
README.TXT

Adaptec ASA-7085H/ASA-7805H/ASA-70165H/ASA-71605H SAS Host Bus Adapters

NOTE: All Adaptec by PMC products are UL listed and for use only with UL listed ITE.

as of October 29, 2015

Please review this file for important information about issues and errata that were discovered after completion of the standard product documentation. In the case of conflict between various parts of the documentation set, this file contains the most current information.

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1. New Features in this Release

NOTE: This release includes updates for Adaptec Series 7H/7He HBAs only. It does not include refreshed firmware, drivers or utilities software for Adaptec Series 6H HBAs. Series 6H Adapters include the software components listed below, released on 04/14/2014:

- Firmware Version 1.4.0.11068 (build 11068)
- Windows Driver (32-bit and 64-bit) Version 1.4.0.11068
- Linux Driver Version 1.4.0-11068
- VMware Driver Version 1.4.0.11068
- FreeBSD Driver Version 1.4.0.11068

Adaptec Series 7H refresh, including:

- o Support for new OS versions (see Section 2.1)
- o Support for customizing HDD spin-up and delay
- o Bugfixes

2. Software and Documentation

2.1 Firmware and Driver Software

NOTE: You can download the latest versions of firmware, BIOS, driver software and utilities from the Adaptec Web Site at start.adaptec.com.

o Adaptec Firmware/BIOS/Drivers Version 1.04.00

Drivers for this release have been tested and certified on the following operating systems. You can load the drivers on out-of-box operating system versions, the latest service pack, or software update. Compatibility issues may be seen with untested OS versions.

Microsoft Windows Drivers:

- o Windows Server 2012 R2
- o Windows Server 2012 64-bit
- o Windows Server 2008 R2, 64-bit
- o Windows SBS 2011 (all versions)
- o Windows 7, Windows 8, Windows 8.1, 32-bit and 64-bit

Linux Drivers:

- o Red Hat Enterprise Linux 7.0, 6.6, 6.5, 6.4, 6.3, 6.0, 5.3, 5.2, 32-bit and 64-bit
- o CentOS 7.0, 6.6, 6.5, 6.4, 6.3, 6.0, 5.3, 5.2, 32-bit and 64-bit
- o SuSE Linux Enterprise Server 11 SP3, 12, 32-bit and 64-bit
- o Ubuntu Linux 14.04, 12.04.4, 12.04.3, 12.04.2, 32-bit and 64-bit
- o Debian Linux 7.5, 7.4, 7.2, 7, 32-bit and 64-bit

FreeBSD Drivers:

- o FreeBSD 10, 9.2, 9.1, 9.0

VMware Drivers:

- o VMware ESXi 5.5

2.2 Documentation

NOTE: You can download the latest documentation from the Adaptec Web Site at start.adaptec.com.

PDF Format (English/Japanese):

- o Adaptec Serial Attached SCSI Host Bus Adapters Installation and User's Guide

Text Format:

- o Adaptec SAS Host Bus Adapters README.TXT file
- o Task-specific readmes (see sections 3.3 and 3.12)

3. Installation and Setup

3.1 Installation Instructions

The Adaptec Serial Attached SCSI Host Bus Adapters Installation and User's Guide contains complete installation information for the adapters and drivers. It also contains usage information for the configuration utility.

3.2 uEFI-Mode Setup

On servers that support the Unified Extensible Firmware Interface, or uEFI (version 2.10 or higher), you can install the OS and setup your HBA from the uEFI BIOS.

To install the OS, boot the server to uEFI (typically by pressing DEL), then insert the OS installation DVD. Assuming the DVD is device fs0, type:

```
Shell>fs0:  
fs0:> \efi\boot\bootx64.efi
```

When the installation screen is displayed, follow the on-screen instructions to complete the installation.

3.3 Windows Installation and Setup

Use the following drivers to install the HBA on Windows:

- o DRV-HIA-SBS-WIN7-ADAP for Small Business Server 2011 + Win 7 + Win 2008 R2
- o DRV-HIA-WIN8-WIN2012-ADAP for Win 8 + Win 2012

3.3.1 uEFI-Mode Setup

When installing Windows in uEFI mode, clearing the metadata on the HDDs is required if the HDDs are moved from an Adaptec RAID controller to the HBA. Clearing the metadata is not required in Legacy mode (non-uEFI).

3.3.2 Windows 7 Setup Issues

When installing Windows 7 (32-bit, 64-bit) on an HBA with multiple drives attached, installation continuation, after initial reboot, may take 30-70 minutes to complete. Following installation, install the hotfix at the link below:

<http://support.microsoft.com/kb/2468345>

3.3.3 Windows SBS 2011 Setup Issues

- o When installing the driver on Windows SBS 2011, it may take 1.5-3 hours to complete the OS installation.
- o To avoid a driver installation problem on Windows SBS 2011 Essential, MBR (Master Boot Record) partitioning is required.
 1. To convert the drive to MBR format, install SBS 2011 Essential in Legacy mode, and abort installation once the drive is partitioned.
 2. Switch to uEFI mode, then install SBS 2011 Essential on the same drive; installation will complete successfully.
- o When installing the driver on Windows SBS 2011 Essential, the installer times out before listing all discovered drives. The number of listed drives varies, depending on the drive type (eg, SAS vs SATA). This is a limitation in the Windows SBS installer; the Adaptec device driver detects all attached drives.
- o Installing Windows SBS 2011 in an expander configuration is not supported in uEFI mode.

3.4 RHEL/CentOS Installation and Setup

When installing the Red Hat driver using the instructions in the user's guide, you may see a message stating that 'no drivers were found or the disk has already been loaded'. To complete the installation, click 'Continue', then finish the installation normally.

3.4.1 RHEL/CentOS Installation with Base System Full Package

When installing RHEL/CentOS 6.5 x64 with the Base System Full Package option, the OS installation fails to set up unity mappings in memory for some devices. As a result, the OS fails to boot with a kernel panic.

WORKAROUND: add 'intel_iommu=off' and 'amd_iommu=off' in the grub during the boot. To ensure persistence across reboots, add 'intel_iommu=off' and 'amd_iommu=off' to '/etc/grub.conf'.

3.4.2 Expander Boot Drive Discovery

When installing the Red Hat driver, the first 16 drives in the expander (if present) are listed in alphabetical order. To determine the first 8 bootable devices, select "Create Custom Layout" in the installation screen. This will display the drives in the order in which they were discovered. You can install the OS on any of the first 8 drives.

3.5 SuSE Linux Installation and Setup

- o After downloading the SLES driver from the Adaptec Web site, execute the following commands to create the HBA iso on the USB drive (assuming the USB drive is /dev/sdd):

```
dd if=/dev/zero of =/dev/sdd
dd if=pm80xx---.iso of =/dev/sdd
```

- o SLES 11 x64 detects direct attached drives on the HBA but times out before discovering drives in the expander (due to an OS mapping issue) and fails to boot to the OS.

WORKAROUND: Remove all drives other than the OS drive and boot up once. Shut down the system, then put back all drives; the OS should boot normally.

- o The maximum supported drives in SLES 11 SP3 is 119.

3.6 FreeBSD Installation and Setup

3.6.1 Building the FreeBSD Custom Kernel

Before installing the HBA driver for FreeBSD, you must build a custom FreeBSD kernel with the 'ahd' driver disabled. Follow these steps:

1. ls to /usr/src/sys/<platform>/conf/ (**<platform>** is amd64/i386)
2. cp GENERIC to MYKERNEL
3. Open the file MYKERNEL, then comment out the ahd option and save the file:
#device ahd
4. cd to /usr/src/
5. Compile the kernel: make buildkernel KERNCONF=MYKERNEL
6. Install the kernel: make installkernel KERNCONF=MYKERNEL
7. Reboot the computer

3.6.2 Boot Partition Mounting Issue

When mounting the boot partition, FreeBSD 9.x may take an improper disk number and boot into mountroot rather than the OS.

WORKAROUND:

1. If the OS boots to mountroot during OS Installation, enter this command:
cd9660:/dev/cd0 ro
then continue the installation.
2. If the OS boots to mountroot during normal booting, at the prompt:
 - a) Enter '?' to list all connected bootable disks.
 - b) Identify the disk number with partitions p1, p2 and p3.
example: If disk number 2 is the OS disk, it shows as da2p1,da2p2 and da2p3
 - c) Enter this command:
ufs:/dev/da2p2 rw
3. The system boots into the OS successfully.

3.7 Ubuntu Installation and Setup

- o If Ubuntu x64 fails to boot to the OS after installation, add the OS option 'quiet splash edd=off' in the GRUB bootloader file "menu.lst". The OS should boot normally.
- o In a configuration with maximum drives/enclosures, Ubuntu may fail to boot with a SATA OS drive.

WORKAROUND: Replace the SATA OS drive with a SAS OS drive.

3.8 Debian Installatin and Setup

Debian x64 supports a maximum of 24 drives during bootup. After booting, it can support up to 128 drives.

3.9 VMware Installation and Setup

VMware supports a maximum of 128 LUNs per target.

3.10 Linux Installation on 4K Sector Drive

When installing Linux in uEFI mode on a 4K sector drive, a 200MB /boot/efi partition is allocated, by default. For some drives, this amount of space is not sufficient. For example, Seagate 4K sector drives work only with 4096MB for the /boot/efi partition.

3.11 Boot Drive Selection

NOTE: Use the following procedure for Legacy mode (non-uEFI) boot drive selection. For uEFI-mode boot drive selection, after OS installation, use the system BIOS Boot menu to move the OS image to priority.

Selecting Boot Drive when BBS=Device (default):

If BBS is set to "Device" in the Ctrl+A Configuration utility, you can

select any of the first 8 drives as the bootable drive.

1. Power on the system, go to the Ctrl+A utility, select Controller Configuration, then set BBS Support=Device.
2. Go to system BIOS setup menu, set CD/DVD ROM as the first bootable device, then select the HDD on which the OS will be installed as the 2nd bootable device in boot priority. You can choose any of the 8 devices listed.
3. Boot from the OS DVD and load the HBA driver. The installer displays the drives in order. Select the drive for the installation.

NOTE: The boot device in the system BIOS and the OS installation device must match. The installer will create the system partition on the first bootable device set in the system BIOS.

Selecting Boot Drive when BBS=Controller:

If BBS is set to "Controller" in the Ctrl+A Configuration utility, only the first drive can be set as the bootable drive.

1. Power on the system, go to the Ctrl+A utility, select Controller Configuration, then set BBS Support=Controller.
2. Go to system BIOS setup menu, set CD/DVD ROM as the first bootable device and Controller as the 2nd bootable device in boot priority.
3. Boot from the OS DVD and load the HBA driver. The installer displays the drives in order. Select the 1st drive for OS installation. (You cannot select any other drive.)

3.12 Building the Open Source Drivers

For instructions for building and installing the Linux open source drivers, see 'pm80xx_build_procedure.txt', available at start.adaptec.com.

3.13 Resetting the Adapter

Adaptec Host Bus Adapters are reset using the HDA mode jumper on the controller board (see the user's guide for the jumper location on your HBA model). If a HDA reset is required, contact Adaptec Support for assistance.

4. Command Line Tool (Adp80xxapp)

The Adp80xxapp command line tool for Windows, Linux, FreeBSD, and VMware is available for download at start.adaptec.com.

NOTES:

- o The command line tool is not backward compatible with older Adaptec HBA driver releases. Adp80xxapp requires the latest drivers and firmware to operate correctly.
- o On Windows systems, Adp80xxapp requires Admin privileges.
- o The device driver must be installed prior to flashing an HBA with the command line tool.
- o The ADP 'phyerr' command is supported on Linux only.
- o The ADP 'phyerr' and 'phystatus' commands are not supported on Adaptec Series 6H HBAs.
- o For VMware and FreeBSD, command line support is limited to:
 - VMware: 'info' and 'fwflash' commands only
 - FreeBSD: 'info', 'fwflash', 'devlist', 'eventlog', error log dump (various), 'sgpio'

5. Known Limitations

5.1 Maximum Number of Adapters, Expanders, and Drives

Maximum Adapters:

With the Legacy BIOS (CTRL-A), you can install a maximum of TWO same-series Adaptec HBAs on one system (two Series 7 HBAs, two

Series 6 HBAs).

With the uEFI BIOS, you can install a maximum of FOUR same-series Adaptec HBAs on one system.

See Section 5.2 for more information.

Adaptec Series 7H/7He HBAs support a maximum of:

- o 32 drives with 2 expanders during physical drive discovery for CTRL-A
- o 8 bootable drives and 2 expanders during boot time (GSM discovery)

Adaptec Series 6H HBAs support a maximum of:

- o 32 drives with 2 expanders during physical drive discovery for CTRL-A
- o 4 bootable drives and 1 expander during boot time (GSM discovery)

NOTE: The HBA drivers and uEFI support 256 drives. However, the BIOS is limited to showing 32 drives only during physical drive discovery.

5.2 Mixing Series 7 and Series 6 Adapter Models

In this release, mixing Adaptec Series 7H/7He and Adaptec Series 6H HBAs in the same system is not supported. Doing so may cause the BIOS to hang on POST.

5.3 Formatting Limitations for Multiple Drives

You can format multiple SAS drives only in the BIOS. Formatting multiple SATA drives is not supported.

5.4 uEFI BIOS Not Available while Formatting a Drive

While formatting a drive with the uEFI BIOS, you cannot perform any other operation until the formatting is complete. Once formatting is complete, the BIOS responds normally.

5.5 HDDs Listed in Reverse Order on NewIsys Expanders

With Adaptec HBAs in NewIsys expanders, PHY numbers and slot numbers are listed in reverse order during POST; eg, 12-1 vs 1-12.j

5.6 Expander Slot Mapping Issues

Box/Slot information for Adaptec HBAs is reported incorrectly in some expanders. For Promise J830, DataOn DNS-1400SM, and Miramar 335SAS expanders, the Box/Slot information is shown as BoxFF/SlotFF for all slots, instead of Box00/Slot00, and so on. In other cases, the Box/Slot mapping is unpredictable.

5.7 Intel System Compatibility Issues

Intel BOXDX79SI motherboards are not supported.

5.8 Quantum Tape Drive Compatibility Issues

After issuing commands to mount and erase a Quantum TC-L52AN (LT05) tape drive, the drive hangs and the operation eventually aborts with the message "/dev/st0: Input/Output error".

5.9 No Activity LED for SATA Drives

With I/O running, the Activity LED blinks for SAS drives but not SATA drives.

5.10 Suspend/Resume Not Supported on Linux OSs

The driver does not support suspend/resume/hibernate for SAS devices on Linux or Linux/VMware OSs.

5.11 Drives Offline with Default Windows SAN Policy

With the default SAN Policy on Windows, a cold reboot leaves some disk drives (above drive 8) offline.

Workaround: Enter these commands at the Windows command prompt:

1. diskpart
2. san policy=onlineall
3. san

5.12 Drive Write Cache Settings

In this release, setting the drive write cache to enable/disable is limited to the OS tools for Windows and Linux. This feature is not available in the HBA BIOS.

From Windows:

1. Open the "Computer Management" console, then select "Device Manager".
2. Select "Disk Drives".
3. Double-click the drive you want to work with, then select "Policies".
4. Select/unselect "Enable write caching on the device", then click OK.
5. Reboot the system.

From Linux:

1. Login as root.
2. Type one of these commands:

```
/sbin/hdparm -W 0 /dev/hdX 0      # disable write caching
/sbin/hdparm -W 1 /dev/hdX 1      # enable write caching
```

where X is any logical drive on that system; a/b/c... etc

5.13 Hotplug Issues

- o In RHEL 6.4 x64, you must allow at least 20 seconds between hotplugging of disk drives.
- o When hotplugging two or more cascaded expanders, RHEL 6.3 will detect only one of the expanders. It fails to detect the others.

WORKAROUND: Upgrade to RHEL 6.4.

- o If FreeBSD (9.0/9.1, 32-bit) is booted from a disk attached to the HBA, the system hangs when a new disk enclosure is hot-plugged.

5.14 FreeBSD Hangs when No Devices on HBA

On FreeBSD systems, the OS fails to boot when no devices are connected to the HBAs.

WORKAROUND: Connect at least one device to the HBA to complete the boot process.

5.15 SGPIO LED Error Pattern

According to the SGPIO SFF-8485 specification, when the SGPIO code is set to 0x4 and 0x5, the Error indicator is Enabled, ie, set ODn.2 bit to 0. In practice, the Error indicator can be enabled only by setting ODn.2 bit to 1. Since the statement in the specification is contradictory, code values 0x4 and 0x5 are not recommended. Use Code 0x0 to disable the error indicator and code 0x1 to enable the indicator.

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