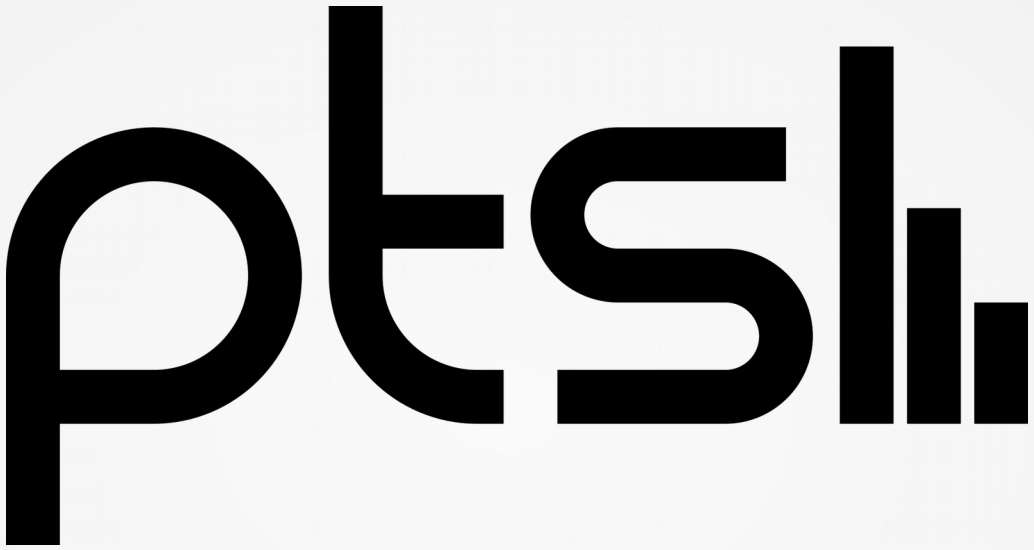
The Phoronix Test Suite



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What is the Phoronix Test Suite (PTS)?

- PTS is a system benchmarking tool developed by Michael "Phoronix" Larabel and first released in 2008 through his company, Phoronix Media
- PTS contains over 100 individual tests or "modules", each module can be run individually or in batch jobs.
- Each test module tends to stress one type of hardware (CPU, GPU, RAM, Storage, Network) though there is almost always overlap into other system functions
- Test output is displayed in the terminal, HTML based reports can be saved into storage for later review
- Tests can be automated using the "Phoromatic" component of PTS. Large scale enterprise level test automation has paid support available, which constitutes Phoronix Media's business model

Why use PTS?

- System burn-in and stability testing. Overclocking your hardware or rolled a custom kernel? See how the system holds up under load
- See what hardware works best in a given use case (hardware vendor, CPU cores/GHz/RAM etc.)
- Test different operating systems (Linux distros vs. each other or Windows/BSD etc.)
- Test different software versions (ex: Kernel patches for Spectre/Meltdown)
- Earn bragging rights...?

Getting Started with PTS

- PTS is developed on Linux but also runs in Windows, Mac OS X, BSD, Solaris, and even GNU Hurd. All major CPU architectures (32bit i686, x86-64, ARM, Power PC, Risc V) are supported although not all tests will run on any given CPU
- PTS for Linux/Unix is primarily written in PHP 7 and bash so has a lot of dependencies on those on install

Getting Started with PTS (cont.)

- Many individual test modules will also have dependencies (especially compile/build benches), PTS will try to in-line install those as part of the test run and ask for a root/admin password
- PTS itself is free software under GPL v3, most test modules are also free software and are automatically installed by PTS
- However some modules that test proprietary software are also available, in these cases you will need the proprietary software installed in advance

Installing PTS

- **RHEL/CentOS**
  #enable EPEL repo
  `sudo yum install phoronix-test-suite`
- **Fedora**
  `sudo dnf install phoronix-test-suite`
- **Arch/Manjaro**
  #install AUR helper of choice (ex. pikaur)
  `sudo pikaur -S phoronix-test-suite`
- **Debian/Ubuntu/Mint**
  #most recent Ubuntu package for PTS is version 5.2.1 from 2014, let's use something newer
  `wget http://phoronix-test-suite.com/releases/repo/pts.debian/files/phoronix-test-suite_8.8.1_all.deb && sudo apt install -f ./phoronix-test-suite_8.8.1_all.deb`
- **SUSE**
  #installs PTS version 7.6 from 2017
  `sudo zypper in phoronix-test-suite`
- **FreeBSD**
  `pkg install phoronix-test-suite-php72`
- **Docker Hub**
  `docker pull phoronix/pts && docker run -it phoronix/pts`

Running Tests in PTS

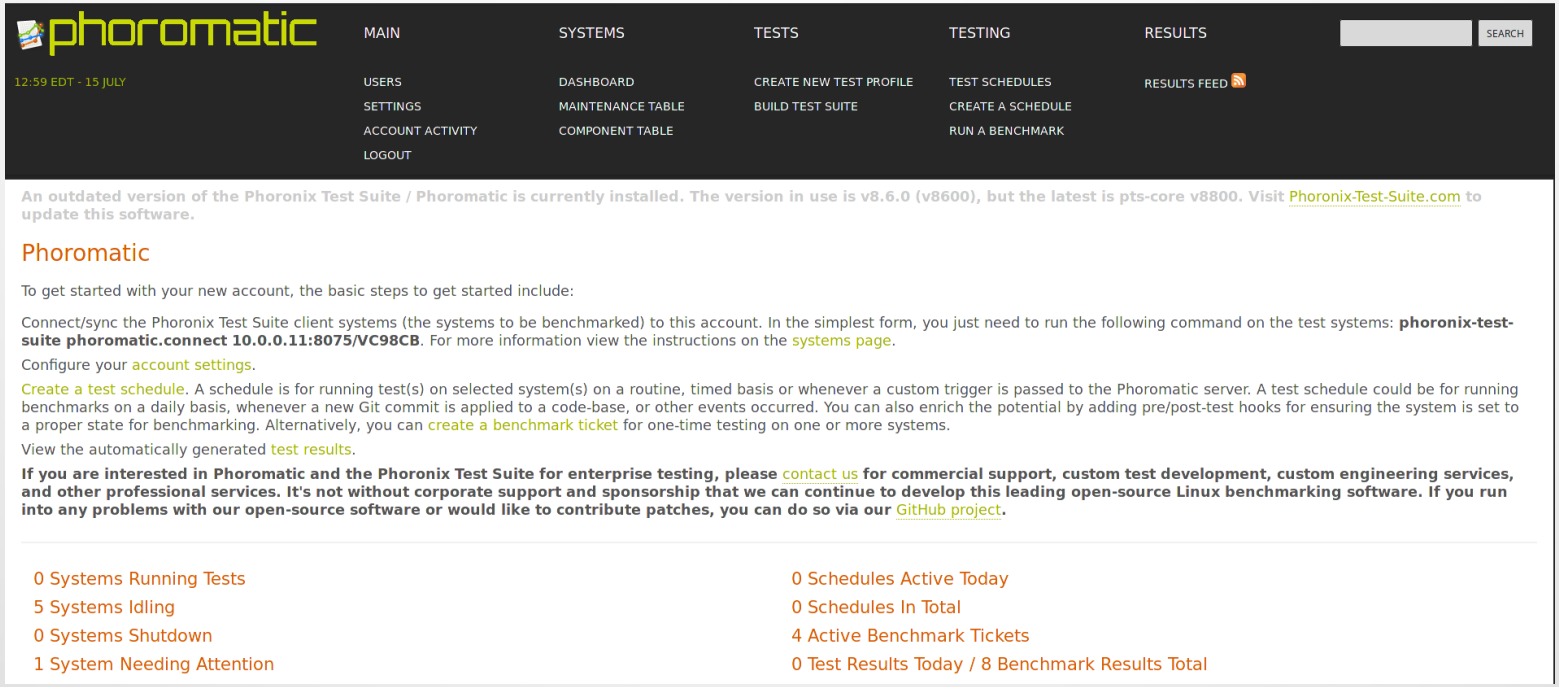
- To run benchmark tests:
  `phoronix-test-suite benchmark <test module>`
- Tests are run three times by default but this can be easily changed using the `FORCE_TIMES_TO_RUN` environment variable
- **CPU**
  `compress-gzip` for single core performance
  `c-ray` for multi-core performance and "burn-in"
  `openssl` for crypto performance
- **GPU**
  `openarena`: classic game (Quake 3 clone from 2005) good for testing integrated GPUs
  `unigine-valley`, `unigine-heaven`: early 2010s era discrete graphics benchmarks
  `unigine-super`: test contemporary state of the art graphics hardware
  dota2: test Vulkan

Running Tests in PTS (cont.)

- **RAM**
  `ramspeed` – more like 10 tests in one, chosen from submenu when test is scheduled
- **Storage**
  `iozone` - similar to ramspeed with multiple submenus
- **Network**
  `netperf`/`iperf` - need a set up a server elsewhere to send and/or receive packets
- **Combined**
  `build-linux-kernel` - excellent test of general purpose computational performance (CPU / RAM / Storage)

PTS automation with Phoromatic

- Phoromatic is the web-based GUI for PTS
- It enables PTS users to quickly and easily run lots of tests on multiple machines at once, to batch up and script the tests with unique settings, and save test results in concise reports for future comparison and analysis



PTS automation with Phoromatic (cont.)

- The Phoromatic PHP based web server and systemd service are included in the core PTS packages. Just run the server executable or start its systemd service and you will be given a unique URL for remote clients to connect to this server and receive testing jobs (after being accepted inside the Phoromatic GUI)
- If a test module has never before been run on a client Phoromatic will attempt to install it, however this process can be error-prone (particularly in regards to dependencies) so pre-installing test modules on each client outside of Phoromatic will often yield the best results. This becomes less of an issue as more modules are installed on each client as many modules share common dependencies (gcc, etc.)

Phoromatic Sample Report