Guideline - Upgrade from old NetBSD version (V.2)

Introduction

Starting from version 2.0.0, 7800/570FC and 7801FC are able to run on Linux operating system and is loaded by uboot boot loader. This new version supports all the existing features of 7800/570FC and 7801FC and will add more features as required. In addition, software running with Linux version has been improved and optimized significantly in terms of stability, availability and expansibility. In order to upgrade FC firmware from old NetBSD version to the new Linux version, the bridge firmware is created for each Linux version release. The bridge firmware runs on Linux operating system but is loaded by ppcboot loader, which enables FC to recover ppcboot environment variables when upgrading to the Linux+uboot version. The bridge firmware is **ONLY** used for upgrading old NetBSD version firmware to the final Linux version firmware. Although bridge firmware has the same functionalities as the final Linux version firmware except persistent data store/restore capability, users have to take the next step to upgrade the FC to use final Linux version firmware. Table1 and Table2 give the description of the old/new firmware.

Table1. 7800FC/570FC firmware description

Old NetBSD version firmware	7800FC_570FC_1v5_b88.bin	This is old 7800FC/570FC firmware. It runs on NetBSD 5.1 operating system and is loaded by ppcboot loader. To migrate to LinuxFC, one shall upgrade the NetBSD FC to use 1v5b88 version.
Bridge firmware	7800FC_570FC_bridge 2v7b2.bin	This is the bridge firmware that is only used for upgrading from old firmware (NetBSD+ppcboot) to the new firmware (Linux+uboot). The bridge firmware runs on Linux operating system but is loaded by ppcboot boot loader. Note, the Linux version 2.7.2 and above shall be used if the IP address and hostname set in NetBSD FC are required to be carried over the LinxuFC.
Final Linux version firmware	7800FC_570FC_2v7b2.img	This is the formal released Linux version firmware that runs on Linux operating system and is loaded by uboot boot loader.

Table2. 7801FC firmware description

Old NetBSD version firmware	7801FC_V1_5_B35.bin	This is old 7801FC firmware. It runs on NetBSD 5.1 operating

		system and is loaded by ppcboot loader.
Bridge firmware	7801FC_bridge_V2_7_B2.bin Or 7801FC_bridge_V2_7_B2_5700MSC.bin (For 5700MSC_IP only)	This is the bridge firmware that is only used for upgrading from old firmware (NetBSD+ppcboot) to the new firmware (Linux+uboot). The bridge firmware runs on Linux operating system but is loaded by ppcboot boot loader.
Final Linux version firmware	7801FC_V2_7_B2.img 7801FC_V2_7_B2_5700MSC.img (For 5700MSC-IP only)	This is the formal released Linux version firmware that runs on Linux operating system and is loaded by uboot boot loader.

Upgrading from NetBSD version to Final Linux version

Following steps show how to upgrade 7800FC from NetBSD version to final Linux version. The same process applies to 7801FC as well.

Step0 - Hardware Preparation: First, please remove "J2" plug on the FC card [J2 is noted in red in the following Figure 1]. Otherwise, watchdog would kick in and reboot the FC card. Do not place back the J2 plug even after the FC is fully upgraded to the Linux Firmware. Second, connect serial cable to the 3-pong connector on the FC card itself (by opening the front door).
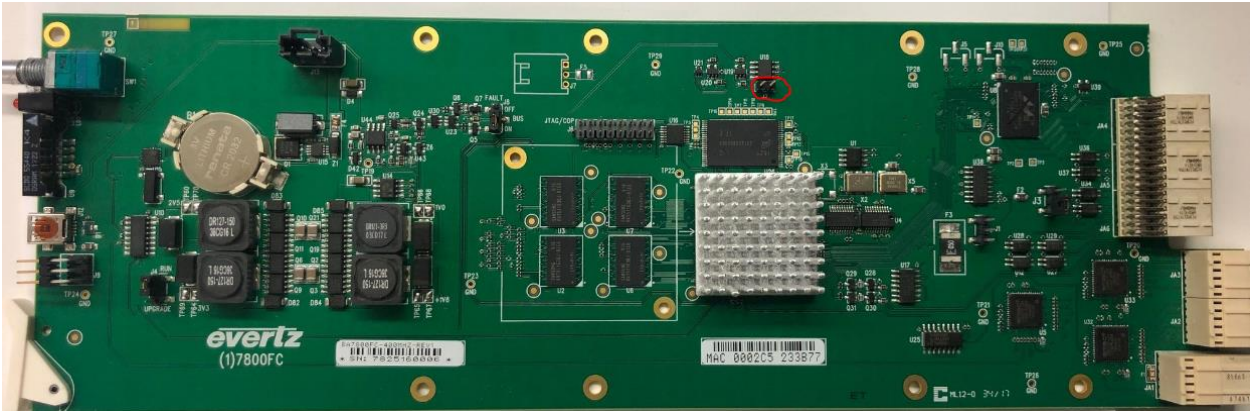

Figure 1

Step1 – Upgrade to latest NetBSD image: This step is optional. If one wants to have the IP address and hostname set in the NetBSD FC be carried over to LinuxFC, he/she must upgrade the NetBSD 7800FC/570FC to 1v5b88 and later, NetBSD 7801FC to 1vb35 and later.

Step2 – Upgrade to Linux Bridge image: While the FC runs the NetBSD version firmware, go to the "upgrade" page of the 780xFC webpage. Choose the bridge firmware, 7800FC_570FC_bridge_2v7b2_xxx.bin for 7800FC or 801FC_V2_7_B2.bin for 7801FC. Then start the

upgrading process. Note if one wants the LinuxFC to carry over he IP address and hostname set in the NetBSD FC, he/she must use 2.7.1 and above.
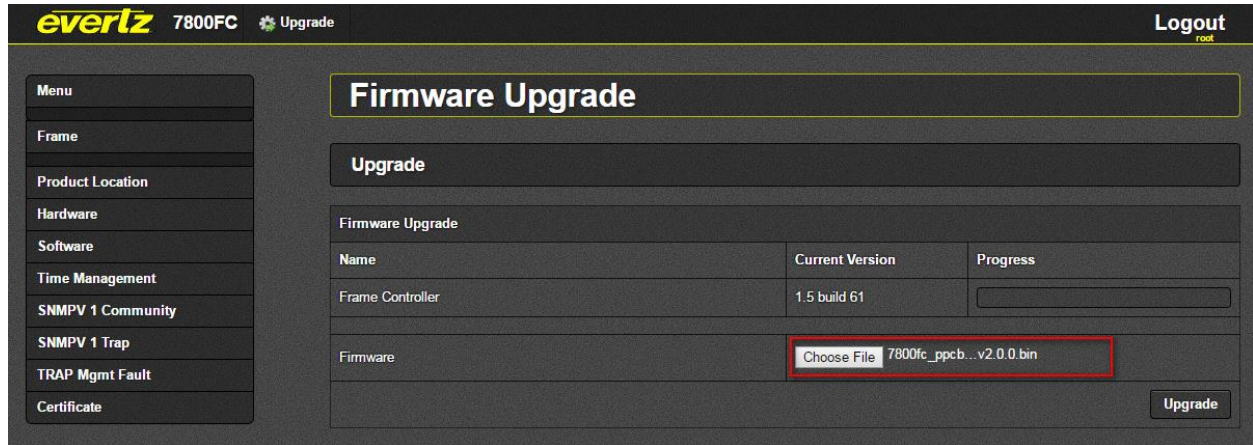
Step3 – Make sure bridge image boot up successfully. 780xFC reboots if above upgrade is successful. You will observe below message on serial port which indicates that a Linux firmware is being loaded by ppcboot loader.

```
LOADING PROGRAM SECTIONS
LOAD COMPLETE
STARTING EVERTZ LINUX LOADER APPLICATION
CLAIM 02000000 TO 020115d3 (71124 BYTES)
space 0000000000 size 0100000000 "root"
   segment 0000000000 size 0010000000 "main"
   segment 00ff400000 size 0000100000 "immr"
   segment 00ff800000 size 0000002000 "nand"
LOADING KERNEL FROM "uImage"
LOADING IMAGE FROM "comp:uImage"
CLAIM 00000000 TO 007fffff (8388608 BYTES)
SYNC ICACHE FROM 0 TO 800000
LOADING ROOTFS IMAGE FROM "rootfs_image"
LOADING IMAGE FROM "comp:rootfs_image"
CLAIM 06cee000 TO 07dff676 (17897079 BYTES)
DT AT 0x00800000 FOR 12288 BYTES
GENERATING DEVICE TREE FOR 7800FC BASED BOARD...
```

Then a warning message will show up on serial port indicating this is a bridge image.

```
##################################################
System: Warning! This is the bridge image that runs with PPCBOOT!
System: Please upgrade to the same version with UBOOT before normal operation!
##################################################
Restoring ppcboot env and configuring network...
```

Step4 – Check network setting and make changes if necessary on the console. If the base NetBSD version was 1v5b88 for 7800FC or 1v5b35 for 7801FC, and the LinuxFC version is >=2.7.1, the IP/Netmask/Gateway have already been properly carried over. You can safely skip this step. Otherwise, check if you have valid IP/Netmask/Gateway in ppcboot file or by typing command "ifconfig". If IP/Netmask/Gateway are not valid, you can use "Console Menu" application to modify them. Those variables will be saved automatically in ppcboot_env. To open Console Menu, you can login serial port

by user customer and password customer. Please do NOT forget to use "Apply changes" to have your changes take effect immediately.

Step 5 – Upgrade to Final Linux Image. Go to 780xFC webpage using the IP address configured above. Then go to "Upgrade" page and chose final Linux version firmware. Then start the upgrade process.
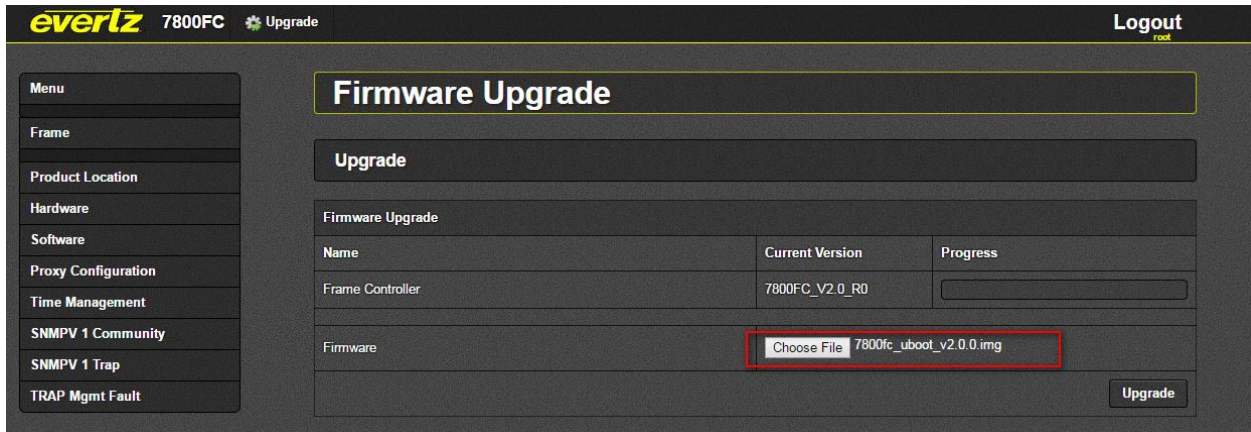
During this upgrade, you can observe syslog message by "tail -f /var/log/message".

```
Jun 17 08:41:48 Evertz-780xfc user.notice upgradeimg: Start upgrading /tmp/upgrade-files/7800fc_uboot_v2.0.0.img
Jun 17 08:41:48 Evertz-780xfc user.notice upgrade: Check image file /tmp/upgrade-files/7800fc_uboot_v2.0.0.img
Jun 17 08:41:48 Evertz-780xfc user.notice upgrade: Image name: 7800fc_v2.0.0
Jun 17 08:41:48 Evertz-780xfc user.notice upgrade: Start Upgrading /tmp/upgrade-files/7800fc_uboot_v2.0.0.img
Jun 17 08:41:48 Evertz-780xfc user.notice upgrade: Bridging from PPCBOOT to UBOOT
Jun 17 08:41:48 Evertz-780xfc user.notice upgrade_uboot: Upgrading uboot
Jun 17 08:41:48 Evertz-780xfc user.notice upgrade_uboot: Updating uboot uboot_env_default
Jun 17 08:41:48 Evertz-780xfc user.notice upgrade_uboot: Build uboot uboot_env_default image
Jun 17 08:41:48 Evertz-780xfc user.notice upgrade_uboot: Writing uboot image
Jun 17 08:41:48 Evertz-780xfc user.notice upgrade_uboot: Writing uboot uboot_env_default image
Jun 17 08:41:48 Evertz-780xfc user.notice upgrade_uboot: Upgraded uboot & env susscessfully
Jun 17 08:41:48 Evertz-780xfc user.notice upgrade_uboot: Formatting flash1
Jun 17 08:41:48 Evertz-780xfc user.notice upgrade: Successfully upgrade /tmp/upgrade-files/7800fc_uboot_v2.0.0.img
Jun 17 08:41:48 Evertz-780xfc user.notice upgradeimg: Upgrade image was done
Jun 17 08:41:48 Evertz-780xfc user.notice upgradeimg: Received upgrade done, reboot...
Jun 17 08:41:48 Evertz-780xfc user.notice upgrade: Rebooting...
```

Step6 – Make sure the final image can boot up. If upgrading is successful, 780xFC will reboot and you should observe uboot loader startup message on serial port as below. After uboot finishes loading Linux kernel and applications, final Linux version firmware is ready for normal operation. (Note: For 7801FC, you may see corrupted prints including non-text strings output to the serial console, and in this case, please disconnect the serial terminal (Hyperterminal, or Teraterm) and reconnect it, and power-cycle the 7801FC frame to correct the serial interface.)

```
Requesting system reboot
reboot: Restarting system
NAND boot... transfering control


U-Boot 2016.07 (Feb 14 2017 - 14:18:39 -0500)MPC83XX

Reset Status: Software Hard, Software Watchdog, External/Internal Soft, External/Internal Hard

CPU:   e300c3, MPC8313E, Rev: 2.1 at 400 MHz, CSB: 133.333 MHz
Board: Freescale MPC8313ERDB
I2C:   ready
DRAM:  256 MiB (DDR2, 32-bit, ECC off, 266.667 MHz)
NAND:  512 MiB
In:    serial
Out:   serial
Err:   serial
Net:   TSEC0
Hit any key to stop autoboot:  0
```

Step 7 – Choose serial console (Back or Front) for 7800FC. After the final Linux image boots up, set up the Serial Connection properly. For 7800FC/570FC, there are two serial console ports, one is the 3-pong connector directly on the FC card, to which the serial cable is already connected to, and the other is the standard RS232 9-pin female connector in back of the frame; therefore, connect the serial cable to the back serial port because final image enables back console port at default, and you can then login to the FC as "customer/customer, and select "(4) System Utilities" in the main menu followed by selecting "(5) Console Serial Port" to select the expected port. For 7801FC, skip this step because there is only one serial port anyway.

```
Welcome to Evertz-780xfc
780xfc login: customer
Password:
Last login: Thu Mar 28 20:21:15 UTC 2019 on console
You are accessing a private Information System (IS) that is provided for intended authorized use only.

By using this IS (which includes any device attached to this IS), you consent to the following conditions:

-The owner (or administrator)  routinely intercepts and monitors communications on this IS for purposes including, but not limited to, penetration testing,

-At any time, the owner may inspect and seize data stored on this IS.

-Communications using, or data stored on, this IS are not private, are subject to routine monitoring, interception, and search, and may be disclosed or used

-This IS includes security measures (e.g., authentication and access controls) to protect owners interests--not for your personal benefit or privacy.

-Notwithstanding the above, using this IS does not constitute consent to PM, LE or CI investigative searching or monitoring of the content of privileged com
--------------------------------------------------------
 Evertz-780xfc Frame Controller
 (Version 2.7.2)
--------------------------------------------------------
(1) Network Setup
(2) SNMP Setup
(3) Certificate Management
(4) System Utilities
(5) Shell Login Management

(X) Exit
> 4

(1) Enable/Disable Security [DISABLED]
(2) Change 'customer' Login Password
(3) Reset Web Password to Default
(4) Select HTTPS Certificate type [SELF_SIGNED]
(5) Console Serial Port [ttyS0(Front)]
(6) Reboot Frame Controller

(X) Exit
>
```

Step 8 – Check Network connection and reconfigure it if necessary. Check and verify network connection. You can first try to ping the FC with the IP address which was set after the bridge image booted up. If you fail to ping the FC, then you have to rely on the console connection, log onto the FC customer menu and configure the Network.

```
Welcome to Evertz-780xfc
780xfc login: customer
Password:
Last login: Thu Mar 28 22:27:03 UTC 2019 on console
You are accessing a private Information System (IS) that is provided for intended authorized use only.

By using this IS (which includes any device attached to this IS), you consent to the following conditions:

-The owner (or administrator)  routinely intercepts and monitors communications on this IS for purposes including, but not limited to, penetration testing,

-At any time, the owner may inspect and seize data stored on this IS.

-Communications using, or data stored on, this IS are not private, are subject to routine monitoring, interception, and search, and may be disclosed or used

-This IS includes security measures (e.g., authentication and access controls) to protect owners interests--not for your personal benefit or privacy.

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--------------------------------------------------------
 Evertz-780xfc Frame Controller
 (Version 2.7.2)
--------------------------------------------------------
(1) Network Setup
(2) SNMP Setup
(3) Certificate Management
(4) System Utilities
(5) Shell Login Management

(X) Exit
> 1
1

--------------------------------------------------------
Network Current Configuration
--------------------------------------------------------
Host Name   : 780xfc
DHCP Enable : No
IP Address  : 172.16.118.201
Netmask     : 255.255.255.0
Gateway     : 172.16.118.1

--------------------------------------------------------
(1) Set Host Name
(2) Set DHCP
(3) Set IP Address
(4) Set Netmask
(5) Set Gateway
(6) Apply changes

(X) Exit
```

try to ping FC with IP address which was set while the FC was running the bridge image. If you cannot ping the FC, you will, unfortunately, have to reconfigure the Network by login to the FC as "customer/customer".

Step 9 – Verify running firmware is indeed final Linux Image. You can ssh login or console login to the FC as user "evertz" with password "Evertz". Upon in the terminal, type "cat /var/boot_type", you shall see message "UBOOT" if the final linux image is indeed loaded to the card.

```
evertz@780xfc:~$ cat /var/boot_type
UBOOT
```

Changes to FC manufacturing

There are some changes in the test procedure when manufacturing Linux version FC firmware. In the manufacturing phase, the operator still follows the steps when performing loading ppcboot loader and hardware test. In the step of loading FC image via ppcboot prompt (Section 34 in the test procedure), instead of loading old NetBSD FC firmware, please "tftp load" the bridge firmware 7800fc_ppcboot_v2.0.0.bin. Then boot up the bridge firmware directly by typing "boot" on ppcboot prompt on serial port. Then follow the Step2 to Step6 of above "**Upgrading from NetBSD version to Final Linux version**" section to get Final Linux version firmware loaded and verified eventually.

In FC manufacturing phase, PROD environment variable might be modified according to which product name is required. For example, 570FC shares the same firmware with 7800FC but needs to be shown "570FC" on webpage or VLPRO. Please follow below steps to modify PROD environment variable with final Linux version firmware.

Step1. Make sure final Linux version firmware is running.

Step2. Login Linux Shell through serial port. The user name is "evertz" and the password is "Evertz". Upon entering the system, please change to superuser by typing "su" and typing "Evertz" upon being prompted for password.

Step3. Type "fw_printenv PROD" to check the current PROD value.

Step4. If the PROD value is not the desired one, please use "fw_setenv" application to modify it. For example, if 570FC is the desired one, then type "fw_setenv PROD 570FC".

Step5. Type "fw_printenv PROD" to verify if the PROD variable was modified correctly.

Note: The default value of PROD variable is 7800FC on 7800FC/570FC board and 7801FC on 7801FC/7801FC-IRD board.

Warning

ONCE IN LINUX, THE FC CANNOT BE DOWNGRADED TO NETBSD. ONE HAS TO FOLLOW THE MANUFACTOURING PROCESS FOR LOADING THE PPCBOOT FOLLOWED BY TFTP THE NETBSD FIRMWARE.