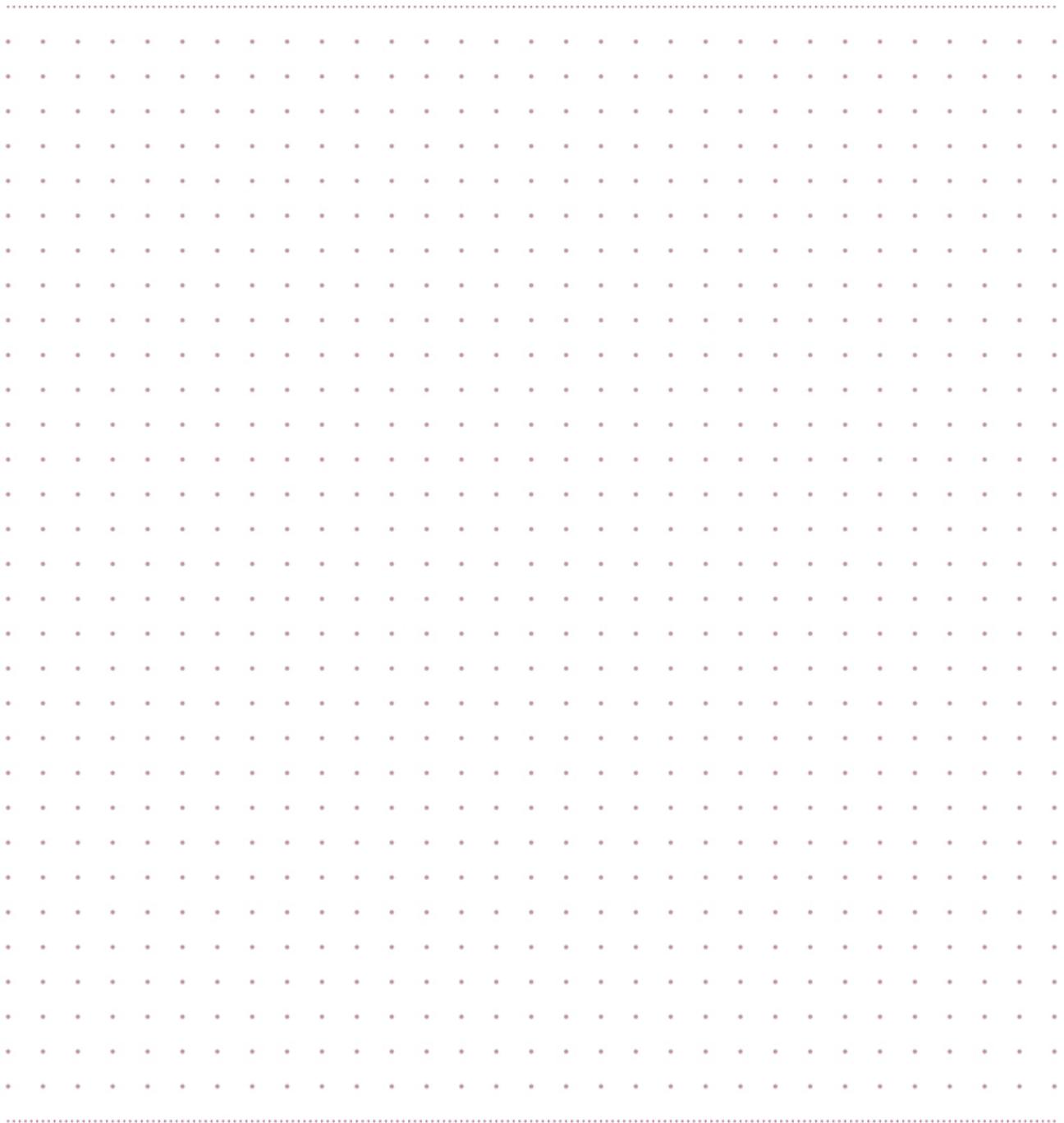


# Ubuntu Server Hardware Certification Coverage (16.04 LTS)

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The Ubuntu Certification team is continuously revisiting the scope of the tests comprising the Ubuntu Certified programme and it is reviewed every six months, following the same cadence as the Ubuntu OS. This revision of new tests is performed during Ubuntu's development cycle and it never applies to already-released versions of Ubuntu.

This document lists the coverage for certification of Ubuntu Server 16.04 LTS. This coverage will remain as it is for Ubuntu Server 16.04 LTS through its life cycle.

The following test categories are specified:

### **Whitelist**

Features that are required for certification. If any of the tests in the whitelist fails, the certification will fail.

### **Greylist**

Features that are tested, but that don't block certification. If any of the tests under the greylist fail, a note will be added to the certificate to warn the potential customer or user.

### **Blacklist**

Features that are not currently tested. The items in the blacklist category are just reference items: **anything not explicitly called out in the whitelist or greylist categories can be considered part of the blacklist category.** Canonical has the option to add and remove tests, provided they are preapproved between Canonical and the customer.

For Blacklist items, Canonical **may** introduce tests for those items at any point; however, those tests will be introduced as Greylist items until the next major suite revision. For example:

MAAS compatibility testing was not required for 12.04 LTS. As of 12.04.3, MAAS was tested as a Greylist item during certification. Thus, if a greylist item does not work, the certification is not blocked but the testing is performed and that data is recorded. As of 14.04, MAAS compatibility was required to pass certification, and thus the MAAS test moved from Greylist to Whitelist. Prior releases of Ubuntu Server LTS test relied on outside setup of PXE, FTP, TFTP, and Power (IPMI) testing. With Ubuntu Server 14.04 LTS testing all of that functionality is now provided via the testing tools and framework to ease setup, reduce variability between lab infrastructure, and align with scale out deployment processes.

Note: only categories of hardware are tested and not specific types of hardware. For example, tests are run to verify USB controllers work, but the type of peripheral(s) used during those tests are not specified.

Full test case descriptions can be found at the Canonical Certification portal for partners:

<http://certification.canonical.com>

## 16.04 LTS Coverage Changes

New for Ubuntu 16.04 LTS are some changes in how certification is performed and the items being tested. As new point releases are released multiple workloads may be deployed to test for regressions and system upgradability.

Additional changes to Server Certification Test Coverage are highlighted below.

### Whitelist

- Processors:
  - ia32 (x86) and x86\_64 processors are tested to ensure proper functionality.
    - By default, 64-bit Ubuntu is used. 32-bit Ubuntu is used only on processors that are 32-bit. 32-bit Ubuntu is *not* tested on 64-bit processors.
  - A general stress test is performed to verify that the system can handle a sustained high load for a period of time. This utilizes the test tool “stress-ng” available in the Universe repositories.
- Memory:
  - Proper detection
  - General usage
  - A general stress test is performed to verify that the system can handle a sustained high load for a period of time. This utilizes the test tool “stress-ng” available in the Universe repository.
- Internal hard drives (RAID AND Non-RAID) <sup>1</sup>:
  - Performance
  - Storage devices (HDDs, RAID LUNs) are I/O load tested using Open Source tools
  - Basic RAID levels (0,1 or 5)

- Mezzanine or Daughter Cards
  - Any mezzanine or daughter card that enables ports on the motherboard must pass. (e.g. a mezz card that enables 10Gb on onboard SFP+ ports)
- Optical drives (CD/DVD):
  - Read
- Networking:
  - Ethernet devices are tested at their full speed and must show a minimum of 80% of advertised maximum speed.
  - Testing is conducted for 1 hour per port.
- System management<sup>2 3</sup>:
  - In-Band Management (IPMI)
  - Out-of-Band Management (IPMI, AMT, etc)
  - Chassis Management (Blade / Cartridge type systems)
  - Virtual Machine Management (for LPAR or VM systems like Power or z13)
  - MAAS Compatibility
- USB controllers. USB ports are tested to ensure operability.
  - USB 2.0/3.x
- Boot/Reboot
  - Includes PXE Booting
- Virtualization<sup>4</sup>:
  - Virtualization extensions
  - Running an Ubuntu image on KVM

## Greylist

- System Identification
  - Ensure that the Make/Model being returned to the operating system and via OOB Management is the same as what is being submitted for certification.
- Firmware Updates
  - Firmware update tools packaged for Ubuntu
  - Firmware updates possible from within the Ubuntu OS

- Storage Management Tools
  - Storage management tools packaged and documented for Ubuntu
  - Storage management tools should be fully functional on Ubuntu (executable from Ubuntu)
- Advanced RAID levels (10, 15, 50, etc)
- Infiniband
- External Storage
  - iSCSI
  - FC, FCoE
- Input devices:
  - External keyboard (basic functionality)

## Blacklist

- External PCI cards
- Graphics
- Tape devices
- Advanced network configuration
- E-Star requirements

## Q & A

### What do you mean by MAAS Compatibility?

As of 14.04 LTS, any system that is listed as Certified has been tested with Ubuntu's deployment tools. This means the system can be deployed using Metal as a Service (MAAS) and workloads can be installed to it. This is determined by using MAAS to provision and deploy the OS onto the target systems to be tested. Additionally, there should be as little human intervention as necessary to perform this task, such as the user manually needing to power the machine on and off between during the provision process.

### Does changing the speed of processors require a new certificate?

No. Only changing the CPU family would require retesting and issuing a new certificate.

### What about non-x86 processors?

Any architecture supported by Ubuntu may be certified. At this time, this includes ia32, x86\_64, ARM, ARM64, PPC64LE and s390x.

## Complete Test Plan

The Hardware Certification Testing Coverage aims to test as thoroughly as possible and ensure that systems and their components are compatible and function well with Ubuntu and Ubuntu Tools; however, it is not possible for this scope of testing to catch issues that are unique to a system or platform or may appear during the hardware development lifecycle. For example, tools to manage firmware, storage configurations, etc., and their usage vary by vendor and platform, but end users expect this functionality. This testing is not done by the Ubuntu Server testing tools and should be tested by the Partner on a regular basis.

Because of this, please work with your Technical Partner Manager to outline and document those tests that are not covered by the standard tooling. Partners are strongly encouraged to integrate the Ubuntu test tools and Ubuntu OS into their own processes for OS and Hardware Validation. Your Technical Partner Manager will gladly help assist you in any way to make this possible.

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- 1 Only RAID hardware solutions.
  - 2 Applicable to systems that ship with a BMC or similar management device.
  - 3 Limited to Power Management and User/Password management for MAAS control.
  - 4 Only applies to Bare Metal and Ubuntu as Guest on a KVM Hypervisor.