

## Application Note

059

### BSM firmware updates for the DXZ4 and DXZ4-M

#### Announcement: AN 059 superseded by DXZ4 Manual

BSM firmware update instructions are now included in the *DXZ4 Manual*, available for download to registered users on the Amulet Hotkey web site <https://resources.amulethotkey.com/resources>

Consequently, application note 059 will no longer be updated. Please refer to the *DXZ4 Manual* to ensure you have the latest firmware update instructions.

### Overview

Amulet Hotkey T2 PCoIP hosts and zero clients now support remote updates for Board Support Microcontroller (BSM) firmware. Specifically, you can now update the BSM firmware by downloading a firmware update package over your network to the target BSM.

Firmware updates are supported on T2 zero clients running BSM firmware version 0.4.x or later.

The update process has four stages. First, you activate the BSM network interface to allow the BSM to acquire an IP address. Second, you transfer the firmware package to the target BSM. Third, you confirm that the package was successfully applied. Finally, you free up the IP address assigned to the BSM during the firmware upgrade.

**Note:** For details about BSM firmware updates on:

- DXH4 and DXP4 PCoIP hosts, see Application Note 083.
- PCoIP mezzanine host cards in 12G and 13G blades, see Application Note 096.

### Procedure summary

To manually update the BSM firmware on an individual DXZ4 or DXZ4-M zero client, you must:

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 and acquire an IP address; see [page 4](#).
5. Transfer the firmware package to the target BSM; see [page 6](#).
6. Confirm that the BSM firmware was updated; see [page 7](#).
7. Deactivate the BSM network interface; see [page 7](#).

## 1. Obtain the BSM firmware update file

You can obtain the BSM firmware update file from Amulet Hotkey:

**For DXZ4 and DXZ4-M:** FW-DXZ4-0010\_0\_4\_7-GA.bsm

The Amulet Hotkey website lists the MD5 and SHA-1 hash values 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 DXZ4 is powered on.
2. Log on to the Administrative Web Interface (AWI) for the DXZ4.  
To access the AWI, browse to the IP address of the DXZ4.
3. Find the current version of the BSM firmware. This is recorded in the zero client'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\_eeeprom\_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 BSM version number is represented by the 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> digits of the **FW: <0xNN>/<0xNN>** string.

For example, in this log entry the BSM firmware version number is **0.4.7**.

MCU : HWID: 0x85, Major/Minor FW: 0x80/0x47, 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.

The BSM's MAC address derives from the MAC address of the Teradici processor on the DXZ4. The BSM and Teradici MAC addresses are the same, except for the fourth group of two hexadecimal digits:

1. Using your preferred administrative tools, identify the MAC address of the Teradici processor.

**Note:** The Teradici MAC address is also printed on the DXZ4 serial number label and displayed on the zero client's Administrative Web Interface (AWI).

2. Add 60<sub>hex</sub> to the fourth group of two hexadecimal digits of the Teradici MAC address. For example:

$$42_{\text{hex}} + 60_{\text{hex}} = A2_{\text{hex}}$$

The result forms the corresponding digits in the BSM MAC address. See the following examples of MAC address conversions:

	Teradici MAC Address	Add 60 <sub>hex</sub>	BSM MAC address
<b>DXZ4</b>	00.17.FD. <b>50</b> .12.34	➔	00.17.FD. <b>B0</b> .12.34
<b>DXZ4-M</b>	00.17.FD. <b>51</b> .12.34	➔	00.17.FD. <b>B1</b> .12.34

**Tip:** All Amulet Hotkey products have a MAC address starting with 00.17.FD.xx.xx.xx. The fourth octet in the MAC address identifies the product type. In the examples above, '50' identifies the product as a standard DXZ4 unit, while '51' identifies a modular DXZ4-M unit.

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.

In order to acquire an IP address, we currently use a Teradici power feature to temporarily activate the BSM network interface for the duration of the update process.

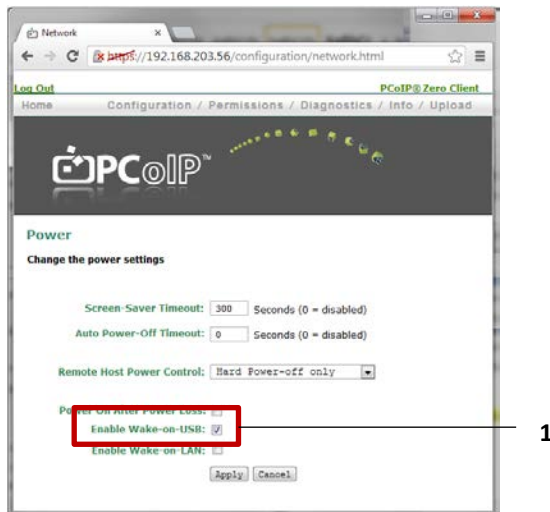
**We apologise!** The methods described here for activating and deactivating the BSM network interface are temporary workarounds. In future releases, we aim to replace these methods with a designed solution that streamlines the firmware update process.

Follow these steps:

1. Log on to the Teradici *PCoIP® Zero Client* web application. (This web application uses the same IP address as the PCoIP session.)

**Note:** It does not matter whether the zero client is in a session or not. However, the zero client must *not* be in Standby.

2. From the home page, choose Configuration > Power.
3. Select the 'Enable Wake-on-USB' check box.



*Teradici PCoIP Zero Client web application, Power page: Enable Wake-on-USB check box (1)*

4. Verify that the target zero client is **On**.
5. Click Apply. The BSM now acquires an IP address from the DHCP server.

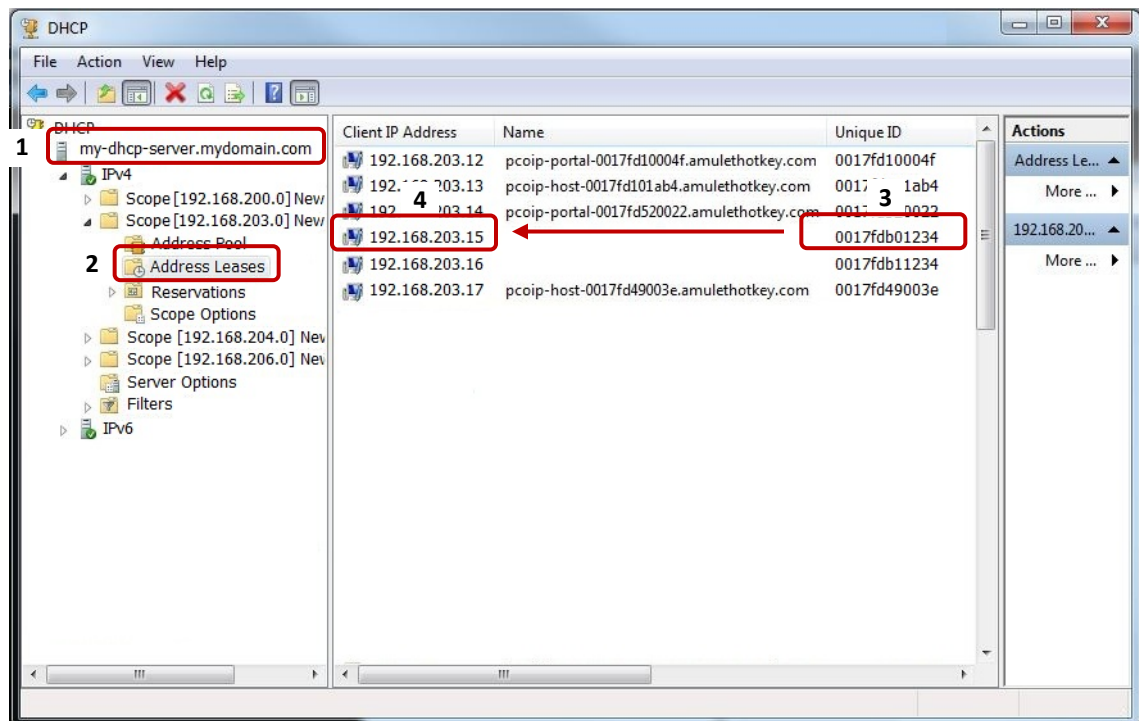
6. Now determine the BSM IP address. There are various ways to do this.

The simplest method is to use the BSM MAC address to look up the BSM IP address in the DHCP console. For example:

- 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.)

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 target zero client is **On** or in **Standby**.
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.

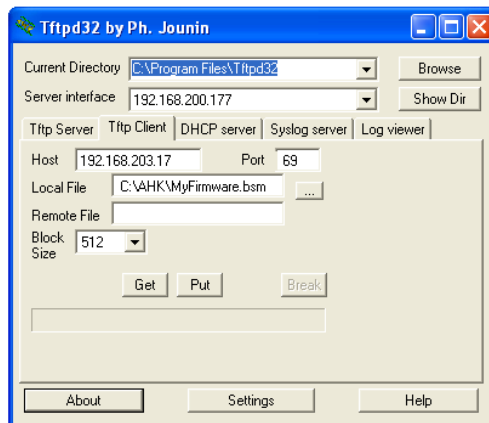
**Port:** Set to port 69. Note that port 69 on the BSM is used to initiate the transfer. The actual port used during the transfer is randomly assigned.

**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. The zero client restarts automatically after a successful upgrade.  
**Note:** If the zero client was On and in a session while the firmware was updated, it automatically restarts after the session has ended. The zero client does not apply the new firmware until it restarts.
2. When the zero client restarts, log on to the Teradici web application again.
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 FW: section (shown in **red**) indicates 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.

Finally, you must 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. Verify that the target zero client is **On**.
2. Log on to the Teradici *PCoIP® Zero Client* web application.
3. In the Teradici web application, choose Configuration > Power.
4. Clear the 'Enable Wake-on-USB' box.
5. Click Apply to deactivate the BSM network interface immediately.

The BSM firmware update is now complete.

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