

Practice LTSI Test Framework & Introduction of ethtool Test Set

Dec 19th, 2014

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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.



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

LTSI Test Project Introduction

- 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

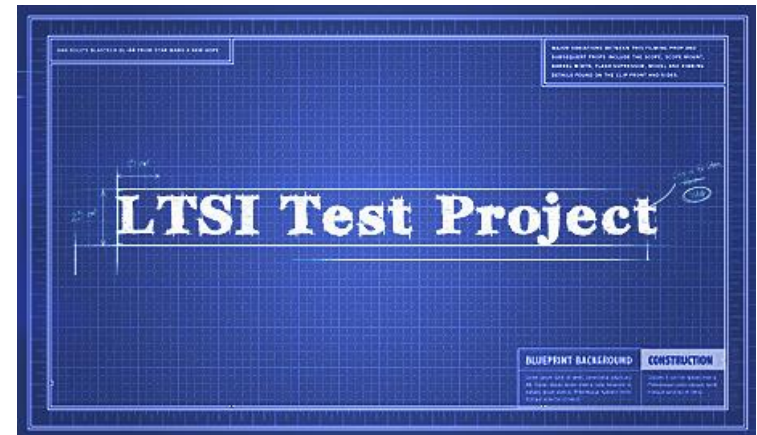
- Collaborative activity to minimize fragmentation



- 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

■ Installation

- Download from bitbucket

<https://bitbucket.org/cogentembedded/jta-public/>

- Install JTA and configure the Environment variables

About 10 minutes

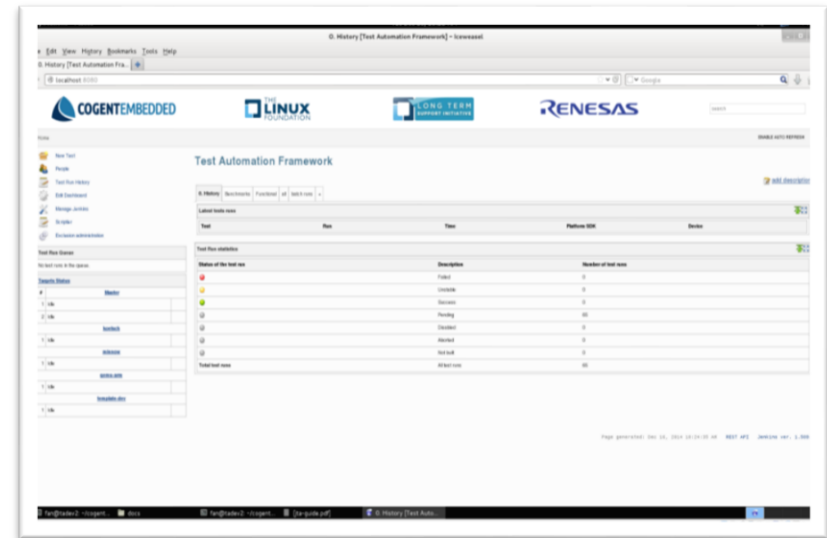
■ Configuration

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

About 2 hours

Environment

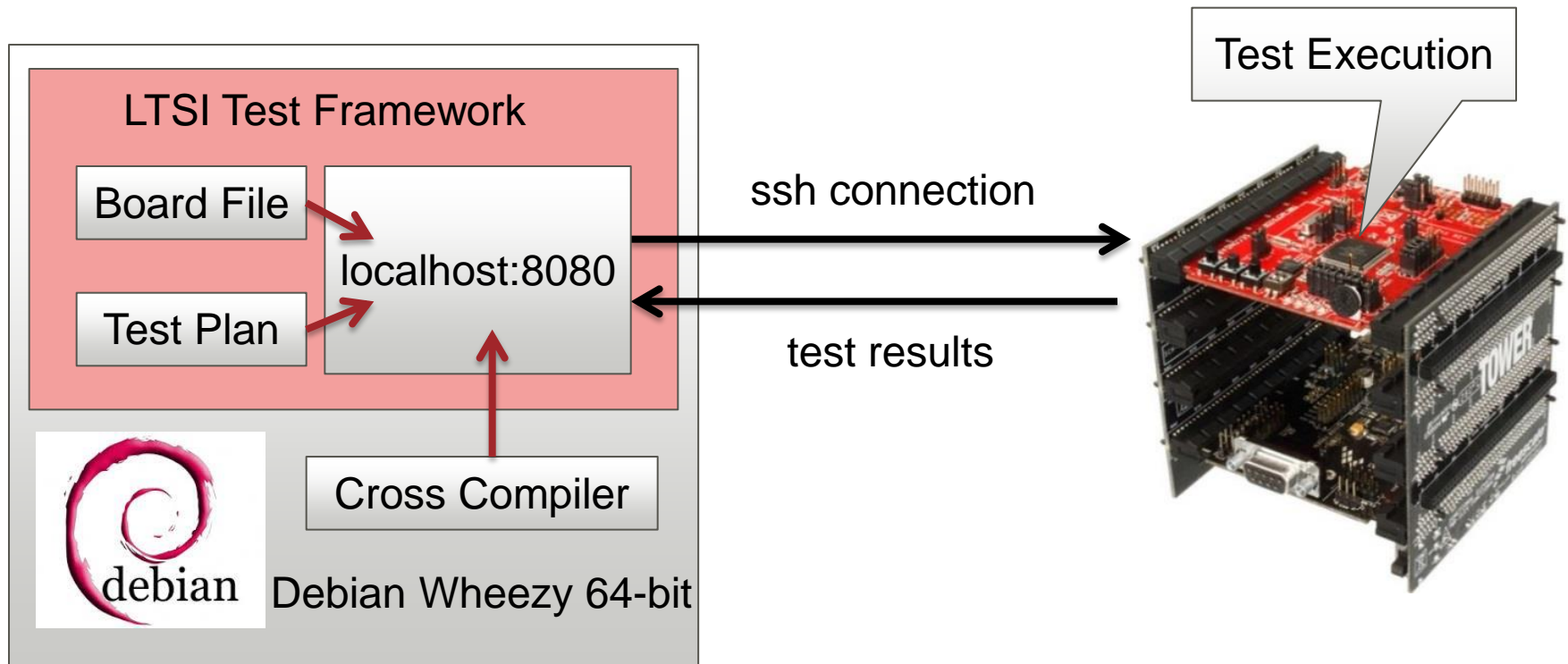
OS	Debian Wheezy
Architecture	AMD 64
Web browser	Javascript and CSS support



JTA: Jenkins-based Test Automation

Evaluation Environment

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



How to run test

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

The screenshot shows the Jenkins test run interface for 'Project test-arm2'. It includes a configuration panel on the left with fields for Device (test-arm), Reboot, Rebuild, Target_Cleanup (checked), and TESTPLAN (testplan_bc_exp2). The main area displays the test results for 'result2' and 'result1', both showing a current value of 4 and a reference value of 0, with a comparison criteria of 'greater or equal'. On the right, a 'Test Run History' table lists previous runs with their IDs, timestamps, and device names.

#	Time	Device
#18	Dec 16, 2014 5:19:00 PM	test-arm / 3.0.15-vybrid
#17	Dec 16, 2014 5:18:08 PM	test-arm / 3.0.15-vybrid
#16	Dec 16, 2014 5:15:57 PM	minnow / unknown
#15	Dec 16, 2014 5:05:08 PM	test-arm / 3.0.15-vybrid
#14	Dec 16, 2014 4:44:30 PM	test-arm / 3.0.15-vybrid
#13	Dec 16, 2014 4:33:33 PM	test-arm / 3.0.15-vybrid
#12	Dec 16, 2014 3:08:22 PM	test-arm / 3.0.15-vybrid
#11	Dec 16, 2014 2:59:08 PM	test-arm / 3.0.15-vybrid

- 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 v3.14.24 – 14 Nov 2014

Linux v3.18 – 7 Dec 2014

Linux v3.19 – X XXX 2015

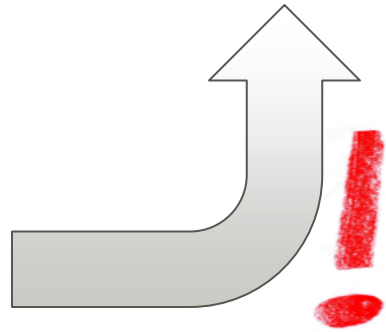
Linux v3.20 – X XXX 2015

.....



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

V3.14.24-ltsi – 25 Dec 2014



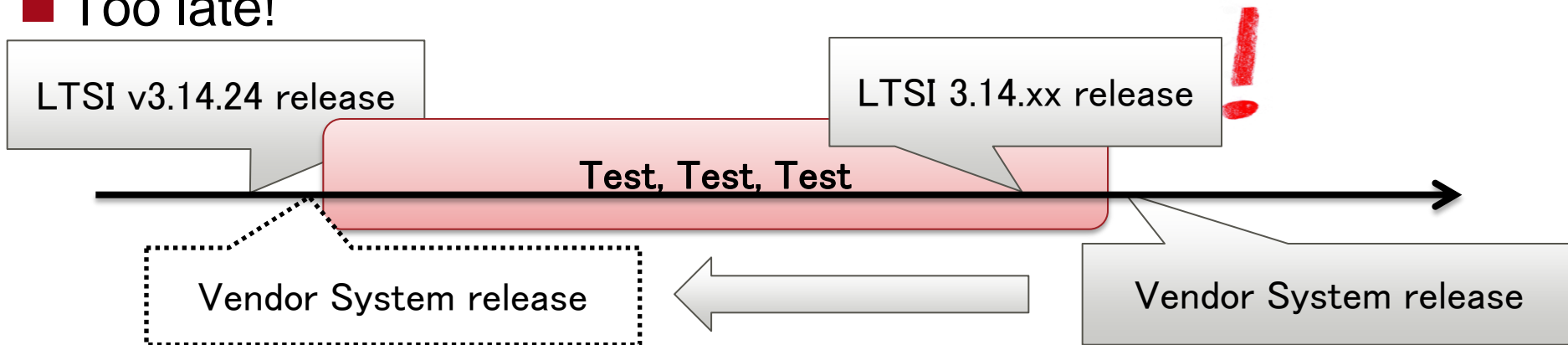
Release Gap is bigger and bigger

Release Time Gap

- The LTSI is released frequently

tags			
3 weeks ago	v3.14.24-ltsi-rc1	This is the 3.14.24-rc1-ltsi release	tag commit shortlog log
6 months ago	v3.4.91-ltsi	This is the 3.4.91-ltsi release	tag commit shortlog log
9 months ago	v3.10.31-ltsi	This is the v3.10.31-ltsi release	tag commit shortlog log
9 months ago	v3.4.81-ltsi	This is the v3.4.81-ltsi release	tag commit shortlog log
9 months ago	v3.0.101-ltsi	This is the v3.0.101-ltsi release	tag commit shortlog log
10 months ago	v3.10.28-ltsi-rc1	This is the 3.10.28-ltsi-rc1 release	tag commit shortlog log
18 months ago	v3.4.46-ltsi	This is the 3.4.46-ltsi release	tag commit shortlog log
18 months ago	v3.0.79-ltsi	This is the 3.0.79-ltsi release	tag commit shortlog log
23 months ago	v3.4.25-ltsi	This is the v3.4.25-ltsi release	tag commit shortlog log
2 years ago	v3.0.38-ltsi	LTSI 3.0.38 release	tag commit shortlog log

- 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!



- 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.

- <https://www.kernel.org/pub/software/network/ethtool/>

- 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

```
[LTSI-dev] Ethtool test suite for LTSI Test Project

Bian, Naimeng biannm@cn.fujitsu.com
Mon Nov 3 01:07:51 UTC 2014

• Next message: \[LTSI-dev\] To enquire LTSI submission requirement
• Messages sorted by: \[date\] \[thread\] \[subject\] \[author\]

Hi all,

As I know, the LTSI Test Project is collecting test cases.
I provide our test set of ethtool.

We have implemented test cases of 50/67 ETHTOOL COMMANDS.
You can obtain details from README in attached archive.

Let's test together!

Questions or comments?

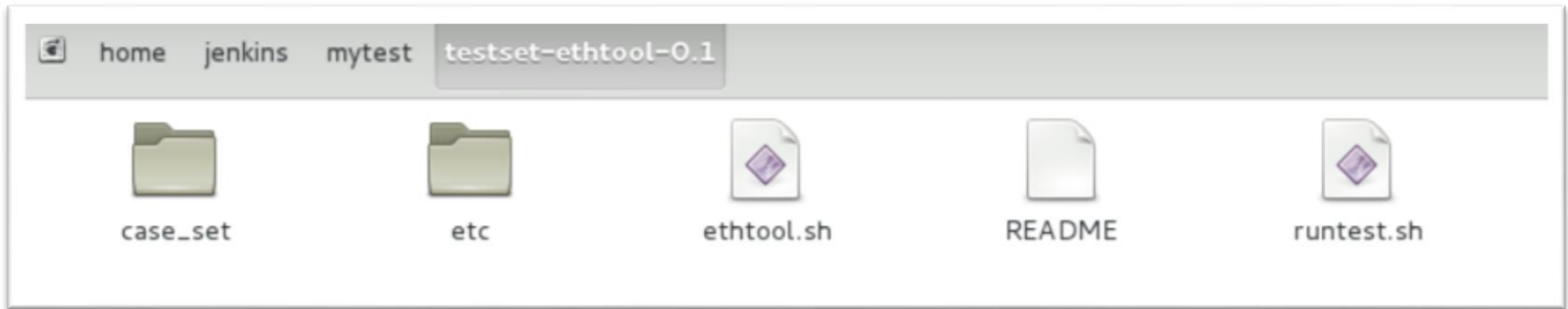
Regards
Bian
----- next part -----
A non-text attachment was scrubbed...
Name: testset-ethtool-0.1.tar.gz
Type: application/x-gzip
Size: 18989 bytes
Desc: testset-ethtool-0.1.tar.gz
URL: <http://lists.linuxfoundation.org/pipermail/ltsi-dev/attachments/20141103/0a0ffcae/attachment.gz>

• Next message: \[LTSI-dev\] To enquire LTSI submission requirement
• Messages sorted by: \[date\] \[thread\] \[subject\] \[author\]

More information about the LTSI-dev mailing list
```

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.

```
jenkins@tadevz:~/home/jenkins/mytest/testset-ethtool-0.1/case_set$ ls
ETHTOOL_FLASHDEV      ETHTOOL_GFLAGS      ETHTOOL_GREGS      ETHTOOL_GSG      ETHTOOL_RESET      ETHTOOL_SMSGLVL      ETHTOOL_SSET
ETHTOOL_GCHANNELS    ETHTOOL_GGRO        ETHTOOL_GRINGPARAM ETHTOOL_GSSET_INFO ETHTOOL_SCHANNELS  ETHTOOL_SPAUSEPARAM  ETHTOOL_SSG
ETHTOOL_GCOALESCE    ETHTOOL_GGSO        ETHTOOL_GRXCLSRALL ETHTOOL_GSTATS    ETHTOOL_SCOALESCE  ETHTOOL_SPFLAGS      ETHTOOL_STSO
ETHTOOL_GDRVINFO     ETHTOOL_GLINK       ETHTOOL_GRXCLSRCNT ETHTOOL_GSTRINGS  ETHTOOL_SEEE       ETHTOOL_SRINGPARAM   ETHTOOL_STXCNUM
ETHTOOL_GEEE         ETHTOOL_GMODULEEEPROM ETHTOOL_GRXCLSRULE ETHTOOL_GTSO      ETHTOOL_SEEPROM    ETHTOOL_SRXCLSRDEL  ETHTOOL_SUFO
ETHTOOL_GEEPROM      ETHTOOL_GMODULEINFO ETHTOOL_GRXCNUM    ETHTOOL_GTXCNUM   ETHTOOL_SET_DUMP   ETHTOOL_SRXCLSRINS  ETHTOOL_SWOL
ETHTOOL_GET_DUMP_DATA ETHTOOL_GMSGLVL     ETHTOOL_GRXFH     ETHTOOL_GUFO      ETHTOOL_SFEATURES  ETHTOOL_SRXCSUM     ETHTOOL_TEST
ETHTOOL_GET_DUMP_FLAG ETHTOOL_GPAUSEPARAM ETHTOOL_GRXFHINDIR ETHTOOL_GWOL      ETHTOOL_SFLGS      ETHTOOL_SRXFH       ETHTOOL_SWOL
ETHTOOL_GET_TS_INFO  ETHTOOL_GPERMADDR   ETHTOOL_GRXRINGS  ETHTOOL_NWAY_RST  ETHTOOL_SGRO       ETHTOOL_SRXFHINDIR  ETHTOOL_SWOL
ETHTOOL_GFEATURES    ETHTOOL_GPFLAGS     ETHTOOL_GSET      ETHTOOL_PHYS_ID   ETHTOOL_SGSO       ETHTOOL_SRXNTUPLE   ETHTOOL_SWOL
```

- 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_STXCNUM  |Set RX Checksumming     |PASS
|65 |ETHTOOL_SUFO     |Set TCP Fragmentation Offload | FAIL
|66 |ETHTOOL_SWOL     |Set Wake-on-lan Mode    |PASS
...
```

notice: this test set needs serial connection

Part of test log

Conclusion and Future Work


- 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!**

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