

Application Note

096

BSM firmware updates for PCoIP mezzanine host cards

This application describes how to update the Board Support Microcontroller (BSM) firmware on Amulet Hotkey PCoIP mezzanine host cards ('mezz cards') installed in 12G and 13G blade workstations.

Firmware updates are supported on PCoIP mezz cards running BSM firmware version 0.4.x or later.

Notes

- This application note uses the term 'host blade' when referring to the Amulet Hotkey DXM blade workstation hosting the mezz card.
- For details about BSM firmware updates on DXZ4 zero clients, see Application Note 59.

Procedure summary

Briefly, you can manually update the BSM firmware on a mezz card by downloading a firmware update package over your network to the target BSM.

The full procedure requires the following steps:

1. Obtain the BSM firmware update file. See [page 2](#).
2. (Optional) Find the current version of the BSM firmware. See [page 2](#).
3. Calculate the MAC address of the BSM. See [page 3](#).
4. Activate the BSM network interface to allow the BSM to acquire an IP address. See [page 4](#).
5. Transfer the firmware package to the target BSM. See [page 7](#).
6. Confirm that the BSM firmware was successfully updated. See [page 8](#).
7. Deactivate the BSM network interface to free up the IP address assigned to the BSM during the firmware upgrade. See [page 8](#).

1. Obtain the BSM firmware update file

You can obtain the BSM firmware update file from the Amulet Hotkey web site. For example:

For DXM13 mezz cards: FW-MHC4-0010_0_4_9.bsm

(Firmware for DXM13 mezz cards is listed on the Support > Resources > DXM630 page of the Amulet Hotkey web site.)

The Amulet Hotkey website lists the MD5 hash value for the firmware file. After downloading the file, use your preferred checksum tool to re-generate and verify the hash values and confirm that no errors occurred during the download.

Now find the current version of the BSM firmware. Continue to [section 2](#).

2. Find the current version of the BSM firmware

This step is optional.

If you want to know the current version of the BSM firmware before performing an update, follow these steps:

1. Verify that the host blade is powered on.
2. Log on to the Administrative Web Interface (AWI) for the PCoIP mezz card.
To access the AWI, browse to the IP address of the PCoIP mezz card.
3. Find the current version of the BSM firmware. This is recorded in the mezz card's event log:
 - a. From the AWI home page, choose Diagnostics > Event Log.
 - b. Click the Event Log Messages **View** button.
 - c. When the log file displays, search for *the final occurrence* of these log entries :

MCU : (tera_mcu_read_eeprom_content): Reading MCU EEPROM - Pass.

MCU : HWID: 0x85, Major/Minor FW: <0xNN>/<0xNN>, <MAC address>

These log entries start with 'MCU'. Within these entries, the current BSM version number is represented by the 2nd, 3rd and 4th digits of the FW: section (shown in red above).

For example, in this log entry the BSM firmware version number is **0.4.9**.

MCU : HWID: 0x85, Major/Minor FW: 0x80/0x**49**, MAC: 00:17:fd:50:00:20

You can now calculate the MAC address of the BSM. Continue to [section 3](#).

3. Calculate the MAC address of the BSM

To perform a BSM firmware update, you will need to discover the IP address of the BSM. However, you can only identify the BSM by its MAC address, so therefore you must first calculate the BSM’s MAC address. This is very simple.

Change ‘49’ to ‘A9’

The BSM’s MAC address derives from the MAC address of the Teradici processor on the mezz card. The BSM and Teradici MAC addresses are the same, except for the fourth octet (that is, the fourth group of two hexadecimal digits).

To obtain the BSM MAC address for a mezz card, simply convert the fourth octet of the Teradici MAC address from 49 to A9.

Example: If the Teradici MAC address is 00.17.FD.49.12.34, then the BSM MAC address is 00.17.FD.A9.12.34.

How to find the MAC address of the Teradici processor

Use your preferred administrative tools to identify the MAC address of the Teradici processor.

Note: *The Teradici MAC address is also printed on the mezz card serial number label and displayed on the mezz card’s Administrative Web Interface (AWI).*

Explanation of MAC address calculation

The fourth octet in the MAC address of the Teradici processor identifies the product type. For example, ‘49’ identifies the product as a PCoIP mezz card.

To calculate a product’s BSM MAC address, you simply add 60_{hex} to the fourth octet of the product’s Teradici MAC address. For mezz cards, the calculation is:

$$49_{\text{hex}} + 60_{\text{hex}} = A9_{\text{hex}}$$

The result forms the corresponding octet in the BSM MAC address. For example:

	Teradici MAC Address	Add 60 _{hex}	BSM MAC address
PCoIP mezz card	00.17.FD.49.12.34	➔	00.17.FD.A9.12.34

Tip: This 60_{hex} conversion works for all Amulet Hotkey PCoIP products. For example, on a DXZ4 zero client the Teradici MAC address is 00.17.FD.50.12.34, so adding 60_{hex} reveals the BSM MAC address to be 00.17.FD.B0.12.34.

You can now use the BSM’s MAC address to look up its IP address. Continue to [section 4](#).

4. Activate the BSM network interface and acquire an IP address

You now need to acquire an IP Address for the BSM firmware. You will use this IP address in [section 5](#) to transfer the firmware package to the BSM.

Note: The methods described below for activating and deactivating the BSM network interface require a temporary change to the mezz card's Ethernet Mode setting. Be assured that the mezz card's network settings and behaviour are unaffected by this process.

Note: There are two methods to determine the BSM IP address with the AWI, depending on the version of Teradici Host firmware you are using. Both methods are described below.

The method for updating firmware for versions after 4.9.0 is a simple process, outlined below.

For a full description, see the chapter '*Update the firmware*' in the DXZ4 [zero client manual](#).

For versions 4.9.0 and later:

1. Log on to the Administrative Web Interface (AWI) for the PCoIP mezz card.

To access the AWI, browse to the IP address of the PCoIP mezz card.

Note: *It does not matter whether the PCoIP mezz card is in a session or not. However, the host blade must be On, not in Standby mode*

2. From the home page, choose Configuration > Network.
3. Click the check box next to BSM network enable.
4. Restart the host blade.

When the blade restarts, the BSM network interface is active. The BSM now acquires an IP address from the DHCP server. This is displayed next to **BSM IP address:**

5. Go to section 5 and use the BSM IP address displayed.

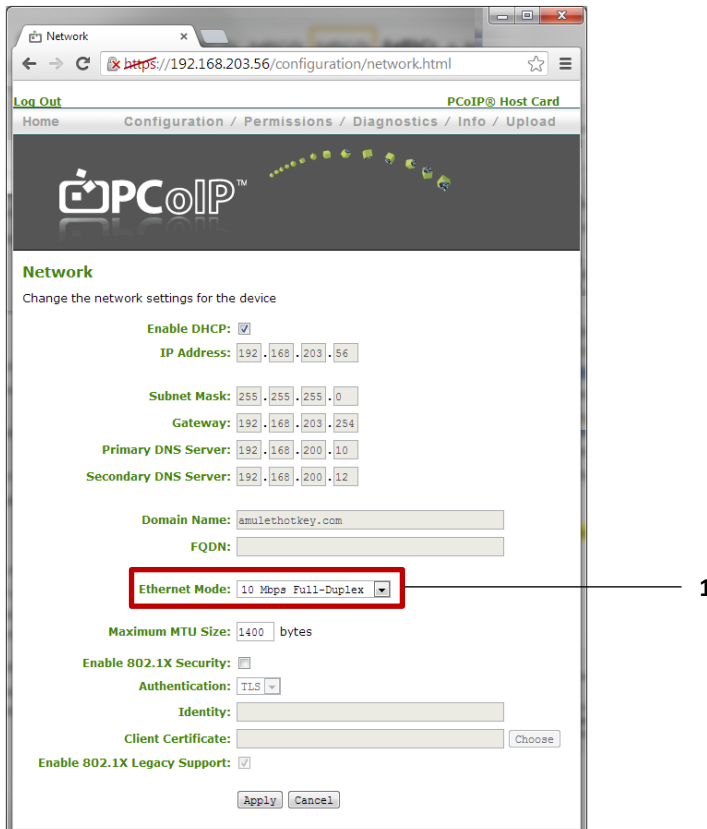
For Teradici firmware prior to 4.9.0:

1. Log on to the Administrative Web Interface (AWI) for the PCoIP mezz card.

To access the AWI, browse to the IP address of the PCoIP mezz card.

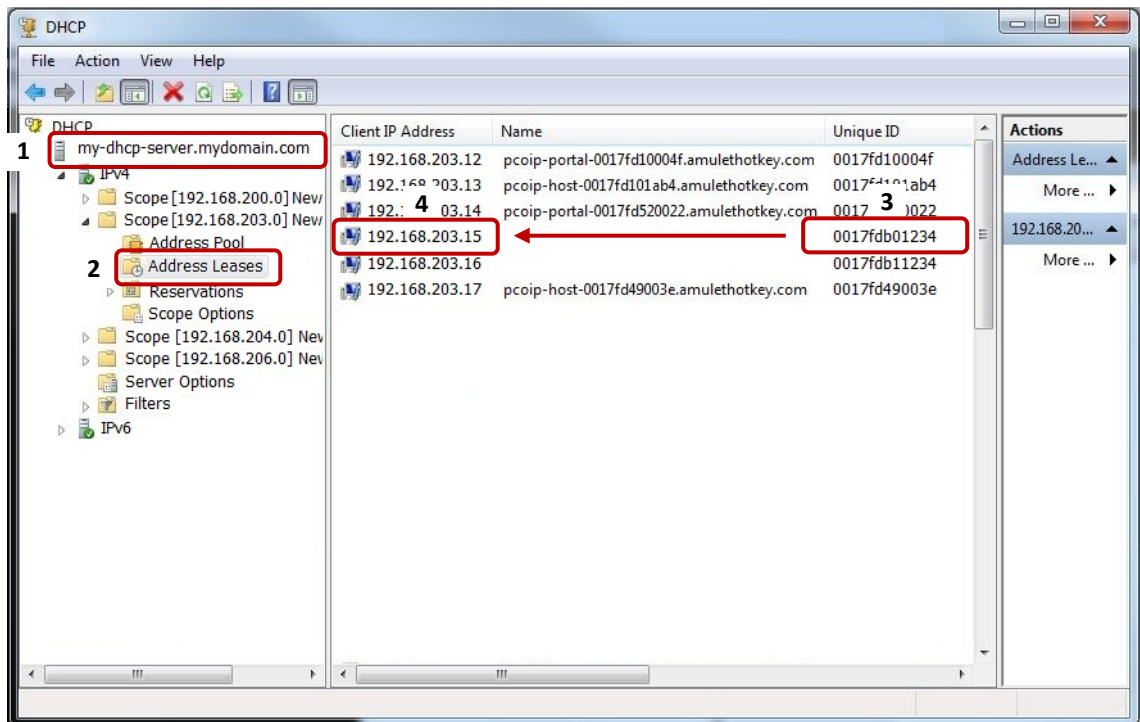
Note: It does not matter whether the PCoIP mezz card is in a session or not. However, the host blade must be On, not in Standby mode.

2. From the home page, choose Configuration > Network.
3. In the Ethernet Mode setting, choose '10 Mbps Full-Duplex' and click Apply.



AWI for PCoIP mezz card. Network page, Ethernet Mode setting (1)

4. Restart the host blade.
When the blade restarts, the BSM network interface is active. The BSM now acquires an IP address from the DHCP server.
5. Now determine the BSM IP address. The simplest method is to use the BSM MAC address to look up the BSM IP address in the DHCP console:
 - a. Launch the DHCP console.
 - b. In the left-hand pane, navigate to the **Address Leases** item for your DHCP server.
 - c. The right-hand pane displays the leased IP address for devices on this server.
 - d. Now locate the BSM. To do this, find the MAC address of the BSM in the **Unique ID** column.
Tip: To speed up your search, you can filter on the MAC address pattern. All Amulet Hotkey products have a MAC address starting with 00.17.FD.xx.xx.xx.
 - e. After locating the BSM, look up its associated IP address in the **Client IP Address** column.
Note: The BSM does not have a DNS name and so has no entry in the **Name** column.



DHCP console. 1 DHCP server. 2 Address Leases. 3 MAC address of BSM, listed in the Unique ID column. 4 IP address assigned to BSM.

Alternatively, if you are upgrading the firmware on multiple units you can automate this process. For example, you can use a script to discover Amulet Hotkey BSMs on your network, querying the ARP cache for known MAC address patterns. Amulet Hotkey Technical Support can offer guidance on this.

(The ARP cache is a collection of Address Resolution Protocol (ARP) entries that map IP addresses to MAC addresses.)

6. Shut down the host blade.

Now transfer the firmware package to the IP address of the target BSM. Continue to [section 5](#).

5. Transfer the firmware package to the target BSM

Use a TFTP server to transfer the .bsm file containing the firmware package. These instructions use the Tftpd32 utility as an example (available from <http://tftpd32.jounin.net/>).

Follow these steps:

1. Verify that the host blade is **Off**.
Important! Do not omit this step! The blade must be off in order to apply the BSM firmware update.
2. Launch the Tftpd32 utility.
3. When Tftpd32 starts, go to the 'Tftp Client' tab and enter the following settings:

Host: Enter the BSM IP address.

Port: Set to port 69. Note that:

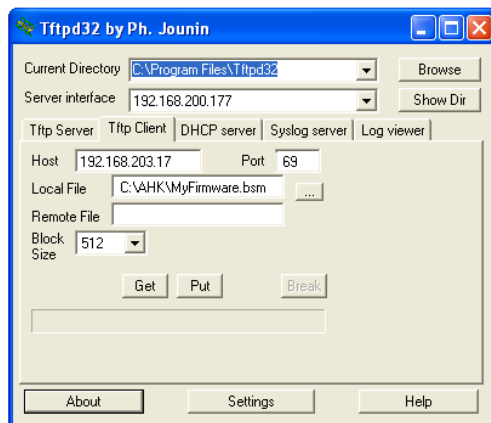
- Port 69 on the BSM is used to initiate the transfer. The actual port used during the transfer is randomly assigned.
- Your organization's routers and firewall may prevent TFTP connectivity across subnets. Verify that connectivity is permitted before proceeding.

Local File: Browse to the .bsm file containing the firmware update. You can retrieve this file from anywhere accessible on your network.

Remote File: Leave this setting blank.

Block Size: Set to 512 bytes.

4. Click Put to start the package transfer.
5. After the BSM receives and validates the package, the BSM restarts automatically.



Example TFTP utility: Tftpd32.exe

Now confirm that the firmware was updated. Continue to [section 6](#).

6. Confirm that the firmware was updated

Now check the log file to confirm that the firmware update was successfully applied.

Follow these steps:

1. Restart the host blade.
2. When the blade restarts, log on to the Administrative Web Interface (AWI) for the PCoIP mezz card.
To access the AWI, browse to the IP address of the PCoIP mezz card.
3. From the home page, choose Diagnostics > Event Log.
4. Click View Event Log Messages.
5. When the log file displays, search for log entries that start with 'MCU'. Within this log entry, the 2nd, 3rd and 4th digits of the FW: section (shown in red) indicate the current BSM firmware version:
MCU : HWID: 0x85, Major/Minor FW: <0xNN>/<0xNN>, <MAC address>
Your Amulet Hotkey contact can advise on the correct firmware version number.

Now deactivate the BSM network interface. Continue to [section 7](#).

7. Deactivate the BSM network interface

Finally, you must deactivate the BSM network interface to free up the IP address assigned in [section 4](#).

Follow these steps:

1. Log on to the Administrative Web Interface (AWI) for the PCoIP mezz card.
To access the AWI, browse to the IP address of the PCoIP mezz card.
2. From the home page, choose Configuration > Network.
3. In the Ethernet Mode setting, choose 'Auto' and click Apply.
4. Restart the host blade.

When the blade restarts, the BSM network interface is deactivated.

The BSM firmware update is now complete.

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