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XFLASH creates binary files in the xCORE flash format, as illustrated in the diagram below. It can also program these files onto flash devices used to boot XMOS systems.

Figure 1: Flash format diagram



# 1 Overall Options

The following options are used to specify the program images and data that makes up the binary and its layout. Padding is inserted when required to ensure that images are aligned on sector boundaries.

-XMOS

```
xe-file [size]
```

```
--factory xe-file [size]
```

Specifies *xe-file* as the factory image. If *size* is specified, padding is inserted to make the space between the start of this image and the next image at least the specified size. The default unit of *size* is "bytes;" the size can be postfixed with k to specify a unit of kilobytes.

At most one factory image may by specified.

--upgrade *id* xe-file [size]

Specifies *xe-file* as an upgrade image with version *id*. Each version number must be a unique number greater than 0. If *size* is specified, padding is inserted to make the space between the start of this image and the next image at least the specified size. The default unit of size is "bytes;" the size can be postfixed with k to specify a unit of kilobytes.

Publication Date: 2013/11/11 XMOS © 2013. All Rights Reserved REV C

Multiple upgrade images are inserted into the boot partition in the order specified on the command line.

If no factory image is specified, a single upgrade image may be specified and written to a file with the option -o.

--factory-version version

Specifies version as the tools release master version that was used to create the factory image. The version number must be equal to or greater than 12. This option need only be specified when --upgrade is provided but --factory is not. This option will ensure that the produced flash upgrade image is of the correct format for the installed factory image.

--boot-partition-size *n* 

Specifies the size of the boot partition to be n bytes. If left unspecified, the default size used is the total size of the flash device. n must be greater than or equal to the minimum size required to store the boot loader, factory image and any upgrade images.

--s2l-partition-size *n* 

Specifies the size of the stage 2 loader partition to be n bytes. If left unspecified, the default size is used. This option should only be used when the xflash error F03010 Failed to compile stage two loader is encountered due to a constraints check failure. This failure normally happens when there is a large number of nodes in a network to be booted from flash causing the stage 2 loader to exceed it's default allocated partition.

- --data *file* Specifies the contents of *file* to be written to the data partition.
- --loader file

Specifies custom flash loader functions in *file* (see XM-000949-PC). The file may be either an object (.o) or archive (.a).

By default, the xCORE flash loader loads the image with the highest version number that validates against its CRC.

- --verbose Prints additional information about the program when loaded onto the target system.
- --help Prints a description of the supported command line options.
- --version Displays the version number and copyrights.

## 2 Target Options

The following options are used to specify which flash device the binary is to be programmed on. The type of flash device used determines the values for the SPI divider, sector size and memory capacity.

-XMOS-

--list-devices

- -1
- Prints an enumerated list of all JTAG adapters connected to the PC and the devices on each JTAG chain, in the form:

|              | ID  | Name           | Adapter ID          | Devices                         |
|--------------|---|----------------|---------------------|---------------------------------|
|              |   |                |                     |                                 |
|              | The adapters are ordered by their serial numbers.   |                |                     |                                 |
| id <i>ID</i> | Specifies the adapter connected to the target hardware.   |                |                     |                                 |
|              | XFLASH connects to the target platform and determines the type of connected to it.  |                |                     |                                 |
| adapter-id   | ADAPTER-SERIAL-NUMBER<br>Specifies the serial number of the adapter connected to the target hardware.<br>XFLASH connects to the target hardware and determines the type of flash device<br>connected to it. |                |                     |                                 |
| jtag-speed   | n<br>Sets the divide  | or for the ITA | C clock to p The co | rresponding ITAC clock speed is |

Sets the divider for the JTAG clock to *n*. The corresponding JTAG clock speed is 6/(n+1)MHz. The default value of the divider for the JTAG clock is 0, representing 6MHz.

### --spi-spec file

Enables support for the flash device specified in *file* (see XM-000941-PC).

- Sets the divider for the SPI clock to n, producing an SPI clock speed of 100/2nMHz. --spi-div N By default, if no target is specified, the divider value is set to 3 (16.7MHz).
- --noing Does not run the device inquisitor program, which checks that images are aligned on sector boundaries. If --noing is omitted XFLASH expects to be able to connect to the device via JTAG.

#### --disable-boot-link-warn

Disables a warning emitted when the links between nodes do not allow for bootfrom-link to work, for example only links lower than link 3 have been specified as connected on bootee nodes, whereas the boot rom enables links 4-7 (and link 3 if a *primary* tile).

#### **Security Options** 3

The following options are used in conjunction with the AES Module (see XM-000955-PC).

--key keyfile

Encrypts the images in the boot partition using the keys in *keyfile*.

--disable-otp

Causes the flash loader to disable access to OTP memory after the program is booted. This is default if the option --key is used.

--enable-otp

Causes the flash loader to enable access to OTP memory after the program is booted. This is default unless the option --key is used.

### 4 **Programming Options**

By default, XFLASH programs the generated binary file to the target flash device.

-o *file* Places output in *file*, disabling programming.

If the target platform is booted from more than one flash device, multiple output files are created, one for each device. The name of each output file is file\_node, where node is the value of the Id attribute (see XM-000929-PC) of the corresponding node.

The following options perform generic read, write and erase operations on the target flash device. A target XN file must be specified, which provides ports used to communicate with the SPI device on the hardware platform.

Specifies *xn-file* as the target platform.

If *xn-file* specifies more than one flash device, a value for *node* must be specified. This value must correspond to the Id attribute (see XM-000929-PC) of the node connected to the target flash device.

--target platform [node]

Specifies a target platform. The platform configuration must be specified in the file platform.xn, which is searched for in the paths specified by the XCC\_DEVICE\_PATH environment variable (see XM-000927-PC).

If *xn-file* specifies more than one flash device, a value for *node* must be specified. This value must correspond to the Id attribute (see XM-000929-PC) of the node connected to the target flash device.

- --erase-all Erases all memory on the flash device.
- --read-all Reads the contents of all memory on the flash device and writes it to a file on the host. Must be used with -o.
- --write-all *file* Writes the bytes in *file* to the flash device.



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<sup>--</sup>target-file xn-file [node]