

Internet of Things Certified Hardware Coverage for Ubuntu Core 22 / Ubuntu 22.04

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1. Introduction

This document lists the coverage for certification of Internet of Things (IoT) devices with Ubuntu images. IoT devices can be certified with the following image types:

- Ubuntu Core 22
- Ubuntu Server 22.04 LTS
- Ubuntu Desktop 22.04 LTS

The guide applies to devices submitted to Canonical through one of the following programmes:

- IoT Devices Enablement Programme with Certification
- IoT ODM Partner Programme

For each test job, one of the following certification statuses is specified:

Blocking

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

Non-blocking

Features that are tested but not mandatory for certification. Failure in non-blocking tests will not prevent certification. However, a note will be added to the certificate to inform potential customers or users.

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.

Coverage is flexible based on customer requirements (for example, if a device's use cases don't require LEDs, then LEDs can be non-blocking)

Certain test jobs are designed to validate specific hardware capabilities, such as camera and audio playback functionality. To ensure that the required hardware capabilities are present and properly recognised on the machine under test, these features are explicitly defined in *manifest entries* and linked to the relevant test jobs. This prevents test jobs from being skipped due to system deficiencies in automated detection.

Full test descriptions can be found in Canonical certification site for partners:

<https://certification.canonical.com>

2. client-cert-iot-ubuntu-core-22

Note

The certification tests presented in this document are validated by [Checkbox¹](#) version 4.3.0.dev71.

2.1. Blocking

2.1.1. Advanced Configuration and Power Interface

The following test units are covered in this category:

Test unit ID	Summary
acpi/oem_osi	Test ACPI OEM _OSI strings

2.1.2. Audio tests

The following test units are covered in this category:

Test unit ID	Summary
audio/alsa-loopback-automated	Captured sound matches played one (automated)
audio/alsa-playback	Playback works
audio/detect-capture-devices	Check that at least one audio capture device exists
audio/detect-playback-devices	Check that at least one audio playback device exists

2.1.3. Bluetooth - BlueZ Self Tests

The following test units are covered in this category:

Test unit ID	Summary
bluetooth/bluez-internal-bnep-tests_bluez-internal-bnep-test	BlueZ-{bluez-internal-bnep-test}
bluetooth/bluez-internal-hci-tests_bluez-internal-hci-test	BlueZ-{bluez-internal-hci-test}
bluetooth/bluez-internal-rfcomm-tests_bluez-internal-rfcomm-test	BlueZ-{bluez-internal-rfcomm-test}
bluetooth/bluez-internal-uc-tests_bluez-internal-uc-test	BlueZ-{bluez-internal-uc-test}

¹ <https://github.com/canonical/checkbox/tree/beta>

2.1.4. Bluetooth tests

The following test units are covered in this category:

Test unit ID	Summary
bluetooth/bluetooth_obex_send	Bluetooth OBEX send
bluetooth/bluez-controller-detect	Check bluez lists a controller if rkill detects one
bluetooth/detect	Make sure at least one bluetooth device is detected
bluetooth/keyboard-manual	Bluetooth keyboard manual test
bluetooth4/beacon-eddystone_url_interface	Test system can get beacon EddyStone URL advertisements on the {interface} adapter

2.1.5. Camera tests

The following test units are covered in this category:

Test unit ID	Summary
camera/multiple-resolution-images-rpi-attachment_name	Attach an image from the multiple resolution images test on rpi
camera/multiple-resolution-images-rpi_name	Webcam multiple resolution capture test for Pi Camera
camera/multiple-resolution-images_name	Webcam multiple resolution capture test for {product_slug}
camera/roundtrip-qr_code_name	Test video output and camera {{ name }} by displaying and reading a QR code

2.1.6. CPU tests

The following test units are covered in this category:

Test unit ID	Summary
cpu/arm64_vfp_support_platform	Validate that the Floating Point Unit is running on {platform} device
cpu/armhf_vfp_support_platform	Validate that the Vector Floating Point Unit is running on {platform} device
cpu/clocktest	Tests the CPU for clock jitter
cpu/cstates	Run C-States tests
cpu/cstates_results.log	Attach C-States test log
cpu/maxfreq_test	Test that the CPU can run at its max frequency
cpu/maxfreq_test-log-attach	Attach CPU max frequency log
cpu/offlining_test	Test offlining of each CPU core
cpu/scaling_test	Test the CPU scaling capabilities
cpu/scaling_test-log-attach	Attach CPU scaling capabilities log
cpu/topology	Check CPU topology for accuracy between proc and sysfs

2.1.7. Disk tests

The following test units are covered in this category:

Test unit ID	Summary
disk/check-software-raid	Validate the configuration of software RAID devices are expected
disk/detect	Gathers information about each disk detected
disk/read_performance_name	Disk performance test for {product_slug}
disk/stats_name	Disk statistics for {product_slug}
disk/storage_device_name	Disk I/O stress test for {product_slug}
thunderbolt3/storage-manual	Thunderbolt 3 HDD storage insertion + read/write + removal

2.1.8. Docker containers

The following test units are covered in this category:

Test unit ID	Summary
docker/build-single_arch	Test docker build with a single container
docker/commit_arch	Test docker commit a change to a single container
docker/compose-and-basic_arch	Test docker compose and basic command
docker/compose-restart_arch	Test compose a container with restart policy applied
docker/compose-single_arch	Test docker compose with a single container
docker/copy_arch	Test copy a file bwtween a container and local filesystem
docker/deploy-registry_arch	Deploy a registry server and run it on localhost
docker/diff_arch	Test changes to files in Ubuntu container
docker/export-and-import_arch	Test docker import and export a docker container
docker/info	Display system-wide information about docker
docker/inspect_arch	Test query low-level information on a docker object
docker/interactive_arch	Test an interactive shell in Ubuntu container
docker/kill_arch	Test killing containers
docker/restart-always_arch	Test container restart policy with always applied
docker/restart-on-failure_arch	Test container restart policy with on_failure applied
docker/run_arch	Download and run ubuntu container
docker/save-and-load_arch	Test docker save and load a docker image
docker/start-stop_arch	Start and stop a single container
docker/update_arch	Test update configuration of one container
docker/version	Display docker version information

2.1.9. Ethernet Device tests

The following test units are covered in this category:

Test unit ID	Summary
ethernet/detect	Detect if at least one ethernet device is detected
ethernet/hotplug-interface	Ensure hotplugging works on port {{ interface }}
ethernet/ping_interface	Can ping another machine over Ethernet port {interface}
ethernet/wol_S3_interface	Wake on LAN (WOL) test from S3 - {interface}
ethernet/wol_S4_interface	Wake on LAN (WOL) test from S4 - {interface}
ethernet/wol_S5_interface	Wake on LAN (WOL) test from S5 - {interface}

2.1.10. Firmware tests

The following test units are covered in this category:

Test unit ID	Summary
firmware/fwts_desktop_diagnosis	Run FWTS QA-concerned desktop-specific diagnosis tests.
firmware/fwts_desktop_diagnosis_results.log.gz	Attach FWTS desktop diagnosis log to submission

2.1.11. Gathers information about the DUT

The following test units are covered in this category:

Test unit ID	Summary
connections	Collect information about connections
rtc	Creates resource info for RTC
serial_assertion	Collect serial assertions on the device
sleep	Create resource info for supported sleep states
snap	Collect information about installed snap packages

2.1.12. General Purpose I/O

The following test units are covered in this category:

Test unit ID	Summary
gpio/gpiomem_loopback_pairs_model	Test GPIO lines exposed on headers can be controlled via /dev/gpiomem
gpio/sysfs_loopback_pairs_model	Test GPIO lines exposed on headers can be controlled via sysfs
gpio/sysfs_loopback_pairs_vendor_product	Test GPIO lines exposed on headers can be controlled via sysfs

2.1.13. Informational tests

The following test units are covered in this category:

Test unit ID	Summary
info/systemd-analyze	System boot-up performance statistics
info/systemd-analyze-critical-chain	Print the tree of the time-critical chain of SystemD
lspci_attachment	Attach a list of PCI devices
lsusb_attachment	Attach output of lsusb
net_if_management_attachment	Collect logging from the net_if_management job
parts_meta_info_attachment	Attaches an information about all parts that constituted this snap

2.1.14. I²C (Inter-Integrated Circuit)

The following test units are covered in this category:

Test unit ID	Summary
i2c/i2c-bus-detect	Check presence of an I ² C bus
i2c/i2c-device-detect	Check if any I ² C devices can be detected

2.1.15. Kernel snap tests

The following test units are covered in this category:

Test unit ID	Summary
kernel-snap/booted-kernel-matches-current-name	The booted kernel image matches the image in the current kernel snap

2.1.16. LED tests

The following test units are covered in this category:

Test unit ID	Summary
led/fn	Test the Fn key LED functionality by activating/deactivating the Fn keys locking.
led/power	Power LED behavior when powered
led/power-blink-suspend	Power LED behavior when suspended
led/serial	Serial ports LED behavior
led/sysfs_led_brightness_off_vendor_product	Ensure the leds_adeon driver properly sets all LEDs to off or minimum brightness by running a test.
led/sysfs_led_brightness_on_vendor_product	Verify the functionality of the leds_adeon driver by ensuring all external LEDs achieve maximum brightness.
led/wireless	Verify the WLAN/Bluetooth LED functionality by toggling wireless connections.

2.1.17. Location Service

The following test units are covered in this category:

Test unit ID	Summary
location/status	Queries the status of a service instance

2.1.18. Media Card tests

The following test units are covered in this category:

Test unit ID	Summary
mediacard/cf-storage-manual	Test Compact Flash (CF) card insertion + read/write + removal.
mediacard/mmc-storage-manual	Test Multimedia Card (MMC) insertion + read/write + removal.
mediacard/ms-storage-manual	Test Memory Stick (MS) card insertion + read/write + removal.
mediacard/msp-storage-manual	Test Memory Stick Pro (MSP) card insertion + read/write + removal.
mediacard/sdhc-storage-manual	Test SDHC card insertion + read/write + removal.
mediacard/sdxc-storage-manual	Test SDXC card insertion + read/write + removal.
mediacard/storage-preinserted-symlink_uuid	Automated test of SD Card reading & writing ({symlink_uuid})
mediacard/xd-storage-manual	Test Extreme Digital (xD) card insertion + read/write + removal.

2.1.19. Memory tests

The following test units are covered in this category:

Test unit ID	Summary
memory/info	Check the amount of memory reported by meminfo against DMI

2.1.20. Miscellaneous tests

The following test units are covered in this category:

Test unit ID	Summary
miscellanea/device_check	Device Check
miscellanea/submission-resources	Check that data for a complete result are present

2.1.21. Monitor tests

The following test units are covered in this category:

Test unit ID	Summary
monitor/displayport_hotplug	Can hotplug monitor (DisplayPort)
monitor/dvi	Monitor works (DVI)
monitor/dvi-to-vga	Monitor works (DVI-to-VGA)
monitor/hdmi	Monitor works (HDMI)
monitor/hdmi-to-vga	Monitor works (HDMI-to-VGA)
monitor/vga	Monitor works (VGA)

2.1.22. Non-device specific networking tests

The following test units are covered in this category:

Test unit ID	Summary
ipv6_detect	Test if the kernel is IPv6 ready
ipv6_link_local_address_interface	Test that {interface} has an IPv6 link local address
networking/info_device__index__interface	Network Information of device {__index__} ({interface})
networking/predictable_names	Verify that all network interfaces have predictable names.

2.1.23. Power Management tests

The following test units are covered in this category:

Test unit ID	Summary
power-management/cold-reboot	Cold reboot
power-management/post-cold-reboot	Post cold reboot service check
power-management/post-warm-reboot	Post warm reboot service check
power-management/warm-reboot	Warm reboot
watchdog/detect	Detect the presence of a Hardware Watchdog
watchdog/post-trigger-system-reset-auto	Post watchdog reset service check
watchdog/systemd-config	Check if the hardware watchdog is properly configured
watchdog/trigger-system-reset-auto	Test that the watchdog module can trigger a system reset

2.1.24. Real Time Clock (RTC)

The following test units are covered in this category:

Test unit ID	Summary
rtc/battery	RTC battery tracks the time and ensures the system can wake up from power off state.

2.1.25. Serial Port

The following test units are covered in this category:

Test unit ID	Summary
serial/loopback-dev	Serial loopback test of {dev}
serial/rs232-console	Serial debugging console is enabled and operational

2.1.26. Snapd

The following test units are covered in this category:

Test unit ID	Summary
snappy/os-refresh	Refresh the system using the snap tool
snappy/os-revert	Rollback system update using the snap tool
snappy/snap-install	Test the snap install command is working
snappy/snap-list	Test that the snap list command is working.
snappy/snap-refresh-automated	Test whether the snap refresh command is working.
snappy/snap-remove	Test the snap remove command is working.
snappy/snap-reupdate-automated	Test the snap refresh command works after blacklisting.
snappy/snap-revert-automated	Test the snap revert command is working.
snappy/snap-search	Test that the snap find command is working.
snappy/test-snaps-confinement	Test all the snaps' confinement
snappy/test-store-config-store	Test that image is using the correct snappy store configuration.
snappy/test-store-install-beta	Snappy install command - beta channel store
snappy/test-store-install-edge	Snappy install command - edge channel store
snappy/test-system-confinement	Test if the system confinement is strict

2.1.27. SocketCAN interface tests

The following test units are covered in this category:

Test unit ID	Summary
socketcan/send_packet_local_eff_virtual	Virtual CAN device support test (Local test with raw socket and EFF)
socketcan/send_packet_local_eff_interface	CAN device support test for {interface} (Raw, Local, EFF)
socketcan/send_packet_local_fd_virtual	Virtual CAN device support test (Raw, Local, FD)
socketcan/send_packet_local_fd_interface	CAN device support test for {interface} (Raw, Local, FD)
socketcan/send_packet_local_sff_virtual	Virtual CAN device support test (Raw, Local)
socketcan/send_packet_local_sff_interface	CAN device support test for {interface} (Raw, Local)
socketcan/send_packet_remote_eff_interface	CAN device support test {interface} (Raw, Remote, EFF)
socketcan/send_packet_remote_fd_interface	CAN device support test {interface} (Raw, Remote, FD)
socketcan/send_packet_remote_sff_interface	CAN device support test {interface} (Raw, Remote)

2.1.28. TPM 2.0 (Trusted Platform Module)

The following test units are covered in this category:

Test unit ID	Summary
clevis-encrypt-tpm2/detect-ecc-capabilities	Ensure the TPM has required capabilities for clevis ECC test
clevis-encrypt-tpm2/detect-rsa-capabilities	Ensure the TPM has required capabilities for clevis RSA test
clevis-encrypt-tpm2/ecc	clevis encrypt/decrypt key ecc
clevis-encrypt-tpm2/precheck	clevis encrypt/decrypt precheck
clevis-encrypt-tpm2/rsa	clevis encrypt/decrypt key rsa
tpm2/fwts-event-log-dump	Dump the contents of the TPM Event Log

2.1.29. Ubuntu Core OS feature tests

The following test units are covered in this category:

Test unit ID	Summary
ubuntucore/os-fail-boot-description	Automatically rollback after failed boot after upgrade
ubuntucore/os-recovery-mode	Reboot into recovery mode and log into the system using prior credentials.
ubuntucore/os-reinstall-mode	Reboot into reinstall mode and trigger a factory reset on the device.
ubuntucore/sshd	SSH is enabled and operational

2.1.30. USB tests

The following test units are covered in this category:

Test unit ID	Summary
usb-c-otg/g_ether	Check DUT can be detected as USB ethernet device
usb-c-otg/g_ether-cleanup	Cleanup USB OTG ethernet interface setup after ethernet device test
usb-c-otg/g_mass_storage	Check DUT can be detected as a mass storage device
usb-c-otg/g_mass_storage-cleanup	Cleanup mass storage setup after mass storage device test
usb-c-otg/g_serial	Check if USB OTG can work as a serial port.
usb-c-otg/g_serial-cleanup	Cleanup USB OTG serial interface setup after serial device test
usb-c/c-to-a-adapter/hid	USB HID work on USB Type-C port using a "USB Type-C to Type-A" adapter
usb-c/c-to-a-adapter/storage-manual	Test USB 3 storage device insertion + read/write + removal using a "Type-C to Type-A" adapter.
usb-c/storage-manual	USB 3.0 storage device insertion + read/write + removal on USB Type-C port
usb/hid	USB keyboard works
usb/storage-detect	Detect storage partitions on a device on the USB bus
usb/storage-manual	Test USB 2.0 storage device insertion + read/write + removal.
usb/storage-preinserted-symlink-uuid	Test USB storage on 2.0 or 1.1 ports detected by udev ({symlink_uuid})
usb3/storage-manual	Test USB 3.0 storage device insertion + read/write + removal.

2.1.31. Wi-Fi access point

The following test units are covered in this category:

Test unit ID	Summary
wireless/nmcli_wifi_ap_a_interface	Create 802.11a Wi-Fi AP on {{ interface }} using NetworkManager
wireless/nmcli_wifi_ap_bg_interface	Create 802.11b/g Wi-Fi AP on {{ interface }} using NetworkManager
wireless/wifi_ap_open_b_no_sta_interface_auto	Create open 802.11b Wi-Fi AP on {interface} with no STA
wireless/wifi_ap_open_b_no_sta_interface_manual	Create open 802.11b Wi-Fi AP on {interface} with no STA (Manual)
wireless/wifi_ap_open_g_no_sta_interface_auto	Create an open 802.11g Wi-Fi AP on {interface} with no STA connected.
wireless/wifi_ap_open_g_no_sta_interface_manual	Create open 802.11g Wi-Fi AP on {interface} with no STA (Manual)
wireless/wifi_ap_setup_wizard_interface_auto	Create Access Point on {interface} using wifi-ap.setup-wizard
wireless/wifi_ap_wpa_b_no_sta_interface_auto	Create WPA2 802.11b Wi-Fi AP on {interface} with no STA
wireless/wifi_ap_wpa_b_no_sta_interface_manual	Create WPA2 802.11b Wi-Fi AP on {interface} with no STA (Manual)
wireless/wifi_ap_wpa_b_with_sta_interface_auto	Create a WPA2 802.11b Wi-Fi Access Point on {interface} with active STA
wireless/wifi_ap_wpa_g_no_sta_interface_auto	Create WPA2 802.11g Wi-Fi AP on {interface} with no STA
wireless/wifi_ap_wpa_g_no_sta_interface_manual	Create WPA2 802.11g Wi-Fi AP on {interface} with no STA (Manual)
wireless/wifi_ap_wpa_g_with_sta_interface_auto	Create WPA2 802.11g Wi-Fi Access Point on {interface} with active STA

2.1.32. Wireless networking tests

The following test units are covered in this category:

Test unit ID	Summary
wireless/check_iwlwifi_microcode_crash_interface	Check there have been no iwlwifi crashes
wireless/detect	Detect if at least one Wireless LAN device is detected
wireless/wireless_connection_open_ac_nm_interface	Connect to unencrypted 802.11ac Wi-Fi network on {{ interface }}
wireless/wireless_connection_open_ac_np_interface	Connect to unencrypted 802.11ac Wi-Fi network on {{ interface }} - netplan
wireless/wireless_connection_open_ax_nm_interface	Connect to unencrypted 802.11ax Wi-Fi network on {{ interface }}
wireless/wireless_connection_open_ax_np_interface	Connect to unencrypted 802.11ax Wi-Fi network on {{ interface }} - netplan
wireless/wireless_connection_open_be_nm_interface	Connect to unencrypted 802.11be Wi-Fi network on {{ interface }}
wireless/wireless_connection_open_be_np_interface	Connect to unencrypted 802.11be Wi-Fi network on {{ interface }} - netplan
wireless/wireless_connection_open_bg_nm_interface	Connect to an unencrypted 802.11b/g Wi-Fi network on {{ interface }}
wireless/wireless_connection_open_bg_np_interface	Connect to unencrypted 802.11b/g Wi-Fi network on {{ interface }} using netplan
wireless/wireless_connection_open_n_nm_interface	Connect to an unencrypted 802.11n Wi-Fi network on {{ interface }}
wireless/wireless_connection_open_n_np_interface	Connect to unencrypted 802.11n Wi-Fi network on {{ interface }} - netplan
wireless/wireless_connection_wpa3_ax_nm_interface	Connect to WPA3-encrypted 802.11ax Wi-Fi network on {{ interface }}
wireless/wireless_connection_wpa3_ax_np_interface	Connect to WPA3-encrypted 802.11ax Wi-Fi network on {{ interface }} - netplan
wireless/wireless_connection_wpa3_be_nm_interface	Connect to WPA3-encrypted 802.11be Wi-Fi network on {{ interface }}
wireless/wireless_connection_wpa3_be_np_interface	Connect to WPA3-encrypted 802.11be Wi-Fi network on {{ interface }} - netplan
wireless/wireless_connection_wpa_ac_nm_interface	Connect to WPA-encrypted 802.11ac Wi-Fi network on {{ interface }}
wireless/wireless_connection_wpa_ac_np_interface	Connect to WPA-encrypted 802.11ac Wi-Fi network on {{ interface }} - netplan
wireless/wireless_connection_wpa_ax_nm_interface	Connect to WPA-encrypted 802.11ax Wi-Fi network on {{ interface }}
wireless/wireless_connection_wpa_ax_np_interface	Connect to WPA-encrypted 802.11ax Wi-Fi network on {{ interface }} - netplan
wireless/wireless_connection_wpa_be_nm_interface	Connect to WPA-encrypted 802.11be Wi-Fi network on {{ interface }}
wireless/wireless_connection_wpa_be_np_interface	Connect to WPA-encrypted 802.11be Wi-Fi network on {{ interface }} - netplan
wireless/wireless_connection_wpa_bg_nm_interface	Connect to WPA-encrypted 802.11b/g Wi-Fi network on {{ interface }}
wireless/wireless_connection_wpa_bg_np_interface	Connect to WPA-encrypted 802.11b/g Wi-Fi network on {{ interface }} - netplan
wireless/wireless_connection_wpa_n_nm_interface	Connect to a WPA-encrypted 802.11n Wi-Fi network on {{ interface }}
wireless/wireless_connection_wpa_n_np_interface	Connect to a WPA-encrypted 802.11n Wi-Fi network on {{ interface }} using netplan
wireless/wireless_scanning_interface	Test system can discover Wi-Fi networks on {{ interface }}

2.1.33. Wireless Wide Area Network

The following test units are covered in this category:

Test unit ID	Summary
wwan/3gpp-scan-manufacturer-model-hw_id-auto	Scan for available 3GPP networks with the {model} modem
wwan/check-sim-present-manufacturer-model-hw_id-auto	Check if a SIM card is present in a slot connected to the modem
wwan/detect	Identify if WWAN module is missing
wwan/gsm-connection-manufacturer-model-hw_id-auto	Verify a GSM broadband modem can create a data connection

2.2. Non-blocking

2.2.1. Informational tests

The following test units are covered in this category:

Test unit ID	Summary
manifest	Hardware Manifest

2.3. Manifest Entries

The following manifest entries are required for certification:

Manifest entry	Summary
gpio_loopback	GPIO Loopback Connector
has_audio_capture	Audio capture: Machine can record sound. (For example, a desktop)
has_audio_loopback_connector	Audio Loopback Connector
has_audio_playback	Audio playback: Machine can emit sound. (For example, a desktop)
has_bt_adapter	A Bluetooth Module
has_bt_obex_support	A Bluetooth Module with OBject EXchange (OBEX) Support
has_card_reader	Media Card Reader
has_dp	DisplayPort
has_dvi	DVI
has_ethernet_adapter	An Ethernet Port
has_ethernet_wake_on_lan_support	Wake-on-LAN support through Ethernet port
has_hardware_watchdog	A Hardware Watchdog Timer
has_hdmi	HDMI
has_i2c	An I ² C bus
has_led_fn_lock	Function key lock (Fn lock)
has_led_power	Power
has_led_serial	Serial transfer
has_led_wireless	Wireless
has_md_raid	Software RAID
has_sim_card	A working SIM card inserted
has_thunderbolt	Thunderbolt Support
has_thunderbolt3	Thunderbolt 3 Support

Table 1 – continued from previous page

Manifest entry	Summary
has_tpm2_chip	TPM 2.0 Support
has_usb_storage	USB Storage Device Connected
has_usbc_data	USB Type-C Data (e.g. HID, Drives, Ethernet)
has_usbc_otg	Does the platform support USB-C OTG?
has_vga	VGA
has_wlan_adapter	A Wi-Fi Module
has_wwan_module	A WWAN Module
socket_can_echo_server_running	A SocketCAN Echo Server

3. client-cert-iot-server-22-04

Note

The certification tests presented in this document are validated by [Checkbox²](#) version *4.3.0.dev71*.

3.1. Blocking

3.1.1. Advanced Configuration and Power Interface

The following test units are covered in this category:

Test unit ID	Summary
acpi/oem_ osi	Test ACPI OEM _OSI strings

3.1.2. Audio tests

Output needs to be undistorted between 0%-100%. Output lines tested:

- Internal speakers
- 3.5mm headphones
- HDMI audio output
- DisplayPort audio output

Input needs to be recorded undistorted between 0%-100%. Input lines tested:

- Internal microphone
- 3.5mm microphone

Plug detection: when a new audio line input or output is plugged in the system, it needs to be recognized.

The following test units are covered in this category:

Test unit ID	Summary
audio/alsa-loopback-automated	Captured sound matches played one (automated)
audio/alsa-playback	Playback works
audio/detect-capture-devices	Check that at least one audio capture device exists
audio/detect-playback-devices	Check that at least one audio playback device exists

² <https://github.com/canonical/checkbox/tree/beta>

3.1.3. Bluetooth - BlueZ Self Tests

The following test units are covered in this category:

Test unit ID	Summary
bluetooth/bluez-internal-bnep-tests_bluez-internal-bnep-test	BlueZ-{bluez-internal-bnep-test}
bluetooth/bluez-internal-hci-tests_bluez-internal-hci-test	BlueZ-{bluez-internal-hci-test}
bluetooth/bluez-internal-rfcomm-tests_bluez-internal-rfcomm-test	BlueZ-{bluez-internal-rfcomm-test}
bluetooth/bluez-internal-uc-tests_bluez-internal-uc-test	BlueZ-{bluez-internal-uc-test}

3.1.4. Bluetooth tests

Bluetooth LE (Smart and Smart Ready) is tested for device scanning and pairing. Apart from pairing, several profiles are specifically tested and required:

- Eddystone Beacon
- HID Over GATT Profile (HOGP), Low-Energy keyboard or mouse with basic functionality

The following test units are covered in this category:

Test unit ID	Summary
bluetooth/bluetooth_obex_send	Bluetooth OBEX send
bluetooth/bluez-controller-detect	Check bluez lists a controller if rfcill detects one
bluetooth/detect	Make sure at least one bluetooth device is detected
bluetooth/keyboard-manual	Bluetooth keyboard manual test
bluetooth4/beacon_eddystone_url_interface	Test system can get beacon EddyStone URL advertisements on the {interface} adapter

3.1.5. Camera tests

The following test units are covered in this category:

Test unit ID	Summary
camera/multiple-resolution-images-rpi-attachment_name	Attach an image from the multiple resolution images test on rpi
camera/multiple-resolution-images-rpi_name	Webcam multiple resolution capture test for Pi Camera
camera/multiple-resolution-images_name	Webcam multiple resolution capture test for {product_slug}
camera/roundtrip-qr-code_name	Test video output and camera {{ name }} by displaying and reading a QR code

3.1.6. CPU tests

x86_64 and ARM processors are tested to ensure proper functionality. We will test specific features as:

- CPU's performance states (frequency up and down in runtime)
- CPU's sleep states (cpu on and off in runtime)
- Running CPU at its maximum frequency

We will also include a general stress test performed for 120 minutes to verify that the system can handle a sustained high load for a period of time. This test uses the tool "stress-ng" available in the Universe repositories.

For Intel CPU's, the IPDT (Intel Processor Diagnostic Tool) test suite will be run. The diagnostic checks for brand identification, verifies the processor operating frequency, tests specific processor features, and performs a stress test on the processor.

The following test units are covered in this category:

Test unit ID	Summary
cpu/arm64_vfp_support_platform	Validate that the Floating Point Unit is running on {platform} device
cpu/armhf_vfp_support_platform	Validate that the Vector Floating Point Unit is running on {platform} device
cpu/clocktest	Tests the CPU for clock jitter
cpu/cstates	Run C-States tests
cpu/cstates_results.log	Attach C-States test log
cpu/maxfreq_test	Test that the CPU can run at its max frequency
cpu/maxfreq_test-log-attach	Attach CPU max frequency log
cpu/offlining_test	Test offlining of each CPU core
cpu/scaling_test	Test the CPU scaling capabilities
cpu/scaling_test-log-attach	Attach CPU scaling capabilities log
cpu/topology	Check CPU topology for accuracy between proc and sysfs

3.1.7. Disk tests

The following test units are covered in this category:

Test unit ID	Summary
disk/check-software-raid	Validate the configuration of software RAID devices are expected
disk/detect	Gathers information about each disk detected
disk/read_performance_name	Disk performance test for {product_slug}
disk/stats_name	Disk statistics for {product_slug}
disk/storage_device_name	Disk I/O stress test for {product_slug}
thunderbolt3/storage-manual	Thunderbolt 3 HDD storage insertion + read/write + removal

3.1.8. Docker containers

The following test units are covered in this category:

Test unit ID	Summary
docker/build-single_arch	Test docker build with a single container
docker/commit_arch	Test docker commit a change to a single container
docker/compose-and-basic_arch	Test docker compose and basic command
docker/compose-restart_arch	Test compose a container with restart policy applied
docker/compose-single_arch	Test docker compose with a single container
docker/copy_arch	Test copy a file bwtween a container and local filesys-tem
docker/deploy-registry_arch	Deploy a registry server and run it on localhost
docker/diff_arch	Test changes to files in Ubuntu container
docker/export-and-import_arch	Test docker import and export a docker container
docker/info	Display system-wide information about docker
docker/inspect_arch	Test query low-level information on a docker object
docker/interactive_arch	Test an interactive shell in Ubuntu container
docker/kill_arch	Test killing containers
docker/restart-always_arch	Test container restart policy with always applied
docker/restart-on-failure_arch	Test container restart policy with on_failure applied
docker/run_arch	Download and run ubuntu container
docker/save-and-load_arch	Test docker save and load a docker image
docker/start-stop_arch	Start and stop a single container
docker/update_arch	Test update configuration of one container
docker/version	Display docker version information

3.1.9. Ethernet Device tests

Connections are tested for functionality, but not for performance.

The following test units are covered in this category:

Test unit ID	Summary
ethernet/detect	Detect if at least one ethernet device is detected
ethernet/hotplug-interface	Ensure hotplugging works on port {{ interface }}
ethernet/ping_interface	Can ping another machine over Ethernet port {interface}
ethernet/wol_S3_interface	Wake on LAN (WOL) test from S3 - {interface}
ethernet/wol_S4_interface	Wake on LAN (WOL) test from S4 - {interface}
ethernet/wol_S5_interface	Wake on LAN (WOL) test from S5 - {interface}

3.1.10. Firmware tests

The Ubuntu image must be installed using the factory default bootloader firmware (for example BIOS, UEFI or uboot as applicable) and with the default options (including SecureBoot, if that's the default setting). Firmware needs to be compliant with Canonical Firmware Test Suite (FWTS).

It is recommended that after running Canonical fwts with the list of tests defined in the [Ap-](#)

pendix A, ideally, no CRITICAL or HIGH failures should be reported, but those are not automatically certification blockers.

The following test units are covered in this category:

Test unit ID	Summary
firmware/fwts_desktop_diagnosis	Run FWTS QA-concerned desktop-specific diagnosis tests.
firmware/fwts_desktop_diagnosis_results.log.gz	Attach FWTS desktop diagnosis log to submission

3.1.11. Gathers information about the DUT

The following test units are covered in this category:

Test unit ID	Summary
connections	Collect information about connections
rtc	Creates resource info for RTC
serial_assertion	Collect serial assertions on the device
sleep	Create resource info for supported sleep states
snap	Collect information about installed snap packages

3.1.12. General Purpose I/O

We test the functionality of individual GPIO lines when the associated controller driver in the kernel implements a GPIO Sysfs Interface via the gpiolib implementers framework. In such cases, the GPIO system may be tested in two ways:

- Direct:
 - GPIO controllers are exposed through sysfs
 - GPIO lines are accessible by the user
- Indirect:
 - Communication with device connected via GPIO

The following test units are covered in this category:

Test unit ID	Summary
gpio/gpiomem_loopback_pairs_model	Test GPIO lines exposed on headers can be controlled via /dev/gpiomem
gpio/sysfs_loopback_pairs_model	Test GPIO lines exposed on headers can be controlled via sysfs
gpio/sysfs_loopback_pairs_vendor_product	Test GPIO lines exposed on headers can be controlled via sysfs

3.1.13. Informational tests

The following test units are covered in this category:

Test unit ID	Summary
info/systemd-analyze	System boot-up performance statistics
info/systemd-analyze-critical-chain	Print the tree of the time-critical chain of SystemD
lspci_attachment	Attach a list of PCI devices
lsusb_attachment	Attach output of lsusb
net_if_management_attachment	Collect logging from the net_if_management job
parts_meta_info_attachment	Attaches an information about all parts that constituted this snap

3.1.14. I²C (Inter-Integrated Circuit)

All devices attached to the I2C bus must be detectable. This includes:

- Temperature sensors
- Humidity sensors
- Accelerometers

The following test units are covered in this category:

Test unit ID	Summary
i2c/i2c-bus-detect	Check presence of an I ² C bus
i2c/i2c-device-detect	Check if any I ² C devices can be detected

3.1.15. Kernel snap tests

The following test units are covered in this category:

Test unit ID	Summary
kernel-snap/booted-kernel-matches-current-name	The booted kernel image matches the image in the current kernel snap

3.1.16. LED tests

When LEDs exist, they will be tested by following some basic expectations here. The actual behavior may vary depending on the hardware design. To ensure that the behavior is working as expected, please be sure to test against specifications obtained from OEM, as each OEM may have different defined behavior for LEDs. The following LEDs are tested:

- Power
- Serial Port LEDs (indicating activity)

The following test units are covered in this category:

Test unit ID	Summary
led/fn	Test the Fn key LED functionality by activating/deactivating the Fn keys locking.
led/power	Power LED behavior when powered
led/power-blink-suspend	Power LED behavior when suspended
led/serial	Serial ports LED behavior
led/sysfs_led_ brightness_off_vendor_ product	Ensure the leds_aaeon driver properly sets all LEDs to off or minimum brightness by running a test.
led/sysfs_led_ brightness_on_vendor_ product	Verify the functionality of the leds_aaeon driver by ensuring all external LEDs achieve maximum brightness.
led/wireless	Verify the WLAN/Bluetooth LED functionality by toggling wireless connections.

3.1.17. Location Service

The following test units are covered in this category:

Test unit ID	Summary
location/status	Queries the status of a service instance

3.1.18. Media Card tests

Media Card readers are tested for read and write for the following type of cards:

- CF
- MMC
- MS
- MSP
- SD
- SDHC
- SDXC
- XD

The following test units are covered in this category:

Test unit ID	Summary
mediacard/cf-storage-manual	Test Compact Flash (CF) card insertion + read/write + removal.
mediacard/mmc-storage-manual	Test Multimedia Card (MMC) insertion + read/write + removal.
mediacard/ms-storage-manual	Test Memory Stick (MS) card insertion + read/write + removal.
mediacard/msp-storage-manual	Test Memory Stick Pro (MSP) card insertion + read/write + removal.
mediacard/sdhc-storage-manual	Test SDHC card insertion + read/write + removal.
mediacard/sdxc-storage-manual	Test SDXC card insertion + read/write + removal.
mediacard/storage-preinserted-symlink_uuid	Automated test of SD Card reading & writing ({symlink_uuid})
mediacard/xd-storage-manual	Test Extreme Digital (xD) card insertion + read/write + removal.

3.1.19. Memory tests

Proper detection of the amount of memory installed is required (the amount of memory installed is the memory seen by the OS).

The following test units are covered in this category:

Test unit ID	Summary
memory/info	Check the amount of memory reported by meminfo against DMI

3.1.20. Miscellaneous tests

The following test units are covered in this category:

Test unit ID	Summary
miscellanea/device_check	Device Check
miscellanea/submission-resources	Check that data for a complete result are present

3.1.21. Monitor tests

Each of the available external video ports (supported ports are HDMI, DisplayPort, DVI) are tested one by one. Output to the display must work i.e. a console is presented.

The following test units are covered in this category:

Test unit ID	Summary
monitor/displayport_hotplug	Can hotplug monitor (DisplayPort)
monitor/dvi	Monitor works (DVI)
monitor/dvi-to-vga	Monitor works (DVI-to-VGA)
monitor/hdmi	Monitor works (HDMI)
monitor/hdmi-to-vga	Monitor works (HDMI-to-VGA)
monitor/vga	Monitor works (VGA)

3.1.22. Non-device specific networking tests

The following test units are covered in this category:

Test unit ID	Summary
ipv6_detect	Test if the kernel is IPv6 ready
ipv6_link_local_address_interface	Test that {interface} has an IPv6 link local address
networking/info_device__index__ interface	Network Information of device {__index__} ({interface})
networking/predictable_names	Verify that all network interfaces have predictable names.

3.1.23. Power Management tests

Warm reboot is tested such that the system must be able to perform the reboot command and services must be restarted such that systemctl does not identify a failed state.

Cold reboot is performed where an RTC is available (see next section). The wakealarm is used to reboot the system after a period of rest and services must be restarted such that systemctl does not identify a failed state.

The following test units are covered in this category:

Test unit ID	Summary
power-management/cold-reboot	Cold reboot
power-management/post-cold-reboot	Post cold reboot service check
power-management/post-warm-reboot	Post warm reboot service check
power-management/warm-reboot	Warm reboot
watchdog/detect	Detect the presence of a Hardware Watchdog
watchdog/post-trigger-system- reset-auto	Post watchdog reset service check
watchdog/systemd-config	Check if the hardware watchdog is properly configured
watchdog/trigger-system-reset- auto	Test that the watchdog module can trigger a system reset

3.1.24. Real Time Clock (RTC)

The following test units are covered in this category:

Test unit ID	Summary
rtc/ battery	RTC battery tracks the time and ensures the system can wake up from power off state.

3.1.25. Serial Port

Tests are carried out on ports that provide access via the Linux tty layer. The exact tests performed depend on the physical characteristics of the driver/receiver hardware. The possible tests include:

- Ensure expected number of devices are available
- Looped tests:

- RS232 Ports: perform loopback test to ensure RX/TX
- RS422/485 Ports: connect together to ensure RX/TX
- Machine to Machine tests: confirm that a connection can be made to another PC device and RX/TX is operational

The following test units are covered in this category:

Test unit ID	Summary
serial/loopback-dev	Serial loopback test of {dev}
serial/rs232-console	Serial debugging console is enabled and operational

3.1.26. Snapd

The following test units are covered in this category:

Test unit ID	Summary
snappy/snap-install	Test the snap install command is working
snappy/snap-list	Test that the snap list command is working.
snappy/snap-refresh-automated	Test whether the snap refresh command is working.
snappy/snap-remove	Test the snap remove command is working.
snappy/snap-reupdate-automated	Test the snap refresh command works after blacklisting.
snappy/snap-revert-automated	Test the snap revert command is working.
snappy/snap-search	Test that the snap find command is working.
snappy/test-snaps-confinement	Test all the snaps' confinement
snappy/test-store-config-store	Test that image is using the correct snappy store configuration.
snappy/test-store-install-beta	Snappy install command - beta channel store
snappy/test-store-install-edge	Snappy install command - edge channel store
snappy/test-system-confinement	Test if the system confinement is strict

3.1.27. SocketCAN interface tests

The following test units are covered in this category:

Test unit ID	Summary
socketcan/send_packet_local_eff_virtual	Virtual CAN device support test (Local test with raw socket and EFF)
socketcan/send_packet_local_eff_interface	CAN device support test for {interface} (Raw, Local, EFF)
socketcan/send_packet_local_fd_virtual	Virtual CAN device support test (Raw, Local, FD)
socketcan/send_packet_local_fd_interface	CAN device support test for {interface} (Raw, Local, FD)
socketcan/send_packet_local_sff_virtual	Virtual CAN device support test (Raw, Local)
socketcan/send_packet_local_sff_interface	CAN device support test for {interface} (Raw, Local)
socketcan/send_packet_remote_eff_interface	CAN device support test {interface} (Raw, Remote, EFF)
socketcan/send_packet_remote_fd_interface	CAN device support test {interface} (Raw, Remote, FD)
socketcan/send_packet_remote_sff_interface	CAN device support test {interface} (Raw, Remote)

3.1.28. TPM 2.0 (Trusted Platform Module)

On Intel and AMD x86 platforms that include TPM 2.0 compliant modules, it is required that all commands necessary to support Ubuntu's Full Disk Encryption functionality are supported.

The following test units are covered in this category:

Test unit ID	Summary
clevis-encrypt-tpm2/detect-ecc-capabilities	Ensure the TPM has required capabilities for clevis ECC test
clevis-encrypt-tpm2/detect-rsa-capabilities	Ensure the TPM has required capabilities for clevis RSA test
clevis-encrypt-tpm2/ecc	clevis encrypt/decrypt key ecc
clevis-encrypt-tpm2/precheck	clevis encrypt/decrypt precheck
clevis-encrypt-tpm2/rsa	clevis encrypt/decrypt key rsa
tpm2/fwts-event-log-dump	Dump the contents of the TPM Event Log

3.1.29. Ubuntu Core OS feature tests

The following test units are covered in this category:

Test unit ID	Summary
ubuntucore/sshd	SSH is enabled and operational

3.1.30. USB tests

USB 2.0

USB storage devices must work on all available USB ports. USB Human Interface Devices (HID), specifically keyboard or mouse, should be working properly on any USB port.

USB 3.0

USB storage devices must work on all available USB ports. USB Human Interface Devices (HID), specifically keyboard or mouse, should be working properly on any USB port.

USB Type C (USB 3.1)

USB Type C (USB 3.1) supports various types of devices (e.g. Video, Power) through the use of adapters or peripherals. The following adapters/peripherals should work:

- Storage devices
- Keyboard or mouse (basic functionality)
- When DisplayPort over USB Type-C is advertised:
 - **Display hot plugging and the following display are required to work:**
mirrored, extended, internal only, external only.
- Audio output needs to be undistorted over this port.

The following test units are covered in this category:

Test unit ID	Summary
usb-c-otg/g_ether	Check DUT can be detected as USB ethernet device
usb-c-otg/g_ether-cleanup	Cleanup USB OTG ethernet interface setup after ethernet device test
usb-c-otg/g_mass_storage	Check DUT can be detected as a mass storage device
usb-c-otg/g_mass_storage-cleanup	Cleanup mass storage setup after mass storage device test
usb-c-otg/g_serial	Check if USB OTG can work as a serial port.
usb-c-otg/g_serial-cleanup	Cleanup USB OTG serial interface setup after serial device test
usb-c/c-to-a-adapter/hid	USB HID work on USB Type-C port using a "USB Type-C to Type-A" adapter
usb-c/c-to-a-adapter/storage-manual	Test USB 3 storage device insertion + read/write + removal using a "Type-C to Type-A" adapter.
usb-c/storage-manual	USB 3.0 storage device insertion + read/write + removal on USB Type-C port
usb/hid	USB keyboard works
usb/storage-detect	Detect storage partitions on a device on the USB bus
usb/storage-manual	Test USB 2.0 storage device insertion + read/write + removal.
usb/storage-preinserted-symlink-uuid	Test USB storage on 2.0 or 1.1 ports detected by udev ({symlink_uuid})
usb3/storage-manual	Test USB 3.0 storage device insertion + read/write + removal.

3.1.31. Wi-Fi access point

The following test units are covered in this category:

Test unit ID	Summary
wireless/nmcli_wifi_ap_a_interface	Create 802.11a Wi-Fi AP on {{ interface }} using NetworkManager
wireless/nmcli_wifi_ap_bg_interface	Create 802.11b/g Wi-Fi AP on {{ interface }} using NetworkManager
wireless/wifi_ap_open_b_no_sta_interface_auto	Create open 802.11b Wi-Fi AP on {interface} with no STA
wireless/wifi_ap_open_b_no_sta_interface_manual	Create open 802.11b Wi-Fi AP on {interface} with no STA (Manual)
wireless/wifi_ap_open_g_no_sta_interface_auto	Create an open 802.11g Wi-Fi AP on {interface} with no STA connected.
wireless/wifi_ap_open_g_no_sta_interface_manual	Create open 802.11g Wi-Fi AP on {interface} with no STA (Manual)
wireless/wifi_ap_setup_wizard_interface_auto	Create Access Point on {interface} using wifi-ap.setup-wizard
wireless/wifi_ap_wpa_b_no_sta_interface_auto	Create WPA2 802.11b Wi-Fi AP on {interface} with no STA
wireless/wifi_ap_wpa_b_no_sta_interface_manual	Create WPA2 802.11b Wi-Fi AP on {interface} with no STA (Manual)
wireless/wifi_ap_wpa_b_with_sta_interface_auto	Create a WPA2 802.11b Wi-Fi Access Point on {interface} with active STA
wireless/wifi_ap_wpa_g_no_sta_interface_auto	Create WPA2 802.11g Wi-Fi AP on {interface} with no STA
wireless/wifi_ap_wpa_g_no_sta_interface_manual	Create WPA2 802.11g Wi-Fi AP on {interface} with no STA (Manual)
wireless/wifi_ap_wpa_g_with_sta_interface_auto	Create WPA2 802.11g Wi-Fi Access Point on {interface} with active STA

3.1.32. Wireless networking tests

Wi-Fi interfaces are tested for connection to access points configured for 802.11 b/g/n/ac/ax protocols.

The following test units are covered in this category:

Test unit ID	Summary
wireless/check_iwlwifi_microcode_crash_interface	Check there have been no iwlwifi crashes
wireless/detect	Detect if at least one Wireless LAN device is detected
wireless/wireless_connection_open_ac_nm_interface	Connect to unencrypted 802.11ac Wi-Fi network on {{ interface }}
wireless/wireless_connection_open_ac_np_interface	Connect to unencrypted 802.11ac Wi-Fi network on {{ interface }} - netplan
wireless/wireless_connection_open_ax_nm_interface	Connect to unencrypted 802.11ax Wi-Fi network on {{ interface }}
wireless/wireless_connection_open_ax_np_interface	Connect to unencrypted 802.11ax Wi-Fi network on {{ interface }} - netplan
wireless/wireless_connection_open_be_nm_interface	Connect to unencrypted 802.11be Wi-Fi network on {{ interface }}
wireless/wireless_connection_open_be_np_interface	Connect to unencrypted 802.11be Wi-Fi network on {{ interface }} - netplan
wireless/wireless_connection_open_bg_nm_interface	Connect to an unencrypted 802.11b/g Wi-Fi network on {{ interface }}
wireless/wireless_connection_open_bg_np_interface	Connect to unencrypted 802.11b/g Wi-Fi network on {{ interface }} using netplan
wireless/wireless_connection_open_n_nm_interface	Connect to an unencrypted 802.11n Wi-Fi network on {{ interface }}
wireless/wireless_connection_open_n_np_interface	Connect to unencrypted 802.11n Wi-Fi network on {{ interface }} - netplan
wireless/wireless_connection_wpa3_ax_nm_interface	Connect to WPA3-encrypted 802.11ax Wi-Fi network on {{ interface }}
wireless/wireless_connection_wpa3_ax_np_interface	Connect to WPA3-encrypted 802.11ax Wi-Fi network on {{ interface }} - netplan
wireless/wireless_connection_wpa3_be_nm_interface	Connect to WPA3-encrypted 802.11be Wi-Fi network on {{ interface }}
wireless/wireless_connection_wpa3_be_np_interface	Connect to WPA3-encrypted 802.11be Wi-Fi network on {{ interface }} - netplan
wireless/wireless_connection_wpa_ac_nm_interface	Connect to WPA-encrypted 802.11ac Wi-Fi network on {{ interface }}
wireless/wireless_connection_wpa_ac_np_interface	Connect to WPA-encrypted 802.11ac Wi-Fi network on {{ interface }} - netplan
wireless/wireless_connection_wpa_ax_nm_interface	Connect to WPA-encrypted 802.11ax Wi-Fi network on {{ interface }}
wireless/wireless_connection_wpa_ax_np_interface	Connect to WPA-encrypted 802.11ax Wi-Fi network on {{ interface }} - netplan
wireless/wireless_connection_wpa_be_nm_interface	Connect to WPA-encrypted 802.11be Wi-Fi network on {{ interface }}
wireless/wireless_connection_wpa_be_np_interface	Connect to WPA-encrypted 802.11be Wi-Fi network on {{ interface }} - netplan
wireless/wireless_connection_wpa_bg_nm_interface	Connect to WPA-encrypted 802.11b/g Wi-Fi network on {{ interface }}
wireless/wireless_connection_wpa_bg_np_interface	Connect to WPA-encrypted 802.11b/g Wi-Fi network on {{ interface }} - netplan
wireless/wireless_connection_wpa_n_nm_interface	Connect to a WPA-encrypted 802.11n Wi-Fi network on {{ interface }}
wireless/wireless_connection_wpa_n_np_interface	Connect to a WPA-encrypted 802.11n Wi-Fi network on {{ interface }} using netplan
wireless/wireless_scanning_interface	Test system can discover Wi-Fi networks on {{ interface }}

3.1.33. Wireless Wide Area Network

WWAN interfaces are tested for connection to 3G/4G/LTE services.

The following test units are covered in this category:

Test unit ID	Summary
wwan/3gpp-scan-manufacturer-model-hw_id-auto	Scan for available 3GPP networks with the {model} modem
wwan/check-sim-present-manufacturer-model-hw_id-auto	Check if a SIM card is present in a slot connected to the modem
wwan/detect	Identify if WWAN module is missing
wwan/gsm-connection-manufacturer-model-hw_id-auto	Verify a GSM broadband modem can create a data connection

3.2. Non-blocking

3.2.1. Informational tests

The following test units are covered in this category:

Test unit ID	Summary
manifest	Hardware Manifest

3.3. Manifest Entries

The following manifest entries are required for certification:

Manifest entry	Summary
gpio_loopback	GPIO Loopback Connector
has_audio_capture	Audio capture: Machine can record sound. (For example, a desktop)
has_audio_loopback_connector	Audio Loopback Connector
has_audio_playback	Audio playback: Machine can emit sound. (For example, a desktop)
has_bt_adapter	A Bluetooth Module
has_bt_obex_support	A Bluetooth Module with OBject EXchange (OBEX) Support
has_card_reader	Media Card Reader
has_dp	DisplayPort
has_dvi	DVI
has_ethernet_adapter	An Ethernet Port
has_ethernet_wake_on_lan_support	Wake-on-LAN support through Ethernet port
has_hardware_watchdog	A Hardware Watchdog Timer
has_hdmi	HDMI
has_i2c	An I ² C bus
has_led_fn_lock	Function key lock (Fn lock)
has_led_power	Power
has_led_serial	Serial transfer
has_led_wireless	Wireless
has_md_raid	Software RAID
has_sim_card	A working SIM card inserted

Table 1 – continued from previous page

Manifest entry	Summary
has_thunderbolt	Thunderbolt Support
has_thunderbolt3	Thunderbolt 3 Support
has_tpm2_chip	TPM 2.0 Support
has_usb_storage	USB Storage Device Connected
has_usbc_data	USB Type-C Data (e.g. HID, Drives, Ethernet)
has_usbc_otg	Does the platform support USB-C OTG?
has_vga	VGA
has_wlan_adapter	A Wi-Fi Module
has_wwan_module	A WWAN Module
socket_can_echo_server_running	A SocketCAN Echo Server

4. Appendix A. FWTS tests

As part of the certification process, we run a series of firmware tests that are part of the Canonical Firmware Test Suite. In general, any HIGH or CRITICAL error found in the fwts log can cause potential errors in the system and should be looked at by OEMs/ODMs.

Category	Test Item	Description
Information	acpidump	Check ACPI table acpidump.
Information	version	Gather kernel system information.
ACPI	acpitables	ACPI table settings confidence checks.
ACPI	apicinstance	Check for single instance of APIC/MADT table.
ACPI	hpet_check	High Precision Event Timer configuration test.
ACPI	mcfg	MCFG PCI Express* memory mapped config space.
ACPI	method	ACPI DSDT Method Semantic Tests.
CPU	mpcheck	Check Multi Processor tables.
CPU	msr	CPU MSR consistency check.
CPU	mtrr	MTRR validation.
System	apicedge	APIC Edge/Level Check.
System	klog	Scan kernel log for errors and warnings.