HITACHI
DATA SYSTEMS

# HiCommand® Device Manager Agent Installation Guide

MK-92HC019-15

## Trademarks


HiCommand® Device Manager includes RSA BSAFE Cryptographic software from RSA Security Inc.

This product includes software developed by Borland Software Corp.

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This software contains code derived from the RSA Data Security Inc. MD5 Message-Digest Algorithm, including various modifications by Spyglass Inc., Carnegie Mellon University, and Bell Communications Research, Inc (Bellcore).

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## Document Revision Level

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| MK-92HC019-00 | November 2002 | Initial Release<br>***Note:*** This document supersedes and replaces *HiCommand Device Manager HiScan Installation Guide* (MK-91HC005-4). |
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# Preface

Welcome to the HiCommand® Device Manager Agent Installation Guide. This guide describes how to install HiCommand Device Manager Agent software for HiCommand Device Manager. We assume that our audience has:

- a background in data processing and understands peripheral storage device subsystems and their basic functions,
- read and understands the user guide(s) for the applicable Hitachi storage subsystem(s); for example, *Hitachi Lightning 9900 V Series User and Reference Guide* (MK-92RD100), *Hitachi Thunder 9500 V Series User and Reference Guide* (MK-92DF601),
- familiarity with the host operating system (e.g., the HP-UX OS) on which the Agent is installed, and has
- knowledge of Storage Area Networks (SANs).

***Notes:***

- The term "Universal Storage Platform (USP)" refers to the entire Hitachi USP subsystem family, unless otherwise noted.
- The term "9900V" refers to the entire Hitachi Lightning 9900 V Series subsystem family, unless otherwise noted.
- The term "9900" refers to the entire Hitachi Lightning 9900 subsystem family, unless otherwise noted. Please refer to the *Hitachi Lightning 9900 User and Reference Guide* (MK-90RD008) for further information on the 9900 disk array subsystems.
- The term "9500" refers to the entire Hitachi Thunder 9500 V Series subsystem family, unless otherwise noted. Please refer to the *Hitachi Thunder 9500 V Series User and Reference Guide* (MK-92RD100) for further information on the 9500V disk array subsystem.
- The term "9200" refers to the entire Hitachi Thunder 9200 subsystem family, unless otherwise noted. Please refer to the *Hitachi Thunder 9200 User and Reference Guide* (MK- 90DF504) for further information on the 9200 disk array subsystem.
- Third-party agents are available for other servers. For the latest information about these agents, please contact your Hitachi Data System representative or refer to documentation about a specific agent.
- The use of HiCommand Device Manager and all other Hitachi Data Systems products is governed by the terms of your agreement(s) with Hitachi Data Systems.

## Readme and Release Notes Contents

Readme and release notes files are included on the installation CD. These files contain requirements and notes for use of HiCommand Device Manager Agent that may not be fully described in this manual. Review these files before installing HiCommand Device Manager Agent.

## Software Version

This document revision applies to HiCommand Device Manager version 5.7 and higher.

## Convention for Storage Capacity Values

This document uses the following convention for storage capacity values:

1 KB (kilobyte) = 1,024 bytes
1 MB (megabyte) = $1,024^2$ bytes
1 GB (gigabyte) = $1,024^3$ bytes
1 TB (terabyte) = $1,024^4$ bytes

## Referenced Documents

- *HiCommand Device Manager Error Codes*, MK-92HC016
- *HiCommand Device Manager Web Client User's Guide*, MK-91HC001
- *HiCommand Device Manager Server Installation and Configuration Guide*, MK-91HC002

Hitachi RAID subsystem documents:

- *Hitachi Lightning 9900 V Series User and Reference Guide*, MK-92RD100
- *Hitachi Lightning 9900 User and Reference Guide*, MK-90RD008
- *Hitachi Thunder 9500 V Series User and Reference Guide*, MK-92RD100
- *Hitachi Thunder 9200 User and Reference Guide*, MK-90DF504

## Comments

Please send us your comments on this document. Make sure to include the document title, number, and revision. Please refer to specific section(s) and paragraph(s) whenever possible.

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***Thank you!*** (All comments become the property of Hitachi Data Systems Corporation.)

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# Chapter 1 Introduction

This chapter provides an overview of HiCommand® Device Manager Agent.

- Overview (see section 1.1)
- Supported Servers and Operating Systems (see section 1.2)

## 1.1 Overview

HiCommand Device Manager Agent is installed on application servers and reports data about LUN utilization, HBAs, World Wide Names (WWNs), operating systems, SCSI addresses, and other vital device-specific information. The collected information is sent, via TCP/IP, to a Device Manager server.

By collecting information about the storage infrastructure, HiCommand Device Manager Agent, together with Device Manager, provides complete, end-to-end capacity and performance management for managing today's complex storage environments.

For even greater flexibility, HiCommand Device Manager Agent can work with Hitachi Provisioning Manager (HPvM), Hitachi Replication Monitor (HRpM), and Hitachi Dynamic Link Manager (HDLM) by requesting:

- host information from the HiCommand® Device Manager Server,
- the creation of a volume pair from the HiCommand Device Manager Server, and
- linkage with other program products such as Dynamic Link Manager, and Provisioning Manager modules.

HiCommand Device Manager Agent can perform these tasks in parallel. For convenience, all processes are integrated into a single add-on module, and managed by HiCommand Device Manager Agent.

### 1.1.1 How HiCommand Device Manager Agent Works

HiCommand Device Manager Agent comprises two programs:

- A daemon for UNIX platforms or a service for Windows platforms
- A WebServer

When HiCommand Device Manager Agent receives a request from the HiCommand Device Manager Server, the daemon or service process generates the WebServer process. The WebServer process gathers server-side information, which it forwards to the HiCommand Device Manager server via TCP/IP. In this way, the Device Manager Server presents its view of Hitachi storage resources to the Device Manager client.

Collected information can be viewed using the command **hldutil** and sent using the command **HiScan**. Both commands are part of the HiCommand Device Manager Agent command line interface (CLI) and are explained later in this guide.

In a standard HiCommand Device Manager Agent installation, the operating system task scheduler is configured to execute the **HiScan** command on a periodic basis for Windows, Solaris, and HP-UX. The recommended duration can range from 30 minutes to 24 hours, depending on your operational environment.

## 1.2 Supported Servers and Operating Systems

HiCommand Device Manager Agent can run under a number of servers and operating systems, including:

- Microsoft® Windows® 2000
- Microsoft Windows Server 2003
- Microsoft Windows Server 2003 x64 Edition
- Microsoft Windows Server 2003 R2
- Solaris
- AIX®
- HP-UX
- Red Hat® Enterprise Linux® AS
- Red Hat Enterprise Linux ES
- SUSE LINUX Enterprise Server

For more information about these operating systems, see section 2.1.

Third-party agents are available for other operating systems and servers. For more information, please contact your Hitachi Data System representative or refer to documentation about a specific agent.

# Chapter 2 Installation Requirements and Procedures

This chapter describes the requirements and procedures for installing HiCommand Device Manager Agent. Topics include:

- Supported Operating Systems and Required Programs (see section 2.1)
- Supported Storage Subsystems (see section 2.2)
- Requirements for Obtaining Host WWN Information (see section 2.3)
- Requirements for using FC-HUB (FC-SWITCH) (see section 2.4)
- When IPv6 Is Enabled on the Host (see section 2.5)
- File Systems Supported by HiCommand Device Manager Agent (see section 2.6)
- Volume Managers Supported by HiCommand Device Manager Agent (see section 2.7)
- Cluster Software Supported by HiCommand Device Manager Agent (see section 2.8)
- Path Management Software Supported by HiCommand Device Manager Agent (see section 2.9)
- Installing HiCommand Device Manager Agent (see section 2.10)
- Setting up HiCommand Device Manager Agent (see section 2.11)
- Uninstalling HiCommand Device Manager Agent (see section 2.12)

## 2.1 Supported Operating Systems and Required Programs

The following table lists the operating systems supported by HiCommand Device Manager Agent, and lists the required programs for it.

***Note:*** Third-party agents are available for other servers. For the latest information about these agents, please contact your Hitachi Data System representative or refer to the documentation about a specific agent.

**Table 2.1 Supported Operating Systems for HiCommand Device Manager Agent**

| OS | OS Version | Supported Architecture | Remarks |
|---|---|---|---|
| Windows 2000 (***Note 1***) | Not applicable | x86 | Service Pack 2 or later is required. |
| Windows Server 2003 (***Note 1***) | Not applicable | x86 | Service Pack 1 and 2 are supported. (***Note 2***) |
| | | IPF | The Enterprise and Datacenter Edition of Windows Server 2003 support the IPF version.<br>Runs under WOW64.<br>Service Pack 1 and 2 are supported. We recommend that Service Pack 2 be installed. (***Note 2***) |
| Windows Server 2003 x64 Edition (***Note 1***) | Not applicable | ▪ EM64T<br>▪ AMD64 | Service Pack 2 is supported. (***Note 2***) |
| Windows Server 2003 R2 (***Note 1***) | Not applicable | x86 | |
| | x64 Edition | ▪ EM64T<br>▪ AMD64 | |
| Solaris | 7 | SPARC (32 and 64 bit) | We recommend that Solaris Patch Cluster be installed. |
| | 8 | | |
| | 9 | | |
| | 10 (***Note 3***) | | |
| AIX | 5.1 | 32 and 64 bit | Not applicable |
| | 5.2 | | |
| | 5.3 | | |
| HP-UX® | 11.0 | PA-RISC (32 and 64 bit) | Workstation is not supported. |
| | 11i v1 | | |
| | 11i v2 | ▪ PA-RISC (64 bit)<br>▪ IPF | |
| | 11i v3 | | |

| OS | OS Version | Supported Architecture | Remarks |
|---|---|---|---|
| Red Hat Enterprise Linux AS | 2.1 | x86 | Not applicable |
| | 3.0 | ▪ x86<br>▪ IPF<br>▪ EM64T | |
| | 4.0 (Update 1, Update 3) | | |
| | 4.0 (Update 4) | x86 | |
| Red Hat Enterprise Linux ES | 3.0 | ▪ x86<br>▪ IPF<br>▪ EM64T | |
| | 4.0 (Update 1, Update 3) | | |
| | 4.0 (Update 4) | x86 | |
| SUSE LINUX Enterprise Server | 9 | x86 | Only the default kernel is supported. |
| | 10 | | |

***Note 1:*** VMware® ESX Server 3.0 is supported.

***Note 2:*** If Windows Firewall is active, you must add HiCommand Device Manager Agent as an exception to the Windows Firewall exceptions list. For details on how to do this after installing the agent, see section 3.2.6.

***Note 3:*** HiCommand Device Manager Agent runs in the usual global environment (global zone) only. If a non-global zone has been created, install HiCommand Device Manager Agent in the global zone.

The Java execution environment in the following table must be installed on the system as a prerequisite for HiCommand Device Manager Agent.

**Table 2.2 Required Java Execution Environment for Various Operating Systems**

| Operating System | Required Java Execution Environment |
|---|---|
| Windows | ▪ Java2 Java Runtime Environment 1.4.2 (Build 06)<br>▪ Use the 32-bit JRE even when the 64-bit processor version is used. |
| Solaris | ▪ Java2 Java Runtime Environment 1.4.2 (Build 06)<br>▪ Use the 32-bit JRE. |
| AIX | ▪ IBM® AIX Developer Kit and Runtime, Java Technology Edition 1.4.2<br>▪ Use the 32-bit JRE. |
| HP-UX | ▪ Java2 Runtime Environment 1.4.2 (Build 06)<br>▪ For a PA-RISC machine, use the RTE for PA-RISC.<br>▪ For an IA-64 machine, use the RTE for Itanium. |
| Linux | ▪ Java2 Runtime Environment 1.4.2 (Build 06)<br>▪ For the 32-bit processor version, use the 32-bit JRE.<br>▪ For the 64-bit processor version, use the 64-bit Java 2 SDK. |

### 2.1.1 Required Patches for Operating Systems Supported by HiCommand Device Manager Agent

Before using HiCommand Device Manager Agent, the following OS patches must be applied. Otherwise, If they are not applied, HiCommand Device Manager Agent may be unable to start.

***Note:*** The following table only lists operating systems to which patches must be applied.

**Table 2.3 Required Patches for Operating Systems Supported by HiCommand Device Manager Agent**

| OS | Patches |
|---|---|
| Windows Server 2003 SP1 | KB922772 |
| Windows Server 2003 x64 Edition without SP | |
| Windows Server 2003 R2 without SP | |
| Solaris 7 | 107544-03 SunOS 5.7: /usr/lib/fs/ufs/fsck patch |
| | 107834-04 SunOS 5.7: dkio.h & commands.h patch |
| | 106541-42 SunOS 5.7: Kernel Update Patch |
| | 106980-26 SunOS 5.7: libthread patch |
| | 106950-24 SunOS 5.7: Linker Patch |
| | 106327-23 SunOS 5.7: 32-Bit Shared library patch for C++ |
| | 108376-46 OpenWindows 3.6.1: Xsun Patch |
| | 106300-24 SunOS 5.7: 64-Bit Shared library patch for C++ |
| | 107702-12 CDE 1.3: dtsession patch |
| | 108374-07 CDE 1.3: libDtWidget Patch |
| | 107656-11 OpenWindows 3.6.1 libXt Patch |
| | 107081-57 Motif 1.2.7 and 2.1.1: Runtime library patch for Solaris 7 |
| | 107226-19 CDE 1.3: dtwm patch |
| | 107636-10 SunOS 5.7: X Input & Output Method patch |

| OS | Patches |
|---|---|
| Solaris 8 | 112003-03 SunOS 5.8: Unable to load fontset in 64-bit Solaris 8 iso-1 or iso-15 |
| | 111310-01 SunOS 5.8: /usr/lib/libdhcpagent.so.1 patch |
| | 112472-01 SunOS 5.8: Font2DTest2 abort when Lucida Sans Thai Typewriter selected |
| | 109147-32 SunOS 5.8: linker patch |
| | 111308-05 SunOS 5.8: /usr/lib/libmtmalloc.so.1 patch |
| | 112438-03 SunOS 5.8: /kernel/drv/random patch |
| | 108434-18 SunOS 5.8: 32-Bit Shared library patch for C++ |
| | 108435-18 SunOS 5.8: 64-Bit Shared library patch for C++ |
| | 113886-26 OpenGL 1.3: OpenGL Patch for Solaris (32-bit) |
| | 113887-26 OpenGL 1.3: OpenGL Patch for Solaris (64-bit) |
| | 111111-04 SunOS 5.8: /usr/bin/nawk patch |
| | 112396-02 SunOS 5.8: /usr/bin/fgrep patch |
| | 110386-03 SunOS 5.8: RBAC Feature Patch |
| | 111023-03 SunOS 5.8: /kernel/fs/mntfs and /kernel/fs/sparcv9/mntfs patch |
| | 111317-05 SunOS 5.8: /sbin/init and /usr/sbin/init patch |
| | 113648-03 SunOS 5.8: /usr/sbin/mount patch |
| | 115827-01 SunOS 5.8: /sbin/sulogin and /sbin/netstrategy patch |
| | 116602-01 SunOS 5.8: /sbin/uadmin and /sbin/hostconfig patch |
| | 108652-88 X11 6.4.1: Xsun patch |
| | 108921-23 CDE 1.4: dtwm patch |
| | 108940-68 Motif 1.2.7 and 2.1.1: Runtime library patch for Solaris 8 |
| | 108773-19 SunOS 5.8: IIIM and X Input & Output Method patch |
| | 108987-15 SunOS 5.8: Patch for patchadd and patchrm |
| | 108528-29 SunOS 5.8: kernel update and Apache patch |
| | 108989-02 SunOS 5.8: /usr/kernel/sys/acctctl and /usr/kernel/sys/exacctsys patch |
| | 108993-40 SunOS 5.8: LDAP2 client, libc, libthread and libnsl libraries patch |
| | 109326-16 SunOS 5.8: libresolv.so.2 and in.named patch |
| | 110615-13 SunOS 5.8: sendmail patch |
| Solaris 9 | 113886-26 OpenGL 1.3: OpenGL Patch for Solaris (32-bit) |
| | 113887-26 OpenGL 1.3: OpenGL Patch for Solaris (64-bit) |
| | 112963-17 SunOS 5.9: linker patch |
| | 113096-03 X11 6.6.1: OWconfig patch |
| | 112785-45 X11 6.6.1: Xsun patch |

| OS | Patches |
|---|---|
| Solaris 10 | 117461-08 SunOS 5.10: ld Patch |
| | 119578-18 SunOS 5.10: FMA Patch |
| | 118822-30 SunOS 5.10: kernel Patch |
| AIX 5L V5.1<br>(5100_05 RMP or later) | APAR IY71981 |
| AIX 5L V5.2<br>(5200_02 RMP or later) | APAR IY71978 |
| AIX 5L V5.3 | APAR IY70159 |
| | APAR IY71980 |
| HP-UX 11.0 (***Note1***) | PHCO_26060 s700_800 11.00 Kernel configuration commands patch |
| | PHCO_26089 s700_800 11.00 libpam and libpam_unix cumulative patch |
| | PHCO_26111 s700_800 11.00 libc cumulative header file patch |
| | PHCO_29959 s700_800 11.00 Pthread library cumulative patch |
| | PHCO_31879 s700_800 11.00 cumulative SAM/ObAM patch |
| | PHCO_27731 s700_800 11.00 libc cumulative patch |
| | PHKL_18543 s700_800 11.00 PM/VM/UFS/async/scsi/io/DMAPI/JFS/perf patch |
| | PHKL_23409 s700_800 11.00 NFS, Large Data Space, kernel memory leak |
| | PHKL_24064 s700_800 11.00 eventport (/dev/poll) pseudo driver |
| | PHKL_26008 s700_800 11.00 pstat patch, long command line storage |
| | PHKL_30073 s700_800 11.00 dyn semphores; big data space; msgmn; msgsnd |
| | PHKL_27207 s700_800 11.00 mmap of a java JAR file on CDROM fails |
| | PHKL_27282 s700_800 11.00 signal cumulative patch |
| | PHKL_28172 s700_800 11.00 kmadmin; autoload; DLKM load; MO; eventport |
| | PHKL_28180 s700_800 11.00 Probe, IDDS, PM, VM, PA-8700, AIO, T600, FS, PDC, CLK |
| | PHKL_29434 s700_800 11.00 POSIX AIO;getdirentries;MVFS;rcp;mmap/IDS; |
| | PHNE_23003 s700_800 11.00 r-commands cumulative patch |
| | PHNE_29473 s700_800 11.00 cumulative ARPA Transport patch |
| | PHNE_29785 s700_800 11.00 ONC/NFS General Release/Performance Patch |
| | PHSS_26559 s700_800 11.00 ld(1) and linker tools cumulative patch |
| | PHSS_30181 s700_800 11.00 Xserver cumulative patch |
| | PHSS_26945 s700_800 11.X HP aC++ -AA runtime libraries (aCC A.03.37) |
| | PHSS_26972 s700_800 11.00 Japanese TrueType fonts patch |
| | PHSS_27869 s700_800 11.00 CDE Runtime Periodic Patch |
| | PHSS_30260 s700_800 11.00 X/Motif 32bit Runtime Periodic Patch |

| OS | Patches |
|---|---|
| | PHSS_28368 s700_800 11.00 X/Motif 64bit Runtime Periodic Patch |
| | PHSS_28469 s700_800 11.00 X Font Server Patch |
| HP-UX 11i (***Notes 2 and 3***) | PHCO_24402 s700_800 11.11 libc cumulative header file patch |
| | PHCO_26061 s700_800 11.11 Kernel configuration commands patch |
| | PHCO_29960 s700_800 11.11 Pthread enhancement and fixes |
| | PHCO_27740 s700_800 11.11 libc cumulative patch |
| | PHCO_27958 s700_800 11.11 mountall cumulative patch, Dev IDs enabler |
| | PHKL_24751 s700_800 11.11 preserve IPSW W-bit and GR31 lower bits |
| | PHKL_25233 s700_800 11.11 select(2) and poll(2) hang |
| | PHKL_25468 s700_800 11.11 eventport (/dev/poll) pseudo driver |
| | PHKL_25993 s700_800 11.11 thread nostop for NFS, rlimit, Ufalloc fix |
| | PHKL_25994 s700_800 11.11 Thread NOSTOP, Psets Enablement, Ufalloc |
| | PHKL_27091 s700_800 11.11 Core PM, vPar, Psets Cumulative, slpq1 perf |
| | PHKL_27094 s700_800 11.11 Psets Enablement Patch, slpq1 perf |
| | PHKL_27096 s700_800 11.11 VxVM,EMC,Psets&vPar,slpq1,earlyKRS |
| | PHKL_27316 s700_800 11.11 Shared synchronization performance support |
| | PHKL_27317 s700_800 11.11 detach; NOSTOP, Abort; Psets; slpq1 perf |
| | PHKL_27686 s700_800 11.11 MO 4k sector size;FIFO;Event Port;perf;shmem |
| | PHKL_28122 s700_800 11.11 signals,threads enhancement,Psets Enablement |
| | PHKL_26233 s700_800 11.11 VM-JFS ddlock, mmap,thread perf, user limits |
| | PHNE_29887 s700_800 11.11 cumulative ARPA Transport patch |
| | PHNE_29783 s700_800 11.11 ONC/NFS General Release/Performance Patch |
| | PHSS_26560 s700_800 11.11 ld(1) and linker tools cumulative patch |
| | PHSS_26971 s700_800 11.11 Japanese TrueType font patch |
| | PHSS_28370 s700_800 11.11 X/Motif Runtime Periodic Patch |
| | PHSS_28470 s700_800 11.11 X Font Server Patch |
| | PHSS_24638 s700_800 11.11 HP aC++ -AA runtime libraries (aCC A.03.33) |
| | PHSS_29964 s700_800 11.11 HP DCE/9000 1.8 DCE Client IPv6 patch |
| HP-UX 11i v2 (PA-RISC) | PHKL_31500 s700_800 11.23 Sept04 base patch (***Note 4***) |
| HP-UX 11i v2 (IPF) | PHKL_31500 s700_800 11.23 Sept04 base patch (***Note 4***) |
| | PHKL_32264 s700_800 11.23 mmap(2) MAP_NORESERVE signal correction |
| | PHSS_30231 s700_800 11.23 Integrity aC++ Runtime (A.05.56) |
| | PHSS_30232 s700_800 11.23 Integrity Unwind Library |
| | PHSS_32765 s700_800 11.23 linker + fdp cumulative patch |

| OS | Patches |
|---|---|
| Red Hat Enterprise Linux AS/ES 3.0 | gdb-5.3.90-0.20030710.40.i386.rpm |
| Red Hat Enterprise Linux AS 3.0 (IPF) | gdb-5.3.90-0.20030710.40.ia64.rpm |
| SUSE LINUX Enterprise Server 10 | gdb-6.5-21.2 or later |

***Note 1***: Do not apply PHCO_29108, because Hewlett-Packard Company warns that this patch can cause an application hang-up. If this patch is already installed, apply PHCO_29959.

***Note 2***: Do not apply PHCO_29109, because Hewlett-Packard Company warns that this patch can cause an application hang-up. If this patch is already installed, apply PHCO_29960.

***Note 3***: Do not apply PHKL_28267, because Hewlett-Packard Company warns that this patch can cause a system panic. If this patch is already installed, delete PHKL_28267 and then apply PHKL_26233 instead.

***Note 4***: Do not install PHKL_31500 alone. Instead, apply HP-UX 11i v2 (B.11.23) released in September 2004, which includes this patch. However, if this patch contains a warning patch, apply a succeeding patch that addresses the problem.

### 2.1.2 JRE Supplied with HiCommand Device Manager Agent

HiCommand Device Manager Agent is shipped with the JRE 1.4. When you install the HiCommand Device Manager Agent, JRE is installed automatically in the installation directory of HiCommand Device Manager Agent.

### 2.1.3 HiCommand Device Manager Server Versions and Agent Connections

HiCommand Device Manager Agent can connect a HiCommand Device Manager server version 5.7 or later. If your version of HiCommand Device Manager server is newer than the version of HiCommand Device Manager Agent, you can use the agent functions supported by HiCommand Device Manager for the version of the agent.

## 2.2 Supported Storage Subsystems

Hitachi storage subsystem models supported by HiCommand Device Manager Agent are:

- Universal Storage Platform V
- TagmaStore® USP
- Lightning 9900V
- Lightning 9900
- TagmaStore® AMS/WMS series
- TagmaStore® AMS
- Thunder 9500V
- Thunder 9200

If a host with HiCommand Device Manager Agent installed is connected to a Hitachi storage subsystem, all HBA models supported by that storage subsystem are available. Please refer to the appropriate Hitachi Data Systems documentation.

***Caution:*** When using the TagmaStore AMS/WMS, Thunder 9500V, or Thunder 9200 series, do not change the following default settings:

- Vendor ID: Do not change the default setting (`HITACHI`).
- Product ID:
  - For Thunder9500V and TagmaStore AMS/WMS series, do not change the default setting (`DF600F`).
  - For Thunder 9200, do not change the default setting (`DF500F`).

***Important:***

- For 9200 LUN attachments, HiCommand Device Manager Agent requires the Hitachi Freedom Storage Thunder 9200 array to be configured with the Report Inquiry Page 83H option and INQUIRY WWN Mode. For more information, contact your Hitachi Data Systems account team.
- If a Hitachi Freedom Storage Lightning 9900 storage subsystem is connected to a Linux host using a fibre channel, they must be in a one-to-one relationship.

## 2.3 Requirements for Obtaining Host WWN Information

You might not be able to obtain host WWN information when one of the following conditions is satisfied:

- The host on which HiCommand Device Manager Agent is running does not recognize the logical unit for the storage subsystem.
- A multi-path configuration is set up in the following host environment:
  - The host OS is Windows, and Dynamic Link Manager or Windows MPIO is used.
  - The host OS is Solaris, and Dynamic Link Manager or Sun StorEdge Traffic Manager is used.
  - The host OS is AIX, and MPIO is used.

To obtain host WWN information, the HBA models shown in the following table and the HBA API library provided by the HBA vendor are required.

**Table 2.4 HBA Models Required to Obtain Host WWN Information**

| OS | Model Name | Hitachi Type Name |
|---|---|---|
| Windows | Emulex® LP8000 | Not applicable |
| | Emulex LP9002DC | Not applicable |
| | Emulex LP9002L | Not applicable |
| | Emulex LP9802 | Not applicable |
| | QLogic® QLA23xx | Not applicable (See ***Note 1***) |
| | QLogic QLA24xx | Not applicable (See ***Note 1***) |
| | Hitachi GV-CC62G1 | Not applicable |
| Solaris (***Note 2***) | JNI® FCI-1063 | A-6516-FCPN |
| | JNI FC64-1063 | A-6716-FCSN |
| | JNI FCE-6410 | Not applicable |
| | JNI FCE-6460 | Not applicable |
| | QLogic QLA2200 | Not applicable |
| AIX | IBM6227 | Not applicable |
| | IBM6228 | Not applicable |
| HP-UX | HP A3404A | HT-F3360-FC2 |
| | HP A3591B | HT-F3360-FC3 |
| | HP A3636A | HT-F3360-FC1 |
| | HP A3740A | HT-F3360-PC5 |
| | HP A5158A | HT-F3360-PC5A |
| | HP A6684A | Not applicable |
| | HP A6685A | Not applicable |

| OS | Model Name | Hitachi Type Name |
|---|---|---|
| | HP A6795A | HT-F3360-PCFC |
| Linux | QLogic QLA2200F | Not applicable |
| | QLogic QLA23xx | Not applicable |
| | QLogic QLA24xx | Not applicable |
| | Hitachi GV-CC62G1 | Not applicable |

***Note 1:*** To use a QLogic HBA, download and install Fibre Channel Information Tool (fcinfo) version x86 from the Microsoft Web site. If a host machine with Device Manager Agent installed is running Linux on IPF or x64, the fcinfo x86 version must be used.

***Note 2:*** If you use an HBA by Sun Microsystems on Solaris 9, install Sun StorEdge SAN Foundation Software 4.2 or later.

## 2.4 Requirements for Using FC-HUB (FC-SWITCH)

Before you connect a host with storage subsystems via FC-HUB (or FC-SWITCH), use the following procedure to confirm whether FC-HUB (or FC-SWITCH) and its firmware are available for the storage subsystem:

1. Depending on the storage subsystem, see section 2.3, and check the corresponding HBA.
2. Check the FC-HUB and related firmware supported by the target storage subsystems.

Please refer to the appropriate documentation for your storage subsystem.

## 2.5 Disabling IPv6 on the Host

If the IPv6 function is enabled at the host, the Device Manager Agent cannot start. Therefore, disable IPv6 at the host. For information about how to disable IPv6 at the host, see the appropriate documentation for each OS.

## 2.6 File Systems Supported by HiCommand Device Manager Agent

The following table lists file systems supported by HiCommand Device Manager Agent.

**Table 2.5 File Systems Supported by HiCommand Device Manager Agent**

| OS | File System |
|---|---|
| Windows 2000 | ▪ NTFS<br>▪ FAT<br>▪ FAT32 |
| Windows Server 2003 | |
| Windows Server 2003 x64 Edition | |
| Windows Server 2003 R2 | |
| Solaris | ▪ Veritas File System<br>▪ UFS |
| AIX | JFS |
| HP-UX | ▪ HFS<br>▪ Veritas File System (JFS) |
| Red Hat Enterprise Linux AS 2.1 | ▪ ext2<br>▪ ext3 |
| Red Hat Enterprise Linux AS/ES 3.0 | |
| Red Hat Enterprise Linux AS/ES 4.0 | |
| SUSE LINUX Enterprise Server 9 | |
| SUSE LINUX Enterprise Server 10 | |

## 2.7 Volume Managers Supported by HiCommand Device Manager Agent

The following table lists the volume managers supported by HiCommand Device Manager Agent. Only the operating systems that support volume managers are listed.

**Table 2.6 Volume Managers Supported by HiCommand Device Manager Agent**

| OS | OS Version or Architecture | Volume Manager |
|---|---|---|
| Windows 2000 SP4 | -- | ▪ Basic<br>▪ Dynamic<br>▪ Veritas Volume Manager 2.7, 3.0 and 3.5 |
| Windows Server 2003 without SP | -- | ▪ Basic<br>▪ Dynamic |
| Windows Server 2003 SP1 | x86 | ▪ Basic<br>▪ Dynamic<br>▪ Veritas Volume Manager 4.3 |
| | IPF | ▪ Basic<br>▪ Dynamic |
| Windows Server 2003 SP2 | -- | ▪ Basic<br>▪ Dynamic |
| Windows Server 2003 x64 Edition | -- | ▪ Basic<br>▪ Dynamic |
| Windows Server 2003 R2 | -- | ▪ Basic<br>▪ Dynamic |
| Solaris | 7 | Veritas Volume Manager 3.2 |
| | 8 | ▪ SDS 4.2.1<br>▪ Veritas Volume Manager 3.2, 3.5 and 4.0 |
| | 9 | ▪ SVM 1.0<br>▪ Veritas Volume Manager 3.5, 4.0 and 4.1<br>▪ Veritas Volume Manager 5.0<br>Veritas Volume Manager 5.0 is included in Veritas Storage Foundation |
| | 10 | ▪ SVM 1.0<br>▪ Veritas Volume Manager 5.0<br>Veritas Volume Manager 5.0 is included in Veritas Storage Foundation |
| AIX | -- | LVM |

| OS | OS Version or Architecture | Volume Manager |
|---|---|---|
| HP-UX | 11.0 | LVM |
| | 11i v1 | ▪ LVM<br>▪ Veritas Volume Manage 3.5 |
| | 11i v2 | ▪ LVM<br>▪ Veritas Volume Manager 3.5 and 4.1 |
| | 11i v3 | ▪ LVM<br>▪ Veritas Volume Manage 4.1 |
| Linux | Red Hat Enterprise Linux AS 2.1 | LVM 1.0.1 rc4 |
| | Red Hat Enterprise Linux AS/ES 3.0 | LVM |
| | Red Hat Enterprise Linux AS/ES 4.0 | LVM2 |
| | SUSE LINUX Enterprise Server 9 | |
| | SUSE LINUX Enterprise Server 10 | |

## 2.8 Cluster Software Supported by HiCommand Device Manager Agent

HiCommand Device Manager Agent runs in cluster environments configured with the cluster software in the following table. HiCommand Device Manager Agent runs in both Active-Standby and Active-Active configurations.

***Notes:***

- The following table lists only the operating systems that support the cluster software.
- Because the HiCommand Device Manager Agent is not compatible with the logical host, it cannot be registered in cluster resources. HiCommand Device Manager Agent is activated on the physical hosts that make up the cluster, and collects the data for those hosts.

**Table 2.7 Cluster Software Supported by HiCommand Device Manager Agent**

| OS | Supported Cluster Software |
|---|---|
| Windows 2000 SP4 | MSCS |
| Windows Server 2003 without SP | ▪ MSCS<br>▪ VCS 4.1 (Only supports x86 version) |
| Windows Server 2003 SP1 | ▪ MSCS<br>▪ VCS 4.1 (Only supports x86 version)<br>▪ VCS 4.3 (Only supports x86 version) |
| Windows Server 2003 x64 Edition without SP | MSCS |
| Windows Server 2003 R2 without SP | MSCS |
| Solaris 7 | VCS 1.3 and 2.0 |
| Solaris 8 | ▪ Sun Cluster 3.0 and 3.1<br>▪ VCS 1.3, 2.0, and 3.5 |
| Solaris 9 | ▪ Sun Cluster 3.1<br>▪ VCS 3.5, 4.0, and 4.1<br>▪ Cluster Perfect 4.1 |
| Solaris 10 | ▪ Sun Cluster 3.1<br>▪ VCS 4.1 |
| AIX 5.1 | HACMP 4.4.1, 4.5, and 5.1 |
| AIX 5.2 | HACMP 5.1 |
| AIX 5.3 | ▪ HACMP 5.2<br>▪ HACMP 5.3 (Only supports AIX 5.3 64 bit version) |
| HP-UX 11i v1 | ▪ MC/Service Guard 11.15 (Only supports HP-UX 11i v1 64 bit version)<br>▪ Serviceguard 11.16 |
| HP-UX 11i v2 | Serviceguard 11.16 and 11.17 |

| OS | Supported Cluster Software |
|---|---|
| HP-UX 11i v3 | Serviceguard 11.17 |
| Red Hat Enterprise Linux AS 2.1 (x86) | VCS 2.2 |
| Red Hat Enterprise Linux AS/ES 4.0 Update 1 (x86) | VCS 4.1 |

## 2.9 Path Management Software Supported by HiCommand Device Manager Agent

The following table lists the path management software supported by HiCommand Device Manager Agent. Only the operating systems that support path management software are listed.

**Table 2.8 Path Management Software Supported by HiCommand Device Manager Agent**

| OS | Architecture | Path Management Software Name | Path Management Software Version |
|---|---|---|---|
| Windows 2000 SP4 | -- | Dynamic Link Manager | 05-01-/A or later |
| Windows Server 2003 without SP | -- | Dynamic Link Manager | 05-01 or later |
| Windows Server 2003 SP1 | -- | Dynamic Link Manager | 5.6 or later |
| | | Windows MPIO (MPIO DSM: Provided by Dynamic Link Manager 5.5 or later) | Versions supported by DSM described to the left |
| Windows Server 2003 SP2 | x86 | Dynamic Link Manager | 5.9.1 or later |
| | | Windows MPIO (MPIO DSM: Provided by Dynamic Link Manager 5.9.1 or later) | Versions supported by DSM described to the left |
| | IPF | Dynamic Link Manager | 5.6 or later |
| | | Windows MPIO (MPIO DSM: Provided by Dynamic Link Manager 5.9.1 or later) | Versions supported by DSM described to the left |
| Windows Server 2003 x64 Edition without SP | -- | Dynamic Link Manager | 5.7 or later |
| | | Windows MPIO (MPIO DSM: Provided by Dynamic Link Manager 5.5 or later) | Versions supported by DSM described to the left |
| Windows Server 2003 x64 Edition SP2 | -- | Dynamic Link Manager | 5.9.1 or later |
| | | Windows MPIO (MPIO DSM: Provided by Dynamic Link Manager 5.9.1 or later) | Versions supported by DSM described to the left |
| Windows Server 2003 R2 without SP | -- | Dynamic Link Manager | 5.8 or later |
| | | Windows MPIO (MPIO DSM: Provided by Dynamic Link Manager 5.5 or later) | Versions supported by DSM described to the left |

| OS | Architecture | Path Management Software Name | Path Management Software Version |
|---|---|---|---|
| Windows Server 2003 R2 SP2 | -- | Dynamic Link Manager | 5.9.1 or later |
| | | Windows MPIO (MPIO DSM: Provided by Dynamic Link Manager 5.9.1 or later) | Versions supported by DSM described to the left |
| Solaris 7 and 8 | -- | Dynamic Link Manager | 03-00, 03-02 and 04-00 or later |
| Solaris 9 | -- | Veritas Volume Manager (Dynamic Multi-Pathing) | 4.1 |
| | | Dynamic Link Manager | 04-01 or later |
| | | Sun StorEdge Traffic Manager | 6.2.6 |
| Solaris 10 | -- | Dynamic Link Manager | 5.6.1 or later |
| | | Sun StorEdge Traffic Manager | -- |
| AIX 5.1 | -- | Dynamic Link Manager | 04-00 or later |
| AIX 5.2 | -- | Dynamic Link Manager | 05-00 or later |
| | | MPIO | -- |
| AIX 5.3 | -- | Dynamic Link Manager | 5.4.1 or later |
| | | MPIO | -- |
| HP-UX 11.0 | 32 bit | PV-link | -- |
| | 64 bit | PV-link | -- |
| | | Dynamic Link Manager | 04-00 or later |
| HP-UX 11i v1 | 32 bit | PV-link | -- |
| | 64 bit | PV-link | -- |
| | | Dynamic Link Manager | 04-00 or later |
| HP-UX 11i v2 | -- | PV-link | -- |
| | | Dynamic Link Manager | 5.6.1 or later |
| HP-UX 11i v3 | -- | PV-link | -- |
| | | MPIO | -- |
| Red Hat Enterprise Linux AS 2.1 | -- | Dynamic Link Manager | 04-00 or later |
| Red Hat Enterprise Linux AS/ES 3.0 | x86 and IPF | Dynamic Link Manager | 5.4 or later |
| Red Hat Enterprise Linux AS/ES 4.0 Update 1 | x86 and IPF | Dynamic Link Manager | 5.7.0-02 or later |
| | EM64T | | 5.7.1 or later |
| Red Hat Enterprise Linux AS/ES 4.0 Update 3 | -- | Dynamic Link Manager | 5.8.1 or later |

| OS | Architecture | Path Management Software Name | Path Management Software Version |
|---|---|---|---|
| Red Hat Enterprise Linux AS/ES 4.0 Update 4 | -- | Dynamic Link Manager | 5.9 or later |
| SUSE LINUX Enterprise Server 9 | -- | Dynamic Link Manager | 5.7 or later |
| SUSE LINUX Enterprise Server 10 | -- | Dynamic Link Manager | 5.9 or later |

## 2.10 Installing HiCommand Device Manager Agent

This section describes how to install HiCommand Device Manager Agent for each supported program.

The following table shows the default installation locations for supported operating systems when HiCommand Device Manager Agent is installed for the first time.

**Table 2.9 Default Installation Locations**

| Operating System | Default Installation Location |
|---|---|
| Windows 32 bit (x86) systems | system-drive\Program Files\HITACHI\HDVM\HBaseAgent |
| Windows 64 bit system (IPF, EM64T, or AMD64) systems | system-drive\Program Files (x86)\HITACHI\HDVM\HBaseAgent |
| Solaris, HP-UX, and Linux | /opt/HDVM/HBaseAgent |
| AIX | /usr/HDVM/HBaseAgent |

***Caution:*** If the installation destination is a Windows system, and if Hitachi Dynamic Link Manager (version 5.8 or later) or HiCommand Device Manager Agent (version 4.3 or earlier) is already installed in the Windows system, the installation destination folders for HiCommand Device Manager Agent are determined in the order shown below.

1. If Dynamic Link Manager version 5.8 or later has already been installed, HiCommand Device Manager Agent is installed on the drive that contains Dynamic Link Manager.
2. If HiCommand Device Manager Agent version 4.3 or earlier has already been installed, HiCommand Device Manager Agent is installed in the following location:

```
installation-folder-for-an-older-version-of-Device-Manager-agent\HBaseAgent
```

If HiCommand Device Manager Agent has already been installed, you can obtain the version of the installed Device Manager Agent by issuing a command that is appropriate for your operating system, as outlined in the following table.

**Table 2.10 Commands for Obtaining the Device Manager Agent Version**

| For This Operating System | Issue This Command |
|---|---|
| Windows | > installation-folder-for-Device-Manager-agent\bin\hdvm_info.exe |
| Solaris, HP-UX, and Linux | # /opt/HDVM/HBaseAgent/bin/hdvm_info |
| AIX | # /usr/HDVM/HBaseAgent/bin/hdvm_info |

***Note:*** Before you install HiCommand Device Manager Agent, be sure there is sufficient space in the default directory for this installation.

***Caution:*** Do not issue any of the following commands when upgrading HiCommand Device Manager Agent. Also, do not install Device Manager Agent while the following commands are executing:

- `hbsasrv`
- `HiScan`
- `hdvmagt_account`
- `hdvmagt_schedule`
- `hdvmagt`
- `hldutil`
- `stop_hdvmagt`
- `TIC`

The `hdvmagt` command and `stop_hdvmagt` command are for versions of the HiCommand Device Manager agent earlier than 5.0.

If you execute these commands during installation, the upgrade installation might end abnormally. Be sure to restart the system after installation. The upgrade installation is complete after you have restarted the system.

***Cautions:***

- If a version of Hitachi Dynamic Link Manager earlier than 5.8 is installed, you must install HiCommand Device Manager Agent, then set the port number used by the Device Manager Agent. For details, see section 3.2.10.
- The Device Manager agent versions 5.7 and later are compatible with the new Daylight Saving Time (DST) rules implemented in the United States and Canada beginning in 2007. When using the Device Manager agent in a United States or Canada time zone, set the host OS for the new DST rules according to information provided by OS vendors. If the host OS is not compatible with the new DST rules, the Device Manager agent will also not be compatible with the new rules.

### 2.10.1 About Additional Installation Options

You can download the Device Manager Agent from the Device Manager server by using the Web client. Decompress the downloaded file and then install the decompressed files. For details on downloading, see the *HiCommand® Device Manager Web Client User's Guide*.

The HiCommand Device Manager agent also has silent installation capability, which does not require any input by the user. For details, see section 2.10.4.**Error! Reference source not found.**

### 2.10.2 Installing the Device Manager Agent on a Windows System

HiCommand Device Manager Agent in Windows provides the following installation methods:

- **New installation**

  Use this installation method to install HiCommand Device Manager Agent in a host where HiCommand Device Manager Agent does not exist. For more information, see section 2.10.2.2.

- **Upgrade**

  Use this installation method to install HiCommand Device Manager Agent in a host that already contains HiCommand Device Manager Agent earlier than version 5.7. For more information, see section 2.10.2.3.

- **Re-installation**

  Use this installation method to install HiCommand Device Manager Agent in a host that already contains HiCommand Device Manager Agent version 5.7. For more information, see section 2.10.2.4.

#### 2.10.2.1 Preparing for the Installation

Before installing HiCommand Device Manager Agent on a Windows system, please review this list and complete any necessary tasks:

- Remove any previous HiScan installation:
  1. Select **Start**, **Settings**, **Control Panel**, and **Add/Remove Programs**.
  2. From the list, select **HiCommand Device Manager - Agent**. Before removing it, you may inspect its execution parameters by opening its properties folder and examining the task tab. See section 3.6.1 for information on Agents.
  3. Select **Change/Remove**.
- Refer to Table 2.1 for supported operating systems and a listing of required programs for your operating system.
- Verify that there is enough space in the default directory for installing HiCommand Device Manager Agent.
- You must be a superuser.
- At least 96 MB of free space is required on the hard disk. An additional 96 MB of free space is required on the system drive to create temporary files during installation.
- If HiCommand Device Manager Agent 5.7 has been already installed, do not install a version of HiCommand Device Manager Agent earlier than version 5.6 by overwriting the existing version. If you need to install an old version, uninstall the existing version first.
- Before starting the installation of the Device Manager Agent, cancel any programs that may be running.
- Check if any security monitoring programs have been installed. If a security monitoring program has been installed, either stop it or change its settings so that it will not interfere with the installation of the HiCommand Device Manager.

- If you log in to Windows from a remote console and install a Device Manager Agent after logging in, you must use Terminal Service Client.
- Stop the `hdvmagt` service before updating HiCommand Device Manager Agent (version 3.5 or earlier).
- If a host environment satisfies both of the following conditions, refreshing the host from the Web client might cause JavaVM to end abnormally and the refresh operation to timeout:
  - The host OS is Windows Server 2003 (IPF), and Service Pack 1 or later has not been installed.
  - The host recognizes many LUs (guideline value is 100 or more).

  To avoid above problem, we recommend that you install Service Pack 1 or later, and then install HiCommand Device Manager Agent.

  If you install a service pack after installing the HiCommand Device Manager agent, after you install the service pack, perform an overwrite installation of the HiCommand Device Manager.

  ***Note:*** If 100 or more LUs are recognized by the host, another error might occur. See section 3.2.14 and change the settings for the Device Manager agent.
- When installing HiCommand Device Manager Agent on a host in which Windows Server 2003 was installed in the following order, you cannot add the Device Manager Agent as an exception to the Windows Firewall exceptions list during the installation.

  1. Install Windows Server 2003 (no Service Pack).
  2. Install Service Pack 1 or later.

  For such hosts, manually add HiCommand Device Manager Agent as an exception to the Windows Firewall exceptions list after installing it. For more information, see section 3.2.6.

  Note that, when you install HiCommand Device Manager Agent on a host in which Windows Server 2003 with Service Pack 1 or later was installed, you can add HiCommand Device Manager Agent to the Windows Firewall exceptions list during the installation.

### 2.10.2.2 New Installation on a Windows System

To install the Device Manager Agent, the JRE version 1.4.2 (Build 06) must be installed in advance. To perform a new installation of Device Manager Agent, use the installation support tool to first install the JRE required for the Device Manager Agent and then the Device Manager Agent.

After completing a new installation of the HiCommand Device Manager agent, you can immediately perform the setup procedure. To install the JRE and Device Manager Agent:

1. Log on to Windows using a User ID in the Administrators Group.
2. Insert the HiCommand Device Manager Agent CD-ROM.

   ***Note:*** Before starting the installation, cancel any programs that may be running.
3. Select **Start, Run, Browse**, and then select and execute `install.exe` in the `\Agent\Windows` folder of the CD-ROM.

   ***Caution:*** If a request from another HiCommand Suite product is being executed, the installation is interrupted and a dialog box appears asking if you want to continue the installation. Select **Retry** to continue the installation, or **Cancel** to cancel the installation.

   Installation of the Device Manager Agent starts, and the Welcome to the InstallShield Wizard for HiCommand Device Manager - Agent dialog box appears.
4. Select **Next**.

   The Agent License Agreement panel appears.
5. Select **Yes**.

   The Choose Destination Location panel appears. Specify (64 bytes or less) the folder on which you want to install the Device Manager Agent.

   Space characters and the following characters can be used in the path name for the installation folder:

   ```
   a-z A-Z 0-9 . _ ( )
   ```

   However, a space character cannot be specified for the first character or the last character of the folder name. Additionally, two or more space characters cannot be specified consecutively.

   ***Cautions:***

   - If the Device Manager Agent or the version 5.8 or later of Dynamic Link Manager has already been installed, this panel does not appear.
   - If the installation path you specify for the Device Manager agent contains a space character, and there is a folder or file whose path matches the specified path (from the beginning until the space character), information cannot be sent to the Device Manager server at the startup of the Device Manager agent service. For example, if you installed the Device Manager agent in the folder `d:\host agent` and a folder or file whose path is `d:\host` exists, this problem occurs. To avoid this problem, perform one of the following:
     - Delete the relevant folder or file.
     - Uninstall the Device Manager agent, and then re-install it in another folder.

6. Select **Next**.

   If the target OS is Windows Server 2003 SP1 or later, or Windows Server 2003 x64 Edition, a confirmation dialog box appears, asking whether you want to add the Device Manager Agent as an exception to the Windows Firewall exceptions list. Select **Yes**.

7. Select **Next**.

   The Start Copying Files panel appears.

   ***Note:*** If you select the **Next** button in this panel, you cannot cancel the HiCommand Device Manager agent installation.

8. Select **Next** to continue.

   After the installation, the Setup Status panel and Installing Add-on panel are displayed.

   Add-on functionality is installed together with HiCommand Device Manager Agent. When the installation process finishes, a dialog box appears asking whether you want to continue with the setup procedure for the HiCommand Device Manager agent.

9. Select **Yes**, and then continue with the setup procedure for the HiCommand Device Manager agent.

   If you select No, a message appears prompting you to use the `hdvmagt_account` command and the `hdvmagt_schedule` command to perform the setup procedure. After installation is complete, manually perform the setup procedure for the Device Manager agent. For details about the setup procedure, see section 2.11.

   A window for setting information for the HiCommand Device Manager server appears.

10. Enter the IP address (or host name), port number, user ID, and password for the HiCommand Device Manager server.

    If you want to set the information for the HiCommand Device Manager server at a later time, select **No. Setup later.** and then **Next**. In this case, the information for the HiCommand Device Manager server must be set manually after installation is complete. For details about the setting method, see section 2.11.1.

    - Specification of the IP address or host name

      Enter the IP address or host name for the HiCommand Device Manager server. If nothing is entered, `255.255.255.255` will be set.

      You can use a character string of 50 bytes or less to specify a host name. The following characters can be used:

      `a-z A-Z 0-9 - . @ _`

    - Specification of the port number

      Enter a port number for the HiCommand Device Manager server. If nothing is entered, `2001` will be set.

    - Specification of the user ID

      Enter a user ID for logging on to the HiCommand Device Manager server. If nothing is entered, the default user ID `HaUser` will be set.

      You can use a character string of 1 to 256 bytes to specify a user ID. The following characters can be used:

      `a-z A-Z 0-9 # + - . @ _`

– Specification of the password

  Enter a password for logging on to the HiCommand Device Manager server. If nothing is entered, the default password for the default user ID `HaUser` will be set. When you have changed the password for `HaUser` by using the Web client, use the new password.

  You can use a character string of 1 to 256 bytes to specify a password. The following characters can be used:

  `a-z A-Z 0-9 ! " # $ % & ( ) * + - . = @ \ ^ _ | '`

11. Select **Next**.

    An error message will appear if characters that cannot be used have been entered. Change the values to characters that can be used, and then select **Next** again.

    After **Next** is selected, a connection to the HiCommand Device Manager server will be attempted.

    If a connection to the Device Manager server is established, a message will appear indicating that the connection to the server is recognized. Select **OK** to go to the next step.

    If the attempt to connect to the Device Manager server fails, a dialog box will appear asking if you want to modify the information for the Device Manager server. Check the error information displayed in the dialog box, and then select **Yes** to go back to step 9 if you want to re-enter the information. Select **No** to go to the next step without re-entering the information to set the entered values as specified.

    Once the settings for the information for the HiCommand Device Manager server are complete, a window for setting the execution period for the `HiScan` command appears.

12. Specify the execution period for the `HiScan` command.

    This setting is optional. If you do not specify the execution period, the Device Manager server is not periodically notified of information acquired by the Device Manager agent. If you want to specify the execution period for the `HiScan` command at a later time, or if you do not want the `HiScan` command to execute automatically, select **No. Setup later.** and then **Next**.

    Select **Hourly** to perform automatic execution once every hour, **Daily** to perform automatic execution once every day, or **Weekly** to perform automatic execution once every week. The default setting is **Daily**.

13. If you select **Weekly** in Step 12, specify the day of the week on which automatic execution is to be performed.

    Select **Sun**, **Mon**, **Tue**, **Wed**, **Thu**, **Fri**, or **Sat**. The default setting is **Sun**.

14. If you have specified a day of the week in Step 13 or selected **Daily** or **Hourly** in Step 12, specify the time when automatic execution is to be performed.

    You can specify a value from `0` to `23` for execution time (hour) and `0` to `59` for execution time (minute).

    The default automatic execution times are as follows:

    – For hourly execution: 47th minute of every hour

    – For daily or weekly execution: 2:47

15. Select **Next**.

    ***Caution:*** When the HiCommand Device Manager agent is installed on multiple hosts, set the `HiScan` command to execute daily or weekly to reduce the load of the HiCommand Device Manager server. Also, change the start times for execution of the `HiScan` command on each host so that the command will not be executed simultaneously from multiple hosts.

    This completes the settings for the execution period for the `HiScan` command. Next, the window for setting information for using CCI appears.

16. Specify the information for using CCI.

    This setting is optional. If you want to set the information for using CCI at a later time, or if you do not use CCI, select **No. Setup later.** and then **Next**. In this case, the information for using CCI with the following properties must be specified in the `server.properties` file.

    - `server.agent.rm.location`
    - `server.agent.rm.centralizePairConfiguration`

    For details about the properties, see section 3.7.1.

    - Specification of the installation drive for CCI

      Specify the drive on which CCI has been installed. The drive on which the HiCommand Device Manager agent has been installed is shown as the default setting.

      ***Caution:*** Do not specify a floppy disk drive or CD-ROM drive. If you do this, the Device Manager agent might not operate normally.

    - Specification of the central management method

      Specify whether to operate the HiCommand Device Manager agent as a central management server. The default setting is **disable**.

      To operate the HiCommand Device Manager agent as a central management server, change the setting to **enable**.

17. Select **Next**.

    After selecting **Next**, the installation status of CCI is checked. If CCI has not been installed on the installation drive that you specified, a dialog box appears asking if you want to change the specified installation drive. Select **Yes** to check whether the specified value has no problem. If the specified value has no problem, select **No** to go to the next step.

    A dialog box indicating the completion of the setup procedure appears.

18. Select **OK**.

19. If *system-drive*`\_HDVMAgent0570_Install_tmp_` remains, delete it manually.

    The *system-drive*`\_HDVMAgent0570_Install_tmp_` folder is a temporary one created during installation.

    If it cannot be deleted, log on to Windows again to delete it.

***Note:*** When you install version 5.7 of the Device Manager Agent, the folder in which commands are installed is automatically added to the environment variable `PATH`. Therefore, when you execute a command, you do not need to change the current folder to the folder that contains commands. After installing the Device Manager Agent, you will have to log off from, and then log on to Windows for the changes in the environment variable `PATH` to be applied.

***Caution:*** If VxVM has been installed, specify the version of the installed VxVM in the `programproductinfo.properties` file. For information about the setting, see section 3.7.3.

### 2.10.2.3 Upgrade on a Windows System

To perform an upgrade:

1. Log on to Windows using a user ID in the Administrators group.
2. Insert the HiCommand Device Manager Agent CD-ROM.
3. Select **Start**, **Run**, and **Browse**, and then select and execute `agent_jre_setup.bat` in the `\Agent\Windows` folder of the CD-ROM. When upgrading the Device Manager Agent by overwriting Device Manager of version 4.0 or later, select **Start**, **Run**, and **Browse**, and then select and execute `install.exe` in the `\Agent\Windows` folder of the CD-ROM.

   ***Caution:*** If a request from another HiCommand Suite product is being executed, or a Device Manager agent command is being executed, the installation is interrupted and a dialog box appears asking if you want to continue the installation. Select **Retry** to continue the installation, or **Cancel** to cancel the installation.

   A confirmation message appears, asking whether you want to continue the upgrade.
4. Select **Yes**.

   A panel indicates that add-on modules are being installed.

   Add-on functionality is installed together with HiCommand Device Manager Agent. Upon completion of the installation process, an Install Complete window appears.
5. Select **OK**.
6. If `system-drive\_HDVMAgent0570_Install_tmp_` remains, delete it manually.

   The `system-drive\_HDVMAgent0570_Install_tmp_` folder is a temporary one created during installation.

   If it cannot be deleted, log on to Windows again to delete it.

***Note:*** For upgrade (overwrite) installations, predefined settings for HiCommand Device Manager server information and the execution period of the `HiScan` command will be inherited. To modify information about the HiCommand Device Manager server, see section 3.4. For information about how to change the execution period, see section 3.5.

***Note:*** When you install version 5.7 of the Device Manager Agent, the folder in which commands are installed is automatically added to the environment variable `PATH`. Therefore, when you execute a command, you do not need to change the current folder to the folder that contains commands. After installing the Device Manager Agent, you will have to log off from, and then log on to Windows for the changes in the environment variable `PATH` to be applied.

***Cautions:***

- If VxVM has been installed, specify the version of the installed VxVM in the `programproductinfo.properties` file. For information about the setting, see section 3.7.3.
- If you upgrade the Device Manager Agent by overwriting the existing Device Manager Agent (version 4.1 or earlier) in Windows Server 2003 or Windows Server 2003 x64 Edition, the previously installed VDS provider is deleted, disabling its use. If you want to use VDS functions, separately install the VDS provider. For details on such installation, see the *HiCommand® Device Manager Server Installation and Configuration Guide*.

**Re-installation/Restoration in Windows**

***Note:*** When performing a re-installation of HiCommand Device Manager Agent, do not execute the following commands during installation:

`HiScan`, `hdvmagt_account`, `hdvmagt_schedule`, `hdvmagt`, `stop_hdvmagt`, and `TIC`

Should you execute any of these commands, the uninstall might not complete properly. In such a case, retry execution of the uninstall.

### 2.10.2.4 Reinstalling on Windows Systems

To perform a HiCommand Device Manager Agent re-installation on a Windows system:

1. Log on to Windows using a user ID in the Administrators group.
2. Insert the HiCommand Device Manager Agent CD-ROM.
3. From the **Start** menu, select **Run** and then **Browse**. Execute `install.exe` in the `\Agent\Windows\` folder on the CD-ROM.

   ***Caution:*** If a request from another HiCommand Suite product is being executed, or a Device Manager agent command is being executed, the installation is interrupted and a dialog box appears asking if you want to continue the installation. Select **Retry** to continue the installation, or **Cancel** to cancel the installation.

   The Welcome panel appears.
4. Select **Repair**, and then **Next**.

   A panel appears for confirmation of the re-installation.
5. Select **OK**.

   A panel indicates that add-on modules are being installed.

   Add-on functionality is installed together with HiCommand Device Manager Agent. Upon completion of the installation process, an Install Complete window appears.
6. Select **OK**.
7. If `system-drive\_HDVMAgent0570_Install_tmp_` remains, delete it manually.

   The `system-drive\_HDVMAgent0570_Install_tmp_`folder is a temporary one created during installation.

   If it cannot be deleted, log on to Windows again to delete it.

***Caution:*** If VxVM has been installed, specify the version of the installed VxVM in the `programproductinfo.properties` file. For information about the setting, see section 3.7.3.

## 2.10.3 Installing the Device Manager Agent on a Solaris, AIX, HP-UX, or Linux System

This section describes how to install HiCommand Device Manager Agent on Solaris, AIX, HP-UX, and Linux systems.

### 2.10.3.1 Preparing for the Installation

#### Installation Requirements

The requirements for installing HiCommand Device Manager Agent on a Solaris, AIX, HP-UX, or Linux system are as follows.

- You must log in with `root` permissions.
- The hard disk must have the amount of free space shown in the following table.

**Table 2.11 Minimum Free Hard Disk Space Needed for Installation**

| OS Name | Amount of Hard Disk Free Space (Unit: MB) |
|---|---|
| Solaris | 100 |
| AIX | 120 |
| HP-UX | 220 |
| Linux | 140 |

#### Installation Directories for First-Time Installations

The following table shows the default installation location for HiCommand Device Manager Agent when you install the program for the first time.

**Table 2.12 Default Installation Locations for Solaris, HP-UX, Linux, and AIX**

| Operating System | Default Installation Location |
|---|---|
| Solaris, HP-UX, and Linux | /opt/HDVM/HBaseAgent |
| AIX | /usr/HDVM/HBaseAgent |

## General Precautions

Before you install HiCommand Device Manager Agent, cancel any programs that are running.

## Symbolic Links

Do not create a symbolic link for any of the directories in the following table. If you have already created a symbolic link by using any of the directories below, do not install the Device Manager agent.

**Table 2.13 Directories for Which Symbolic Links Cannot be Created**

| Operating System | Directory |
|---|---|
| Solaris, HP-UX, and Linux | /opt |
| | All subdirectories under /opt/HDVM (including the /opt/HDVM) |
| | /var |
| | /var/opt |
| | All subdirectories under /var/opt/HBaseAgent (including /var/opt/HBaseAgent) |
| | All subdirectories under /var/opt/HDVM (including /var/opt/HDVM) |
| | /var/tmp |
| AIX | /usr |
| | All subdirectories under /usr/HDVM (including /usr/HDVM) |
| | All subdirectories under /var/HDVM (including /var/HDVM) |
| | /var |
| | All subdirectories under /var/HBaseAgent (including /var/HBaseAgent) |
| | /var/tmp |

## Notes about Security Monitoring Programs

Check if any security monitoring programs have been installed. If a security monitoring program has been installed, either stop it or change its settings so that it will not interfere with the installation of HiCommand Device Manager.

### Cautionary Notes on Installing on Solaris 10

- When installing the HiCommand Device Manager agent, do not specify the system's zone settings. If you do this, installation might fail.
- When a HiCommand Device Manager agent version earlier than 5.7 is installed in an environment where the local zone is set, it will be installed in both the global zone and the local zone. In this environment, if you perform an upgrade installation of HiCommand Device Manager agent version 5.7, only the HiCommand Device Manager agent in the global zone will be upgraded. Log in to the local zone to execute the following command, and then delete the HiCommand Device Manager agent in the local zone.

```
# pkgrm HDVMAgent
```

### Cautionary Notes on Installing on HP-UX

- If you perform the installation on a workstation, the following message will be displayed and the installation will fail:

```
ERROR: Could not apply the software selection "HDVMAgent" because there are no product
variations that are compatible with the destination host(s).
```

- When installing HiCommand Device Manager Agent, the `swagentd` daemon needs to be running. If the `swagentd` daemon is not running, execute the following command to start it.

```
/usr/sbin/swagentd
```

- Confirm that the file system currently mounted on the host matches the file system defined in `/etc/fstab`, and then install HiCommand Device Manager Agent.
- Before installing HiCommand Device Manager Agent, make sure that the network settings such as those in the `hosts` file are correct.

### Cautionary Notes on Installing on Linux

If a Linux firewall is configured, the Device Manager Agent might be unable to communicate with the Device Manager server. In that case, execute the `iptables stop` command on the Linux host to disable `iptables`, and then configure the host to not automatically start `iptables` when the OS starts, or configure `iptables` so that the Device Manager releases the port in use. For the port numbers used, see the *HiCommand® Device Manager Server Installation and Configuration Guide*.

## Cautionary Notes on Installing on AIX

- When IBM XL C/C++ Enterprise Edition V8 for AIX Runtime version from 8.0.0.3 to 8.0.0.5 has been applied, the overwrite installation of the Device Manager agent will hang if one of the following conditions exists:
  - The installed version of Dynamic Link Manager is from 5.8 or later to earlier than 5.9.
  - The installed version of Device Manager agent is from 5.0 to 5.1.03.

  When you use the Device Manager agent, upgrade IBM XL C/C++ Enterprise Edition V8 for AIX Runtime to version 8.0.0.6 or later, or apply the patch (APAR IY87291). For details about the patch (APAR IY87291), see the IBM website.

  You can use the following command to check the version of IBM XL C/C++ Enterprise Edition V8 for AIX Runtime:

  ```
  # lslpp -L xlC.aix50.rte
  ```

- AIX has the Stack Execution Disable (SED) function that protects systems from attacks that use a buffer overflow. If the SED mode is set to `all`, you need to change the mode to a mode other than `all` before installing the Device Manager agent. To change the SED mode to a mode other than `all`, execute the following command:

  ```
  # sedmgr -m {select | off | setidfiles}
  ```

  For details about the `sedmgr` command, see the AIX documentation.

  If you want to return the SED mode to `all` after installing the Device Manager agent, you need to exclude the java process that is bundled with the Device Manager agent from the SED protection targets. For details, see section 3.2.16.

## Cautionary Notes on Overwrite Installations

If HiCommand Device Manager Agent version 5.7 has already been installed, do not overwrite the installation with an earlier version. To install an earlier version, uninstall the existing version first.

### 2.10.3.2 Deleting the HDSHiScan Package

For Solaris, AIX, or HP-UX, the currently installed HDSHiScan package must be deleted before HiCommand Device Manager Agent is installed. HDSHiScan is the name used for versions prior to 2.2. HDVMAgent is the name used for version 2.2 and later.

#### Installation directory for the HDSHiScan package

- In Solaris or HP-UX:

  `/opt/HDVM`

- In AIX:

  `/usr/HDVM`

To delete the HDSHiScan package:

1. At the prompt, use the following commands to check for the presence of a HiScan package installation:
   - In Solaris:

     ```
     % su
     # pkginfo -l HDSHiScan
     ```

   - In AIX:

     ```
     % su
     # lslpp -l HDSHiScan.rte
     ```

   - In HP-UX:

     ```
     % su
     # swlist HDSHiScan
     ```

   ***Note:*** It is recommended that you remove any agents that you will not be using.

2. If the HDSHiScan package is already installed, you may wish to review the HiScan execution parameters before uninstalling. Enter the following commands (See section 3.6.2 for an interpretation of the HiScan scheduling entry):

   ```
   % su
   # crontab -l
   ```

3. To remove the existing HiScan package, enter the following commands:
   - In Solaris:

     ```
     % su
     # pkgrm HDSHiScan
     ```

     The screen will verify that the selected program has been deleted.

   - In AIX:

   If the version of HiCommand Device Manager Agent is 3.0 or later:

   ```
   # /usr/HDVM/bin/.uninstall.sh
   ```

   ***Note:*** This is the preferred method for installing on an AIX system.

If the version of HiCommand Device Manager Agent is 2.4 or earlier:

```
% su
# installp -u HDSHiScan.rte
```

***Note:*** This is the manual method for installing on an AIX system.

– In HP-UX:

```
% su
# swremove HDSHiScan
```

### 2.10.3.3 Installing the HiCommand Device Manager Agent

After completing a new installation of the HiCommand Device Manager agent, you can immediately perform the setup procedure.

***Note:*** For upgrade (overwrite) installations, predefined settings for HiCommand Device Manager server information and the execution period of the `HiScan` command are inherited. To modify information about the HiCommand Device Manager server, see section 3.4. For details about how to change the execution period, see section 3.5.

To install the Device Manager agent:

1. Insert the HiCommand Device Manager Agent CD-ROM and mount it.

   ***Caution:*** If the CD-ROM cannot be automatically mounted, mount the CD-ROM to `/mnt/cdrom`.

2. Move to the directory that contains `install.sh`, then issue the following command:

   ```
   # ./install.sh
   ```

   ***Cautions:***

   – If a request from another HiCommand Suite product is being executed, the installation is interrupted and a message appears asking if you want to continue the installation. If you want to continue the installation, press the **Enter** key without entering a value or enter `y`. If you want to cancel the installation, enter `n`.

   – For an overwrite installation, if a command of the Device Manager agent is being executed, the installation is interrupted and a message appears asking if you want to continue the installation. If you want to continue the installation, press the **Enter** key without entering a value or enter `y`. If you want to cancel the installation, enter `n`.

   Issuing `install.sh` starts installation of the HiCommand Device Manager agent (Installation of add-on functionality is also performed).

3. At this point, software licensing agreement information will appear. If you do not accept the licensing agreement, uninstall the HiCommand Device Manager agent after installation finishes.

4. The following message appears when installation finishes:

   ```
   Device Manager - Agent installed successfully.
   ```

5. For a new installation, a message appears asking whether you want to continue with the setup procedure for the HiCommand Device Manager agent. Press the **Enter** key without entering a value or enter `y` to perform the setup procedure for the Device Manager agent.

```
Would you like to setup the Device Manager agent? (Y)es or (N)o. (default:Y)
```

   If you enter `n`, a message appears prompting you to use the `hdvmagt_account` command and the `hdvmagt_schedule` command to perform the setup procedure. After installation is complete, manually perform the setup procedure for the Device Manager agent. For details about the setup procedure, see section 2.11.

6. A message appears, asking you whether you want to set the Device Manager server information. Press the **Enter** key without entering a value, or enter `y`.

```
Do you want to specify the Device Manager server information? (Y)es or (N)o.
(default:Y)
```

   If you want to set the information for the HiCommand Device Manager server at a later time, enter `n`. In this case, the information for the HiCommand Device Manager server must be set manually after installation is complete. For details about the setting method, see section 2.11.1.

7. The following message appears, prompting you to enter the IP address or host name of the Device Manager server. Enter the IP address (in the *xxx.xxx.xxx.xxx* format) or host name.

```
Enter the IP address or hostname of the Device Manager server. (default:
255.255.255.255)
```

   If you do not enter a value and press the **Enter** key, the default IP address `255.255.255.255` is set.

   Specification of the host name

   You can use a character string of 50 bytes or less to specify a host name. The following characters can be used:

   `a-z  A-Z  0-9  -  .  @  _`

   If you enter a character that cannot be used and then press the **Enter** key, you will be prompted to re-enter a value.

8. The following message appears, prompting you to enter the port number of the Device Manager server. Enter the port number. The default value is `2001`.

```
Enter the port number of the Device Manager server. (default:2001)
```

   If you do not enter a value and press the **Enter** key, the default port number `2001` is set.

9. The following message appears, prompting you to enter the user ID for logging on to the Device Manager server. Enter the user ID.

```
If you want to use the default value(HaUser), leave this field blank and press the
Enter key.
Enter the user ID for logging on to the Device Manager server.
```

   If you do not enter a value and then press the **Enter** key, the default user ID `HaUser` is set.

   Specification of the user ID

   You can use a character string of 1 to 256 bytes to specify a user ID. The following characters can be used:

```
a-z  A-Z  0-9  #  +  -  .  @  _
```

If you enter a character that cannot be used and then press the **Enter** key, you will be prompted to re-enter a value.

10. The following message appears, prompting you to enter the password for logging on to the Device Manager server. Enter the password.

```
If you want to use the default value, leave this field blank and press the Enter key.
Enter the password for logging on to the Device Manager server.
```

If you do not enter a value and then press the **Enter** key, the default password for the default user ID `HaUser` is set. When you have changed the password for `HaUser` by using the Web client, use the new password.

Specification of the password

You can use a character string of 1 to 256 bytes to specify a password. The following characters can be used:

```
a-z A-Z 0-9 ! " # $ % & ( ) * + - . = @ \ ^ _ | '
```

If you enter a character that cannot be used and then press the **Enter** key, you will be prompted to re-enter a value.

If you enter usable characters and then press the **Enter** key, the following message appears, and then a connection to the Device Manager server will be attempted:

```
Connecting to the server...
```

If a connection to the Device Manager server is established, the following message appears:

```
The connection to the server has been verified.
```

If the attempt to connect to the Device Manager server fails, the message shown below appears together with the message ID and error information. Press the **Enter** key without entering a value or enter `y`, and then make sure that the entered values are correct. If the entered values are correct, enter `n` to go to the next step.

```
Do you want to modify the server configuration?
Enter (Y)es to modify the server configuration. Enter (N)o to keep the setting and
proceed to the next step. (default:Y)
```

11. A message appears, asking you whether you want to specify the execution period for the `HiScan` command. Press the **Enter** key without entering a value, or enter `y`.

```
Do you want to specify the execution period of the HiScan command? (Y)es or (N)o.
(default:Y)
```

This setting is optional. If you do not specify the execution period, the Device Manager server is not periodically notified of information acquired by the Device Manager agent. If you want to specify the execution period for the `HiScan` command at a later time, or if you do not want the `HiScan` command to execute automatically, enter `n`.

12. A message appears, prompting you to specify the execution period. Enter `h` for automatic hourly execution, `d` for automatic daily execution, or `w` for automatic weekly execution.

```
Enter execution period: (H)ourly, (D)aily, (W)eekly (default:D)
```

13. If you enter `w` for Step 12, the following message appears, prompting you to specify the day of the week when automatic execution is performed. Specify the day of the week.

```
Enter a day of the week:
(0)Sun,(1)Mon,(2)Tue,(3)Wed,(4)Thu,(5)Fri,(6)Sat
```

14. If you specify the day of the week for Step 13, or enter `h` or `d` for Step 12, the following message appears, prompting you to specify when automatic execution is performed. To accept the default time, enter `y`. If you want to specify the time for automatic execution, enter `n`.

    When you specify the day of the week or enter `d`:

    ```
    Do you want to set the default time (2:47) to the execution time? (Y)es or (N)o.
    (default:N)
    ```

    When you enter `h`:

    ```
    Do you want to set the default time (*:47) to the execution time? (Y)es or (N)o.
    (default:N)
    ```

    The default automatic execution times are as follows:

    - For hourly execution: 47th minute of every hour
    - For daily or weekly execution: 2:47

    When you enter `n`, the following message appears (specify the execution time):

    ```
    Enter time (hour): (0-23)
    Enter time (minute): (0-59)
    ```

15. A message appears, asking you whether you want to apply the settings. Press the **Enter** key without entering a value or enter `y`. In addition to a message, the contents of the settings to be applied are also displayed.

    ```
    This will set the HiScan automatic execution schedule.
    Are you sure? (Y)es or (N)o. (default:Y)
    ```

    ***Caution:*** If you enter `n`, all of the execution period settings for the `HiScan` command will be canceled. Go to the next step.

    If you enter `y`, the following message appears, and the settings for the execution period are completed:

    ```
    Configuration of the HiScan automatic execution schedule has completed.
    ```

    ***Caution:*** When the HiCommand Device Manager agent is installed on multiple hosts, set the HiScan command to execute daily or weekly to reduce the load of the HiCommand Device Manager server. Also, change the start times for execution of the `HiScan` command on each host so that the command will not be executed simultaneously from multiple hosts.

16. A message appears, asking whether you want to specify the installation directory for CCI. Press the **Enter** key without entering a value or enter `y`.

    ```
    Do you want to specify the RAID Manager install directory? (Y)es or (N)o. (default:Y)
    ```

    This setting is optional. If you want to set the information for using CCI at a later time, or if you do not use CCI, enter `n`. In this case, the information for using CCI with the following properties must be specified in the `server.properties file`.

    - `server.agent.rm.location`
    - `server.agent.rm.centralizePairConfiguration`

    For details about the properties, see section 3.7.1.

17. Specify the installation directory of CCI. If CCI is installed in the `/HORCM` directory, press the **Enter** key without entering a value.

    ```
    Enter the RAID Manager install directory. (default: /HORCM)
    ```

After you enter the installation directory of CCI, the CCI installation status will be checked. If the specified installation directory cannot be found, the message shown below appears. Press the **Enter** key without entering a value or enter `y`, and then make sure that the entered values are correct. If the entered values are correct, enter `n` to go to the next step.

```
RAID Manager is not installed in the selected directory.
Do you want to select another directory?
Enter (Y)es to select another directory. Enter (N)o to keep the settings and proceed to
the next step. (default:Y)
```

18. A message appears, asking whether you want to operate the Device Manager agent as a central management server. If you want to operate the Device Manager agent as a central management server, enter `y`. If you do not want to operate the Device Manager agent as a central management server, press the **Enter** key without entering a value, or enter `n`.

```
Enter (Y)es when a single host centrally manages the creation, status change, and
deletion of copy pairs.
Do you want to be enable centrally manage pair configuration? (Y)es or (N)o.
(default:N)
```

If you enter `y` or `n`, or press the **Enter** key without entering a value, the following message appears, and the setup of the Device Manager agent is completed:

```
The Device Manager agent setup has completed successfully.
```

### 2.10.4 Installing the Device Manager Agent Using Silent Installation

The HiCommand Device Manager agent has silent installation capability, which does not require any input by the user. You can use a script file to automatically install the HiCommand Device Manager agent on multiple hosts. However, you must create the script file yourself. In addition, pay careful attention to the following points:

- For a new installation, you cannot perform the setup procedure immediately after installation.
- For an overwrite installation, version 4.1 or later of the HiCommand Device Manager agent must already be installed.
- The HiCommand Device Manager agent cannot be automatically registered as an exception to the Windows firewall.

Following are the scripts for executing silent installation:

**Windows**:

```
install.exe /s [Device-Manager-agent-installation-folder]
```

The Device Manager agent installation folder is enabled only for a new installation. For details about the number and type of characters that can be specified, see section 2.10.2. If this setting is not made, the HiCommand Device Manager agent will be installed in the default installation folder.

**Solaris, AIX, HP-UX, or Linux**:

```
install.sh -s
```

No error messages will appear during the execution of silent installation, even if the installation fails. Refer to the values returned in the execution results to resolve any problems that occur. The following table lists and describes the return values in the execution results for silent installation.

**Table 2.14 Return Values in the Execution Results for Silent Installation**

| Return value | Description | Action |
|---|---|---|
| 00 | Ended normally. | None. |
| 0x90 | A failure occurred during the installation of the HiCommand Device Manager agent. | The following are likely causes:<br>▪ There is insufficient free disk space. Secure sufficient disk space, and then perform the installation again.<br>▪ The OS where the installation is being performed is not supported. Check the OS.<br>▪ The HiCommand Device Manager agent is running. Wait a few minutes, and then perform the installation again. |
| 0x91 | The installation command contains a syntax error. | The syntax of the installation command argument is incorrect. Correct the syntax, and then perform the installation again. |
| | The setting value for the installation directory is not correct. | The installation directory has been set with characters that cannot be used, or exceeds 64 bytes. Correct the setting, and then perform the installation again.<br>The following characters can be in for the installation directory:<br>a-z A-Z 0-9 . _ ( )<br>Note that a space character cannot be specified for the first character or the last character of the directory name. Additionally, two or more space characters cannot be specified consecutively. |
| 0x93 | A failure occurred while copying files of another program product. | For an environment in which HiCommand Protection Manager Console has been installed, execute either hptmguiinst.exe or hptmguiinst.sh. Check the error message, take the appropriate action to correct the error, and then perform the installation again.<br>For an environment in which the GUI for Dynamic Link Manager has been installed, contact maintenance personnel for assistance. |
| 0x95 | A failure occurred during the installation of add-on functionality. | There is insufficient free disk space. Secure sufficient disk space, and then perform the installation again. |

## 2.11 Setting up HiCommand Device Manager Agent

After installing HiCommand Device Manager Agent, set the following information for HiCommand Device Manager Agent operation:

- Information for the Device Manager server
- Execution period of the `HiScan` command
- Information for using CCI

***Notes:***

- You can set any execution period for the `HiScan` command. If you do not set up the execution period, the Device Manager server is not periodically notified of information acquired by the Device Manager Agent.
- Setting information for using CCI is optional.

### 2.11.1 Setting Server Information

Set the IP address or host name, port number, user ID, and password of the Device Manager server interactively using the `hdvmagt_account` command.

***Caution***: When prompted for each item, operations will end abnormally if you enter three invalid values consecutively.

To set the server information:

1. Issue the `hdvmagt_account` command from the command prompt.

   The `hdvmagt_account` command is stored in the following locations:

   In Windows:

   ```
   installation-folder-for-Device-Manager-agent\bin\hdvmagt_account.bat
   ```

   In Solaris, HP-UX, or Linux:

   ```
   /opt/HDVM/HBaseAgent/bin/hdvmagt_account
   ```

   In AIX:

   ```
   /usr/HDVM/HBaseAgent/bin/hdvmagt_account
   ```

2. A message asks whether you want to change the Device Manager server information. Type `y`.

   ```
   Would you like to change the Device Manager Server information? (Y)es or (N)o.
   (default:N)
   ```

3. The following message prompts you to enter the IP address or host name of the Device Manager server. Enter the IP address (in the *xxx.xxx.xxx.xxx* format) or host name.

```
Enter the IP address or host name of the Device Manager Server. (default:
255.255.255.255)
```

If you omit a value and press the **Enter** key, the default IP address `255.255.255.255` is set.

Specify the host name. You can use a character string of 50 bytes or less to specify a host name. The following characters can be used:

```
a-z A-Z 0-9 - . @ _
```

If the entered value is not in the specified format, or the host name cannot be resolved to an IP address, you are prompted to re-enter it.

4. The following message prompts you to enter the port number of the Device Manager server. Enter the port number. The default value is `2001`.

```
Enter the port for the Device Manager Server.(default:2001)
```

If you omit a value and press the **Enter** key, the default port number `2001` is set. If the entered value is invalid, you will be prompted to re-enter it.

5. The following message prompts you to enter the user ID for logging on to the Device Manager server. Enter the user ID.

```
Enter the Device Manager Server user ID.
```

The default user ID is `HaUser`.

Specification of the user ID

You can use a character string of 1 to 256 bytes to specify a user ID. The following characters can be used:

```
a-z A-Z 0-9 # + - . @ _
```

If you omit a value or if you enter an invalid character and press the **Enter** key, you will be prompted to re-enter the user ID.

6. The following message prompts you to enter the password for logging on to the Device Manager server. Enter the password.

```
Enter the Device Manager Server password.
```

The default password for the `HaUser` user ID is `haset`. When you have changed the password for `HaUser` by using the Web client, use the new password.

Specification of the password

You can use a character string of 1 to 256 bytes to specify a password. The following characters can be used:

```
a-z A-Z 0-9 ! " $ % & ( ) * + - . = @ \ ^ _ | '
```

If you do not enter anything or enter an invalid character and press the **Enter** key, you will be prompted to re-enter the password.

7. When a message confirms whether the settings are to be saved, type `y`.

```
Would you like to save to server.properties? (Y)es or (N)o. (default:N)
```

***Caution:*** For Windows, restart the HiCommand Device Manager Agent service after executing the `hdvmagt_account` command. For details on starting and stopping HiCommand Device Manager Agent, see section 3.3.

### 2.11.2 Setting the Execution Period for HiScan Command

Set the execution period for notifying the HiCommand Device Manager Server of the information obtained by HiCommand Device Manager Agent. For new HiCommand Device Manager Agent installations, the information obtained by HiCommand Device Manager Agent is not regularly sent to the HiCommand Device Manager Server, unless you set the execution period for the HiScan command.

Cautionary notes on when the host operating system is Linux (these cautionary notes apply to the following versions):

- Linux AS 2.1
- Versions earlier than Linux AS 3.0 Update 6
- Versions earlier than Linux ES 3.0 Update 6

- Do not set the execution period of the `HiScan` command. If the execution period of the `HiScan` command is set, clear the setting. For information about how to clear this setting, see section 3.6.4.
- If system operation requires the `HiScan` command to be executed automatically, do not perform any operations on the host while the `HiScan` command is automatically executing.

To set the execution period:

1. Issue the `hdvmagt_schedule` command from the command prompt:

   The `hdvmagt_schedule` command is stored in the following locations:

   In Windows:

   ```
   installation-folder-for-Device-Manager-agent\bin\hdvmagt_Schedule.bat
   ```

   In Solaris, HP-UX, or Linux:

   ```
   /opt/HDVM/HBaseAgent/bin/hdvmagt_schedule
   ```

   In AIX:

   ```
   /usr/HDVM/HBaseAgent/bin/hdvmagt_schedule
   ```

2. When a message asks whether you want to set the execution period, type `y` or `n`.

   If the schedule for performing automatic execution is already registered, the registered contents are also displayed.

   When a schedule for performing automatic execution has not been registered:

   ```
   Do you want to set the execution period of the HiScan command? (Y)es or (N)o.
   (default:Y)
   ```

   When a schedule for performing automatic execution has already been registered:

   ```
   Do you want to set the execution period of the HiScan command? (Y)es or (N)o.
   (default:N)
   ```

3. When a message prompts you to specify the execution period, enter h for automatic hourly execution, d for automatic daily execution, or w for automatic weekly execution. If you do not want to perform automatic execution or to cancel the set automatic execution, enter c.

   When a schedule for performing automatic execution has not been registered:

```
Enter execution period: (H)ourly, (D)aily, (W)eekly (default:D)
```

   When a schedule for performing automatic execution has already been registered:

```
Enter execution period: (H)ourly, (D)aily, (W)eekly, (C)lear (default:D)
```

   If you enter a character other than c, go to the next step.

   If you enter c, the message "This will remove the current HiScan automatic execution schedule. Are you sure? (Y)es or (N)o. (default:N)" is displayed. Also, the registered contents are displayed. When you enter y, the message "Configuration of the HiScan automatic execution schedule has completed." appears, and then the setting of the execution period finishes.

4. If you enter w for Step 3, the following message prompts you to specify the day of the week when automatic execution is performed. Specify the day of the week.

```
Enter a day of the week: (0)Sun,(1)Mon,(2)Tue,(3)Wed,(4)Thu,(5)Fri,(6)Sat
```

5. If you specify the day of the week for Step 4, or enter h or d for Step 3, the following message prompts you to specify when automatic execution is performed. To accept the default time, enter y. If you want to specify the time for automatic execution, enter n.

   When you specify the day of the week or enter d:

```
Do you want to set the default time (2:47) to the execution time? (Y)es or (N)o.
(default:N)
```

   When you enter h:

```
Do you want to set the default time (*:47) to the execution time? (Y)es or (N)o.
(default:N)
```

   The default automatic execution times are as follows:

   – For hourly execution: 47th minute of every hour
   – For daily or weekly execution: 2:47

   When you enter n, the following message appears (specify the execution time):

```
Enter time(hour):(0-23)
Enter time(minute):(0-59)
```

6. A message asks whether you want to apply the settings. Enter y or n.

   The new settings are also displayed along with the message.

   When setting the execution period for the first time:

```
This will set the HiScan automatic execution schedule.
Are you sure? (Y)es or (N)o. (default:N)
```

When updating the execution period:

```
This will update the current HiScan automatic execution schedule.
Are you sure? (Y)es or (N)o. (default:N)
```

7. If you enter `y`, the following message appears, and the setting of the execution period finishes.

```
Configuration of the HiScan automatic execution schedule has completed.
```

8. For Windows, start the HiCommand Device Manager Agent service.

   For information about how to start the HiCommand Device Manager Agent service, see section 3.3.

For information about how to change the execution period for the HiScan command, see section 3.5.

## Cautionary Notes on Installing HiCommand Device Manager agent on Multiple Hosts

When the HiCommand Device Manager agent is installed on multiple hosts, set the `HiScan` command to execute daily or weekly to reduce the load of the HiCommand Device Manager server. Change the start times for execution of the HiScan command on each host, so the command will not be executed simultaneously from multiple hosts. When changing a start time, set a time that does not overlap the HiScan command execution period (command start time to end time) set for any other hosts.

You can check the HiScan command execution period by referencing the following messages output to the `HiScan.log` file:

- `KAIC22805-I` (This message is output when the HiScan command starts.)
- `KAIC22804-I` (This message is output when the HiScan command ends.)

The `HiScan.log` file is stored in the following locations:

**Windows**:

```
installation-folder-for-Device-Manager-agent\bin\logs\HiScan.log
```

**Solaris, HP-UX, and Linux**:

```
/opt/HDVM/HBaseAgent/bin/logs/HiScan.log
```

**AIX**:

```
/usr/HDVM/HBaseAgent/bin/logs/HiScan.log
```

### 2.11.3 Setting Information for Using CCI

Set information for using CCI from the Device Manager agent. The information for using CCI must be set in the following properties in the `server.properties` file:

- `server.agent.rm.location`
- `server.agent.rm.centralizePairConfiguration`

For details on network configuration properties, see section 3.7.1.

## 2.12 Uninstalling HiCommand Device Manager Agent

Before uninstalling HiCommand Device Manager Agent, review the following notes:

- When uninstalling HiCommand Device Manager Agent, HiCommand Device Manager Agent and add-on modules stop automatically. If attempts to stop fail, see section 3.3.5.
- You cannot perform uninstallation while HiCommand Device Manager Agent is processing a job. Wait until HiCommand Device Manager Agent completes the job, and then retry uninstallation.
- Do not execute any of the following commands during the uninstallation. Also, do not uninstall while the following commands are executing:

  `hbsasrv, HiScan, hdvmagt_account, hdvmagt_schedule, hldutil, or TIC`

  If you execute the above commands during uninstallation, uninstallation might fail.
- If you attempt to uninstall while the HiScan command is executing, uninstallation will stop. So wait for the execution to finish, and then uninstall again.
- If you attempt to uninstall while a command other than HiScan is executing, the uninstallation might end abnormally. In this case, reboot the system.
- If Dynamic Link Manager version 5.8 or later has been installed, some folders, files, and detailed information will not be deleted even if HiCommand Device Manager Agent is uninstalled. However, these folders, files, and detailed information will be deleted when Dynamic Link Manager is uninstalled.
- Files created by using HiScan, CCI configuration definition files, and error information files created from the results of TIC commands cannot be deleted.

### 2.12.1 Uninstalling the Device Manager Agent in Windows Systems

The following section describes how to uninstall HiCommand Device Manager Agent and delete tasks that run the `HiScan` command.

***Notes:***

- Once uninstallation is started, you cannot use the **Cancel** button to stop the processing. After the uninstallation finishes, install HiCommand Device Manager Agent again.
- If a Device Manager Agent is registered as an exception in the Windows Firewall exceptions list, you must release the Windows Firewall settings after uninstalling the Device Manager Agent. For details on how to release these settings, see step 3 in section 3.2.6.

#### 2.12.1.1 Uninstalling HiCommand Device Manager Agent in Windows

1. Select **Start**, **Settings**, **Control Panel**, and **Add/Remove** Programs.
2. Click the **Change/Remove** button for HiCommand Device Manager Agent.
3. In the displayed HiCommand Device Manager Agent maintenance menu, choose **Remove**.

   ***Note:*** In the maintenance menu, although **Repair** and **Remove** are selectable, do not select **Repair**. When performing re-installation (installation for restoration) of HiCommand Device Manager Agent, follow the procedures described in the "Re-installation in Windows" part of section 2.10.2.4.

   ***Caution:*** If a request from another HiCommand Suite product is being executed, or a Device Manager agent command is being executed, the uninstallation is interrupted and a dialog box appears asking if you want to continue the uninstallation. Select **Retry** to continue the uninstallation, or **Cancel** to cancel the uninstallation.

#### 2.12.1.2 Deleting Tasks that Execute the HiScan Command

The following tasks execute the `HiScan` command. They cannot be deleted even if HiCommand Device Manager Agent is uninstalled.

- Tasks that execute `exeHiScan.bat` whose task schedule was modified by a user using **Scheduled Tasks** in the Control Panel
- Tasks that execute `exeHiScan.bat` in Windows Server 2003 or Windows Server 2003 x64 Edition

Instead, delete these tasks from **Scheduled Tasks** in the control panel.

### 2.12.2 Uninstalling the Device Manager Agent in Solaris, AIX, HP-UX, and Linux

#### Cautionary Notes on Uninstalling on Solaris 10

When uninstalling the HiCommand Device Manager agent, do not specify the system's zone settings. If you do this, uninstallation might fail.

#### Cautionary Notes on Uninstalling on HP-UX

When uninstalling HiCommand Device Manager Agent, the `swagentd` daemon must be running. If the `swagentd` daemon is not running, issue the following command to start it:

```
/usr/sbin/swagentd
```

Confirm that the file system currently mounted on the host matches the file system defined in `/etc/fstab`, and then uninstall HiCommand Device Manager Agent.

To uninstall HiCommand Device Manager Agent in Solaris, AIX, HP-UX, or Linux:

1. Issue the following command from the command line:

   In Solaris, HP-UX, and Linux:

   ```
   # /opt/HDVM/HBaseAgent/bin/.uninstall.sh
   ```

   In AIX:

   ```
   # /usr/HDVM/HBaseAgent/bin/.uninstall.sh
   ```

   The following message asks whether you want to perform the uninstallation.

   ```
   Are you sure to UNINSTALL HiCommand Device Manager - Agent? (Y)es or (N)o:
   ```

2. Type `y`.

   The following message appears, indicating that the uninstallation procedure has finished.

   ```
   Device Manager - Agent removed successfully.
   ```

   ***Caution:*** If a request from another HiCommand Suite product is being executed, or a Device Manager agent command is being executed, the uninstallation is interrupted and a dialog box appears asking if you want to continue the uninstallation. Select **Retry** to continue the uninstallation, or **Cancel** to cancel the uninstallation.

# Chapter 3 HiCommand Device Manager Agent Operations

This chapter describes how to specify commands used for HiCommand Device Manager Agent operations, and provides details on HiCommand Device Manager Agent properties. Topics include:

- Configuring and Operating HiCommand Device Manager Agent (see section 3.1)
- Notes on Device Manager Agent Operations (see section 3.2)
- Starting and Stopping HiCommand Device Manager Agent (see section 3.3)
- Modifying Server Information (see section 3.4)
- Changing the execution period of the HiScan Command (see section 3.5)
- HiCommand Device Manager Agent Commands (see section 3.6)
- Property Files (see section 3.7)
- Using a User-created CCI Configuration Definition File (see section 3.8)

## 3.1 Configuring and Operating HiCommand Device Manager Agent

When HiCommand Device Manager Agent is normally installed, the resident program (**hdvmagt**) starts automatically, and the HiScan command executes periodically by the system's task-management function.

***Caution:*** The name of the host running HiCommand Device Manager Agent must be unique for each HiCommand Device Manager Server to which information is to be reported.

### 3.1.1 Automatic and Manual Execution of the HiScan Command

The `HiScan` command can execute automatically and manually.

- Under auto execution, the `HiScan` command runs according to the specified execution period. For details on how to set up the execution period, see section 2.11.2. For information about how to change the specified execution period, see section 3.5.
- Under manual execution, the user runs the `HiScan` command as necessary.

### 3.1.2 Choosing how to Operate HiCommand Device Manager Agent

You can operate the HiCommand Device Manager Agent by modifying server information or changing the execution period:

- **Modifying server information**: You can modify the server information you set up during setup. For information about modifying the server information, see section 3.4.
- **Changing the execution period**: You can change the execution period for the `HiScan` command. For information about how to change the execution period, see section 3.5.

## 3.2 Notes on Device Manager Agent Operations

This section provides additional notes on HiCommand Device Manager Agent operations and the settings required before HiCommand Device Manager Agent operations.

### 3.2.1 Using Hosts with Multiple Network Adapters

If HiCommand Device Manager Agent runs on a host with multiple network adapters, specify the IP address of the network adapter used by HiCommand Device Manager Agent in the `server.http.socket.agentAddress` property in the `server.properties` file.

### 3.2.2 Changing Storage Subsystem Configurations

The OS may not recognize the latest updates immediately after the storage subsystem configuration is changed (for example, if an LU is registered or deleted). In such a case, HiCommand Device Manager Agent reports old information to HiCommand Device Manager Server. If the changes in the storage subsystem configuration are not reflected in HiCommand Device Manager Server, execute the `hldutil` command to check that the host recognizes the configuration changes, and then execute the `HiScan` command. For information about the `hldutil` command, see section 3.6.3. For information about the `HiScan` command, see section 3.6.2.

### 3.2.3 Correcting Invalid Paths

Occasionally, a path for an LU managed by HiCommand Device Manager that the host recognizes is invalid due to a problem such as a disconnection. If the `HiScan` command is executed in this situation, the error message `KAIC22019-E` is output to the console where the command is executed or to the error log file. In such a case, the system might be unable to register the host information in HiCommand Device Manager Server.

If this happens, restore the invalid path, or change the OS settings so the OS cannot recognize the invalid path.

### 3.2.4 Hosts Running Windows Server 2003 or Windows Server 2003 x64 Edition

The HiCommand Device Manager Agent runs on WOW64 when the host is Windows Server 2003 or Windows Server 2003 x64 Edition. Execute the commands provided by HiCommand Device Manager Agent from the command prompt for WOW64. The following shows an example of executing commands at the command prompt:

```
C:\WINDOWS\SysWOW64\cmd.exe
```

If other programs linked with HiCommand Device Manager frequently access HiCommand Device Manager Agent running on a Windows Server 2003 or Windows Server 2003 x64 Edition host, JavaVM might end abnormally. In such a case, edit the following file:

*installation-folder-for-Device-Manager-agent*\agent\bin\server.cmd

Use a text editor to open the `server.cmd` file, and add `-Djava.compiler=NONE` to the java startup option. The following example shows how the `server.cmd` file should be edited:

```
..java -Dalet.msglang -Djava.compiler=NONE %1 %2 -classpath "C:\Program
Files\HITACHI\HDVM\HBaseAgent\jar\agent4.jar;C:\Program
Files\HITACHI\HDVM\HBaseAgent\jar\jdom.jar;C:\Program
Files\HITACHI\HDVM\HBaseAgent\jar\xerces.jar;C:\Program
Files\HITACHI\HDVM\HBaseAgent\jar\servlet.jar;C:\Program
Files\HITACHI\HDVM\HBaseAgent\jar\log4j-1.2.3.jar"
com.Hitachi.soft.HiCommand.DVM.agent4.as.export.Server %*
exit /b %ERRORLEVEL%
```

### 3.2.5 Using Multi-path Configurations

When multi-path configurations are used in the following host environments, WWN information and LU information (including file systems, volume usage, copy types, copy roles, and copy statuses) might not be obtainable for alternate paths:

- The host OS is Windows, and Dynamic Link Manager or Windows MPIO is used.
- The host OS is Solaris, and Dynamic Link Manager or Sun StorEdge Traffic Manager is used.
- The host OS is AIX, and MPIO is used.

For information about obtaining WWN information for alternate paths, see section 2.3.

### 3.2.6 Changing Windows Firewall Settings Manually

To run Device Manager Agent for which Windows Firewall is active, add the Device Manager Agent to the Windows Firewall exceptions list.

To register Device Manager as an exception:

1. Issue the following command to register the exception:

```
> netsh firewall add allowedprogram
 program="installation-folder-for-the-Device-Manager-agent\agent\bin\hbsa_service.exe"
name="HBase Agent" mode=ENABLE
> netsh firewall add allowedprogram
 program="installation-folder-for-the-Device-Manager-agent\agent\JRE1.4\bin\java.exe"
```

   ***Note:*** If Windows Firewall has been turned on for the first time, restart the machine.

2. Issue the following command to check the registered contents:

```
  > netsh firewall show all
```

   Make sure of the following from the command execution results:

   - That `HBase Agent` is displayed.
   - That `Mode` is `Enable`.
   - That the paths to `hbsa_service.exe` and `java.exe` are correct.

3. Issue the following command to deactivate this setting:

```
> netsh firewall delete allowedprogram "installation-folder-for-Device-Manager-
agent\agent\bin\hbsa_service.exe"

> netsh firewall delete allowedprogram "installation-folder-for-Device-Manager-
agent\agent\JRE1.4\bin\java.exe"
```

### 3.2.7 Granting Administrator Privileges to Users of Device Manager Agent Service Execution

In Windows systems, LocalSystem privileges are set up for the user who executes the HiCommand Device Manager Agent service. To grant Administrator privileges to this user, use the following procedure to change the `hdvmagt` Service execution user.

1. Stop the Device Manager Agent. For details on this procedure, see section 3.3.2.
2. Open the Services window by choosing **Management Tools** and then **Services**.
3. Select **HBsA Service**, **Operations**, and then **Properties**. The HBsA Service property window opens.
4. Click the **Logon** tab and select **Account**.
5. Set up the user and password and click **OK**.
6. From the Services window, choose the **HBsA Service** and start it.

### 3.2.8 Solaris, AIX, HP-UX, and Linux Host Operating Systems

Write `localhost` and your host (host name) into the `/etc/hosts` file. If the host OS is Linux, write your host on the line above the `localhost` line. After this, restart the Device Manager agent service.

### 3.2.9 AIX Hosts in a Cluster Environment

SC_DISK_ERR2 (Device Busy) may occasionally be output to the error log in the standby node if:

- The execution period for the HiScan command of HiCommand Device Manager Agent is set to the same period in both the active node and standby node, and
- If the I/O load on the shared disk increases.

In this case, the shared disk is correctly reserved by the active node, so the system is not affected by this error. In addition, because the information about the shared disk is obtained from HiCommand Device Manager Agent operating in the active node, there is no problem in the operation.

### 3.2.10 Troubleshooting when HiCommand Suite Products Access the Device Manager Agent

If HiCommand Device Manager Agent is accessed by another HiCommand product either immediately after the agent was installed or immediately after the service was started, a transmission error occurs and the other HiCommand Suite product might stop running. If the product stops running, wait a few minutes and then restart it.

If a version of Dynamic Link Manager earlier than 5.8 is installed, set the port number used by HiCommand Device Manager Agent.

The following examples show the values set for the property in the `server.properties` file:

- server.http.port: 23011
- server.agent.port: 23013

### 3.2.11 Drive Letters Assigned to a Device for Windows Hosts

HiCommand Device Manager Agent will not acquire data from devices assigned drive letter A or B. Assign a drive letter from C to Z for a device managed by using HiCommand Device Manager Agent.

### 3.2.12 Using a Solaris Host with VxVM

If the host OS is Solaris and a VxVM version earlier than 4.0 is used, when a device is named based on its enclosure, the HiCommand Device Manager agent does not notify the HiCommand Device Manager server of correspondence between a file system and a LUN.

### 3.2.13 Using a Linux Host OS

If the host OS is Linux AS 2.1, or an earlier version of Linux AS 3.0 (Update 6) or Linux ES 3.0 (Update 6), observe the following points:

- Do not perform the following operations while updating host information in the Device Manager client:
  - Setting up a host (creating or deleting a device file; or creating, expanding, or deleting a file system) by using the Provisioning Manager client
  - Executing the Dynamic Link Manager `dlmcfgmgr` command
  - Executing disk control-related commands (such as `blockdev`)
- Do not perform the following operations while starting the Device Manager Agent:
  - Setting up a host by using the Provisioning Manager client
  - Executing the Dynamic Link Manager `dlmcfgmgr` command
  - Executing disk control-related commands (such as `blockdev`)
- Do not perform the following operations concurrently with the Device Manager Agent `HiScan` command or `hldutil` command:
  - Setting up a host by using the Provisioning Manager client
  - Executing the Dynamic Link Manager `dlmcfgmgr` command
  - Executing disk control-related commands (such as `blockdev`)
- Do not perform automatic execution of the Device Manager Agent `HiScan` command.

  If the `HiScan` command has been set for automatic execution, cancel this setting. For information about the procedure, see section 3.6.4.

  If the `HiScan` command needs to be automatically executed for system-operational reasons, do not perform any operation in the host during automatic execution of the `HiScan` command.

### 3.2.14 Applying Settings When 100 or More LUs are Recognized by the Host

If the number of LUs managed by Device Manager and recognized by a single host is 100 or more, the following problems might occur:

- When the `HiScan` command is executed, the `KAIC22009-E, KAIC22014-E, KAIC22019-E`, or `KAIC22048-E` error message is output, and the host information cannot be registered in the Device Manager server.
- When performing operations such as refreshing the host, an `OutOfMemory` error occurs on the host, and the host does not respond even after waiting for a while.

To avoid these issues, change the values shown in the following table.

**Table 3.1 Items to Set When Several LUs Are Recognized by a Host**

| Setting item | Description |
|---|---|
| The maximum length of data that can be received by the Device Manager server | Set the value for the `server.http.entity.maxLength` property in the `server.properties` property file of the HiCommand Device Manager server.<br>For details about the `server.http.entity.maxLength` property, see the *HiCommand® Device Manager Server Installation and Configuration Guide*. |
| The timeout value for the processing to register information in a server | Set the following properties in the `server.properties` property file for the HiCommand Device Manager agent:<br>▪ `server.http.server.timeOut`<br>▪ `server.util.processTimeOut`<br>For details about the properties, see section 3.7.1. |
| The memory heap size | Set the value for the `server.agent.maxMemorySize` property in the `server.properties` property file of the HiCommand Device Manager agent.<br>For details about the `server.agent.maxMemorySize` property, see section 3.7.1. |

The values set for the above items differ depending on whether the host is using a volume manager. For details when no volume manager is used, see section 3.2.14.1. For details when a volume manager is used, see section 3.2.14.2.

***Caution:*** Depending on the load status of the Device Manager server, an OutOfMemory error might also occur. If the following error message is output to the log file specified for the `-t` option of the `HiScan` command or the HiScan.msg file, change the memory heap size of the Device Manager server by following the procedure in the *HiCommand® Device Manager Server Installation and Configuration Guide*.

```
<html><head><title>400 Bad request</title>
 <meta http-equiv="Content-Type" content="text/html; charset=ISO-8859-1">
 </head><body>
 <h1>400 Bad request</h1>
 <p><strong>ServiceConnection#0: java.lang.OutOfMemoryError</strong>
 </body></html>
```

In addition, to reduce the load of the Device Manager server, use the `hdvmagt_schedule` command to set the execution period of the `HiScan` command to prevent multiple hosts from executing the `HiScan` command at the same time.

***Notes:***

- Depending on the environment, this issue may not be solved by setting the guide values. Make sure that you adjust the values to suit your environment.
- In the following cases, set a value two-to-three times larger than the guide value:
  - When executing the `HiScan` command shortly after restarting HiCommand Device Manager Agent.
  - When executing the `hldutil` command and `HiScan` command at the same time.
  - When executing multiple `HiScan` commands at the same time.
- If the host OS is Windows Server 2003 (IPF), make sure that Service Pack 1 or later has been installed.

#### 3.2.14.1 Setting Values When a Volume Manager is not Used

The following table lists approximate standards for the setting values.

**Table 3.2 Setting Values When a Volume Manager is not Used**

| Number of LUs Managed by Device Manager, and Recognized by the Host | server.http.entity.maxLength (units: bytes) | server.http.server.timeOut (units: seconds) | server.util.processTimeOut (units: milliseconds) |
|---|---|---|---|
| 100 | Default value (131072) | Default value (600) | Default value (600000) |
| 256 | 153600 | 600 | 600000 |
| 512 | 307200 | 600 | 600000 |
| 1024 | 614400 | 1200 | 1200000 |

### 3.2.14.2 Setting Values When a Volume Manager is Used

The following tables list the setting values when the execution of the `HiScan` command finishes within an hour, for each host OS. Using a configuration where the number of LUs or logical volumes is more than the number shown in the following tables is not recommended because, in such a configuration, it will take more than one hour to execute the `HiScan` command, and the `HiScan` command might fail.

**Table 3.3 Setting Values When a Volume Manager Is Used (in Windows)**

| Number of LUs and Logical Volumes Managed by Device Manager and Recognized by the Host | server.http.entity .maxLength (units: bytes) | server.http.server .timeOut (units: seconds) | server.util.process TimeOut (units: milliseconds) | server.agent.maxMemory Size (units: MB) |
|---|---|---|---|---|
| 88/10 | 230000 | Default value (600) | Default value (600000) | 64 |
| 88/20 | 750000 | 600 | 600000 | 64 |
| 100/200 | 12000000 | 600 | 600000 | 128 |
| 100/500 | 30000000 | 600 | 600000 | 384 |

**Table 3.4 Setting Values When a Volume Manager Is Used (in Solaris)**

| Number of LUs and Logical Volumes Managed by Device Manager and Recognized by the Host | server.http.entity .maxLength (units: bytes) | server.http.server .timeOut (units: seconds) | server.util.process TimeOut (units: milliseconds) | server.agent.maxMemory Size (units: MB) |
|---|---|---|---|---|
| 100/200 | 3100000 | Default value (600) | Default value (600000) | 128 |
| 100/500 | 7200000 | 600 | 600000 | 384 |
| 150/500 | 12000000 | 600 | 600000 | 512 |
| 250/500 | 18000000 | 600 | 600000 | 768 |
| 500/1000 | 36000000 | 600 | 720000 | 768 |

**Table 3.5 Setting Values When a Volume Manager Is Used (in AIX)**

| Number of LUs and Logical Volumes Managed by Device Manager and Recognized by the Host | server.http.entity.maxLength (units: bytes) | server.http.server.timeOut (units: seconds) | server.util.processTimeOut (units: milliseconds) | server.agent.maxMemorySize (units: MB) |
|---|---|---|---|---|
| 100/200 | 2500000 | Default value (600) | Default value (600000) | 128 |
| 100/500 | 6000000 | 600 | 600000 | 384 |
| 175/500 | 11000000 | 600 | 670000 | 640 |
| 250/500 | 15000000 | 600 | 1200000 | 768 |
| 500/1000 | 19000000 | 600 | 1800000 | 768 |

**Table 3.6 Setting Values When a Volume Manager Is Used (in HP-UX)**

| Number of LUs and Logical Volumes Managed by Device Manager and Recognized by the Host | server.http.entity.maxLength (units: bytes) | server.http.server.timeOut (units: seconds) | server.util.processTimeOut (units: milliseconds) | server.agent.maxMemorySize (units: MB) |
|---|---|---|---|---|
| 100/50 | 745000 | Default value (600) | Default value (600000) | 64 |
| 100/100 | 1400000 | 600 | 600000 | 64 |
| 100/256 | 3500000 | 600 | 600000 | 192 |
| 200/256 | 7000000 | 600 | 600000 | 512 |
| 500/1000 | 40000000 | 600 | 600000 | 896 |
| 1000/100 | 8000000 | 600 | 600000 | 192 |
| 1000/500 | 42000000 | 600 | 1200000 | 896 |

**Table 3.7 Setting Values When a Volume Manager Is Used (in Linux)**

| Number of LUs and Logical Volumes Managed by Device Manager and Recognized by the Host | server.http.entity.maxLength (units: bytes) | server.http.server.timeOut (units: seconds) | server.util.processTimeOut (units: milliseconds) | server.agent.maxMemorySize (units: MB) |
|---|---|---|---|---|
| 100/50 | 748000 | Default value (600) | Default value (600000) | 64 |
| 100/100 | 1420000 | 600 | 600000 | 64 |
| 100/256 | 3600000 | 600 | 600000 | 192 |
| 200/256 | 7100000 | 600 | 600000 | 512 |

### 3.2.15 When the Host OS Is Solaris

You cannot obtain partition information of LUs that do not have a label. Therefore, Provisioning Manager displays the partition size of such LUs as Unknown.

### 3.2.16 When the Host OS Is AIX and the SED Mode Is all

If you want to change the SED mode to `all`, you need to follow the procedure below to register the java process that is bundled with the Device Manager agent as an SED exception.

To register the java process as an SED exception:

1. Execute the following command to register the java process that is bundled with the Device Manager agent as an SED exception:

   ```
   # sedmgr -c exempt /usr/HDVM/HBaseAgent/agent/JRE1.4/bin/java
   ```

   If this command execution succeeds, the execution result will not be output.

2. Execute the following command to make sure that the java process that is bundled with the Device Manager agent has been registered as an SED exception:

   ```
   # sedmgr -d /usr/HDVM/HBaseAgent/agent/JRE1.4/bin/java
   ```

   If the java process has been registered as an SED exception, the following information will be displayed:

   ```
   /usr/HDVM/HBaseAgent/agent/JRE1.4/bin/java : exempt
   ```

3. Restart the host.

### 3.2.17 When the Host OS Is Windows and VMware ESX Server is Used

To use the Device Manager agent to manage virtual hosts on VMware ESX Server, do not share a single HBA among multiple virtual hosts. The following figure shows examples of a correct configuration and incorrect configuration when VMware ESX Server is used.

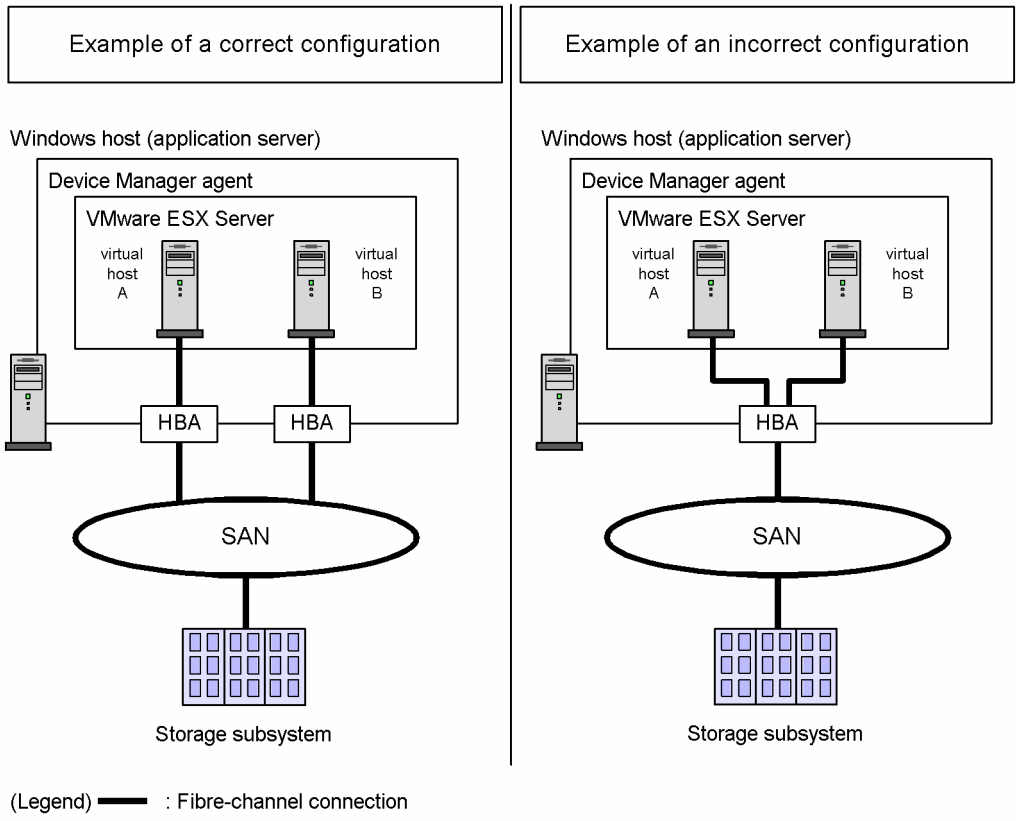


**Figure 3.1 Configuration Examples when using VMware ESX Server**

If a virtual host on VMware ESX Server uses a volume in the storage subsystem, you must define that volume as Mapped Raw LUN. If you do not this, the Device Manager agent will not notify the Device Manager server of the information about that volume.

To define a volume that a virtual host on VMware ESX Server uses as Mapped Raw LUN:

1. From Virtual Infrastructure Client, shut down the virtual host that has a volume to be used.
2. On Virtual Infrastructure Client, choose the virtual host that you have shut down, and then select the **Summary** tab.
3. Choose **Edit Settings** in **Commands**.

   The Virtual Machine Properties window appears.
4. Select the **Hardware** tab, and then choose **Add**.

The Add Hardware Wizard window appears.

5. Select **Hard Disk**, and then **Next**.
6. Select the **Mapped SAN LUN** radio button, and then **Next**.
7. Select the volume that you want to use, and then **Next**.
8. Select the **Store with Virtual Machine** radio button, and then **Next**.
9. Select **Physical**, and then **Next**.
10. Select the desired node, and then **Next**.
11. Check the displayed settings, and then select **Finish**.

For details, see the VMware ESX Server documentation.

## 3.3 Starting and Stopping HiCommand Device Manager Agent

This section describes how to start, stop, and check the operating status of the HiCommand Device Manager agent.

***Note:*** Starting the HiCommand Device Manager agent starts the daemon process of the HiCommand Device Manager agent. The daemon processes are shown below:

- Windows: `hbsa_service.exe` (service name: HBsA Service)
- Solaris, AIX, HP-UX, or Linux: `hbsa_service`

***Note:*** In Solaris, AIX, HP-UX, or Linux, if setup is performed after HiCommand Device Manager Agent installation finishes, the HiCommand Device Manager Agent service or daemon process starts automatically.

### 3.3.1 Starting HiCommand Device Manager Agent

This section describes how to start HiCommand Device Manager Agent. This operation requires Administrator or superuser privileges.

***Caution:*** To run the HiCommand Device Manager agent properly, setup for the HiCommand Device Manager agent must be completed beforehand. For details about the setup procedure, see section 2.11.

In Windows systems, there are two ways to start HiCommand Device Manager Agent:

- From the Services window, select **HBsA Service** to start the service, or
- Execute the `hbsasrv` command from the command line:

  > *installation-folder-for-Device-Manager-agent*\bin\hbsasrv.exe start

In Solaris, HP-UX, or Linux, issue the following command from the command line:

```
# /opt/HDVM/HBaseAgent/bin/hbsasrv start
```

In AIX, issue the following command from the command line:

```
# /usr/HDVM/HBaseAgent/bin/hbsasrv start
```

### 3.3.2 Stopping HiCommand Device Manager Agent

This section describes how to stop HiCommand Device Manager Agent. This operation requires Administrator or superuser privileges.

In Windows systems, there are two ways to stop HiCommand Device Manager Agent:

- From the Services window, select **HBsA Service** to stop the service, or
- Issue the `hbsasrv` command from the command line:

  > *installation-folder-for-Device-Manager-agent*\bin\hbsasrv.exe stop

  ***Caution:*** If you are working in a Windows Server 2003 or Windows Server 2003 x64 Edition environment, use the `hbsasrv` command to stop the service.

In Solaris, HP-UX, or Linux, issue the following command from the command line:

```
# /opt/HDVM/HBaseAgent/bin/hbsasrv stop
```

In AIX, issue the following command from the command line:

```
# /usr/HDVM/HBaseAgent/bin/hbsasrv stop
```

### 3.3.3 Checking HiCommand Device Manager Agent Operating Status

This section describes how to check the HiCommand Device Manager Agent operating status. This operation requires Administrator or superuser privileges.

***Caution:*** The checking methods shown below are used to check whether the HiCommand Device Manager agent service or daemon process is running. To run the HiCommand Device Manager agent properly, setup for the HiCommand Device Manager agent must be completed beforehand. For details about the setup procedure, see section 2.11.

In Windows systems, the following methods can be used to check the operating status:

- From the Services window, check the HBsA Service status, or
- Issue the following command from the command line:

  > *installation-folder-for-Device-Manager-agent*\bin\hbsasrv.exe status

In Solaris, HP-UX, or Linux, issue the following command from the command line:

```
# /opt/HDVM/HBaseAgent/bin/hbsasrv status
```

In AIX, issue the following command from the command line:

```
# /usr/HDVM/HBaseAgent/bin/hbsasrv status
```

If the command execution result displays `Status` as `Running`, it means the HiCommand Device Manager Agent service or daemon process is operating. If the result displays `Status` as `Stop`, the service or daemon process has stopped.

***Caution:*** The version displayed when you execute the `hbsasrv` command is not the Device Manager agent version. You must use one of the following commands to check the Device Manager agent version.

In Windows:

```
> installation-folder-for-Device-Manager-agent\bin\hdvm_info.exe
```

In Solaris, HP-UX, or Linux:

```
# /opt/HDVM/HBaseAgent/bin/hdvm_info
```

In AIX:

```
# /usr/HDVM/HBaseAgent/bin/hdvm_info
```

### 3.3.4 Restarting HiCommand Device Manager Agent

The HiCommand Device Manager Agent must be restarted if:

- The IP address of a host in which HiCommand Device Manager Agent is installed is changed.
- The HBA driver or HBA API library was installed on a host in which HiCommand Device Manager Agent is installed.
- A host in which the HiCommand Device Manager Agent is running is deleted in the Web client host management window.
- The contents of the property files (`logger.properties` and `server.properties`) of the HiCommand Device Manager Agent were modified.
- CCI was installed or uninstalled.
- Hitachi Dynamic Link Manager was installed or uninstalled in AIX or Linux.
- The `hdvmagt_account` command execution was interrupted
- The `hdvmagt_account` command was executed in Windows.

***Caution:*** If the Device Manager server is not running, information will not be reported to the server even if a Device Manager agent is installed or a Device Manager agent service starts. For information to be reported to the Device Manager server, make sure that the Device Manager server service is running, and then install a Device Manager agent or start a Device Manager agent service.

### 3.3.5 If HiCommand Device Manager Agent Cannot Stop

A HiCommand Device Manager Agent may be unable to stop when an add-on module or version 05-80 or later of Dynamic Link Manager is running. In such a case, the error message `KAIE62604-E` appears. To stop HiCommand Device Manager Agent, wait until processing is complete for the add-on module and Dynamic Link Manager, and then try to stop HiCommand Device Manager Agent again.

***Note:*** If you need to stop HiCommand Device Manager Agent immediately, you can force HiCommand Device Manager Agent to shut down by executing the `hbsasrv` command with the stop `-f` option. In such a case, all processing by HiCommand Device Manager Agent is forced to terminate, thus ongoing processing of jobs is not guaranteed.

## 3.4 Modifying Server Information

You can use the `hdvmagt_account` command to change the Device Manager server to which HiCommand Device Manager Agent transmits information.

This command provides an interactive user interface for setting the following property values in the `server.properties` file:

- `server.server.serverIPAddress`
- `server.server.serverPort`
- `server.server.authorization`

For information about the `hdvmagt_account` command, see section 3.6.5.

## 3.5 Changing the Execution Period of the HiScan Command

To change the execution period of the `HiScan` command, use the `hdvmagt_schedule` command. For information about this command, see section 3.6.4.

## 3.6 HiCommand Device Manager Agent Commands

With the Device Manager Agent, you can use the following commands:

- `hbsasrv` command

  This command starts and stops the Device Manager Agent and displays the operating status. See section 3.6.1.

- `HiScan` command

  This command sends information to the Device Manager server. See section 3.6.2.

- `hldutil` command

  This command displays device information and manages execution of result log files. See section 3.6.3.

- `hdvmagt_schedule` command

  This command changes the execution period of the `HiScan` command. See section 3.6.4.

- `hdvmagt_account` command

  This command changes information about the Device Manager server. See section 3.6.5.

***Note:*** In Windows, the folder in which the Device Manager Agent commands are installed is automatically added to the environment variable `PATH`. Therefore, when you execute a command, you do not need to change the current folder to the folder that contains commands. After installing the Device Manager Agent, you will have to log off from, and then log on to Windows for the changes in the environment variable `PATH` to be applied.

### 3.6.1 hbsasrv Command Syntax

The `hbsasrv` command is used to start and stop HiCommand Device Manager Agent and to display the operating status.

The `hbsasrv` command is stored in the following location:

In Windows:

```
installation-folder-for-Device-Manager-agent\bin\hbsasrv.exe
```

In Solaris, HP-UX, or Linux:

```
/opt/HDVM/HBaseAgent/bin/hbsasrv
```

In AIX:

```
/usr/HDVM/HBaseAgent/bin/hbsasrv
```

The following table describes the `hbsasrv` command syntax.

**Table 3.8 hbsasrv Command Syntax**

| Item | Description |
|---|---|
| Synopsis | `hbsasrv [start \| stop [-f] \| status]` |
| Description | Starts or stops the service or daemon process of HiCommand Device Manager Agent. Also, this command displays the status of the service or daemon process. |
| Options | `start`: Starts the service or daemon process. |
| | `stop [-f]`: Stops the service or daemon process.<br>If any add-on module or version 5.8 or later of Dynamic Link Manager is still running, you may not be able to stop HiCommand Device Manager Agent. In such a case, the error message `KAIE62604-E` appears. Wait until the add-on module or Dynamic Link Manager completes its operation, and then execute the command again.<br>If you urgently need to stop HiCommand Device Manager Agent, you can force HiCommand Device Manager Agent to shut down by executing the `hbsasrv` command with the stop `-f` option. In such a case, all processing is forced to terminate, thus ongoing processing of jobs is not guaranteed. |
| | `status`: Displays the service or daemon process operating status. |
| | ***Note:*** If you execute the command without specifying an argument, the command usage information is displayed. |

### 3.6.2 HiScan Command Syntax

The `HiScan` command is stored in the following locations.

In Windows:

```
installation-folder-for-Device-Manager-agent\bin\HiScan.bat
```

In Solaris, HP-UX, or Linux:

```
/opt/HDVM/HBaseAgent/bin/HiScan
```

In AIX:

```
/usr/HDVM/HBaseAgent/bin/HiScan
```

The following table lists and describes the Agent (HiScan) command syntax.

**Table 3.9 HiScan Command Syntax**

| Item | Description |
|---|---|
| **Synopsis** | `HiScan { -s` **server** `[-u` **userid** `-p` **password**`] [ { -c` **sec** `\| -t` **output-file** `} ] \| -t` **output-file** `}` |
| **Description** | Sends host information to the HiCommand Device Manager server. Host information includes the host name, the WWN of HBA, file systems, mount points, and information about the LU to which the host is connected. From these results it creates a HTTP/XML message. You can specify the HiCommand Device Manager server destination by using the `-s` option.<br>This command requires superuser or Administrator privileges. |
| **Options** | `-s` *server*`:` *server* can be specified in the following format:<br>`{`*IP-address*`[:`*port-number*`] \|` *host-name*`[:`*port-number*`] \| localhost[:`*port-number*`] }`<br>Specifies the network address for the transfer destination of the HTTP/XML message generated by HiCommand Device Manager Agent.<br>An IP address, a host name, or `localhost` can be specified as a network address. In addition, a port number can be attached to the address in an *address*`:`*port-number* format.<br>If no port number is provided, the default port number is `2001`. For example; `192.168.1.102:2001`.<br>You can use a character string of 50 bytes or less to specify a host name. The following characters can be used:<br>`a-z A-Z 0-9 - . @ _`<br>This is an optional parameter. If `-s` is omitted, the `-t` option must be supplied.<br>`-u` *userid*: The user identifier is used by the HiCommand Device Manager Server to validate `HiScan` database update requests. If the `-s` option is supplied and `-u` option is omitted, HiScan uses the userid and password that are stored in `server.server.authorization` of the `server.properties` file (see Table 3.20). |

| Item | Description |
|---|---|
| **Options** (continued) | You can use a character string of 1 to 256 bytes to specify this option. The following characters can be used:<br>`a-z A-Z 0-9 # + - . @ _`<br>`-p` *password*: The password is used by the HiCommand Device Manager Server to validate the userid supplied if the `-u` option. parameter is supplied.<br>***Note***: If the `-s` option. is supplied and `-p` option. is omitted, HiScan uses the userid and password that are stored in `server.server.authorization` of the `server.properties` file (see Table 3.20).<br>You can use a character string of 1 to 256 bytes to specify this option. The following characters can be used:<br>`a-z A-Z 0-9 ! " # $ % & ( ) * + - . = @ \ ^ _ \| '`<br>`-c` *sec*: Specifies the interval (in seconds) at which host information is sent to the HiCommand Device Manager server. Host information is continuously sent to the HiCommand Device Manager server at the specified interval, until a forced termination occurs. Values of less than ten seconds are recognized as invalid. If `-t` is supplied, `-c` must not be used.<br>`-t` *output-file*: Sends the output messages to the indicated output file.<br>***Note***: This option is intended for diagnostic purposes only. The `-t` option may be supplied in addition to the `-s` option. If both are supplied, the output request message and input response message (from HiCommand Device Manager Server) are both included in the output file. If `-t` is supplied, `-c` must not be used. |

### 3.6.3 hldutil Command Syntax

The `hldutil` command is stored in the following locations:

In Windows:

```
installation-folder-for-Device-Manager-agent\util\bin\hldutil.exe
```

In Solaris, HP-UX, or Linux:

```
/opt/HDVM/HBaseAgent/util/bin/hldutil
```

In AIX:

```
/usr/HDVM/HBaseAgent/util/bin/hldutil
```

The following table lists and describes the `hldutil` command syntax.

**Table 3.10 hldutil Command Syntax**

| Item | Description |
|---|---|
| **Synopsis** | For the device information display function:<br>`hldutil [-d [`*device-file*`]\|-g [`*disk-group*`]\|-l` *ldev#.ser#*`] [-p] [-q] [-nolog] [-s` *sort-key*`...] [-serdec] [-k\|-hf [`*log-file*`]\|-h [`*log-number*`]]`<br>For the execution-result log file management function:<br>`hldutil -h [`*log-number*`] -hb [`*log-file*`]\| -hrm [`*log-number*`\|all]\| -history` *number* |
| **Description** | The hldutil command provides device information display and execution results log file management functions. If you do not specify an option, the command outputs information about all currently recognized logical devices.<br>This command requires superuser or Administrator privileges<br>If you execute the `hldutil` command immediately after the host environment is changed (for example, when a logical unit is added or deleted), the command might not be able to recognize the changed contents of the host. |
| **Options** | `-d` [device-file]: If you want to view information about a specific logical device, specify the device special file name (in Solaris, AIX, HP-UX, or Linux) or disk number (in Windows) of the logical device. If you omit this option, the command displays information about all currently recognized logical devices. You cannot specify the `-d` option and the `-g` or `-l` option at the same time.<br>`-g` [disk-group]: If you want to view information about a specific disk group, specify the name of the disk group. If you omit the disk group name, the command outputs information about all currently defined disk groups. You cannot specify the `-g` option and the `-d` or `-l` option at the same time.<br>`-l` ldev# ser#: If you want to view information about a specific logical device, specify the logical device number (ldev#) and serial number (ser#) of the logical device. The logical device number and serial number must be specified in the indicated order. If you omit the logical device number or serial number, the command does not output information about the logical device. You cannot specify the `-l` option and the `-d` or `-g` option at the same time. If you specify the `-l` option, the display items output by the command with this option specified is limited to Ldev# (logical device number). If you specify the `-l` option, the command displays only the following items:<br>Ldev# (logical device number), Ser#(storage subsystem serial number), Device (device special file or disk number), Dg name (disk group name), fs (file system)<br>`-p`: Specify this option to add the P-VOL and S-VOL information (that you set up by using ShadowImage, TrueCopy, Copy-on-Write Snapshot, QuickShadow or Universal Replicator) to the logical device information to be output. If no P-VOL or S-VOL information is assigned to a logical device, the command with this option specified does not output P-VOL or S-VOL information. |

| Item | Description |
|---|---|
| **Options** | -q: Specify this option to output command execution results only to the execution-result log file. If you specify this option, the command does not send its execution results to the standard output (quiet mode). Typically, you specify this option when you want to run a background job to supply the latest logical device information to the execution-result log file. However, error messages are output to the standard error output.<br><br>-nolog: Specify this option to output command execution results only to the standard output. If you specify this option, the execution-result log file is not updated.<br><br>-s sort-key: Specify this option when sorting logical device information in ascending order of ASCII codes. This option includes one or more sort keys. When specifying multiple sort keys, place a one-byte space between adjacent sort keys. If you specify multiple sort keys, the command sorts information using the sort keys in the order in which they are specified. If you specify the file system name as the sort key, the command sorts logical device information using the file system name that is included in each logical device and assigned the lowest ASCII code. If you do not specify a sort key or if you specify the same sort key more than once, you receive an error message. If you do not specify the -s option, the command outputs logical device information in the order in which it has processed the information. See Table 3.11 for the sort key descriptions.<br><br>-k: Specify this option when outputting the latest execution-result log file to the standard output. This processing involves no hardware access. Since the command skips processing for obtaining logical device information, its execution does not affect device input or output. However, if the execution-result log file contains no record, the command acquires logical device information and output the results to the standard output and the execution-result log file. You cannot specify the -k option and the -h or -hf option at the same time.<br><br>-hf [log-file]: The command outputs the contents of the specified execution-result log file to the standard output. The command does not access any disk array device. If you omit the file name, the command waits for the entry of a file name. If the specified file name does not identify an execution-result log file, the command outputs an error message and ends. You cannot specify the -hf option and the -k or -h option at the same time.<br><br>-h [log-number]: If you use the device information display function, the command outputs the contents of the execution-result log file identified by the specified log number to the standard output. The command does not access any disk array device. If you use the execution-result log file management function, the command copies an execution-result log file. Assign the copy source execution-result log file name to a log number and specify the -hb option to designate the copy destination. If you omit the log number, the command displays a list of the existing execution-result log files and waits for the entry of a log number. If the specified log number does not identify an execution-result log file, the command outputs an error message and terminates. You cannot specify the -h option and the -k or -hf option at the same time.<br><br>-hb [log-file]: Specify this option when copying an execution-result log file that is the result of using the device information display function. The command copies the execution-result log file specified by the -h option to the file specified by the -hb option. Use the full path name (including directories) or relative path name for the file. If you omit the log file, the command waits for the specification of a file name. If the specified file already exists, the command displays a prompt asking you whether you want to overwrite the file and waits for your reply. You must specify this option together with the -h option. You cannot specify the -hb option together with any option other than -h.<br><br>-hrm [log-number\|all]: Specify this option when deleting an execution-result log file that was created when the device information display function was used. Specify the log number that identifies the execution-result log file to be deleted. If you specify all instead of a log number, the command deletes all execution-result log files from the default log storage directory. If you omit the log number, the command displays a list of execution-result log files and waits for the specification of a log number. If the specified log number does not identify any execution-result log file, the command displays an error message and terminates. You cannot specify the -hrm option together with any other option.<br><br>-history number: Specify the number of generations of execution-result log files to be retained. The execution-result log files are created when the device information display function is used. You can specify a number between 1 and 64. The default value is 32. The specified number becomes effective the next time the device information display function is used to create an execution-result log file. You cannot specify the -history option together with any other option.<br><br>-serdec: Specify this option to display the serial number of the storage subsystem in the decimal format when displaying device information. |

**Table 3.11 Sort Key Descriptions**

| Sort Key | Descriptions |
|---|---|
| dg | Disk group name |
| Fs | File system name |
| ldev | Logical device number |
| lun | Logical unit number |
| port | Port number |
| prod | Product name |
| Rg | RAID Group number |
| rid | Character string representing a storage subsystem model |
| ser | Serial number of a storage subsystem |
| tid | Target ID |
| vend | Vendor name |
| wwnn | Node WWN name |
| wwnp | Port WWN name |

The following table lists and describes the items displayed by the device information display function. The displayed items differ depending on the OS and the specified options.

**Table 3.12 Displayed Items**

| Item | Description |
|---|---|
| Dg name | Disk group name |
| Device | Device special file name (for Solaris, AIX, HP-UX, or Linux)<br>Disk number (for Windows) |
| fs | File system name |
| P/S | Identification of the primary volume or secondary volume |
| Vend. | Vendor name |
| Prod. | Product name |
| Port# | Port number (on the DKC) |
| Tid# | Target ID (SCSI interface on the host) |
| Lun# | Logical unit number (SCSI interface on the host) |
| Ldev# | Logical device number (on the DKC)<br>For the Lightning 9900 Series, this item is shown in the *CU-number*:*logical-device* format. |
| Ser# | Serial number of the storage subsystem |
| RaidID | Character string indicating the model of the storage subsystem |
| RG# | RAID Group number |
| PortWWN | Port WWN |
| NodeWWN | Node WWN |

The following table describes the correspondence between the character string for `RaidID` and the models.

**Table 3.13 Correspondence between RaidID and Models**

| RaidID | Model |
|---|---|
| D50L | Thunder 9200 |
| D500 | Thunder 9200 |
| D60J | Thunder 9530V |
| D600 | Thunder 9570V, Thunder 9520V |
| D60H | Thunder 9580V |
| 71 | TagmaStore® WMS 100 |
| 73 | TagmaStore® AMS 200 |
| 75 | TagmaStore® AMS 500 |
| 77 | TagmaStore® AMS 1000 |
| R401 | Lightning 9910V |
| R400 | Lightning 9960 |
| R451 | Lightning 9970V |
| R450 | Lightning 9980V |
| R500 | TagmaStore USP |
| R501 | TagmaStore® NSC 55 |
| R600 | Universal Storage Platform V |

### 3.6.4 hdvmagt_schedule Command Syntax

The `hdvmagt_schedule` command specifies the execution period of the `HiScan` command.

The `hdvmagt_schedule` command is stored in the following locations:

In Windows:

```
installation-folder-for-Device-Manager-agent\bin\hdvmagt_Schedule.bat
```

In Solaris, HP-UX, or Linux:

```
/opt/HDVM/HBaseAgent/bin/hdvmagt_schedule
```

In AIX:

```
/usr/HDVM/HBaseAgent/bin/hdvmagt_schedule
```

The following table lists and describes the `hdvmagt_account` command syntax.

**Table 3.14 hdvmagt_schedule Command Syntax**

| Item | Description |
|---|---|
| Synopsis | `hdvmagt_schedule` |
| Description | The `hdvmagt_schedule` command provides an interactive interface to setup the automatic execution period of the `HiScan` command. To execute the `hdvmagt_schedule` command, you must be a superuser or a member of the Administrators group.<br>When you execute this command, you can choose one of four automatic execution periods for the `HiScan` command, as follows:<br>▪ Hourly<br>▪ Daily<br>▪ Weekly<br>▪ No automatic execution (or cancel the set schedule). This can be selected only if an automatic execution period has already been set.<br>You can specify any execution time.<br>If you do not specify the execution time, for the hourly execution period, the `HiScan` command is executed at the 47th minute of every hour. For the daily or weekly period, the command is executed at 2:47 AM. |
| Options | None |

### 3.6.5 hdvmagt_account Command Syntax

The `hdvmagt_account` command specifies information for the Device Manager server to which HiCommand Device Manager Agent sends host information.

When you change an account used in HiCommand Device Manager Agent, use the Web client to create or change the user ID. For this work, set the user privileges to `Peer`. For information about how to create or change a user ID, see the *HiCommand® Device Manager Web Client User's Guide*.

***Caution:*** For Solaris, AIX, HP-UX or Linux, if you execute the `hdvmagt_account` command, HiCommand Device Manager Agent will be restarted regardless of whether the server information has changed. For details on how to start and stop HiCommand Device Manager Agent, see section 3.3.

The `hdvmagt_account` command is stored in the following locations:

In Windows:

```
installation-folder-for-Device-Manager-agent\bin\hdvmagt_account.bat
```

In Solaris, HP-UX, or Linux:

```
/opt/HDVM/HBaseAgent/bin/hdvmagt_account
```

In AIX:

```
/usr/HDVM/HBaseAgent/bin/hdvmagt_account
```

The following table lists and describes the `hdvmagt_account` command syntax.

**Table 3.15 hdvmagt_account Command Syntax**

| Item | Description |
|---|---|
| Synopsis | `hdvmagt_account` |
| Description | The `hdvmagt_account` command allows you to change the information about the Device Manager server that communicates with HiCommand Device Manager Agent. This command provides an interactive interface to set `server.server.serverIPAddress`, `server.server.serverPort`, and `server.server.authorization` in the `server.properties` file. To execute this command, you must be a superuser or a member of the Administrators group. Note that when prompted for each item, operations will end abnormally if you enter three invalid values consecutively.<br>***Note:*** On Windows, after using the `hdvmagt_account` command to change the `server.properties` file, you must restart HiCommand Device Manager Agent. For information about how to start HiCommand Device Manager Agent, see section 3.3.<br>Enter the following information when requested:<br>*IPAddress*: Enter the IP address or host name of the HiCommand Device Manager server. This is specified in the property file, `server.server.serverIPAddress`.<br>▪ When specifying an IP address:<br>Specify it in the dotted-decimal format.<br>▪ When specifying a host name:<br>You can use a character string of 50 bytes or less to specify a host name. The following characters can be used:<br>`a-z A-Z 0-9 - . @ _`<br>If the entered value is not in the specified format, or the host name cannot be resolved to an IP address, you will be prompted to re-enter it.<br>*Port*: Enter the port number of the HiCommand Device Manager Server to which HiCommand Device Manager Agent is going to connect. This must be a number from `0` to `65535`.<br>***Note:*** This is specified in the property file, `server.server.serverPort` (see Table 3.20).<br>*Userid* and *Password*: Enter the user ID and password authorized by the HiCommand Device Manager Server to give validity to any database update requests of HiCommand® Device Manager Agent and the `HiScan` command. The default user ID is `HaUser`. The default password for `HaUser` is `haset`.<br>You can use a character string of 1 to 256 bytes to specify a user ID. The following characters can be used:<br>`a-z A-Z 0-9 # + - . @ _`<br>You can use a character string of 1 to 256 bytes to specify a password. The following characters can be used:<br>`a-z A-Z 0-9 ! " # $ % & ( ) * + - . = @ \ ^ _ \| '`<br>The `hdvmagt_account` command encodes the user ID and password and stores it in the property file, `server.server.authorization` (see Table 3.20).<br>***Note:*** The `server.server.authorization` is encoded data, so you cannot edit it. |
| **Options** | None |

## 3.7 Property Files

This section describes the property files used in HiCommand Device Manager Agent.

- The `server.properties` file:

  This property file is used to configure HiCommand Device Manager Agent.

- The `logger.properties` file:

  This property file is used to configure the logging function of HiCommand Device Manager Agent.

- The `programproductinfo.properties` file (for Windows):

  This property file is used to specify program product information.

- The `hldutil.properties` file

  This property file is used to specify the action of the `hldutil` command.

These four files define various properties.

The `server.properties`, `logger.properties`, and `hldutil.properties` files are stored in the following locations:

In a Windows system:

```
installation-folder-for-Device-Manager-agent\agent\config\server.properties
installation-folder-for-Device-Manager-agent\agent\config\logger.properties
installation-folder-for-Device-Manager-agent\agent\config\programproductinfo.properties
installation-folder-for-Device-Manager-agent\util\bin\hldutil.properties
```

In a Solaris, HP-UX, or Linux system:

```
/opt/HDVM/HBaseAgent/agent/config/server.properties
/opt/HDVM/HBaseAgent/agent/config/logger.properties
/opt/HDVM/HBaseAgent/util/bin/hldutil.properties
```

In an AIX system:

```
/usr/HDVM/HBaseAgent/agent/config/server.properties
/usr/HDVM/HBaseAgent/agent/config/logger.properties
/usr/HDVM/HBaseAgent/util/bin/hldutil.properties
```

### 3.7.1 server.properties File

The server.properties file contains network configuration properties. Table 3.16 to Table 3.22 list and describe the HTTP communication function properties for the HiCommand Device Manager agent.

**Table 3.16 server.properties File (Setting Up Ports Used by the Daemon Process and the Web Server Function)**

| Property | Description |
|---|---|
| server.agent.port | Specify the port number for the HiCommand Device Manager agent's daemon process (or service).<br>Normal range is 1024 to 49151. Note that too small a number may conflict with other applications. If a version of Dynamic Link Manager earlier than 5.8 is installed, set `23013`.<br>Default: `24041` |
| server.http.localPort | Specify the port number for communication between the HiCommand Device Manager agent's daemon process and the WebServer process.<br>Normal range is 1024 to 49151. Note that too small a number may conflict with other applications.<br>Default: `24043` |
| server.http.port | Specify the port number that the HiCommand Device Manager agent's WebServer uses.<br>Avoid specifying small port numbers because such numbers might conflict with other applications. Normal range is 1024 to 49151. Note that too small a number may conflict with other applications. If a version of Dynamic Link Manager earlier than 5.8 is installed, set `23011`.<br>Default: `24042` |

**Table 3.17 server.properties File (Setting the Host Name, IP Address, and NIC Used by the Web Server Function)**

| Property | Description |
|---|---|
| server.http.host | Specify the host that executes the HiCommand Device Manager agent's WebServer.<br>Default: `localhost` |
| server.http.socket.agentAddress | Specify the IP address at which the HiCommand Device Manager agent transmits notifications to a HiCommand Device Manager server. To limit the IP address at which a HiCommand Device Manager agent transmits notifications to the HiCommand Device Manager server, specify the desired IP address as a dotted decimal number. The default is the IP address acquired by the HiCommand Device Manager agent. For multiple IP addresses, the first IP address acquired by the HiCommand Device Manager agent via API is used.<br>Default: IP address acquired by the HiCommand Device Manager agent |
| server.http.socket.bindAddress | In situations in which the HiCommand Device Manager agent runs on a platform on which two or more network interface cards (NICs) are installed, this property allows you to specify the NIC through which the HiCommand Device Manager agent can accept requests. If the property is left blank (which is the default), the HiCommand Device Manager agent can accept requests through all NICs. When restricting the NIC to be accepted, enter the dotted decimal IP addresses that the HiCommand Device Manager agent accepts.<br>Default: None. (The HiCommand Device Manager agent listens to all NICs.) |

**Table 3.18 server.properties File (Setting Up Basic Operations of the Web Server Function)**

| Property | Description |
|---|---|
| server.agent.maxMemorySize | Specify the maximum memory heap size for Web server function processes of the HiCommand Device Manager agent, in MB.<br>Specifiable range (MB): 32 to 4096.<br>Default: None (the heap runs in a 64-megabyte memory area). |
| server.agent.shutDownTime | Specify the period (in milliseconds) to shutdown the HiCommand Device Manager agent's WebServer since it received or sent the last http message. If a value of zero or less is specified, the waiting period is unlimited.<br>Do not edit this property without current knowledge of the HiCommand Device Manager agent's performance.<br>Default :`600000`[msec] |

**Table 3.19 server.properties File (Security Settings for the Web Server Function)**

| Property | Description |
|---|---|
| server.http.entity.maxLength | Specify the maximum size (in bytes) of HTTP request entities permitted by the Web server function of the HiCommand Device Manager agent. Normally, the default value of this property need not be changed. By limiting the impact of malicious requests with an entity that has an abnormally large data size, this setting can be useful in repelling attacks that are intended to impair services or cause a buffer overflow. When detecting a post request larger than the specified limit, the HiCommand Device Manager agent sends a remote error response and records details of the request in the log.<br>Default: `1024` |
| server.http.security.clientIP | Specify that the remote host or subnet can send a request to the HiCommand Device Manager agent.<br>This setting limits the IP addresses permitted for connection, thus preventing denial-of-service attacks or other attacks that intend to overflow buffers.<br>In the following example, the specification to permits `191.0.0.2` and `192.168.0.0` to `192.168.255.255` to connect to the HiCommand Device Manager agent:<br>`server.http.security.clientIP=191.0.0.2, 192.168.*.*.`<br>You can use an asterisk (`*`) as a wildcard character to specify multiple connections from a single IP address. To specify multiple IP addresses, separate them by commas (,). Invalid specifications for dotted decimal IP addresses and spaces are ignored, and do not cause an error.<br>Default: `*.*.*.*` (any host can access the HiCommand Device Manager agent) |

**Table 3.20 server.properties File (Information of the Device Manager Server)**

| Property | Description |
|---|---|
| server.server.authorization | This property is a stored user ID and password authorized by the HiCommand Device Manager server. This property is encoded data, so you cannot edit it using a text editor. To edit this property, use the `hdvmagt_account` command (see section 3.6.5).<br>Default: None |

| Property | Description |
|---|---|
| server.server.serverIPAddress | Enter the IP address or host name of the HiCommand Device Manager server.<br>When specifying an IP address:<br>Specify it in the dotted-decimal format.<br>When specifying a host name:<br>You can use a character string of 50 bytes or less to specify a host name. The following characters can be used:<br>`a-z A-Z 0-9 - . @ _`<br>You may specify this property using the text editor, or by executing the `hdvmagt_account` command (see section 3.6.5).<br>Default: 255.255.255.255 |
| server.server.serverPort | Specify the port number of the HiCommand Device Manager server to which the HiCommand Device Manager agent is going to connect. As a general rule, you can specify a value from 1024 to 49151. You must specify the same value specified for the `server.http.port` property of HiCommand Device Manager server.<br>***Note:*** The value of this property equals the value of the port number of the HiCommand Device Manager server. You may specify this property by using a text editor, or executing the `hdvmagt_account` command (see section 3.6.5).<br>Default: `2001` |

**Table 3.21 server.properties File (Setting Up CCI)**

| Property | Description |
|---|---|
| server.agent.rm.centralizePairConfiguration | When a specific host is used to centrally manage pair configurations of ShadowImage, TrueCopy, Copy-on-Write Snapshot, QuickShadow, or UniversalReplicator for the storage subsystems managed by a HiCommand Device Manager server, set this property to `enable` for that host. In this case, if the host recognizes the command device in each storage subsystem, the LUs not recognized by the host can also be used for a pair setting.<br>The default value of this property is `disable`, in which only LUs that are recognized by the host can be used for a pair setting.<br>Default: `disable` |
| server.agent.rm.exclusion.instance | When a volume pair on the host installing the HiCommand Device Manager agent is already managed by CCI and you attempt to exclude the volume pair from Device Manager operations, you may specify the instance number of CCI to exclude that volume pair. When you specify multiple instance numbers, separate the individual numbers with commas (,). From the HiCommand Device Manager agent, you cannot operate a CCI that has the instance number specified in this property.<br>Default: None |
| server.agent.rm.location | You can specify the install directory of CCI. For Windows systems, you cannot specify `\` as a delimiter. Use `\\` or `/` instead. To view copy pair information or operate copy pairs, it is necessary to specify the correct directory where CCI is installed.<br>Default for Windows: *drive-where-Device-Manager-agent-is-installed*`/HORCM`<br>Default for Solaris, AIX®, HP-UX®, and Linux®: `/HORCM` |

| Property | Description |
|---|---|
| server.agent.rm.optimization.userHorcmFile | Specify whether you want the user-created CCI configuration definition file to be optimized. To optimize the file, specify `true`. If you do this, the file is updated so that Device Manager can use it. Also, when the HiCommand Device Manager agent starts or when the configuration definition file is updated by pair operations, the following optimizations are performed:<br>A serial number is added to a command device as a comment.<br>▪ The unit ID, logical device number, and serial number of a command device are added as comments.<br>▪ If the above command device becomes unavailable due to, for example, a change to the volume name, the configuration definition file information is updated so that the command device can be used.<br>▪ If the host is connected to multiple command devices in a storage subsystem and only some of those command devices are specified, the rest of the command devices are specified as reserved command devices.<br>▪ Command devices that are not being used are deleted.<br>▪ The CU and LDEV numbers of a command device and pair volume are added as a comment in the *cu*:*ldev* format.<br>Default: `false` |

**Table 3.22 server.properties File (Setting Up Timeout)**

| Property | Description |
|---|---|
| server.agent.rm.moduleTimeOut | This property allows you to set a timeout value (in seconds) for return of the command execution result when the HiCommand Device Manager agent executes a CCI command.<br>When a command takes longer to execute than the setting in this property, the HiCommand Device Manager agent concludes that an error occurred during the command execution.<br>This property should be changed only by a system administrator who has expert knowledge, when he or she needs to fine-tune performance of the HiCommand Device Manager agent's pair configuration facility.<br>Default: `600` (seconds) |
| server.http.server.timeOut | Specify a timeout value (in seconds) for receiving a response from the Device Manager server when registering host information using the `HiScan` command. If no response is received from the Device Manager server by the time specified in this property, the HiCommand Device Manager agent concludes that an error has occurred and the HiScan command terminates abnormally. You can specify a minimum value of 100 and a maximum value of 3600 in this property. When the specified value is outside these bounds, the timeout is assumed to be 100 if the specified value is less than the minimum, or 3600 if the specified value exceeds the maximum.<br>Default: `600` |
| server.util.processTimeOut | Specify the period (in milliseconds) that is regarded as the HiCommand Device Manager agent's normal execution time of external programs.<br>If an external program takes longer than the time period specified in this property, the HiCommand Device Manager agent regards the program as something abnormal and terminates it. If you specify too short a time period, the HiCommand Device Manager agent may stop execution of external programs that are running regularly. Do not edit this property without current knowledge of the HiCommand Device Manager agent's performance.<br>Default: `600000`[msec] (= 10 minutes) |

### 3.7.2 logger.properties File

The following table contains the logging function properties of the HiCommand Device Manager agent.

**Table 3.23 logger.properties File**

| Property | Description |
|---|---|
| logger.loglevel | You can specify the level of log that HiCommand Device Manager Agent outputs to the files `error.log` and `trace.log`.<br>Log levels: DEBUG, INFO, WARN, ERROR and FATAL.<br>Default: `INFO` |
| logger. MaxBackupIndex | You can specify the maximum number of log file backups. If more log files are generated than specified, HiCommand Device Manager Agent writes over the oldest one. If a log file reaches the maximum size, the file is renamed by adding a counter (which represents the version) to the file name. For example, `access.log` becomes `access.log.1`. If additional backup log files are created, the counter increases until the specified number of backup log files is generated (for example, `access.log.1` becomes `access.log.2`). After the specified number of backup log files are created, each time a new backup file is created, the oldest backup file is deleted.<br>Specifiable range: `1` through `20`.<br>Default: `10` |
| logger.MaxFileSize | You can specify the maximum size of each log file. If a log file becomes larger than you specified here, HiCommand Device Manager Agent creates a new file and writes logs to it. Unless `KB` is specified for kilobytes or `MB` for megabytes, a specified size is interpreted to mean bytes. In this property, the term `KB` is interpreted as 1024 bytes, and `MB` as 1024 kilobytes. Specifiable range: from `512KB` to `32MB`<br>Default: `1 MB` |

### 3.7.3 programproductinfo.properties File

The following table contains the program product information properties of HiCommand Device Manager Agent.

**Table 3.24 programproductinfo.properties File**

| Property | Description |
|---|---|
| veritas.volume.manager.version | Indicates the version of VxVM installed in Windows. If VxVM is installed in a Windows environment, specify the VxVM version in this property, in the *x.x* format.<br>Default: None |

### 3.7.4 hldutil.properties File

The following table lists and describes the properties used to specify the action of the `hldutil` command.

**Table 3.25 hldutil.properties File**

| Property | Description |
|---|---|
| agent.util.hpux.displayDsf | Specifies the format of the device file name displayed when the `hldutil` command is executed on a host on which HP-UX 11i v3 is running as the OS.<br>▪ If `disk` is specified:<br>The disk device files are displayed.<br>▪ If `ctd` is specified:<br>The ctd device files are displayed.<br>▪ If `mix` is specified:<br>Both the disk device files and ctd device files are displayed.<br>If any value other than the above is specified, `mix` is assumed. This property cannot be specified in an OS other than HP-UX 11i v3 and later.<br>Default: `mix` |

## 3.8 Using a User-created CCI Configuration Definition File

In HiCommand Device Manager, you can use a user-created CCI configuration definition file to manage copy pairs. This section describes requirements for using a user-created CCI configuration definition file in HiCommand Device Manager, how to report the information of the CCI configuration definition file to HiCommand Device Manager, and cautionary notes.

### 3.8.1 Requirements for Using a User-created CCI Configuration Definition File

This subsection describes requirements for using a user-created CCI configuration definition file in HiCommand Device Manager, referring to the following four items:

- Installation and setup for the HiCommand Device Manager agent
- Storage location for a CCI configuration definition file
- Contents of a CCI configuration definition file
- Instance number for a CCI configuration definition file

#### 3.8.1.1 Installation and Setup for the HiCommand Device Manager Agent

When you use a CCI configuration definition file in HiCommand Device Manager, the following setup is required in the HiCommand Device Manager agent:

##### Installation and Setup for the HiCommand Device Manager Agent

- The HiCommand Device Manager agent must be installed on a host on which CCI has been installed.
- The HiCommand Device Manager server information must be registered after the setup has been completed.

##### Setup for the HiCommand Device Manager Agent

- If you are using centralized management, you need to specify `enable` for the `server.agent.rm.centralizePairConfiguration` property in the `server.properties` file.
- If one of the following conditions is satisfied, you need to specify the installation directory of CCI for the `server.agent.rm.location` property of the `server.properties` file.
  - CCI have been installed in a directory other than the default installation directory.
  - In Windows, the installation drive for CCI, and the installation drive for the HiCommand Device Manager agent are different.

### 3.8.1.2 Storage Location for a CCI Configuration Definition File

When you use a user-created CCI configuration definition file in HiCommand Device Manager, the configuration definition file must be stored in the following location:

- **Windows**: System folder (which is indicated by the environment variable `%windir%`)
- **UNIX**: `/etc` directory

### 3.8.1.3 Reviewing the Contents of a CCI Configuration Definition File

When you use a CCI configuration definition file in HiCommand Device Manager, there are some limitations on the format and contents of the CCI configuration definition file.

The following table lists the CCI configuration definition file formats that are supported.

**Table 3.26 Supported Formats in the CCI Configuration Definition File Used in Device Manager**

| Parameter | Item | Value | | Version of Device Manager agent | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 5.6 or later | 5.1 or 5.5 | 5.0 | 4.0 to 4.3 | Earlier than 3.5 |
| HORCM_MON | ip_address | IP address | | Yes | Yes | Yes | Yes | Yes |
| | | Host name | | Yes | Yes | Yes | Yes | Yes |
| | | NONE | | -- | -- | -- | -- | -- |
| | service | service Port name | | -- | -- | -- | -- | -- |
| | | Port number | | Yes | Yes | Yes | Yes | Yes |
| | poll | A value (in milliseconds) | | Yes | Yes | Yes | Yes | Yes |
| | | -1 | | Yes | Yes | Yes | Yes | Yes |
| | timeout | Timeout period | | Yes | Yes | Yes | Yes | Yes |
| HORCM_CMD | dev_name | Solaris, AIX, HP-UX, or Linux | Special file | Yes | Yes | Yes | Yes | Yes |
| | | Windows | PhysicalDrive format | Yes | Yes | Yes | Yes | Yes |
| | | | GUID format | Yes | Yes | Yes | -- | -- |
| | | | CMD format | Yes | Yes | -- | -- | -- |
| | | Specifying multiple command devices in the same device | | Yes | Yes | Yes | Yes | Yes |
| | | Specifying command devices in multiple devices | | Yes | Yes | Yes | Yes | Yes |
| HORCM_DEV | dev_group | Group name | | Yes | Yes | Yes | Yes | Yes |
| | dev_name | Pair logical volume name | | Yes | Yes | Yes | Yes | Yes |

| Parameter | Item | Value | | Version of Device Manager agent | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 5.6 or later | 5.1 or 5.5 | 5.0 | 4.0 to 4.3 | Earlier than 3.5 |
| | port# | Port name | | Yes | Yes | Yes | Yes | Yes |
| | targetID | Target ID of SCSI/Fibre | | Yes | Yes | Yes | Yes | Yes |
| | LU# | Logical unit number of SCSI/Fibre | | Yes | Yes | Yes | Yes | Yes |
| | MU# | Mirror descriptor | Omitted (blank) or a numerical value | Yes | Yes | Yes | Yes | Yes |
| | | | A numerical value that starts with a character h | Yes | Yes | Yes | Yes | -- |
| HORCM_LDEV | dev_group | Group name | | Yes | -- | -- | -- | -- |
| | dev_name | Pair logical volume name | | Yes | -- | -- | -- | -- |
| | Serial# | Device number of the storage subsystem | | Yes | -- | -- | -- | -- |
| | LDEV# | Disk number of the storage subsystem# | | Yes | -- | -- | -- | -- |
| | MU# | Mirror descriptor | | Yes | -- | -- | -- | -- |
| HORCM_INST | dev_group | dev_group of HORCM_DEV or HORCM_LDEV | | Yes | Yes | Yes | Yes | Yes |
| | ip_address | IP address | | Yes | Yes | Yes | Yes | Yes |
| | | Host name | | Yes | Yes | Yes | Yes | Yes |
| | service | Port name | | -- | -- | -- | -- | -- |
| | | Port number | | Yes | Yes | Yes | Yes | Yes |

Legend:

Yes: The format of the relevant CCI configuration definition file is supported.

--: The format of the relevant CCI configuration definition file is not supported.

# You need to specify the LDEV to which a path has already been assigned.

The requirements for a CCI configuration definition file for each parameter are shown below.

Common to all parameters

The following are limits common to all parameters:

– A line that consists only of space characters cannot be included.

– If the version of Device Manager agent is 5.5 or earlier, a line that starts with H and includes any of the following character strings cannot be included (except in the starting line of the parameter):

  HORCM_MON, HORCM_CMD, HORCM_DEV, HORCM_INST

HORCM_MON parameter

The following table describes the limitations for the HORCM_MON parameter.

**Table 3.27 Requirements for a CCI Configuration Definition File Used in HiCommand Device Manager (HORCM_MON Parameter)**

| Item | Requirements |
|---|---|
| ip_address | Specify the IP address or name of the host.<br>The following values are not allowed because the HiCommand Device Manager server cannot resolve the host with those values:<br>▪ Loopback IP address (127.0.0.1)<br>▪ Loopback host name (localhost)<br>▪ Cluster virtual IP address<br>▪ Cluster virtual host name<br>▪ NONE |
| service | Specify the port number by using a value from 0 to 65535. |

HORCM_CMD parameter

The following table describes the limitations for the HORCM_CMD parameter.

**Table 3.28 Requirements for a CCI Configuration Definition File Used in HiCommand Device Manager (HORCM_CMD Parameter)**

| Item | Requirements |
|---|---|
| dev_name | Specify this item in one of the following formats:<br>▪ \\.\PhysicalDrive*disc-number-defined-by-Windows*<br>For the HiCommand Device Manager agent 4.3 or earlier, this item is case sensitive.<br>▪ \\.\Volume{*GUID*}<br>The version of the HiCommand Device Manager agent must be 5.0 or later.<br>▪ \\.\CMD–*serial-number*[*-logical-device-number*[*-port-name*[*-host-group-number*]]]<br>The version of the HiCommand Device Manager agent must be 5.1 or later.<br>You must use base 10 numbers to specify the serial number and logical device number.For the host group number, if the version of the Device Manager agent is 5.6 or later, specify a value from 0 to 254. If the version of the Device Manager agent is 5.5 or earlier, specify a value from 0 to 127.<br>The specified command device must be recognized by the host. |

HORCM_DEV parameter

The following table describes the limitations for the HORCM_DEV parameter.

**Table 3.29 Requirements for a CCI Configuration Definition File Used in HiCommand Device Manager (HORCM_DEV Parameter)**

| Item | Requirements |
|---|---|
| dev_group | Specify this item by using no more than 31 single-byte characters. A hyphen (-) cannot be specified at the beginning of a character string. |
| dev_name | Specify this item by using no more than 31 single-byte characters. A hyphen (-) cannot be specified at the beginning of a character string. |
| Port# | If you specify the host group number immediately after the port name, the range of the value you can specify differs depending on the version of the Device Manager agent as follows:<br>▪ When the version of the HiCommand Device Manager agent is 5.6 or later<br>Specify a value from 0 to 254.<br>▪ When the version of the HiCommand Device Manager agent is 5.5 or earlier<br>Specify a value from 0 to 127. |
| MU# | The value that can be specified differs depending on the version of the HiCommand Device Manager agent.<br>▪ When the version of the HiCommand Device Manager agent is 3.5 or earlier<br>Specify a value from 0 to 13.<br>▪ When the version of the HiCommand Device Manager agent is 4.0 or 4.1<br>Specify a value from 0 to 13, or from h1 to h3.<br>▪ When the version of the HiCommand Device Manager agent is 4.2 or later<br>Specify a value from 0 to 63, or from h1 to h3.<br>You cannot specify h0. |

The combination of the specified dev_group and dev_name values must not be duplicated.

HORCM_LDEV parameter

You can specify the HORCM_LDEV parameter when version 5.6 or later of the HiCommand Device Manager agent has been installed.

***Caution:*** If you use the HORCM_LDEV parameter to set up copy pair volumes, you can only view or delete the CCI configuration definition file.

The following table describes the limitations for the HORCM_LDEV parameter.

**Table 3.30 Requirements for a CCI Configuration Definition File Used in HiCommand Device Manager (HORCM_LDEV Parameter)**

| Item | Requirements |
|---|---|
| dev_group | Specify this item by using no more than 31 single-byte characters. A hyphen (–) cannot be specified at the beginning of a character string. |
| dev_name | Specify this item by using no more than 31 single-byte characters. A hyphen (–) cannot be specified at the beginning of a character string. |
| Serial# | Specify this item by using base 10 numbers. |
| LDEV# | Specify this item by using hexadecimal numbers in *CU:LDEV* format, hexadecimal numbers, or base 10 numbers.<br>Example: 01:04 (Hexadecimal numbers in *CU:LDEV* format)<br>Example: 0x104 (Hexadecimal numbers)<br>Example: 260 (base 10 numbers) |
| MU# | Specify this item by using a value from 0 to 63, or from h1 to h3. You cannot specify h0. |

The combination of the specified dev_group and dev_name values must not be duplicated.

HORCM_INST parameter

The following table describes the limitations for the HORCM_INST parameter.

**Table 3.31 Requirements for a CCI Configuration Definition File Used in HiCommand Device Manager (HORCM_INST Parameter)**

| Item | Requirements |
|---|---|
| dev_group | Specify this item by using no more than 31 single-byte characters. A hyphen (–) cannot be specified at the beginning of a character string. |
| ip_address | Specify the IP address or name of the host.<br>The following values are not allowed because the HiCommand Device Manager server cannot resolve the host with those values:<br>▪ Loopback IP address (127.0.0.1)<br>▪ Loopback host name (localhost)<br>▪ Cluster virtual IP address<br>▪ Cluster virtual host name |
| service | Specify the port number by using a value from 0 to 65535. |

You cannot specify multiple ip_address for a single dev_group.

#### 3.8.1.4 Using the Correct Instance number for a CCI configuration definition file

When using HiCommand Device Manager to collect copy pair information or to operate copy pairs, the instance number for the CCI configuration definition file must be in the range from `0` to `4094`.

***Note:*** Instance numbers from `900` to `998` might be used temporarily when HiCommand Device Manager acquires copy pair information. We recommend that you do not use these instance numbers when creating a configuration definition file.

### 3.8.2 Reporting CCI Configuration Definition File Data to the HiCommand Device Manager Server

If you created or changed a CCI configuration definition file, you must report the information of the configuration definition file to the HiCommand Device Manager server. To report the information, refresh the storage subsystems that are associated with copy pair volumes that are stored in the configuration definition file.

### 3.8.3 Cautionary Notes when using HiCommand Device Manager with CCI

This subsection gives cautionary notes when HiCommand Device Manager is used with CCI.

#### 3.8.3.1 Notes About Deleting Copy Pairs

When you perform a delete operation of copy pairs from a client, if all the definitions of the copy pairs in a configuration definition file is deleted, that configuration definition file will be deleted. If you do not want the configuration definition file to be deleted, make a backup of the configuration definition file before you perform a delete operation.

#### 3.8.3.2 Notes on Optimization Processing of the Configuration Definition File

If `true` is specified for the `server.agent.rm.optimization.userHorcmFile` property of the `server.properties` file, when the HiCommand Device Manager agent service starts, or when you operate copy pairs, the HiCommand Device Manager agent optimizes the contents of the CCI configuration definition file. In this case, note the following points:

##### Backing up the Configuration Definition File

In the optimization processing, the original configuration definition file `horcmXX.conf` is backed up as `horcmXX.conf.bk`. If the optimization processing is performed twice or more, the original user-created configuration definition file will be lost, because only one generation of backup file can be made. Therefore, make a backup as necessary.

### Working with Comments in the Command Device Definition

When the CCI configuration definition file is optimized, the unit ID, logical device number, and serial number for the command device are added as comments on the line before the line on which the command device is defined. In this case, be careful about the following:

- Do not change the contents of the comment because the Device Manager agent references it.
- When you copy the CCI configuration definition file that the Device Manager agent is already managing, and then create a new CCI configuration definition file, delete this comment.

## 3.8.3.3 Changing a CCI Instance Number and Service Number

When acquiring copy pair information, HiCommand Device Manager temporarily creates a configuration definition file. This configuration definition file uses the following instance number and service number:

- Instance number: 900 to 998
- Service number: 53232 to 53330

If a number shown above is used in a user-created configuration definition file, CCI error information might be output to the system log or event log. We recommend that you change the number in the user-created configuration definition file to a number other than those listed above.

# Chapter 4 Troubleshooting HiCommand Device Manager Agent Operations

This chapter covers the following topics:

- Acquiring Error Information Collectively (see section 4.1)
- Calling the Hitachi Data Systems Support Center (see section 4.2)

## 4.1 Acquiring Error Information Collectively

If an error occurs in HiCommand Device Manager Agent, acquire error information from both HiCommand Device Manager Agent and the Device Manager server. In HiCommand Device Manager Agent, you can use Trouble Information Collector (TIC). TIC acquires the log files and other information necessary to determine the cause of the error collectively from the HiCommand Device Manager Agent environment. For information about how to acquire error information in the Device Manager server, see the *HiCommand® Device Manager Server Installation and Configuration Guide*.

***Note:*** To use TIC, you must be a member of the Administrator group or a superuser.

The location of the TIC command differs depending upon the following operating systems.

In Windows:

```
installation-folder-for-Device-Manager-agent\bin
```

In Solaris, HP-UX, or Linux:

```
/opt/HDVM/HBaseAgent/bin
```

In AIX:

```
/usr/HDVM/HBaseAgent/bin
```

Format

In Windows:

```
TIC.bat [-outdir location-of-resultDir-directory [-f]]
```

In Solaris, AIX, HP-UX, or Linux:

```
TIC.sh [-outdir location-of-resultDir-directory [-f]]
```

Arguments

`-outdir` *location-of-resultDir-directory*

Specifies the location of the `resultDir` directory for storing the acquired error information. Specify the relative path from the execution directory or the absolute path. If another `resultDir` directory already exists in the specified location, a confirmation message appears, asking you whether you want to delete that directory.

***Note:*** If you do not specify this argument, the `resultDir` directory is created in the directory that contains the `TIC` command.

`-f`

When this argument is specified, and another `resultDir` directory already exists in the location specified in `-outdir`, the `TIC` command deletes the existing directory without displaying a confirmation message. The acquired error information files will be stored in a new `resultDir` directory.

***Caution:*** This argument can be specified only when the location of the directory is specified in `-outdir`.

To acquire error information collectively using TIC:

1. Open the Command Prompt window, and execute the `TIC` command.

   If the `resultDir` directory already exists, the following confirmation message appears:

```
Output Directory [location-of-resultDir-directory\resultDir] already exists.
This program will delete [location-of-resultDir-directory\resultDir] before working.
Continue ?
(Y)es or (N)o :
```

2. Enter `y` or `n`.

   When you enter `y`, the command deletes the `resultDir` directory, and stores the acquired error information files in a new `resultDir` directory. When you enter `n`, processing is canceled.

   ***Note:*** Even if you enter `y`, the `resultDir` directory may not be deleted. If the `resultDir` directory remains undeleted, the command creates a new directory in the specified location. The directory name is `resultDir` with an index (for example, `resultDir_1`).

   A listing of acquired error information appears.

```
Completed collection of name-of-acquired-file: last-update-time
...
```

   A termination message appears once the command successfully acquired error information:

```
Finished successfully.
```

   When the command terminated abnormally, the following message appears:

```
Finished abnormally. Message
```

## 4.2 Calling the Hitachi Data Systems Support Center

If you need to call the Hitachi Data Systems Support Center, please provide as much of the following information about the problem as possible:

- Circumstances surrounding the error or failure
- The platform (OS and version)
- Host agent version and build
- HBA make, model, firmware, and driver
- HDvM Server version and build
- HDvM Server OS and version (including build)
- All applicable configuration and log files of HiCommand Device Manager Agent and the HiScan command (see Table 4.1 through Table 4.5)
- The exact content of any error messages displayed on the HiCommand Device Manager Server, HiCommand Device Manager client, HiCommand Device Manager Agent, and/or host system
- The required logs as shown in Table 4.1 through Table 4.5.

The Hitachi Data Systems customer support staff is available 24 hours a day, seven days a week. If you need technical support, please call:

United States: (800) 446-0744

Outside of the United States: (858) 547-4526

**Table 4.1 Required Logs for Troubleshooting Windows Hosts**

| File to Collect | File Location | Explanation |
|---|---|---|
| access.log | *Installation-directory-for-Device-Manager-agent*/agent/logs/ | Access log for the communication control function |
| error.log | *Installation-directory-for-Device-Manager-agent*/agent/logs/ | Communication control function error log |
| service.log | *Installation-directory-for-Device-Manager-agent*/agent/logs/ | Servlet function operation log |
| trace.log | *Installation-directory-for-Device-Manager-agent*/agent/logs/ | Warnings of communication control function, internal trace data log |
| HiScan.msg | *Installation-directory-for-Device-Manager-agent*/bin/logs/ | Directory where HiScan output messages are stored |
| HiScan.log | *Installation-directory-for-Device-Manager-agent*/bin/logs/ | HiScan output log |
| HiScan.err | *Installation-directory-for-Device-Manager-agent*/bin/logs/ | HiScan output error log |
| hdvmagterr.log | *Installation-directory-for-Device-Manager-agent*/bin/logs/ | hdvmagt log file |
| hldu_err.log | *Installation-directory-for-Device-Manager-agent*/util/logs/ | hldutil.exe error log |
| *Timestamp*.log | *Installation-directory-for-Device-Manager-agent*/util/logs/ | Volume information extracted by HLDUTIL |
| HiCommand_Device_Manager_VERSION NO._InstallLog.log | *Installation-directory-for-Device-Manager-agent* | An information output log file when HiCommand Device Manager Agent is installed. |

**Table 4.2 Required Logs for Troubleshooting Solaris Hosts**

| File to Collect | File Location | Explanation |
|---|---|---|
| access.log | /opt/HDVM/agent/logs/ | Access log for the communication control function |
| error.log | /opt/HDVM/agent/logs/ | Communication control function error log |
| service.log | /opt/HDVM/agent/logs/ | Servlet function operation log |
| trace.log | /opt/HDVM/agent/logs/ | Warnings of communication control function, internal trace data log |
| HiScan.msg | /var/opt/HDVM/logs/ | Directory where HiScan output messages are stored |
| HiScan.log | /var/opt/HDVM/logs/ | HiScan output log |
| HiScan.err | /var/opt/HDVM/logs/ | HiScan output error log |
| hdvmagterr.log | /var/opt/HDVM/logs/ | Hdvmagt log file |
| hldn_err.log | /var/opt/HDVM/logs/ | HLDUTIL log file |
| *timestamp*.log | /var/opt/HDVM/logs/ | Volume information extracted by HLDUTIL |
| messages | /var/adm/ | OS output log |

**Table 4.3 Required Logs for Troubleshooting HP-UX Hosts**

| File to Collect | File Location | Explanation |
|---|---|---|
| access.log | /opt/HDVM/agent/logs/ | Access log for the communication control function |
| Error.log | /opt/HDVM/agent/logs/ | Communication control function error log |
| service.log | /opt/HDVM/agent/logs/ | Servlet function operation log |
| Trace.log | /opt/HDVM/agent/logs/ | Warnings of communication control function, internal trace data log |
| HiScan.msg | /var/opt/HDVM/logs/ | Directory where HiScan output messages are stored |
| HiScan.log | /var/opt/HDVM/logs/ | HiScan output log |
| HiScan.err | /var/opt/HDVM/logs/ | HiScan output error log |
| hdvmagterr.log | /var/opt/HDVM/logs/ | Hdvmagt log file |
| hldn_err.log | /var/opt/HDVM/logs/ | HLDUTIL log file |
| *timestamp*.log | /var/opt/HDVM/logs/ | Volume information extracted by HLDUTIL |
| syslog.log | /var/adm/syslog/ | OS output log |
| swagent.log | /var/adm/sw/ | HiCommand Device Manager Agent install log |
| swinstall.log | /var/adm/sw/ | HiCommand Device Manager Agent install log |

**Table 4.4 Required Logs for Troubleshooting AIX Hosts**

| File to Collect | File Location | Explanation |
|---|---|---|
| access.log | /usr/HDVM/agent/logs/ | Access log for the communication control function |
| Error.log | /usr/HDVM/agent/logs/ | Communication control function error log |
| service.log | /usr/HDVM/agent/logs/ | Servlet function operation log |
| Trace.log | /usr/HDVM/agent/logs/ | Warnings of communication control function, internal trace data log |
| HiScan.msg | /var/HDVM/logs/ | Directory where HiScan output messages are stored |
| HiScan.log | /var/HDVM/logs/ | HiScan output error log |
| HiScan.err | /var/HDVM/logs/ | HiScan output error log |
| hdvmagterr.log | /var/HDVM/logs/ | hdvmagt log file |
| hldu_err.log | /var/HDVM/logs/ | HLDUTIL log file |
| *timestamp*.log | /var/HDVM/logs/ | Volume information extracted by HLDUTIL |
| syslog.log | /var/adm/syslog/ | OS output log |

**Table 4.5 Required Logs for Troubleshooting Linux Hosts**

| File to Collect | Location where File is Stored | Explanation |
|---|---|---|
| access.log | /opt/HDVM/agent/logs/ | Access log for the communication control function |
| error.log | /opt/HDVM/agent/logs/ | Communication control function error log |
| service.log | /opt/HDVM/agent/logs/ | Servlet function operation log |
| trace.log | /opt/HDVM/agent/logs/ | Warnings of communication control function, internal trace data log |
| HiScan.msg | /var/opt/HDVM/logs/ | Directory where HiScan output messages are stored |
| HiScan.log | /var/opt/HDVM/logs/ | HiScan output log |
| HiScan.err | /var/opt/HDVM/logs/ | HiScan output error log |
| hdvmagterr.log | /var/opt/HDVM/logs/ | Hdvmagt log file |
| hldu_err.log | /var/opt/HDVM/logs/ | HLDUTIL log file |
| *timestamp*.log | /var/HDVM/logs/ | Volume information extracted by HLDUTIL |

# Acronyms and Abbreviations

| | |
|---|---|
| AMS | TagmaStore Adjustable Modular Storage |
| API | application programming interface |
| ASCII | American Standard Code for Information Interchange |
| CCI | command control interface |
| CIM | Common Information Model |
| CVS | custom volume size |
| DNS | Domain Name Server |
| DSM | Device Specific Module |
| DST | Daylight Saving Time |
| HBA | host bus adapter |
| HDvM | HiCommand Device Manager |
| HPvM | HiCommand Provisioning Manager |
| HRpM | HiCommand Replication Monitor |
| HTML | hypertext markup language |
| HTTP | hypertext transfer protocol |
| JFS | Journaled File System |
| JRE | Java Runtime Environment or Java 2 Runtime Environment |
| LU | logical unit |
| LUN | logical unit number, logical unit |
| LVM | Logical Volume Manager |
| MPIO | MultiPath I/O |
| MRCF-Lite | Multiple RAID Coupling Feature - Lite |
| NIC | network interface card |
| NTFS | NT File System |
| OS | operating system |
| RTE | run time environment |
| SCSI | small computer systems interface |
| SDK | software development kit |
| SED | stack execution disable |
| SNIA | Storage Networking Industry Association |
| SP | service pack |

| | |
|---|---|
| TCP/IP | transmission control protocol/internet protocol |
| TIC | trouble information collector |
| UFS | UNIX File System |
| VDS | virtual disk service |
| VxVM | Veritas Volume Manager |
| WOW64 | Windows on Windows 64 |
| WWN | worldwide name |
| XML | extensible markup language |
| CLI | command line interface |

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