Release Notes for QNX Neutrino 6.4.0 BSP for Renesas SH7780 EDOSK 1.0.0#

System requirements#

Target system#

- QNX Neutrino RTOS 6.4.0
- Board version: renesas sh7780 edosk board
- 128M AMD / SPANSION MirrorBit flash
- 128M RAM

Host development system#

- QNX Momentics 6.4.0, one of the following host systems:
  - QNX Neutrino 6.4.0
  - Microsoft Windows Vista, XP SP2 or SP3, 2000 SP4
  - Linux Red Hat Enterprise Workstation 4 or 5, Red Hat Fedora Core 6 or 7, Ubuntu 6.0.6 LTS or 7, or SUSE 10
- Terminal emulation program (Qtalk, Momentics IDE Terminal, tip, HyperTerminal, etc.)
- RS-232 serial port
- NULL-modem serial cable
- Ethernet link

System Layout#

The tables below depict the memory layout for the image and for the flash.

Item	Address
OS image loaded at:	0x88010000
OS image begins execution at:	0x88012ba0
Flash base address (Bank A SW4 - 1 ON)	0x00000000
Flash base address (Bank B SW4 - 1 ON)	0x04000000
Serial base address (SCIF 0)	0xFFE00000 (IRQ: 0x2018)
Serial base address (SCIF 1)	0xFFE10000 (IRQ: 0x203C)
Ethernet base address	0x15800000 (IRQ: 6)

Getting Started#

Step 1: Connect your hardware#

Connect the serial cable to the serial port of the Renesas SH7785 EDOSK and to a free serial port on the host machine (e.g. ser1 on a Neutrino host).

Note: If you have a Neutrino host with a serial mouse, you may have to move the mouse to the second serial port on your host, because some terminal programs require the first serial port.

Step 2: Build the BSP#

- unzip the bsp package archive to the desired location on the host machine
- cd to the root of the BSP and type 'make'. The resulting OS image will be located in the images directory

Step 3: Transfer the OS image to the target#

Note:
There are two different ways that you can boot the board:

- The combined IPL and OS image, ipl-ifs-edosk7780.bin (which the BSP generates by default), can be programmed directly into flash bank B, using the EDOSK7780's ETS ROM Monitor. The board can then be configured to boot from flash bank B, directly into QNX.
- Alternatively, the BSP build file can be modified to generate an ELF format OS image, which can be downloaded to memory, using the ETS ROM Monitor's TFTP download capability.

Step 3A: Using ETS to Program the Combined IPL and OS Image to Flash Bank B#

To program the combined IPL and OS image ipl-ifs-edosk7780.bin into flash, using the ETS Monitor, do the following:

1. Configure the ETS Monitor as follows, substituting your own IP addresses for server and board:

```
TFTP Bootloader Main Menu
-------------------------
  1. Boot from network
  2. Boot from flash
  3. Boot from FAT32 format MMC card
  4. Load program into flash
  5. Display configuration
  6. Change configuration
Command:> 6
Setup TFTP Bootloader Configuration:
At any prompt press 'Enter' to leave unchanged or 'Esc' key to quit

Use DHCP to setup network? (default=Static IP) [y/n]: n
Enter board IP address [10.42.106.251]:
Enter server IP address [10.42.106.240]:
Enter kernel (/xfer/ipl-ifs-edosk7780.bin) filename:
Download to flash Bank B? (default=Bank A) [y/n]: y
Download file format bin/srec? [b/s]: b
Binary load address [default=H'40010000]        :
Load a disk image? [y/n]: n
Setup kernel command line? [y/n]: n
Boot option: TFTP, Flash, None(TFTP Menu)? [t/f/n]: t

Is flash Bank A write protect switch SW4-4 = 'OFF'? [Y/N] : y

Updating Boot Flash - Do not switch-off or disconnect until complete
Please wait, saving the new Boot configuration...

Successfully saved new TFTP Bootloader configuration.


TFTP Bootloader Main Menu
```

```
------------------------
  1. Boot from network
  2. Boot from flash
  3. Boot from FAT32 format MMC card
  4. Load program into flash
  5. Display configuration
  6. Change configuration
Command:> 4
Board IP address: 10.42.106.251
Server IP address: 10.42.106.240
Downloading /xfer/ipl-ifs-edosk7780.bin to flash bank B
0020003 Downloaded 3432 bytes, crc 17

Is flash Bank B write protect switch SW4-5 = 'OFF'? [Y/N] : y
Flash: AM29GL512N (67108864 bytes)
Sectors: 256 (262144 bytes each)
Writing Binary to flash...
Is the BIN image Big or Little Endian? [b/l]: l
b 2 add A4000000

Toggle flash bank select switch to boot from bank B
```

2. Remove power from the Target, and change DIP switch MISC_SW1 to the OFF position, to boot from flash bank B. When power is reapplied, the board should now boot the QNX IPL.

3. Once the IPL is loaded, you will be given two choices:

- Boot the image in flash.
- Download the image serially.

If you've followed the directions above, you can simply press any key (other than d) and the OS image in flash will boot.

If you wish to download the OS image serially, press the d key and use sendnto to download the image:

```
sendnto -b115200 -d/dev/ser1 ifs-edosk7780.bin
```

Note:
The serial port will change depending on which is connected to the target. Please see the sendnto documentation in the Utilities Reference.

Step 3B: Using ETS to download an ELF Format QNX Image Directly to Memory#

To download a QNX OS image directly to the board's memory, using the ETS TFTP loader, do the following:

1. Modify the OS image build file edosk7780.build to generate an ELF image.

Change the original line: **`[virtual=shle/binary +compress] .bootstrap = {`**

to: **`[virtual=shle/elf +compress] .bootstrap = {`**

2. Generate the ELF image as described in the previous section. Note: The name of the resultant image will remain ifs-edosk7780.bin.

3. Apply power to the EDOSK7780.

4. The following should display in the serial console:

```
=========================================================
(c) Renesas Technology Europe Ltd.[www.Renesas.com]
Embedded Test Suite (ETS) for SDK7780
ETS Version: 2.00 Oct 08 2004 FPGA Version: 2.00 Sep 16 2004
Ethernet MAC Address for this platform: H'0000.87D6.DE30
=========================================================
ETS MAIN MENU
0. Flash Programming Menu
1. Test Menu
2. Boot Configuration Menu
3. Upgrade FPGA Version
4. Display System Configuration
=========================================================
Command:>
```

5. Follow the instructions in the User's Manual provided by Renesas to start the TFTP Loader.

6. Setup the host system to accept tftp requests.

7. Using the instructions provided by Renesas for the TFTP Loader, load the ELF image.

Creating a flash partition#

1. Enter the following command to start the flash filesystem driver:

```
devf-edosk7780 -s0x0,64M
```

or:

```
devf-edosk7780 -s0x04000000,64M
```

2. Erase the flash, except for the first 2 megabytes:

```
flashctl -p/dev/fs0 -o2M -ev
```

3. Format the partition:

```
flashctl -p/dev/fs0p0 -o2M -f
```

4. Slay, then restart the driver:

```
slay devf-edosk7780
```

```
devf-edosk7780 -s0x0,64M &
```

or:

```
devf-edosk7780 -s0x04000000,64M
```

You should now have a /fs0p1 directory that you can copy files to.

Driver Command Summary#

The following table summarizes the commands to launch the various drivers.

Component	Buildfile Command	Required Binaries	Required Libraries	Source Location
Startup	`startup-edosk7780 -Dscif..115200.1843200.16 -f400000000 -v`	.	.	`src/hardware/startup/boards/edosk7780`
Serial	`devc-sersci -e -F -x -b115200 -c1843200/16 scif0 scif1 &`	devc-sersci	.	`src/hardware/devc/sersci`
Flash (NOR)	First 64MB at 0x0 : `devf-edosk7780 -s0x0,64M` Second 64MB at 0x04000000 : `devf-edosk7780 -s0x04000000,64M` Note: Bank A / B depends on SW4 - 1 position	devf-edosk7780 flashctl	.	`src/hardware/flash/boards/edosk7780`
PCI	`pci-edosk7780`	pci-edosk7780 pci	.	`src/hardware/pci/edosk7780`
Network	`io-pkt-v4 -dsmc9000 ioport=0x15800000,irq=6 -pttcpip if=en0:x.x.x.x`	io-pkt-v4 ifconfig	devn-smc9000.so libsocket.so	`src/hardware/devn/smc9000`
ATA/ATAPI	`devb-eide-edosk7780`	devb-eide-edosk7780	.	`src/hardware/devb/eide/sh/edosk7780.le`
Audio	`io-audio -dedosk7780_ac97`	io-audio wave mix_ctl	deva-ctrl-edosk7780_ac97.so deva-mixer-ac97.so libasound.so	`src/hardware/deva/ctrl/edosk7780_ac97`

Some of the drivers are commented out in the default buildfile. To use the drivers in the target hardware, you'll need to uncomment them in your buildfile, rebuild the image, and load the image into the board.

ATA/ATAPI:#

Note:

- The devb-eide-edosk7780 driver requires that the resource_seed utility is run, prior to running the driver.
- Due to an issue with the FPGA image on the EDOSK7780, the devb-eide-edosk7780 driver works only in PIO mode. Contact Renesas for information on obtaining and updating the FPGA image.

Audio:#

Note:
The deva-ctrl-edosk7780_ac97.so driver requires that the resource_seed utility is run, prior to running the driver.

Known issues for this BSP#

- Due to the use of an external clock, the serial driver must run at 115200 baud.
- The documentation references the OS image and the combined IPL/OS image files respectively as ifs-edosk7780.bin and ipl-ifs-edosk7780.bin. These are the correct names when building the BSP from the command line. However when building the BSP from the IDE these names are renamed respectively to bsp-renesas-edosk7780.ifs and ipl-bsp-renesas-edosk7780.bin.
- The devn-smc9000.so driver does not handle large packets well (Ref# 24818). **`Workaround`**: Always specify block sizes less than 5 KB (5120 bytes) to transmit / receive data. For example, use a smaller block size for fs-nfs3: **`fs-nfs3 -B4096`**
- In those instances where the the ROM monitor's MAC address is different from the one you pass in when running io-pkt, the host can cache the ROM monitor's address. This can result in a loss of connectivity.**`Workaround`**: If you need to specify a MAC address to io-pkt, we recommend that you use the same MAC address that the ROM monitor uses. This will ensure that if the host caches the ROM monitor's MAC address, you'll still be able to communicate with the target. Otherwise you might need to delete the target's arp entry on your host.