USB PD ENGINEERING CHANGE NOTICE

Title: Discover Identity VDO
Applied to: USB Power Delivery Revision 2.0, Version 1.0, 11 August 2014

Brief description of the functional changes:
Provide the Product VDO as the first VDO for every product type. Currently the Cable and Undefined types are missing this field. Remove the Unassigned VID and require a valid USB-IF assigned VID in all cases.

Benefits as a result of the changes:
Will be possible to identify any given cable or device in a consistent way.

An assessment of the impact to the existing revision and systems that currently conform to the USB specification:
Existing implementations will need to ensure that they provide this additional information since VDOs are identified by order.

An analysis of the hardware implications:
May require a small amount of additional memory for the 32 bit VDO.

An analysis of the software implications:
Requires changes to provide the Product VDO.

An analysis of the compliance testing implications:
Need to test that a Product VDO is supplied in response to a Discover Identity request.

USB PD ENGINEERING CHANGE NOTICE

Actual Change

(a). Section 6.4.4.2.1, Table 6-21, Page 168

From Text:

Parameter	Value	Description
PD SID	0xFF00	Standard ID allocated to this specification.
VID Unassigned	0x0000	Manufacturer does not have a USB-IF assigned Vendor ID e.g. because they do not manufacture USB communications capable devices. Shall only be returned in a Structured VDM ***Discover Identity*** ACK Command response as part of the ID Header (see Section 6.4.4.3.1.1).

To Text:

Parameter	Value	Description
PD SID	0xFF00	Standard ID allocated to this specification.

(b). Section 6.4.4.3.1, Page 170

From Text:

The ***Discover Identity*** Command sent back by the Responder contains an ID Header, a Cert Stat VDO and some Type specific VDOs which depend on the Product Type (see Figure 6-5). This specification defines the following Type specific VDOs:

- Product VDO (see Section 6.4.4.3.1.8)
- Cable VDO (see Section 6.4.4.3.1.9).
- Alternate Mode Adapter VDO (see Section 6.4.4.3.1.10)

Figure 6-5 Discover Identity Command response

To Text:

The ***Discover Identity*** Command sent back by the Responder contains an ID Header, a Cert Stat VDO, a Product VDO and some specific Product Type VDOs (see Figure). This specification defines the following specific Product Type VDOs:

- Cable VDO (see Section 6.4.4.3.1.9).
- Alternate Mode Adapter VDO (see Section 6.4.4.3.1.10)

No VDOs other than those defined in this specification shall be sent as part of the ***Discover Identity*** Command response. Where there is no Product Type VDO defined for a specific Product Type, no VDOs shall be sent as part of the ***Discover Identity*** Command response. Any additional VDOs received by the responder shall be ignored.

Figure 6-5 Discover Identity Command response

Header No. of Data Objects = 4-7[1]	VDM Header	ID Header	Cert Stat VDO	Product VDO	0..3[2] Product Type VDO(s)

[1] Only Data objects defined in this specification can be sent as part of the Discover Identity Command.
[2] The following sections define the number and content of the VDOs for each Product Type.

(c). Section 6.4.4.3.1.4, Page 171

From Text:

The Product Type field indicates the type of Product, whether a VDO will be returned and if so the type of VDO to be returned. Table 6 24 defines the VDOs which shall be returned.

Table 6-24 Product Types

Product Type	Description	VDO	Reference
Undefined	Shall be used where no other Product Type value is appropriate.		
Hub	Shall be used when the Product is a USB Hub.	Product VDO	6.4.4.3.1.8
Peripheral	Shall be used when the Product is a USB Device other than a USB Hub.	Product VDO	6.4.4.3.1.8
Active Cable	Shall be used when the Product is a cable that incorporates signal conditioning circuits.	Cable VDO	6.4.4.3.1.9
Passive Cable	Shall be used when the Product is a cable that does not incorporate signal conditioning circuits.	Cable VDO	6.4.4.3.1.9
Alternate Mode Adapter	Shall be used when the Product is a USB Device that supports one or more Alternate Modes.	Product VDO AMA VDO	6.4.4.3.1.10

To Text:

The Product Type field indicates the type of Product, whether a VDO will be returned and if so the type of VDO to be returned. Table 6 24 defines the Product Type VDOs which shall be returned.

Table 6-24 Product Types

Product Type	Description	Product Type VDO	Reference
Undefined	Shall be used where no other Product Type value is appropriate.	None	
Hub	Shall be used when the Product is a USB Hub.	None	
Peripheral	Shall be used when the Product is a USB Device other than a USB Hub.	None	
Active Cable	Shall be used when the Product is a cable that incorporates signal conditioning circuits.	Cable VDO	6.4.4.3.1.9
Passive Cable	Shall be used when the Product is a cable that does not incorporate signal conditioning circuits.	Cable VDO	6.4.4.3.1.9
Alternate Mode Adapter	Shall be used when the Product is a USB Device that supports one or more Alternate Modes.	AMA VDO	6.4.4.3.1.10

(d) Section 6.4.4.3.1.6, Page 171

From Text:

Manufacturers who have a Vendor ID assigned by USB-IF shall set the Vendor ID field to this value. For USB Devices or Hubs which support USB communications the Vendor ID field shall be identical to the Vendor ID field defined in the product's USB Device Descriptor (see [USB2.0] and [USB3.0]).

Manufacturers who do not have a Vendor ID assigned by USB-IF shall set the Vendor ID field to ***Vendor ID Unassigned***.

To Text:

Manufacturers shall set the Vendor ID field to the value assigned by USB-IF. For USB Devices or Hubs which support USB communications the Vendor ID field shall be identical to the Vendor ID field defined in the product's USB Device Descriptor (see [USB2.0] and [USB3.0]).

(e). Section 6.4.4.3.1.8, Page 172

From Text:

The Product VDO shall be returned when the Product Type is Hub, Peripheral or Alternate Mode Adapter. The Product VDO contains identity information relating to the product. The fields in the Product VDO shall be as defined in Table.

Table 6-26 Product VDO

Bit(s)	Description	Reference
B31..16	16-bit unsigned integer. USB Product ID	***[USB2.0]/[USB3.1]***
B15..0	16-bit unsigned integer. bcdDevice	***[USB2.0]/[USB3.1]***

Manufacturers should set the USB Product ID field to a unique value identifying the product and should set the bcdDevice field to a version number relevant to the release version of the product. For USB Devices or Hubs which support USB communications the Product ID and bcdDevice fields shall be identical to the Product ID and bcdDevice fields defined in the product's USB Device Descriptor (see ***[USB2.0]*** and ***[USB3.1]***).

When the Vendor ID field in the ID Header is set to ***Vendor ID Unassigned*** the Product VDO shall not be sent.

To Text:

The Product VDO contains identity information relating to the product. The fields in the Product VDO shall be as defined in Table.

Table 6-26 Product VDO

Bit(s)	Description	Reference
B31..16	16-bit unsigned integer. USB Product ID	***[USB2.0]/[USB3.1]***
B15..0	16-bit unsigned integer. bcdDevice	***[USB2.0]/[USB3.1]***

Manufacturers should set the USB Product ID field to a unique value identifying the product and should set the bcdDevice field to a version number relevant to the release version of the product. For USB Devices or Hubs which support USB communications the Product ID and bcdDevice fields shall be identical to the Product ID and bcdDevice fields defined in the product's USB Device Descriptor (see ***[USB2.0]*** and ***[USB3.1]***).

(f) Section G.1.2, Page 524

From Text:

G.1.2 Discover Identity Command response – Active Cable

Table G.2 shows the contents of the key fields in the Message Header and VDM header for a Responder returning VDOs in response to a ***Discover SVIDs*** Command request. In this illustration, the responder is an active Gen2 cable which supports Modal Operation.

Table G-2 Discover Identity Command response from Active Cable Responder Example

Bit(s)	Field	Value
Message Header		
15	Reserved	0
14..12	***Number of Data Objects***	4 (VDM Header + ID Header + Cer Stat VDO + Cable VDO)
11..9	***MessageID***	0..7
8	***Port Power Role***	0 or 1
7..6	***Specification Revision***	01b
5..4	Reserved	0
3..0	***Message Type***	1111b (Vendor Defined Message)
VDM Header		
B31..16	Standard or Vendor ID (SVID)	0xFF00 (***PD SID***)
B15	VDM Type	1 (Structured VDM)
B14..13	Structured VDM Version	00b (Version 1.0)
B12..11	Reserved	00b
B10..8	Object Position	000b
B7..6	Command Type	01b (Responder ACK)
B5	Reserved	0
B4..0	Command	2 (***Discover Identity***)
ID Header		
B31	Data Capable as USB Host	0 (not data capable as a Host)
B30	Data Capable as a USB Device	0 (not data capable as a Device)
B29..27	Product Type	100b (Active Cable)
B26	Modal Operation Supported	1 (supports Modes)
B25..16	Reserved. Shall be set to zero.	0
B15..0	16-bit unsigned integer. USB Vendor ID	USB-IF assigned VID for this cable vendor
Cert Stat VDO		
B31..20	Reserved, shall be set to zero.	0
B19..0	20-bit unsigned integer	USB-IF assigned TID for this cable
Cable VDO		
B31..28	Cable HW Version	Cable HW version number (vendor defined)
B27..24	Cable Firmware Version	Cable FW version number (vendor defined)
B23..20	Reserved	0
B19..18	Type-C to Type-A/B/C	10b (Type-C)
B17	Type-C to Plug/Receptacle	0 (Plug)
B16..13	Cable Latency	0001b (<10ns (~1m))
B12..11	Cable Termination Type	11b (Both ends Active, VCONN required)

Bit(s)	Field	Value
B10	SSTX1 Directionality Support	0 (Fixed)
B9	SSTX2 Directionality Support	0 (Fixed)
B8	SSRX1 Directionality Support	0 (Fixed)
B7	SSRX2 Directionality Support	0 (Fixed)
B6..5	V_{BUS} Current Handling Capability	01b (3A)
B4	V_{BUS} through cable	1 (Yes)
B3	SOP" controller present?	1 (SOP" controller present)
B2..0	USB Superspeed Signaling Support	010b (***[USB3.1]*** Gen1 and Gen2)

To Text:

G.1.2 Discover Identity Command response – Active Cable

Table G.2 shows the contents of the key fields in the Message Header and VDM header for a Responder returning VDOs in response to a ***Discover SVIDs*** Command request. In this illustration, the responder is an active Gen2 cable which supports Modal Operation.

Table G-2 Discover Identity Command response from Active Cable Responder Example

Bit(s)	Field	Value
Message Header		
15	Reserved	0
14..12	***Number of Data Objects***	5 (VDM Header + ID Header + Cer Stat VDO + Product VDO + Cable VDO)
11..9	***MessageID***	0..7
8	***Cable Plug***	1
7..6	***Specification Revision***	01b
5..4	Reserved	0
3..0	***Message Type***	1111b (Vendor Defined Message)
VDM Header		
B31..16	Standard or Vendor ID (SVID)	0xFF00 (***PD SID***)
B15	VDM Type	1 (Structured VDM)
B14..13	Structured VDM Version	00b (Version 1.0)
B12..11	Reserved	00b
B10..8	Object Position	000b
B7..6	Command Type	01b (Responder ACK)
B5	Reserved	0
B4..0	Command	2 (***Discover Identity***)
ID Header		
B31	Data Capable as USB Host	0 (not data capable as a Host)
B30	Data Capable as a USB Device	0 (not data capable as a Device)
B29..27	Product Type	100b (Active Cable)
B26	Modal Operation Supported	1 (supports Modes)

Bit(s)	Field	Value
B25..16	Reserved. Shall be set to zero.	0
B15..0	16-bit unsigned integer. USB Vendor ID	USB-IF assigned VID for this cable vendor
Cert Stat VDO		
B31..20	Reserved, shall be set to zero.	0
B19..0	20-bit unsigned integer	USB-IF assigned TID for this cable
Product VDO		
B31..16	16-bit unsigned integer. USB Product ID	Product ID assigned by the cable vendor
B15..0	16-bit unsigned integer. bcdDevice	Device version assigned by the cable vendor
Cable VDO (returned for Product Type "Active Cable")		
B31..28	Cable HW Version	Cable HW version number (vendor defined)
B27..24	Cable Firmware Version	Cable FW version number (vendor defined)
B23..20	Reserved	0
B19..18	Type-C to Type-A/B/C	10b (Type-C)
B17	Type-C to Plug/Receptacle	0 (Plug)
B16..13	Cable Latency	0001b (<10ns (~1m))
B12..11	Cable Termination Type	11b (Both ends Active, VCONN required)
B10	SSTX1 Directionality Support	0 (Fixed)
B9	SSTX2 Directionality Support	0 (Fixed)
B8	SSRX1 Directionality Support	0 (Fixed)
B7	SSRX2 Directionality Support	0 (Fixed)
B6..5	V_{BUS} Current Handling Capability	01b (3A)
B4	V_{BUS} through cable	1 (Yes)
B3	SOP" controller present?	1 (SOP" controller present)
B2..0	USB Superspeed Signaling Support	010b (***[USB3.1]*** Gen1 and Gen2)