The Ubuntu Kernel

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Agenda

- What this talk is not...
- Kernel Team Overview
- Kernel Team Responsibilities
- Process/Procedure
- What's Different in the Ubuntu Kernel
- What's new for Karmic Koala
- Q & A
What this talk is not...

- A gripe session about your favorite bug
- A debate over upstream policy or technical decisions
- A distro bashing session
Why this talk?

Transparency
Kernel Team

- Made up of 3 distinct parts
  - Canonical Paid Employees working on the Ubuntu Platform (9)
  - Canonical Paid Employees working on Partner Contract work (8)
  - Community Contributors
Canonical Employees

- Canonical Kernel Team consists of two sub-teams:
  - Platform
    - Works on the mainline Ubuntu distro
    - Enables reference platforms & devices
  - Hardware Enablement
    - Enables device specific enablement
    - Mostly contract work for partners, OEMs & ODMs
- Located globally across 7 countries (Finland, US, UK, Germany, Taiwan, China, Australia)
Community consists of:

- Upstream Developers
- Partners & Vendors
- Volunteers
  - Developers
  - Testers
  - Bug Handlers
  - Documentation
Kernel Team Responsibilities
Responsibilities

- Develop in an open model, in collaboration with community and upstream.
- Enable a wide range of hardware
- Maintenance of the Linux Kernel for Ubuntu on supported architectures
- Development standards & collaborative development support for the Ubuntu kernel tree
- Care and feeding of: Kernel git tree, Ubuntu kernel-team mailing list, Bug Policies, Documentation
- Automated Vanilla Linux Kernel Builds and packaging
- Selection of the Linux Kernel Version for Ubuntu Releases
- Serve as the interface to the Linux Kernel Upstream
- Conduct weekly public Ubuntu Kernel Team IRC meetings
- Ubuntu Kernel Roadmaps for new releases
- Develop & conduct Kernel tracks at the Ubuntu Developer Summit (UDS)
Kernel Development
Development Lifecycle

**PLAN**
- Collect requirements
- Generate ideas
- Agree preliminary feature list

**OPEN**
- Merge from Debian
- Add new, experimental components
- Highly unstable

**DESIGN**
- Ubuntu Developer Summit
- Create detailed designs
- Final add/drop of features

**TEST**
- Feature development ends
- Exclusive focus on stabilization
- Fix regressions

**RELEASE**
- Finished product
- Security and maintenance only

**DEVELOP**
- Active feature development
- Variable experience
Development Schedule

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Kernel Bug Handling
Hardware DB workshop
Kernel Config Review
Kernel Mode Setting
Newer Kernel on LTS
Review of non-upstreamed code
Kernel SRU Policy Review

Android Kernel Components
Kernel Decision Session
Sponsoring /staging drivers
SSD Performance
Suspend Resume
Wifi Improvements
Kernel Team Communications

- IRC – Freenode #ubuntu-kernel
- Mailing List – kernel-team@lists.ubuntu.com
- Weekly IRC Team Meeting: 1700 UTC on Tuesdays on FreeNode in #ubuntu-meeting
Kernel Differences

Kernel Differences
Ubuntu Kernel Differences

- Very small delta from Linus' tree
- Differences are referred to as “Sauce” patches.
- Differences are in the following areas:
  - Distro integration patches
  - Support for live cd filesystems (aufs)
  - Differentiated System Description Table (DSDT)
  - Limited backports of newer upstream drivers or patches for problematic hardware (linux-next)
  - Security: AppArmor
- All changes from mainline can be found in the Ubuntu Kernel Tree under the `/ubuntu` directory
Kernel Team Policies
Kernel Team Policies

- What goes into Stable Release Updates (SRU)?
  - Long Term Support (LTS) Releases:
    - Hardware Enablement
    - Critical Bug & Security Fixes
  - Non LTS Releases:
    - Critical Bug Fixes
    - Security Fixes
- SRUs release schedule is quarterly except security with is asynchronous
Kernel Team Policies

- Operate as close as possible to upstream
  - Mailing list operation
  - Patch review
  - Patch submission
Kernel Packages
Kernel Packages

- Ubuntu Released Kernels
  - generic & server
  - <= Hardy: x86, x86_64, PPC, SPARC, HPPA, IA64
  - Intrepid: x86, x86_64
  - Jaunty: x86, x86_64, ARM (imx51, ixp4xx, versatile)
  - Karmic: x86, x86_64, ARM (imx51, versatile)

- Upstream Mainline Builds
  - No Sauce patches
  - Ubuntu Configs
  - No supporting packages (LBM, LUM, LRM)
Kernel Packages

- Daily Tip
  - Daily build of Linus' tree
  - No Sauce patches
  - Ubuntu Configs
  - AKA: crack of the day (c-o-d)
  - No supporting packages (LBM, LUM, LRM)
Linux Restricted Modules (LRM) have gone away as of Karmic

- Drivers in LRM are now DKMS packages
  - fglrx
  - nvidia
  - wl
Whats in Karmic
What's in Karmic...

- 2.6.31 Kernel
- KMS default
- Grub2
- Ext4 default
- Removal of AUFS
- AppArmor upstream in .31 merge window
- Android kernel support
- Better wifi support
- Focus on suspend/resume
- Auto tuning of SSD media (kernel & installer)
Questions?