LTSI Project update

Long Term Support Initiative

Tsugikazu SHIBATA, NEC
2, June 2017
Automotive Linux Summit
Ariake, Tokyo Japan
Who am I

• Tsugikazu SHIBATA, NEC
• Founder and project lead of LTSI
• LTS/LTSI Advocate

• Board member of Linux Foundation
• Involved with Linux community since 2.4
Open Source is being dominant

• All the innovative new projects are started with Open Source activities
• Well established Open and Collaborative method
• Great human resource; Experienced and Trained come across other communities
• Existing Legal model, Open Source license and its framework
Linux is one of the most successful Open Source project

Continue growing in 26 years; expanding adoption for new area:
- IT enterprise, Cloud, SNS, Network, Smart Phone, Robotics, Embedded, IoT and many others

Developing and delivering under GPLv2
Developed by the community

- Participating ~1700 developers, ~230 companies every release
- Growing yearly 1.5M lines of code, 4000 files increased
- 26 Years of history
- Maintainers have great skill to manage the subsystem and professional knowledge of its area of technologies
Status of Latest Linux Kernel

- Latest released Kernel: 4.11
  - Released: May 1st, 2017
  - Lines of code: 23,137,402 (+297,743)
  - Files: 57,964 (+792)
  - Developed period: 70 days

- Current Stable Kernel: 4.11.3

- Current development kernel: 4.11-rc2
Kernel release cycle

- Release cycle: 65 ~ 70 days, 5~6 releases/year

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Linux development policy

• Upstream is only the place to accept the patches
  – Reviewed by skilled maintainer
  – Tested with other proposals to confirm no conflicts
  – Well coordinated development process for over thousands of developers
Linux Development process

• Just after the release of 4.n, two weeks of merge window will be opened for proposal of new features
• After 2 weeks of merge window, -rc1 will be released and the stabilization will be started
• 4.n+1 will be released when it becomes reasonably stable by some of -rcX released
Linux Source Code Growth

• Increasing 0.3ML/Version, 1.5ML/year
Rapid Release cycle of Linux

- Yearly more than 5 times of chance to merge the code into upstream. Other project maybe 6 month release cycle that is 2 times/year.
- So many choice for own products and need deeper knowledge to pick right version.
Stable kernel release

- Recommended branch for users who want the most recent stable kernel
- 3 part version like 4.n.m
- Contain small and critical fixes for security problems or significant regressions discovered in a latest development version
- Becomes End Of Life when next stable kernel were released
Status of Latest Linux Kernel Again

• Latest released Kernel : 4.11
• Current Stable Kernel : 4.11.3
• Current development kernel : 4.12-rc3
LTS: Long Term Stable Kernel

- Extended maintenance period for stable kernel
- Kernel tree continue to back port bug and Security fixes for more long term
- Pick one version per year and maintain 2 years
Why LTS?

• Only the tree get fixes from the community
• In the real use case, tested/confirmed kernel is important, less important for new features
• Fixes will be released # of times and should be applied frequently, Security/Bug fixes are being more important
• Bugs found in LTS should be reported and fixed in upstream
Current LTS versions

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<td>2012-01-04</td>
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https://www.kernel.org/category/releases.html
LTS includes large number of fixes

- 600 – 700 fixes included in a Stable release
- LTS include several thousands of fixes

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LTSI Status
What is LTSI

• Open Source community to create and maintain LTSI kernel tree for long term
  – Based on LTS
  – Add another chance to include further patches on top of LTS
  – Same lifetime with LTS (yearly release and 2 years life time)

• Industry party to share best practice and help companies to use Linux for long term
LTSI includes LTS

**LTSI**
- Add vendor required features
- Share status, info, problem among industry people
- Huge testing by contributors
- Auto test frame-work
- Provide help developer for upstream

**LTS**
- Release 1 version / year, Maintain 2 years
- Frequently and large number of bug / security fixes
History of LTSI

• Established 2011 – 6 years now  
  – Started for stable Kernel for Android  
• Integrated by Yocto Project (2012, May)  
• Have had a workshop/session to share information and discuss issues among industry people  
• Released yearly basis; 3.0, 3.4, 3.10, 3.14, 4.1
Shape of LTSI Project

• Small staff to coordinate workshop, session at LF conference
• Maintainer: Greg Kroah-Hartman, Fellow of Linux Foundation
• Working with upstream Linux Community
• Keeping neutral position to be able to use for variety of use case
Upstream first: OLD DAYS of Distro

Upstream Community

User

Request patches for inclusion for next release

Distro: Down stream

User
Upstream first: OLD DAYS of Distro

Upstream Community

Distro: Down stream

User

Request patches for inclusion for next release

User
Develop add on features based on a Kernel version
It will take some (one or more) version period to merge it

Upstream first Development model

User

Send patches for upstream

User
LTSI kernel

Additional chance to merge required patch on top of LTS

- LTS Continuous fixes
- Own Changes for Vanilla kernel (already in later upstream)
  - Company’s own changes,
  - SoC’s Add-on Patches
- Vanilla Kernel Features (LTS version)
LTSI development process

- Preparation: 4-6 month (~2 of upstream release)
- Merge window: 1~2 month to propose additional patches. Self contained or upstream features accepted
- Validation: a month or more. All the contributor must validate and report back
LTSI 2017 Development Plan

Announcements
- AMM 2/8
- ELC 2/20
- OSSJP 5/31
- OSSNA 9/11
- ELCE/KernelSummit 10/23
- LTSI 4.9 LTS

Announce
- 2/8 or 20

Merge Window Open
- End of June

Merge Window Close
- End of July

Release
- End of August

Events
- 4.9 LTS
- 4.9 LTS
- 4.10
- 4.11
- 4.12
- 4.13
- 4.14
- 4.15
- Announce
- Merge Window Open
- Merge Window Close
- Release
- Daring Dab
- Yocto2.4

Timeline:
- LTSI 4.9 Release
- 6 month
Here comes the Treble project

Before Treble

- Previous Android Release
  - Previous Android OS framework
  - Previous vendor implementation

With Treble

- Updated Android Release
  - Updated Android OS framework
  - Reworked vendor implementation

Vendor interface

Original vendor implementation

You can participate LTSI

- Follow on Twitter account: @LinuxLTSI
- Web: http://ltsi.linuxfoundation.org
- Mailing list: https://lists.linuxfoundation.org/mailman/listinfo/ltsi-dev
- Git tree: http://git.linuxfoundation.org/?p=ltsi-kernel.git;a=summary
Conclusion

• LTSI was started to fill the gap between community and industry but still there is the gap
  – We will continue our activity to discuss both side to better align each other

• Upstream first policy is important for Open Source

• Why don’t you join LTSI?
  – By joining LTSI, you will be able to share best practice
  –Be able to get information for stable kernel
THANK YOU