

ECN for USB Power Delivery Specification Revision 3.2

Version 1.1, 2024-10

Title: ECR HardReset Processing Time Clarification

Brief description of the functional changes proposed:

When SenderResponseTimer expires, PE sends the information to PRL which asks PHY layer to send HardReset message, or to go to ErrorRecovery State or PE goes back to Ready State
Depending on implementation, it might take time to process the timer expiration and determine next step and send the message or to direct to ErrorRecovery or HardReset: currently the PE state diagram is silent on this which leads to false fail in compliance.

- Extend tSenderResponse max to 50ms from 33ms. The current time allows very little room beyond a 10% timer error to process.
- Allow PD2 to use the same max time.
- Add a time for processing and sending the hardreset (matches protocol error hard reset timing)
- Also provide a time for going to ErrorRecovery on a timer error.

Benefits as a result of the proposed changes:

Ease design requirements for SenderResponse timer and allow proper time to process timer expiration. This is particularly useful in implementations with split software stacks such as TCPCI.

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

Provide clear rule/statement on behavior post timer expiration. Allows more time before HardReset or ErrorRecovery. This won't break interop with earlier implementations

An analysis of the hardware implications:

Relaxation of timer making implementations easier.

An analysis of the software implications:

NA

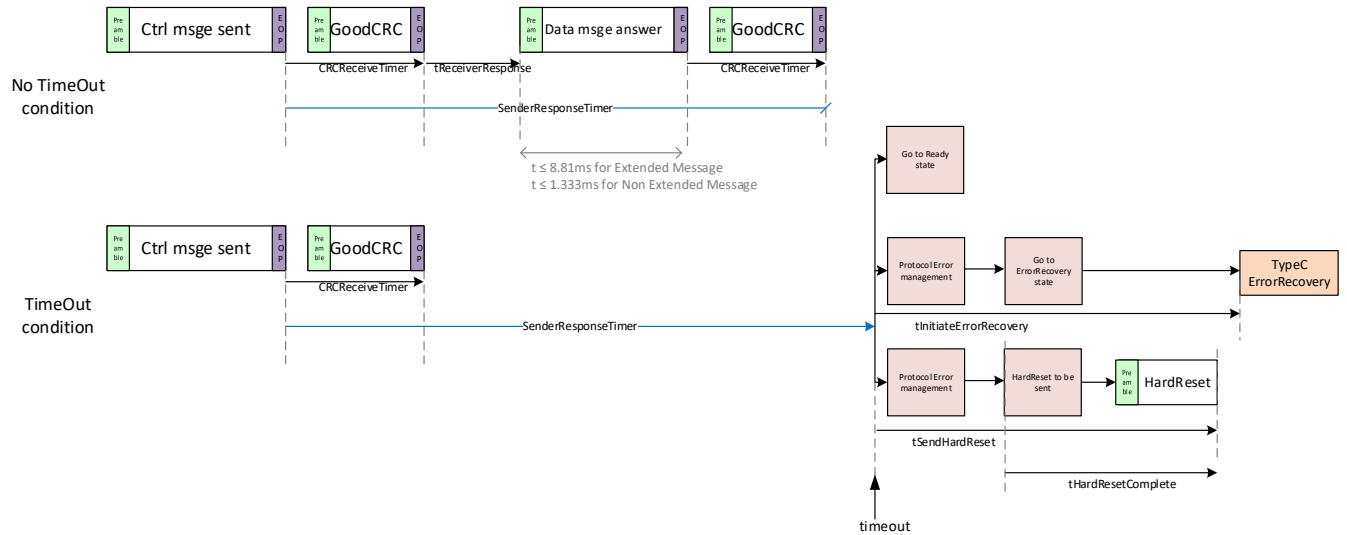
An analysis of the compliance testing implications:

Common check needs to be reviewed

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Illustration of the clarification:



	What for ?	Min (ms)	Max (ms)
CRCReceiveTimer (tReceive)	Timeout	0.9	1.1
SenderResponseTimer(tSenderResponse)	Timeout	27	50
VDMResponseTimer (tVDMSenderResponse)	Timeout	24	50
tReceiverResponse	Max time to send response	-	15
tHardResetComplete	Max time to send message	4	5
tSendHardReset	Max time to send message		15
tInitiateErrorRecovery	Max time to ErrorRecovery		15

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Actual Change Requested

(a). Section 8.8.3.2.9

From Text:

8.3.3.2.9 PE_SRC_Hard_Reset State

The *Policy Engine* **Shall** transition to the **PE_SRC_Hard_Reset** state from any state when:

- *Hard Reset* request from *Device Policy Manager* or
- In *EPR Mode* and a **Request** Message is received or
- *EPR Capable* and in *SPR Mode* and an **EPR_Request** Message is received.

On entry to the **PE_SRC_Hard_Reset** state the *Policy Engine* **Shall**:

- request the generation of **Hard Reset** Signaling by the PHY Layer
- initialize and run the **NoResponseTimer**.

Note: The **NoResponseTimer** **Shall** continue to run in every state until it is stopped or times out.

- initialize and run the **PSHardResetTimer** and increment the **HardResetCounter**.

To Text:

9.2.3.9 PE_SRC_Hard_Reset State

The *Policy Engine* **Shall** transition to the **PE_SRC_Hard_Reset** state from any state when:

- *Hard Reset* request from *Device Policy Manager* or
- In *EPR Mode* and a **Request** Message is received or
- *EPR Capable* and in *SPR Mode* and an **EPR_Request** Message is received.

On entry to the **PE_SRC_Hard_Reset** state the *Policy Engine* **Shall**:

- request the generation of **Hard Reset** Signaling by the PHY Layer which might take up to **tHardResetComplete**.
- initialize and run the **NoResponseTimer**.

Note: The **NoResponseTimer** **Shall** continue to run in every state until it is stopped or times out.

- initialize and run the **PSHardResetTimer** and increment the **HardResetCounter**.

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(b). Section 6.6.22, Table 6.68

From Text:

<i>tVDMSenderResponse</i>	24	27	30	ms	Section 6.6.12.1
<i>tSenderResponse</i>	27	30	33	ms	Section 6.6.2

To Text (table 7.9):

<i>tVDMSenderResponse</i>	24		50 ⁽¹⁾	ms	
<i>tSenderResponse</i>	27 ⁽¹⁾		50 ⁽¹⁾	ms	

(1) Same timing can be used when USBPD device is in a PD2 explicit contract

(c). Section 6.6.11

To Text:

7.31.10.5 *tSendHardReset*

When a timer expiration leads to sending a **Hard Reset**, the transmission of the last bit of the **Hard Reset** message **shall** be completed within *tSendHardReset*.

tSendHardReset applies to the expiration of:

- *SenderResponseTimer*,
- *SourcePPSCommTimer* or
- *SourceEPRKeepAliveTimer*

(d). Section 6.6.11

To Text:

7.31.10.6 *tInitiateErrorRecovery*

When an event or timer expiration leads to **ErrorRecovery**, the **ErrorRecovery** State **shall** be entered within *tInitiateErrorRecovery*.