
TB9100 base station

Upgrading Firmware using TFTP



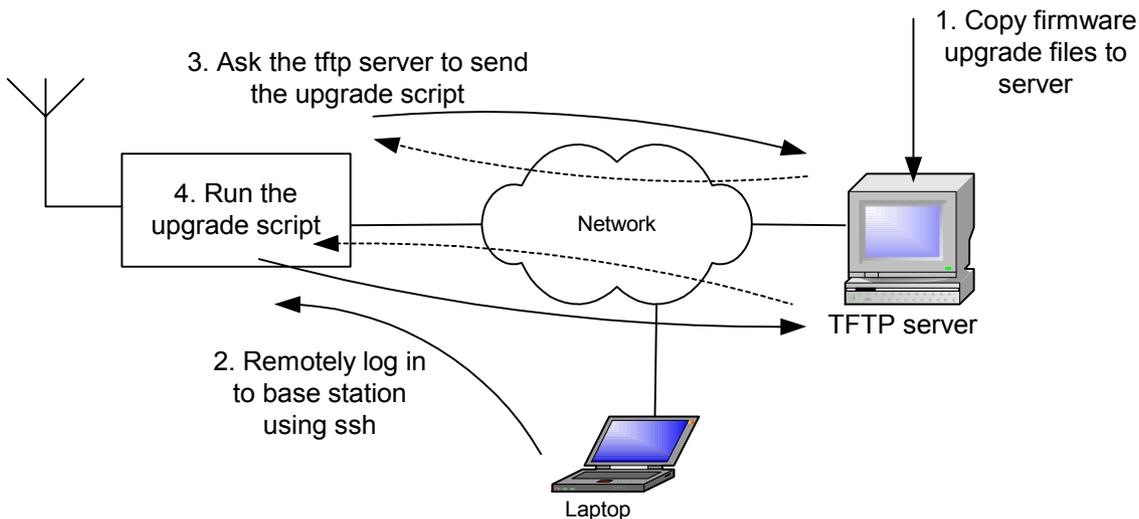
Normally, TB9100 base station or analog gateway firmware is updated using the CSS. However, if the operating system kernel and/or application firmware not handled by the CSS need updating, this can be done remotely using SSH and TFTP, as described below. TFTP can also be used if the base station is unable to communicate with the CSS. If the bootloader needs updating, the reciter must be returned to the factory.

The following matrix indicates which procedure to follow for different versions. All version changes provide new application firmware as well as a new operating system kernel.

Current version	Desired version	Procedure	Comments
2.0x	2.1x	TN-977b (this technical note)	ssh access.
1.2x	2.0x	TN-977a	telnet access initially, ssh access after upgrading.
1.2x	2.1x	TN-977b (this technical note)	telnet access initially, ssh access after upgrading. If necessary, see TN-977a for assistance on telnet access.
2.1x	2.0x	TN-977a	

Overview

The TFTP upgrade procedure described in this technical note has been simplified by the use of an upgrade script. The process involves the following main steps.



1. Copy the required files to the TFTP server.
2. Remotely log in from your PC to the base station, so that commands you enter at your PC are processed by the base station.

3. From the PC, instruct the base station to ask the TFTP server to send the file 'upscript.'
4. Instruct the base station to run the 'upscript' file. This supervises the loading of the kernel and file system files, and then asks the bootloader to restart the network board.

Equipment Required

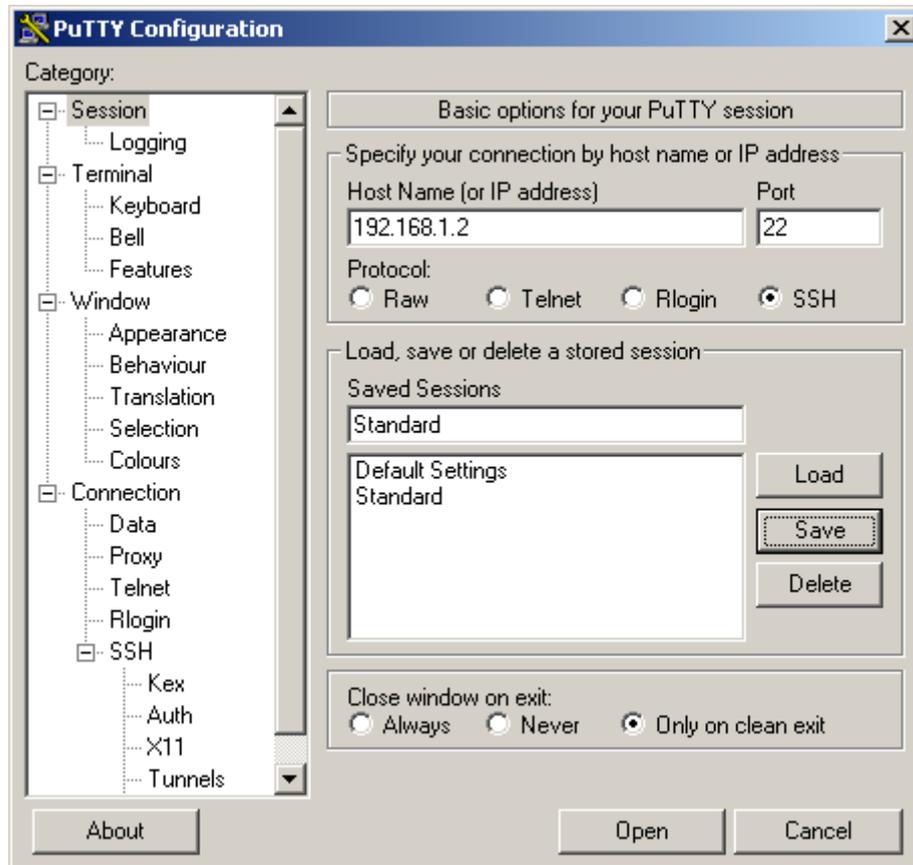
You need the following:

- Firmware images and the upgrade script 'upscript' from the product CD.
- A TFTP server. You can search the Web and select a suitable one, for example http://solarwinds.net/Tools/Free_tools/TFTP_Server.) Install the server on your PC or on a suitable network location.
- SSH client software, for example PuTTY (see <http://www.putty.nl/download.html>).
- 9-way straight through cable

Step 1: Preparation

1. Using the CSS, connect to the base station.
2. Read the base station configuration and save it to a file. You will need to restore the configuration after the firmware upgrade.
3. From the Software folder on the product CD, copy firmware.exe to your computer and execute it. This unpacks all firmware files, putting the ones that needed to be upgraded via TFTP in their own subfolder.
4. Run the TFTP server program.
5. Set the server's security configuration to receive and transmit, so that files can be transferred. (To do this to the SolarWinds server, select File > Configure and then the Security tab.)
6. Specify the server's root directory. This is the directory for the files that the server will transfer. (To do this to the SolarWinds server, select File > Configure.)
7. Copy the files to the TFTP server's root directory.
8. Make sure that there is a network connection between your PC and the base station.
9. Set up a remote connection to the base station, as follows.
 - a. Run PuTTY.
 - b. Enter the base station's IP address or hostname.
 - c. Select the SSH protocol

- d. If desired, save your settings for future use.
- e. Click **Open**.



- f. At the login prompt, enter the user name (root) and then the password (default is k1w1).
- You are presented with the Linux prompt (#).

Step 2: Copy your current environment values

At the # prompt, enter `envread`, and then copy the display into Notepad and save it. This record of environmental values is only needed if problems arise.

Step 3: Change the network parameters

You may need to change parameters such as the netmask, gateway IP address or the reciter IP address, if the base station has been taken out of its normal environment.

Step 4: TFTP the upgrade script

From the # prompt, type the following and then press Enter:

```
cd /tmp
tftp -l upscript -r upscript -g <TFTP server IP address>
```

Note -l is the letter 'l' not the number '1'.

Note The SolarWinds TFTP server displays the IP address on the right-hand side of the status bar. If you are using another server program, you can find out the IP address by running ipconfig from the DOS prompt:

If the network board can find the TFTP server, it will obtain the script file. When it has done this, enter the following:

```
chmod +x upscript
```

Step 5: Run the upgrade script

From the # prompt, type the following and then press Enter:

```
/tmp/upscript <TFTP server IP address>
```

This runs the newly obtained script, which supervises the loading and programming of the kernel and file system files, and then asks the bootloader to restart the network board.

Answer 'y' to each question.

Wait for around five minutes after the script has completed (for the base station to reboot) before proceeding with the next step.

Step 6: Reconnect to the base station

When the base station rebooted, it ended your SSH session.

1. Run PuTTY again.
2. Connect to the base station.
3. If you cannot connect, wait and try again. Rebooting after a TFTP upgrade can take up to 15 minutes.

On successful connection, the following error appears, because the upgrade overwrote the security key:



4. Click **Yes**.

Step 7: Restore the original network parameters

Once you have established that the base station is operating correctly, any network parameters that were changed should be restored. The script defined a server IP address and this needs to be cleared. If you changed any other network parameters, restore the original settings from the notepad file you saved.

1. Enter the following command:
`envedit serverip`
2. Enter commands to restore any other parameters such as the reciter's IP address.

Step 8: Use the CSS to complete the upgrade

The TFTP process only upgrades firmware in the reciter network board. The rest of the base station firmware must be upgraded using the CSS.

1. Run the CSS and connect to the base station.
2. Carry out a firmware download.
3. Program the base station with the configuration you saved in step 1 [on page 3](#). (This must be done manually after a TFTP firmware upgrade.)

Troubleshooting

This firmware upgrade procedure is robust; it can survive failure of the remote link and loss of the TFTP server. However, it cannot survive mistyped file names. For the unlikely event that you actually have difficulties, the following tips aim to give assistance.

- If the link goes down or the TFTP server crashes, you may need to wait for up to two minutes after the situation has recovered before seeing anything in the TFTP log.
- If nothing appears in the TFTP server log even though the base station can ping the TFTP server, there is a problem at the base station. You need to go to the site and recover the base station, see [“Recovering from a failed TFTP upgrade” on page 7.](#)
- The TFTP server may not alert you if it times out before the transfer is complete. Check the size of the transferred file; it should be about the same as the properties for the file. (Right-click the file and select Properties to get its size in bytes.) If it is smaller, wait for the base station to ask the TFTP server to resend.

Recovering from a failed TFTP upgrade

If the TFTP upgrade has not completed, you are unable to remotely connect to the base station. You will need hyper terminal or tera-term (whichever you are comfortable with). Go to the site and follow these steps.

1. Create a connection at 57600 baud, 8 bits, no parity, no flow control on COM1 of a PC.
2. Connect the PC COM1 to the serial port on the reciter in the TB9100 with a straight through PC cable.
3. Power cycle the Base Station and then keep hitting the enter or space key until you get a prompt like this:

=>

4. Type:

```
set bootcmd 'run flash_jff'  
save  
reset
```

5. You should now be able to connect into the base station using ssh and restart the tftp upgrade process.

If you notice that the base station has started to tftp the kernel again, you have missed the opportunity to get into the bootloader (like setup on a PC) and need to power-cycle the base station again.

Quick Reference

A summary of the steps to carry out, for those who are already familiar with the procedure. Change the TFTP server IP address and the file names as needed.

1. Using the CSS, save the base station configuration.
2. Connect to the base station using SSH.
3. Enter `envread`. Copy the display into Notepad and save it.
4. Enter the following

```
cd /tmp
tftp -l upscript -r upscript -g <TFTP server IP address>
chmod +x upscript
/tmp/upscript <TFTP server IP address>
```
5. Re-connect to the base station using SSH.
6. Enter the following:

```
envedit serverip
```

Restore any changed network parameters.
7. Close the SSH connection.
8. Run the CSS and carry out a firmware download.
9. Open the saved configuration and load it back into the base station.

Publication Information

Issuing Authority This TN was issued by: Kurt Ebrecht
Technical Publications Manager

Distribution Level Tait Only

Publication History

Publication Date	Author
8 April 2005	R Gilks/R Searle/L Chisholm
18 May 2005	A McHaffie/R Searle/L Chisholm
15 June 2005	L Chisholm
15 August 2005	L Chisholm
19 December 2005 (TN-977a)	L Chisholm
1 May 2006 (TN-977b)	L Chisholm

Amendment Record

Publication Date	Page	Amendment
19 December 2005 (TN-977a)		Remote connection using SSH. Setting bootloader password. Text specific to version 2.0x. Quick Reference added.
1 May 2006 (TN-977b)		Modifications reflecting the use of the script 'upscript'. TN now applies to upgrades to version 2.1x and above.

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