QEFS - Working with the EFS Partition of a Modem

QEFS is designed to process EFS partition. This section stores the files that the modem's DSP cores work with, as well as NVRAM. The partition has a tree-like file structure that is almost POSIX compliant — files can be regular files, directories, or special files (symbolic links and pseudo-files). Each file has a set of attributes similar to UNIX (rwx) attributes.
With qefs, you can manipulate individual files (read, write, view, delete), and you can back up the entire EFS partition.

View Directory Tree - -ld switch

In this mode, the directory tree is displayed. Regular files are not included in the list. Team format:

./qefs -ld [-f] [<path>]

The -f switch allows the full path to each directory to be printed. This is useful when, for example, the full path to the directory needs to be typed into the clipboard and used in subsequent commands. The tree is drawn from the path specified in the command, or, if no path is specified, from the root.
For example:

```
$ ./qefs -ld nv/

item_files/
   CoreCpu/
      CoreAll/
         Startup/
      Default/
         Fixed/
         Startup/
         qdsp_classic/
   Thin_UI/
   Conf/
   gsm/
      gl1/
```

Same with the -f switch:

```
$ ./qefs -ld -f nv/

nv/item_files/
   nv/item_files/CoreCpu/
      nv/item_files/CoreCpu/CoreAll/
         nv/item_files/CoreCpu/CoreAll/Startup/
      nv/item_files/CoreCpu/Default/
         nv/item_files/CoreCpu/Default/Fixed/
         nv/item_files/CoreCpu/Default/Startup/
         nv/item_files/CoreCpu/Default/qdsp_classic/
   nv/item_files/Thin_UI/
   nv/item_files/conf/
   nv/item_files/gsm/
      nv/item_files/gsm/gl1/
```

Each next level of directory nesting is displayed on the screen with indentation, so the list is built in the form of a tree.

View File Tree - -lt switch

This mode is similar to the previous one, but the tree includes not only directories, but also regular files. The format of the command line is also similar to the previous one (but the -ld switch is replaced by -lt). For example:

```
$ ./qefs -lt nv/

item_files/
   CoreCpu/
      CoreAll/
         Startup/
            Algorithm.txt
            LogSize.uint
      Default/
         Fixed/
```

```
            MIPS.uint
         Startup/
            AVSEnable.uint
            Algorithm.txt
            LogSize.uint
         qdsp_classic/
            HighThresholdBusyPct.uint
            SamplePeriod.uint
   Thin_UI/
      enable_thin_ui_cfg
   Conf/
      cgps_me.conf
```

A '/' sign is displayed at the end of directory names to distinguish the directory name from the file name.

View a simple list of files - -ll switch

In this mode, a simple list of files in the specified directory is displayed. Team format:

./qefs -ll [<path>]

If no path is specified, the contents of the root directory are displayed. For example:

```
$ ./qefs -ll

/.efs_private/
/AUTORUN. FLG
/CGPS_ME/
/CGPS_PE/
/CGPS_SM/
/NODOWNLOAD. FLG
/SUPL/
/UimEfsAPDULog.Txt
/true/
/client-cert/
/client-key/
/config
```

As in the previous cases, a '/' sign is displayed at the end of directory names to distinguish the directory name from the file name.

View the full list of files - -lf switch

In this mode, full information about each file is displayed, such as attributes, size, and creation date. Team format:

./qefs -lf [-r] [<path>]

The -r switch causes the program to display not only the contents of the specified directory, but also all of its subdirectories. If no path is specified, the contents of the root directory are displayed. For example:

```
 ./qefs -lf nv/item_files/conf

 Directory nv/item_files/conf ***
-rwxrwxrwx 0 1375 --------------- cgps_me.conf
-rwxrwxrwx 0 212 --------------- cgps_pdcomms.conf
Irwxrwxrwx 15 41 01-Jan-70 03:00 w_idle_mode.conf
-rwxrwxrwx 0 3720 --------------- wcdma_csg_efs_1.conf
-rwxrwxrwx 0 3720 --------------- wcdma_csg_efs_2.conf
-rwxrwxrwx 0 3720 --------------- wcdma_csg_efs_3.conf
-rwxrwxrwx 0 3720 --------------- wcdma_csg_efs_4.conf
-rwxrwxrwx 0 3720 --------------- wcdma_csg_efs_5.conf
-rwxrwxrwx 0 54 --------------- wcdma_csg_efs_db.conf
-rwxrwxrwx 0 1170 --------------- wcdma_rrc_external.conf
Irwxrwxrwx 15 43 01-Jan-70 03:00 wl1_atuner.conf
-rwxrwxrwx 0 171 --------------- wl1_cme.conf
Irwxrwxrwx 15 41 01-Jan-70 03:00 wl1_dc_w2l_mode.conf
```

If the date of file creation is recorded incorrectly in the system, it is not displayed (it is replaced with a '-' sign). The file size is displayed in bytes.

View the contents of a file as text - -tt switch

Any existing file can be viewed in text form using the -tt switch. Team format:

./qefs -tt <filename>

filename is the full path to the file being viewed, starting from the root (the -f switch in the -lt command is used to get it). For example:

```
$ ./qefs -tt /mcfg_debug.log

:Log:Modem Config task-START
:Err:mcfg_efs_read_config_map: Unable to open MCFG Image file (1002)
:Log:mcfg_efs_read_factory_config_map: factory config doesn't exist
:Err:mcfg_efs_read_config_map: Unable to open MCFG Image file (1002)
:Log:mcfg_efs_read_factory_config_map: factory config doesn't exist
:Log:mcfg_efs_print_map: type 0 active 0 pending 0
:Log:mcfg_efs_print_map: type 1 active 0 pending 0
:Log:==== Starting modem_cfg_process ====
:Log:modem_cfg_load_and_auth_mcfg 5 - mcfg_load_status=1
:Err:mcfg_load_and_auth_seg fail for cfg type 0, status = 1
:Log:modem_cfg_load_and_auth_mcfg 5 - mcfg_load_status=1
:Err:mcfg_load_and_auth_seg fail for cfg type 1, status = 1
:Err:Modem Config Processing Error 0x1
:Log:Modem Config Processing -DONE
```

Note that if you try to view non-text files in this mode, you will see undefined garbage that could potentially break the console (by interpreting this garbage as control characters).

View the contents of a file as a dump - -td switch

Unlike the previous mode, you can use the -td command to view the contents of absolutely any file. The file is displayed as a canonical dump (hex+ascii). For example:

```
$ ./qefs -td /config
00000000: 12 34 56 78 7F 01 00 00 BF 4F 00 00 3C D9 5C 78 *.4Vx^?.... Or.. <.\x*
00000010: 01 00 00 00 70 01 00 00 20 08 08 18 03 00 00 00  *.... p... .......*
00000020: 42 44 5f 4d 54 53 38 33 30 46 54 56 31 2e 30 2e *BD_MTS830FTV1.0.*
00000030: 30 42 30 31 00 00 00 00 00 00 00 00 00 00 00 00  *0B01............*
00000040: 38 33 30 46 54 00 00 00 00 00 00 00 00 00 00 00  *830FT...........*
00000050: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  *................*
00000060: 38 33 30 46 54 2d 31 2e 30 2e 30 00 00 00 00 *830FT -1.0.0.....*
00000070: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  *................*
00000080: 5a 54 45 20 43 4f 52 50 4f 52 41 54 49 4f 4e 00 *ZTE CORPORATION.*
00000090: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  *................*
000000a0: 50 43 57 5f 4d 54 53 52 55 53 48 49 56 31 2e 30 *PCW_MTSRUSHIV1.0*
000000b0: 2e 30 42 30 32 00 00 00 00 00 00 00 00 00 00 00 *.0B02...........*
```

Reading a file from EFS to a local file is the -gf switch.

This command reads the specified file from EFS and saves a local copy of it to the current directory. Room format:

./qefs -gf <filename>

filename is the full path to the file from the root. As a result, a copy of this file will be saved in the current directory. For example:

```
 $ ./qefs -gf /config
 $ ls -l config
-rw-rw-r-- 1 forth32 forth32 20415 дек.   1 08:02 Config
```

Write a local file to EFS - -wf switch

The -wf command writes the local file to the modem's EFS at the specified path. Team format:

./qefs -wf <localfile> <path>

localfile—the path to the local file and its name. A file can reside anywhere in the file system.
Path is the path in EFS to save the file. The file name will be the same as the local name. For example:

```
 $ ./qefs -wf m823x/config/
```

In this example, the local 823x/config file will be written to the EFS root under the name config.

Delete a file from EFS - -ef switch

The -ef command removes the specified file from the EFS partition. Team format:

./qefs -ef <filename>

filename—the full path and name of the file to be deleted. For example:

```
$ ./qefs -ef config
```

This command removes the config file from the root of the EFS file system.

Creating an EFS Backup - -be Switch

You can use the -be switch to create a file that contains an exact backup of the EFS partition. The resulting efs.mbn file has the same format as the same file obtained with QPST (in backup EFS mode). The same format is used for efs.mbn files that are part of firmware update packages. You can write the file back to the modem using the xNPRG loader-programmer in the partition writing mode, under the control of the qwflash utility or the same QPST.
In principle, the best EFS preservation results can be achieved by taking an accurate image of the EFS partition using the qrflash utility (the image is written back using the qwdirect utility). However, the efs.mbn file is the official EFS Quantcom save-restore tool, so support for it is included in this utility.
Team format:

./qefs -be [-o file]

You can use the -o switch to specify an output file name other than efs.mbn