ARC — new first class citizen in U-Boot

Porting U-Boot to yet another ARChitecture

Alexey Brodkin

October 13th, 2014
Agenda

• Where we started
• Why move?
• First steps
• Great rebase
• Clean-up
• Review
• Being a custodian
• Next steps
• Things to improve in U-Boot
Where we started

- Pre-historic
  1.1.3, 1.3.3 in internal SVN

- Middle ages
  2009.01, 2009.06, 2011.03 in internal SVN

- Modern history
  2012.07, 2013.01 on GitHub
  https://github.com/foss-for-synopsys-dwc-arc-processors/u-boot
Why move?

- Get up-to-date:
  a. drivers
  b. filesystems
  c. features
  d. fixes

- Escape manual rebasing of ARC patches

- Make ARC more visible

- Aren't we as cool as others?
First steps

- Added support for new board

- Fixes for used drivers:
  a. DesignWare SD/MMC
  b. DesignWare I2C
  c. DesignWare GMAC

- Fixes for CPUs with caches
Great rebase

- Switch to common board
  - Init calls - which ones to use?

- Relocation is required!
  - No assembly, please (steal from x86)
  - "Elf32_Rela" but not "Elf32_Rel"
  - Middle-endian on little-endian

- PIC
  - Initial success
  - CONFIG_NEEDS_MANUAL_RELOC
  - Not enough MANUAL_RELOC

- No more PIC, use PIE
Clean-up

- Unused headers and legacy code
- Linux stuff
  a. Some definitions differ: CPU_BIG_ENDIAN vs SYS_BIG_ENDIAN
  b. __KERNEL__ is obsolete in U-Boot
  c. Dead/unused in U-boot parts of headers
  d. Re-format even code from upstream kernel
Review

- Recent port as a reference (OpenRISC)
- More clean-up
- Explain unexpected arch specifics
  a. AUX regs are in separate address space.
- Accessors saga
  b. “IO_READ8”, “IO_READ16”, “IO_READ32”;
     “IO_WRITE8”, “IO_WRITE16”, “IOWRITE32”
- Upstream never sleeps
Being a custodian

● Repository on http://git.denx.de/
  a. It's you who decides what is acceptable
  b. Move sets of patches upstream at once

● Wiki on www.denx.de/wiki/U-Boot
  a. Save handy tips and tricks for yourself
     ▪ How to manage custodian repo
  a. Provide useful informations for users
     ▪ Tools for your architecture
     ▪ How to run your U-Boot on target
Next steps

- ISA v2 support (ARC EM, ARC HS)
  a. Incompatible vector table

- More boards
  a. nSIM OSCI
  b. EMSK v1/v2

- SPL
  a. No printfs
  b. Avoid usage of libcommon and friends
Things to improve in U-Boot

• More generalization
  a. Init calls
  b. Accessors
  c. Relocation functionality

• Wrappers for printf
  a. Debug
  b. Info
  c. Errors
Thank You

Synopsys
Accelerating Innovation