

Automatic Firmware Update

Occasional upgrading of the firmware on an ft1800 system may be necessary to add new functionality, fix bugs, and so on. New firmware will be delivered using the standard patch and install mechanisms. The upgrade procedure for installing new firmware runs automatically and should require no user intervention.

Note – A firmware update is a time consuming operation (of the order of minutes) and it should be scheduled to allow it to proceed to conclusion; interruption will cause system corruption.

Note – The system must be reset and/or power cycled for the newly-upgraded firmware to take effect. This is handled automatically at boot time or when the module concerned is enabled through the CMS.

As the firmware upgrade proceeds, appropriate messages are displayed, either on the console or in `cmsconfig`.

Operation

The system functions automatically at discrete points in time as follows:

Preboot Checks

The PROM partially validates the firmware as part of its preboot sequence and this may trigger various reset actions to ensure that newly loaded firmware is activated.

Boot Checks

Every time the system boots, a check is made to ensure that the system is running firmware supported by the installed version of the operating system. If this check is successful, the boot proceeds as normal.

If the check fails, one or more pieces of firmware are incompatible with the operating system and an attempt will be made to rectify the situation by installing new version(s) of the firmware if they are available. During the update, a message is displayed on the console. Once the firmware has been installed, the system will automatically reboot.

If the firmware installation fails, an appropriate message will be printed on the console and the boot will proceed as normal.

Firmware updated during boot includes:

- Boot side PROM
- Boot side motherboard FPGA
- Boot side RCP

If the system is configured for fault tolerant operation, the following additional firmware may be updated:

- Nonboot side motherboard FPGA
- Nonboot side RCP

Enabling the Other CPUset Module

Since the non-boot side PROM cannot be checked or upgraded automatically when the system boots, the compatibility of that PROM is established when the other CPUset module is enabled by the CMS.

If an upgrade is required, it will be performed automatically. However, this process will delay the enabling of the FRU by CMS. An informative message is displayed by `cmsconfig` will the upgrade occurs. It is important that the process is not interrupted otherwise the PROM will be corrupted.

Regardless of the success of the upgrade operation the CPU FRU will still enable as normal unless another problem is detected.

Motherboard Hot Swap

If a motherboard is hot swapped, the firmware on the replacement board may not be compatible with that in the running system. Therefore, it is also checked when the motherboard FRU is enabled in the CMS.

If the firmware is out of date, the new firmware is downloaded (with an informative message). However, there are then two possible outcomes that depend upon the power state of the motherboard.

- If the power was OFF, after the update the enable will proceed as usual with no further user interaction.
- If the power was ON, the enable of the motherboard will FAIL and its state in CMS will be set to `enable_failed`. This situation can be cleared only by using the CMS to first disable and then re-enable the upgraded motherboard. This action is required because new firmware downloaded to a motherboard is not activated until the next power-on.

Firmware Updates and Module EEPROMS

Each time a firmware update takes place, the part number of its firmware image is recorded in the module's EEPROM. You can read these part numbers using the `cmsfruinfo(1M)` utility.

For example:

```
# cmsfruinfo -1 A-CPU EE_CPU_PROM
EE_CPU_PROM_PARTNO=2587354
EE_CPU_PROM_DASH=10

# cmsfruinfo -1 B-MBD EE_MBD_BRIDGE_FWARE
EE_MBD_BRIDGE_FWARE_PARTNO=2587134
EE_MBD_BRIDGE_FWARE_DASH=08
```

