Cross Distribution issues

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ARM distribution support

ARM distribution support

- ARM support arriving to pretty much all major distributions
- But quality varies...
  - Vendor kernels
  - Only a few ARM system targets supported
  - Installation using tricks rather than installer
  - Not all software that is available is available for ARM users
  - Not all ARM optimizations enabled in software
- Complaints about ARM
  - slow ARM builders
  - ARM system diversity makes support hard
  - Hardware support gets abandoned
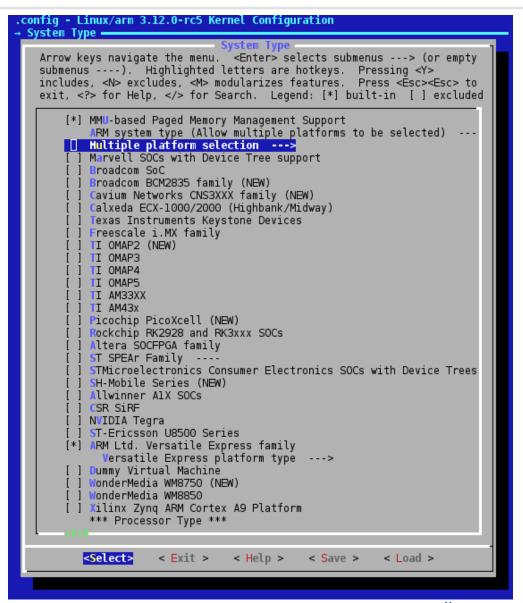- Any other pain points?

Work done: Device tree files

- Actually more work for distributions
  - Device Tree Files remain grey area between firmware and OS
  - Since they are updated in kernels' we need to ship them with kernel
- Recommendation: Install DTB to
  - **/boot/dtb/**$filename_as_in_kernel.dtb
  - This is also where u-boot/uefi/grub should read it from
  - Consider UEFI can only read from 'EFI' FAT partition
- Speaking of firmware
  - Avoid shipping u-boot/UEFI in distro (like you wouldn't ship BIOS)
  - If you do, make updating bootloader a manual step

Work done: multiplatform kernels

- Single zImage
- Now in Debian http://packages.debian.org/sid/linux-image-armmp
- Potential issues remain
- Enabling ARM errata tricky
- Kernels might get too big for some bootloaders
- Please start using multiplatform kernels so we can fix any issues

Mainline support of boards

- Vendor kernels in distributions is bad, mmkay?
  - users stuck in old releases
  - maintaining multiple kernels is extra work
  - please work instead on mainlining stuff
- Bad news
  - Graphics, 3d support bad and proprietary
  - Power management flaky
  - HW Vendors give up supporting old cpu's early
- Good news
  - Server-like systems (nas..) getting supported well
    - 5 years of support of IOP32x based thecus n2100 nas in Debian using mainline kernels - community support is possible
  - Supporting kernels for virtual machines (kvm, xen) easy - do so!
- Which boards would your distribution like Linaro to work on mainlining?

State of GPU drivers

- No open GPU drivers from vendors
  - Pressure needed on all fronts
  - Redistributable binary drivers only from nvidia so far!
- Reverse engineering projects
  - Done on free time so slow progress
  - [Qualcomm adreno drivers developed furthest](#)
  - Mali-200/Mali-400 Next
- Improving llvmpipe/mesa important for now
  - http://www.mesa3d.org/llvmpipe.html
- Standardizing location for proprietary opengl drivers?

ARMv7 aka Aarch32 userland

- Almost feature complete, but can be optimized more
  - Has your distribution enabled OpenSSL optimizations?
    - Fedora yes, debian only recently, opensuse no
  - Mesa renderer use llvmpipe?
  - Many other places
- Missing bits
  - Mono, Haskell (ghci), …
  - Java is zero-port only

ARMv8 aka Aarch64

- Above distros have bootstrapped and support Aarch64 now
- From Bootstrapping to deploying
  - Core infrastructure from gcc to LAMP "pretty much done"
  - New bits ported all the time, recent ports include klibc, Java, Qemu, kvm and xen
  - Most GNU/Linux software has little problems porting to Aarch64
  - Hardest bits are esoteric programming languages and JIT code generators.

ARMv8 aka Aarch64 future

- Expand the list above
- From Bootstrapping to deploying
  - We still need a lot of software ported
  - https://launchpad.net/linaro-aarch64
  - bigger porting jobs need a card and approval: Linaro ARMv8 Card
  - Optimization work
  - We need your input on what to port next!

Cross-Distro standardization effort

- We want to avoid pointless diversity
- Linker path bikeshed, history now?
  - armhf: /lib/ld-linux-armhf.so.3
  - aarch64: /lib/ld-linux-aarch64.so.1
  - same linker path for big endian systems!
- What else do we need to agree on?
  - boot file location (/boot/dtb) ?
  - interface between OS and firmware?
  - opengl / opengl es libraries?
  - Anything else?

connect.linaro.org

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