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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 20.04 LTS. This coverage will remain as it is for Ubuntu Server 20.04 LTS through its life cycle.

The following test categories are specified:

Blocking

Features that are required for certification. If any of the blocking tests fail, the certification will fail.

Non-Blocking

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

Untested

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

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

In previous versions of Ubuntu up to 16.04 LTS, we did not test GPGPUs. Thus GPGPUs were Untested items. As of 18.04 LTS, GPGPU testing was introduced as a tech preview test, which is non-blocking. As of 20.04 LTS, AI/ML focused systems **must** pass GPGPU testing (GPGPUs are a blocker here) but standard servers that happen to also have GPGPU options are not gated if GPGPUs are not tested.

The use of Canonical's Metal as a Service tool is a required part of server certification testing. Thus MAAS is considered a blocker. If a system cannot be automatically enlisted, commissioned, and deployed using MAAS **without user interaction other than manually powering the system on the first time** the system cannot pass Ubuntu Server Certification.

Note: only categories of hardware are tested and not specific types of hardware. For example, tests are run to verify that 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>

20.04 LTS Coverage Changes

As introduced in the 18.04 LTS cycle, Ubuntu 20.04 LTS continues the policy of Comprehensive Server Certification. This means that all Vendor Approved Options for sale with a given model Server must be tested at some point.

Once a Vendor Approved Option has been tested in one Server Model, it does not need to be retested for another Server Model. This increases the scope of testing but minimizes the amount of extra test work necessary. Thus, if Model A and Model B both feature Networkcard 1, Networkcard 1 is only required to be tested once in either Model A or Model B, and will be considered tested for both.

Additional changes to Server Certification Test Coverage are highlighted below.

Blocking

- Processors:
 - All supported processor architectures are tested to ensure proper functionality.
 - 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. Currently, the following architectures are supported
 - Both Intel and AMD CPUs (64-bit only)
 - IBM and OpenPOWER Power 8 and Power 9 (ppc64el)
 - ARM64 (ARM64 based Server Models must use a SoC that has been SoC Certified.)
 - IBM s390x
- 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.
- Intel Optane DCPMM devices:
 - Configuration
 - Intel DCPMMs are tested in both Memory and AppDirect ¹ (Storage) modes.
- Internal storage (RAID **and** Non-RAID) ²:
 - Performance
 - Storage devices (HDDs, SSDs, Hybrid, NVMe, 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.
 - High Speed network devices (40 Gb/s and faster must also meet this requirement, however additional configuration and testing steps may be required)
 - Testing is conducted for 1 hour per port.
- System management ^{3 4}:
 - 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
 - PXE Booting from a MAAS server
 - Rebooting to finalize deployment
- Virtualization ⁵:
 - Virtualization extensions
 - Running an Ubuntu image on KVM
- Containers
 - LXC must function
- 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 must accurately reflect the Make/Model being certified.
- GPGPU Devices
 - Systems that are AI/ML focused, such as those that ship with multiple GPGPUs and marketed for AI/ML workloads, **must** pass the GPGPU tests in addition to the standard test plan for certification.

Non-Blocking

- 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)
- GPGPU devices
 - Systems that include a GPGPU option but are not AI/ML focused (e.g. systems that allow adding one or more GPGPUs into available PCIe slots) will not be gated if the GPGPU options have not been tested.

Untested

- Graphics Display Adapters and external monitors
- Tape devices
- Advanced network configuration (Bonding, Failover, etc)
- E-Star requirements
- Sleep states

Q & A

What do you mean by MAAS Compatibility?

In order to be listed as certified, a system is required to have been deployed using Ubuntu's Metal as a Service (MAAS) tool. This is determined by using MAAS to enlist, commission, and deploy the OS and certification tools 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 during the initial enlistment phase.

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 x86_64, ARM, ARM64, PPC64LE and s390x.

Complete Test Plan

The Hardware Certification Testing Coverage aims to test as thorough 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 Partner Engineer 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 Partner Engineer will gladly help assist you in any way to make this possible.

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- 1 fsdax, raw, and sector modes only, devdax is not currently tested.
 - 2 Only RAID hardware solutions.
 - 3 Applicable to systems that ship with a BMC or similar management device.
 - 4 Limited to Power Management and User/Password management for MAAS control and probing for info from the BMC.
 - 5 Only applies to Ubuntu on Bare Metal and limited LPAR scenarios.