USB Type-C ENGINEERING CHANGE NOTICE

Title: Removal of Proprietary Charging Methods
Applied to: USB Type-C Specification Release 1.2, March 25, 2016

Brief description of the functional changes:
Removal of language allowing proprietary signaling for negotiating V_{BUS} current to co-exist with USB specification defined charging methods on the Type-C connector. .

Benefits as a result of the changes:
The USB Type-C connector is rapidly growing in popularity across multiple product segments including computing, mobile, industrial, and automotive. In addition to data connectivity, it also provides the opportunity to charge a broad range of products. It is vital to the industry that products that adopt the Type-C connector be able to interoperate and to provide a consistent experience for end users. The ability to charge a device reliably across product offerings from multiple vendors is something that the industry expects from the Type-C connector. This is best achieved by ensuring that all products conform to openly published, standards based charging definitions.

An assessment of the impact to the existing revision and systems that currently conform to the USB specification:
The USB Type-C specification will no longer permit the fallback to using proprietary signaling methods for negotiating V_{BUS} current, when the USB methods are not available. Products that conform to the USB standards will not be impacted by this change. In a scenario when both the Source and the Sink rely on proprietary charging methods and one is replaced by a similar product that conforms to this ECR then the Sink may charge at a slower rate or not at all. The user impact is not expected to be significant in the majority of use cases.

An analysis of the hardware implications:
Products that are in design which include proprietary charging methodologies can easily disable the proprietary modes and will be able to comply with this requirement without costly re-spins. Products which do not incorporate proprietary charging methodologies are not impacted.

An analysis of the software implications:
N/A

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An analysis of the compliance testing implications:
Proprietary charging methods are not tested in compliance, and this ECR will not change that in any way. What will change is that a checklist item will be added to the compliance process on January, 1st, 2019 for Source functions and January 1st, 2018 for Sink functions which will require that new submissions for logo disclose that no proprietary charging methods are present/enabled.

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Actual Change

(a). Section 4.5.3.2.2 Legacy Host Port to Sink Behavior

From Text:

The following describes the behavior when a legacy host adapter that has an Rp to VBUS so as to mimic the behavior of a Source that is connected to a Sink. The value of Rp shall indicate an advertisement of Default USB Power (See Table 4-15), even though the cable itself can carry 3 A. This is because the cable has no knowledge of the capabilities of the power source, and any higher current is negotiated via *USB BC 1.2* or by proprietary means.

To Text:

The following describes the behavior when a legacy host adapter that has an Rp to VBUS so as to mimic the behavior of a Source that is connected to a Sink. The value of Rp shall indicate an advertisement of Default USB Power (See Table 4-15), even though the cable itself can carry 3 A. This is because the cable has no knowledge of the capabilities of the power source, and any higher current is negotiated via *USB BC 1.2*.

(b) 4.5.3.2.4 Legacy Host Port to DRP Behavior

From Text:

The following describes the behavior when a legacy host adapter that has an Rp to VBUS so as to mimic the behavior of a Source is connected to a DRP. The value of Rp shall indicate an advertisement of Default USB Power (See Table 4-15), even though the cable itself can carry 3 A. This is because the cable has no knowledge of the capabilities of the power source, and any higher current is negotiated via *USB BC 1.2* or by proprietary means.

To Text:

The following describes the behavior when a legacy host adapter that has an Rp to VBUS so as to mimic the behavior of a Source is connected to a DRP. The value of Rp shall indicate an advertisement of Default USB Power (See Table 4-15), even though the cable itself can carry 3 A. This is because the cable has no knowledge of the capabilities of the power source, and any higher current is negotiated via *USB BC 1.2.*

(c) 4.6.2.3 Proprietary Power Source

From Text:

A proprietary power source (i.e., battery charger) with a USB Type-C-captive cable or a USB Type-C receptacle that is capable of supplying at least 1.5 A and less than 3.0 A shall advertise USB Type-C Current at least at the 1.5 A level.

A proprietary power source with a USB Type-C-captive cable or a USB Type-C receptacle that is capable of supplying at least 3.0 A shall advertise USB Type-C Current at least at the 3.0 A level.

To Text:

This section has been deprecated. Devices with USB Type-C connectors shall only employ signaling methods defined in USB specifications to negotiate power.

(d) 4.8.1 DFP as a Power Source

From Text:

Sources (e.g. battery chargers, hub downstream ports and hosts) may all be used for battery charging. When a charger is implemented with a USB Type-C receptacle or a USB Type-C captive cable, it shall follow all the applicable requirements.

- A Source shall expose its power capabilities using the USB Type-C Current method and it may additionally support other USB-standard methods (*USB BC 1.2* or *USB-PD*).
- A Source may also expose its identity and/or power capabilities using a proprietary (e.g. non-USB-standard) method. A proprietary method may source up to 5 A if it has a captive cable capable of carrying that level of current. See Section 4.6.2.3 for additional requirements.
- A Source advertising its current capability using *USB BC 1.2* shall meet the requirements in Section 4.6.2.2 regarding USB Type-C Current advertisement.
- A Source that has negotiated a *USB-PD* contract shall meet the requirements in Section 4.6.2.4 regarding USB Type-C Current advertisement.
- If a Source is capable of supplying a voltage greater than default VBUS, it shall fully conform to the *USB-PD* specification, and shall negotiate its power contracts using only *USB-PD*.
- If a Source is capable of reversing source and sink power roles, it shall fully conform to the *USB-PD* specification, and shall negotiate its power contracts using only *USB-PD*.
- If a Source is capable of supplying a current greater than 3.0 A, it shall use the *USB-PD* Discover Identity to determine the current carrying capacity of the cable.

To Text:

Sources (e.g. battery chargers, hub downstream ports and hosts) may all be used for battery charging. When a Source is implemented with a USB Type-C receptacle or a USB Type-C captive cable, it shall follow all the applicable requirements.

- A Source shall expose its power capabilities using the USB Type-C Current method and it may additionally support other USB-standard methods (*USB BC 1.2* or *USB-PD*).
- A Source advertising its current capability using *USB BC 1.2* shall meet the requirements in Section 4.6.2.2 regarding USB Type-C Current advertisement.
- A Source that has negotiated a *USB-PD* contract shall meet the requirements in Section 4.6.2.4 regarding USB Type-C Current advertisement.
- If a Source is capable of supplying a voltage greater than default VBUS, it shall fully conform to the *USB-PD* specification, and shall negotiate its power contracts using only *USB-PD*.
- If a Source is capable of reversing source and sink power roles, it shall fully conform to the *USB-PD* specification, and shall negotiate its power contracts using only *USB-PD*.
- If a Source is capable of supplying a current greater than 3.0 A, it shall use the *USB-PD* Discover Identity to determine the current carrying capacity of the cable.

(e) 4.8.2 Non-USB Charging Methods

From Text:

A charger with a USB Type-C connector may employ additional proprietary charging methods to source power beyond what is allowed by the USB defined methods. When implemented, proprietary methods must meet the following requirements:

- The method shall only be used to establish identity and/or a current level at default VBUS voltage in a manner not defined by the USB methods
- The method shall only define the current level and shall not change the voltage delivered on VBUS
- The method shall not alter the Source's role to supply VBUS or the Sink's role to consume VBUS
- See Section 4.6.2.3 for additional requirements regarding USB Type-C Current advertisement.

A product with a USB Type-C connector that consumes power may support proprietary charging methods, these products shall not support methods that redefine VBUS voltage beyond what is defined by the *USB 2.0* and *USB 3.1* specifications.

To Text:

A product (Source and/or Sink) with a USB Type-C connector shall only employ signaling methods defined in USB specifications to negotiate power over its USB Type-C connector(s).