Demand for Linux eco-system for the future challenges

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Agenda

• Current pipeline of using Open Source for new industries
• Case of IT industry
• Why LTSI
Pipeline of using Open Source

• New industries happening
Why Open Source?

• Open Source is
  – Easy to start
  – Quickly to build
  – No initial cost
  – Including wide range of drivers as reference
  – Many of experienced engineers

• From experimental use to industry use
Case of IT industry

- Linux server business in IT industry is on going by Linux distributions
  - RedHat
  - SUSE
  - Ubuntu
  - CentOS
  - Fedora
  - OpenSUSE
Build Distribution
Integrate over 1000 of packages. Pick right version to run stable, matching version each other, configure every packages. Test whole packages work properly

Maintain packages
Fix bugs/security issue from upstream. Apply newer version (with confirmation)

Fix Problem
Solve problems, fix code with upstream community

Deliver to User
Fixed packages should be delivered and replaved
There is no specific distro in my new industry.

What is the choice?
Self Service is one of choice

- Build own distribution by themselves

Cloud Computing  Mobile device

Many other case is ongoing
Self Service = Own the role of Distribution

NOTE: Build eco system to foster distribution business is also important as long term view point
Linux kernel is one of important piece

• Kernel is most basic part of distribution
  – Drivers
  – File System
  – Network
  – Processor architecture
  – Memory usage
  – Power management
  – ...

LTSI is recommended choice

- Major items of LTSI
  1. Keep release of LTS
  2. Vender required additional patches
  3. Testing Kernel
  4. Share information
1. Keep release of LTS

- LTS (long term supported) kernel is keep releasing by Greg KH
- Decide a version per year and maintain two years
- Back port bug and security fixes from upstream
- Greg is part of LTSl tem and find most reasonable version for industry use yearly basis
Stable kernel release

- Recommended branch for users who want the most recent stable kernel
- 3 part version like 4.n.m
- Back ported critical bug and security fixes found in a latest development version
- Becomes “End Of Life” when next stable kernel were released
LTS (Long Term Stable) release

- Extended maintenance period for stable kernel
- Pick one version per year and maintain 2 years
- Bug and security fixes found in latest version are continued to back ported
## Current LTS versions

<table>
<thead>
<tr>
<th>Version</th>
<th>Maintainer</th>
<th>Released</th>
<th>Projected EOL</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.19</td>
<td>Kamal Mostafa</td>
<td>announced</td>
<td>July, 2016</td>
</tr>
<tr>
<td>3.18</td>
<td>Sasha Levin</td>
<td>2014-12-07</td>
<td>Jan, 2017</td>
</tr>
<tr>
<td>3.10</td>
<td>Greg Kroah-Hartman</td>
<td>2013-6-30</td>
<td>Sep, 2015</td>
</tr>
<tr>
<td>3.4</td>
<td>Li Zefan (Greg KH)</td>
<td>2012-5-20 (2014-9-4)</td>
<td>Sep, 2016</td>
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<td>3.2</td>
<td>Ben Hutchings</td>
<td>2012-1-4</td>
<td>2016</td>
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<td>2.6.32</td>
<td>Willy Tarreau</td>
<td>2009-12-3</td>
<td>Mid-2015</td>
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</table>

https://www.kernel.org/category/releases.html
LTS back port process is engine of Long Term kernel
LTS includes large number of fixes

- 600 – 700 fixes included in a Stable release
- LTS include fixes multi number of stable releases

As of 2015/5/26

<table>
<thead>
<tr>
<th>Version</th>
<th># of commits</th>
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<tbody>
<tr>
<td>From</td>
<td>To</td>
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<td>3.6</td>
<td>3.6.11</td>
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<td>3.7</td>
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<tr>
<td>3.9</td>
<td>3.9.11</td>
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<td>To</td>
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<td>3.10.79</td>
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<td>3.19</td>
<td>3.19.8</td>
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</table>
## Number of yearly commits on LTS

<table>
<thead>
<tr>
<th>LTS Version</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
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<td>3.14</td>
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<td>2401</td>
<td>876</td>
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<td>3354</td>
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</table>

As of 2015/5/26

1700 ~ 2000 of commits were back ported from latest upstream version into LTS.
Taking over after “End Of Life”

• In case of 3.4, Li Zefan took over LTS when EOL
• How to take over LTS when EOL:
  – Maintainer have experience to work on Linux Community
  – He have trusted relationship among maintainers
Vendor required additional patches

- LTSI tree is set of vendor required patches
- LTSI have another development process to gather patches on top of LTS
- This will be able to share additional patches among the industries
  - SoC additional drivers
  - Kernel Tools
<table>
<thead>
<tr>
<th>Items</th>
<th>Date</th>
</tr>
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<tbody>
<tr>
<td>kernel 3.14 merge window open kernel</td>
<td>2014.1.20</td>
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<tr>
<td>3.14 merge window close</td>
<td>2014.2.2</td>
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<tr>
<td>kernel 3.14 release</td>
<td>2014.3.30</td>
</tr>
<tr>
<td>3.14 becomes LTS (=3.16 release)</td>
<td>2014.8.3</td>
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<td>Announce of 2014 LTSI kernel version</td>
<td>2014.8.4</td>
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<tr>
<td>LTSI-3.14 merge window open</td>
<td>2014.8.28</td>
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<td>patch collection period</td>
<td>78 days</td>
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<tr>
<td>LTSI-3.14-rc1 (=merge window close)</td>
<td>2014.11.14</td>
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<tr>
<td>validation period</td>
<td>56 days</td>
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<tr>
<td>LTSI-3.14 release</td>
<td>2015.1.9</td>
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Achievements for LTSI 3.14

- **Common:**
  - ktap 0.4, a lightweight script-based dynamic tracing tool

- **x86:**
  - Intel Low Power Sub-system (LPSS) PWM, found in Intel Baytrail & Braswell SoC.
  - I2C/SMBus i801, added PCI Device ID for Intel Baytrail, Braswell & Intel Wildcat Point (PCH).
  - supports PCI enumeration for Intel Braswell SoC and Intel 9 Series PCH
  - iTCO v3 support for Intel Avoton SoC.
  - GPIO support for Intel Avoton SoC, Panther Point PCH and NM10 chipset

- **ARM:**
  - Renesas R-CarH2 Lager Board and R-CarM2 Koelsch board
This year’s LTS kernel?
Linux 4.1 is LTS version of 2015!!
Testing kernel

• LTSI patch set is tested by contributors and result will be shared in the mailing list

• Providing Automated test frame work
  – Fully automated execution using Jenkins
  – Web based GUI to see what’s happened
  – 28 bench marks and 33 major test packages included
  – Now implementation of CI is on going
LTSI Auto Test Framework

https://bitbucket.org/cogentembedded/jta-public/
Share information

• LTSI have mailing list and wiki for usual communication

• F2F meeting at Linux Foundation event
  – A wide variety of discussion happened among companies at workshop
    • Requirements, use case and issues, In-house patch versus upstream

• Help developers to upstream their code
Conclusion

• Many of new industry is growing and trying to use Open Source

• Open Source is best fit for experimental use
  – At later phase, stable and secure version of Open Source will be required

• Self service is a challenge
  – Build own distribution = Own the Role of Distributor

• LTSI is useful choice of stable kernel

• Please prepare if you have additional patches to LTSI
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
THANK YOU

LONG TERM SUPPORT INITIATIVE