



Application Note

Upgrading ePipe Firmware

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1 Introduction

ePipe periodically releases updates to the ePipe firmware to add new features to the ePipe and fix bugs or other problems. To allow this, ePipe's operating system image is held in a type of erasable memory commonly called flash memory. Flash memory is memory based on an erasable and programmable memory technology. This allows you to "flash" ePipe and perform upgrades without removing and replacing memory or ROM chips on the ePipe circuit board. Flash memory does not require power or batteries and the information in flash memory is retained even when ePipe is turned off.

There are two methods of upgrading the ePipe firmware:

1. **Use the ePipe CLI (Command Line Interface) and a TFTP server**

You will need to download the firmware image from the ePipe web site (<http://www.ml-ip.com/>).

2. **Use the ePipe Management Assistant and a TFTP server**

You will need to download the firmware image from the ePipe web site (<http://www.ml-ip.com/>).

Before performing a firmware upgrade, please take note of the following important information:

Firmware is periodically released by ePipe and is available from the ePipe web site in the Support area. Please check the web site for the latest firmware release prior to upgrading your ePipe.

During the firmware upgrade the following events occur:

1. ePipe unit reboots for the first time.
2. ePipe unit downloads the firmware and checks the validity of the file.
3. ePipe unit downloads the firmware for a second time. ePipe erases its flash memory in preparation for writing the new firmware image into flash memory and then writes the firmware image into flash memory.
4. ePipe unit reboots for the second time, and is now running the new firmware.

NOTE: Due to the fact that the ePipe unit will reboot during the upgrade process, you can only upgrade the firmware via Ethernet 1, not via any other link such as a dial-up modem, ADSL service or any other Ethernet port. Ethernet 1 should always be used to connect the ePipe to your internal LAN.

CAUTION: Never terminate the update process once it has been started. Always allow the firmware upgrade process to complete or recover itself. If the upgrade process stops half way through, data in the flash ROM may be corrupted. The ePipe unit may not be able to start up; if so, send the unit back for repair.

SPECIAL NOTE: RE: 2.3.X Firmware (and later)

When upgrading from 1.x.x firmware to 2.3.x (or later) firmware for the first time, four (4) downloads of the binary firmware image file will be performed. Therefore, do NOT use the eFlash utility to upgrade ePipe units to 2.3.x (or later). Only use a TFTP server and option 1 or option 2 (above).

SPECIAL NOTE: RE: Users Upgrading from firmware version 1.0.8 or lower

When upgrading from firmware version 1.0.8 or lower up to 2.3.x – be aware that you must perform an incremental upgrade. Upgrade to firmware version 1.0.9 first and then follow the same procedure to upgrade to version 2.3.1. The special note given above still applies – do not use the eFlash utility.

2 Upgrading Firmware via the ePipe Management Assistant and a TFTP server

ePipe supplies firmware updates as binary flash firmware image files which can be downloaded directly into the ePipe from a TFTP server. To be able to do this you must already have a functioning TFTP server on your network. Most UNIX operating systems have a TFTP server, although it may not be ready for use until it is configured. Windows operating systems are not supplied with a TFTP server, however there are third party TFTP servers that can be downloaded from the Internet. An easy to use example of a TFTP server for Windows is "Pumpkin" from Klever Group, Inc. (<http://www.klever.net/>)¹. Please view section 7 in this document for notes on configuring Pumpkin. For extra information on configuring your chosen TFTP server, consult your TFTP server or operating system documentation.

The ePipe Management Assistant is the internal configuration software of the ePipe and can be accessed using any JavaScript-enabled web browser by browsing to the ePipe's IP address.

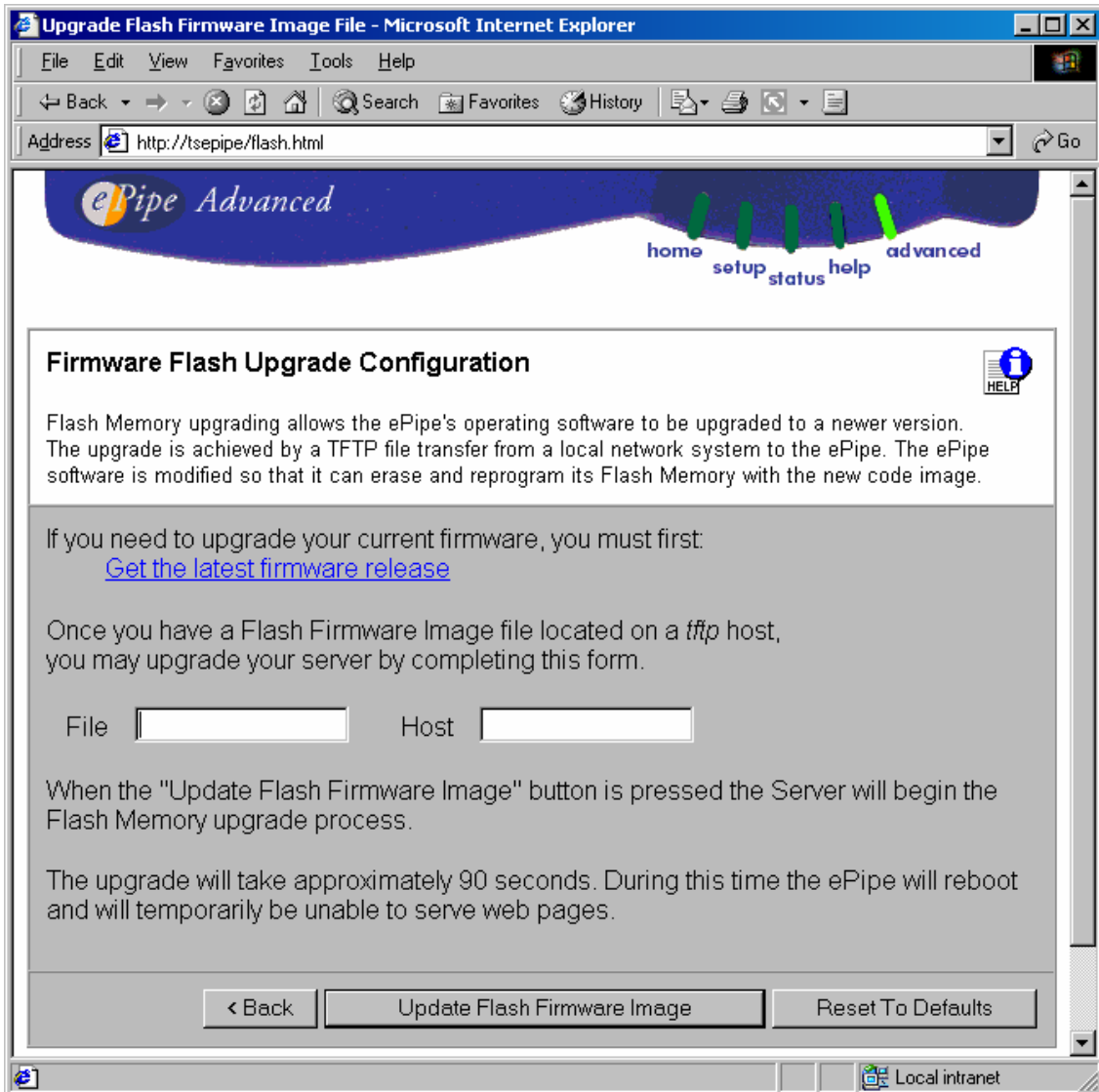
Follow these steps to upgrade your ePipe using a TFTP server and the ePipe Management Assistant:

1. Ensure your TFTP server is operational and files can be downloaded from the server's download directory.
2. Download the flash firmware image file from the ePipe web site (<http://www.ml-ip.com/>) and copy it to the download directory of your TFTP server. All downloads are available from the download options in the Support area. The name of the file will be similar to "epipe2X00-flash-NNN.bin" where X is 1, 2 or 3 (representing the 2100, 2200 or 2300 series of ePipe) and NNN is the firmware version number. E.g. epipe2200-flash-109.bin is the file name of the firmware image for a 2200 series ePipe with version number 1.0.9.
3. Using a web browser, browse to the ePipe's IP address and navigate to the Advanced page. If you are prompted to login, provide the name and password of a privileged user. The default privileged user is "root" and the default password is "system".
4. Select the "Update" option at the bottom of the Advanced page. The figure below shows the page that will be displayed.
5. On the "Firmware Flash Upgrade Configuration" page, type in the name of the firmware image file and the IP address of your TFTP server in the spaces provided ("File:" and "Host:" respectively). When finished, click on the "Update Flash Firmware Image" button.

NOTE: Once the "Update Flash Firmware Image" button has been pressed, the ePipe will immediately reboot and start the firmware upgrade process. This will disconnect all users and other connections.

6. After about 90 seconds, the firmware upgrade process should have finished and the browser should load the ePipe's home page. You can also click on the "Refresh" button on this page to manually load the ePipe home page. (Note that the "Refresh" button does NOT refer to the browser's refresh button.)

¹ NOTE: ePipe makes no warranty, either expressed or implied, as to the usefulness or capabilities of any software herein mentioned. Use of any software referred to in this document is at the sole discretion of the reader.



This completes the upgrade. See "Viewing the Firmware Upgrade Process" for problem diagnosis or "Checking the Current Firmware Version" to check the revision of firmware before and after the upgrade.

3 Upgrading Firmware via the ePipe CLI and a TFTP server

ePipe also supplies firmware updates as binary flash firmware image files which can be downloaded directly into the ePipe from a TFTP server. To be able to do this you must already have a functioning TFTP server on your network. Most UNIX operating systems have a TFTP server, although it may not be ready for use until it is configured. Windows operating systems are not supplied with a TFTP server, however there are third party TFTP servers that can be downloaded from the Internet. An easy to use example of a TFTP server for Windows is "Pumpkin" from Klever Group, Inc. (<http://www.klever.net/>)². Please view section 7 in this document for notes on configuring Pumpkin. For extra information on configuring your chosen TFTP server, consult your TFTP server or operating system documentation.

Follow these steps to upgrade your ePipe using a TFTP server and the CLI (Command Line Interface):

1. Login to the ePipe via the console port or via a telnet session as a privileged user. The default privileged user is "root" and the default password is "system".

If you login via the console port you will need a dumb terminal or terminal emulation software on your PC to access the console and it will need to be configured at the following serial communication parameters:

Speed:	9600 bps
Data bits:	8
Parity:	None
Stop bits:	1
Flow control:	Software (XON/XOFF)

NOTE: If you login via a telnet session, you will not be able to see the progress of the firmware upgrade process. You will need to use the ePipe console port to see the upgrade status information. (See Section 5, below.)

2. Type in the following command to configure the ePipe for the upgrade. Note that the upgrade will not start until the ePipe is rebooted.

```
>> DEFINE SERVER FLASHFILE file_name HOST ip_address TRACE ENABLED
```

Where: file_name is the name of the firmware image file on the TFTP server.
ip_address is the IP address of the TFTP server.

3. Reboot the ePipe using the "REBOOT" command. The reboot will happen immediately and all active users and connections will be disconnected. Once the ePipe has started, the upgrade process will commence. The ePipe will download the firmware from the TFTP server twice and, once the firmware has been written to flash memory, the ePipe will reboot for the second and last time. If you are using the console port then you will see the progress of the upgrade.

This completes the upgrade. See "Viewing the Firmware Upgrade Process" for problem diagnosis or "Checking the Current Firmware Version" to check the revision of firmware before and after the upgrade.

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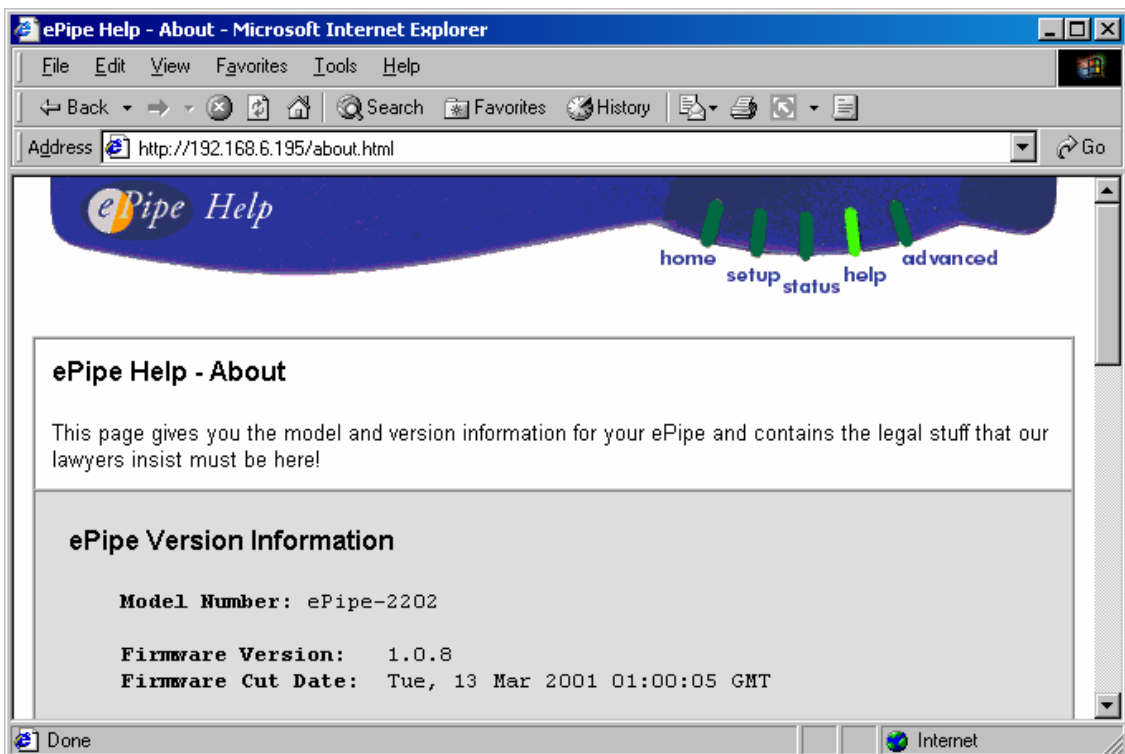
5 Checking the Current Firmware Version

Before a firmware upgrade is started, it is important to check the current version of firmware in the ePipe. When using either of the upgrade methods requiring a TFTP server, the upgrade process does not check or show the current firmware version in the ePipe, so it is important to check the current version prior to doing the upgrade.

There are several ways to check the current version of firmware in the ePipe.

5.1 Using the ePipe Management Assistant

You can check the current version of firmware at any time by simply browsing to the ePipe and navigating to the Help > About page. This will display a page similar to that displayed below.



Note that the model and firmware version are shown.

5.2 Using the CLI

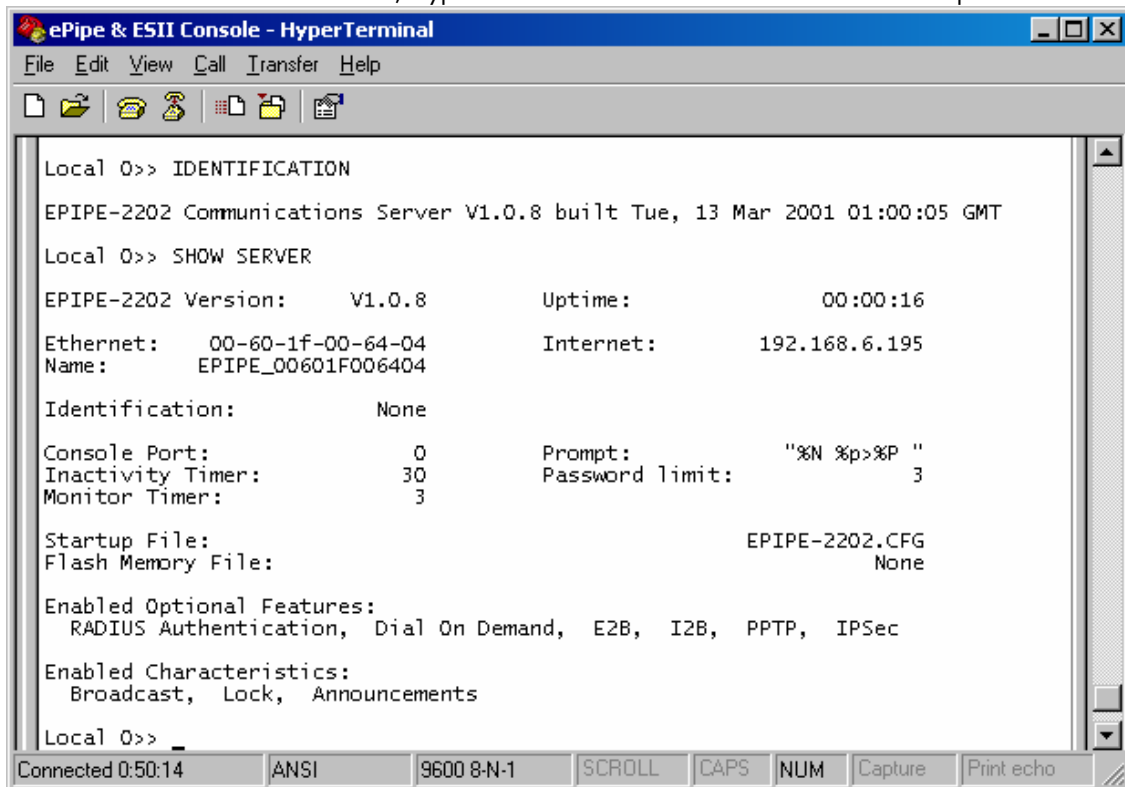
You can check the current version of firmware at any time by using the ePipe CLI (Command Line Interface). The CLI can be accessed via a telnet session or via the console port of the ePipe. Simply login as a privileged user and run either of the following commands:

```
>> IDENTIFICATION
```

OR

```
>> SHOW SERVER
```

The diagram below shows a sample of the output you would expect to see. The output of both commands is shown. In this case, HyperTerminal was used to access the console port.



```
ePipe & ESII Console - HyperTerminal
File Edit View Call Transfer Help
Local 0>> IDENTIFICATION
EPIPE-2202 Communications Server V1.0.8 built Tue, 13 Mar 2001 01:00:05 GMT
Local 0>> SHOW SERVER
EPIPE-2202 Version:      V1.0.8           Uptime:                00:00:16
Ethernet:      00-60-1f-00-64-04      Internet:      192.168.6.195
Name:          EPIPE_00601F006404
Identification:      None
Console Port:      0           Prompt:      "%N %p>%P "
Inactivity Timer:  30          Password limit: 3
Monitor Timer:    3
Startup File:      EPIPE-2202.CFG
Flash Memory File:      None
Enabled Optional Features:
  RADIUS Authentication, Dial On Demand, E2B, I2B, PPTP, IPSec
Enabled Characteristics:
  Broadcast, Lock, Announcements
Local 0>> _
Connected 0:50:14  ANSI  9600 8-N-1  SCROLL  CAPS  NUM  Capture  Print echo
```

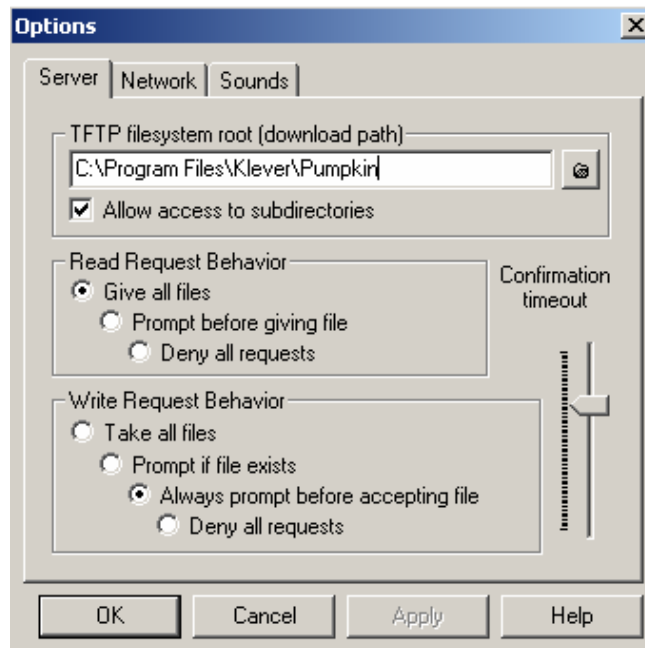

6 Common Problems

If you are having problems upgrading the firmware of your ePipe, read the following list of problems and solutions for assistance.

Problem	Explanation/Solution
Cannot see any progress information on the console when doing a firmware upgrade.	<ul style="list-style-type: none"> • This is most likely due to the 'trace' option not being enabled on the CLI. • This may also be due to a communications problem between the console port and the terminal. Check the serial port configuration of your terminal and the cable between the terminal and the ePipe console port. • Ensure that the terminal or terminal emulation software you are using is 'connected' to the ePipe console port. You can test this by logging into the ePipe to ensure communication to the console port is working correctly.
Connection refused message like: TFTP: rcvfrom: Connection refused	<ul style="list-style-type: none"> • This is typically due to an incorrect IP address or name specified for the TFTP server. Check the IP address or DNS/host name of your TFTP server and try again. • This could also be due to the TFTP server not being enabled or not functioning properly on the host. Check that your TFTP server is working correctly.
File error message like: FLASH file "<file_name>" not readable.	<p>This is a generic error and could be due to any of the following problems:</p> <ul style="list-style-type: none"> • TFTP server is not enabled or working. • The file name to be downloaded is not correct or the file is not located in the TFTP server's download directory. • The IP address or DNS/host name specified for the TFTP server may be incorrect.
File error message like: TFTP: file "<file_name>" not found	<p>This error indicates the specified file cannot be found by the TFTP server and usually is caused by an incorrectly specified firmware file name or the firmware file not being present in the TFTP server's download directory.</p>
File Error message like: FLASH Memory file is not a valid image.	<p>This is caused by the firmware image file on the TFTP server being corrupt or the incorrect file is being downloaded to the ePipe. ePipe does an integrity check on the firmware image before writing the firmware into flash memory. If this check fails this error will be displayed.</p>
File Error message like: FLASH Memory file download failed too many times.	<p>This is a generic message indicating several attempts have been made to download a firmware file, all of which failed. The ePipe will then reboot into the original firmware. This message is shown at the end of the upgrade attempt. Other errors will indicate the actual problem.</p>
Error message like: TFTP: send: No route to host	<p>This problem is caused by the ePipe attempting to download a file from a host that it does not have a route to. This is usually caused by an incorrectly specified IP address or by the user attempting to download the firmware from a TFTP server on another IP subnet. Try upgrading the ePipe from a TFTP server located on the same IP subnet as the ePipe.</p>

7 Notes on configuring the Pumpkin TFTP Server

An easy to use example of a TFTP server for Windows is "Pumpkin" from Klever Group, Inc. (<http://www.klever.net/>)³. When configuring the Pumpkin TFTP server we recommend that you set the "Read Request Behaviour" to "Give all files". Otherwise the download of the flash image will timeout if the prompt from Pumpkin is not answered quickly enough.



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