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Firmware Test Suite (fwts)

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Agenda



- Firmware Test Suite (fwts)
 - Introduction to fwts
 - Installation and Source Code
 - Release Schedule
- Firmware Test Suite Live (fwts-live)
 - Introduction to fwts-live
 - Installation
- Contributing to fwts
 - File fwts bugs on Launchpad
 - Email Questions and Suggestions to Mailing List
 - Commit Patches









What is fwts?

FWTS is a Linux tool that automates firmware checking. It aims to detect bugs and to get firmware fixed.

- Automatically detect errors
- Sanity check core functionality
- Ensure interactions between Linux and firmware
- Catch kernel warnings
- Suggest possible workarounds
- Gather firmware data for debug



What does fwts test?

fwts comprises large set of fifty tests that are designed to exercise and test different aspects of a machine's firmware – including ACPI, UEFI, hardware configuration, power-saving and so on.

- ✓ ACPI
- CPU Configuration
- Legacy/UEFI BIOS Interface
- PCIe/PCI Configuration
- Power Management
- System Configuration
- Others



Key features

Command line

Designed to be used by other test tools

..or to be run stand alone

..and to gather data for a developer

Batch tests – run without supervision

Interactive tests – e.g. hotkey, lid, AC power.

Extensive logging

Per test PASS/FAIL results

Explain reasons for failures (ADVICE lines)

Classify failures (CRITICAL, HIGH, LOW..)

Summarise results

Output log format can be configured

Soak testing (suspend/resume, hibernate/resume)



Firmware Test Suite (fwts) – Test Examples



fwts examples

Show tests

fwts --show-tests / fwts -show-tests-full

Run all batch tests

sudo fwts

Scan ACPI Methods

sudo fwts method

Dump UEFI veriables

sudo fwts uefidump

Execute UEFI tests (runtime services)

sudo fwts uefirtmisc uefirttime uefirtvariable

Scan CPU configuration

sudo fwts msr mtrr nx virt

Scan kernel log

sudo fwts klog



Installation

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sudo apt-get update

sudo apt-get install fwts

Ubuntu

- Current version for a distro: sudo apt-get install fwts
- Development (stable) release:
 - sudo add-apt-repository ppa:firmware-testing-team/ppa-fwts-stable
- Development (unstable) release:
 - sudo add-apt-repository ppa:firmware-testing-team/ppa-fwts-devel

Source code

- Source code: git clone git://kernel.ubuntu.com/hwe/fwts.git
- Configure:
 - sudo apt-get build-dep fwts
 - autoreconf-ivf
 - ./configure --prefix=/usr
- Compile: make (or "make -j 4" to use 4-cores to compile)
- Install: sudo make install



Release Schedule



- fwts is released monthly
 - New versioning: Year.Month.Minior_version: 13.06,13.07 and 13.08
- Release notes are available online
 - 13.06 @ https://wiki.ubuntu.com/FirmwareTestSuite/ReleaseNotes/13.06.00
 - 13.07 @ https://wiki.ubuntu.com/FirmwareTestSuite/ReleaseNotes/13.07.00
 - 13.08 @ https://wiki.ubuntu.com/FirmwareTestSuite/ReleaseNotes/13.08.00
 - 1x.0y @ https://wiki.ubuntu.com/FirmwareTestSuite/ReleaseNotes/1x.0y.00









What is fwts-live?

fwts-live is a bootable USB image that will boot and run the firmware test suite without the need to install Linux/Ubuntu. Results of the tests are saved on the USB drive to be analysed later.



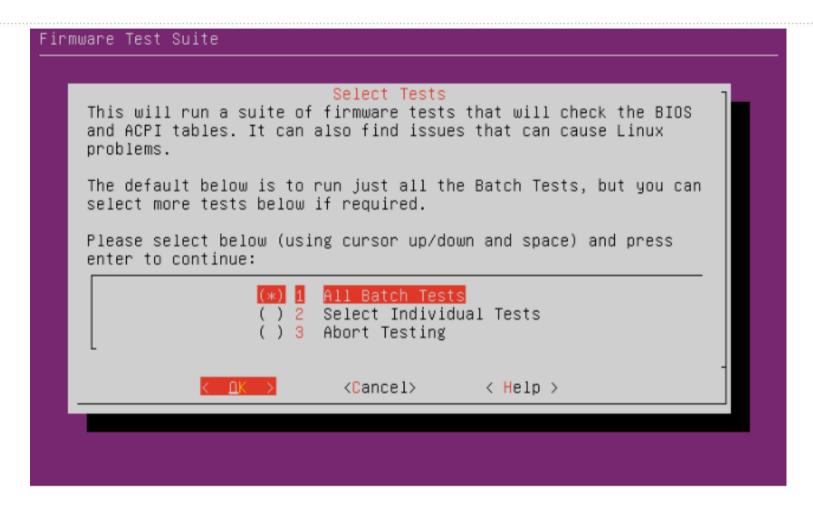
Easy to use

Release with latest Ubuntu

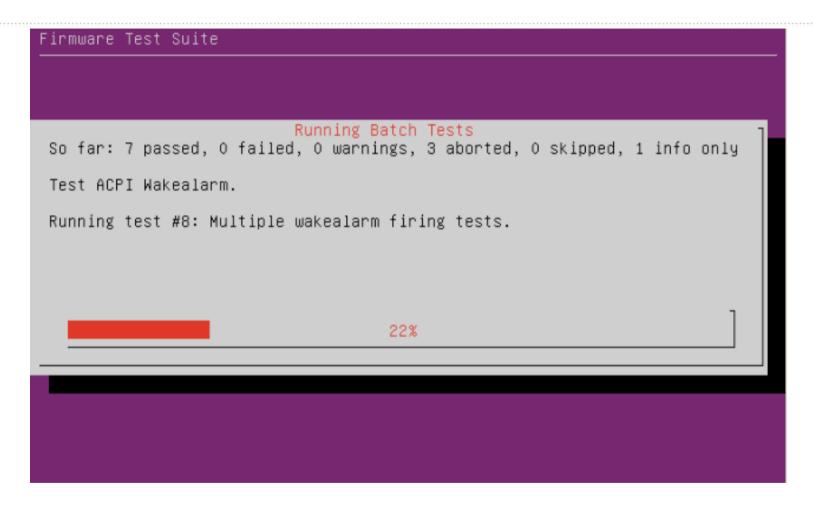
Relese schedule: fwts-live is planned to be released with fwts (monthly)



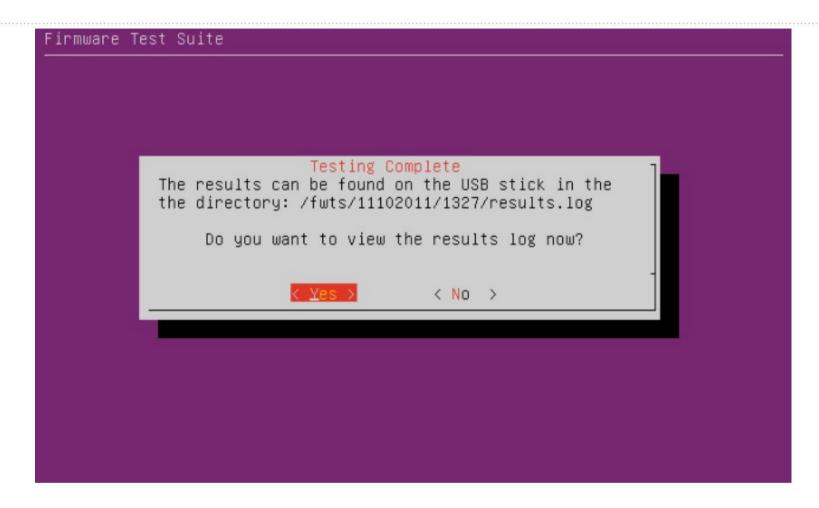












Download fwts-live

(Temporary) URL: http://people.canonical.com/~alexhung/fwts-live/

Make bootable fwts-live USB

• Linux:

- [2525.654620] sd 6:0:0:0: [sdb] Attached SCSI removable disk
- Identify USB device: dmesg | tail -10 | grep Attached



- Copy image: sudo dd if=fwts-live-13.08.00.img of=/dev/sdb; sync
- Windows: Use "Win32 Disk Imager"





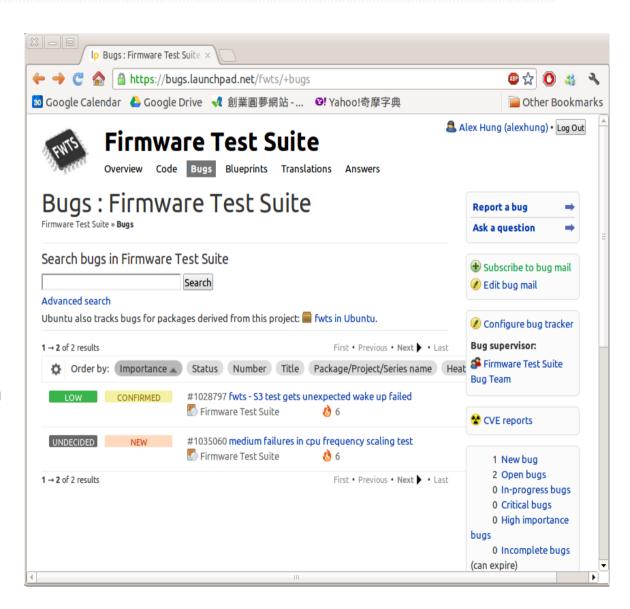
Contributing to fwts

File bugs on Launchpad



https://launchpad.net/fwts

- File a bug:
 - Click on "Report a bug"
 - Input a summary for the bug
 - Follow on-screen instructions
 - •
- fwts team receives notification when a bug is filed.
 - All discussion can take place on Launchpad.





Email Suggestions and Questions to Mail List



- Mailing list: fwts-devel.lists.ubuntu.com
 - Questions
 - Suggestions
 - Feature requests
 - Patches (more next slide)
 - Etc...

Commit Patches



- We use a similar approach as Linux kernel uses of git
 - Generate patches (git format-patch)
 - Send patches (git send-email) to fwts-devel.lists.ubuntu.com
 - Get two acknowledges (ACK) from fwts developers
 - Refine patches if NACK is received
- Maintainer (Kengyu Lin < kengyu@canonical.com >) adds patches to git repo





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Online Resource for fwts

Information for fwts



Architecture Supported:

x86 PC – full support

ARM – limited features



Information for fwts and fwts-live



Looking for more information?

fwts:

https://wiki.ubuntu.com/Kernel/Reference/fwts

fwts-live:

https://wiki.ubuntu.com/HardwareEnablementTeam/Documentation/FirmwareTestSuiteLive







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Thank you