Practice LTSI Test Framework & Introduction of ethtool Test Set

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In-House Embedded Linux Distributor of Fujitsu

Our Distribution includes LTSI Kernel and is built with Yocto Project

Our Distribution is used for

- Server System Controller
- Storage System
- Network Equipment
- Printer
- IVI etc.

IVI: In-Vehicle Infotainment
Agenda

- LTSI Test Project Introduction
- Evaluation of LTSI Test Framework
- Problem and Solution
- Conclusion and Future Work
LTSI Test Project Introduction
LTSI

- Short for Long Time Support Initiative

- It is expected to help those vendors get their code upstream to benefit the entire Linux Community.

- Reduce the duplication effort

- Collaborative activity to minimize fragmentation

Reference: http://ltsi.linuxfoundation.org/what-is-ltsi
LTSI Test Project

A project to create a “common test platform” which anyone can use and reduce a lot of duplicated effort.

Gather test cases from companies to try to find the common test elements among the companies.

Based on the gathered test cases, create “LTSI Common Test Platform”

http://ltsi.linuxfoundation.org/ltsi-test-project

Gaps with my expectation

- The existing test cases is not enough.
- Test results also should be shared
Evaluation of LTSI Test Framework
Practice with LTSI Test Project

Installation

- Download from bitbucket
  https://bitbucket.org/cogentembedded/jta-public/
- Install JTA and configure the Environment variables

About 10 minutes

Configuration

- Install the cross compiler
- Add the board file
- Add the test plan file
- Run the test

About 2 hours

Environment

<table>
<thead>
<tr>
<th>OS</th>
<th>Debian Wheezy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Architecture</td>
<td>AMD 64</td>
</tr>
<tr>
<td>Web browser</td>
<td>Javascript and CSS support</td>
</tr>
</tbody>
</table>

JTA: Jenkins-based Test Automation

About 10 minutes

About 2 hours
Evaluation Environment

- **Target Device**: Freescale Vybrid VF-6xx (Cortex-A5) Tower System

  - LTSI Test Framework
    - Board File
    - Test Plan
    - Cross Compiler

  - Debian Wheezy 64-bit

  - localhost:8080

  - ssh connection

  - test results

  - Test Execution
How to run test

- Conduct the bc computing test case
- Confirm the test environment easily and make a quick start

- Takes 4 hours from install to finish the first simple test
- Easy to use, prefer a video demonstration, more platforms
Problem and Solution
Release Time Gap

Linux v3.14 – 30 Mar 2014

Linux v3.15 – 8 Jun 2014

Linux v3.16 – 3 Aug 2014

Linux v3.17 – 5 Oct 2014


Linux v3.18 – 7 Dec 2014

Linux v3.19 – X XXX 2015

Linux v3.20 – X XXX 2015

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Release Gap is bigger and bigger

git log --oneline v3.14..v3.14.24 | wc -l 2193


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Release Time Gap

- The LTSI is released frequently.

- After LTSI releases, the vendor has to conduct a series of tests to validate and then release their systems.

- This procedure takes few months or more.

- Too late!
Effort

- In order to erase these two time gaps, we contribute our test set to community.

- Furthermore, by using our test set, more hardware platforms could be validated and evaluated.

- Finally, it is convenient for the customer to select and evaluate various kinds of hardware platforms.
Our contribution to LTSI Test Project

- As the first step, we contribute our ethtool test set to LTSI Test Project

ethtool

- A utility for Linux kernel-based operating system for displaying and modifying some parameters of network interface controllers (NICs) and their device drivers.


Advantages

- Common test element
- Easy to check each hardware support features
- Useful for not only person but also the vendors which provide systems for multiple platforms

Quick Start of ethtool test set (1/2)

ethtool test set

Create New Test

Change script name to ethtool.sh

Make Directory : /home/jenkins/tests/test-ethtool

 Decompress testset-ethtool-0.1 to /home/jenkins/tests/test-ethtool

Start Test
Quick Start of ethtool test set (2/2)

- We can use this test case to check whether the ethtool in kernel is support commands or not.
- There are so many commands and we pickup some of them with high frequency to test.

We finished 50/67 feature support tests in provided test set.

```
| 62 | ETHTOOL_SSG | Set Scatter-gather | PASS |
| 63 | ETHTOOL_STSO | Set TCP Segmentation Offload | PASS |
| 64 | ETHTOOL_STXCSUM | Set RX Checksumming | PASS |
| 65 | ETHTOOL_SUFO | Set TCP Fragmentation Offload | FAIL |
| 66 | ETHTOOL_SWOL | Set Wake-on-lan Mode | PASS |
```

Part of test log

notice: this test set needs serial connection
Conclusion and Future Work
Summary

- We practice the LTSI Test Project and contribute our test set of ethtool to the community

- Fujitsu will continue to contribute to LTSI Test Framework

Future Work

- Finish the rest test cases (17 cases)
- Contribute more test sets to community
- Validate the LTSI Test Project on more platforms

- Let’s contribute test cases to LTSI Test Framework together!
shaping tomorrow with you