CELF Project and Conference Information

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Agenda

- Contract work update
- Open Project Proposals
- Conferences
Current Contract Work
Recent Contract Work

- Device Tree support for ARM
- Function-sections work (size)
- Cache effects of small data size
- Matt Mackall – embedded maintainership
Device Tree for ARM

- Add support for “device tree” for ARM platforms
- Contractor: Secret Labs (Grant Likely)
  - Grant is now maintainer of DT code for all architectures
Device Tree work status

- All the infrastructure is up and running, and the mechanism is in place to pass a device tree to the kernel at boot
  - Device tree support is ported to ARM and running on multiple OMAP platforms (Overo and BeagleBoard)
  - Can boot two different ARM boards with same base kernel (with statically linked device tree)
- Grant is working to complete automatic registration of devices and patching the device drivers to work with the new data
- Next milestone is to write the documentation and final report
Device Tree mainline status

- Most of the needed code is already merged, or is queued up for the next merge window.
  - Latest merge of device tree changes in Linus' tree: http://git.kernel.org/?p=linux/kernel/git/torvalds/linux-2.6.git;a=commit;h=6ebdc661b608671e9ca572af8bb42d58108cc008
  - More stuff is ready at: http://git.secretlab.ca/?p=linux-2.6.git;a=summary
- Core ARM device tree patches have been posted, but haven't received any comments yet
Function-sections

- Add support for compiler flag -ffunction-sections to Linux kernel
- Contractor: Denys Vlasenko
- Main work: Rename existing linker sections to avoid possible collision with function-sections
- Purpose: shrink the size of the Linux kernel image by up to 10%
Function-sections purpose

- `-ffunction-sections` puts each function in its own linker section
- Allows eliminating more code by the linker
  - Which results in space savings
- Also, could support code re-ordering for bootup time reduction or improved cache utilization:
  - See [http://www.celinux.org/elc08_presentations/DDLink%20FunctionReorder%202008%202004.pdf](http://www.celinux.org/elc08_presentations/DDLink%20FunctionReorder%202008%202004.pdf)
Cache effects of small data size

- Investigate performance effects of using small data elements in kernel data structures
- Contractor: Denys Vlasenko
- Investigate whether use of small integers (1-byte) has positive or negative performance impact
- Sony research indicates that cache effects are a big deal, for real-time performance
- Interesting article on compressing kernel data structures:
Matt Mackall

- CELF sponsor's Matt to do general “embedded Linux” maintenance tasks
  - CELF pay him part time to work on task of general interest for embedded Linux

- Status:
  - Not much activity in last 2 months
  - Has worked to resolve name conflicts in MTD code
Open Project Proposals
Contract Project Planning

- CELF is using an open process for 2010 project planning
- Public can propose a project to be worked on
  - CELF will decide which ones to work on, up to our annual contractor budget
Contract Project Status

- Have received many bids and now need to prioritize projects
  - Haven't had time to prepare materials for AG vote
- Total projects: 28
- Total bids received so far: 14
- Percent of budget used, if all current bids accepted: 88%
- AG vote on 2010 projects should occur in March
  - With follow-on discussion in April after ELC
Past Conferences

• ELC Europe 2009
  – Videos available by end of year soon
• Japan Linux Symposium
  – Videos available at: http://video.linuxfoundation.org/
Conferences coming up...

- ELC 2010 – April 12-14, San Francisco
- LinuxCon (US) – August 10-12, Boston
- ELC Europe 2010 – Fall, Cambridge, UK
- LinuxCon Japan – September, 27-29, Tokyo
- Kernel Summit – November 1-2, Cambridge, Massachusetts
Embedded Linux Conference

- See http://www.embeddedlinuxconference.com/
- Sessions are now online
- Schedule almost done – hopefully posted in next 2 days
ELC Highlights

• **Keynotes**
  – Greg Kroah-Hartman – Kernel maintainer
  – Matt Asay – new COO of Canonical, former executive at Lineo

• **Topics**
  – Real-time, power management, security, porting, tracing, SMP, graphics and multi-media, development tools, bootloaders, kernel performance, file system issues,
  – Platforms (moblin, maemo, android)
  – Kernel developer tutorials (jtag, threaded interrupts, using emulators, LTTng)

• **Collaboration Summit**
  – Kernel Panel, Meego keynote, State of Linux, breakout sessions
ELC Europe 2010

• Fall, Cambridge, UK
  – Tentative dates: September 9, 10

• Tentative joint events
  – Open Source DLNA summit
  – Gstreamer conference
  – Xenomai conference (very tentative)
LinuxCon Japan

- September 27-29 in Tokyo, Japan
  - In Roppongi Hills
- CELF will help organize an embedded track
- Embedded Linux Summit planned for same time
Questions & Answers!