HID++ 2.0 Collection Usages

For the host to recognize a device as a HID++ device certain collections and reports must be present. The usage page, usage, and number of these reports depend on device capabilities and whether the device uses the legacy or the modern scheme.

Modern scheme

The modern scheme uses a collection usage page of **0xFF43** and contains two, four, or six input and output reports corresponding to the input/output directions of the various request types.

The collection usage value is variable and encodes the list of supported request types in its most-significant byte (referred to as 0x*NN* below). Doing so simplifies the application implementation on certain operating systems because it allows the app to obtain that list from whichever report it enumerates first.

0x*NN* is a bitmask byte value comprised of the following bits:

> bit 0 (0x01): short
> bit 1 (0x02): long
> bit 2 (0x04): very long

For example, a device that supports all three types would use 0x*NN* = 0x07 and provide reports 0x10 (usage 0x0701), 0x11 (usage 0x0702), and 0x12 (usage 0x0704). A device that only supports short and long requests would use 0x*NN* = 0x03 and only provide reports 0x10 (usage 0x0301) and 0x11 (usage 0x0302).

Collection usage page Collection usage	Usage	Report ID	Size (incl. report ID)	Direction
0xFF43 (Vendor-defined) 0x*NN*01	0x0001 (Short)	0x10 (16)	7 bytes	Output
0xFF43 (Vendor-defined) 0x*NN*01	0x0001 (Short)	0x10 (16)	7 bytes	Input
0xFF43 (Vendor-defined) 0x*NN*02	0x0002 (Long)	0x11 (17)	20 bytes	Output
0xFF43 (Vendor-defined) 0x*NN*02	0x0002 (Long)	0x11 (17)	20 bytes	Input
0xFF43 (Vendor-defined) 0x*NN*04	0x0004 (Very long)	0x12 (18)	64 bytes	Output
0xFF43 (Vendor-defined) 0x*NN*04	0x0004 (Very long)	0x12 (18)	64 bytes	Input

Legacy scheme

The legacy scheme uses a collection usage page of **0xFF00** and contains four input and output reports corresponding to the input/output directions of the short and long request types:

Collection usage page Collection usage	Usage	Report ID	Size (incl. report ID)	Direction
0xFF00 (Vendor-defined) 0x0001	0x0001 (Short)	0x10 (16)	7 bytes	Output
0xFF00 (Vendor-defined) 0x0001	0x0001 (Short)	0x10 (16)	7 bytes	Input
0xFF00 (Vendor-defined) 0x0002	0x0002 (Long)	0x11 (17)	20 bytes	Output
0xFF00 (Vendor-defined) 0x0002	0x0002 (Long)	0x11 (17)	20 bytes	Input

Example

The following is what (part of) a HID++ report descriptor using the modern scheme might look like:

```
// HID++ usage page
0x06, 0x43, 0xFF,  // Usage Page (Vendor Defined 0xFF43)

// HID++ short reports
0x0A, 0x01, 0x07,  // Usage (0x0701)
0xA1, 0x01,        // Collection (Application)
0x85, 0x10,        //   Report ID (16)
0x75, 0x08,        //   Report Size (8)
0x95, 0x06,        //   Report Count (6)
0x15, 0x00,        //   Logical Minimum (0)
0x26, 0xFF, 0x00,  //   Logical Maximum (255)
0x09, 0x01,        //   Usage (0x01)
0x81, 0x00,        //   Input (Data, Array)
0x09, 0x01,        //   Usage (0x01)
0x91, 0x00,        //   Output (Data, Array)
0xC0,              // End Collection

// HID++ long reports
0x0A, 0x02, 0x07,  // Usage (0x0702)
0xA1, 0x01,        // Collection (Application)
0x85, 0x11,        //   Report ID (17)
0x75, 0x08,        //   Report Size (8)
0x95, 0x13,        //   Report Count (19)
0x15, 0x00,        //   Logical Minimum (0)
0x26, 0xFF, 0x00,  //   Logical Maximum (255)
0x09, 0x02,        //   Usage (0x02)
0x81, 0x00,        //   Input (Data, Array)
0x09, 0x02,        //   Usage (0x02)
0x91, 0x00,        //   Output (Data, Array)
0xC0,              // End Collection

// HID++ very long reports
0x0A, 0x04, 0x07,  // Usage (0x0704)
0xA1, 0x01,        // Collection (Application)
0x85, 0x12,        //   Report ID (18)
0x75, 0x08,        //   Report Size (8)
0x95, 0x3F,        //   Report Count (63)
0x15, 0x00,        //   Logical Minimum (0)
0x26, 0xFF, 0x00,  //   Logical Maximum (255)
0x09, 0x04,        //   Usage (0x04)
0x81, 0x00,        //   Input (Data, Array)
0x09, 0x04,        //   Usage (0x04)
0x91, 0x00,        //   Output (Data, Array)
0xC0,              // End Collection
```

The first section sets the usage page, which is identical for all reports.

The following three sections each define a pair of input and output reports.