

# Evaluation each versions of LTP for LTSI-4.1

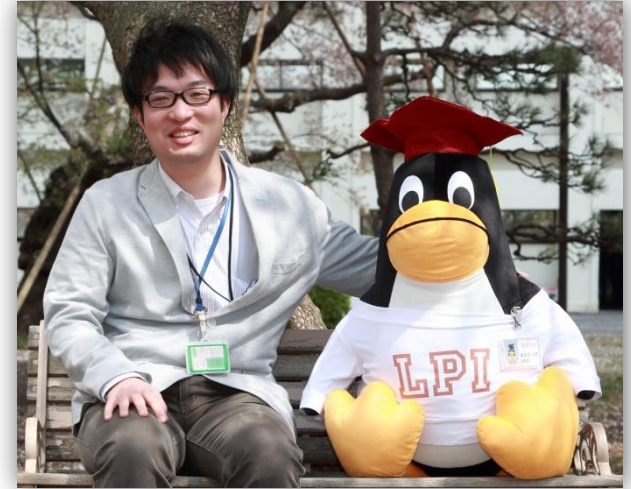
Sep 18th, 2015

Yuki Machida

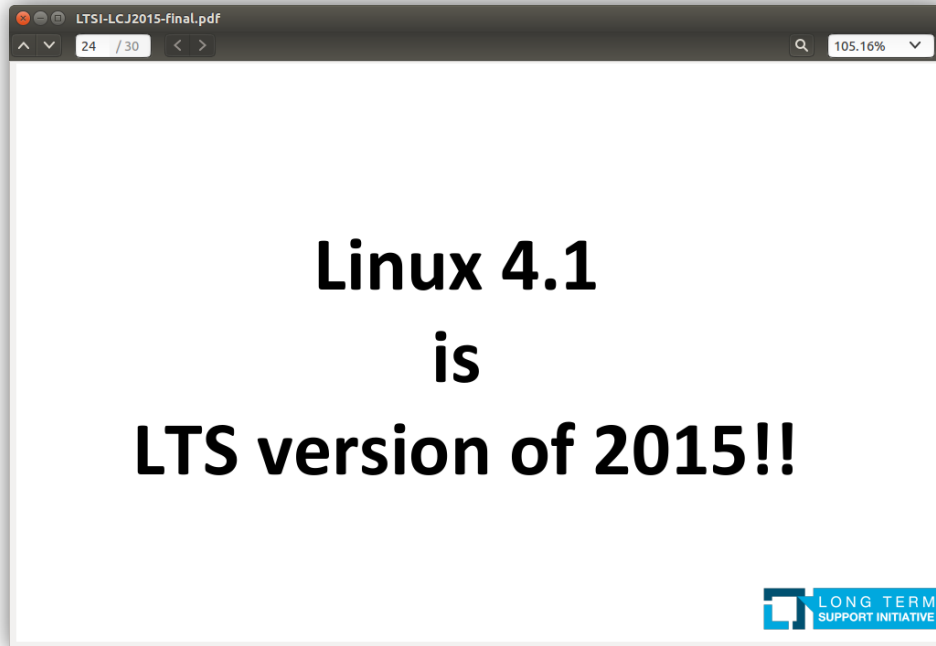
Fujitsu Computer Technologies Limited

# \$ whoami

- Yuki Machida, Fujitsu Computer Technologies Ltd.
- Embedded Linux Development
- 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 etc.



# The next LTSI version is v4.1!



<http://events.linuxfoundation.jp/sites/events/files/slides/LTSI-LCJ2015-final.pdf>

## LTSI-4.1 Development Schedule

Here is the LTSI Development Schedule for this year.

**Target kernel version: 4.1**

**Open up LTSI Merge Window:**  
August 17th

**Close Merge Window:**  
End of October (roughly 80 days)

**Validation Period:**  
Nov 1. to Dec 20 (roughly 50day)

**Expected release date:**  
December 20th (right before Christmas)

<http://ltsi.linuxfoundation.org/ltsi-4.1-development-schedule>

# Use LTP to Test of LTSI-4.1

## ■ What's LTP?

■ <http://linux-test-project.github.io/>

## ■ Using LTP can find some bugs in Linux

LTP (contd.)

- Case Study 1  
Find a bug of distribution in LTP
  - Float test cases are failed on PowerPC (e500mc core) in Kernel 3.0
  - Optimize option “-O2” is turned off “-fcprop-register” flag in GCC 4.4.6

```
$ powerpc-e500mc-linux-gnu-gcc -I/home/ubinux/e500mc/target/usr/include -O -g -fsigned-char -fcprop-register -mcpu=e500mc -mha -me500mc -mhard-float -g -O2 -fno-strict-aliasing -pipe -Wall -I/home/ubinux/e500mc/target/usr/include -I/home/ubinux/e500mc/build/ltp-full-20101031/testcases/kernel/include -L.../include -L.../include -L/home/ubinux/e500mc/target/lib -L.../lib float_exp_log.c -lltp -lpthread -lm -o float_exp_log
```

-O2 turns on all optimization flags specified by -O. It also turns on the following optimization flags:

- fthread-jumps
- falign-functions -falign-jumps
- falign-loops -falign-labels
- fcaller-saves
- fcross-jumping
- fcs-follow-jumps -fcs-skip-blocks
- fdelete-null-pointer-checks
- fexpensive-optimizations
- fgcse -fgcse-lm
- findirect-inlining
- foptimize-sibling-calls
- fpeephole2
- fregmove
- freorder-blocks -freorder-functions
- frerun-cse-after-loop
- fsched-interblock -fsched-spec
- fschedule-insns -fschedule-insns2
- fstrict-aliasing -fstrict-overflow
- ftree-switch-conversion
- ftree-pre
- ftree-vrp

**No -fcprop-register!**

LTP (contd.)

- Case Study 3
- TLS (Thread Local Storage) test case on x86 platform, the test result is fail

V3.14	V3.14.28
PASS	FAIL

- Check the change between v3.14 and v3.14.28
  - e990e54 x86/tls: Don't validate lm in set\_thread\_area() after all
  - 643152b x86/tls: Disallow unusual TLS segments
  - aeb83c0 x86/tls: Validate TLS entries to protect espfix

The implementation of TLS is changed !

- Backport these patches, the test result is pass
- Fixed in 4.0.0-rc6, confirmed fixed in 3.14.37

[http://events.linuxfoundation.jp/sites/events/files/slides/agl\\_2015\\_r006.pdf](http://events.linuxfoundation.jp/sites/events/files/slides/agl_2015_r006.pdf)

# LTSI Test Project

## ■ What's LTSI Test Project?

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

## ■ Contains Old version of LTP in jta-public

- Confirmed on Sep 16<sup>th</sup>, 2015

Source code view for cogentembedded/jta-public. The file `ltp_2011-09-07.tar.bz2` is highlighted.

Expand & Build

```
% cat Version
LTP-20100831
%
```

Old!!

# What is good version of LTP?

- カーネルの実装に追従するテストケースが含まれること
  - 新しいシステムコール
  - システムコールの仕様変更
  
- bugfixが取り込まれること

## ■ linux.git: 3.17でgetrandom(2)が追加された

```
% git log --oneline v3.14..v4.1 -- arch/x86/syscalls/syscall_64.tbl
(snip)
f4f142e Merge tag 'random_for_linus' of ¥
  git://git.kernel.org/pub/scm/linux/kernel/git/tytso/random
c6e9d6f random: introduce getrandom(2) system call★
48dc92b seccomp: add "seccomp" syscall
(snip)

% git tag --contains=c6e9d6f
v3.17★
(snip)
```

## ■ ltp.git: 20150903でgetrandom(2)のテストケースが追加された

```
% git log --oneline testcases/kernel/syscalls/getrandom
17dce71 syscalls/getrandom: add configure check for linux/random.h
cc63481 getrandom: fix compilation with older kernels
7f72a2c syscall/getrandom: Add tests for getrandom★

% git tag --contains=7f72a2c
20150903★
```

## ■ FAIL of madvise02 cause is kernel change!!

```
% git log --oneline 20110915..20140422 -- testcases/kernel/syscalls/madvise/madvise02.c
6042d45 madvise/madvise02.c: extend EINVAL tests
9cb1db8 madvise/madvise02.c: cleanup
31dffcf syscalls/madvise02: fix madvise case due to kernel change★
0101f63 syscalls/madvise: code cleanup
d59a659 s/Tst_count/tst_count/ to avoid CamelCase
354ebb4 cleanup code indent
472267d madvise02: code cleanup
```

```
% git show 31dffcf
commit 31dffcf9420430f6a5042b74d4beb72317523f18
Author: Caspar Zhang <caspar@casparzhang.com>
Date: Thu Mar 7 14:39:16 2013 +0800
```

syscalls/madvise02: fix madvise case due to kernel change

**since kernel commit 1998cc0 (after kernel-3.8 released),  
madvise(MADV\_WILLNEED) to anonymous memory doesn't return -EBADF now, as  
now we support swap prefetch.** Thus the 5th testcase in madvise02 will  
not pass. This patch fixes this by adding a `tst_kvercmp()` condition, and  
will give a pass if kernel is `>=3.9` (including the RCs).

Signed-off-by: Caspar Zhang <caspar@casparzhang.com>  
Reviewed-by: Wanlong Gao <gaowanlong@cn.fujitsu.com>  
Reviewed-by: Zhouping Liu <zliu@redhat.com>



## ■ FAIL of fanotify02 cause is incorrect testcase!!

```
% git log --oneline 20150119..20150420 -- testcases/kernel/syscalls/fanotify
9f662f5 syscalls/fanotify02: Fixup testcase
d6d11d0 Introduce tst_parse_opts()
aabb834 Include usctest.h in test.h
605fa33 Get rid of TEST_CLEANUP
%
```

```
% git show 9f662f5
commit 9f662f54564f3db08224c0adfaa5dc544a3ad02f
Author: Jan Kara <jack@suse.cz>
Date: Thu Apr 2 09:14:11 2015 +0200
```

```
syscalls/fanotify02: Fixup testcase
```

**The testcase incorrectly assumed** that events will be generated for a directory when FAN\_ONDIR was not specified. That used to be the case due to a kernel bug but it's not the case anymore.

```
Signed-off-by: Jan Kara jack@suse.cz
```

```
(snip)
```

## ■ Environment

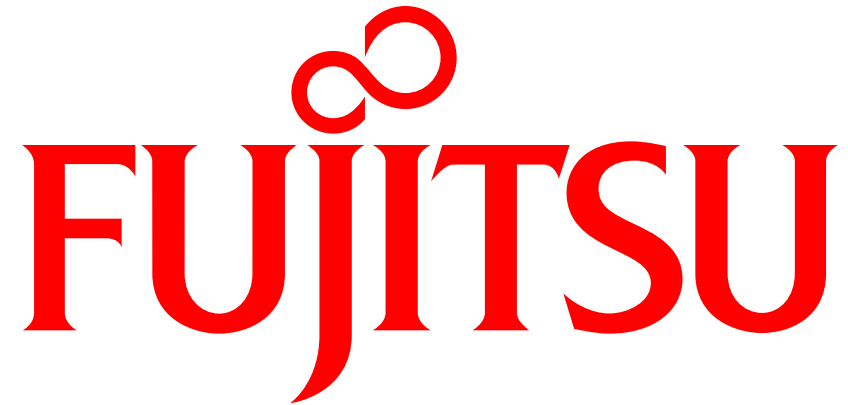
Component	Version
Hardware	Intel Core i3 2100 on Intel DH67CF (x86_64)
Linux kernel	v4.1.6
Userland	Yocto 1.7 based Fujitsu In-House Distro via NFS
Glibc	glibc 2.20
GCC	gcc 4.9.2
Test scenario	syscalls

## ■ 結果をテストケースごとに整理した

Testcase	20100831 ※	20110915 ※	20140422	20140828	20150119	20150420	20150903
Testcases	967	967	1026	1047	1048	1062	1072
fanotify02	-	-	Hang up	Hang up	Hang up	PASS	PASS
recv01	FAIL	FAIL	FAIL	FAIL	PASS	PASS	PASS
recvfrom01	FAIL	FAIL	FAIL	FAIL	PASS	PASS	PASS
recvmsg01	FAIL	FAIL	FAIL	FAIL	PASS	PASS	PASS
setregid02	PASS	PASS	PASS	FAIL	FAIL	PASS	FAIL

※1 他に creat08, get\_robust\_list01, getrusage03, ioctl03, lseek03, msgctl11, madvise02, sendmsg01, sendto01, sockioctl01, sysctl01, sysctl03, sysctl04, sysctl05もFAILであった

- Should maintain latest LTP
  - カーネルの進化に追従し、テストケースが追加・更新される
  - bugfixが取り込まれる
- Should contain latest LTP test in LTSI Test Framework
- 皆さんも新しいLTPを使ってLTSI-4.1をテストしましょう!!



shaping tomorrow with you

## Itp 20150420

Upstream status: **Not updated**

Upstream version: 20150903

Maintainer: [Robert Yang](#)

### Updates

Title	Version	Milestone	Date	Maintainer	Commit
Itp: 20150119 -> 20150420	20150420	<a href="#">1.9 M1</a>	2015-04-30	<a href="#">Robert Yang</a>	<a href="#">b91909e15f</a>
Itp: update to 20150119 release	20150119	<a href="#">1.8 M3</a>	2015-01-29	Maxin B. John	<a href="#">01f91eaa81</a>
Itp: update to 20140828 release	20140828	<a href="#">1.8 M1</a>	2014-11-08	Fathi Boudra	<a href="#">a1dacd52d8</a>
Itp: update version to 20140422	20140422	<a href="#">1.6 M5</a>	2014-04-29	Maxin B. John	<a href="#">d724307724</a>
Itp: update SRC_REV to	20140115	<a href="#">1.6 M3</a>	2014-02-02	Fathi Boudra	<a href="#">30b24980ea</a>

### About Itp

#### Summary

Linux Test Project

#### Section

console/utils

#### License

GPLv2 & GPLv2+ & LGPLv2+ &  
LGPLv2.1+ & BSD-2-Clause

#### Recipe file

[recipes-extended/itp](#)  
[/itp\\_20150420.bb](#)

#### Layer

[openembedded-core \(master  
branch\)](#)

#### Homepage

<http://itp.sourceforge.net>