LTSI Project update
Long Term Support Initiative

Tsugikazu SHIBATA, NEC

Hisao Munakata, Renesas

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Key activities of LTSI
Long Term Support Initiative

- ☐ Provide a industry managed kernel and maintain Long term based on LTS

- ☐ Provide a common place for embedded industry to share information: Mailing list, Workshop …

- ☐ Provide place to support upstream activity : Help industry developer

LTSI history

- Established 2011 in Prague
- LTSI = LTS + Industry demanded patch (Back ports from the newer version)
  - We have gathered great number of patches from Intel, Toshiba, Renesas and others

LTSI 3.10 Released

- LTSI 3.10 had been released 24th Feb 2014
- LSTI 3.0 : updated base version to 3.0.101 and becomes EOL
- LTSI 3.4 : updated base version to 3.4.81

Why LTSI considered

Protocol	Location
HTTP	https://www.kernel.org/pub/
FTP	ftp://ftp.kernel.org/pub/
RSYNC	rsync://rsync.kernel.org/pub/

Latest Stable Kernel:
⊕ 3.14.4

mainline:	3.15-rc5	2014-05-09	[tar.xz]	[pgp]	[patch]	[view patch]		[cgit]
stable:	3.14.4	2014-05-13	[tar.xz]	[pgp]	[patch]	[view patch]	[view inc]	[cgit] [changelog]
stable:	3.13.11 [EOL]	2014-04-22	[tar.xz]	[pgp]	[patch]	[view patch]	[view inc]	[cgit] [changelog]
longterm:	3.12.20	2014-05-15	[tar.xz]	[pgp]	[patch]	[view patch]	[view inc]	[cgit] [changelog]
longterm:	3.10.40	2014-05-13	[tar.xz]	[pgp]	[patch]	[view patch]	[view inc]	[cgit] [changelog]
longterm:	3.4.90	2014-05-13	[tar.xz]	[pgp]	[patch]	[view patch]	[view inc]	[cgit] [changelog]
longterm:	3.2.58	2014-04-30	[tar.xz]	[pgp]	[patch]	[view patch]	[view inc]	[cgit] [changelog]
longterm:	2.6.32.61	2013-06-10	[tar.xz]	[pgp]	[patch]	[view patch]	[view inc]	[cgit] [changelog]

You can consider 1) latest version, 2) current development version (lots of experimental features are included, 3) several longterm stable kernels

Kernel release cycle

- Release cycle of Linux kernel is mostly 70 days

Version	Release	Duration
3.0	2011-7-21	
3.1	2011-10-24	95
3.2	2012-1-4	72
3.3	2012-3-18	74
3.4	2012-5-20	63
3.5	2012-7-21	62
3.6	2012-9-30	71
3.5	2012-12-10	71
3.8	2013-2-18	70
3.9	2013-4-28	69

Version	Release	Duration
3.10	2013-6-30	63
3.11	2013-9-2	64
3.12	2013-11-15	74
3.13	2014-1-21	67
3.14	2014-3-30	68

Released kernel and its maintained status

Ver.	Status
3.0	**EOL, Maintained as Long term till 3.0.101**
3.1	EOL, maintained till 3.1.9
3.2	**Maintained as Long term 3.2.55 For Debian**
3.3	EOL, maintained till 3.3.8
3.4	**Maintained as Long term 3.4.84**
3.5	EOL, maintained till 3.5.7
3.6	EOL, maintained till 3.6.11
3.7	EOL, maintained till 3.7.10
3.8	EOL, maintained till 3.8.13
3.9	EOL, maintained till 3.9.11

Ver.	Status
3.10	**Maintained as Long term 3.10.37 LTSI, RedHat**
3.11	EOL, maintained till 3.9.11
3.12	**Maintained as Long term 3.12.18 For SUSE**
3.13	EOL, maintained till 3.13.11
3.14	EOL, maintained till 3.16 is out

Stable release includes MUST APPY fixes

- Stable release only back port important bug and security fixes
- There are thousand fixes happened

Version		# of Fixes
From	To	
3.0	**3.0.101**	**36953**
3.1	3.1.9	647
3.2	**3.2.58**	**4873**
3.3	3.3.8	698
3.4	**3.4.90**	**4160**
3.5	3.5.7	62
3.6	3.6.9	676
3.7	3.7.10	718
3.8	3.8.13	996
3.9	3.9.11	746

Version		# of FIxes
From	To	
3.10	**3.10.40**	**2661**
3.11	3.11.10	677
3.12	**3.12.20**	**1952**
3.13	3.13.11	903
3.14	3.14.1	24

LTS and LTSI release cadence

- Maintainer choose one LTS version per year
- Maintain for 2 years from its original release
- Max 2 LTS maintained
  - 3.0 moves to EOL when 3.10 becomes new LTS
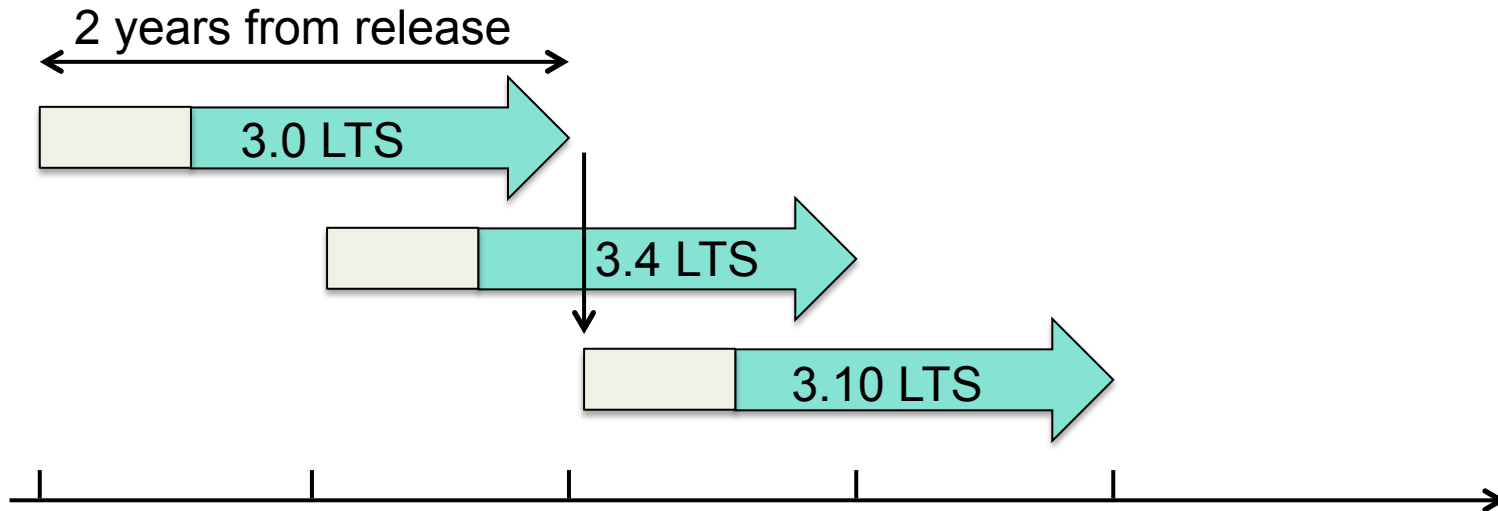
LTSI 3.10 DEVELOPMENT RESULTS

LTSI3.10 history

Event	Date
kernel 3.10 merge window open	2013.4.28
kernel 3.10 merge window close	2013.5.12
kernel 3.10 release	2013.6.30
Announce of 2013 LTS kernel version	2013.8.4
LTSI-3.10 git tree open	2013.9.11
3.10 becomes LTS (=3.12 release)	2013.11.15
LTSI-3.10 merge window open	
patch collection period	75 days
LTSI-3.10-rc1 (=merge window close)	2014.1.29
validation period	26 days
LTSI-3.10 release	2014.2.24

Major contributors for LTSI-3.10

Contributor	Patch count
Darren Hart (Intel)	1,197
Simon Horman (for Renesas)	1,122
Daniel Sangorrin (Toshiba)	123
Patrik Jakobsson (for Intel)	46
Mark Brown (linaro)	11
Greg Kroah-Hartman (Linux Foundation)	11
Total	2,510

Major achievement of LTSI 3.10

- LTTng
- Power efficient work queues
- Intel BayTrail support
- Intel Minnow board support
- Renesas R-Car H2/M2 series support
- Xilinx Zinq board support

Yocto and LTSI is connected

- Yocto is a tool to create own distribution and LTSI is used as its kernel
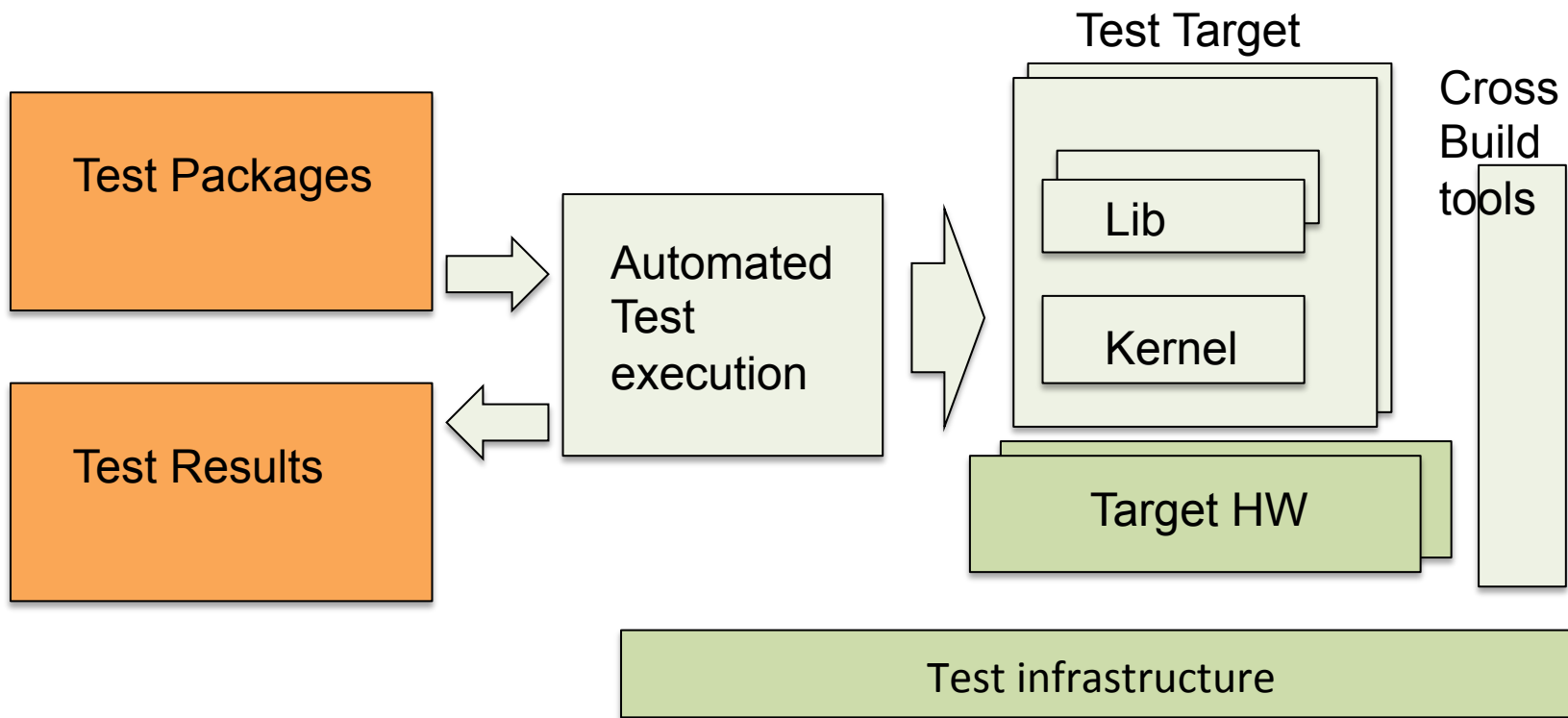
Discipline of LTSI project management

- Community LTS + industry demanded extra patches
- Governed by LF/CEWG
- Focus on kernel code, not aiming to support BSP
- CPU architecture neutral
- Comply with upstream rules
- Industry friendly acceptance
- Help embedded industry to utilize Linux

LTSI KERNEL TEST PROJECT

Overview of general Test Environment

Linux tests activities

- Linaro Lava

- Yocto

- Gregs's kernel test

- LTSI test

Linux tests: LAVA

- LAVA (Linaro Automated Validation Architecture)is automated test system
  - including Web framework with extension of scheduling job
  - Support ARM architecture
  - Open Source and be able to create infrastructure for their own
- Linaro Lab has facility for its members
  - Bug tracking system and mailing lists
- Test packages seems not delivered

Linux tests: Yocto test

- Yocto is tool to create distribution and supporting multiple architecture(x86, ARM, PPC, MIPS)

- Yocto project itself is testing the distribution

- Broad range of testing
  - CoreOS feature kernel, file system, driver, Build system, tool chain,
  - Performance and power consumption check
  - Distribution support run Yocto on top of Ubuntu. Fedora, CentOS …
  - Compliance test LSB, LTP, POSIX
  - Stress test

Linux tests: Greg's Test

- Add "Make test" means:
  - Developers can test minimum test before submit patches
    - That can push back simple unchecked problem
  - Every one can do minimum test when modify kernel
    - Everyone can confirm their modification

Linux tests: LTSI 1/2

- Initial purpose of LTSI test is to confirm its kernel works well

- Full automated, easy to manage and monitor its result using web interface

- Trial version can be used for LTSI member

- Next steps are:
  - Gather tests from companies to share
  - Deliver test system software and be able to run tests by their own site

Linux test: LTSI 2/2

- Over view of LTSI automated test;
  - Provide Web interface
  - Cross build and run on target HW
  - Both interactive and batch run
  - Result can be checked using Browser
  - 28 benchmarks and 33 typical tests are integrated
  - More tests need to be merged from companies
  - Test packages could be shared with other project
  - Test system will be able to deliver

More discussion for LTSI test will be at Workshop: My 20th 4pm@Orchid5

Conclusion

- Understanding LTS/LSTI mechanism could be important for you product/service plan

- By using LTS/LTSI, you can gain huge cost for Linux based products and services

- Current version is LTSI-3.10. Stay tuned for next version

- Be prepared if you have your own patches to be merged

- Test activities are also on going, join us to share your tests

THANK YOU

How 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-ernel.git;a=summary

LinuxLTSI
@LinuxLTSI
LTSI stands for Long-Term Support Initiative. A group of CE Working Group of the Linux Foundation to provide Long-Term and stable Linux for Industry

White paper: Economic value of LTSI

LINUX FOUNDATION

The Economic Value of the Long-Term Support Initiative (LTSI)

Understanding the Long-Term Support Kernel and the Value of Collaborative Development

October 2013

Hisao Munakata, Renesas
Tsugikazu Shibata, NEC
Noriaki Fukuyasu, The Linux Foundation

Maintenance cost of single LTS version is about 3M$

http://www.linuxfoundation.org/publications/ workgroup/value-of-ltsi