# UL 2640

Test Method for Server Performance

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Test Method for Server Performance, UL 2640

First Edition, Dated July 8, 2011

#### Summary of Topics

#### This is the First Edition of the Test Method for Server Performance

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## Test Method for Server Performance

# **First Edition**

# July 8, 2011

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#### INTRODUCTION

#### 1 Scope

1.1 These performance ratings apply to desktop servers, rack-mountable servers, individual blade servers, chassis containing multiple blade servers, and supercomputers intended to be supplied by a branch circuit of 600 volts ac or less.

1.2 The servers covered by this Test Method shall be provided with at least one CPU and at least one hard disk drive or solid state drive, support an operating system, and be capable of being booted from a memory stick.

1.3 These requirements are intended to be a hardware performance efficiency metric and not an application performance metric.

1.4 These requirements do not cover servers that are provided with a means for direct connection to a DC power supply.

1.5 For this Test Method, server performance is evaluated using standardized server performance software.

#### 2 Units of Measurement

2.1 Values stated without parentheses are the requirement. Values in parentheses are explanatory or approximate information.

#### **3 Undated References**

3.1 Any undated reference to a code or standard appearing in the requirements of this Test Method shall be interpreted as referring to the latest edition of that code or standard.

## 4 Glossary

4.1 For the purpose of this Test Method, the following definitions apply.

4.2 SERVER – A computer that provides services and manages networked resources for client devices.

4.3 CHASSIS – Enclosure that contains multiple servers or individual blades.

4.4 SUPERCOMPUTERS – Chassis or multiple chassis containing several servers which are connected to act as one. May be powered from one common dc supply or powered from individual ac supplies.

4.5 IDLE MODE – An operational state in which the operating system and other software have completed loading and the server is capable of completing workload transactions, but no active workload transactions are requested or pending by the system.

4.6 OFF MODE – The lowest power consumption mode which cannot be switched off (influenced) by the user and that may persist for an indefinite time when a server is connected to the main electricity supply.

# CONSTRUCTION

#### 5 General

5.1 In addition to these requirements, a server shall comply with the construction, performance, production, marking, and instruction requirements in the Standard for Safety for Information Technology Equipment Safety - Part 1: General Requirements, UL 60950-1.

#### PERFORMANCE

#### 6 General

6.1 The following tests shall be conducted in this order: Power-On Spike Test, Boot Cycle Test, and the Benchmark Test.

6.2 Each of the following tests shall be conducted at both 110 V ac and 208 V ac and the BIOS settings shall be in the default mode.

6.3 All tests are performed with the standardized server performance software that does not allow vendors to run specific versions of run time environments or test cycles that favor their equipment or configuration.

6.4 When performing tests at the maximum normal load conditions in accordance with the Standard specified in 5.1, the server is to be loaded to the maximum CPU capacity that may occur under normal conditions.

#### 7 Power-On Spike Test

7.1 The Power-On Spike test is used to determine the initial power surge that occurs when a device is first turned on or plugged in. The initial surge shall not exceed a duration of 100 ms.

7.2 The test shall begin when the device is powered on and end as soon as the spike is observed using an oscilloscope and recorded.

7.3 Some devices spike within the first second of powering up, while others have a delay. Either outcome is acceptable.

## 8 Boot Cycle Test

8.1 The Boot Cycle Test is used to measure the time it takes for the server to transition from Off Mode to Idle Mode.

8.2 The maximum power value in watts attained during the test is also recorded.

8.3 The test is to be conducted using the standardized bootable flash memory device that contains the operating system and test software.

## 9 Benchmark Test

9.1 The benchmark rating is determined by the standardized server performance software based on the average of three cycles.

9.2 The benchmark test is used to determine and establish a rating for the efficiency of the server.

9.3 The test shall be conducted at the maximum ambient temperature permitted by the manufacturer's specification, or 25°C (77°F), whichever is greater.

9.4 Each core of all CPUs shall be fully loaded and at their maximum capacity during the test.

9.5 Power consumption during the measurement shall be stable for a minimum of 15 minutes during this test.