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An overview of the SPECpower_ssj[®] 2008 benchmark on HPE servers

Contents

What SPECpower_ssj [®] 2008 measures.....	2
Benchmark methodology.....	2
Benchmark metrics and comparing results.....	2
Benchmark workload.....	3

What SPECpower_ssj® 2008 measures

SPECpower_ssj2008 is the first generation benchmark for evaluating the power and performance characteristics of server class computers. This measurement provides a way to compare the energy efficiency of servers and determine the amount of power servers require at different levels of utilization. Developed by the Standard Performance Evaluation Corporation (SPEC), SPECpower_ssj2008 is a consortium-policed benchmark that provides a way for server vendors to compare benchmark results in a fair manner.

Benchmark methodology

In SPECpower_ssj2008, the amount of performance at a target load level is measured in “ssj_ops@target load level”, e.g. 123.123@90%. The benchmark consists of measuring power consumption in 13 intervals at different levels of system utilization. First, the system runs three intervals at maximum system capacity. These three intervals calibrate the benchmark for the 100% performance level of the system and are not counted in the final benchmark results. From there, the workload is throttled and runs intervals in 10% steps from 100% to active idle, measuring system performance and power consumption. Several environmental factors must be adhered to during the benchmark; for instance, the ambient temperature cannot fall below 20°C (68°F).

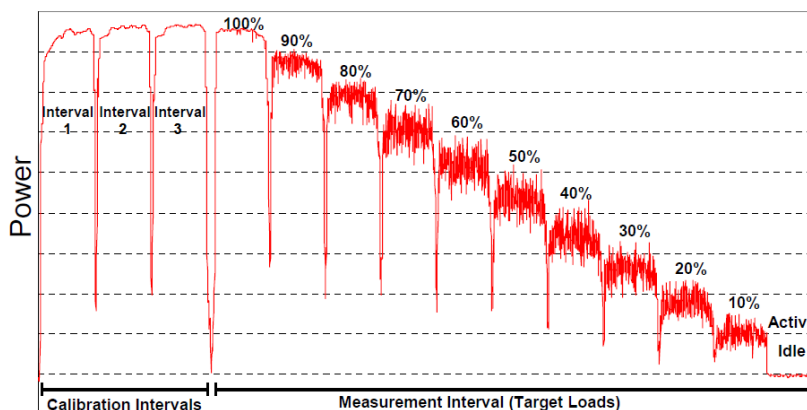


Figure 1. SPECpower_ssj2008 workload iteration.

Benchmark metrics and comparing results

The SPECpower_ssj2008 metric is the “overall ssj_ops/watt”. This metric is computed by taking the sum of the ssj_ops scores for all target load levels, and then dividing by the sum of the power consumption averages for all target load levels – including the “active idle” (0% utilization) measurement interval. SPECpower_ssj2008 benchmark results are available on the SPEC website at spec.org/power_ssj2008.

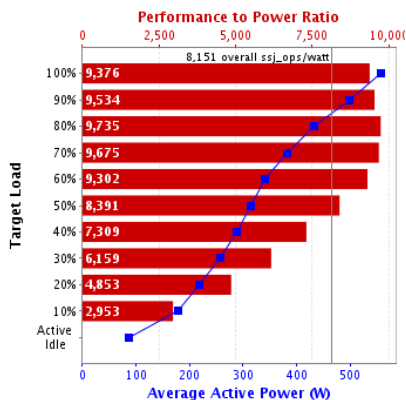


Figure 2. Sample SPECpower_ssj2008 benchmark metrics; HPE ProLiant DL560 Gen9 results published June 22, 2016.

Benchmark workload

The SPECpower_ssj2008 workload represents a three-tier system; where all three tiers run on the same server. The three-tier model simulates a wholesaling operation that processes orders, checks the status on the orders, manages stock levels and deliveries, and runs reports on customer data. The workload is reminiscent of an OLTP database workload; however, the emphasis is on the server-side Java-driven middle tier (hence, the “ssj”) rather than on a back-end database system. In SPECpower_ssj2008, the back-end database is implemented without a commercial database but is implemented as in-memory Java objects with transactions being logged in XML. With today’s multi-core processors quickly becoming the standard, expect multiple concurrent Java Virtual Machines to be running in most SPECpower_ssj2008 benchmarks.

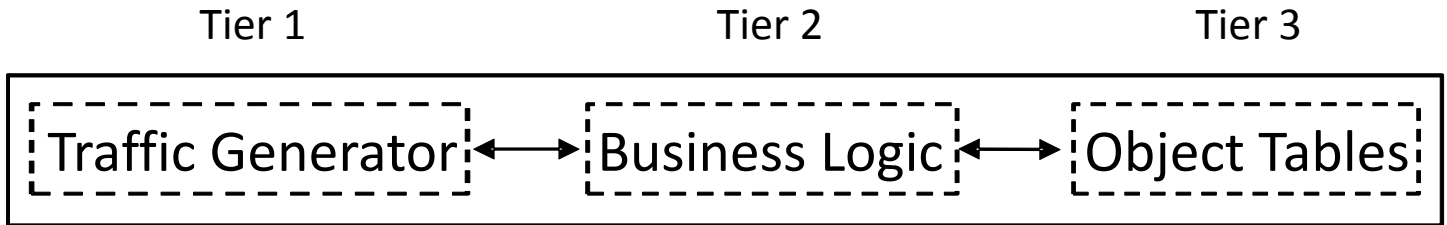


Figure 3. SPECpower_ssj2008 three-tier workload.

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