

ECN for USB Power Delivery Specification Revision 3.2

Version 1.1, 2024-10

Title: Clarify EPR_Get_Source_Cap negative response.

Brief description of the functional changes proposed:

Clarify the required response message to be sent by DRP ports when receiving an EPR_Get_Source_Cap or EPR_Get_Sink_Cap message.
Clarify the applicability of EPR_Source_Cap and EPR_Sink_Cap messages.

Benefits as a result of the proposed changes:

Will resolve a conflict between two portions of the USB-PD base spec. This will help guide the CTS to enact proper and clear ECRs / implementation and give implementers clear implementation requirements.
Will also correct wrong/unclear requirements for EPR_Source_Cap / EPR_Sink_Cap message applicability.

An assessment of the impact to the existing revision and systems that currently conform to the USB specification:

No impact to transmitters of the response messages, as this ECR would allow either previous possible implementation (Reject or Not_Supported).
Receivers of the response message may possibly need to be updated to handle more types of messages as Valid responses. That is, if some port was treating either Not_Supported or Reject as an invalid response (and therefore a Protocol Error), then that port would need to be updated to treat the new set of allowed messages as Valid. Note: It would seem very unlikely that any existing ports would need to be updated in this way, as both Not_Supported and Reject were both already possible valid responses in certain cases.
Regarding changes related to EPR_Source_Cap / EPR_Sink_Cap message applicability, there is no impact expected.

An analysis of the hardware implications:

None

An analysis of the software implications:

As mentioned above, the expected impact is likely to be none or minimal. Please see the assessment above.

An analysis of the compliance testing implications:

The CTS and compliance tester implementations would need to be updated to allow an increased set of Valid or allowed responses to EPR_Get_Source_Cap / EPR_Get_Sink_Cap initiator messages from the tester.
Regarding changes related to EPR_Source_Cap / EPR_Sink_Cap message applicability, there is no impact expected.

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Actual Change Requested

(a). Section 6.5.14.1 “EPR_Get_Source_Cap Message”, Page 244, Paragraph 1

From Text:

The **EPR_Get_Source_Cap** (EPR Get Source Capabilities) Message **Shall** only be sent by a Port capable of operating as a Sink and that supports EPR Mode to request the Source Capabilities and Dual-Role Power capability of its Port Partner. A Port that can operate as an EPR Source **Shall** respond by returning an **EPR_Source_Capabilities** Message (see [Section 6.5.15.2, "EPR Source Capabilities Message"](#)). A Port that does not support EPR Mode as a Source **Shall** return the **Not_Supported** Message.

To Text:

The **EPR_Get_Source_Cap** (EPR Get Source Capabilities) Message **Shall** only be sent by a Port capable of operating in EPR Mode as a Sink to request the EPR Source Capabilities of its Port Partner. A Port that can operate as an EPR Source **Shall** respond by returning an **EPR_Source_Capabilities** Message (see [Section 6.5.15.2, "EPR Source Capabilities Message"](#)). A Port that does not support EPR Mode as a Source **Shall** have the following behavior:

- If the Port supports EPR Mode as a Sink and is a DRP Port, it **Shall** return a **Reject** or **Not_Supported** Message.
- If the Port does not support EPR Mode as a Sink or is not a DRP Port, it **Shall** return a **Not_Supported** Message.

(b). Section 6.5.14.2 “ EPR_Get_Sink_Cap Message”, Page 244, Paragraph 1

From Text:

The **EPR_Get_Sink_Cap** (EPR Get Sink Capabilities) Message **Shall** only be sent by a Port capable of operating as a Source and that supports EPR Mode to request the Sink Capabilities and Dual-Role Power capability of its Port Partner. A Port that is EPR Capable operating as a Sink **Shall** respond by returning an **EPR_Sink_Capabilities** Message (see [Section 6.5.15.3, "EPR Sink Capabilities Message"](#)). A Port that does not support EPR Mode as a Sink **Shall** return the **Not_Supported** Message.

To Text:

The **EPR_Get_Sink_Cap** (EPR Get Sink Capabilities) Message **Shall** only be sent by a Port capable of operating in EPR Mode as a Source to request the EPR Sink Capabilities of its Port Partner. A Port that is EPR Capable operating as a Sink **Shall** respond by returning an **EPR_Sink_Capabilities** Message (see [Section 6.5.15.3, "EPR Sink Capabilities Message"](#)). A Port that does not support EPR Mode as a Sink **Shall** behave as follows:

- If the Port supports EPR Mode as a Source and is a DRP Port, it **Shall** return a **Reject** or **Not_Supported** Message.

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- If the *Port* does not support *EPR Mode* as a *Source* or is not a *DRP Port*, it **Shall** return a ***Not_Supported*** Message.

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(c). Section 6.3.4 “Reject Message”, Page(s) 129-130

From Text:

The **Reject Message** is a **Valid** response in the following cases:

- It **Shall** be sent to signal the *Sink*, in *SPR Mode*, that the *Source* is unable to meet the **Request Message**. This **May** be due an **Invalid** request or because the *Source* can no longer provide what it previously *Advertised*.
- It **Shall** be sent to signal the *Sink*, in *EPR Mode*, that the *Source* is unable to meet the **EPR_Request Message**. This **May** be due an **Invalid** request or because the *Source* can no longer provide what it previously *Advertised*.
- It **Shall** be sent by the recipient of a **PR_Swap Message** to indicate it is unable to do a *Power Role Swap*.
- It **Shall** be sent by the recipient of a **PR_Swap Message** while in *EPR Mode*.
- It **Shall** be sent by the recipient of a **DR_Swap Message** to indicate it is unable to do a *Data Role Swap*.
- It **Shall** be sent by the recipient of a **VCONN_Swap Message** that is not presently the *VCONN Source*, to indicate it is unable to do a *VCONN Swap*.
- It **Shall** be sent by *UFP* on receiving an **Enter_USB Message** to indicate it is unable to enter the requested *USB Mode*.

To Text:

The **Reject Message** is a **Valid** response in the following cases:

- It **Shall** be sent to signal the *Sink*, in *SPR Mode*, that the *Source* is unable to meet the **Request Message**. This **May** be due an **Invalid** request or because the *Source* can no longer provide what it previously *Advertised*.
- It **Shall** be sent to signal the *Sink*, in *EPR Mode*, that the *Source* is unable to meet the **EPR_Request Message**. This **May** be due an **Invalid** request or because the *Source* can no longer provide what it previously *Advertised*.
- It **Shall** be sent by the recipient of a **PR_Swap Message** to indicate it is unable to do a *Power Role Swap*.
- It **Shall** be sent by the recipient of a **PR_Swap Message** while in *EPR Mode*.
- It **Shall** be sent by the recipient of a **DR_Swap Message** to indicate it is unable to do a *Data Role Swap*.
- It **Shall** be sent by the recipient of a **VCONN_Swap Message** that is not presently the *VCONN Source*, to indicate it is unable to do a *VCONN Swap*.
- It **Shall** be sent by *UFP* on receiving an **Enter_USB Message** to indicate it is unable to enter the requested *USB Mode*.
- It **May** be sent by the recipient of an **EPR_Get_Source_Cap Message** only when the recipient is

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EPR Capable and is a DRP Port and does not support EPR Mode as a Source.

- It **May** be sent by the recipient of an **EPR_Get_Sink_Cap** Message only when the recipient is *EPR Capable and is a DRP Port and does not support EPR Mode as a Sink.*

(d). Section 6.13.4 “Applicability of Extended Control Messages”, Page 308, Table 6.80

From Text:

Table 6.80 Applicability of Extended Control Messages

Message Type	Source	Sink	Dual-Role Power	Dual-Role Data	Cable Plug	VPD ²
Transmitted Message						
<i>EPR_Get_Source_Cap</i>	NA	CN ¹	CN ¹		NA	NA
<i>EPR_Get_Sink_Cap</i>	CN ¹	NA	CN ¹		NA	NA
<i>EPR_KeepAlive</i>	NA	CN ¹			NA	NA
<i>EPR_KeepAlive_Ack</i>	CN ¹	NA			NA	NA
Received Message						
<i>EPR_Get_Source_Cap</i>	CN ¹	NS	CN ¹		I	I
<i>EPR_Get_Sink_Cap</i>	NS	CN ¹	CN ¹		I	I
<i>EPR_KeepAlive</i>	CN ¹	NS			I	I
<i>EPR_KeepAlive_Ack</i>	NS	CN ¹			I	I
1)	Shall be supported by products that support <i>EPR Mode</i> .					
2)	VPD includes <i>CT-VPDs</i> when not <i>Connected</i> to a <i>Charger</i> . PD communication with a <i>CT-VPD</i> Shall only take place when not <i>Connected</i> to a <i>Charger</i> .					

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To Text:

Table 6.80 Applicability of Extended Control Messages

Message Type	Source	Sink	Dual-Role Power	Dual-Role Data	Cable Plug	VPD ⁴
Transmitted Message						
<i>EPR_Get_Source_Cap</i>	NA	CN ¹	CN ¹		NA	NA
<i>EPR_Get_Sink_Cap</i>	CN ²	NA	CN ²		NA	NA
<i>EPR_KeepAlive</i>	NA	CN ¹			NA	NA
<i>EPR_KeepAlive_Ack</i>	CN ²	NA			NA	NA
Received Message						
<i>EPR_Get_Source_Cap</i>	CN ²	NS	CN ² / NS ³		I	I
<i>EPR_Get_Sink_Cap</i>	NS	CN ¹	CN ¹ / NS ³		I	I
<i>EPR_KeepAlive</i>	CN ²	NS			I	I
<i>EPR_KeepAlive_Ack</i>	NS	CN ¹			I	I
1) Shall be supported by <i>Ports</i> that support <i>EPR Mode</i> as a <i>Sink</i> . 2) Shall be supported by <i>Ports</i> that support <i>EPR Mode</i> as a <i>Source</i> . 3) An <i>EPR Capable DRP Port</i> that does not support <i>EPR Mode</i> as both <i>Source</i> and <i>Sink</i> May send a Reject instead of Not_Supported . A <i>DRP Port</i> that is not <i>EPR Capable</i> at all Shall send Not_Supported . 4) <i>VPD</i> includes <i>CT-VPDs</i> when not <i>Connected</i> to a <i>Charger</i> . PD communication with a <i>CT-VPD</i> Shall only take place when not <i>Connected</i> to a <i>Charger</i>						

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(e). Section 6.13.3 “Applicability of Extended Messages”, Page 306, Table 6.79

From Text:

Table 6.79 Applicability of Extended Messages

Message Type	Source	Sink	Dual-Role Power	Cable Plug SOP'	Cable Plug SOP''	VPD ¹³
Transmitted Message						
<u>EPR Source Capabilities</u>	CN ¹⁴ /NA	NA	CN ¹⁴ /NA	NA	NA	NA
<u>EPR Sink Capabilities</u>	NA	CN ¹⁴ /NA	CN ¹⁴ /NA	NA	NA	NA
Received Message						
<u>EPR Source Capabilities</u>	NS	CN ¹⁴ /NS	CN ¹⁴ /NS	I	I	I
<u>EPR Sink Capabilities</u>	CN ¹⁴ /NS	NS	CN ¹⁴ /NS	I	I	I
1) Shall be supported by products that contain batteries. 2) Shall be supported by products that can transmit the <u>Get_Source_Cap_Extended</u> Message. 3) Shall be supported by products that can transmit the <u>Get_Status</u> Message. 4) Shall be supported by products that can transmit the <u>Get_Battery_Cap</u> Message. 5) Shall be supported by products that can transmit the <u>Get_Manufacturer_Info</u> Message. 6) Shall be supported by products that support USB security communication as defined in <u>[USBTypeCAuthentication 1.0]</u> . 7) Shall be supported by products that support USB firmware update communication as defined in <u>[USBPDFirmwareUpdate 1.0]</u> . 8) Shall be supported when PPS is supported. 9) Shall be supported by products that can transmit the <u>Get_PPS_Status</u> Message. 10) Shall be supported when required by a country authority. 11) Shall be supported by products that can transmit the <u>Get_Sink_Cap_Extended</u> Message. 12) Shall be supported by <i>Active Cables</i> . 13) VPD includes <i>CT-VPDs</i> when not <i>Connected</i> to a <i>Charger</i> . PD communication with a <i>CT-VPD</i> Shall only take place when not <i>Connected</i> to a <i>Charger</i> . 14) Shall be supported by products that support operation in <i>EPR Mode</i> . 15) Shall be supported by <i>Sources</i> that support the <u>Alert</u> Message.						

To Text:

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Table 6.79 Applicability of Extended Messages

Message Type	Source	Sink	Dual-Role Power	Cable Plug SOP'	Cable Plug SOP''	VPD ¹³
Transmitted Message						
<i>EPR Source Capabilities</i>	CN ¹⁴ / NA	NA	CN ¹⁴ / NA	NA	NA	NA
<i>EPR Sink Capabilities</i>	NA	CN ¹⁶ /NA	CN ¹⁶ /NA	NA	NA	NA
Received Message						
<i>EPR Source Capabilities</i>	NS	CN ¹⁶ / NS	CN ¹⁶ / NS	I	I	I
<i>EPR Sink Capabilities</i>	CN ¹⁴ / NS	NS	CN ¹⁴ / NS	I	I	I
<ol style="list-style-type: none"> 1) Shall be supported by products that contain batteries. 2) Shall be supported by products that can transmit the <i>Get_Source_Cap_Extended</i> Message. 3) Shall be supported by products that can transmit the <i>Get_Status</i> Message. 4) Shall be supported by products that can transmit the <i>Get_Battery_Cap</i> Message. 5) Shall be supported by products that can transmit the <i>Get_Manufacturer_Info</i> Message. 6) Shall be supported by products that support USB security communication as defined in <i>[USBTypeCAuthentication 1.0]</i>. 7) Shall be supported by products that support USB firmware update communication as defined in <i>[USBPDFirmwareUpdate 1.0]</i>. 8) Shall be supported when PPS is supported. 9) Shall be supported by products that can transmit the <i>Get_PPS_Status</i> Message. 10) Shall be supported when required by a country authority. 11) Shall be supported by products that can transmit the <i>Get_Sink_Cap_Extended</i> Message. 12) Shall be supported by <i>Active Cables</i>. 13) VPD includes CT-VPDs when not <i>Connected</i> to a <i>Charger</i>. PD communication with a CT-VPD Shall only take place when not <i>Connected</i> to a <i>Charger</i>. 14) Shall be supported by <i>Ports</i> that support <i>EPR Mode as a Source</i>. 15) Shall be supported by <i>Sources</i> that support the <i>Alert</i> Message. 16) Shall be supported by <i>Ports</i> that support <i>EPR Mode as a Sink</i>. 						