FreeBSD/embedded summary

Rafał Jaworowski
raj@freebsd.org

FreeBSD Developers Summit 2008, Ottawa

ARM – current state

- Highlights
  - Official FreeBSD/arm appearance: 7.0-RELEASE
  - Considered very good condition overall: "almost" Tier-1
- CVS
  - AVILA, BWCT, CRB, EP80219, HL200, IQ31244, KB920X, SIMICS, SKYEYE
- P4
  - Additionally: DB-88F5XXX, FS2410, GUMSTIX, KBRAM, SLUG, TS7200, TSC4370
- Problems with LINT: so many arch variations
- Coming soon
  - Better support for Orion 5x
  - Newcoming: Kirkwood 6x, Discovery (MV-78xxx)

MIPS – current state

- Highlights
  - FreeBSD/mips first appearance in CURRENT
  - Targets: mips32, mips64
  - Kernel reaches multiuser, builds world
- CVS/P4
  - ADM5120, IDT, MALTA, QEMU, SENTRY5
- Coming soon
  - More improvements

PowerPC – current state

- Highlights
  - e500/MPC85xx
  - SMP PowerPC
  - Very promising WIP: G5 (Nathan Whitehorn) – bridge-mode is the first step towards 64-bit PowerPC support
  - http://wiki.freebsd.org/powerpc/BookE (TODO list etc.)
  - http://wiki.freebsd.org/powerpc/ToDo
- CVS/P4
  - MAC, MPC85XX
- Coming soon
  - dual-core MPC8572 (2x e500)

GSoC 2008 – FreeBSD embedded projects

- Optimizing build system for embedded environments
    - Minimal installation footprint
    - Non-i386 architectures
    - http://wiki.freebsd.org/JamesAndrewHarrison
- Port to Efika
    - PowerPC: MPC5200B SoC, e300 core CPU
    - http://wiki.freebsd.org/Porting_FreeBSD_to_Efika_%28PPC_bring_up%29
    - Previous work (Andrew Turner)

Embedded TODO highlights

- FLASH file system (NOR, NAND)

  - NOR: cfi(4) available, but no FS

  - NAND: only some older pieces, no FS

- Improve build system

  - Not fully cross (building FreeBSD kernel/world on Linux, MacOS etc.)

  - Not convenient/easy to integrate out-of-the tree toolchain

- Better system/kernel configuration

- Kernel infrastructure

  - Generic on-chip peripherals bus: ocp(4) – Marcel

  - sys/dev [lack of] hierarchy: maintenance/naming more difficult with many new drivers coming to the tree

  - bus_dma(9): not up-to-date WRT NetBSD reference