

Understanding HP-UX 11i v2 and v3 USB ioscan



Sample USB Controller and Device *ioscan*

Sample Mass Storage SCSI *ioscan* legacy view

Sample Mass Storage SCSI *ioscan -N*, agile view (11iv3 only)

USB H/W Path Definition

vMedia Devices

USB Attach/Detach

Systems with no USB Hardware

Understanding the HP-UX USB *ioscan*

Introduction

This document describes the *ioscan* output for the HP-UX 11iv2 and 11iv3 updated USB driver. Please refer to the following document for support and update notes for this USB driver, "Update to USB Driver Support on HP-UX 11iv3", December 15, 2008.

Sample USB Controller and Device *ioscan*

The following sample is a section of a system *ioscan* output showing the discovered USB controllers and devices. Notice that there are 3 NEC USB controllers. The first 2 USB controllers are OHCI (Open Host Controller Interface) controllers for low and full speed USB 1.0 and 1.1 devices. The 3rd USB controller is an EHCI (Enhanced Host Controller Interface) controller for high speed USB 2.0 devices. The first OHCI USB controller has a keyboard, a mouse, and a mass storage device attached. The second OHCI USB controller has no devices attached. The third USB controller, EHCI, has 2 mass storage devices attached.

```
Class      I  H/W Path      Driver      S/W State H/W Type Description
=====
...
usb        0  0/0/2/0       hcd          CLAIMED  INTERFACE NEC OHCI Controller
usbcomp    0  0/0/2/0.1     usbcomposite CLAIMED  DEVICE     USB Composite Device
usbhid     0  0/0/2/0.1.0   hid          CLAIMED  DEVICE     USB HID Kbd(0)
usbhid     1  0/0/2/0.1.1   hid          CLAIMED  DEVICE     USB HID Pointer(1)
usbms      0  0/0/2/0.1.2   ms           CLAIMED  DEVICE     USB Mass Storage [0]
usb        1  0/0/2/1       hcd          CLAIMED  INTERFACE NEC OHCI Controller
usb        2  0/0/2/2       ehci         CLAIMED  INTERFACE NEC EHCI Controller
usbms      2  0/0/2/2.2     ms           CLAIMED  DEVICE     USB Mass Storage [1]
usbms      3  0/0/2/2.3     ms           CLAIMED  DEVICE     USB Mass Storage [2]
...
```

Sample Mass Storage SCSI *ioscan* legacy view

The following sample is a section of *ioscan* output that shows the SCSI interface nodes corresponding to the USB mass storage devices shown above. This view is for 11iv2, and represents the legacy view for 11iv3. Each of the USB mass storage devices has an associated SCSI *sdisk* node. These nodes appear under the *mass_storage* driver, and are claimed by a virtual SCSI bus (VIRTBUS). The target number of the mass storage *sdisk* can be used to refer back to the specific USB mass storage device displayed under the USB controllers.

```
Class      I  H/W Path      Driver      S/W State H/W Type Description
=====
...
usbmsvbus  0  255/0         mass_storage CLAIMED  VIRTBUS   USB Mass Storage
ext_bus    1  255/0/0       usb_ms_scsi CLAIMED  INTERFACE USB Mass Storage SCSI
target     4  255/0/0.0     tgt          CLAIMED  DEVICE
disk       7  255/0/0.0.0   sdisk        CLAIMED  DEVICE     HP
target     2  255/0/0.1     tgt          CLAIMED  DEVICE
disk       5  255/0/0.1.0   sdisk        CLAIMED  DEVICE     hp          DriveKey II
target     3  255/0/0.2     tgt          CLAIMED  DEVICE
disk       6  255/0/0.2.0   sdisk        CLAIMED  DEVICE     HP          DVD Writer 630c
...
```

In this example,

"USB Mass Storage [0]" corresponds to SCSI target 0 with hwpath "255/0/0.0"
"USB Mass Storage [1]" corresponds to SCSI target 1 with hwpath "255/0/0.1"
"USB Mass Storage [2]" corresponds to SCSI target 2 with hwpath "255/0/0.2"

And more generally:

"USB Mass Storage [N]" corresponds to SCSI target N with hwpath "255/0/0.N"

Sample Mass Storage SCSI "ioscan -N", agile view

The following sample is a section of an "ioscan -N" output that shows the ESCSI interface nodes corresponding to a single USB mass storage device. This view is the I/O agile view, introduced in lliv3. The USB mass storage device node appears under the mass_storage driver claimed by a virtual SCSI bus (VIRTBUS), with the interface driver, usb_ms_scsi, a virtual controller, as was seen in the legacy view. The TARGET path and LUN path nodes appear under the usb_ms_scsi driver for this device. These nodes have no device special filenames(DSFs) associated with them, but refer to the persistent DSF, as seen in the LUN path description, "LUN path for disk10". The disk10 node is shown under the Escsi virtual root as disk, instance 10, accessed with the persistent DSF, /dev/disk/disk10.

```
usbmsvbus 0 64000/0x0      mass_storage CLAIMED VIRTBUS  USB Mass Storage
escsi_ctlr 1 64000/0x0/0x0  usb_ms_scsi  CLAIMED INTERFACE USB Mass Storage Virt Ctrl

tgtpath    3 64000/0x0/0x0.0x0  estp  CLAIMED  TGT_PATH  usb target served by usb_ms_scsi
driver, target port id 0x0

lunpath    3 64000/0x0/0x0.0x0.0x0  eslpt CLAIMED  LUN_PATH  LUN path for disk10

...

esvroot    0 64000/0xfa00          esvroot    CLAIMED  VIRTBUS    Escsi virtual root
disk       4 64000/0xfa00/0x0    esdisk     CLAIMED  DEVICE     HP          DG036A8B5B
disk       5 64000/0xfa00/0x1    esdisk     CLAIMED  DEVICE     HP          DG072A8B54
disk       10 64000/0xfa00/0x9     esdisk     CLAIMED  DEVICE     HP
```

USB H/W Path Definition

The generic representation of the USB H/W Path in the USB controller and device section of *ioscan* is:

```
/0/0/PCI#/USB_ctl_#.port[.interface]
```

where

- PCI# is the PCI bus instance
- USB_ctl_# is the USB controller instance number
- port is the USB port number
- interface is the device interface # (used for composite devices)

vMedia Devices

vMedia attached devices are remote USB devices attached to a Windows PC, typically a laptop. A network connection between the HP-UX server and Windows laptop make the laptop USB devices visible to HP-UX as virtual USB devices at the server. These USB devices are presented to HP-UX as distinct USB device interfaces of a composite device. The sample USB Controller and Device *ioscan* output shows vMedia under the first OHCI controller. This composite device consists of a keyboard, a mouse and a

DVD. The DVD is a virtual connect mass storage USB device, and its associated SCSI interface *sdisk* node is at SCSI target 0.

USB Attach/Detach

USB devices can be dynamically attached and detached. Attaching/detaching occurs when the USB device is physically plugged in/out of the USB port. As USB devices are attached, the USB device will automatically appear in the *ioscan*, and when they are detached, the device node will disappear from the *ioscan*. When a USB Mass Storage device is detached, both the USB Mass Storage device node and the associated SCSI target *sdisk* node will disappear from the *ioscan*.

WARNING: do not detach a USB mass storage device that is currently mounted. Unmount, then detach.

From the previous sample *ioscan*, after detaching the Drive Key II device, for example, the *ioscan* would show both the "USB Mass Storage [1]" and "USB Mass Storage SCSI" target 1 nodes destroyed:

```
Class      I  H/W Path      Driver      S/W State H/W Type Description
=====
...
usb        0  0/0/2/0       hcd          CLAIMED   INTERFACE NEC OHCI Controller
usbcomp    0  0/0/2/0.1     usbcomposite CLAIMED   DEVICE     USB Composite Device
usbhid     0  0/0/2/0.1.0   hid          CLAIMED   DEVICE     USB HID Kbd(0)
usbhid     1  0/0/2/0.1.1   hid          CLAIMED   DEVICE     USB HID Pointer(1)
usbms      0  0/0/2/0.1.2   ms           CLAIMED   DEVICE     USB Mass Storage [0]
usb        1  0/0/2/1       hcd          CLAIMED   INTERFACE NEC OHCI Controller
usb        2  0/0/2/2       ehci         CLAIMED   INTERFACE NEC EHCI Controller
usbms      3  0/0/2/2.3     ms           CLAIMED   DEVICE     USB Mass Storage [2]
...
usbmsvbus  0  255/0         mass_storage CLAIMED   VIRTBUS   USB Mass Storage
ext_bus    1  255/0/0       usb_ms_scsi CLAIMED   INTERFACE USB Mass Storage SCSI
target     4  255/0/0.0     tgt          CLAIMED   DEVICE
disk       7  255/0/0.0.0   sdisk        CLAIMED   DEVICE     HP
target     3  255/0/0.2     tgt          CLAIMED   DEVICE
disk       6  255/0/0.2.0   sdisk        CLAIMED   DEVICE     HP          DVD Writer 630c
```

Systems with no USB hardware

In the case that the system has no USB hardware, the VIRTBUS interface nodes will still be present:

```
usbmsvbus  0  255/0         mass_storage CLAIMED   VIRTBUS   USB Mass Storage
ext_bus    3  255/0/0       usb_ms_scsi CLAIMED   INTERFACE USB Mass Storage SCSI
```

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