*3)	
LOGICAL_HBA_USAGE					X			O (*5)	
PHYSICAL_CPU_DETAIL		X				X	O (*3)		
LOGICAL_CPU_DETAIL		X				X	O (*2) (*8)		
GROUP_USAGE		X				X	O (*3)		
PHYSICAL_CPU_GROUP_USAGE		X				X	O (*3)		
LPAR_CPU_GROUP_USAGE		X				X			
VF_NIC_USAGE								O (*9) (*10)	
CACHE_USAGE							O (*11)		
<p>X: Not output</p> <p>O: Output extended field by specifying output suppression/extension options.</p> <p>*1: Supported by HvmSh Ver. 5.0 or higher.</p> <p>*2: Supported by HvmSh Ver. 5.1 or higher.</p> <p>*3: Supported by HvmSh Ver. 5.5 or higher.</p> <p>*4: Supported by HvmSh Ver. 5.6 or higher.</p> <p>*5: Supported by HvmSh Ver. 6.2 or higher.</p> <p>*6: Supported by HvmSh Ver. 6.4 or higher.</p> <p>*7: Supported by HvmSh Ver. 7.1 or higher.</p> <p>*8: Supported by HvmSh Ver. 7.3 or higher.</p> <p>*9: Supported by HvmSh Ver. 8.3 or higher.</p> <p>*10: This command outputs the times of interrupts (INT) of VF-NIC ports with the SR-IOV function. The statistics of "PHYSICAL_NIC_USAGE" and "LOGICAL_NIC_USAGE" does not include those of VF NIC ports with the SR-IOV function.</p> <p>*11: Supported by HvmSh Ver.9.5or higher</p>									

Related function

None

Required authority

None

Response message

(Syntax)

Begin<tab>1.0<CRLF>

[Record name]<CRLF>

<tab>Field name<tab>Field name<tab>...<CRLF>

<tab>Field value<tab>Field value<tab>...<CRLF>

...

End<CRLF>

For the details of each record or field, see the following table.

Table 2-78 Summary of HVM statistical information records

Record name	Content	Number of records
MONITORING_INFORMATION	Information on statistical information monitoring.	1
SYSTEM_CONFIGURATION	HVM system information.	1
LPAR_CONFIGURATION	LPAR configuration information.	No. of defined LPARs (*1)
SYSTEM_USAGE_SUMMARY	Resource usage of HVM.	4
SYSTEM_CPU_USAGE	CPU usage of HVM.	4
SYSTEM_MEM_USAGE	Memory usage of HVM.	2
LPAR_CPU_USAGE	CPU usage of LPAR.	No. of activated LPARs (*2,*7)
PHYSICAL_CPU_USAGE	CPU usage in physical layer.	No. of physical CPU cores
PHYSICAL_NIC_USAGE	NIC usage in physical layer.	No. of physical NIC ports
PHYSICAL_HBA_USAGE	HBA usage in physical layer.	No. of physical HBA ports (*3)
LOGICAL_CPU_USAGE	CPU usage in logical layer.	No. of logical CPUs (*2,*7)
LOGICAL_NIC_USAGE	NIC usage in logical layer.	No. of logical NIC ports (*2, *4)
LOGICAL_HBA_USAGE	HBA usage in logical layer.	No. of logical HBA ports (*2, *5)
PHYSICAL_CPU_DETAIL	Details of CPU usage in physical layer.	No. of physical CPUs
LOGICAL_CPU_DETAIL	Details of CPU usage in logical layer.	No. of logical CPUs (*2)
GROUP_USAGE	CPU usage of processor group.	No. of defined processor group
PHYSICAL_CPU_GROUP_USAGE	CPU usage in physical layer of each processor group.	No. of physical CPU cores
LPAR_CPU_GROUP_USAGE	CPU usage in logical layer of each processor group.	No. of logical CPUs (*2,*7)
VF_NIC_USAGE	SR-IOV usage in SR-IOV.	No. of VF NIC ports
CACHE_USAGE	L3 cache usage	No. of sockets x No. of activated LPARs (*6)
<p>*1: When there is no defined LPAR, only the record name and the field titles are shown without content. *2: When there is no activated LPAR, only the record name and the field titles are shown without content. *3: When there is no installed HBA, only the record name and the field titles are shown without content. *4: No record is shown for NICs allocated as dedicated NICs or VF NICs. *5: No record is shown for HBAs allocated as dedicated HBAs. *6: No record is shown for HVMs not supporting L3CacheAllocationCMT(The L3 cache allocation function) *7: If the guest OS uses the MWAIT instruction with the LPAR for which the guest idle mode is set to "mwait", CPUs excluding those in the guest idle status are counted as the CPU resources used by LPAR.</p>		

Table 2-79 MONITORING_INFORMATION record

Field	Content	Data type	Max. digits
HVM_ID	HVM identifier. *: Refer to "Notes for HVM ID" - "Notes for situation-dependent message".	Character	16
PRODUCT	Product name e.g. "HVM 57-30(00-00) ".	Character	64
CURR_DATE_TIME	Date and time when HVM statistical information is created by HvmPerfMon HVM interface this time.	Date and time (*)	29
PREV_DATE_TIME	Date and time when HVM statistical information was created by HvmPerfMon HVM interface last time.	Date and time (*)	29
INTERVAL_TIME	Interval time from PREV_DATE_TIME to CURR_DATE_TIME.	Numeric (seconds)	3
Date and time: YYYY/MM/DD HH:MM:SS GMT+hh:mm			

Table 2-80 SYSTEM_CONFIGURATION record

Field	Content	Data type	Max. digits
CORES	No. of physical CPU cores allocatable to LPARs. Not include No. of spare cores for capacity on Demand. (*1) Not include No. of degenerated cores. (*1)	Numeric	3
CPUs	No. of physical CPUs allocatable to LPARs. The quantity depends on whether SMT (simultaneous multithreading) is enabled or not. <ul style="list-style-type: none"> When SMT is enabled: No. of threads. When SMT is disabled: No. of cores. 	Numeric	3
NICs	No. of NIC ports installed in the server blade. Not include PCI device ports which in PCI block or hot remove status. (*2)	Numeric	3
HBAs	No. of HBA ports installed in the server blade. Not include PCI device ports which in PCI block or hot remove status. (*2)	Numeric	3
MEM	Amount of memory installed in the server blade.	Numeric (MB)	6
DEF_LPARs	No. of defined LPARs.	Numeric	2
ACT_LPARs	No. of activated LPARs.	Numeric	2
CPU_CAP	Total amount of CPU resource installed in the server blade (<i>CORE_CAP</i> × <i>CORES</i>).	Numeric (MHz)	6
NIC_CAP	Maximum aggregate throughput of NICs installed in the server blade.	Numeric (Mbps)	6
HBA_CAP	Maximum aggregate throughput of HBAs installed in the server blade.	Numeric (Mbps)	6
CORE_CAP	Amount of CPU resource per CPU core (reference frequency).	Numeric (MHz)	6
SYS_MEM	Amount of memory used by HVM system layer.	Numeric (MB)	6
LPAR_MEM	Amount of memory allocatable to LPARs.	Numeric (MB)	6
*1: After "core activation" or "core degeneration" occurs, the first execution of the "get HvmperfMon" command ends with the error "0x101F002x". *2: After "PCI block" or "hot remove" occurs, the first execution of the "get HvmPerfMon" command ends with the error "0x101F002x".			

Table 2-81 LPAR_CONFIGURATION record

Field	Content	Data type	Max. digits
L#	LPAR No. of defined LPAR.	Numeric	2
NAME	LPAR name.	Character	31
STATE	LPAR status. <ul style="list-style-type: none"> • ACT: Activated. • DEACT: Deactivated. • ACTPEND: Activation pending (in progress). • DEACTPEND: Deactivation pending (in progress). • FAILURE: Failing. 	Character	10
MODE	Mode of CPU allocation. <ul style="list-style-type: none"> • S: Shared. • D: Dedicated. 	Character	1
CORES	No. of CPU cores for this LPAR.	Numeric	3
CPUs	No. of CPUs for this LPAR.	Numeric	3
NICs	No. of shared NIC ports allocated to this LPAR.	Numeric	3
HBAs	No. of shared HBA ports allocated to this LPAR.	Numeric	3
MEM	Amount of memory allocated to this LPAR.	Numeric(MB)	6
CPU_CAP	Amount of CPU resource allocated to this LPAR. The value depends on whether SMT (simultaneous multithreading) is enabled or not. <ul style="list-style-type: none"> • When SMT is enabled: The value is derived from the formula "<i>CORE_CAP in SYSTEM_CONFIGURATION record</i> / 2 × CPUs". • When SMT is disabled: The value is derived from the formula "<i>CORE_CAP in SYSTEM_CONFIGURATION record</i> × CPUs". 	Numeric(MHz)	6
CPU_MAX	Maximum amount of CPU resource usable by this LPAR. If a shared-mode CPU is allocated to this LPAR, the value of CPU_MAX is determined by the combination of MODE, CC, and CPU_CAP settings as follows: <ul style="list-style-type: none"> • When MODE=D, the value of CPU_MAX is the value of CPU_CAP. • When MODE=S and CC=N, the value of CPU_MAX is the value of CPU_CAP. • When MODE=S and CC=Y: <ul style="list-style-type: none"> • If CPU_CAP is equal to or smaller than CPU_SRV, the value of CPU_MAX is the value of CPU_CAP. • If CPU_CAP is greater than CPU_SRV, the value of CPU_MAX is the value of CPU_SRV. 	Numeric (MHz)	6
CPU_WIGHT	Guaranteed weight for using CPU resource in the event of contention among LPARs on a shared-mode CPU (same value as that of "Service Ratio" displayed on HVM screen). On an LPAR allocated to a dedicated-mode CPU, "*" is shown.	Numeric	3
CPU_SRV	Guaranteed amount of CPU resource in the event of contention among LPARs on a shared-mode CPU. CPU_SRV value becomes same to the CPU SRV field in the LPAR CPU GROUP USAGE when processor group exist. On an LPAR allocated to a dedicated-mode CPU, "*" is shown.	Numeric (MHz)	6
CPU_SRV%	Guaranteed ratio of CPU resource in the event of contention among LPARs on a shared-mode CPU, derived from the formula " <i>CPU_SRV / CAPACITY in SHR_LPAR line of SYSTEM_CPU_USAGE record</i> ". On an LPAR allocated to a dedicated-mode CPU, "*" is shown.	Numeric (%)	3 for integer, 2 for fraction
CPU_MAX%	Ratio of maximum amount of CPU resource usable by this LPAR derived from the formula " <i>CPU_MAX / CPU_CAP</i> ".	Numeric (%)	3 for integer, 2 for fraction
CPU_SRVs	Guaranteed No. of CPU cores for CPU resource in the event of contention among LPARs on a shared-mode CPU, derived from the formula " <i>CPU_SRV / CORE_CAP in SYSTEM_CONFIGURATION record</i> ". On an LPAR allocated to a dedicated-mode CPU, "*" is shown.	Numeric	3 for integer, 2 for fraction

Field	Content	Data type	Max. digits
CC	Capping status of shared-mode CPU. <ul style="list-style-type: none"> N: Disabled. Y: Enabled. On an LPAR allocated to a dedicated-mode CPU, "*" is shown.	Character	1
ID	Action on detection of CPU idle state. <ul style="list-style-type: none"> N: Does not allow resources of idle-state CPU to be used by other LPARs. Y: Allows resources of idle-state CPU to be used by other LPARs. 	Character	1
NIC_CAP	Aggregate throughput of NICs usable by this LPAR, derived from the summation of CAPACITY in PHYSICAL_NIC_USAGE record for NICs allocated to this LPAR.	Numeric (Mbps)	6
HBA_CAP	Aggregate throughput of HBAs usable by this LPAR, derived from the summation of CAPACITY in PHYSICAL_HBA_USAGE record for HBAs allocated to this LPAR.	Numeric (Mbps)	6
AFFINITY	List of physical CPUs usable by this LPAR. Not supported on this version. "*" is shown.	Character	32
INFORMATION	OS type in combination of the following factors: <ul style="list-style-type: none"> Windows or Linux 32-bit mode or 64-bit mode Example: "Windows (x86)" or "Linux (x64)" On an LPAR running EFI pre-boot firmware or unknown OS type, "*" is shown.	Character	64

When you set the Output Extension Option "excpu" with HvmSh Ver 10.2 or higher, the following is also output.

Field	Content	Data type	Max. digits
CORE_SRV	Guaranteed amount of processor core resource in the event of contention among LPARs on a shared-mode. On an LPAR allocated to a dedicated-mode CPU, "*" is shown. If the core scheduling is disabled, "*" is shown.	Numeric (MHz)	6

Table 2-82 SYSTEM_USAGE_SUMMARY record

Field title	Content	Data type	Max. digits																				
NAME	Resource identifier. <ul style="list-style-type: none"> CPU: CPU. MEM: Memory. NIC: NIC. HBA: HBA. 	Character	3																				
CAPACITY	Total amount of resource. <ul style="list-style-type: none"> CPU: Clock frequency of CPU cores. MEM: Total memory capacity. NIC: Total NIC throughput. HBA: Total HBA throughput. 	Numeric (MHz, MB, or Mbps)	6																				
USED	Used amount of resource. See (*1), when a resource identifier is HBA.	Numeric (MHz, MB, or Mbps)	6																				
UNUSED	Unused amount of resource. See (*1), when a resource identifier is HBA.	Numeric (MHz, MB, or Mbps)	6																				
INSUFF	Insufficient amount of resource. <ul style="list-style-type: none"> CPU: Clock frequency of CPU, or "999999" when exceeded. MEM, NIC, and HBA: "*" is shown. 	Numeric (MHz, MB, or Mbps)	6																				
USED%	Ratio of used resource derived from the formula " $USED / CAPACITY$ ". See (*1), when a resource identifier is HBA.	Numeric (%)	3 for integer, 2 for fraction																				
UNUSED%	Ratio of unused resource ($USED\% + UNUSED\% = 100$). See (*1), when a resource identifier is HBA.	Numeric (%)	3 for integer, 2 for fraction																				
INSUFF%	Ratio of insufficient resource. <ul style="list-style-type: none"> CPU: Value derived from the formula "$INSUFF / CAPACITY$", or "999.99" when exceeded. MEM, NIC, and HBA: "*" is shown. 	Numeric (%)	3 for integer, 2 for fraction																				
<p>(*1) When resource identifier is HBA, displays as follows; When exio option is not specified, "*" is shown. When exio option is specified, USED and UNUSED are shown as follows; <ul style="list-style-type: none"> USED: Sum value of the record of "LOGICAL_HBA_USAGE: USED". ($USED = \Sigma \text{LOGICAL_HBA_USAGE: USED}$) UNUSED: $CAPACITY - USED$ "*" is shown, when all values of "LOGICAL_HBA_USAGE:USED" are "*". See Table 2-92 HBA statistical support map for the condition to be able to show the values.</p> <p>(*2) The output of each resource are as follows.</p> <table> <tr> <th>NAME</th><th>CAPACITY</th><th>INSUFF</th><th>INSUFF%</th></tr> <tr> <td>CPU</td><td>Frequency of a CPU core (MHz)</td><td>Frequency of CPU (MHz)</td><td>INSUFF/CAPACITY</td></tr> <tr> <td>MEM</td><td>Memory size (MB)</td><td>*</td><td>*</td></tr> <tr> <td>NIC</td><td>NIC data transfer rate (Mbps)</td><td>*</td><td>*</td></tr> <tr> <td>HBA</td><td>HBA data transfer rate (Mbps)</td><td>*</td><td>*</td></tr> </table>				NAME	CAPACITY	INSUFF	INSUFF%	CPU	Frequency of a CPU core (MHz)	Frequency of CPU (MHz)	INSUFF/CAPACITY	MEM	Memory size (MB)	*	*	NIC	NIC data transfer rate (Mbps)	*	*	HBA	HBA data transfer rate (Mbps)	*	*
NAME	CAPACITY	INSUFF	INSUFF%																				
CPU	Frequency of a CPU core (MHz)	Frequency of CPU (MHz)	INSUFF/CAPACITY																				
MEM	Memory size (MB)	*	*																				
NIC	NIC data transfer rate (Mbps)	*	*																				
HBA	HBA data transfer rate (Mbps)	*	*																				

When you specify some value at the "excpu" option with V5.6 or higher of HvmSh, the fields listed in the above table are also output in addition of the fields listed in the following table. Note that, when the resource identifier does not show "CPU", "*" is displayed.

Field title	Content	Data type	Max. digits
COREs_USED	Number of processor cores corresponding to resources in use (USED/(CORE_CAP of SYSTEM_CONFIGURATION))	Numeric	2 for integer, 2 for fraction
COREs_UNUSED	Number of processor cores corresponding to available resources (UNUSED/(CORE_CAP of SYSTEM_CONFIGURATION))	Numeric	2 for integer, 2 for fraction
COREs_INSUFF	Number of processor cores corresponding to insufficient resources (INSUFF/(CORE_CAP of SYSTEM_CONFIGURATION))	Numeric	2 for integer, 2 for fraction
CPUs_USED	Number of physical processors corresponding to resources in use (USED/(CORE_CAP of SYSTEM_CONFIGURATION*COREs/CPUs))	Numeric	2 for integer, 2 for fraction
CPUs_UNUSED	Number of physical processors corresponding to available resources (UNUSED/(CORE_CAP of SYSTEM_CONFIGURATION*COREs/CPUs))	Numeric	2 for integer, 2 for fraction
CPUs_INSUFF	Number of physical processors corresponding to insufficient resources (INSUFF/(CORE_CAP of SYSTEM_CONFIGURATION*COREs/CPUs))	Numeric	2 for integer, 2 for fraction

Table 2-83 SYSTEM_CPU_USAGE record

Field	Content	Data type	Max. digits
NAME	HVM system identifier (*1). <ul style="list-style-type: none"> • SYS1: HVM system layer for other than shared NIC. • SYS2: HVM system layer for shared NIC. • SHR_LPAR: All LPARs to use shared-mode CPUs. • DED_LPAR: All LPARs to use dedicated-mode CPUs. 	Character	8
COREs	No. of CPU cores usable by HVM system. <ul style="list-style-type: none"> • SYS1: No. of physical CPU cores usable by SYS1 HVM. • SYS2: No. of physical CPU cores usable by SYS2 HVM. • SHR_LPAR: No. of physical CPU cores running in shared mode. • DED_LPAR: No. of physical CPU cores running in dedicated mode. Not include No. of spare cores for capacity on Demand. Not include No. of degenerated cores.	Character	3
CPUs	No. of CPUs usable by HVM system. <ul style="list-style-type: none"> • SYS1: No. of physical CPUs usable by SYS1 HVM. • SYS2: No. of physical CPUs usable by SYS2 HVM. • SHR_LPAR: No. of physical CPUs running in shared mode. • DED_LPAR: No. of physical CPUs running in dedicated mode. 	Character	3
CAPACITY	Amount of CPU resource used by LPARs. <ul style="list-style-type: none"> • SYS1: "" is shown. • SYS2: "" is shown. • SHR_LPAR: Amount of resource used by shared-mode CPU. • DED_LPAR: Amount of resource used by dedicated-mode CPU. 	Numeric	3
USED	Amount of CPU resource used by HVM system.	Numeric (MHz)	6
USED%	Ratio of CPU resource used by HVM system, derived from the formula " $USED / CPU_CAP$ in <i>SYSTEM_CONFIGURATION</i> record".	Numeric (%)	3 for integer, 2 for fraction
USED_COREs	No. of CPU cores for CPU resource used by HVM system, derived from the formula " $USED / CORE_CAP$ in <i>SYSTEM_CONFIGURATION</i> record".	Numeric	2 for integer, 2 for fraction
MODE_USED%	Ratio of CPU resource used by LPARs based on CPU scheduling mode. <ul style="list-style-type: none"> • SYS1: "" is shown. • SYS2: "" is shown. • SHR_LPAR: Ratio of resource used by shared-mode CPU, derived from the formula "$USED / CAPACITY$". • DED_LPAR: Ratio of resource used by dedicated-mode CPU, derived from the formula "$USED / CAPACITY$". 	Numeric (%)	3 for integer, 2 for fraction

When you set the Output Extension Option "excpu" with HvmSh Ver 5.6 or higher, the following is also output.

Field	Content	Data Type	Max. Digits	
CPUs_USED	Value of physical CPU number which was converted from used CPU resource. (USED / (CORE_CAP of SYSTEM_CONFIGURATION * COREs / CPUs))	Numeric	2 for integer, 2 for fraction	
(*1) When you set the Output Extension Option "hvm" with HvmSh Ver. 7.1 or higher, the output of "SYS2[n](n=0,1,...)" as a child process of SYS2 is also output. (*2) The output for each resource is as follows.				
NAME	COREs	CPUs	INSUFF	MODE_USED%
SYS1	No. of physical cores	No. of physical processors	*	*
SYS2	No. of physical cores	No. of physical processors	*	*
SHR_LPAR	No. of physical cores in shared mode	No. of physical processors in shared mode	No. of physical processors in shared mode	USED/CAPACITY
DED_LPAR	No. of physical cores in dedicated mode	No. of physical processors in dedicated mode	No. of physical processors in shared mode	USED/CAPACITY

Table 2-84 SYSTEM_MEM_USAGE record

Field	Content	Data type	Max. digits
NAME	HVM component identifier. <ul style="list-style-type: none"> • SYS: HVM system layer. • LPAR: LPAR layer. 	Character	8
USED	Amount of memory used.	Numeric (MB)	6
USED%	Ratio of memory used by HVM system, derived from the formula " <i>USED / MEM in SYSTEM_CONFIGURATION record</i> ".	Numeric (%)	3 for integer, 2 for fraction
LPAR_USED%	Ratio of memory used by LPAR. <ul style="list-style-type: none"> • SYS: "*" is shown. • LPAR: Value derived from the formula "<i>USED / LPAR_MEM in SYSTEM_CONFIGURATION record</i>". 	Numeric (%)	3 for integer, 2 for fraction

Table 2-85 LPAR_CPU_USAGE record

Field	Content	Data type	Max. digits
L#	LPAR No.	Numeric	2
NAME	LPAR name.	Character	31
USED	Amount of CPU resource used by this LPAR.	Numeric (MHz)	6
ROB	Amount of CPU resource-1 for which command execution was disrupted.	Numeric (MHz)	6
DELAY	Amount of CPU resource-2 for which command execution was suspended.	Numeric (MHz)	6
COREs	No. of CPU cores for CPU resource used by this LPAR, derived from the formula " <i>USED / CORE_CAP in SYSTEM_CONFIGURATION record</i> ".	Numeric	2 for integer, 2 for fraction
HST_USED%	Used ratio of CPU utilization on the basis of standard ratio for all CPUs, derived from the formula " <i>USED / CPU_CAP in SYSTEM_CONFIGURATION record</i> ".	Numeric (%)	3 for integer, 2 for fraction
SHR_USED%	Used ratio of CPU utilization for shared-mode CPUs allocated to this LPAR, derived from the formula " <i>USED / CAPACITY in SHR_LPAR line of SYSTEM_CPU_USAGE record</i> ". On an LPAR allocated to a dedicated-mode CPU, "*" is shown.	Numeric (%)	3 for integer, 2 for fraction
SRV_USED%	Used service ratio of CPU utilization for shared-mode CPUs allocated to this LPAR, derived from the formula " <i>USED / CPU_SRV of applicable LPAR in LPAR_CONFIGURATION record</i> ". On an LPAR allocated to a dedicated-mode CPU, "*" is shown.	Numeric (%)	3 for integer, 2 for fraction
USED%	Used ratio of CPU utilization for CPUs allocated to this LPAR, derived from the formula " <i>USED / CPU_CAP of applicable LPAR in LPAR_CONFIGURATION record</i> ". (<i>USED% + ROB% + DELAY% + IDLE% + IOW% + NIOW% = 100</i>)	Numeric (%)	3 for integer, 2 for fraction
ROB%	Ratio of CPU resource-1 for which command execution was disrupted, derived from the formula " <i>ROB / CPU_CAP of applicable LPAR in LPAR_CONFIGURATION record</i> ".	Numeric (%)	3 for integer, 2 for fraction
DELAY%	Ratio of CPU resource-2 for which command execution was suspended, derived from the formula " <i>DELAY / CPU_CAP of applicable LPAR in LPAR_CONFIGURATION record</i> ".	Numeric (%)	3 for integer, 2 for fraction
IDLE%	Ratio of CPU resource which entered an idle state, derived from the formula " <i>IDLE / CPU_CAP of applicable LPAR in LPAR_CONFIGURATION record</i> ".	Numeric (%)	3 for integer, 2 for fraction
IOW%	Ratio of CPU resource which entered an I/O wait state, derived from the formula " <i>IOW / CPU_CAP of applicable LPAR in LPAR_CONFIGURATION record</i> ".	Numeric (%)	3 for integer, 2 for fraction
NIOW%	Ratio of CPU resource which entered a wait state other than I/O wait, derived from the formula " <i>NIOW / CPU_CAP of applicable LPAR in LPAR_CONFIGURATION record</i> ".	Numeric (%)	3 for integer, 2 for fraction
G_RUN%	Ratio of (virtual) CPU utilization viewed by guest OS, derived from the formula " <i>G_RUN / CPU_CAP of applicable LPAR in LPAR_CONFIGURATION record</i> ". (<i>G_RUN% + G_IDLE% = 100</i>)	Numeric (%)	3 for integer, 2 for fraction
G_IDLE%	Unused ratio of (virtual) CPU utilization viewed by guest OS.	Numeric (%)	3 for integer, 2 for fraction
OVER%	Ratio of overhead increase due to CPU resource shortage, derived from the formula " <i>(ROB% + DELAY%) / USED%</i> ".	Numeric (%)	3 for integer, 2 for fraction

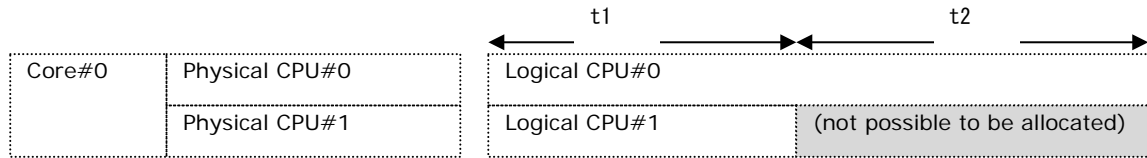
When you set the output extension option "excpu", the following fields are also output.

Field Title	Content	Data Type	Max. Digits
INSUFF	Total amount of insufficient CPU resource.	Numeric (MHz)	6
INSUFF%	Ratio of insufficient CPU resource derived from the formula " <i>INSUFF / CPU_CAP of applicable LPAR in LPAR_CONFIGURATION record</i> ".	Numeric (%)	3 for integer, 2 for fraction
HST_INSUFF%	Ratio of insufficient CPU resource derived from the formula " <i>INSUFF / CPU_CAP in SYSTEM_CONFIGURATION record</i> ".	Numeric (%)	3 for integer, 2 for fraction
SRV_INSUFF%	Ratio of Insufficient CPU resource. (INSUFF / CPU SRV of SHR_LPAR in SYSTEM_CPU_USAGE) Dedicated CPU is indicated by "*" character on LPAR. (This field is supported by HvmSh Ver. 5.5 or higher)	Numeric (%)	3 for integer, 2 for fraction
COREs_INSUFF%	Ratio of Insufficient CPU resource. (INSUFF / SHR_LPAR of CAPACITY in SYSTEM_CPU_USAGE) (This field is supported by HvmSh Ver. 5.5 or higher)	Numeric	2 for integer, 2 for fraction
CPUs_USED	Value of physical CPU number which was converted from used CPU resource. (USED / (CORE_CAP of SYSTEM_CONFIGURATION * COREs / CPUs)) *HvmSh V5.6 or higher	Numeric	2 for integer, 2 for fraction
CPUs_INSUFF	Value of physical CPU number which was converted from insufficient CPU resource. (INSUFF / (CORE_CAP of SYSTEM_CONFIGURATION * COREs / CPUs)) *HvmSh V5.6 or higher	Numeric	2 for integer, 2 for fraction
SWITCH	CPU resource used for the process switching. * This is included in "ROB+DELAY".	Numeric (MHz)	6
COREs_VMMODE	The value that converts the needed CPU resource for the VM mode (VMentry to VMexit) into the number of CPU cores (the total value of all "COREs_VMMODE" fields in the "LOGICAL_CPU_DETAIL" record) *HvmSh V7.3 or higher	Numeric	2 for integer, 2 for fraction
CPUs_VMMODE	The value that converts the needed CPU resource for the VM mode (VMentry to VMexit) into the number of CPUs (the total value of all "CPUs_VMMODE" fields in the "LOGICAL_CPU_DETAIL" record) *HvmSh V7.3 or higher	Numeric	2 for integer, 2 for fraction
INT_RUN	CPU resource-3 in suspended state *HvmSh V8.3 or higher * V8.1 or lower: included in "ROB", V8.3 or higher: independent of "ROB"	Numeric (MHz)	6
INT_RUN_RAT	Ratio of CPU resource-3 in suspended state *HvmSh V8.3 or higher * V8.1 or lower: included in "ROB", V8.3 or higher: independent of "ROB"	Numeric (%)	3 for integer, 2 for fraction

When you set the Output Extension Option "excpu" with HvmSh Ver 10.2 or higher, the following statistical information of core scheduling is also output. If the core scheduling is disabled, "*" is displayed in the all fields listed in this table.

Field	Content	Data type	Max. digits
CORE_USED	Amount of processor core resource used by this LPAR. (*1)	Numeric (MHz)	6
WASTED_GUEST	Amount of processor core resource could not use by this LPAR due to Guest factor. (*1)	Numeric (MHz)	6
WASTED_HOST	Amount of processor core resource could not use by this LPAR due to Host factor. (*1)	Numeric (MHz)	6
CORE_USED%	Ratio of the amount of processor core resource used by this LPAR to the processor core service time. (CORE_USED÷(LPAR_CONFIGURATION: CORE_SRV)) On this LPAR allocated to a dedicated-mode CPU, "*" is shown.	Numeric (%)	3 for integer, 2 for fraction
COREs_CORE_USED	Value of converting CORE_USED to the number of physical cores. (CORE_USED×n÷SYSTEM_CONFIGURATION : CORE_CAP) (*2)	Numeric	2 for integer, 2 for fraction
COREs_WASTED_GUEST	Value of converting WASTED_GUEST to the number of physical cores. (WASTED_GUEST×n÷SYSTEM_CONFIGURATION : CORE_CAP) (*2)	Numeric	2 for integer, 2 for fraction
COREs_WASTED_HOST	Value of converting WASTED_HOST to the number of physical cores. (WASTED_HOST×n÷SYSTEM_CONFIGURATION : CORE_CAP) (*2)	Numeric	2 for integer, 2 for fraction

(*1) When SMT(simultaneous multithreading) is enabled and Physical CPUs are allocated to LPAR as shown in the figure below, the value of (t1+t2) is CORE_USED, the value of t2 is either WASTED_GUEST or WASTED HOST depending on some factor, and COREs_CORE_USED is 1(core).



(*2) When SMT is enabled: n=2
When SMT is disabled: n=1

When you set the output extension option "hvm", the following fields are also output.

Field title	Content	Data type	Max. digits
REG0	The statistical information for the HVM internal operation evaluation. REG0 to REG7 are indicated as the number of times for occurrence per second or the value that converts the used CPU resource into the number of physical CPU.	Numeric (times/s)	7
REG1			
REG2			
REG3			
REG4	Note: Data Type of REG0 to REG7 are decided either "Numeric (times/s)" or "Numeric" depending on HVM implementation (or version). For an integer representation (example: 0), an occurrence frequency per second is displayed. For a fixed point representation (example: 0.00), a value that CPU resource of use is converted into number of physical CPU is displayed.	Numeric	2 for integer, 2 for fraction
REG5			
REG6			
REG7			

Table 2-86 PHYSICAL_CPU_USAGE record

Field	Content	Data type	Max. digits																	
CORE#	CPU core No.	Numeric	3																	
CAPACITY	Amount of CPU resource per CPU core (reference frequency), having the same value as CORE_CAP in SYSTEM_CONFIGURATION record.	Numeric (MHz)	6																	
MODE	<div>Mode for assigning a CPU core.<ul style="list-style-type: none">• S: Shared.• D: Dedicated.When the processor is broken, "*" is shown.</div> <div>Note that the value of this field varies depending on the mode for assigning each thread in the CPU core with SMT enabled in a server blade.</div> <table><tr><th colspan="2">Mode for assigning each thread in a CPU core</th><th rowspan="2">Mode for assigning a CPU core</th></tr><tr><th>#0</th><th>#1</th></tr><tr><td>Dedicated</td><td>Dedicated</td><td>Dedicated</td></tr><tr><td>Dedicated</td><td>Shared</td><td>Shared</td></tr><tr><td>Shared</td><td>Dedicated</td><td>Shared</td></tr><tr><td>Shared</td><td>Shared</td><td>Shared</td></tr></table>	Mode for assigning each thread in a CPU core		Mode for assigning a CPU core	#0	#1	Dedicated	Dedicated	Dedicated	Dedicated	Shared	Shared	Shared	Dedicated	Shared	Shared	Shared	Shared	Character	1
Mode for assigning each thread in a CPU core		Mode for assigning a CPU core																		
#0	#1																			
Dedicated	Dedicated	Dedicated																		
Dedicated	Shared	Shared																		
Shared	Dedicated	Shared																		
Shared	Shared	Shared																		
USED	Used amount of CPU resource.	Numeric (MHz)	6																	
UNUSED	Unused amount of CPU resource. (<i>CAPACITY=USED+UNUSED</i>)	Numeric (MHz)	6																	
USED%	Used ratio of CPU resource (<i>USED / CAPACITY</i>).	Numeric (%)	3 for integer, 2 for fraction																	
UNUSED%	Unused ratio of CPU resource (<i>UNUSED / CAPACITY</i>).	Numeric (%)	3 for integer, 2 for fraction																	
NAME	CPU name that is designated by SMBIOS and may include space characters.	Character	64																	

When you set the output extension option "excpu", the following fields are also output. (These are supported in Ver. 5.5 or higher of HvmSh.)

Field Title	Content	Data Type	Max. Digits
SYS1_USED	CPU resource which was used by HVM system layer except shared NIC.	Numeric (MHz)	6
SYS2_USED	CPU resource which was used by only shared NIC of HVM system layer.	Numeric (MHz)	6
LPAR_USED	CPU resource which was used by LPARs. (*1)	Numeric (MHz)	6
SYS1_USED%	Used ratio of CPU resource which was used by HVM system layer except shared NIC. (SYS1_USED / CAPACITY)	Numeric (%)	3 for integer, 2 for fraction
SYS2_USED%	Used ratio of CPU resource which was used by only shared NIC of HVM system layer. (SYS2_USED / CAPACITY)	Numeric (%)	3 for integer, 2 for fraction
LPAR_USED%	Used ratio of CPU resource which was used by LPAR. (LPAR_USED / CAPACITY)	Numeric (%)	3 for integer, 2 for fraction
SWITCH	CPU resource used for the process switching. * This is included in SYS1_USED.	Numeric (MHz)	6
1: "" is displayed when using HVM firmware version is 58-60/78-60 or lower (CB 2000) or 17-70 or lower (CB 320).			

Table 2-87 PHYSICAL_NIC_USAGE record

Field	Content	Data type	Max. digits
SID	<p>Installed location of NIC.</p> <ul style="list-style-type: none"> Gxn: Onboard NICn of server blade x. Exn: Mezzanine slot n of server blade x. n: Riser slot n. ($0 \leq n \leq 15$) ##X: IOBD(IO Board Module)($01 \leq ## \leq 14$, X=A or B) Xxn: HVM NICn of server blade x. (*1) inn: Slot nn of IO Slot Expansion Unit (i+1) ($1 \leq i \leq 7$) 100 to 115: IO Slot Expansion Unit 0 (slot 0 through 15) 200 to 215: IO Slot Expansion Unit 1 (slot 0 through 15) 300 to 315: IO Slot Expansion Unit 2 (slot 0 through 15) <p>Note: Contents of this field not accord to <i>Description of Device Equipped Locations</i> at section <i>Note for HVM Interface</i> of this document.</p> <p>Note: For CB2000, CB500, and CB320, server blade number x is decimal digit. For CB2500, server blade number x is hexadecimal (1 to 9, A to F).</p>	Character	3
P#	NIC port No. (0 through 7).	Numeric	1
CAPACITY	Maximum throughput of NIC (dependent on NIC type). (*4)	Numeric (Mbps)	6
MODE	<p>Mode of NIC allocation.</p> <p>S: Shared. D: Dedicated.</p> <p>"D" is always outputted to NICs of HVM. (*2)</p>	Character	1
USED	Used amount of NIC for transmitting and receiving. For NIC in dedicated mode, "*" is shown. (*4)	Numeric (Mbps)	6
UNUSED	Unused amount of NIC for transmitting and receiving (CAPACITY-USED). For NIC in dedicated mode, "*" is shown.	Numeric (Mbps)	6
USED%	Used ratio of NIC for transmitting and receiving(USED / CAPACITY). For NIC in dedicated mode, "*" is shown. (*4)	Numeric (%)	3 for integer, 2 for fraction
UNUSED%	Unused ratio of NIC in shared mode (100 -USED%). For NIC in dedicated mode, "*" is shown.	Numeric (%)	3 for integer, 2 for fraction
REQ	No. of activations per second. "*" is always shown.	Numeric (times/s)	7
INT	No. of interrupts per second.	Numeric (times/s)	7
R_BYTE	No. of bytes received by NIC in shared mode per second. For NIC in dedicated mode, "*" is shown.	Numeric (KB/s)	7
S_BYTE	No. of bytes sent by NIC in shared mode per second. For NIC in dedicated mode, "*" is shown.	Numeric (KB/s)	7
T_BYTE	No. of bytes sent and received by NIC in shared mode per second. For NIC in dedicated mode, "*" is shown.	Numeric (KB/s)	7
R_PACKET	No. of packets received by NIC in shared mode per second. For NIC in dedicated mode, "*" is shown.	Numeric (packets/s)	7
S_PACKET	No. of packets sent by NIC in shared mode per second. For NIC in dedicated mode, "*" is shown.	Numeric (packets/s)	7
T_PACKET	<p>No. of packets sent and received by NIC in shared mode per second.</p> <p>(T_PACKET=R_PACKET+S_PACKET)</p> <p>For NIC in dedicated mode, "*" is shown.</p>	Numeric (packets/s)	7
NAME	NIC name (same as that displayed on HVM screen).	Character	31

When you set the output extension option "exio", the following fields are also output. (These are supported in Ver. 5.5 or higher of HvmSh.)

Field Title	Content	Data Type	Max. Digits
Location	Equipped location of NICs For details, see Description format for device location.	Character	6
PCI_SEG	Segment number of Config address (Hex-decimal) (*3)	Numeric	2
PCI_BUS	Bus number of Config address (Hex-decimal) (*3)	Numeric	2
PCI_DEV	Device number of Config address (Hex-decimal) (*3)	Numeric	2
PCI_FNC	Function number of Config address (Hex-decimal) (*3)	Numeric	1

When you set the output extension option "exio", the following fields are also output. (These are supported in Ver. 6.1 or higher of HvmSh.)

Field Title	Content	Data Type	Max. Digits
R_USED	Used amount of NIC for receiving. For NIC in dedicated mode, "***" is shown.	Numeric (Mbps)	6
S_USED	Used amount of NIC for transmitting. For NIC in dedicated mode, "***" is shown.	Numeric (Mbps)	6
R_USED_RAT	Used ratio of NIC for receiving. (USED / CAPACITY) For NIC in dedicated mode, "***" is shown.	Numeric (%)	3 for integer, 2 for fraction
S_USED_RAT	Used ratio of NIC for transmitting. (USED / CAPACITY) For NIC in dedicated mode, "***" is shown.	Numeric (%)	3 for integer, 2 for fraction
<p>*1: "Xnn" indicates management LAN which is only equipped on CB 2000. The management LAN is used by SVP, SC/BSM and HvmSh for communicating to HVM.</p> <p>*2: "***" is also displayed on NIC of HVM like as dedicated NIC of each field.</p> <p>*3: Those are the same as PHYSICAL_IO_CONFIGURATION record of output which is outputted by executing "get ConfigAll" command. When the hvm option is specified on HvmSh Ver5.6 or higher, a numerical value is displayed to NIC of HVM as well.</p> <p>*4: NIC maximum transfer rate (CAPACITY) is indicated maximum transfer rate of transmitting or receiving. NIC usage (USED) or NIC usage percentage (USED%) is indicated totaled usage or totaled usage percentage of transmitting or receiving. Therefore, NIC usage (USED) exceeds CAPACITY, and NIC usage percentage (USED%) may exceed 100%.In that case, UNUSED and UNUSED% are indicated by "0".</p>			

Table 2-88 PHYSICAL_HBA_USAGE record

Field	Content	Data type	Max. digits
SID	<p>Installed location of HBA.</p> <ul style="list-style-type: none"> • Exn: Mezzanine slot n of server blade x. • n: Riser slot n. ($0 \leq n \leq 15$) • ##X: IOBD(IO Board Module)($01 \leq ## \leq 14$, X=A or B) • inn: Slot nn of IO Slot Expansion Unit (i+1) ($1 \leq i \leq 7$) <p>100 to 115: IO Slot Expansion Unit 0 (slot 0 through 15) 200 to 215: IO Slot Expansion Unit 1 (slot 0 through 15) 300 to 315: IO Slot Expansion Unit 2 (slot 0 through 15) </p> <p>Note: Contents of this filed not accord to <i>Description of Device Equipped Locations</i> at section <i>Note for HVM Interface</i> of this document.</p> <p>Note: For CB2000, CB500, and CB320, server blade number x is decimal digit. For CB2500, server blade number x is hexadecimal (1 to 9, A to F).</p>	Character	3
P#	HBA port No. (0 through 3).	Numeric	1
CAPACITY	Maximum throughput of HBA (dependent on HBA type).	Numeric (Mbps)	6
MODE	<p>Mode of HBA allocation.</p> <ul style="list-style-type: none"> • S: Shared. • D: Dedicated. 	Character	1
USED	Used amount of HBA. *2	Numeric (Mbps)	6
UNUSED	Unused amount of HBA ($CAPACITY - USED$). *2	Numeric (Mbps)	6
USED%	Used ratio of HBA ($USED / CAPACITY$). *2	Numeric (%)	3 for integer, 2 for fraction
UNUSED%	Unused ratio of HBA ($100 - USED\%$). *2	Numeric (%)	3 for integer, 2 for fraction
REQ	No. of activations per second. "*" is always shown.	Numeric (times/s)	7
INT	No. of interrupts per second.	Numeric (times/s)	7
R_BYTE	No. of bytes read per second. *2	Numeric (KB/s)	7
W_BYTE	No. of bytes written per second. *2	Numeric (KB/s)	7
T_BYTE	No. of bytes read and written per second. *2	Numeric (KB/s)	7
R_FRAME	No. of frames read per second. *2	Numeric (frames/s)	7
W_FRAME	No. of frames written per second. *2	Numeric (frames/s)	7
T_FRAME	No. of frames read and written per second. *2	Numeric (frames/s)	7
NAME	HBA name (same as that displayed on HVM screen).	Character	31

When you set the output extension option "exio", the following fields are also output. (These are supported in Ver. 5.5 or higher of HvmSh.)

Field Title	Content	Data Type	Max. Digits
Location	Equipped location of NICs For details, see Description format for device location.	Character	6
PCI_SEG	Segment number of Config address (Hex-decimal) (*1)	Numeric	2
PCI_BUS	Bus number of Config address (Hex-decimal) (*1)	Numeric	2
PCI_DEV	Device number of Config address (Hex-decimal) (*1)	Numeric	2
PCI_FNC	Function number of Config address (Hex-decimal) (*1)	Numeric	1
<p>*1: Those are the same as PHYSICAL_IO_CONFIGURATION record of output which is outputted by executing the "get ConfigAll" command.</p> <p>*2: When exio option is not specified, "*" is displayed. When exio option is specified, the each sum value of the target field in the "LOGICAL_HBA_USAGE" record is displayed. "*" is displayed, when all values of the target field in the "LOGICAL_HBA_USAGE" record are "*".</p> <p>See Table 2-92 HBA statistical support map for the condition to be able to show the values.</p>			

Table 2-89 LOGICAL_CPU_USAGE record

Field	Content	Data type	Max. digits
L#	LPAR No.	Numeric	2
NAME	LPAR name.	Character	31
CPU#	Logical CPU No.	Numeric	2
USED	Used amount of CPU resource.	Numeric (MHz)	6
ROB	Amount of CPU resource-1 for which command execution was disrupted (lacking amount of resource).	Numeric (MHz)	6
DELAY	Amount of CPU resource-2 for which command execution was suspended (lacking amount of resource).	Numeric (MHz)	6
IDLE	Amount of CPU resource which entered an idle state (unused amount of resource)	Numeric (MHz)	6
IOW	Amount of CPU resource which entered an I/O wait state.	Numeric (MHz)	6
NIOW	Amount of CPU resource which entered a wait state other than I/O wait.	Numeric (MHz)	6
G_RUN	Amount of (virtual) CPU utilization viewed by guest OS (<i>USED+ROB</i>).	Numeric (MHz)	6
USED%	Used ratio of CPU resource, derived from the formula " <i>USED / CORE_CAP in SYSTEM_CONFIGURATION record</i> ".	Numeric (%)	3 for integer, 2 for fraction
ROB%	Ratio of CPU resource-1 for which command execution was disrupted, derived from the formula " <i>ROB / CORE_CAP in SYSTEM_CONFIGURATION record</i> ".	Numeric (%)	3 for integer, 2 for fraction
DELAY%	Ratio of CPU resource-2 for which command execution was suspended, derived from the formula " <i>DELAY / CORE_CAP in SYSTEM_CONFIGURATION record</i> ".	Numeric (%)	3 for integer, 2 for fraction
IDLE%	Ratio of CPU resource which entered an idle state, derived from the formula " <i>IDLE / CORE_CAP in SYSTEM_CONFIGURATION record</i> ".	Numeric (%)	3 for integer, 2 for fraction
IOW%	Ratio of CPU resource which entered an I/O wait state, derived from the formula " <i>IOW / CORE_CAP in SYSTEM_CONFIGURATION record</i> ".	Numeric (%)	3 for integer, 2 for fraction
NIOW%	Ratio of CPU resource which entered a wait state other than I/O wait, derived from the formula " <i>NIOW / CORE_CAP in SYSTEM_CONFIGURATION record</i> ".	Numeric (%)	3 for integer, 2 for fraction
G_RUN%	Ratio of (virtual) CPU utilization viewed by guest OS, derived from the formula " <i>G_RUN / CORE_CAP in SYSTEM_CONFIGURATION record</i> ". (<i>G_RUN% + G_IDLE% = 100</i>)	Numeric (%)	3 for integer, 2 for fraction
G_IDLE%	Unused ratio of (virtual) CPU utilization viewed by guest OS.	Numeric (%)	3 for integer, 2 for fraction
OVER%	Ratio of overhead increase due to CPU resource shortage, derived from the formula " <i>(ROB% + DELAY%) / USED%</i> ".	Numeric (%)	3 for integer, 2 for fraction

When you set the output extension option "excpu", the following fields are also output.

Field	Content	Data type	Max. digits
SWITCH	CPU resource used for the process switching. * This is included in(ROB+DELAY).	Numeric (MHz)	6
INT_RUN	CPU resource-3 in suspended state *HvmSh V8.3 or higher * V8.1 or lower: included in "ROB", V8.3 or higher: independent of "ROB"	Numeric (MHz)	6
INT_RUN_RATIO	Ratio of CPU resource-3 in suspended state *HvmSh V8.3 or higher * V8.1 or lower: included in "ROB", V8.3 or higher: independent of "ROB"	Numeric (%)	3 for integer, 2 for fraction
L_CPU_CAP	Logical CPU resource For SMT Enable: (CORE_CAP of SYSTEM_CONFIGURATION / 2) For SMT Disable: (CORE_CAP of SYSTEM_CONFIGURATION)	Numeric (MHz)	6

Table 2-90 LOGICAL_NIC_USAGE record

Field	Content	Data type	Max. digits
L#	LPAR No.	Numeric	2
NAME	LPAR name.	Character	31
SID	<p>Installed location of NIC.</p> <ul style="list-style-type: none"> Gxn: Onboard NICn of server blade x. Exn: Mezzanine slot n of server blade x. n: Riser slot n. ($0 \leq n \leq 15$) ##X: IOBD(IO Board Module)($01 \leq ## \leq 14$, X=A or B) inn: Slot nn of IO Slot Expansion Unit (i+1) ($1 \leq i \leq 7$) <ul style="list-style-type: none"> 100 to 115: IO Slot Expansion Unit 0 (slot 0 through 15) 200 to 215: IO Slot Expansion Unit 1 (slot 0 through 15) 300 to 315: IO Slot Expansion Unit 2 (slot 0 through 15) <p>.....</p> <p>Note: Contents of this filed not accord to <i>Description of Device Equipped Locations</i> at section <i>Note for HVM Interface</i> of this document.</p> <p>Note:For CB2000, CB500, and CB320, server blade number x is decimal digit. For CB2500, server blade number x is hexadecimal (1 to 9, A to F).</p>	Character	3
P#	NIC port No. (0 through 3).	Numeric	1
USED (*1)	Used amount of NIC. (*2)	Numeric (Mbps)	6
USED% (*1)	Used ratio of NIC($USED / CAPACITY$ in <i>PHYSICAL_NIC_USAGE</i> record). (*2)	Numeric (%)	3 for integer, 2 for fraction
REQ (*1)	No. of activations per second. For LPAR allocated to CPU in dedicated mode, "*" is shown.	Numeric (times/s)	7
INT (*1)	No. of interrupts per second.	Numeric (times/s)	7
R_BYTE (*1)	No. of bytes received per second.	Numeric (KB/s)	7
S_BYTE (*1)	No. of bytes sent per second.	Numeric (KB/s)	7
T_BYTE (*1)	No. of bytes sent and received per second. ($T_BYTE = R_BYTE + S_BYTE$)	Numeric (KB/s)	7
R_PACKET (*1)	No. of packets received per second.	Numeric (packets/s)	7
S_PACKET (*1)	No. of packets sent per second.	Numeric (packets/s)	7
T_PACKET (*1)	No. of packets sent and received per second. ($T_PACKET = R_PACKET + S_PACKET$)	Numeric (packets/s)	7
TIME1 (*1)	Average I/O transaction time1 in microseconds or 999999.99 if in excess of 1 second.	Numeric (microseconds)	6 for integer, 2 for fraction
TIME2 (*1)	Average I/O transaction time2 in microseconds or 999999.99 if in excess of 1 second.	Numeric (microseconds)	6 for integer, 2 for fraction
<p>*1: When duplicate assigning of shared NIC is performed, values of each field are sum of logical NICs on LPAR. Specify "exio" option for outputting values per logical NICs. When specifying "exio" option, following field is added to the record above. (Those are supported by HvmSh Ver. 5.5 or higher)</p> <p>*2: NIC maximum transfer rate (CAPACITY) is indicated maximum transfer rate of transmitting or receiving. NIC usage (USED) or NIC usage percentage (USED%) is indicated totaled usage or totaled usage percentage of transmitting or receiving. Therefore, NIC usage (USED) exceeds CAPACITY, and NIC usage percentage (USED%) may exceed 100%. In that case, UNUSED and UNUSED% are indicated by "0".</p>			

When you set the output extension option "exio", the following fields are also output. (These are supported in Ver. 5.5 or higher of HvmSh.)

Field Title	Content	Data type	Max. digits
VNIC#	Virtual NIC No. If duplicate assigning of shared NICs is not supported, "***" appears.	Numeric	2

When you set the output extension option "exio", the following fields are also output. (These are supported in Ver. 8.1 or higher of HvmSh.)

Field Title	Content	Data type	Max. digits
R_USED	Used amount of NIC for receiving. For NIC in dedicated mode, "***" is shown.	Numeric (Mbps)	6
S_USED	Used amount of NIC for transmitting. For NIC in dedicated mode, "***" is shown.	Numeric (Mbps)	6
R_USED_RAT	Used ratio of NIC for receiving. (USED / CAPACITY) For NIC in dedicated mode, "***" is shown.	Numeric (%)	3 for integer, 2 for fraction
S_USED_RAT	Used ratio of NIC for transmitting. For NIC in dedicated mode, "***" is shown.	Numeric (%)	3 for integer, 2 for fraction

When you set the output extension option "exio", the following fields are also output. (These are supported in Ver. 8.3 or higher of HvmSh.)

Field Title	Content	Data type	Max. digits
TIME_CNT	The times of the 1st interrupt in IO start	Numeric (times/s)	7
Location	Equipped location of NICs For details, see Description format for device location . *** is displayed for NICs on an LPAR manager whose SID field shows Xxn.	Character	6

When you set the output extension option "exio", the following fields are also output. (These are supported in Ver. 9.9 or higher of HvmSh.)

Field Title	Content	Data type	Max. digits
DFULL_CNT(S)	The number of times that outgoing packets were dropped due to lack of capacity of send buffer.	Numeric (times/s)	7
DFULL_PACKET(S)	The number of out going dropped packets due to lack of capacity of send buffer.	Numeric (times/s)	7
DFULL_CNT(R)	The number of times that incoming packets were dropped due to lack of capacity of receive buffer.	Numeric (times/s)	7
DFULL_PACKET(R)	The number of incoming dropped packets due to lack of capacity of receive buffer.	Numeric (times/s)	7

Table 2-91 LOGICAL_HBA_USAGE record

Field	Content	Data type	Max. digits
L#	LPAR No.	Numeric	2
NAME	LPAR name.	Character	31
SID	Installed location of HBA. <ul style="list-style-type: none"> • Exn: Mezzanine slot n of server blade x. • n: Riser slot n. ($0 \leq n \leq 15$) • ##X: IOBD(IO Board Module)($01 \leq ## \leq 14$, X=A or B) • inn: Slot nn of IO Slot Expansion Unit (i+1) ($1 \leq i \leq 7$) 100 to 115: IO Slot Expansion Unit 0 (slot 0 through 15) 200 to 215: IO Slot Expansion Unit 1 (slot 0 through 15) 300 to 315: IO Slot Expansion Unit 2 (slot 0 through 15) Note: Contents of this field not accord to <i>Description of Device Equipped Locations</i> at section <i>Note for HVM Interface</i> of this document. Note: For CB2000, CB500, and CB320, server blade number x is decimal digit. For CB2500, server blade number x is hexadecimal (1 to 9, A to F).	Character	3
P#	HBA port No. (0 through 3).	Numeric	1
USED	Used amount of HBA. *1	Numeric (Mbps)	6
USED%	Used ratio of HBA ($USED / CAPACITY$ in <i>PHYSICAL_HBA_USAGE record</i>). *1	Numeric (%)	3 for integer, 2 for fraction
REQ	No. of activations per second. *1	Numeric (times/s)	7
INT	No. of interrupts per second.	Numeric (times/s)	7
R_BYTE	No. of bytes read per second. *1	Numeric (KB/s)	7
W_BYTE	No. of bytes written per second. *1	Numeric (KB/s)	7
T_BYTE	No. of bytes read and written per second. *1 ($T_BYTE = R_BYTE + W_BYTE$)	Numeric (KB/s)	7
R_FRAME	No. of frames read per second. *1	Numeric (frames/s)	7
W_FRAME	No. of frames written per second. *1	Numeric (frames/s)	7
T_FRAME	No. of frames read and written per second. *1 ($T_FRAME = R_FRAME + W_FRAME$)	Numeric (frames/s)	7
TIME1	Average I/O transaction time1 in microseconds or 999999.99 if in excess of 1 second.	Numeric (microseconds)	6 for integer, 2 for fraction
TIME2	Average I/O transaction time2 in microseconds or 999999.99 if in excess of 1 second.	Numeric (microseconds)	6 for integer, 2 for fraction

When you set the output extension option "exio", the following fields are also output. (These are supported in Ver. 6.4 or higher of HvmSh.)

Field	Content	Data type	Max. digits
DRV_STAT E	Hexadecimal data which shows the status about getting HBA driver statistical information. This information is for cooperating with HVM Navigator.	Numeric (Hexadecimal number)	4

When you set the output extension option "exio", the following fields are also output. (These are supported in Ver. 8.3 or higher of HvmSh.)

Field	Content	Data type	Max. digits
TIME_CNT	I/O operation times for "TIME1" and "TIME2" * TIME1 = I/O operation time1 / TIME_CNT * TIME1 = I/O operation time2 / TIME_CNT * The same as CB2000 59-7x/79-7x or lower, CB500 01-84 or lower.	Numeric (times/s)	7
Location	Equipped location of NICs For details, see Description format for device location.	Character	6
(*1) When the HBA driver in whom HVM supported statistical information has been operated and HVM FW is in the version which supported the HBA statistical information, appropriate value will be displayed. Otherwise, "*" is displayed. See the support map below.			

Table 2-92 HBA statistical support map

HvmSh version	exio option	HVM version	HBA driver version	Statistics information display
Ver.6.0 or lower	invalid specification	All versions	All versions	*
Ver.6.4 or higher	Not specified specified	All versions	All versions	*
		CB2000 58-xx or lower /78-xx or lower CB320 17-85or lower	All versions	*
		CB2000 59-00 or higher /79-00 or higher CB320 18-86 or higher CB500 01-00 or higher CB2500 02-00 or higher	except below	*
			Windows: x.y.6.840 or higher RHEL5: x.5.16.1268 or higher RHEL6: x.6.17.2092 or higher	Numeric

Table 2-93 PHYSICAL_CPU_DETAIL record

Field	Content	Data type	Max. digits
CPU#	CPU No. The value depends on whether SMT (simultaneous multithreading) is enabled or not. <ul style="list-style-type: none"> When SMT is enabled: Sequence No. of threads. When SMT is disabled: Sequence No. of cores. 	Numeric	3
CORE#	CPU core No.	Numeric	3
I_ALL	Frequency of all interrupt events to CPU ($I_ALL = I_NIC + I_HBA + I_USB + I_IPI + I_TIM + I_OTH$).	Numeric (times/s)	6
I_NIC	Frequency of NIC interrupt event to CPU.	Numeric (times/s)	6
I_HBA	Frequency of HBA interrupt event to CPU.	Numeric (times/s)	6
I_USB	Frequency of USB interrupt event to CPU. "*" is always shown.	Numeric (times/s)	6
I_IPI	Frequency of IPI interrupt event to CPU.	Numeric (times/s)	6
I_TIM	Frequency of timer interrupt event to CPU.	Numeric (times/s)	6
I_OTH	Frequency of other device interrupt events to CPU.	Numeric (times/s)	6
I_USED	Amount of CPU resource used for interrupt event handling.	Numeric (MHz)	6
I_USED%	Ratio of CPU resource used for interrupt handling ($I_USED / CORE_CAP$ in <i>SYSTEM_CONFIGURATION</i> record).	Numeric (%)	3 for integer, 2 for fraction

When you set the output extension option "excpu", the following fields are also output. (These are supported in Ver. 5.5 or higher of HvmSh.)

Field	Content	Data type	Max. digits
CAPACITY	Resource of CPU core. Case of SMT is Enabled: 1/2 Value of CORE_CAP field on SYSTEM_CONFIGURATION Case of SMT is Disabled: Value of CORE_CAP field on SYSTEM_CONFIGURATION	Numeric (MHz)	6
MODE	Assigning mode of CPU core S: Shared D: Dedicated *: Processor failure	Character	1
USED	Used CPU resource	Numeric (MHz)	6
USED%	Used ratio of CPU resource (USED / CAPACITY)	Numeric (%)	3 for integer, 2 for fraction
PTHD_USED (*1)	Case of SMT is Disabled or is not supported by HVM: 0 Case of SMT is Enabled: Used CPU resource which is used by the other thread of a same core.	Numeric (MHz)	6
PTHD_USED% (*1)	Case of SMT is Disabled or is not supported by HVM: 0 Case of SMT is Enabled: PTHD_USED / CAPACITY	Numeric (%)	3 for integer, 2 for fraction
SYS1_USED (*1)	CPU resource which was used by HVM system layer except shared NIC.	Numeric (MHz)	6
SYS2_USED (*1)	CPU resource which was used by only shared NIC of HVM system layer.	Numeric (MHz)	6
LPAR_USED (*1)	CPU resource which was used by LPARs.	Numeric (MHz)	6
SYS1_USED% (*1)	Used ratio of CPU resource which was used by HVM system layer except shared NIC. (SYS1_USED / CAPACITY)	Numeric (%)	3 for integer, 2 for fraction
SYS2_USED% (*1)	Used ratio of CPU resource which was used by only shared NIC of HVM system layer. (SYS1_USED / CAPACITY)	Numeric (%)	3 for integer, 2 for fraction
LPAR_USED% (*1)	Used ratio of CPU resource which was used by LPAR. (LPAR_USED / CAPACITY)	Numeric (%)	3 for integer, 2 for fraction
1: "" is displayed when using HVM firmware version is 58-60/78-60 or lower (CB 2000) or 17-70 or lower (CB 320).			

Table 2-94 LOGICAL_CPU_DETAIL record

Field	Content	Data type	Max. digits
L#	LPAR No.	Numeric	2
NAME	LPAR name.	Character	31
CPU#	Logical CPU No.	Numeric	2
X_ALL (*2)	Frequency of all HVM events to logical CPU	Numeric (times/s)	7
X_MM1	Frequency of EOI HVM event to logical CPU.	Numeric (times/s)	7
X_MM2	Frequency of LAPIC HVM event to logical CPU.	Numeric (times/s)	7
X_MM3	Frequency of MMIO HVM event to logical CPU.	Numeric (times/s)	7
X_IOP	Frequency of I/O Port HVM event to logical CPU.	Numeric (times/s)	7
X_IPI	Frequency of IPI HVM event to logical CPU.	Numeric (times/s)	7
X_EXTG	Frequency of Guest EX HVM event to logical CPU.	Numeric (times/s)	7
X_EXTH	Frequency of Interruption to HVM event to logical CPU.	Numeric (times/s)	7
X_HALT1	Frequency of HALT1 HVM event to logical CPU.	Numeric (times/s)	7
X_HALT2	Frequency of HALT2 HVM event to logical CPU.	Numeric (times/s)	7
X_OTH (*3)	Frequency of other HVM events to logical CPU.	Numeric (times/s)	7
X_USED	Amount of CPU resource used for HVM event handling.	Numeric (MHz)	6
X_USED%	Ratio of CPU resource used for interrupt handling ($X_USED /$ Logical CPU resource (*1)).	Numeric (%)	3 for integer, 2 for fraction
<p>*1: Logical CPU resource For SMT Enable: CORE_CAP in SYSTEM_CONFIGURATION/ 2 For SMT Disable: CORE_CAP in SYSTEM_CONFIGURATION</p> <p>*2: If <i>excpu</i> option is specified, <i>X_ALL</i> indicates below: [HvmSh Ver. 7.2 or lower] $X_ALL = X_MM1 + X_MM2 + X_MM3 + X_IOP + X_IPI + X_EXTG + X_EXTH + X_HALT + X_OTH + X_CPUID + X_EXCEPT$ [HvmSh Ver. 7.3 or higher] $X_ALL = X_MM1 + X_MM2 + X_MM3 + X_IOP + X_IPI + X_EXTG + X_HALT + X_OTH + X_CPUID + X_EXCEPT + X_EXTINT + X_MSR + X_VMCALL + X_VMX + X_EPT$</p> <p>*3: If <i>excpu</i> option is not specified, <i>X_OTH</i> indicates the frequency including ($X_CPUID + X_EXCEPT + X_EXTINT + X_MSR + X_VMCALL + X_VMX + X_EPT$).</p>			

When you set the output extension option "excpu", the following fields are also output, following the field "X_OTH". (These are supported in Ver. 7.3 or higher of HvmSh.)

Field	Content	Data type	Max. digits
X_CPUID	Frequency of CPUID HVM event to logical CPU.	Numeric (times/s)	7
X_EXCEPT	Frequency of program exception HVM event to logical CPU.	Numeric (times/s)	7
X_EXTINT	Frequency of external interrupt HVM event to logical CPU.	Numeric (times/s)	7
X_MSR	Frequency of RDMSR/WRMSR instruction HVM event to logical CPU.	Numeric (times/s)	7
X_VMCALL	Frequency of VMCALL instruction HVM event to logical CPU.	Numeric (times/s)	7
X_VMX	Frequency of VMX instruction except VMCALL instruction HVM event to logical CPU.	Numeric (times/s)	7
X_EPT	Frequency of Page Walk of a guest EPT HVM event to logical CPU.	Numeric (times/s)	7

When you set the output extension option "excpu", the following fields are also output, following the field "X_USED%".

Field	Content	Data type	Max. digits
X_RUN1	Value1 of logical CPU operation (only for analysis of performance).	Numeric (ms/s)	4
X_RUN2	Value2 of logical CPU operation (only for analysis of performance).	Numeric (count/s)	7
X_RUN3	Value3 of logical CPU operation (only for analysis of performance).	Numeric (us)	7
COREs_VMM ODE	The value that converts the needed CPU resource for the VM mode (VMentry to VMexit) into the number of CPU cores. HvmSh Ver.7.3 or higher	Numeric	2 for integer, 2 for fraction
CPUs_VMM ODE	The value that converts the needed CPU resource for the VM mode (VMentry to VMexit) into the number of CPUs. HvmSh Ver.7.3 or higher	Numeric	2 for integer, 2 for fraction
X_HALT	Frequency of HALT HVM event to logical CPU.	Numeric (times/s)	7

Table 2-95 GROUP_USAGE record

Field	Content	Data type	Max. digits
GROUP#	Processor group No.	Numeric	3
GRP NAME	Processor group name.	Character	31
DED CORE	No. of cores on dedicated mode in the group. (*1)	Numeric	3
SHR CORE	No. of cores on shared mode in the group. (*1)	Numeric	3
GRP CAP	CPU resource of the group. (<i>CORE CAP X of SYSTEM CONFIGURATION(DED CORE + SHR CORE)</i>)	Numeric (MHz)	6
USED	Used group resource.	Numeric (MHz)	6
UNUSED	Unused group resource. (<i>GRP CAP=USED + UNUSED</i>)	Numeric (MHz)	6
INSUFF	Insufficient group resource. Indicates 999999 if exceed 999999.	Numeric (MHz)	6
USED%	Used ratio of group resource. (<i>USED/GRP CAP</i>)	Numeric (%)	3 for integer, 2 for fraction
UNUSED%	Unused ratio of group resource. (<i>UNUSED/GRP CAP</i>)	Numeric (%)	3 for integer, 2 for fraction
HST USED%	Used ratio of group resource based on entire system. (<i>USED/CPU CAP in SYSTEM CONFIGURATION</i>)	Numeric (%)	3 for integer, 2 for fraction
INSUFF%	Insufficient ratio of group resource. (<i>INSUFF/GRP CAP</i>)	Numeric (%)	3 for integer, 2 for fraction
HST INSUFF%	Insufficient ratio of group resource based on entire system. (<i>INSUFF/CPU CAP in SYSTEM CONFIGURATION</i>)	Numeric (%)	3 for integer, 2 for fraction
No record is displayed for undefined processor group. *1: If allocating threads of same CPU core to different mode (Shared/Dedicated) on SMT Enable status, the core is treated as shared according to MODE in <i>PHYSICAL_CPU_USAGE</i> record and it is counted as SHR CORE.			

When you set the output extension option "excpu", the following fields are also output. (These are supported in Ver. 5.5 or higher of HvmSh.)

Field	Content	Data type	Max. digits
SYS1_USED (*1)	CPU resource which was used by HVM system layer except shared NIC.	Numeric (MHz)	6
SYS2_USED (*1)	CPU resource which was used by only shared NIC of HVM system layer.	Numeric (MHz)	6
LPAR_USED (*1)	CPU resource which was used by LPARs.	Numeric (MHz)	6
SYS1_USED% (*1)	Used ratio of CPU resource which was used by HVM system layer except shared NIC. (SYS1_USED / CAPACITY)	Numeric (%)	3 for integer, 2 for fraction
SYS2_USED% (*1)	Used ratio of CPU resource which was used by only shared NIC of HVM system layer. (SYS1_USED / CAPACITY)	Numeric (%)	3 for integer, 2 for fraction
LPAR_USED% (*1)	Used ratio of CPU resource which was used by LPAR. (LPAR_USED / CAPACITY)	Numeric (%)	3 for integer, 2 for fraction
1: "" is displayed when using HVM firmware version is 58-60/78-60 or lower (CB 2000) or 17-70 or lower (CB 320).			

When you set the output extension option "excpu", the following fields are also output. (These are supported in Ver. 6.4 or higher of HvmSh.)

Field	Content	Data type	Max. digits
COREs_USED	The number of the CPU cores converted from the used group resource. { USED/(CORE_CAP in SYSTEM_CONFIGURATION) }	Numeric	2for integer, 2 for fraction
CPUs_USED	The number of the physical CPUs converted from the used group resource. { USED/(CORE_CAP in SYSTEM_CONFIGURATION×COREs/CPUs)}	Numeric	2for integer, 2 for fraction

When you set the output extension option "excpu", the following fields are also output. (These are supported in Ver. 7.1 or higher of HvmSh.)

Field Title	Content	Data Type	Max. Digits
COREs_INSUFF	The number of the CPU cores converted from the insufficient group resource. { INSUFF /(CORE_CAP inSYSTEM_CONFIGURATION) }	Numeric	2for integer, 2 for fraction
CPUs_INSUFF	The number of the physical CPUs converted from the insufficient group resource. { INSUFF /(CORE_CAP in SYSTEM_CONFIGURATION×COREs/CPUs)}	Numeric	2for integer, 2 for fraction

Table 2-96 PHYSICAL_CPU_GROUP_USAGE record

Field	Content	Data type	Max. digits
GROUP#	Processor group No.	Numeric	3
GRP NAME	Processor group name.	Character	31
CORE#	CPU core No. (Same value as CORE# in PHYSICAL_CPU_USAGE record)	Numeric	3
CAPACITY	Amount of CPU resource per CPU core, having the same value as CAPACITY in PHYSICAL_CPU_USAGE record.	Numeric (MHz)	6
MODE	Mode of CPU core allocation (Same value as MODE in PHYSICAL_CPU_USAGE record)	Character	1
USED	Used amount of CPU resource. (Same value as USED in PHYSICAL_CPU_USAGE record)	Numeric (MHz)	6
UNUSED	Unused amount of CPU resource. (Same value as UNUSED in PHYSICAL_CPU_USAGE record) ($CAPACITY = USED + UNUSED$)	Numeric (MHz)	6
GRP USED%	Used ratio of CPU resource based on group CPU resource. ($USED / GRP\ CAP$ in <i>GROUP_USAGE</i>)	Numeric (%)	3 for integer, 2 for fraction
GRP UNUSED%	Unused ratio of CPU resource based on group CPU resource. ($UNUSED / GRP\ CAP$ in <i>GROUP_USAGE</i>)	Numeric (%)	3 for integer, 2 for fraction
HST USED%	Used ratio of CPU resource based on entire system. ($USED / CPU\ CAP$ in <i>SYSTEM CONFIGURATION</i>)	Numeric (%)	3 for integer, 2 for fraction

When you set the output extension option "excpu", the following fields are also output. (These are supported in Ver. 5.5 or higher of HvmSh.)

Field	Content	Data type	Max. digits
SYS1_USED (*1)	CPU resource which was used by HVM system layer except shared NIC.	Numeric (MHz)	6
SYS2_USED (*1)	CPU resource which was used by only shared NIC of HVM system layer.	Numeric (MHz)	6
LPAR_USED (*1)	CPU resource which was used by LPARs.	Numeric (MHz)	6
SYS1_USED% (*1)	Used ratio of CPU resource which was used by HVM system layer except shared NIC. ($SYS1_USED / CAPACITY$)	Numeric (%)	3 for integer, 2 for fraction
SYS2_USED% (*1)	Used ratio of CPU resource which was used by only shared NIC of HVM system layer. ($SYS1_USED / CAPACITY$)	Numeric (%)	3 for integer, 2 for fraction
LPAR_USED% (*1)	Used ratio of CPU resource which was used by LPAR. ($LPAR_USED / CAPACITY$)	Numeric (%)	3 for integer, 2 for fraction

1: "" is displayed when using HVM firmware version is 58-60/78-60 or lower (CB 2000) or 17-70 or lower (CB 320).

When you set the output extension option "excpu", the following fields are also output. (These are supported in Ver. 6.4 or higher of HvmSh.)

Field	Content	Data type	Max. digits
COREs_USED	The number of the CPU cores converted from the used group resource. { USED/(CORE_CAP in SYSTEM_CONFIGURATION) }	Numeric	2for integer, 2 for fraction
CPUs_USED	The number of the physical CPUs converted from the used group resource. { USED/(CORE_CAP in SYSTEM_CONFIGURATION×COREs/CPUs) }	Numeric	2for integer, 2 for fraction

Table 2-97 LPAR_CPU_GROUP_USAGE record

Field	Content	Data type	Max. digits
GROUP#	Processor group No.	Numeric	3
GRP NAME	Processor group name.	Character	31
L#	LPAR No.	Numeric	2
NAME	LPAR name.	Character	31
USED	Amount of CPU resource used by this LPAR. (Same value as USED in LPAR_CPU_USAGE record)	Numeric (MHz)	6
GRP USED%	Used ratio of CPU resource based on group CPU resource. (USED/GRP CAP in GROUP_USAGE)	Numeric (%)	3 for integer, 2 for fraction
HST USED%	Used ratio of CPU resource based on entire system. (USED/CPU CAP in SYSTEM CONFIGURATION)	Numeric (%)	3 for integer, 2 for fraction

The following two fields are also output in Ver. 5.3 or higher of HvmSh.

Field	Content	Data type	Max. digits
SRV_USED%	CPU usage rate (based on service rate) SRV_USED%=USED / CPU_SRV ("999.99" is displayed when 999.99% or higher)	Numeric (%)	3 for integer, 2 for fraction
CPU_SRV	Guaranteed amount of CPU resource in the event of contention among LPARs on a shared-mode CPU. ((CORE_CAP of SYSTEM_CONFIGURATION) x (SHR_CORE of GROUP_USAGE)) / (CPU_WIGHT of LPAR_CONFIGURATION) On an LPAR allocated to a dedicated-mode CPU, "*" is shown.	Numeric (MHz)	6

When you set the output extension option "excpu", the following fields are also output. (These are supported in Ver. 6.4 or higher of HvmSh.)

Field	Content	Data type	Max. digits
COREs_USED	The number of the CPU cores converted from the used group resource. {USED/(CORE_CAP in SYSTEM_CONFIGURATION) }	Numeric	2for integer, 2 for fraction
CPUs_USED	The number of the physical CPUs converted from the used group resource. {USED/(CORE_CAP in SYSTEM_CONFIGURATION×COREs/CPUs)}	Numeric	2for integer, 2 for fraction

Table 2-98 VF_NIC_USAGE record

Field	Content	Data type	Max. digits
Location	Installed location of PCI device. Note: For details, see Description format for device location.	Character	6
P#	VF NIC port 0 to n (n: maximum number of VF NIC port per physical port)	Numeric	1
CAPACITY	VF NIC maximum transfer rate *Same as CAPACITY of PF NIC	Numeric (MHz)	6
MODE	VF NIC allocation mode * Always show "D" S: Shared allocation D: Dedicated allocation	Character	1
INT	Interrupt times per second	Numeric (times/s)	7
PCI_SEG	Segment number of PCI device Config address (hexadecimal)	Numeric	2
PCI_BUS	Bus number of PCI device Config address (hexadecimal)	Numeric	2
PCI_DEV	Device number of PCI device Config address (hexadecimal)	Numeric	2
PCI_FNC	Function number of PCI device Config address (hexadecimal)	Numeric	1

The following table lists the HvmSh versions and the HVM firmware versions supporting each field. For V7.x or higher of HvmSh, see Rev.7.40 of this manual.

Table 2-99 CACHE_USAGE record

Field	Content	Data type	Max. digits
L#	LPAR number Note that * is displayed for SYS1 or SYS2.	Numeric	2
NAME	SYSTEM name {SYS1 SYS2 LPAR name}	Character	31
MODE	The processor scheduling mode of an LPAR {S D} Note that * is displayed for SYS1 or SYS2.	Character	1
BLADE#	Server blade number	Numeric	2
SOCKET#	Socket number	Numeric	2
L3CO%	Usage ratio of the L3 cache in a socket	Numeric (%)	Integer part: 3 Decimal part: 2
L3TEB	Size of data transferred from the L3 cache in a socket to higher layers in the socket	Numeric (KB/sec)	10
L3LEB	Size of data transferred from the L3 cache in a socket to the same memory controller	Numeric (KB/sec)	10

Table 2-100 Support matrix of HVM statistics information fields

Record	Field	HvmShCommand version	Required HVMfirmware version	
			CB500	CB2500
	MONITORING_INFORMATION	V7.x or lower	-	-
	SYSTEM_CONFIGURATION	V7.x or lower	-	-
	LPAR_CONFIGURATION	V7.x or lower	-	-
	CORE_SRV (*1)	V10.2 or higher	02-65 or higher	02-65 or higher
	SYSTEM_USAGE_SUMMARY	V7.x or lower	-	-
	SYSTEM_CPU_USAGE	V7.x or lower	-	-
	SYSTEM_MEM_USAGE	V7.x or lower	-	-
	LPAR_CPU_USAGE	V7.x or lower	-	-
	INT_RUN	V8.3 or higher	-	-
	INT_RUN%	V8.3 or higher	-	-
	RE G0 to RE G7	V7.3 or higher	-	-
	CORE_USED (*1)	V10.2 or higher	02-65 or higher	02-65 or higher
	WASTED_GUEST (*1)	V10.2 or higher	02-65 or higher	02-65 or higher
	WASTED_HOST (*1)	V10.2 or higher	02-65 or higher	02-65 or higher
	CORE_USED% (*1)	V10.2 or higher	02-65 or higher	02-65 or higher
	COREs_CORE_USED (*1)	V10.2 or higher	02-65 or higher	02-65 or higher
	COREs_WASTED_GUEST (*1)	V10.2 or higher	02-65 or higher	02-65 or higher
	COREs_WASTED_HOST (*1)	V10.2 or higher	02-65 or higher	02-65 or higher
	PHYSICAL_CPU_USAGE	V7.x or lower	-	-
	PHYSICAL_NIC_USAGE	V7.x or lower	-	-
	R_USED	V8.1 or higher	-	-
	S_USED	V8.1 or higher	-	-
	R_USED%	V8.1 or higher	-	-
	S_USED%	V8.1 or higher	-	-
	PHYSICAL_HBA_USAGE	V7.x or lower	-	-
	LOGICAL_CPU_USAGE	V7.x or lower	-	-
	INT_RUN	V8.3 or higher	-	-
	INT_RUN%	V8.3 or higher	-	-
	L_CPU_CAP	V8.3 or higher	-	-
	LOGICAL_NIC_USAGE	V7.x or lower	-	-
	R_USED	V8.1 or higher	-	-
	S_USED	V8.1 or higher	-	-
	R_USED%	V8.1 or higher	-	-
	S_USED%	V8.1 or higher	-	-
	TIME_CNT	V8.3 or higher	02-00 or higher	-
	Location	V8.3 or higher	02-00 or higher	-
	DFULL_CNT(S)	V9.9 or higher	02-59 or higher	02-59 or higher
	DFULL_PACKET(S)	V9.9 or higher	02-59 or higher	02-59 or higher
	DFULL_CNT(R)	V9.9 or higher	02-59 or higher	02-59 or higher
	DFULL_PACKET(R)	V9.9 or higher	02-59 or higher	02-59 or higher

Record	Field	HvmShCommand version	Required HVMfirmware version	
			CB500	CB2500
LOGICAL_HBA_USAGE		V7.x or lower	-	-
	TIME_CNT	V8.3 or higher	02-00 or higher	-
	Location	V8.3 or higher	02-00 or higher	-
PHYSICAL_CPU_DETAIL		V7.x or lower	-	-
LOGICAL_CPU_DETAIL		V7.x or lower	-	-
	X_FAST	V8.3 or higher	02-00 or higher	-
	X_FAST_USED	V8.3 or higher	02-00 or higher	-
	X_FAST_USED%	V8.3 or higher	02-00 or higher	-
	X_HALT	V10.0 or higher	02-63 or higher	02-63 or higher
GROUP_USAGE		V7.x or lower	-	-
PHYSICAL_CPU_GROUP_USAGE		V7.x or lower	-	-
LPAR_CPU_GROUP_USAGE		V7.x or lower	-	-
VF_NIC_USAGE		V8.3 or higher	01-84 or higher	-
CACHE_USAGE		V9.5 or higher	02-55 or higher	02-55 or higher
-: Not depending on version *1: Supported by CB2000 59-85/79-85 or higher.				

Notes

- When a value, for example a ratio (%) such as OVER%, is over 999.99, this command outputs "999.99%".
- The following two functions do not affect the value of CPU frequency to be displayed.
- The value of the field "USED" in the "LOGICAL_NIC_USAGE" record may exceed the bandwidth of a NIC port. It also brings a value over 100% at the field "USED%". This occurs in communication between LPARs through a shared NIC port.
- When the SMT function for CPU is enabled, the following fields show up to twice as high performance data as those with the SMT function disabled. However, this does not indicate that the LPAR performance is twice higher.

Table 2-101 Fields affected by SMT

Record	Field
SYSTEM_CONFIGURATION	CPU_CAP, CORE_CAP
LPAR_CONFIGURATION	CPU_CAP, CPU_MAX, CPU_SRV
SYSTEM_USAGE_SUMMARY	CAPACITY, USED, UNUSED, INSUFF
SYSTEM_CPU_USAGE	CAPACITY, USED
PHYSICAL_CPU_USAGE	CAPACITY, USED, UNUSED

- Acquisition of HVM statistical information is available for the sampling interval time ranging from 1 second to 10 minutes (5 seconds or greater is recommended).
- If your acquisition attempt with HvmSh command exceeds 10 minutes from the last attempt, the command ends with the error "Return: 0x101F0002". In such a case, retry your acquisition.
- When HVM interface of getting HVM statistical information is executed with HvmSh command for the first time, the command ends with the error "Return: 0x101F0001". In such a case, retry your acquisition.
- HvmSh command may end with the error "Return: 0x101F002x" when LPAR configuration or LPAR status has been changed (examples below). In such a case, retry your acquisition.
 - Activation, deactivation, or failure of LPAR.
 - Reboot guest OS
 - Change in NIC scheduling mode (dedicated or shared)
 - LPAR Migration

When setting interval times for sampling information to t0, t1, t2,..., acquired information are as None, average of t0 through t1, average of t1 through t2,...,. See HVM getting statistical information operation.

Description of SID

- The description of the field "SID" in the "PHYSICAL_NIC_USAGE" record, "PHYSICAL_HBA_USAGE", "LOGICAL_NIC_USAGE", and "LOGICAL_HBA_USAGE" is not the same as that described in [Description format for device location](#). The description is as follows.

Table 2-102 Description of SID

Item	Description
Gxn	Onboard NICn of server blade x.
Exn	Mezzanine slot n of server blade x.
n	Riser slot n. ($0 \leq n \leq 15$)
##X	IOBD(IO Board Module)($01 \leq ## \leq 14$, X=A or B)
Xxn	HVM NICn of server blade x. (*1)
inn	Slot nn of IO Slot Expansion Unit (i+1) ($1 \leq i \leq 7$) 100 to 115: IO Slot Expansion Unit 0 (slot 0 through 15) 200 to 215: IO Slot Expansion Unit 1 (slot 0 through 15) 300 to 315: IO Slot Expansion Unit 2 (slot 0 through 15)
*: For CB2000, CB500, and CB320, server blade number x is decimal digit. For CB2500, server blade number x is hexadecimal (1 to 9, A to F).	

Procedure of "Get HVM statistical information"

HvmSh calculates the amount of resource used in unit time from the increments of the amount of accumulation resource used. When "get HVM statistical information" commands are issued, HvmSh acquires the performance data which HVM is sampling and accumulating. HvmSh calculates the "amount of resources used in unit time" from 2 times of data.

For example;

The amount of resource used in unit time is calculated as " $(v2-v1) / (t2-t1)$ " where

- $t1, t2$: the time in which command is issued and data is acquired
- $v1, v2$: the amount of accumulation resource used at time $t1, t2$

Therefore, by this method, the upper layer programs which issue HvmSh such as HVM Navigator can determine the interval of measurement time by themselves.

The HvmSh command executes the following procedures;

- At the time $t1$, saves the performance data $v1$ to the temporary file.
- At the time $t2$, gets the performance data $v2$ and writes to memory.
- From both data $v1$ and $v2$ above, calculates $(v2-v1)/(t2-t1)$ and outputs as statistical information.
- Writes the performance data $v1$ to memory.
- Saves the performance data $v2$ to the temporary file.

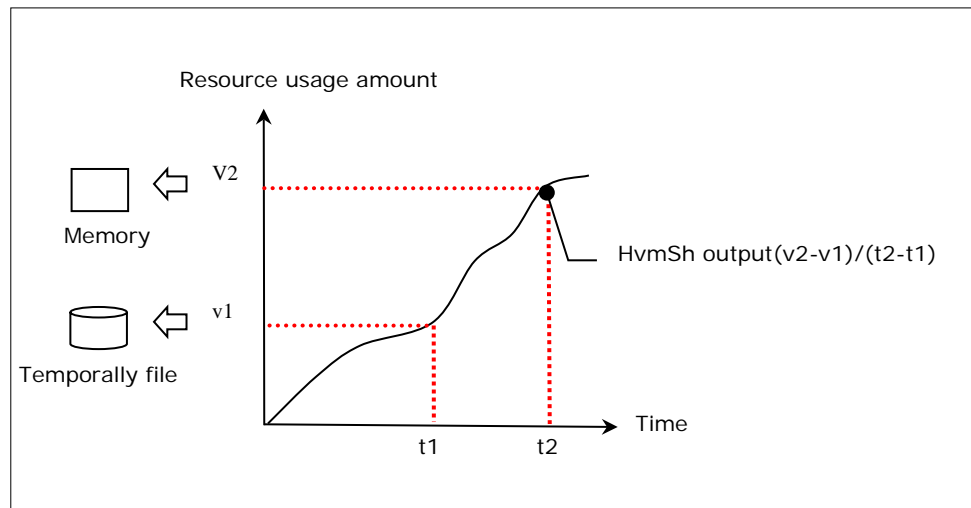


Figure 2-1 Getting statistical information in HvmSh

Specifies the behavior in the case which configuration or LPAR status changes

It is possible to specify the behavior in the case with the error code "0x101F002x" after the configuration or LPAR status changes, by specifying the option "-perf={cnfchg_nodata,0 | cnfchg_nodata,1}" to the initial file. This function is for the specific program with which HvmSh cooperates and is available in HvmSh Ver.6.4 or higher.

When you specify the option "-perf={cnfchg_nodata,0|cnfchg_nodata,1}" to the initial file, displays only the specific field in the specific record as follows.

- The field "HVM_ID PRODUCT" in the "MONITORING_INFORMATION" record
- The field "DEF_LPARs ACT_LPARs" in the "SYSTEM_CONFIGURATION" record
- The field "L# NAME STATE INFORMATION" in the "LPAR_CONFIGURATION" record

1: "" are displayed in the fields except the fields above.

*2: Only the field names are displayed in the records except the records above.

When "-perf=cnfchg_nodata0" is specified, the return code is 0x00000000.
When "-perf=cnfchg_nodata1" is specified, the return code is 0x101F002x.

Table 2-103 Operation after configuration or LPAR status changes

HvmSh version	-perf=option	Return code	Statistical information record display
Ver.6.0 or higher	Invalid specification	0x101F002x	None
Ver.6.4 or higher	Not specified	0x101F002x	None
	-perf=cnfchg_nodata,0	0x00000000	Yes (Specific field only)
	-perf=cnfchg_nodata,1	0x101F002x	

Support matrix

This chapter describes the first versions of HvmSh command and HVM supporting each HVM interface. For BS1000, CB2000, or CB320, see [Support_matrix\(2\)](#) in [Chapter 6, BS1000, CB2000, or CB320](#).

□ [Support matrix](#)

Support matrix

The following table lists the HVM interfaces with the combinations of HvmSh and HVM versions supporting the HVM interfaces. For BS1000, CB2000, or CB320, see Table 6-6 Combinations of HvmSh and HVM versions supporting HVM interfaces.

Table 3-1 Combinations of HvmSh and HVM versions supporting HVM interfaces

HVM interface	HvmSh Version	Prerequisite HVM version	
		CB500	CB2500
set HvmOptions (savetimeconfig=option) (safemode=option) (keepconfig=option)	V5.1 or higher	01-00 or higher	02-00 or higher
	V7.3 or higher	01-70 or higher	02-00 or higher
	V8.5 or higher	02-10 or higher	02-10 or higher
set FcBootFunction (MultiplePortID=option)	V9.6 or higher	02-56 or higher	02-56 or higher
	V5.3 or higher	01-00 or higher	02-00 or higher
opr FcBootFunction	V8.5 or higher	02-10 or higher	02-10 or higher
	V5.5 or higher	01-00 or higher	02-00 or higher
opr HvmRestart	V5.5 or higher	Unsupported	Unsupported
opr HvmOperatingMode	V6.0 or higher	01-00 or higher	02-00 or higher
get LPARVNICMac (format2)	V6.0 or higher	Unsupported	Unsupported
get LPARVNICDev	V6.0 or higher	Unsupported	Unsupported
set LPARVNICDev	V6.0 or higher	01-00 or higher	02-00 or higher
opr HvmDumpToSystem	V6.2 or higher	02-00 or higher	02-00 or higher
get HvmDumpData	V6.4 or higher	01-20 or higher	02-00 or higher
set LPARMN	V6.5	01-30 or higher	02-00 or higher
opr TimerCounterBase	V7.2 or higher (*1)	01-50 or higher	02-00 or higher
get HvmAlertList	V7.2 or higher (*1)	01-60 or higher	02-00 or higher
opr HvmDumpToSystemCompress	V7.2 or higher (*1)	01-60 or higher	02-00 or higher
get HvmDumpDataCompress	V7.3 or higher (*1)	01-70 or higher	02-00 or higher
set LPARVTX	V7.3 or higher (*1)	01-70 or higher	02-00 or higher
set LPAROsType	V7.3 or higher (*1)	01-70 or higher	02-00 or higher
get LPARVfVNIC	V7.3 or higher (*1)	01-70 or higher	02-00 or higher
set LPARVfVNIC	V7.3 or higher (*1)	01-80 or higher	02-00 or higher
get HvmSecureCmmConfig	V8.0 or higher (*1)	01-80 or higher	02-00 or higher
get HvmServerCertificate	V8.0 or higher (*1)	01-80 or higher	02-00 or higher
opr HvmCSR	V8.0 or higher (*1)	01-80 or higher	02-00 or higher
opr HvmIfSecureLevel	V8.0 or higher (*1)	01-80 or higher	02-00 or higher
opr HvmIfSecureVerify	V8.0 or higher (*1)	01-80 or higher	02-00 or higher
opr HvmServerCertificate	V8.0 or higher (*1)	01-80 or higher	02-00 or higher
opr HvmCACertificateRegist	V8.0 or higher (*1)	01-80 or higher	02-00 or higher
opr HvmClientCertificateRegist	V8.0 or higher (*1)	01-80 or higher	02-00 or higher
opr HvmClientCertificateRemove	V8.0 or higher (*1)	01-80 or higher	02-00 or higher

HVM interface	HvmSh Version	Prerequisite HVM version	
		CB500	CB2500
opr HvmSecureCmmConfigSave	V8.0 or higher (*1)	01-80 or higher	02-00 or higher
opr CACertificateRegist	V8.0 or higher (*1)	01-80 or higher	02-00 or higher
set LPARGuestNuma	V8.3 or higher (*1)	02-00 or higher	02-00 or higher
get LPARNodeMem	V8.3 or higher (*1)	02-00 or higher	02-00 or higher
set LPARNodeMem	V8.3 or higher (*1)	02-00 or higher	02-00 or higher
opr login	V8.3 or higher (*1)	02-00 or higher	02-00 or higher
opr logout	V8.3 or higher (*1)	02-00 or higher	02-00 or higher
get HvmFunctionLicense	V8.4 or higher (*1)	02-05 or higher	02-05 or higher
opr VCConnectType	V8.4 or higher (*1)	02-05 or higher	02-05 or higher
opr HvmSshHostKey	V8.4 or higher (*1)	02-05 or higher	02-05 or higher
get HvmUserList	V8.4 or higher (*1)	02-05 or higher	02-05 or higher
opr HvmIfAuthentication	V8.4 or higher (*1)	02-05 or higher	02-05 or higher
opr HvmPasswdExpiry	V8.4 or higher (*1)	02-05 or higher	02-05 or higher
opr HvmUserAdd	V8.4 or higher (*1)	02-05 or higher	02-05 or higher
opr HvmUserRemove	V8.4 or higher (*1)	02-05 or higher	02-05 or higher
opr HvmPasswd	V8.4 or higher (*1)	02-05 or higher	02-05 or higher
get HvmAuthenticationLogs	V8.4 or higher (*1)	02-05 or higher	02-05 or higher
opr HvmShLoginValidTime	V8.4 or higher (*1)	02-05 or higher	02-05 or higher
opr MgmtStandbyPortDiagnosis	V8.5 or higher (*1)	02-10 or higher	02-10 or higher
get MgmtStandbyPortStatus	V8.5 or higher (*1)	02-10 or higher	02-10 or higher
set LPARMshyp	V8.6 or higher (*1)	02-25 or higher	02-25 or higher
set FcCoreDedMode	V8.6 or higher (*1)	02-25 or higher	02-25 or higher
get SystemConfigIPv6	V8.6 or higher (*1)	02-25 or higher	02-25 or higher
opr SystemConfigIPv6	V8.6 or higher (*1)	02-25 or higher	02-25 or higher
set LPARIdleMode	V8.7 or higher (*1)	02-27 or higher	02-27 or higher
set LPARLowLatency	V8.7 or higher (*1)	02-27 or higher	02-27 or higher
set LPAREpt1GB	V8.7 or higher (*1)	02-27 or higher	02-27 or higher
set LPARGuestNumaBindLproc	V9.0 or higher (*1)	02-40 or higher	02-40 or higher
set LPARNodeLproc	V9.0 or higher (*1)	02-40 or higher	02-40 or higher

HVM interface	HvmSh Version	Prerequisite HVM version	
		CB500	CB2500
set FcIoConnectionMode	V9.0 or higher (*1)	02-40 or higher	02-40 or higher
opr SystemConfigDNS	V9.0 or higher (*1)	02-40 or higher	02-40 or higher
get HvmScdOptions	V9.0 or higher (*1)	01-50 or higher	02-00 or higher
opr HvmScdOptions	V9.0 or higher (*1)	01-50 or higher	02-00 or higher
format2	V10.2 or higher (*1)	02-65 or higher	02-65 or higher
opr AuditLogConfig	V9.0 or higher (*1)	02-40 or higher	02-40 or higher
Policy option	V9.5 or higher (*1)	02-55 or higher	02-55 or higher
opr ExternalAuthentication	V9.0 or higher (*1)	02-40 or higher	02-40 or higher
opr LdapConfig	V9.0 or higher (*1)	02-40 or higher	02-40 or higher
opr LdapPasswd	V9.0 or higher (*1)	02-40 or higher	02-40 or higher
set PciPortDedMode	V9.2 or higher (*1)	02-45 or higher	02-45 or higher
opr HvmPasswdRecovery	V9.2 or higher (*1)	02-45 or higher	02-45 or higher
opr RadiusConfig	V9.2 or higher (*1)	02-45 or higher	02-45 or higher
opr RadiusConnectivityVerify	V9.2 or higher (*1)	02-45 or higher	02-45 or higher
opr RoleConfig	V9.2 or higher (*1)	02-45 or higher	02-45 or higher
opr HvmUserConfig	V9.2 or higher (*1)	02-45 or higher	02-45 or higher
opr ManagementModuleUserRole	V9.2 or higher (*1)	02-45 or higher	02-45 or higher
get LPARPCI (format2)	V9.2or higher (*1)	01-00 or higher	02-00 or higher
set LPARPCI (format2)	V9.2or higher (*1)	01-00 or higher	02-00 or higher
get SystemPci (format2)	V9.2or higher (*1)	01-00 or higher	02-00 or higher
set SystemPci (format2)	V9.2or higher (*1)	01-00 or higher	02-00 or higher
opr HvmIfCertificateType	V9.3or higher (*1)	02-50 or higher	02-50 or higher
set MgmtPathSwitchLinkDown	V9.5 or higher (*1)	02-55 or higher	02-55 or higher
opr MgmtPathSwitch	V9.5 or higher (*1)	02-55 or higher	02-55 or higher
opr LparCatCbm	V.9.5 or higher (*1)	02-55 or higher	02-55 or higher
get VnicInterruptModeration	V9.6 or higher (*1)	02-56 or higher	02-56 or higher
set VnicInterruptModeration	V9.6 or higher (*1)	02-56 or higher	02-56 or higher
set LPARHpet	V9.6 or higher (*1)	02-56 or higher	02-56 or higher
opr SystemPPProc (format2)	V9.7 or higher (*1)	—	—

HVM interface	HvmSh Version	Prerequisite HVM version	
		CB500	CB2500
opr SystemConfig sys2proc option	V9.9 or higher (*1)	02-62 or higher	02-62 or higher
get HvmControlSetting	V9.9 or higher (*1)	02-62 or higher	02-62 or higher
set HvmControlSetting	V9.9 or higher (*1)	02-62 or higher	02-62 or higher
set LparPCID	V9.9 or higher (*1)	02-62 or higher	02-62 or higher
set LparIBRS	V9.9 or higher (*1)	02-62 or higher	02-62 or higher
get ConfigSummary	V9.9 or higher (*1)	02-62 or higher	02-62 or higher
summary=cpufeatures option	V10.0 or higher (*1)	02-63 or higher	02-63 or higher
get HvmSys2Dump	V10.0 or higher (*1)	02-63 or higher	02-63 or higher
opr HvmSys2Dump	V10.0 or higher (*1)	02-63 or higher	02-63 or higher
get HvmSys2DumpData	V10.0 or higher (*1)	02-63 or higher	02-63 or higher
set LparSSBD	V10.0 or higher (*1)	02-63 or higher	02-63 or higher
set LparCpuFeatures	V10.0 or higher (*1)	02-63 or higher	02-63 or higher
set LparMDClear	V10.3 or higher (*1)	02-67 or higher	02-67 or higher
[The other commands]	(No description)	01-00 or higher	02-00 or higher
*1: The HVM interfaces supported in V7.1 or higher of HvmSh uses TCP or TLS protocol even though you set no value or a value of "UDP" at the option "-prot" of HvmSh commands or in the default file.			

Example of use

This chapter describes the examples of uses of interfaces.

- [Example of batch processing of asynchronous HVM interfaces](#)
- [Operating boot information of LPAR](#)
- [Example workflow of preparing certificates for TLS communication](#)
- [Example of batch processing for getting HVM dump](#)
- [Example of batch processing for getting HVM statistics information](#)

Example of batch processing of asynchronous HVM interfaces

The batch description of asynchronous HVM interface that can be retrieved with the "getResult" command after an execution is as follows. Note that the following is an example of the "opr Activate" command.

```
@echo off
REM
set hvmpip=172.16.206.41
REM
set srcip=172.16.0.243
REM filename for result
set dt=%date:~0,10%
set dt=%dt:/%=%
set tm=%time:~0,8%
set tm=%tm:=%
set tm=%tm: =0%
set outf=HvmSh_%hvmpip%_%dt%_%tm%.txt
echo result file:%outf%
set /A rcode=0

REM target LPAR are 1, 3 and 5.
REM if you want to Activate LPAR 1 to 5 then discribe FOR /L %%i IN (1,1, 5) do (
FOR %%i IN (1 3 5) do (
    call :ACTIVATE %%i
)
pause > nul
exit

REM ACTIVATE
:ACTIVATE
set lparno=%1
set cmd=opr Activate lpar=%lparno%
echo . %HvmSh -prot=tcp -host=%hvmpip% -srcip=%srcip% %cmd% >>%outf%
    . %HvmSh -prot=tcp -host=%hvmpip% -srcip=%srcip% %cmd% 1>>%outf% 2>nul
set /A rcode=%errorlevel%
if %rcode% EQU 0x00000000 (
    echo [success %rcode%] %cmd%
    exit /B
)
if %rcode% GEQ 0x01000000 (
    echo [failed %rcode%] %cmd%
    exit /B
)
echo [success %rcode%] %cmd%
call :WAITEND %rcode%
exit /B

REM wait for operation end
:WAITEND
set accept=%1
set cmd=getResult accept=%accept%
echo . %HvmSh -prot=tcp -host=%hvmpip% -srcip=%srcip% %cmd% >>%outf%
```

```
. %HvmSh -prot=tcp -host=%hvmip% -srcip=%srcip% %cmd% 1>>%outf% 2>nul
set /A rcode=%errorlevel%
set /A state=%rcode%-(%rcode%/65536)*65536
if 1 EQU %state% (
    ping -n 2 localhost > nul
    goto :WAITEND
)
if 0 NEQ %state% (
    echo [failed %rcode%] %cmd%
    exit /B %state%
)
echo [success %rcode%] %cmd%
exit /B %state%
```

Control of LPAR boot information

Notes on conflict of controlling boot information of LPAR

HvmSh controls the LPAR boot information with the "opr Activate" command, the "get BootDevice" command and the "set BootOrder" command. A sample of HvmSh command sequence is below.

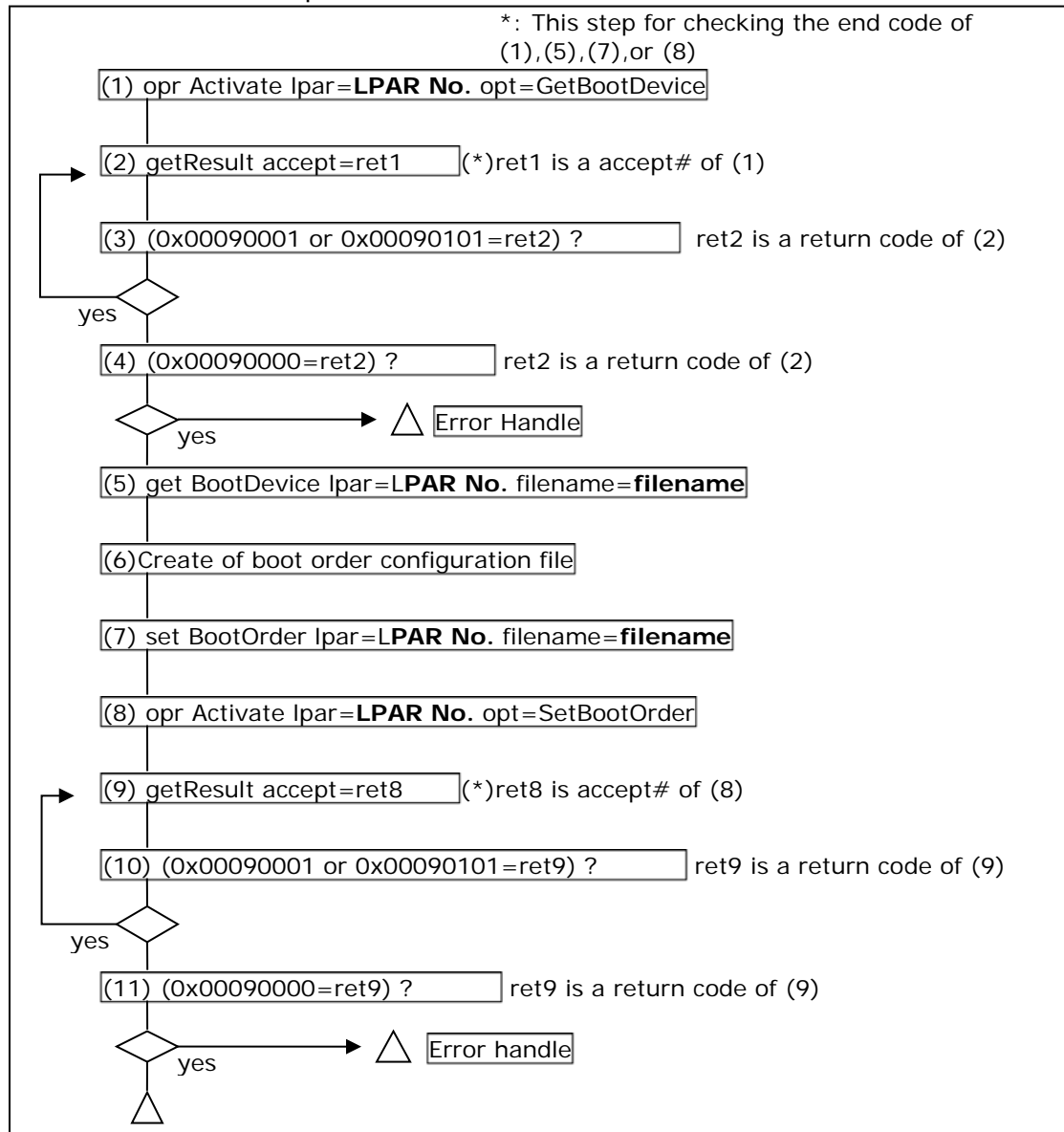


Figure 4-1 Control sequence of LPAR boot information

Notes on conflict of controlling boot information of LPAR

When the following three commands for control of LPAR boot information are executed to an HVM, the third command waits for the second command to be completed for up to 30 seconds.

(1) Case of get boot information.

1st command: "opr Activate opt=GetBootDevice" for an LPAR

2nd command: "get BootDevice" for the LPAR

3rd command: "opr Activate opt=GetBootDevice" for another LPAR

When the 2nd command is executed after finish of 3rd command, 2nd command fails with the error "Return: 0x0104 0000".

(2) Case of set boot information.

1st command : "set BootOrder" for an LPAR

2nd command : "opr Activate opt=SetBootOrder" for the LPAR

3rd command : "set BootOrder" for another LPAR

When the 2nd command is executed after completion of the 3rd command, the 2nd command fails with the error "Return: 0x00090103".

Therefore, do not execute the command for control of LPAR boot information at the same time to two LPARs. It causes conflict of commands. An example of command conflict is as follows

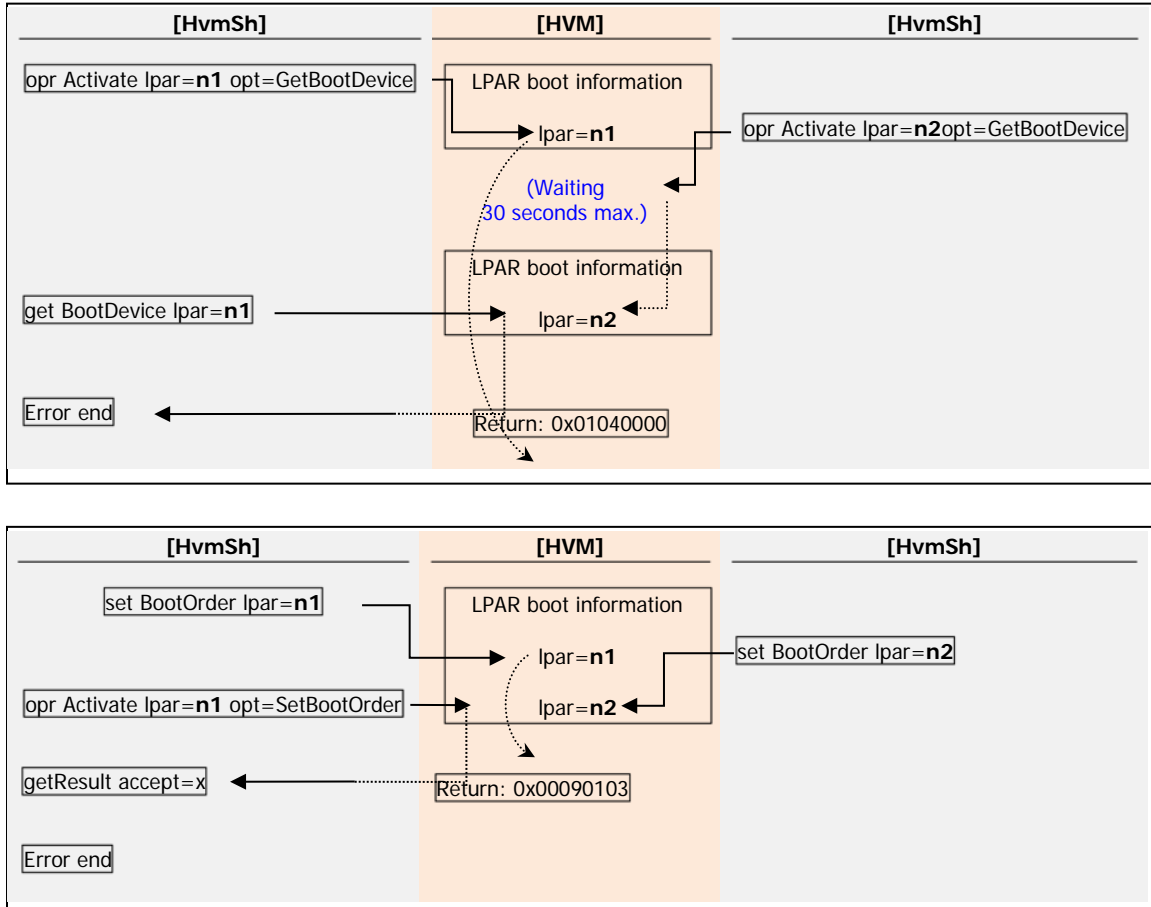


Figure 4-2 Example of command conflict

File format for controlling LPAR boot information

Table 4-1 File format for control of boot information

No.	File format
1	ASCII text file
2	Return code is MSDOS mode (CR+LF)
3	All characters are 1byte code
4	Mac address uses small letter
5	For "get BootDevice": Maximum device number is 512 For "set BootDevice": Maximum device number is 16
6	Boot order begins from No.1. (Don't use No.0) Boot order is not admit lack number. "*" are displayed for item which has not the boot order number. (for "get BootDevice" file)
7	Device information format is below. Boot order No.: Boot ID<tab>Data<tab>Data<tab>..."DevicePath"<tab>"segbusdevfunc "<tab>Boot Name<CR+LF>
8	Maximum Boot Name is 75 characters. (containing NULL end code) Specific character (!"#%\$&'()*=- _{ }~?*\` +><.,/\:];[@\^ -) can use to Boot Name. Boot Name is set automatically when it has not been set. (to XXXX000#, XXXX: Device type, #: hex number) Examples of automatically named device names. PXE: NIC0001 LU: FC0002 iSCSI: iSCSI0003 CD/DVD-KVM: KVM0004 CD/DVD-Front: USB0005
9	Donot describe the device information which has not set to BootOrder. (for "Set BootOrder" file)
10	Cannot set device information to the un-bootable device (without "*" mark) except EFI-SHELL. (for "set BootOrder" file)

Table 4-2 Boot ID

No.	Boot ID	Device type
1	PXE	Network device
2	LU	FC device
3	iSCSI	iSCSI device
4	CD/DVD-KVM	KVM-CD/DVD device
5	CD/DVD-Front	Front USB-CD/DVD device
6	EFI-SHELL	EFI shell

Table 4-3 PXE data format

Field	Contents	Format	Length
1	Boor order	Decimal data	2
2	:	Character	1
3	PXE or PXE*	Character	3 or 4
-	<tab>	<tab>	1
4	MAC address	Mac format (xx-xx-xx-xx-xx-xx)	17
-	<tab>	<tab>	1
5	Device path	Character	300
-	<tab>	<tab>	1
6	seg bus dev func	Hex data	13
-	<tab>	<tab>	1
7	Boot name	Character (available omission)	75
-	Return	<CR+LF>	2

Table 4-4 LU data format

Field	Contents	Format	Length
1	Boor order	Decimal data	2
2	:	Character	1
3	LU or LU*	Character	2 or 3
-	<tab>	<tab>	1
4	Slot No.	Hex data Exx Ixxx	3
-	<tab>	<tab>	1
5	Port No.	Hex data	1
-	<tab>	<tab>	1
6	SANRISE Prot WWN	Hex data	16
-	<tab>	<tab>	1
7	LU No.	Decimal data	3
-	<tab>	<tab>	1
8	Device path	Character	300
-	<tab>	<tab>	1
9	seg bus dev func	Hex data	13
-	<tab>	<tab>	1
10	Boot name	Character (available omission)	75
-	Return	<CR+LF>	2

Table 4-5 iSCSI data format

Field	Contents	Format	Length
1	Boor order	Decimal data	2
2	:	Character	1
3	iSCSI or iSCSI*	Character	5 or 6
-	<tab>	<tab>	1
4	MAC address	Mac format (xx-xx-xx-xx-xx-xx)	17
-	<tab>	<tab>	1
5	LU No.	Decimal data	3
-	<tab>	<tab>	1
6	Device path	Character	300
-	<tab>	<tab>	1
7	seg bus dev func	Hex data	13
-	<tab>	<tab>	1
8	Boot name	Character (available omission)	75
-	Return	<CR+LF>	2

Table 4-6 CD/DVD-KVM data format

Field	Contents	Format	Length
1	Boor order	Decimal data	2
2	:	Character	1
3	CD/DVD-KVM orCD/DVD-KVM*	Character	10 or 11
-	<tab>	<tab>	1
4	Device path	Character	300
-	<tab>	<tab>	1
5	seg bus dev func	Hex data	13
-	<tab>	<tab>	1
6	Boot name	Character (available omission)	75
-	Return	<CR+LF>	2

Table 4-7 CD/DVD-Front data format

Field	Contents	Format	Length
1	Boor order	Decimal data	2
2	:	Character	1
3	CD/DVD-Front orCD/DVD-Front*	Character	12 or 13
-	<tab>	<tab>	1
4	Port No.	Decimal data	1
-	<tab>	<tab>	1
5	Device path	Character	300
-	<tab>	<tab>	1
6	seg bus dev func	Hex data	13
-	<tab>	<tab>	1
7	Boot name	Character (available omission)	75
-	Return	<CR+LF>	2

Table 4-8 EFI-SHELL data format

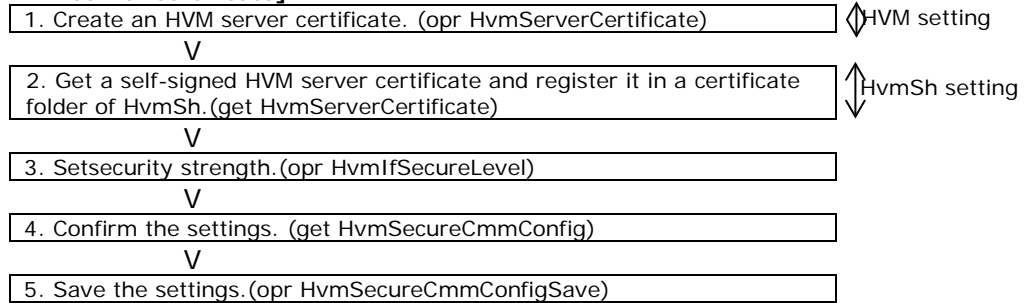
Field	Contents	Format	Length
1	Boor order	Decimal data	2
2	:	Character	1
3	EFI-SHELL	Character	9
-	Return	<CR+LF>	2

Example workflow of preparing certificates for TLS communication

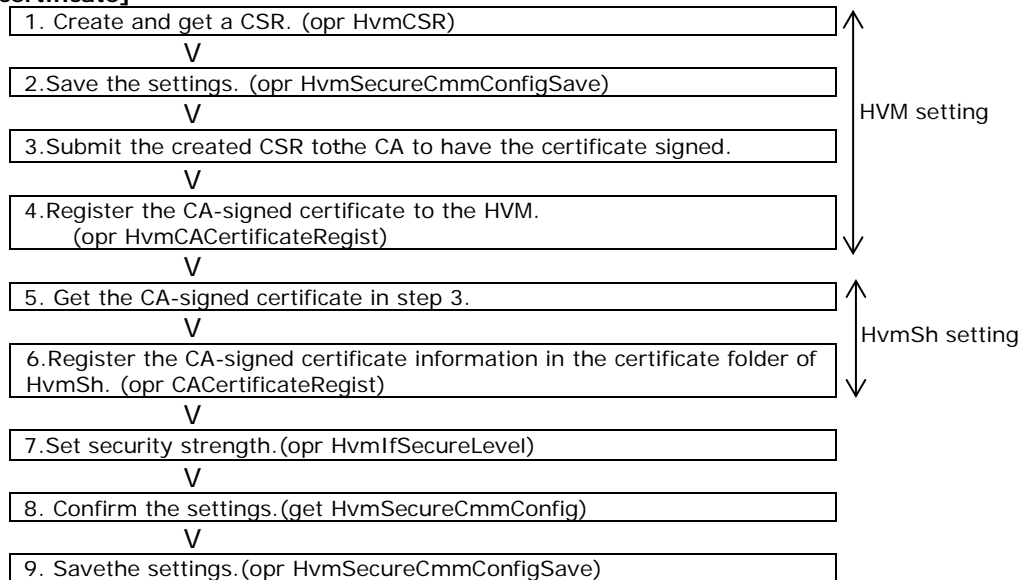
When HvmSh connects to an HVM using TLS protocol, both of them use the server certificate of the HVM. When you boot an HVM for the first time, HVM creates a default HVM server certificate for the HVM. For higher levels of security, you can create either of the two types of server certificate, as a step towards encrypted communication environment construction, according to your security needs: self-signed server certificate and CA (Certificate Authority)-signed certificate.

To create a self-signed or CA-signed server certificate, specify "-prot=tls" option and "-verify=yes" option in the HvmSh initial file and enter the HvmSh commands, or enter the HvmSh commands with the same optional parameters after configuring an HVM. The following example workflow shows this step by step.

[Using self-signed HVM server certificate]



[Using CA-signed certificate]



Note: When you reboot or shut down the HVM before Step 4, execute Step 2 (Save the Settings) before the reboot or shutdown.

Example of batch processing for getting HVM dump

An example of batch processing for getting an archived HVM dump. When you change the two commands in the following example as follows, you can get an extracted HVM dump.

Table 4-9 Getting archived or extracted HVM dump

HVM dump	Command 1	Command 2
Archived	opr HvmDumpToSystemCompress	opr HvmDumpToSystem
Extracted	get HvmDumpDataCompress	get HvmDumpData

When you execute the two commands for getting an extracted HVM dump, two files are created with each file name included "_01" or "_02".

```
@echo off
setlocal enableDelayedExpansion

REM
set hvmpip=172.16.206.41
REM
set srcip=172.16.0.243
set /A rcode=0

REM When you desire to get 5 dumps, change (1 1 1) to (1 1 5).
FOR /L %%i IN (1,1,1) do (
    call :HVM_DUMP
)

pause > nul
exit

REM -----
:HVM_DUMP
set dt=%date:~0,10%
set dt=%dt: /=%
set tm=%time:~0,8%
set tm=%tm: :=%
set tm=%tm: =0%
set outf=HvmDump_%hvmpip%_%dt%_%tm%.txt
set dmpf=HvmDump_%hvmpip%_%dt%_%tm%
echo result file :%outf%

set cmd=opr HvmDumpToSystemCompress
echo . %HvmSh -prot=tcp -timeout=180 -host=%hvmpip% -srcip=%srcip% %cmd% >>%outf%
. %HvmSh -prot=tcp -timeout=180 -host=%hvmpip% -srcip=%srcip% %cmd% 1>>%outf% 2>nul
set /A rcode=%errorlevel%
if %rcode% EQU 0x00000000 (
    echo [success %rcode%] %cmd%
    goto :DUMPDATA
)
if %rcode% GEQ 0x01000000 (
```

```

        echo [failed %rcode%] %cmd%
        exit /B
    )
    echo [success %rcode%] %cmd%
    call :WAITEND %rcode%
    if %errorlevel% neq 0 exit /B

:DUMPDATA
set cmd=get HvmDumpDataCompress filename=%dmpf%
echo . ¥HvmSh -prot=tcp -timeout=180 -host=%hvmip% -srcip=%srcip% %cmd% >>%outf%
    . ¥HvmSh -prot=tcp -timeout=180 -host=%hvmip% -srcip=%srcip% %cmd% 1>>%outf% 2>nul
set /A rcode=%errorlevel%
if %rcode% neq 0 (
    echo [failed %rcode%] %cmd%
    exit /B
)
echo [success %rcode%] %cmd%
echo HVMDump file:%dmpf%
exit /B

REM ----- wait for operation end
:WAITEND
set accept=%1
set cmd=getResult accept=%accept%
echo . ¥HvmSh -prot=tcp-host=%hvmip% -srcip=%srcip% %cmd% >>%outf%
    . ¥HvmSh -prot=tcp -host=%hvmip% -srcip=%srcip% %cmd% 1>>%outf% 2>nul
set /A rcode=%errorlevel%
set /A state=%rcode%-(%rcode%/65536)*65536
if 1 EQU %state% (
    ping -n 2 localhost > nul
    goto :WAITEND
)
if 0 NEQ %state% (
    echo [failed %rcode%] %cmd%
    exit /B %state%
)
echo [success %rcode%] %cmd%
exit /B %state%

```

Example of batch processing for getting HVM statistics information

An example of batch processing for getting HVM statistics information 20 times at intervals of 10 seconds is as follows. When you desire to get the statistics information of multiple HVMs simultaneously, execute "start **batch file name**HVM IP address" multiple times.

```
@echo off
setlocal enableDelayedExpansion

REM
set hvmpip=172.16.206.41
if "%1" NEQ "" set hvmpip=%1
REM
set srcip=172.16.0.243
REM
set loopmax=20
REM
set interval=10
REM base filename for result
set dt=%date:~0,10%
set dt=%dt: /=%
set tm=%time:~0,8%
set tm=%tm: :=%
set tm=%tm: =0%
set outf=PerfMon_%hvmpip%_%dt%_%tm%

set /A rcode=0
REM
FOR /L %%i IN (0,1,%loopmax%) do (
    call :HVMPERF %%i
    ping -n %interval% localhost > nul
)
echo result file:%outf%_.txt (n=1-%loopmax%)
pause > nul
exit

REM -----
:HVMPERF

set cnt=%1
set cmd=get HvmPerfMon filename=%outf%.bin excpu exio hvm
if "%cnt%" EQU "0" (
    . %HvmSh -prot=tcp -host=%hvmpip% -srcip=%srcip% %cmd% 1>nul 2>nul
    exit /B
) else (
    echo . %HvmSh -prot=tcp -host=%hvmpip% -srcip=%srcip% %cmd% >>%outf%_%cnt%.txt
    . %HvmSh -prot=tcp -host=%hvmpip% -srcip=%srcip% %cmd% 1>>%outf%_%cnt%.txt 2>nul
)
set /A rcode=%errorlevel%
if %rcode% EQU 0 (
    echo [success %rcode%] %cmd%
```

```
    exit /B
)
echo [failed %rcode%] %cmd%
exit /B
```


Notes

This chapter describes the notes on usage.

- ☐ [Parallel operation of HvmSh commands](#)
- ☐ [Conflict of configuration changes and LPAR generation number](#)
- ☐ [Examples of response timeouts \(error code: 0x10020001\)](#)
- ☐ [HVM interfaces specialized for LPAR relocation](#)
- ☐ [Notes on HVM network](#)
- ☐ [Notes on HVM ID](#)
- ☐ [Description format for device location](#)
- ☐ [Collecting HVM dump \(to save in HVM\)](#)

Parallel operation of HvmSh commands

- Two or more HvmSh commands can run in parallel; however, as the number of commands running in parallel increases, so does the workload on the management server and HVM. Excessively increased workload (e.g., by 10 or more commands) can lead to abnormal end of HvmSh commands entered due to the potential connection failure with HVM. To avoid such problems, keep the condition " $c < (t / 0.2)$ " where:

Execution time per HvmSh command = 0.2 second

Time interval between HvmSh commands entered = t seconds

Number of HvmSh commands running in parallel on a management server $[n] = cn$

Number of all the HvmSh commands running in parallel on all the management servers = c ($c = \sum cn$)

- Cn , the number of HvmSh commands running in parallel on a management server, must not exceed $c/2$ when you execute HvmSh commands from two or more management servers to the same HVMs.
- Since the execution time for each HvmSh command differs depending on the status of the network, it is recommended that you gradually increase the number of HvmSh commands while confirming the following:

Enough room in the management server resource

Normal ends of HvmSh commands

- If you encounter an abnormal end of an HvmSh command, decrease the number of HvmSh commands to run in parallel.

Conflict of configuration changes and LPAR generation number

Every LPAR has an LPAR generation number ranging from 1 through 65535. It is used to prevent conflicts in modifying the configuration of LPARs. HVM increases the LPAR generation number every time a command from the HVM screen or SC/BCM or an HvmSh command from other management server changes the configuration of an LPAR.

The number can be specified by an optional "generation" parameter of HvmSh. LPAR configuration is not modified when specified number differed from the LPAR generation number. When sent HvmSh commands without specifying the number, HVM unconditionally configures LPAR in order of accepted command.

Careful attention is required to avoid conflicts when you try to modify LPAR configuration by two or more tools; for example, HVM screen, SC/BCM, or HvmSh commands from other management server.

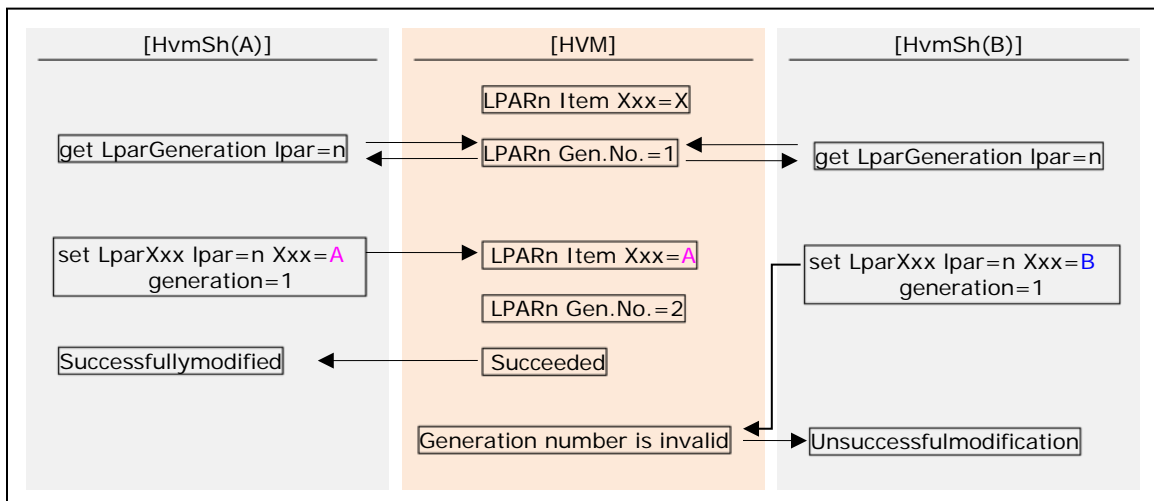


Figure 5-1 Conflict in modification (using the generation number)

Examples of response timeouts (error code: 0x10020001)

Running multiple HvmSh commands raise the workload on the network. When the load overwhelms the capacity of the network, a "Response Timeout" occurs. If, however, response timeout frequently occurs and if the workload on the network is not heavy, it should indicate some problem in the network environment settings. Here are two such examples.

Example 1

If the communication mode of the LAN switch set to "Fixed" and if the communication mode of the management module is "Auto", the communication takes place in "Half-duplex". Then, the packet collisions cause frequent CRC errors, resulting in a "Response Timeout".

[Solution]

Set the communication mode on the LAN switch to "Auto".

Note, however, that you cannot change the communication mode on the management module.

Example 2

Due to the inappropriate offload setting on a NIC and due to the LPAR used as the management server, a communication error occurs and causes a "Response Timeout".

[Solution]

To use an LPAR as a management server, set the offload option according to the instructions in the user guide for your server blade.

HVM interfaces specialized for LPAR relocation

The followings are the commands only for LPAR relocation. Do not use them for other purposes.

CB500 and CB2500 do not support LPAR re-allocation.

get VfcWWN

set VfcWWN

get ActInhibit

set ActInhibit

get LPARRTCdiff

set LPARRTCdiff

get autoVnicMac

set autoVnicMac

get VfcIdChangeInhibit

set VfcIdChangeInhibit

get RelativeSlot

LPAR migration and LPAR relocation are exclusive operations. Therefore, do not use those commands to the LPAR which has been migrated.

If execute either of those commands to the LPAR which has been migrated, command fails with return code 0x0402 0000 (CB2000DP: Ver.58-61 or higher / CB2000MP: Ver.78-61 or higher / CB320: Ver.17-71 or higher), or the HVM might become unstable condition (previous HVM Ver.).

LPAR relocation by Linux HvmSh command does not guarantee normal operation.

Notes on HVM network

Do not execute the commands listed in the following table with the network between an HVM and the management module down. For the details, see notes on the management path and others in the user's guide for your server blade.

Table 5-1 HVM commands not allowed to be executed in a failure of network between HVM and management module

HVM interface
opr ForceRecovery
oprSystemConfig (with any of the following options) <ul style="list-style-type: none">- hvmid=HVM identifier- vnicsysno=VNIC system No.- vcport=Virtual COM console port
set SystemPCI

Notes on HVM ID

You can get an HVM ID with one of the following three HVM interfaces, however, there is difference in whether adding trailing spaces.

Table 5-2 HVM ID format

HVM interface	Trailing spaces	Specification
get SystemConfig	Yes	Displays HVM ID as 16 characters by adding trailing spaces to HVM ID displaying followed by <i>hvmid=</i> .
get ConfigAll	Yes	For HVM ID on HVM INFORMATION record, displays HVM ID as 16 characters by adding trailing spaces
get HvmPerfMon	No	For HVM_ID on MONITORING_INFORMATION record, displays HVM ID only.

Description format for device location

Description format of Device location on HvmSh commands are as follows except specifying in individual cases.

Table 5-3 Description format for device location

Device type	Description format	Value
PCI Slot CB 2000: Rear side of Chassis CB 320: Front Side of Blade	□ □□	□ = 0 - 9 PCI Slot No. on rear side of Chassis. (CB 2000) □□ = 10 - 15 PCI Slot No. on rear side of Chassis. (CB 2000)
	Δ	Δ = 0 - 9 PCI Slot No. on front side of Blade. (CB 320)
Onboard NIC	GΔ GΔΔ GΔ□	Δ = 0 - 9 Blade No. (No.8 & 9 are only for CB 320, for CB2500 No.0 is none.) ΔΔ = 10-15 Blade No. (for CB2500) □ = Onboard GbE Controller No. (0 or 1) (Only for CB 320 and CB500 EP4S)
USB, Remote KVM	UΔ UΔΔ UKΔ UKΔΔ	Δ = 0 - 9 Blade No. (No.8 & 9 are only for CB 320, for CB2500 No.0 is none.) ΔΔ = 10-15 Blade No. (for CB2500)
Mezzanine Slot	EΔ◇ EΔΔ◇	Δ = 0 - 9 Blade No. (No.8 & 9 are only for CB 320, for CB2500 No.0 is none.) ΔΔ = 10-15 Blade No. (for CB2500) ◇ = 0 - 2 Mezzanine Slot No. (2 for CB 500)
IOBD (IO Board Module)	ΔΔA ΔΔB	ΔΔ = 01 to 14 (Blade No.) or (Blade No.+1) A or B = Identifier for IOBD device location * IOBD mounting is only for CB2500 * (Blade No.+1) is only for full wide blade

Table 5-4 Description format for individual cases

Command	Target	Description format
get SystemPCI	slotno [Optional parameter] slot	Standard Format
set SystemPCI	[Optional parameter] slot	Standard Format
get PciDeviceMapping	H_Slot, L_Slot	Standard Format
get LPARSFC	slotno	Standard Format
get LPARPCI	[Optional parameter] slot	Standard Format
set LPARPCI	[Optional parameter] slot	Standard Format
set LPARSFC	[Optional parameter] slotno	Standard Format
get LPARDedFC	slotno	Standard Format
get SystemFC	slotno	Standard Format
get HvmPerfMon	PHYSICAL_NIC_USAGE, PHYSICAL_HBA_USAGE, LOGICAL_NIC_USAGE, SID of LOGICAL_HBA_USAGE	Specified Format
	PHYSICAL_NIC_USAGE, Location of PHYSICAL_HBA_USAGE	Standard Format
get ConfigAll	PHYSICAL_IO_CONFIGURATION, Location of VFC_ASSIGN_INFORMATION	Standard Format
	LocationEx of PHYSICAL_IO_CONFIGURATION Record, and VFC_ASSIGN_INFORMATION Record	Specified Format
opr LPARaddAndSet	[Optional parameter] slotno	Standard Format
get FcBootFunction	[Optional parameter] slot	Standard Format
set/opr FcBootFunction	[Optional parameter] slot	Standard Format
set FcCoreDedMode	[Optional parameter] slot	Standard Format
set FcIoConnectionMode	[Optional parameter] slot	Standard Format
set PciPortDedMode	[Optional parameter] slot	Standard Format

Collecting HVM dump (to save in HVM)

The commands for collecting an HVM dump are listed in the following table.

Table 5-5 Types of HVM dump collection

#	Command name	Dump transfer destination	Data compression	remarks
1	opr TakeHvmDump	FTP Server	YES	-
2	opr HvmDumpToSvp	SVP	YES	Options Screen of HVM Equivalent to Take HVM Dump
3	opr HvmDumpToSystem get HvmDumpData	(NO) The management server which is executing the HvmSh command	NO NO	Use opr HvmDumpToSystem and get HvmDumpData
4	opr HvmDumpToSystemCompress get HvmDumpDataCompress	(NO) The management server which is executing the HvmSh command	YES YES	Use opr HvmDumpToSystemCompress and get HvmDumpDataCompress

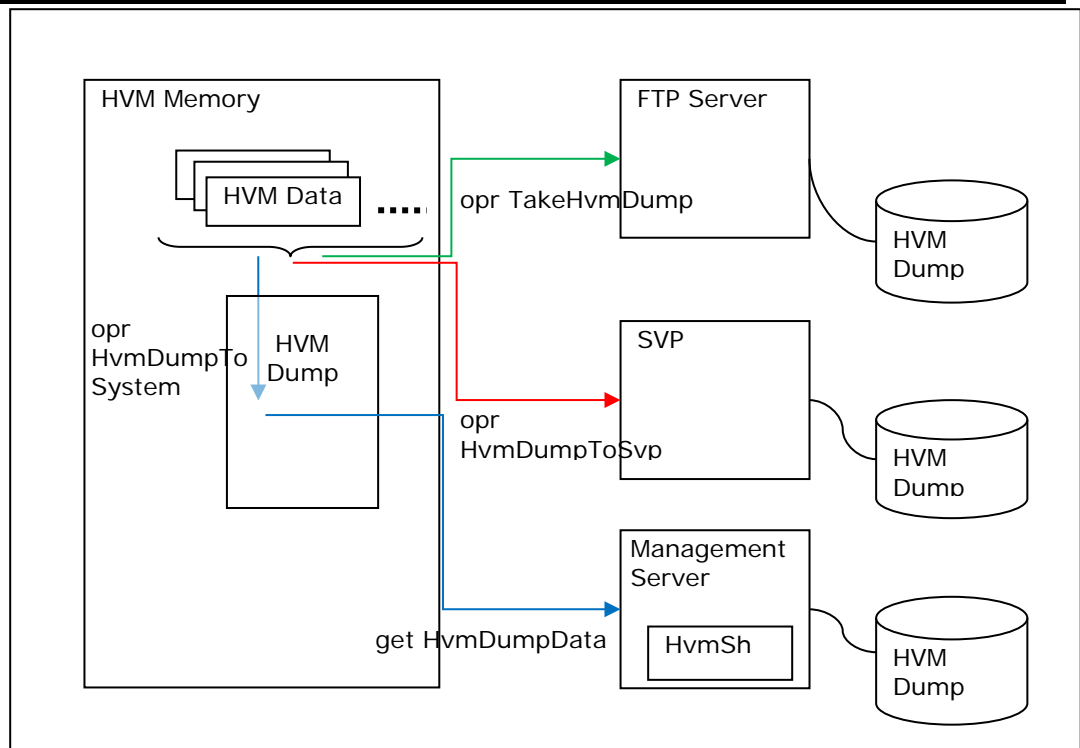


Figure 5-2Types of HVM dump collection

BS1000, CB2000, or CB320

This chapter provides descriptions for BS1000, CB2000, or CB320.

- [Response message of "get LPARLProc"](#)
- [Response message of "get SystemConfig"](#)
- [Support matrix of HvmOptions](#)
- [Support_matrix\(2\)](#)

Response message of "get LPARLProc"

The form of situation-dependent message varies with the combination of the HVM firmware version and the HvmSh version shown below.

Form1.

lproctype={ * | S | D | **physical processor No.**}

Form2.

lproctype={ * | A | **physical processor No.**}

Table 6-1 Form of situation-dependent message (2)

HVM version HvmSh version	BladeSymphony 1000	Compute Blade2000 Standard/High- performance		Compute Blade 320	
	All versions	58-4x 78-4x or lower	58-50 78-50 or higher	17-4x or lower	17-61 or higher
V5.0 or lower	Form 1	Form 1	-	Form 1	-
V5.1 or higher	Form 1	Form 1	Form 2	Form 1	Form 2
-: Not supported. Use HvmSh of Ver.5.1 or higher.					

Response message of "get SystemConfig"

Table 6-2 Difference of display content

Term	BladeSymphony 1000	Compute Blade 2000 MP /2000 DP	Compute Blade 320
svpip	SVP IP address	Fixed value 0.0.0.0	Fixed value 0.0.0.0
bsmxip (x=1-4)	BSM IP address	BSM IP address	BSM IP address
bsmxalert (x=1-4)	BSM	BSM	BSM IP address
language	Language mode of BSM alert or HVM WEB system	Language mode of BSM alert or HVM WEB system	Language mode of BSM alert or HVM WEB system
connect	Connection status for Management path	Connection status for Internal path	Connection status for Management path
link	Link status for Management path	Link status for Internal path	Link status for Management path
port	Port No. for Management path	Port No. for Internal path (fixed value 0)	Port No. for Management path

Table 6-3 HVM operation mode support map

HVM version HvmSh version	BladeSymphony 1000	Compute Blade 2000 Standard/High-performance			Compute Blade 320		
	All versions	58-50 78-50 or lower	58-60 78-60 or higher	58-71 78-71 or higher	17-5x or lower	17-70 or higher	17-8x or higher
V5.3 or lower	×	×	×	×	×	×	×
V5.5 or higher	×	×	Standard	Standard/ Expansion	×	Standard	Standard/ Expansion
V6.0 or higher	×	↑	Standard	Standard/ Expansion	×	Standard	Standard/ Expansion
V8.3 or higher	×	↑	Standard	Standard/ Expansion	×	Standard	Standard/ Expansion

Support matrix of HvmOptions

Table 6-4 HVM Option support map (CB2000)

HvmSh Option	HVM version	HvmSh ver.	CB2000DP CB2000MP				
			58-4x, 78-4x or lower	58-50, 78-50 or higher	59-00, 79-00 or higher	59-50, 79-50 or higher	59-79, 79-79 or higher
prestate		V5.1or higher	Yes	Yes	Yes	Yes	Yes
autosd		V5.1or higher	Yes	Yes	Yes	Yes	Yes
errwatching		V5.1or higher	No	Yes	Yes	Yes	Yes
shutdownstate		V5.1or higher	No	Yes	Yes	Yes	Yes
activateconfirm		V5.1or higher	No	Yes	Yes	Yes	Yes
deactivateconfirm		V5.1or higher	No	Yes	Yes	Yes	Yes
screenswchar		V5.1or higher	No	Yes	Yes	Yes	Yes
pcpucstate (*1)		V6.0 or higher	No	No	Yes	Yes	Yes
usbautoalloc (*1)		V6.0or higher	No	No	Yes	Yes	Yes
savechangedconfig (*1)		V6.0or higher	No	No	Yes	Yes	Yes
savetimeconfig(*1)		V7.3 or higher	No	No	No	Yes	Yes
safemode (*1)		V8.5 or higher	No	No	No	No	Yes
keepconfig (*1)		V9.6 or higher	No	No	No	No	Yes
YES: Setting/Getting is possible NO: Setting/Getting is impossible (*1): This command ends with the error "Return: 0x11000000" if these are specified to an HVM not supporting the HVM interfaces of pcpucstate, usbautoalloc, savechangedconfig, savetimeconfig, safemode and keepconfig.							

Table 6-5 HVM Option support map (BS1000, CB320)

HvmSh Option	HVM version	HvmSh ver.	BS1000	CB320		
			All version	17-4x or lower	17-60 or higher	17-86 or higher
prestate		V5.1or higher	Yes	Yes	Yes	Yes
autosd		V5.1or higher	Yes	Yes	Yes	Yes
errwatching		V5.1or higher	No	No	Yes	Yes
shutdownstate		V5.1or higher	No	No	Yes	Yes
activateconfirm		V5.1or higher	No	No	Yes	Yes
deactivateconfirm		V5.1or higher	No	No	Yes	Yes
screenswchar		V5.1or higher	No	No	Yes	Yes
pcpucstate (*1)		V6.0or higher	No	No	No	Yes
usbautoalloc (*1)		V6.0or higher	No	No	No	Yes
savechangedconfig (*1)		V6.0or higher	No	No	No	Yes
savetimeconfig(*1)		V7.3or higher	No	No	No	No
safemode (*1)		V8.5 or higher	No	No	No	No
keepconfig (*1)		V9.6 or higher	No	No	No	No
Yes: Setting/getting is possible No: Setting/getting is impossible (*1): Thiscommand ends with the error "Return: 0x11000000" if these are specified to an HVM not supporting the HVM interfaces of pcpucstate, usbautoalloc, savechangedconfig, savetimeconfig, safemode and keepconfig.						

Support matrix(2)

Table 6-6 Combinations of HvmSh and HVM versions supporting HVM interfaces

HVM interface	HvmSh Version	Prerequisite HVM version			
		BS1000	CB2000 DP	CB2000 MP	CB320
opr TakeHvmDump	V3.0 or higher	56-10 or higher	57-00 or higher	78-10 or higher	17-20 or higher
opr StartGuestDump	V3.0 or higher	56-10 or higher	57-00 or higher	78-10 or higher	17-20 or higher
opr CancelGuestDump	V3.0 or higher	56-10 or higher	57-00 or higher	78-10 or higher	17-20 or higher
get GuestDumpProgress	V3.0 or higher	56-10 or higher	57-00 or higher	78-10 or higher	17-20 or higher
get HvmPerfMon	V4.0 or higher	Unsupported	57-30 or higher	78-10 or higher	17-40 or higher
get ConfigAll	V4.1 or higher	54-01 or higher	57-00 or higher	78-10 or higher	17-20 or higher
get LPARSchd	V5.0 or higher	Unsupported	58-40 or higher	78-40 or higher	17-60 or higher
opr LPARSchd	V5.0 or higher	Unsupported	58-40 or higher	78-40 or higher	17-60 or higher
get LPARVC	V5.0 or higher	Unsupported	58-40 or higher	78-40 or higher	17-60 or higher
set LPARVC	V5.0 or higher	Unsupported	58-40 or higher	78-40 or higher	17-60 or higher
set LPARLproc (format2)	V5.0 or higher	Unsupported	58-40 or higher	78-40 or higher	17-60 or higher
set SystemPCI (format1)	V5.0 or higher	Unsupported	58-40 or higher	78-40 or higher	17-60 or higher
set SystemPCI (format2)	V5.1 or higher	Unsupported	58-40 or higher	78-40 or higher	17-60 or higher
get ProcGroup	V5.0 or higher	Unsupported	58-40 or higher	78-40 or higher	17-60 or higher
opr ProcGroupAdd	V5.0 or higher	Unsupported	58-40 or higher	78-40 or higher	17-60 or higher
opr ProcGroupRemove	V5.0 or higher	Unsupported	58-40 or higher	78-40 or higher	17-60 or higher
set ProcGroupName	V5.0 or higher	Unsupported	58-40 or higher	78-40 or higher	17-60 or higher
opr ProcGroupPproc	V5.0 or higher	Unsupported	58-40 or higher	78-40 or higher	17-60 or higher
opr ProcGroupLpar	V5.0 or higher	Unsupported	58-40 or higher	78-40 or higher	17-60 or higher
opr LparActCheck	V5.0 or higher	Unsupported	58-40 or higher	78-40 or higher	17-60 or higher
opr LPARaddAndSet	V5.0 or higher	Unsupported	58-40 or higher	78-40 or higher	17-60 or higher
opr LparNvramClear	V5.1 or higher	Unsupported	58-50 or higher	78-50 or higher	17-60 or higher
opr LparNvramCopy	V5.1 or higher	Unsupported	58-50 or higher	78-50 or higher	17-60 or higher

HVM interface	HvmSh Version	Prerequisite HVM version			
		BS1000	CB2000 DP	CB2000 MP	CB320
opr SystemPProc (format2)	V5.1 or higher	Unsupported	58-50 or higher	78-50 or higher	17-60 or higher
	V9.7 or higher	Unsupported	59-79 or higher	79-79 or higher	Unsupported
get SystemConfig (ver=option)	V5.3 or higher	Unsupported	58-60 or higher	78-60 or higher	17-70 or higher
opr SystemConfig	V5.1 or higher	Unsupported	58-50 or higher	78-50 or higher	17-60 or higher
clixip=option (x=1,...,8)	V5.3 or higher	Unsupported	58-60 or higher	78-60 or higher	17-70 or higher
get LPARVNICPrm	V5.1 or higher	Unsupported	58-50 or higher	78-50 or higher	17-60 or higher
set LPARVNICPrm	V5.1 or higher	Unsupported	58-50 or higher	78-50 or higher	17-60 or higher
get SystemSNICFilter	V5.1 or higher	Unsupported	58-50 or higher	78-50 or higher	17-60 or higher
set SystemSNICFilter	V5.1 or higher	Unsupported	58-50 or higher	78-50 or higher	17-60 or higher
get HvmFacilityMap	V5.1 or higher	Unsupported	58-50 or higher	78-50 or higher	17-60 or higher
get HvmOptions	V5.1 or higher	Unsupported	58-50 or higher	78-50 or higher	17-60 or higher
set HvmOptions (savetimeconfig=option) (safemode=option) (Keepconfig=option)	V5.1 or higher	Unsupported	58-50 or higher	78-50 or higher	17-60 or higher
	V7.3 or higher	Unsupported	59-50 or higher	79-50 or higher	Unsupported
	V8.5 or higher	Unsupported	Unsupported	Unsupported	Unsupported
	V9.6 or higher	Unsupported	59-79 or higher	79-79 or higher	Unsupported
get HvmStatus	V5.1 or higher	Unsupported	58-50 or higher	78-50 or higher	17-60 or higher
opr HvmShutdown	V5.1 or higher	Unsupported	58-50 or higher	78-50 or higher	17-60 or higher
get HvmSystemLogs	V5.1 or higher	Unsupported	58-50 or higher	78-50 or higher	17-60 or higher
opr ForceRecovery	V5.1 or higher	Unsupported	58-50 or higher	78-50 or higher	17-60 or higher
opr HvmDumpToSvp	V5.1 or higher	Unsupported	58-50 or higher	78-50 or higher	17-60 or higher
get FcBootFunction (format1) (format2)	V5.3 or higher	Unsupported	58-60 or higher	78-60 or higher	17-70 or higher
	V6.5 or higher	Unsupported	58-60 or higher	78-60 or higher	17-70 or higher
set FcBootFunction (MultiplePortID=option)	V5.3 or higher	Unsupported	58-60 or higher	78-60 or higher	17-70 or higher
	V8.5 or higher	Unsupported	Unsupported	Unsupported	Unsupported
opr FcBootFunction	V8.5 or higher	Unsupported	59-77 or higher	79-77 or higher	Unsupported
get BootDevice	V5.3 or higher	Unsupported	58-60 or higher	78-60 or higher	17-70 or higher
set BootOrder	V5.3 or higher	Unsupported	58-60 or higher	78-60 or higher	17-70 or higher

HVM interface	HvmSh Version	Prerequisite HVM version			
		BS1000	CB2000 DP	CB2000 MP	CB320
opr Activate (opt=option)	V5.3 or higher	Unsupported	58-60 or higher	78-60 or higher	17-70 or higher
set SystemTime	V5.3 or higher	Unsupported	58-60 or higher	78-60 or higher	17-70 or higher
get LPARTime	V5.3 or higher	Unsupported	58-60 or higher	78-60 or higher	17-70 or higher
opr LPARTimeAdjust (src=, zone=option)	V5.3 or higher	Unsupported	58-60 or higher	78-60 or higher	17-70 or higher
	V7.3 or higher	Unsupported	59-50 or higher	79-50 or higher	Unsupported
get LPARLcd	V5.3 or higher	Unsupported	58-60 or higher	78-60 or higher	17-70 or higher
opr LPARFrontPanelDump	V5.3 or higher	Unsupported	58-60 or higher	78-60 or higher	17-70 or higher
get LPARConsoleLog	V5.3 or higher	Unsupported	58-60 or higher	78-60 or higher	17-70 or higher
opr LPARConsoleLogErase	V5.3 or higher	Unsupported	58-60 or higher	78-60 or higher	17-70 or higher
get SystemTimeCtrl	V5.5 or higher	Unsupported	58-70 or higher	78-70 or higher	17-80 or higher
opr SystemTimeCtrl	V5.5 or higher	Unsupported	58-70 or higher	78-70 or higher	17-80 or higher
get PciDeviceMapping	V5.5 or higher	Unsupported	58-70 or higher	78-70 or higher	17-80 or higher
opr HvmRestart	V5.5 or higher	Unsupported	58-70 or higher	78-70 or higher	17-80 or higher
opr HvmOperatingMode	V5.5 or higher	Unsupported	58-71 or higher	78-71 or higher	17-80 or higher
get LPARVNICMac(format2)	V6.0 or higher	Unsupported	59-00 or higher	79-00 or higher	17-86 or higher
get LPARVNICDev	V6.0 or higher	Unsupported	59-00 or higher	79-00 or higher	17-86 or higher
set LPARVNICDev	V6.0 or higher	Unsupported	59-00 or higher	79-00 or higher	17-86 or higher
opr HvmDumpToSystem	V6.0 or higher	Unsupported	59-00 or higher	79-00 or higher	17-86 or higher
get HvmDumpData (format1) (format2)	V6.0 or higher	Unsupported	59-00 or higher	79-00 or higher	17-86 or higher
	V6.2 or higher	Unsupported	59-00 or higher	79-00 or higher	17-86 or higher
set LPARMN	V6.4 or higher	Unsupported	59-10 or higher	79-10 or higher	17-86 or higher
opr TimerCounterBase	V6.5 or higher	Unsupported	59-20 or higher	79-20 or higher	17-86 or higher
get HvmAlertList	V7.2 or higher (*1)	Unsupported	59-40 or higher	79-40 or higher	Unsupported
opr HvmDumpToSystemCompress	V7.2 or higher (*1)	Unsupported	59-40 or higher	79-40 or higher	Unsupported
get HvmDumpDataCompress	V7.2 or higher (*1)	Unsupported	59-40 or higher	79-40 or higher	Unsupported
set LPARVTX	V7.3 or higher (*1)	Unsupported	59-50 or higher	79-50 or higher	Unsupported

HVM interface	HvmSh Version	Prerequisite HVM version			
		BS1000	CB2000 DP	CB2000 MP	CB320
set LPAROsType	V7.3 or higher (*1)	Unsupported	59-50 or higher	79-50 or higher	Unsupported
get LPARVfVNIC	V7.3 or higher (*1)	Unsupported	59-58 or higher	79-58 or higher	Unsupported
set LPARVfVNIC	V7.3 or higher (*1)	Unsupported	59-58 or higher	79-58 or higher	Unsupported
get HvmSecureCmmConfig	V8.0 or higher (*1)	Unsupported	59-60 or higher	79-60 or higher	Unsupported
get HvmServerCertificate	V8.0 or higher (*1)	Unsupported	59-60 or higher	79-60 or higher	Unsupported
opr HvmCSR	V8.0 or higher (*1)	Unsupported	59-60 or higher	79-60 or higher	Unsupported
opr HvmIfSecureLevel	V8.0 or higher (*1)	Unsupported	59-60 or higher	79-60 or higher	Unsupported
opr HvmIfSecureVerify	V8.0 or higher (*1)	Unsupported	59-60 or higher	79-60 or higher	Unsupported
opr HvmServerCertificate	V8.0 or higher (*1)	Unsupported	59-60 or higher	79-60 or higher	Unsupported
opr HvmCACertificateRegist	V8.0 or higher (*1)	Unsupported	59-60 or higher	79-60 or higher	Unsupported
opr HvmClientCertificateRegist	V8.0 or higher (*1)	Unsupported	59-60 or higher	79-60 or higher	Unsupported
opr HvmClientCertificateRemove	V8.0 or higher (*1)	Unsupported	59-60 or higher	79-60 or higher	Unsupported
opr HvmSecureCmmConfigSave	V8.0 or higher (*1)	Unsupported	59-60 or higher	79-60 or higher	Unsupported
opr CACertificateRegist	V8.0 or higher (*1)	Unsupported	59-60 or higher	79-60 or higher	Unsupported
* Of the HVM interfaces supported in V8.3 or higher of HvmSh(see Table 3-1 Combinations of HvmSh and HVM versions supporting HVM interfaces), only the following are supported for BS1000, CB2000, or CB320.					
opr HvmScdOptions (format2)	V9.0 or higher (*1)	Unsupported	Unsupported	Unsupported	Unsupported
	V10.2 or higher (*1)	Unsupported	59-85 or higher	79-85 or higher	Unsupported
opr HvmIfCertificateType	V9.3 or higher (*1)	Unsupported	59-77 or higher	79-77 or higher	Unsupported
set LPARHpet	V9.6 or higher (*1)	Unsupported	59-79 or higher	79-79 or higher	Unsupported
set LparPCID	V9.9 or higher (*1)	Unsupported	59-82 or higher	79-82 or higher	17-95 or higher
set LparIBRS	V9.9 or higher (*1)	Unsupported	59-82 or higher	79-82 or higher	17-95 or higher
get ConfigSummary (summary=cpufeatures option)	V9.9 or higher (*1)	Unsupported	59-82 or higher	79-82 or higher	17-95 or higher
	V10.0 or higher (*1)	Unsupported	59-83 or higher	79-84 or higher	Unsupported
set LparSSBD	V10.0 or higher (*1)	Unsupported	59-83 or higher	79-84 or higher	Unsupported
set LparCpuFeatures	V10.0 or higher (*1)	Unsupported	59-83 or higher	79-84 or higher	Unsupported

HVM interface	HvmSh Version	Prerequisite HVM version			
		BS1000	CB2000 DP	CB2000 MP	CB320
set LparMDClear	V10.3 or higher	Unsupported	59-87 or higher	Unsupported	Unsupported
[The other commands]	V1.0 or higherV1.0	54-01 or higher	57-00 or higher	78-10 or higher	17-20 or higher
<p>*1: The HVM interfaces supported in V7.1 or higher of HvmSh uses TCP or TLS protocol even though you set no value or a value of "UDP" at the option "-prot" of HvmSh commands or in the default file. If the HVM doesn't support TCP protocol, HvmSh command specified one of these interfaces ends with one of the errors "Return: 0x10020001 Response Timeout".</p>					

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