SPEC® – Power and Performance
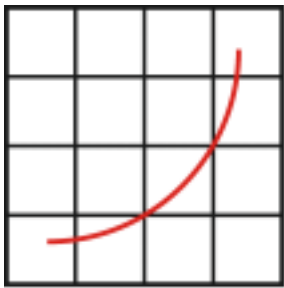
SPEC PTDaemon

Design Document

Standard Performance Evaluation Corporation

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1   Overview

SPEC's power/temperature daemon (also known as PTDaemon, PTD or ptd) is used by benchmarks to offload the work of controlling a power analyzer or temperature sensor during measurement intervals to a system other than the SUT. It hides the details of different power analyzer interface protocols and behaviors from the benchmark software, presenting a common TCP-IP-based interface that can be readily integrated into different benchmark harnesses.

The benchmark harness connects to PTDaemon by opening a TCP port and using a proprietary protocol to control devices and retrieve measurement data. For larger configurations, multiple IP/port combinations can be used to control multiple devices.

PTDaemon can connect to multiple analyzer and sensor types, via protocols and interfaces specific to each device type. The device type is specified by a parameter passed locally on the command line on initial invocation of the daemon.

The communication protocol between the SUT and PTDaemon does not change regardless of device type. This allows the benchmark to be developed independently of the device types to be supported.

**To check for possible updates to this document, please see
http://www.spec.org/power/docs/SPEC-PTDaemon_Design.pdf.**

2   Code Structure

PTDaemon is implemented using a main process that controls initialization and the network command interface, with a separate thread that manages the power analyzer or temperature sensor. Some analyzers that do not operate with a standard command/response structure also require an additional thread to receive asynchronous data from the device.

Upon startup the main process performs the following steps:
- Parses command-line arguments and checks for validity
- Initializes the analyzer interface
- Connects to the analyzer and checks for valid responses
- Initializes the network connection and opens a socket in listen mode
- Optionally sets ampere and voltage ranges

At this point, the main process goes into a command-handling loop, where it receives commands, parses them, performs any necessary actions, and sends a response back across the network.

The device thread is started any time a measurement interval is begun. It consists of a timed loop that calls the analyzer read function, logs the values, then sleeps any remaining time before the next scheduled sample. The device thread ends when either the benchmark harness requests an end to measurements or a network error occurred.

The device thread will not disconnect when the network connection is closed cleanly by the remote end. This allows measurements to continue without an active network connection, allowing the possibility of measuring power during arbitrary periods including reboots or low power modes without the necessity of any third-party software control.

3   Usage

Please see the Measurement Setup Guide at http://www.spec.org/power/docs/SPEC-Power_Measurement_Setup_Guide.pdf for command-line options and device-specific usage instructions.

4   Adding Measurement Devices

The process for adding support for new measurement devices is documented in the Power Analyzer Acceptance Process found at
http://www.spec.org/power/docs/SPEC-Power_Analyzer_Acceptance_Process.pdf.

5   Disclaimer

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