

NAME

cyapa - Cypress APA trackpad with I2C interface driver

SYNOPSIS

To compile this driver into the kernel, place the following lines into the kernel configuration file:

```
device cyapa
device ig4
device iicbus
```

Alternatively, to load the driver as a module at boot time, place the following line in loader.conf(5):

```
cyapa_load="YES"
ig4_load="YES"
```

On many Chromebook models this driver can be automatically configured with the help of the chromebook_platform(4) driver. Alternatively, the

cyapa driver can be manually configured in */boot/device.hints*:

```
hint.cyapa.0.at="iicbus0"
hint.cyapa.0.addr="0xCE"
hint.cyapa.1.at="iicbus1"
hint.cyapa.1.addr="0xCE"
```

DESCRIPTION

The **cyapa** driver provides support for the Cypress APA trackpad. It emulates the IntelliMouse PS/2 protocol. It supports basic mouse ioctls, so that moused(8) is supported properly.

Trackpad layout

```

      2/3          1/3
+-----+-----+
|           | Middle |
|           | Button |
|  Left    |         |
| Button   +-----+
|           | Right  |
|           | Button |
+-----+.....|
| Thumb/Button Area | 15%
+-----+-----+
```

Trackpad features*Two finger scrolling*

Use two fingers for Z axis scrolling.

Button down/second finger

While one finger clicks and holds down the touchpad, the second finger can be used to move the mouse cursor. This can be useful for drawing or selecting text.

Thumb/Button area

The lower 15% of the trackpad will not affect the mouse cursor position. This allows for high precision clicking, by controlling the cursor with the index finger and pushing/holding the pad down with the thumb.

Trackpad button

Push physical button. The left two thirds of the pad issues a LEFT button event. The upper right corner issues a MIDDLE button event. The lower right corner issues a RIGHT button. Optionally, tap to click can be enabled (see below).

On a system using `device.hints(5)`, these values are configurable for **cyapa**:

hint.cyapa.%d.at target `iicbus(4)`.

hint.cyapa.%d.addr **cyapa** i2c address on the `iicbus(4)`.

SYSCTL VARIABLES

These `sysctl(8)` variables are available:

debug.cyapa_idle_freq

Scan frequency in idle mode, the default is 1.

debug.cyapa_slow_freq

Scan frequency in slow mode, the default is 20.

debug.cyapa_norm_freq

Scan frequency in normal mode, the default is 100.

debug.cyapa_minpressure

Minimum pressure to detect a finger, the default is 12.

debug.cyapa_enable_tapclick

Controls tap to click. Possible values:

- 0 Tap to click is disabled. This is the default value.
- 1 Tap to click always generates a left mouse button event.
- 2 Tap to click generates left mouse button event if the left 2/3rds of the pad are tapped and a right mouse button event otherwise.
- 3 Tap to click generates mouse button events as if the physical button was pressed (see *DESCRIPTION* above).

debug.cyapa_tapclick_min_ticks

Minimum tap duration in ticks to create a click, the default is 1.

debug.cyapa_tapclick_max_ticks

Maximum tap duration in ticks to create a click, the default is 8.

debug.cyapa_move_min_ticks

Minimum ticks before cursor movement occurs, the default is 4.

debug.cyapa_scroll_wait_ticks

Ticks to wait before starting to scroll, the default is 0.

debug.cyapa_scroll_stick_ticks

Ticks while preventing cursor movement on single finger after scroll, the default is 15.

debug.cyapa_thumbarea_percent

Size of bottom thumb area in percent, the default is 15.

debug.cyapa_debug

Setting this to a non-zero value enables debug output to console and syslog, the default is 0.

debug.cyapa_reset

Setting this to a non-zero value reinitializes the device. The sysctl resets to zero immediately.

FILES

cyapa creates */dev/cyapa0*, which presents the mouse as an *IntelliMouse PS/2* device. It supports moused(8) levels 0 through 2, level 1 is used by default.

EXAMPLES

To use **cyapa** with `moused(8)`, add the following lines to the `rc.conf(5)` file:

```
moused_enable="YES"
moused_port="/dev/cyapa0"
```

If vertical scrolling is not desired, add

```
moused_flags="-10"
```

to `rc.conf(5)`.

Enable tap to click for the left and the right mouse button and disable the thumb area by adding these lines to the `sysctl.conf(5)` file:

```
debug.cyapa_thumbarea_percent=0
debug.cyapa_enable_tapclick=2
```

SEE ALSO

`chromebook_platform(4)`, `ig4(4)`, `iicbus(4)`, `sysmouse(4)`, `moused(8)`

AUTHORS

The original **cyapa** driver was written for DragonFly by Matthew Dillon.

It has been ported, modified, and enhanced for FreeBSD by Michael Gmelin <freebsd@grem.de>.

This manual page was written by Michael Gmelin <freebsd@grem.de>.

BUGS

The **cyapa** driver detects the device from the I2C address. This might have unforeseen consequences if the initialization sequence is sent to an unknown device at that address.