Canonical

Ubuntu Certified Docking Stations Coverage for 22.04 LTS

Canonical

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1. Introduction

Although docking stations are currently out of scope of the general Ubuntu Desktop Certified Hardware programme at Canonical, we have an extension to the programme to enable and certify a particular docking station with an already Ubuntu certified system. This programme does not certify a particular docking station to work with all Ubuntu certified systems, nor will a docking station be tested and/or certified in isolation, but always as part of the certification of a full system.

This document lists the coverage for certification of docking stations for Ubuntu Desktop 22.04 LTS. This coverage will remain as it is for Ubuntu Desktop 22.04 LTS through the life cycle of Ubuntu Desktop 22.04 LTS.

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

Note

At the time of this writing, only wired docks are supported. Wireless docking requires functionality that is not known to be supported by IHVs.

Note

This also does not cover “smart” docks, i.e. docks that contain additional components (like graphics adapters, etc.).

2. Main testing flow

Once the connected components like DP monitors, HDMI monitors, and ethernet cables have been plugged, they will remain plugged in throughout testing. However, for user-removable components such as USB drives or Thunderbolt storage devices, hotplugging functionality will be tested. The testing process will follow a flow similar to:

1. Plug all the components into the docking station
2. Unplug the storage when meet the storage test
3. Start storage testing(Insert, auto, remove)
4. Plug it back when finish the storage test

3. dock-cert-full

Note

The certification tests presented in this document are validated by Checkbox[1] version *4.4.0.dev55*.

3.1. Blocking

3.1.1. Docking station audio tests

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

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

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

- 3.5mm microphone

The following test units are covered in this category:

[1] https://github.com/canonical/checkbox/tree/beta

Test unit ID	Summary
dock/all-hotplug-audio-alsa-record-playback-external	External microphone plugged to the dock to record sound test
dock/all-hotplug-audio-microphone-plug-detection	Microphone recognized when plugged to the dock test
dock/all-hotplug-audio-playback-headphones	Headphones output test
dock/all-hotplug-audio-speaker-headphone-plug-detection	Headphones recognized when plugged to the dock test
dock/all-hotplug-monitor-multi-head-audio-playback	Multiple monitor audio test
dock/all-init-audio-alsa-record-playback-external	External microphone plugged to the dock to record sound test
dock/all-init-audio-microphone-plug-detection	Microphone recognized when plugged to the dock test
dock/all-init-audio-playback-headphones	Headphones output test
dock/all-init-audio-speaker-headphone-plug-detection	Headphones recognized when plugged to the dock test
dock/all-init-monitor-multi-head-audio-playback	Multiple monitor audio test
dock/all-poweroff-audio-alsa-record-playback-external	External microphone plugged to the dock to record sound test
dock/all-poweroff-audio-microphone-plug-detection	Microphone recognized when plugged to the dock test
dock/all-poweroff-audio-playback-headphones	Headphones output test
dock/all-poweroff-audio-speaker-headphone-plug-detection	Headphones recognized when plugged to the dock test
dock/all-poweroff-monitor-multi-head-audio-playback	Multiple monitor audio test
dock/all-reboot-audio-alsa-record-playback-external	External microphone plugged to the dock to record sound test
dock/all-reboot-audio-microphone-plug-detection	Microphone recognized when plugged to the dock test
dock/all-reboot-audio-playback-headphones	Headphones output test
dock/all-reboot-audio-speaker-headphone-plug-detection	Headphones recognized when plugged to the dock test
dock/all-reboot-monitor-multi-head-audio-playback	Multiple monitor audio test
dock/all-suspend-audio-alsa-record-playback-external	External microphone plugged to the dock to record sound test
dock/all-suspend-audio-microphone-plug-detection	Microphone recognized when plugged to the dock test
dock/all-suspend-audio-playback-headphones	Headphones output test
dock/all-suspend-audio-speaker-headphone-plug-detection	Headphones recognized when plugged to the dock test
dock/all-suspend-monitor-multi-head-audio-playback	Multiple monitor audio test

3.1.2. Docking station display tests

Multi-monitors should be supported following the specifications of the docking station and DUT. The amount of monitors and which ports are going to be used is not specified, it depends on the hardware limitation of the docking station and DUT.

The following test units are covered in this category:

Test unit ID	Summary
dock/all-hotplug-monitor-multi-head	Dual monitors test while docked
dock/all-init-monitor-multi-head	Dual monitors test while docked
dock/all-poweroff-monitor-multi-head	Dual monitors test while docked
dock/all-reboot-monitor-multi-head	Dual monitors test while docked
dock/all-suspend-monitor-multi-head	Dual monitors test while docked

3.1.3. Docking station network tests

- Ethernet (RJ-45 Network Jack). Connections are tested for functionality, but not for performance.

The following test units are covered in this category:

Test unit ID	Summary
dock/all-hotplug-networking-gateway-ping	Ping test using dock's Ethernet connectivity
dock/all-hotplug-networking-ntp	NTP sync test using dock's Ethernet connectivity
dock/all-init-networking-gateway-ping	Ping test using dock's Ethernet connectivity
dock/all-init-networking-ntp	NTP sync test using dock's Ethernet connectivity
dock/all-poweroff-networking-gateway-ping	Ping test using dock's Ethernet connectivity
dock/all-poweroff-networking-ntp	NTP sync test using dock's Ethernet connectivity
dock/all-reboot-networking-gateway-ping	Ping test using dock's Ethernet connectivity
dock/all-reboot-networking-ntp	NTP sync test using dock's Ethernet connectivity
dock/all-suspend-networking-gateway-ping	Ping test using dock's Ethernet connectivity
dock/all-suspend-networking-ntp	NTP sync test using dock's Ethernet connectivity

3.1.4. Docking station tests

The following test units are covered in this category:

Test unit ID	Summary
dock/all-hotplug-thunderbolt3-storage-manual	Thunderbolt3 storage insertion + read/write + removal
dock/all-init-thunderbolt3-storage-manual	Thunderbolt3 storage insertion + read/write + removal
dock/all-poweroff-thunderbolt3-storage-manual	Thunderbolt3 storage insertion + read/write + removal
dock/all-reboot-thunderbolt3-storage-manual	Thunderbolt3 storage insertion + read/write + removal
dock/all-suspend-thunderbolt3-storage-manual	Thunderbolt3 storage insertion + read/write + removal

3.1.5. Docking station usb tests

USB controllers are tested using storage devices in all available USB ports.

- USB 2.0
- USB 3.0 SuperSpeed mode

USB 3.1 (Type C)

USB Type C (USB3.1) are tested using various adapters/peripherals , as the new USB Type C interface supports more types of devices (i.e. Video, Storage, etc). The following adapters/peripherals should work(Video is not necessary).

- Storage devices

The following test units are covered in this category:

Test unit ID	Summary
dock/all-hotplug-usb-c/insert	Verify the correct detection of a USB 3 storage device ins
dock/all-hotplug-usb-c/remove	Check the system's detection of USB 3 storage device rem
dock/all-hotplug-usb-c/storage-automated	Automatically test USB-C storage functionality after the u
dock/all-hotplug-usb3-insert	USB3 drive insertion test
dock/all-hotplug-usb3-remove	USB3 drive removal test
dock/all-hotplug-usb3-storage-automated	USB3 drive storage test
dock/all-init-usb-c/insert	Verify the correct detection of a USB 3 storage device ins
dock/all-init-usb-c/remove	Check the system's detection of USB 3 storage device rem
dock/all-init-usb-c/storage-automated	Automatically test USB-C storage functionality after the u
dock/all-init-usb3-insert	USB3 drive insertion test
dock/all-init-usb3-remove	USB3 drive removal test
dock/all-init-usb3-storage-automated	USB3 drive storage test
dock/all-poweroff-usb-c/insert	Verify the correct detection of a USB 3 storage device ins
dock/all-poweroff-usb-c/remove	Check the system's detection of USB 3 storage device rem
dock/all-poweroff-usb-c/storage-automated	Automatically test USB-C storage functionality after the u
dock/all-poweroff-usb3-insert	USB3 drive insertion test
dock/all-poweroff-usb3-remove	USB3 drive removal test
dock/all-poweroff-usb3-storage-automated	USB3 drive storage test

Table 1 – continued from previous page

Test unit ID	Summary
dock/all-reboot-usb-c/insert	Verify the correct detection of a USB 3 storage device ins
dock/all-reboot-usb-c/remove	Check the system's detection of USB 3 storage device rem
dock/all-reboot-usb-c/storage-automated	Automatically test USB-C storage functionality after the u
dock/all-reboot-usb3-insert	USB3 drive insertion test
dock/all-reboot-usb3-remove	USB3 drive removal test
dock/all-reboot-usb3-storage-automated	USB3 drive storage test
dock/all-suspend-usb-c/insert	Verify the correct detection of a USB 3 storage device ins
dock/all-suspend-usb-c/remove	Check the system's detection of USB 3 storage device rem
dock/all-suspend-usb-c/storage-automated	Automatically test USB-C storage functionality after the u
dock/all-suspend-usb3-insert	USB3 drive insertion test
dock/all-suspend-usb3-remove	USB3 drive removal test
dock/all-suspend-usb3-storage-automated	USB3 drive storage test

3.2. Non-blocking

3.2.1. Docking station tests

The following test units are covered in this category:

Test unit ID	Summary
dock/all-hotplug	Verify the device functionality after hotplug actions with the docking station.
dock/all-init	Prepare all I/O ports on the dock by connecting all devices it supports.
dock/all-poweroff	Test device functionality after powering off and on.
dock/all-reboot	<missing summary>
dock/all-suspend	Test the system's functionality after suspend and resume.

3.3. Manifest Entries

The following manifest entries are required for certification:

Manifest entry	Summary
has_audio_capture	Audio capture: Machine can record sound. (For example, a desktop PC probably requires a microphone connected to it)
has_audio_playback	Audio playback: Machine can emit sound. (For example, a desktop PC probably requires speakers connected to it)
has_ethernet_adapter	An Ethernet Port
has_thunderbolt	Thunderbolt Support
has_thunderbolt3	Thunderbolt 3 Support
has_usbc_data	USB Type-C Data (e.g. HID, Drives, Ethernet)