Qualcomm Technologies, Inc.

Qualcomm Device Loader

User Guide

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Revision history

Revision	Date	Description
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1 Overview

Qualcomm Device Loader (QDL) is a software tool that communicates with Qualcomm USB devices to upload a flash loader and flash software images.

2 Installation

2.1 Hardware prerequisites

The following hardware items are required to operate QDL.

NOTE: These items represent the minimum requirements for normal operation. If your hardware meets or exceeds these requirements, no upgrade is necessary to use QDL.

Table 2-1 Hardware requirements

Item	Description
Computer	Desktop or laptop computer with any Intel processor, AMD x86-64 processor, or Arm® processor
RAM	2 GB or greater
Hard drive	70 MB of available space
Video monitor	Minimum display resolution of 800 x 600
USB or serial communications	Free USB or serial I/O (COM) ports
MTP, SURF, or FFA device	QTI-compatible device
Data cables or wireless connection	Appropriate data cables to attach each device model to the computer

2.2 Operating system prerequisites

Table 2-2 OS requirements

OS	Description
Windows	Microsoft Windows 10 and newer
Linux	Ubuntu 18.04 LTS and newer
MacOS	MacOS 14.0 and newer

2.3 Install QDL

1. Download QDL from Qualcomm Software Center (QSC).
2. Unzip the QDL executable.

   The unzipped directory includes the following contents.

   ```
   QDL_Linux_ARM/
   QDL_Linux_x64/
   QDL_Mac_x64/
   QDL_Mac_ARM/
   QDL_Win_x64/
   THIS_VERSION_IS_1.0.0
   QDL_User_Guide.pdf
   ```

3. For MacOS only, need to install libusb and libxml2 via homebrew. Steps:

   3.1. Install homebrew using

   /bin/bash -c "$(curl -fsSL https://raw.githubusercontent.com/Homebrew/install/HEAD/install.sh)"

   3.2. Install libusb

   brew install libusb

   3.3. Install libxml2

   brew install libxml2

4. For Linux Ubuntu only, need to install libusb and libxml2 via apt-get. Steps:

   4.1 apt-get install libusb

   4.2. apt-get install libxml2

3 Usage

3.1 Put the device in EDL mode before software download, or UFS provisiong

1. Use the device hardware button to put the device in EDL mode, if applicable.
2. Run the following commands in an ADB shell.

NOTE: You may need to separately install ADB.

```
adb root
adb wait-for-device
adb shell mount -o remount, rw /
adb wait-for-device
adb shell reboot edl
```

3.2 Run QDL

3.2.1 Linux x64

Run the executable in the extracted `QDL_Linux_x64` directory.

1. Open a terminal window in the directory with your program, `rawprogram*.xml`, `patch*.xml`, and the QDL binaries.
2. Run the QDL executable in the `QDL_Linux_x64` directory using the following command for software download.

```
/qdl --storage ufs prog_firehose_ddr.elf rawprogram*.xml patch*.xml
```

3. Run the QDL executable in the `QDL_Linux_x64` directory using the following command for UFS provisioning

```
/qdl --storage ufs prog_firehose_ddr.elf provision_default.xml
```

3.2.2 Linux Arm® architecture

Run the executable in the extracted `QDL_Linux_ARM` directory.

1. Open a terminal window in the directory with your program, `rawprogram*.xml`, `patch*.xml`, and the QDL binaries.
2. Run the QDL executable in the `QDL_Linux_ARM` directory using the following command for software download

```
/qdl --storage ufs prog_firehose_ddr.elf rawprogram*.xml patch*.xml
```

3. Run the QDL executable in the `QDL_Linux_ARM` directory using the following command for UFS provisioning

```
/qdl --storage ufs prog_firehose_ddr.elf provision_default.xml
```

3.2.3 MacOS x64

Run the executable in the extracted `QDL_Mac_x64` directory.

1. Open a terminal window in the directory with your program, `rawprogram*.xml`, `patch*.xml`, and the QDL binaries.
2. Run the QDL executable in the `QDL_Mac_x64` directory using the following command for software download

```
/qdl --storage ufs prog_firehose_ddr.elf rawprogram*.xml patch*.xml
```

3. Run the QDL executable in the `QDL_Mac_x64` directory using the following command for UFS provisioning

```
/qdl --storage ufs prog_firehose_ddr.elf provision_default.xml
```

3.2.4 MacOS Arm® architecture

Run the executable in the extracted `QDL_Mac_ARM` directory.

4. Open a terminal window in the directory with your program, `rawprogram*.xml`, `patch*.xml`, and the QDL binaries.
5. Run the QDL executable in the `QDL_Mac_ARM` directory using the following command for software download

```
/qdl --storage ufs prog_firehose_ddr.elf rawprogram*.xml patch*.xml
```

6. Run the QDL executable in the `QDL_Mac_ ARM` directory using the following command for UFS provisioning

```
/qdl --storage ufs prog_firehose_ddr.elf provision_default.xml
```

3.2.5 Windows x64

Run the executable in the extracted `QDL_Win_x64` directory.

1. Install winUSB Driver.
   - In the folder of QDL
   - Run install_driver.bat

2. Run the QDL executable in the `QDL_Win_x64` directory using the following command software download.

NOTE: Wildcards are not supported for filenames. Each image file must be listed in the command.

```
<pathToQDL>\QDL.exe prog_firehose_ddr.elf rawprogram0.xml
rawprogram1.xml rawprogram2.xml rawprogram3.xml rawprogram4.xml
rawprogram5.xml patch0.xml patch1.xml patch2.xml patch3.xml patch4.xml
patch5.xml
```

3. Run the QDL executable in the `QDL_Win_x64` directory using the following command UFS provisioning.

<pathToQDL>\QDL.exe prog_firehose_ddr.elf provision_default.xml

3.2.6 Windows ARM64

Run the executable in the extracted `QDL_Win_ARM64` directory.

1. Install winUSB driver. Following same instruction ast 3.2.5 (Windows X64)
2. Run the QDL executable in the `QDL_Win_ARM64` directory using the following command software download.

3. Wildcards are not supported for filenames. Each image file must be listed in the command.

   a. `<pathToQDL>\QDL.exe prog_firehose_ddr.elf rawprogram0.xml rawprogram1.xml rawprogram2.xml rawprogram3.xml rawprogram4.xml rawprogram5.xml patch0.xml patch1.xml patch2.xml patch3.xml patch4.xml patch5.xml`

4. Run the QDL executable in the `QDL_Win_ARM64` directory using the following command UFS provisioning.

<pathToQDL>\QDL.exe prog_firehose_ddr.elf provision_default.xml

3.2.7 Example: Successful loading result

```
partition 1 is now bootable
LOG: INFO: Calling handler for power
LOG: INFO: Will issue reset/power off 100 useconds, if this hangs check if
           watchdog is enabled
LOG: INFO: bsp_target_reset() 1
```

4 Supported Features

4.1 SWDL Tool Feature Matrix

	Question/Feature Definition	PCAT+QMSCT	Freemium PCAT	fh_loader+QSaharaServer	Open-source QDL tool
1	Executable Installer can be downloaded from QPM3 web portal?	No.	Yes, by licensee and LRU user.	No.	Yes.
2	Can be installed without QPM3 login?	No.	No.	Yes.	Yes.
3	Can be launched without QPM3 login?	No.	No.	Yes.	Yes.
4	Can download image to blank flash?	Yes.	Yes.	Yes.	Yes.

5	Can re-download image to programmed flash(upgrade)?	Yes.	Yes.	Yes.	Yes.
6	Can erase flash?	Yes.	Yes.	Yes.	Yes.
7	Can support eMMC downloading?	Yes.	Yes.	Yes.	Yes
8	Can support NAND downloading?	Yes.	Yes.	Yes.	Yes
9	Can support UFS downloading?	Yes.	Yes.	Yes.	Yes.
10	Can support UFS provisioning?	Yes.	Yes.	Yes.	Yes.
11	Can support flatten build downloading?	Yes.	Yes.	Yes.	Yes.
12	Can support meta build downloading?	Partially support.	Partially support.	Partially support.	No.
13	Can support validation mode?	Yes.	Yes.	Yes.	No.
14	Can support VIP downloading on secure device?	Yes.	Yes.	Yes.	Pending.
15	Can support partition readback?	Yes.	Yes.	Yes.	No.
16	Can support switch from HLOS to EDL?	Yes.	Yes.	Yes.	No.
17	Can support reboot to HLOS after downloading/dump collection?	Yes.	Yes.	Yes.	Yes.
18	Can support RAM dump collection?	Yes.	Yes.	Yes.	Yes. (not in initial release)
19	Can support xQCN backup/restore?	Yes.	Yes.	Yes.	No. (need Diag support at first)
20	Can support partition backup/restore?	Yes.	Yes.	Yes.	No.
21	Can run on Windows for x86?	Yes.	Yes.	Yes.	Yes.
22	Can run on Windows for ARM?	Yes.	Yes.	Yes.	Yes. (not in initial release)
23	Can run on Linux Ubuntu for x86?	Partially support.	Partially support.	Tentatively support.	Yes.
24	Can run on Linux Ubuntu for ARM?	No.	No.	Tentatively support.	Yes.
25	Can run on other Linux distribution(e.g. Debian, CentOS, Fedora)?	Partially support.	Partially support.	Tentatively support.	Tentatively support. (not officially verified)

26	Can run on MAC OS?	No.	No.	Tentatively support.	Yes.
27	Can provide GUI?	Yes.	Yes.	No.	No.
28	Can provide CLI?	Yes.	Yes.	Yes.	Yes.
29	Can provide Multi-DUT GUI?	Yes.	No.	No.	No.
30	Can provide Automation API?	Yes.	Yes.	No.	Yes.
31	Can provide full source code?	No.	No.	Yes.	Yes.
32	support PBL dump	No.	Yes.	Yes.	No.
33	support flash read / write benchmark	No.	No.	Yes.	No.
34	support digest performance benchmark	No.	No.	Yes.	No.
35	support skip-write (Used to test USB overhead)	No.	No.	Yes.	No.
36	support getting storage info	No.	Yes.	Yes.	No.
37	support sparse image downloading	Yes.	Yes.	Yes.	No.
38	support multi-devprg loading (SM8850)	Yes.	Yes.	Yes.	No.
39	support flashless downloading	??	Yes.	Yes.	No.
40	support eMMC/UFS firmware update	No.	Yes.	Yes.	No.

5 Open Source

Open-source repository:
https://github.com/linux-msm/qdl

Build instructions:
Please refer to the README in the open-source repository for detailed steps on how to build the project for your target platform.

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