Qt Extended® Open Source

Openmoko® Neo SDK

Developer Quickstart Guide

For gta01 (Neo1973) and gta02 (Freerunner) devices

Disclaimer

WARNING: This device's primary purpose is a mobile telephone application development platform and is not intended as a primary end-user mobile device. This device is not assured to be bug-free and should not be used in safety critical environments or where confidentiality needs to be preserved.

Table of Contents

1 SDK Installation

1.1 SDK Linux Installation

1. Download the latest version of VMWare® Player from http://www.vmware.com.
2. Install VMWare Player in accordance with the instructions in VMWare Documentation.
3. Insert the Qt Extended® SDK CDROM.
4. Go to the mount point of the CDROM drive.
   For example: `cd /mnt/cdrom` or `cd /media/cdrom`.
5. Run the script: ./`install.sh`.
6. Follow the instructions in the Qt Extended SDK installer.
7. Run VMWare Player and select `Qtextended.vmx` from the SDK installation directory.

1.2 SDK Windows Installation

1. Download the latest version of VMWare Player from http://www.vmware.com.
2. Install VMWare Player in accordance with the instructions in VMWare Player Documentation.
3. Insert the Qt Extended SDK CDROM.
4. The autorun installer should automatically display.

If the installer does not display follow these steps:

a) Click `My Computer.`

b) Click the CDROM icon.

c) Click `autorun.exe`.

2 Setup on X86 for the FIC Neo

The following sections use X86 as an example of how to compile and install the Qt Extended example application.

2.1 Phonebounce Mode

`Phonebounce` allows the use of the phones modem from within Qt Extended running in `QVFb`.

To configure desktop Qt Extended to use the Neo as a modem:

1. Ensure the Neo is connected via USB.
2. In VMWare Player click on the icon labeled '`runqpe (phonebounce mode)`'.
3. On the Neo, go into `Settings` and in `Startup Flags` select `Modem -> Phone Bounce Mode` then reboot the Neo for the change to take effect.

To test that phonebounce is working correctly:

1. `ssh root@neo:12345`
   once connected you can send AT commands directly to the modem.
2. By typing AT you should see `OK` displayed.
3. Type `exit` to close and exit the `ssh` session.

2.2 VMWare Player

1. Click the `runqpe` icon to start phonesim and Qt Extended in the QVFb with the Neo skin.
2. Click the `Konsole` icon to open a command shell and enter the following commands:
   - `source /opt/Qtopia/SDK/scripts/devel-x86.sh`
   - `cd ~/projects/application`
   - `qbuild`
   - `qbuild clean` ! if previous build exists
   - `sdk -p` ! create the package file
   - `sdk -i` ! install the package to the device
   - On the device, select *Install* from the dialog that appears.
3. Launch the `Example` application in the Qt Extended environment by selecting `Applications-> Example.`

3 Flashing the Neo from the Development Environment

The Qt Extended SDK requires the latest Qt Extended to be loaded onto the device and there are two methods to do this:

1. via `updatedevice` script.
2. via low-level flash using the `flash-neo` or `dfu-util` utility.

3.1 Update via the UPDATEDEVICE script

Note: Before commencing this process it is recommended to backup all documents on the Neo as per the instructions in Section 9: *Transferring Documents To and From the* .

1. From the VMWare Player's **Device** menu, select **Trolltech Neo** then run one of the following commands in a command shell:
   - `updatedevice [image]` to update the device with the specified image.
2. The first time you connect to the Neo, you will be asked whether to continue connecting. Answer "yes".

3.2 Low-level Flash using usbflash Utility

You will need to download the latest flash image for the Neo (gta01 or gta02) from Qtextended.org.

NOTE: You will also need a native Linux operating system, as the dfu-util flashing command will not work correctly if run from within vmware image. Use the following command and then follow the instructions in the console:

-
  ```
  sudo usbflash –i /opt/Qtopia/extras/images/qtopia-neo-
  flash.jffs2
  ```

Note: The Neo will automatically reboot once the flash process is complete.

4 Setup, Develop and Create Qt Extended Packages

The process to setup, develop and create packages for the Neo is as follows:

In VMWare Player, open the console and enter:

1. `source /opt/Qtopia/SDK/scripts/devel-ficgta01.sh`
2. `cd ~/projects/application`
3. `qtopiamake`
4. `make clean` ! if previous build exists
5. `make` ! make loud to display compiler output
6. `sdk –p` ! create the package file
7. `sdk –i` ! install the package to the device
8. On the device, select *Install* from the dialog that appears.
9. On the device, launch the `Example` application by selecting `Applications-> Example.`

For further `sdk` command line options refer to Section 10: *sdk Command Utility.*

To uninstall the package, use the Software Packages settings application on the Neo.

5 Remote Debugging for Neo

To remotely debug the example Qt Extended application follow these steps:

1. `source /opt/Qtopia/SDK/scripts/devel-ficgta01.sh`
2. `cd ~/project/application`
3. `qbuild –debug`
4. `qbuild clean` ! if previous build exists
5. `Qbuild -verbose` ! `make loud` to display compiler output
6. `sdk –p` ! create the package file
7. `sdk –i` ! install the package to the device
8. On the device, select *Install* from the dialog that appears.
9. `sdk –r –debug` ! run the application in gdbserver on the device
10. In the SDK, click the `arm-linux debugger` icon.
11. Open the example application by selecting `File->Executable` from the `kdbg` menu, and navigate to the application executable, in this case `/home/user/projects/applications/example`.
12. Open the source code of the example application by selecting `File->Open Source` from the `kdbg` menu, and select the file `example.cpp`.
13. In the source listing, set a breakpoint by clicking on a line of code and then right-clicking and selecting `Set/Clear Breakpoint` from the popup menu. The first line of the `Example` class constructor is a good place to set a breakpoint.
14. Execute the program by selecting `Execution->Run` from the `kdbg` menu. The application will run to the breakpoint and then stop.
15. Further debugging activities can then be performed. For example, to resume running the example application, choose `Execution->Run` from the `kdbg` menu.

To view debug information click the `Neo Log` icon.

Note: To rerun the example application it is necessary to repeat steps 9-14 above to re-initialize the remote connection to the Neo.

6 Neo Console Access

For development and debugging it is sometimes useful to have direct access to a command prompt on the Neo device.

To get a command prompt on the Neo:

1. Login to the device:

   ```
   sdk -console
   ```

Once you have a command prompt, you will be able to run any of the standard Linux commands that are installed on the device.

7 Installing Qt Extended Source Code into the SDK

Follow the instructions for Building a Neo Flash Image below.

8 Building a Neo Flash Image

To build a Neo flash image follow these steps:

1. If you have a commercial source package you will have received a Qt license file. This file must be copied to `/home/user/.qt-license` in the SDK. This step is not required if you are using an Open Source package.

2. Download source packages, for example to `/devel/sdk-source/package`.

   a. qt-extended-phone-<version>.tar.gz

   b. qt-extended-helix-commercial-src-<version>.tar.gz (optional)

3. Extract Qt Extended source package:

```
cd /devel/sdk-source/package

tar -xzf qt-extended-phone-<version>.tar.gz

cd Qt-extended-phone-<version>

export QDEPOT_PATH=$PWD
```

4. Extract Helix source package (optional):

```
cd $QDEPOT_PATH

tar -xzf ../qt-extended-helix-commercial-src-
<version>.tar.gz
```

5. Build Qt Extended:

```
export QPEDIR=/devel/build/qt-extended-<version>/

mkdir –p $QPEDIR

cd $QPEDIR

$QDEPOT_PATH/configure -device neo

make

make install
```

6. Create the flash and updatedevice image:

```
$QTOPIA_DEPOT_PATH/devices/neo/scripts/make-flash.sh
```

7. Install the new Qt Extended on the Neo:

```
updatedevice Qt Extended-ficgta01-update.tar.gz
```

9 Transferring Documents To and From the Neo

To transfer documents to or from the Neo follow these steps:

1. Ensure the device is connected via USB cable.
2. Ensure the device is selected in VMWare Player's **Devices** menu.
3. Open a `Konsole` on the SDK and enter the command: `sdk –net.`
4. Open the `Konqueror` web browser.
5. Select the bookmark `fish://root@neo/.`
6. Navigate the browser to `Documents.`
7. Files can now be copied to and from the Desktop or another web browser.
8. Open the `Documents` view list on the phone.
9. From the Options menu, select `Rescan Systems`.

Files are now available in the Documents application.

10 sdk Command Utility

`sdk` is a command line utility used to streamline the build process and simplify Neo related tasks such as network setup. The following describes the command-line format and available options:

```
FORMAT: ./sdk <options>

Options:
 -h          display command help
 -q          quiet mode
 -c          clean
 -C <opt>    reconfig <x86> or <neo>, default neo
 -b          build using qbuild
 -p          build package using qbuild
 -i          install package to device
 -r          run application on device
 -all        reconfig, make, make package, install, run
 -debug      force configure for debug build, override default
 -release    force configure for release build, override default

 -options "<opts>" pass extra options to build system
          eg. ./gph -C x86 -all -options "CONFIG+=debug"

 -net        bring up network to neo
 -console    console on neo
 -ipk <file> install ipk to neo, next arg it ipk filename
 -rescan     Tell Qt Extended running in QVFb that new application
exists
```