Focused Efforts around LTS

Linux Plumbers Android Microconf 2017

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Why ‘renewed’ interest in LTS?

- Short Answer: AOSP Kernels.
- Earlier, AOSP kernels would start with an LTS kernel, then branch out deep, into vendor trees
  - Fixes and security updates were scattered all around, mostly staying put in vendor trees, or sometimes android-common, but not sent to -stable.
  - This also meant fixes weren’t tested well outside of vendor tree scope.
- Devices would follow a ‘longer than LTS’ lifecycle.
  - Level of Confidence on these devices was low wrt fixes, security updates and general stability
- Need to Streamline Fixes & Testing
New Phones, Old Kernels

- 2015 Nexus devices (Oct 2015): 2 years, 4 months
- 2016 Pixel Phone (Oct 2016): 1 year, 10 months
- Early 2016 Flagship (Mar 2016): 1 year, 3 months
- Early 2017 Flagship (April 2017): 1 year, 4 months

Kernels:
- v3.10 (Jun 2013)
- v3.18 (Dec 2014)
- v4.4 (Jan 2016)

LTS 2yr lifetime:
Kernel Flow

1. LTS
2. Android common.git
3. SoC vendor Kernel
4. Device Kernel
LEADING COLLABORATION IN THE ARM ECOSYSTEM

Kernel Flow

LTS

Android common.git

SoC vendor Kernel

SoC vendor Kernel

SoC vendor Kernel

SoC vendor Kernel

Device Kernel

Device Kernel

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Device Kernel
Kernel Flow

LTS

- Distro Kernel
- Android common.git
- Distro Kernel
- Distro Kernel

SoC vendor Kernel

Device Kernel

Device Kernel

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Device Kernel
What is being done?

● More fixes into LTS
  ○ At Linaro, we are actively scouting distro and vendor kernels for -stable worthy patches, and proposing them - like a few other community members.
  ○ Since March 2017, we’ve scouted ~3400 patches, while having ~300 accepted into LTS kernels.

● AOSP common kernels are now continually merging corresponding LTS releases.
  ○ They don’t accept generic fixes; pushed to propose towards -stable instead.
  ○ As a result, these fixes that used to stay in vendor trees, or get added to android-common, get merged into LTS
What is being done?

- Increased testing of LTS
  - Each -stable -rc release is tested for regressions, and reports sent to Greg - seemed missing for ARM devices.
  - CTS and VTS have been enhanced for increased testing as well.
  - LKFT runs a battery of tests against LTS and Android kernels
    - Amit will talk about LKFT in detail
  - As an example, LKFT runs kselftest-mainline against LTS, AOSP & mainline kernels.

- This should increase confidence for downstream SoC vendors and devices to do regular merges of common trees to get fixes, without fear of regressions.
LTS Testing and Bug Fixing

● From LKFT’s runs, as of 7/Sept/17:
  ○ Eg We test kselftest-mainline with 4.4 / 4.9 both stable & aosp, and
  ○ We found 86 bugs
  ○ 50 got fixed - out of which
    ■ 12 were test case issues or updates,
    ■ 5 were kernel issues - timekeeping one was interesting,
    ■ 4 config mismatch related,
    ■ 6 related to Infrastructure,
    ■ 1 fix went into AOSP,
    ■ 5 were related to OE
  ○ In Progress / Under discussion:
    ■ Many of these are related to stable kernels tested with mainline kselftests: they should ‘degrade gracefully’, but don’t: some of the difficult ones to handle this are firmware, seccomp, bpf.
We need all the help...

- How can we source more fixes for LTS?
- What more can we do to promote ‘upstreaming fixes’ amongst distros and vendor companies?
- How can testing infra be improved in a way to be useful for an ‘old’ LTS kernel, while being relevant for mainline and next?
- Help triage and fix bugs as they are found
Thank You

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