
PDUSB Status Reporting and Device States

USB PD - Companion Specification

Revision 1.1

January 1, 2026

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Revision 1.1
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Revision History

Revision	Date	Author	Description
1.0	2026-01-08	S. Jackson	Split out from [USB PD].

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1. Glossary and Info

1.1. Conventions

1.1.1. Precedence

If there is a conflict between text, figures, and tables, the precedence is tables, figures, and then text.

1.1.2. Keywords

The following keywords differentiate between the various levels of a requirement and the applicable options.

Table 1. Keywords

Keyword	Definition
May / May Not	Indicates a choice with no implied preference.
Reserved	Indicates bits, bytes, words, fields, and code values that are set aside for future standardization. Their use and interpretation might be specified by future extensions to this specification and are not utilized or adapted by vendor implementation. A Reserved bit, byte, word, or field is set to zero by the sender and is ignored by the receiver. Reserved field values are sent by the sender and are ignored by the receiver.
Shall	Equivalent keywords indicating a mandatory requirement. Designers are mandated to implement all such requirements to ensure interoperability with other compliant devices.
Should	Indicates a flexibility of choice with a preferred alternative; equivalent to the phrase "it is recommended that...".
Valid	Inverse of Invalid indicating either a Packet or Signaling that fall within the defined specification or an Explicit Contract that can be maintained by the Source.

1.2. Numbering

Numbers that are immediately followed by a lowercase "b" (e.g., 01b) are binary values. Numbers that are immediately followed by an uppercase "B" are byte values. Numbers that are immediately followed by a lowercase "h" (e.g., 3Ah) or are preceded by "0x" (e.g., 0xFF00) are hexadecimal values. Numbers that do not contain any letters are decimal values.

1.3. Related Documents

Document references listed in [Table 2](#) are inclusive of all approved and published ECNs and Errata.

Table 2. Document References

Bookmark Reference	Title
[UCSI]	USB-C Connector System Software Interface (UCSI) Specification www.usb.org/documents .
[USB2]	Universal Serial Bus 2.0 Specification, www.usb.org/documents .
[USB3]	Universal Serial Bus 3.2 Specification www.usb.org/documents .
[USB4]	Universal Serial Bus 4 Specification (USB4®), www.usb.org/documents .
[USB-C]	Universal Serial Bus Type-C Cable and Connector Specification, Release 2.4, www.usb.org/documents .
[USB BC]	Universal Serial Bus Battery Charging Specification, Revision 1.2, www.usb.org/documents .
[USB PD]	Universal Serial Bus Power Delivery Specification, www.usb.org/documents .

1.4. Terms and Abbreviations

This section defines terms used throughout this document. For additional terms that pertain to the Universal Serial Bus, see the [USB2], [USB3], [USB-C] and [USB BC] specifications.

Table 3. Terms and Abbreviations

Term	Description
Attach / Attached / Attachment	See [USB PD] for the definition.
Battery	See [USB PD] for the definition.
BCD	Binary-Coded Decimal (BCD). See [USB3] for usage.
BOS	See [USB3] for the definition.
Capabilities	See [USB PD] for the definition.
Command	See [USB PD] for the definition.
Contract	See [USB PD] for the definition.

Term	Description
Consumer	The capability of a PD Port (typically a Device's UFP) to sink power from the power conductor (e.g., VBUS). This corresponds to a [USB-C] Port with Rd asserted on its CC wire.
Consumer/Provider	A Consumer with the additional capability to function as a Provider. This corresponds to a Dual-Role Power Port with Rd asserted on its CC wire.
CRC / Cyclic Redundancy Check	See [USB PD] for the definition.
Data Role	See [USB PD] for the definition.
Data Role Swap	See [USB PD] for the definition.
Device	See [USB PD] for the definition.
Downstream Facing Port / DFP	See [USB PD] for the definition.
Dual-Role Power / DRP	See [USB PD] for the definition.
End of Packet / EOP	See [USB PD] for the definition.
Error Recovery	See [USB PD] for the definition.
Explicit Contract	See [USB PD] for the definition.
Fast Role Swap / FRS	See [USB PD] for the definition.
Hard Reset	See [USB PD] for the definition.
ICCHPF	See [USB2] and [USB3] for the definition.
ICCLPF	See [USB2] and [USB3] for the definition.
Host	See [USB PD] for the definition.
Hub	See [USB PD] for the definition.
Implicit Contract	See [USB PD] for the definition.
Local Policy	See [USB PD] for the definition.
Message	See [USB PD] for the definition.
Message Header	See [USB PD] for the definition.
Mode	See [USB PD] for the definition.
Negotiate / Negotiated / Negotiation	See [USB PD] for the definition.
Packet	See [USB PD] for the definition.
Payload	See [USB PD] for the definition.
PD	See [USB PD] for the definition.
PD Capable	See [USB PD] for the definition.
PDUSB	See [USB PD] for the definition.
PDUSB Device	See [USB PD] for the definition.
PDUSB Host	See [USB PD] for the definition.
PDUSB Hub	See [USB PD] for the definition.
PDUSB Peripheral	See [USB PD] for the definition.
Peripheral	See [USB PD] for the definition.
Policy	See [USB PD] for the definition.
Policy Engine / PE	See [USB PD] for the definition.
Port	See [USB PD] for the definition.
Port Pair	See [USB PD] for the definition.
Port Partner	See [USB PD] for the definition.
Power Delivery Mode	See [USB PD] for the definition.
Power Role	See [USB PD] for the definition.
Power Role Swap	See [USB PD] for the definition.
Provider	A PD Port (typically a USB Host, Hub, or Charger DFP) that can source power over the power conductor (e.g., VBUS). This corresponds to a [USB-C] Port with Rp asserted on its CC wire.
Provider/Consumer	A Provider with the additional capability to act as a Consumer. This corresponds to a Dual-Role Power Port with Rp asserted on its CC wire.

Term	Description
Preamble	See [USB PD] for the definition.
Re-Negotiate / Re-Negotiated / Re-Negotiation	See [USB PD] for the definition.
Request	See [USB PD] for the definition.
Revision	See [USB PD] for the definition.
Signaling	See [USB PD] for the definition.
Sink	See [USB PD] for the definition.
Sink Port	See [USB PD] for the definition.
SOP / Start of Packet	See [USB PD] for the definition.
SOP*	See [USB PD] for the definition.
Source	See [USB PD] for the definition.
Source Port	See [USB PD] for the definition.
State	See [USB PD] for the definition.
System Policy	See [USB PD] for the definition.
System Policy Manager / SPM	See [USB PD] for the definition.
UFP / Upstream Facing Port	See [USB PD] for the definition.
USB Attached State	See [USB PD] for the definition.
USB Default Operation	See [USB PD] for the definition.
USB Device	See [USB PD] for the definition.
USB Host	See [USB PD] for the definition.
USB Powered State	See [USB PD] for the definition.
USB-C	See [USB PD] for the definition.
USB-C Multi-Port Charger	See [USB PD] for the definition.
VBUS	See [USB PD] for the definition.
VCONN	See [USB PD] for the definition.
VCONN Source	See [USB PD] for the definition.

2. States and Status Reporting

2.1. Overview

This companion specification uses the term PDUSB Device to mean a USB Host or Peripheral that supports USB ([USB2] or [USB3]) data and also supports [USB PD]. This specification describes the status reporting mechanisms for PDUSB Devices. It also describes the corresponding USB state to which a PDUSB Device Shall transition as a result of changes in its [USB PD] state.

This specification does not define System Policy or the System Policy Manager. Those are defined in [UCSI]. In addition, the policies themselves are not described here; they are left to the implementers of the relevant products and systems to define.

2.2. Operational Requirements

All PDUSB Devices Shall report themselves in the Binary Object Store (BOS) descriptor set as self-powered devices (over USB) when plugged into a PD Capable Port even if they are entirely powered from VBUS. However, there are differences between PD and [USB2] / [USB3]; for example, the presence of VBUS alone does not mean that the device (Sink) moves from the USB Attached State to the USB Powered State. Similarly, the removal of VBUS alone does not move the device (Sink) from any USB state to the USB Attached State. See [Section 2.5](#) for details.

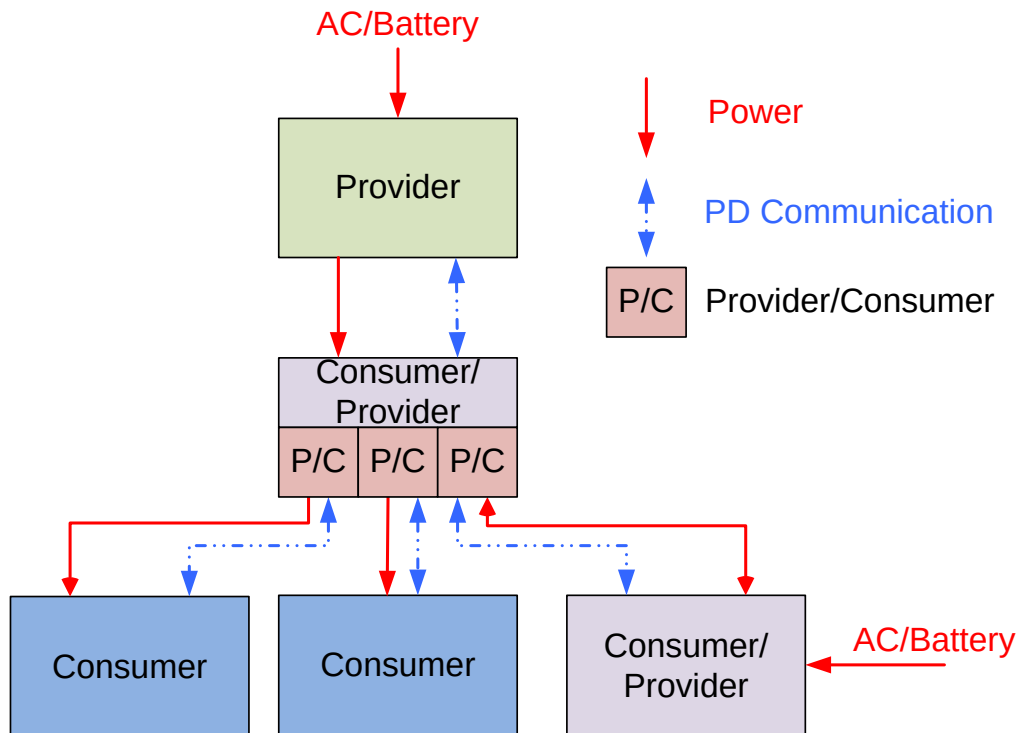
PDUSB Devices Shall follow the PD requirements when it comes to suspend (see [USB PD], "USB Suspend Supported"), configured, and operational power. The PD requirements when the device is configured or operational are defined in this section (see [Table 8](#)).

Note: The power requirements reported in the PD Sink Port descriptor of the device Shall override the power draw reported in the bMaxPower field in the configuration descriptor. A PDUSB Device Shall report zero in the bMaxPower field after successfully negotiating a mutually agreeable Explicit Contract and Shall disconnect and re-enumerate when it switches operation back to operating in standard [USB2], [USB3], [USB4], [USB-C] or [USB BC]. When operating in [USB2], [USB3], [USB-C] or [USB BC] mode it Shall report its power draw via the bMaxPower field.

2.3. System Policy and Status Context

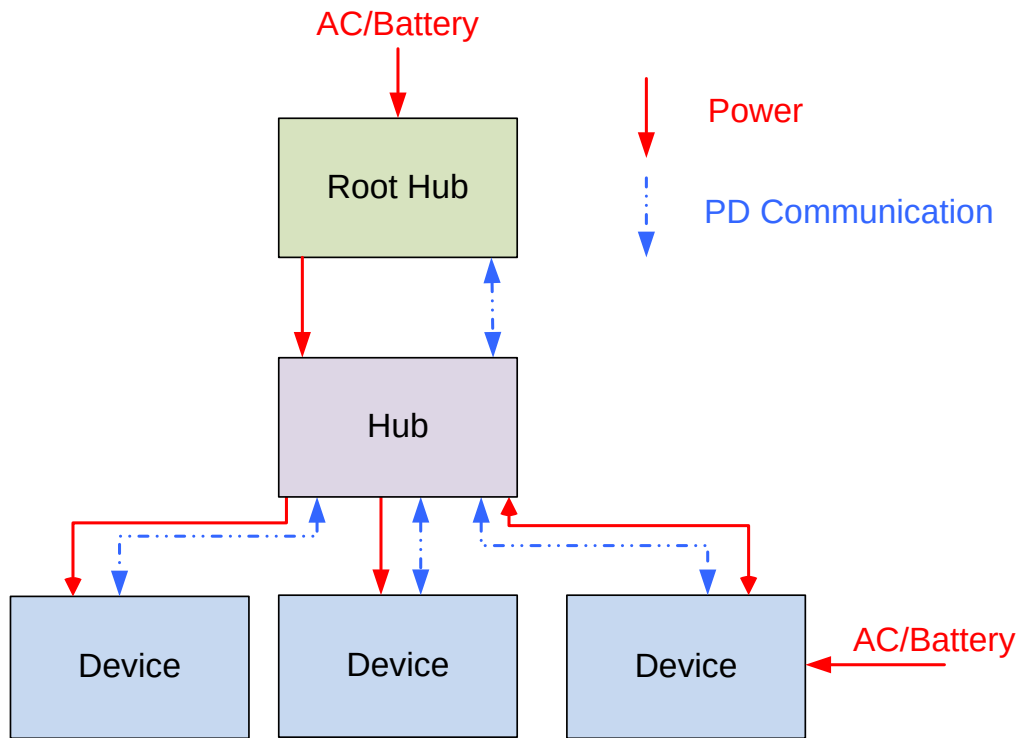
Each Provider and Consumer will have their own Local Policies that operate between Port Partners. An example of a typical PD system is shown in [Figure 1](#). This example consists of a Provider, Consumer/Provider and Consumers connected together in a tree topology. Between directly connected devices there is both a flow of Power and also Communication consisting of both Status and Control information.

Figure 1. Example PD Topology



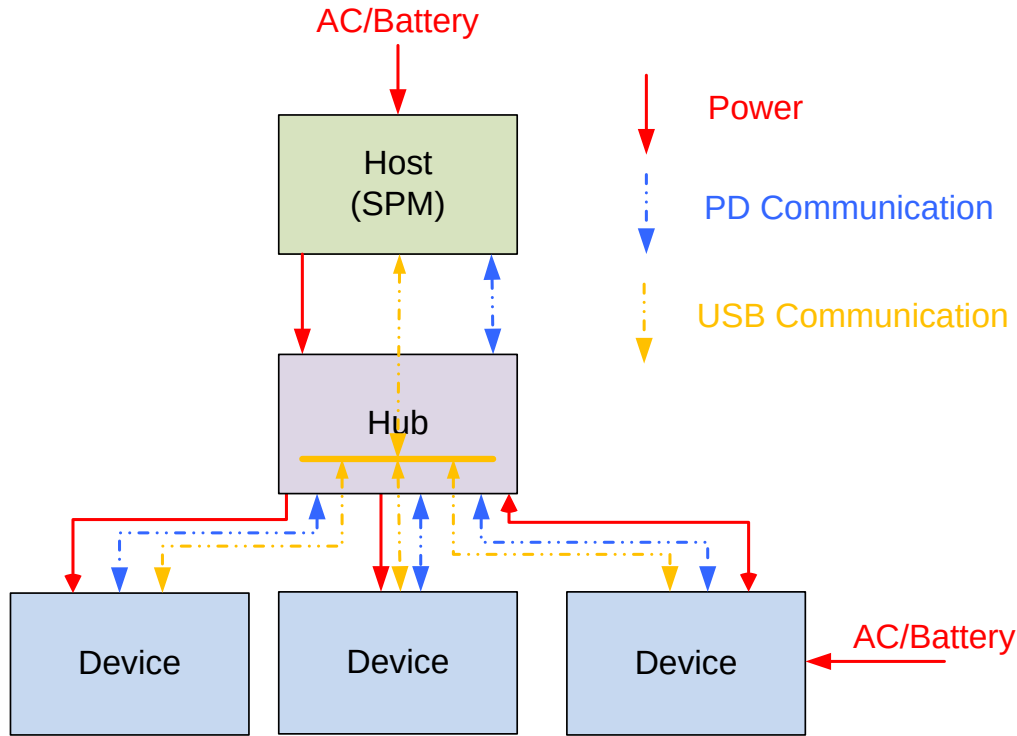
[Figure 2](#) shows how this same topology can be mapped to USB.

Figure 2. Mapping of PD Topology to USB



In a USB-based system, policy is managed by the host and communication of system-level policy information is via standard USB data line communication. This is a separate mechanism to the [USB PD] VBUS protocol which is used to manage Local Policy. When USB Communication is used, status information and control requests are passed directly between the System Policy Manager (SPM) on the host and the Source or Sink. See [Figure 3](#).

Figure 3. Use of SPM in the PD System



Status information comes from a Source or Sink to the SPM so it can better manage the resources on the host and provide feedback to the end user.

Real systems will be a mixture of devices that, in terms of power management support, might have implemented PD, [USB2], [USB3], [USB4], [USB-C] or [USB BC] or they might even just be non-compliant “power sucking devices”. The level of communication of system status to the SPM will therefore not necessarily be comprehensive. The aim of the status mechanisms described here is to provide a mechanism whereby each connected entity in the system provides as much information as possible on the status of itself.

Information described in this section that is communicated to the SPM is as follows:

- Versions of [USB-C], [USB PD] and [USB BC] supported.
- Capabilities as a Source/Sink.
- Current operational state of each Port e.g. Standard, [USB-C] Current, [USB BC], [USB PD] and negotiated power level.
- Status of AC or Battery Power for each PDUSB Device in the system.

The SPM can negotiate with Sources or Sinks in the system in order to request a different Local Policy, or to request the amount of power to be delivered by the Source to the Sink. Any change in Local Policy could

trigger a re-negotiation of the Explicit Contract, using [USB PD] protocols, between a directly connected Source and Sink. A change in how much power is available can, for example, cause a re-negotiation.

2.4. PDUSB Device and Hub Requirements

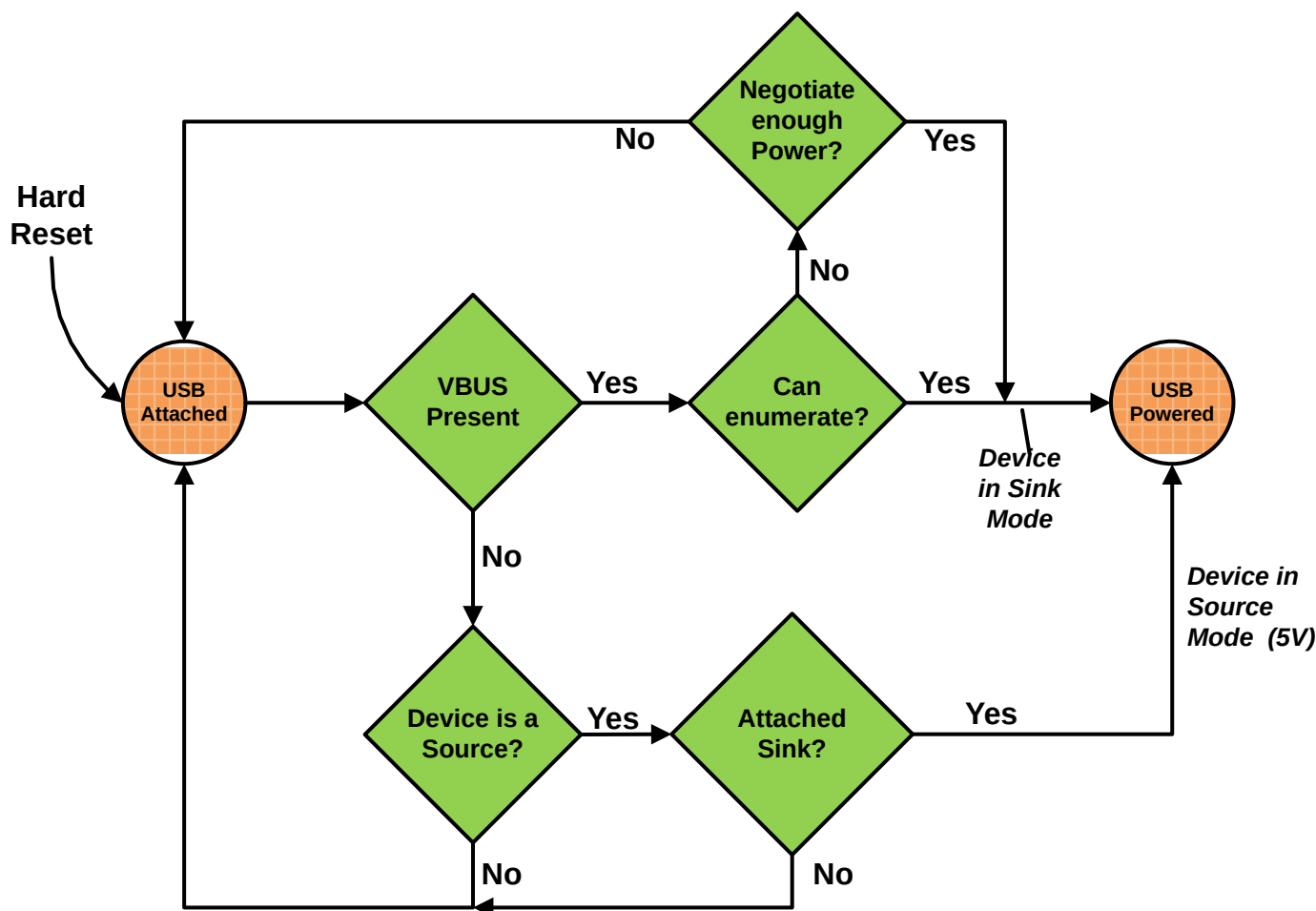
All PDUSB Devices Shall return all relevant descriptors mentioned in this specification. PDUSB Hubs Shall also support a PD bridge as defined in [UCSI].

2.5. Mapping to USB Device States

As mentioned in [Section 2.1](#), a PDUSB Device reports itself as a self-powered device. However, the device Shall determine whether or not it is in the USB Attached State or USB Powered States as described in [Figure 4](#), [Figure 5](#), and [Figure 6](#). All other USB states of the PDUSB Device Shall be as described in [USB2] and [USB3].

[Figure 4](#) shows how a PDUSB Device determines when to transition from the USB Attached State to the USB Powered State. [USB-C] Dead Battery operation does not require special handling since the default state at Attach or after a Hard Reset is that the USB Device is a Sink.

Figure 4. USB Attached to USB Powered State Transition



[Figure 5](#) shows how a PDUSB Device determines when to transition from the USB Powered State to the USB Attached State when the device is a Sink. A PDUSB Device determines that it is performing a Power Role Swap as described in [USB PD], "Policy Engine in Source to Sink Power Role Swap State Diagram" and "Policy Engine in Sink to Source Power Role Swap State Diagram". See [USB PD], "Hard Reset" for additional information on device behavior during Hard Resets.

Figure 5. Any USB State to USB Attached State Transition (When operating as a Sink)

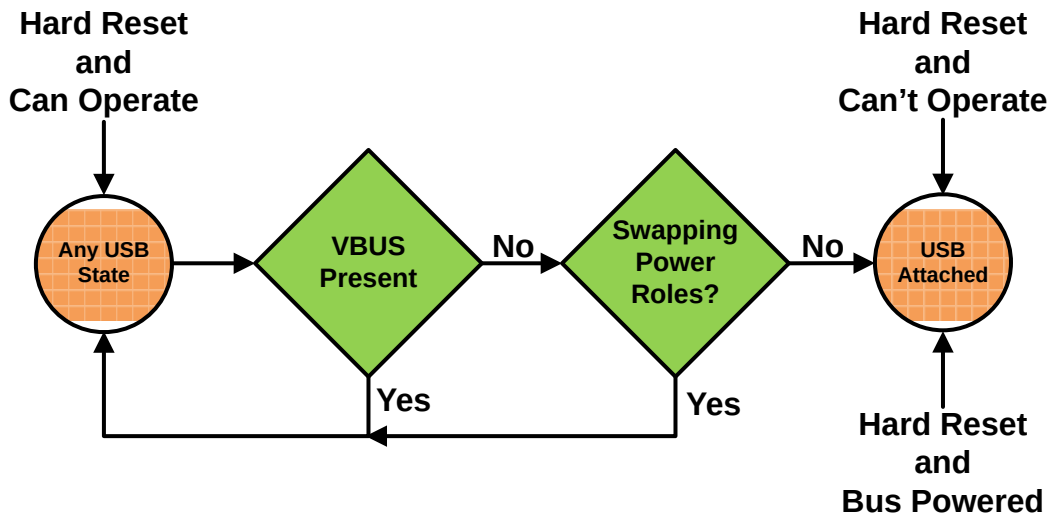


Figure 6 shows how a PDUSB Device determines when to transition from the USB Powered State to the USB Attached State when the device is a Source.

Figure 6. Any USB State to USB Attached State Transition (When operating as a Source)

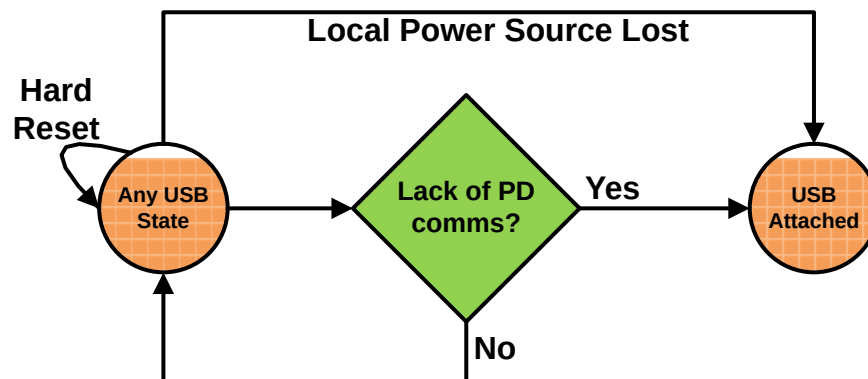
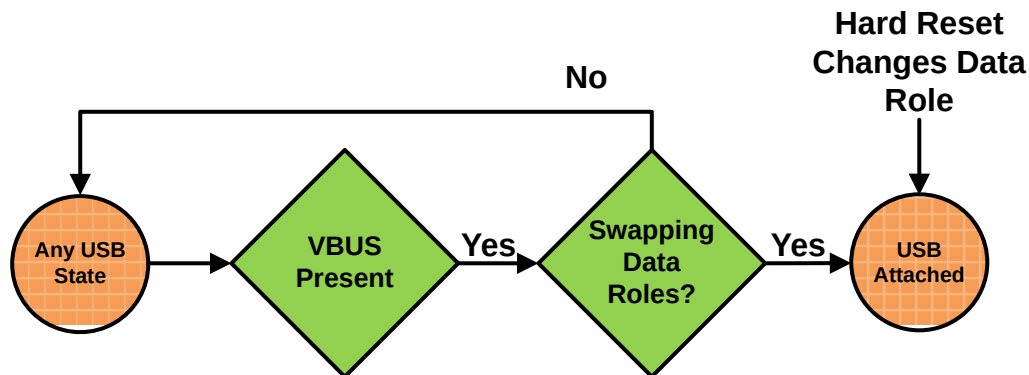


Figure 7 shows how a PDUSB Device using the USB-C connector determines when to transition from the USB Powered State to the USB Attached State after a Data Role Swap has been performed; i.e., it has just changed from operation as a PDUSB Host to operation as a PDUSB Device. The Data Role Swap is described in [USB PD], "DR_Swap". A Hard Reset will also return a Sink acting as a PDUSB Host to PDUSB Device operation as described in [USB PD], "Hard Reset". See [USB PD], "Hard Reset" for additional information on device behavior during Hard Resets.

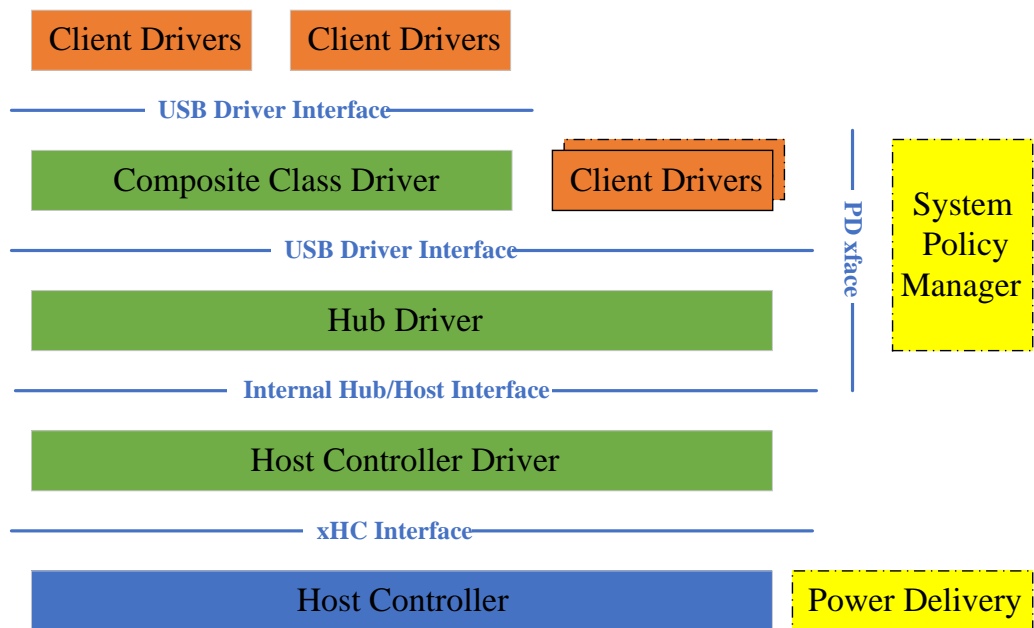
Figure 7. Any USB State to USB Attached State Transition (After a USB-C Data Role Swap)



2.6. PD Software Stack

[Figure 8](#) gives an example of the software stack on a PD-aware OS. In this stack we are using the example of a system with an xHCI based controller. The USB PD hardware May or May Not be a part of the xHC.

Figure 8. Software stack on a PD-aware OS

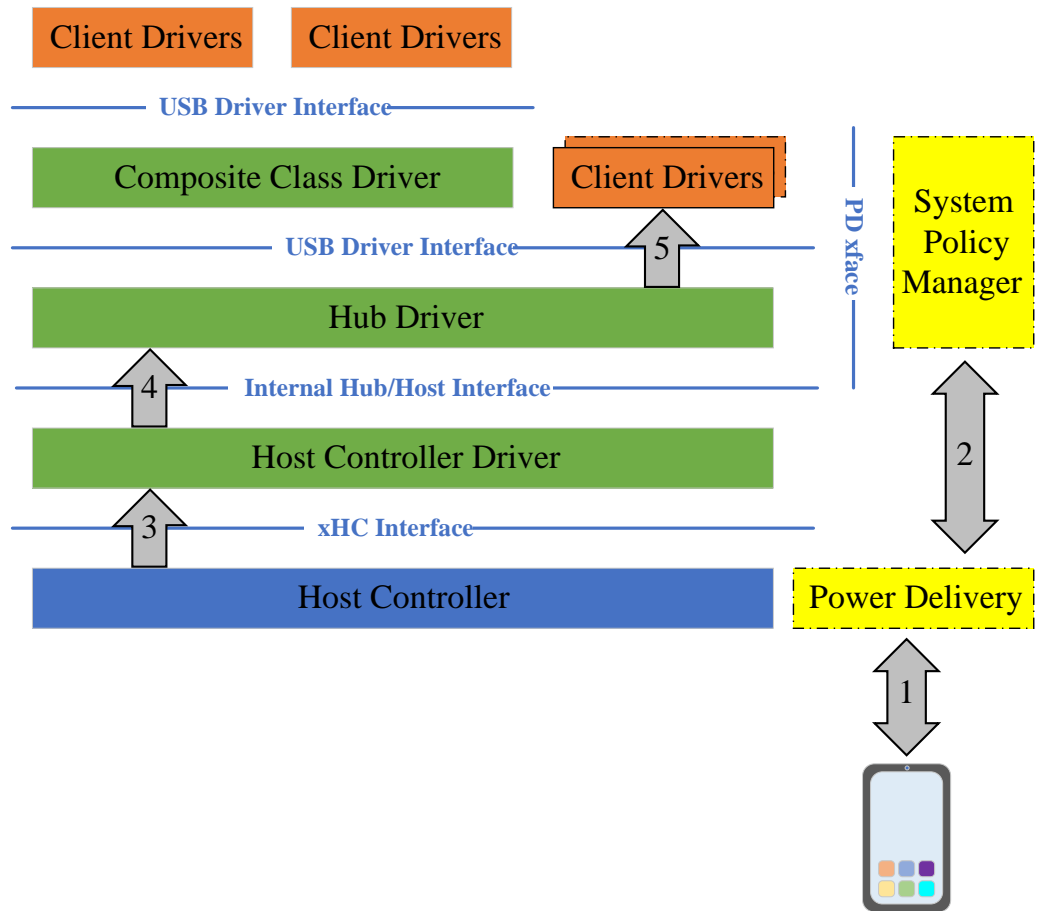


2.7. PDUSB Device Enumeration

As described earlier, a PDUSB Device acts as a self-powered device with some caveats with respect to how it transitions from the USB Attached State to USB Powered State. [Figure 9](#) gives a high-level overview of the enumeration steps involved due to this change. A PDUSB Device will first (Step 1) interact with the USB PD hardware and the Local Policy manager to determine whether or not it can get sufficient power to enumerate/operate.

PD is likely to have established an Explicit Contract prior to enumeration. The SPM will be notified (Step 2) of the result of this negotiation between the Power Delivery hardware and the PDUSB Device. After successfully negotiating a mutually agreeable Explicit Contract the device will signal a connect to the xHC. The standard USB enumeration process (Steps 3, 4 and 5) is then followed to load the appropriate driver for the function(s) that the PDUSB Device exposes.

Figure 9. Enumeration of a PDUSB Device



If a PDUSB Device cannot perform its intended function with the amount of power that it can get from the Port it is connected to, then the host system Should display a notification (on a PD-aware OS) about the failure to provide sufficient power to the device. In addition, the device Shall follow [USB PD], "Capability Mismatch".

3. PD Specific Descriptors

A PDUSB Device Shall return all relevant descriptors mentioned in this section.

The device Shall return its capability descriptors as part of the device's Binary Object Store (BOS) descriptor set.

[Table 4](#) lists the type of PD device capabilities.

Table 4. USB PD Type Codes

Capability Code	Value	Description
POWER_DELIVERY_CAPABILITY	06H	Defines the various PD Capabilities of this device
BATTERY_INFO_CAPABILITY	07H	Provides information on each Battery supported by the device
PD_CONSUMER_PORT_CAPABILITY	08H	The Sink characteristics of a Port on the device
PD_PROVIDER_PORT_CAPABILITY	09H	The Source characteristics of a Port on the device

3.1. USB PD Capability Descriptor

[Table 5](#) details the fields in the USB POWER_DELIVERY_CAPABILITY Descriptor.

Table 5. USB PD Capability Descriptor

Offset	Field	Size	Value	Description		
0	bLength	1	Number	Size of descriptor		
1	bDescriptorType	1	Constant	DEVICE CAPABILITY Descriptor type		
2	bDevCapabilityType	1	Constant	Capability type: POWER_DELIVERY_CAPABILITY		
3	bReserved	1	Reserved	Shall be set to zero.		
4	bmAttributes	4	Bitmap	Bitmap encoding of supported device level features. A value of one in a bit location indicates a feature is supported; a value of zero indicates it is not supported. Encodings are:		
				Bit	Description	
				0	Reserved. Shall be set to zero.	
				1	Battery Charging. This bit Shall be set to one to indicate this device supports [USB BC] as per the value reported in the bcdBCVersion field.	
				2	USB PD. This bit Shall be set to one to indicate this device supports [USB PD] as per the value reported in the bcdPDVersion field.	
				3	Source. This bit Shall be set to one to indicate this device is capable of providing power. This field is only Valid if Bit 2 is set to one.	
				4	Sink. This bit Shall be set to one to indicate that this device is a consumer of power. This field is only Valid if Bit 2 is set to one.	
				5	This bit Shall be set to 1 to indicate that this device supports the feature CHARGING_POLICY. Note: Supporting the CHARGING_POLICY feature does not require a BC or PD mechanism to be implemented.	
				6	USB Type-C Current. This bit Shall be set to one to indicate this device supports power capabilities defined in [USB-C] as per the value reported in the bcdUSBTypeCVersion field	
				7	Reserved. Shall be set to zero.	
				15:8	bmPowerSource. At least one of the following bits 8, 9 and 14 Shall be set to indicate which power sources are supported.	
					Bit	Description
					8	AC Supply
					9	Battery
					10	Other
					13:11	NumBatteries. This field Shall only be Valid when the Battery field is set to one and Shall be used to report the number of batteries in the device.
					14	Uses Vbus
					15	Reserved and Shall be set to zero.
				13:16	Reserved. Shall be set to zero.	

Table 6. USB PD Capability Descriptor (cont..)

Offset	Field	Size	Value	Description
8	bcdBCVersion	2	BCD	[USB BC] Specification Release Number in Binary-Coded Decimal (e.g., V1.20 is 120H). This field Shall only be Valid if the device indicates that it supports [USB BC] in the bmAttributes field.
10	bcdPDVersion	2	BCD	[USB PD] Specification Release Number in Binary-Coded Decimal. This field Shall only be Valid if the device indicates that it supports [USB PD] in the bmAttributes field.
12	bcdUSBTypeCVersion	2	BCD	[USB-C] Specification Release Number in Binary-Coded Decimal. This field Shall only be Valid if the device indicates that it supports [USB-C] in the bmAttributes field.

3.2. Battery Info Capability Descriptor

A PDUSB Device Shall support the capability descriptor shown in [Table 7](#) if it reported that one of its power sources was a Battery in the bmPowerSource field in its Power Deliver Capability Descriptor. It Shall return one BATTERY_INFO_CAPABILITY Descriptor per Battery it supports.

Table 7. Battery Info Capability Descriptor

Offset	Field	Size	Value	Description
0	bLength	1	Number	Size of descriptor
1	bDescriptorType	1	Constant	DEVICE CAPABILITY Descriptor type
2	bDevCapabilityType	1	Constant	Capability type: BATTERY_INFO_CAPABILITY
3	iBattery	1	Index	Index of string descriptor Shall contain the user-friendly name for this Battery.
4	iSerial	1	Index	Index of string descriptor Shall contain the Serial Number String for this Battery.
5	iManufacturer	1	Index	Index of string descriptor Shall contain the name of the Manufacturer for this Battery.
6	bBatteryId	1	Number	Value Shall be used to uniquely identify this Battery in status Messages.
7	bReserved	1	Number	Reserved and Shall be set to zero.
8	dwChargedThreshold	4	mWh	Shall contain the Battery charge value above which this Battery is considered to be fully charged but not necessarily "topped off."
12	dwWeakThreshold	4	mWh	Shall contain the minimum charge level of this Battery such that above this threshold, a device can be assured of being able to power up successfully (see [USB BC]).
16	dwBatteryDesignCapacity	4	mWh	Shall contain the design capacity of the Battery.
20	dwBatteryLastFullchargeCapacity	4	mWh	Shall contain the maximum capacity of the Battery when fully charged.

3.3. PD Sink Port Capability Descriptor

A PDUSB Device Shall support the PD_CONSUMER_PORT_CAPABILITY descriptor shown in [Table 8](#) if it is a Sink.

Table 8. PD Sink Port Descriptor

Offset	Field	Size	Value	Description
0	bLength	1	Number	Size of descriptor

Offset	Field	Size	Value	Description
1	bDescriptorType	1	Constant	DEVICE CAPABILITY Descriptor type
2	bDevCapabilityType	1	Constant	Capability type: PD_CONSUMER_PORT_CAPABILITY
3	bReserved	1	Number	Reserved and Shall be set to zero.
4	bmCapabilities	2	Bitmap	Capability: This field Shall indicate the specification the Sink Port will operate under.
			Bit	Description
			0	Battery Charging (BC)
			1	USB PD (PD)
			2	USB Type-C Current
			15:3	Reserved and Shall be set to zero.
6	wMinVoltage	2	Number	Shall contain the minimum voltage in 50mV units that this Sink is capable of operating at.
8	wMaxVoltage	2	Number	Shall contain the maximum voltage in 50mV units that this Sink is capable of operating at.
10	wReserved	2	Number	Reserved and Shall be set to zero.
12	dwMaxOperatingPower	4	Number	Shall contain the maximum power in 10mW units this Sink can draw when it is in a steady state operating mode.
16	dwMaxPeakPower	4	Number	Shall contain the maximum power in 10mW units this Sink can draw for a short duration of time (dwMaxPeakPowerTime) before it falls back into a steady state.
20	dwMaxPeakPowerTime	4	Number	Shall contain the time in 100ms units that this Sink can draw peak current. A device Shall set this field to 0xFFFF if this value is unknown.

3.4. PD Source Port Capability Descriptor

A PDUSB Device Shall support the PD_PROVIDER_PORT_CAPABILITY descriptor shown in [Table 9](#) if it is a Source.

Table 9. PD Source Port Descriptor

Offset	Field	Size	Value	Description
0	bLength	1	Number	Size of descriptor
1	bDescriptorType	1	Constant	DEVICE CAPABILITY Descriptor type
2	bDevCapabilityType	1	Constant	Capability type: PD_PROVIDER_PORT_CAPABILITY
3	bReserved	1	Number	Reserved and Shall be set to zero.
4	bmCapabilities	2	Bitmap	Capability: This field Shall indicate the specification the Source Port will operate under.
			Bit	Description
			0	Battery Charging (BC)
			1	USB PD (PD)
			2	USB Type-C Current
			15:3	Reserved and Shall be set to zero.
6	bNumOfPDObjects	1	Number	Shall indicate the number of Power Data Objects.
7	bReserved	1	Number	Reserved and Shall be set to zero.
8	wPowerDataObject1	4	Bitmap	Shall contain the first Power Data Object supported by this Source Port. See [USB PD], "Power Data Objects" for details of the Power Data Objects.

Offset	Field	Size	Value	Description
...
4*(N+1)	wPowerDataObjectN	4	Bitmap	Shall contain the 2nd and subsequent Power Data Objects supported by this Source Port. See [USB PD], "Power Data Objects" for details of the Power Data Objects.

4. PD Specific Requests and Events

A PDUSB Hub that is compliant to this specification Shall support a [USB PD] Bridge as described in [UCSI] irrespective of whether the PDUSB Hub is a Source, a Sink, or both.

4.1. PD Specific Requests

PD defines requests to which PDUSB Devices Shall respond as outlined in [Table 10](#). All Valid requests in [Table 10](#) Shall be implemented by PDUSB Devices.

Table 10. PD Requests

Request	bmRequestType	bRequest	wValue	wIndex	wLength	Data
GetBatteryStatus	10000000B	GET_BATTERY_STATUS	Zero	Battery ID	Eight	Battery Status
SetPDFeature	00000000B	set_feature	Feature Selector	Feature Specific	Zero	None

[Table 11](#) gives the bRequest values for Commands that are not listed in the hub/device framework specifications of [USB2], [USB3].

Table 11. PD Request Codes

bRequest	Value
GET_BATTERY_STATUS	21

[Table 12](#) gives the Valid feature selectors for the PD class. Refer to [Section 5.2.1](#) and [Section 5.2.2](#) for a description of the features.

Table 12. PD Feature Selectors

Feature Selector	Recipient	Value
BATTERY_WAKE_MASK	Device	40
CHARGING_POLICY	Device	54

5. PDUSB Hub and PDUSB Peripheral Device Requests

5.1. GetBatteryStatus

The request shown in [Table 13](#) returns the current status of the Battery in a PDUSB Hub/Peripheral, with Battery Status information as shown in [Table 14](#).

Table 13. Get Battery Status Request

bmRequestType	bRequest	wValue	wIndex	wLength	Data
10000000B	GET_BATTERY_STATUS	Zero	Battery ID	Eight	Battery Status

Table 14. Battery Status Structure

Offset	Field	Size	Value	Description
0	bBatteryAttributes	1	Number	Shall indicate whether a Battery is installed and whether this is charging or discharging.
				Value Description
				0 There is no Battery
				1 The Battery is charging
				2 The Battery is discharging
				3 The Battery is neither discharging nor charging
				255...4 Reserved and Shall Not be used
1	bBatterySOC	1	Number	Shall indicate the Battery State of Charge given as percentage value from Battery Remaining Capacity.
2	bBatteryStatus	1	Number	If a Battery is present Shall indicate the present status of the Battery.
				Value Description
				0 No error
				1 Battery required and not present
				2 Battery non-chargeable/wrong chemistry
				3 Over-temp shutdown
				4 Over-voltage shutdown
				5 Over-current shutdown
				6 Fatigued Battery
				7 Unspecified error
				255...8 Reserved and Shall Not be used
3	bRemoteWakeCapStatus	1	Bitmap	If the device supports remote wake, then the device Shall support Battery Remote wake events. The default value for the Remote wake events Shall be turned off (set to zero) and can be enable/disabled by the host as required. If set to one the device Shall generate a wake event when a change of status occurs. See Section 5.2 for more details.
				Value Description
				0 Battery present event
				1 Charging flow
				2 Battery error
				7:3 Reserved and Shall be set to zero
4	wRemainingOperatingTime	2	Number	Shall contain the operating time (in minutes) until the Weak Battery threshold is reached, based on Present Battery Strength and the device's present operational power needs. Note: This value Shall exclude any additional power received from charging. A Battery that is not capable of returning this information Shall return a value of 0xFFFF.
6	wRemainingChargeTime	2	Number	Shall contain the remaining time (in minutes) until the Charged Battery threshold is reached based on Present Battery Strength, charging power and the device's present operational power needs. Value Shall only be Valid if the Charging Flow is "Charging". A Battery that is not capable of returning this information Shall return a value of 0xFFFF.

If wValue or wLength are not as specified above, then the behavior of the PDUUSB Device is not specified.

If wIndex refers to a Battery that does not exist, then the PDUSB Device Shall respond with a Request Error. If the PDUSB Device is not configured, the PDUSB Hub's response to this request is undefined.

If the PDUSB Hub is not configured, the PDUSB Hub's response to this request is undefined.

5.2. SetPDFeature

The request shown in [Table 15](#) sets the value requested in the PDUSB Hub/Peripheral.

Table 15. Set PD Feature

bmRequestType	bRequest	wValue	wIndex	wLength	Data
00000000B	set_feature	Feature Selector	Feature Specific	Zero	None

Setting a feature enables that feature or starts a process associated with that feature; see [Table 12](#) for the feature selector definitions. Features that May be set with this request are:

- BATTERY_WAKE_MASK.
- CHARGING_POLICY.

5.2.1. BATTERY_WAKE_MASK Feature Selector

When the feature selector is set to BATTERY_WAKE_MASK, then the wIndex field is structured as shown in

[Table 16](#).

Table 16. Battery Wake Mask

Bit	Description
0	Battery Present: When this bit is set then the PDUSB Device Shall generate a wake event if it detects that a Battery has been inserted.
1	Charging Flow: When this bit is set then the PDUSB Device Shall generate a wake event if it detects that a Battery switched from charging to discharging or vice versa.
2	Battery Error: When this bit is set then the PDUSB Device Shall generate a wake event if the Battery has detected an error condition.
15:3	Reserved and Shall Not be used

The SPM May Enable or Disable the wake events associated with one or more of the above events by using this feature.

If the PDUSB Hub is not configured, the PDUSB Hub's response to this request is undefined.

5.2.2. CHARGING_POLICY Feature Selector

When the feature selector is set to CHARGING_POLICY, the wIndex field Shall be set to one of the values defined in [Table 17](#). If the device is using [USB-C] Current above the default value or is using PD then this feature setting has no effect and the rules for power levels specified in the [USB-C] or [USB PD] specifications Shall apply.

Table 17. Charging Policy Encoding

Value	Description
00H	The device Shall follow the default current limits as defined in [USB2] or [USB3] specification, or as negotiated through other USB mechanisms such as BC. This is the default value.
01H	The Device May draw additional power during the unconfigured and suspend states for the purposes of charging. For charging the device itself, the device Shall limit its current draw to the higher of these two values: ICCHPF as defined in the [USB2] or [USB3] specification, regardless of its USB state. Current limit as negotiated through other USB mechanisms such as BC.
02H	The Device May draw additional power during the unconfigured and suspend states for the purposes of charging. For charging the device itself, the device Shall limit its current draw to the higher of these two values: ICCLPF as defined in the [USB2] or [USB3] specification, regardless of its USB state. Current limit as negotiated through other USB mechanisms such as BC.
03H	The device Shall Not consume any current for charging the device itself regardless of its USB state.
04H-FFFFH	Reserved and Shall Not be used

This is a Valid Command for the PDUSB Hub/Peripheral in the Address or Configured USB states. Further, it is only Valid if the device reports a [USB PD] capability descriptor in its BOS descriptor and Bit 5 of the bmAttributes in that descriptor is set to 1. The device will go back to the wIndex default value of 0 whenever it is reset.