

Course Project Assignment

NSWI004

Project Specification

Port HelenOS to ColdFire platform using QEMU.

(1) Research on QEMU target emulator capabilities

- QEMU provides System emulators for non PC targets. *ColdFire System emulator is available.*
- The M5208EVB board emulation includes the following devices:
 - *MCF5208 ColdFire V2 Microprocessor (ISA A+ with EMAC)*
 - *Two on-chip UARTs*
 - *Fast Ethernet Controller (FEC)*

(2) Research on target platform properties

- Coldfire V2 features:
 - *32-bit MCU*
 - *endianness: big endian*
 - *stack implementation: stack pointer is decremented*
 - *no MMU (allowed direct access to the full 32-bit address space)*
- Familiarize myself with microprocessor architecture and assembly instructions.

(3) Research on HelenOS properties

- Coldfire V2 features:
 - *HelenOS is compiled from C, Objective C and C++ source code.*
- Familiarize myself with HelenOS

(4) Research on cross-platform development toolchain

- **Cross-platform compiler:**
 - *GCC 4.3 implemented scheduling support for ColdFire V2 processors*
 - *GCC 4.4 supports instruction scheduling for ColdFire V1, V3 and V4 processors*
- **Binutils:**
 - *Latest stable release*
- **C library:**
 - *Newlib latest stable release (only for QEMU demos, the HelenOS implements its own libc)*

(5) Prepare cross-platform development toolchain

- **binutils-2.20**

configure --target=m68k-elf

- **gcc-4.4.2**

configure --target=m68k-elf

- **newlib-1.18.0**

configure --target=m68k-elf

(6) Porting OS to target platform

- *stack implementation*
 - *memory allocation*
 - *context switching*
 - *setting up a timer*
 - *ISRs*
 - *device drivers*
- (and many other features ...)*

(7) Prepare QEMU boot image

- Bootable disk image, like e.g.:
 - *image.iso*
 - *image.boot*
- Required platform proprietary implementation