

USB4 2.0 ENGINEERING CHANGE NOTICE FORM

Title: Notification Packet Retry Limit
Applied to: USB4 Specification Version 2.0

Brief description of the functional changes:

Allowing to have non-infinite number of retries for Notification Packets
--

Benefits as a result of the changes:

The current specification definition mandates infinite retries on some Notification Packets which can be redundant and wasteful in resources (CM time, Ring entries).

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

NA

An analysis of the hardware implications:
--

NA

An analysis of the software implications:
--

NA

An analysis of the compliance testing implications:
--

Dedicated test can be added for the new Capability. CV tests validating the number of supported Capabilities should be updated to support the new Capability (e.g. TD 8.101).
--

USB4 2.0 ENGINEERING CHANGE NOTICE FORM

Actual Change

(a). Section 6.6 Notification Acknowledgement

From Text:

A Router shall retransmit a Notification Packet that requires a Notification Acknowledgment if a Notification Acknowledgment Packet is not received within the time specified by the Notification Timeout field in Router Configuration Space. A Router shall retransmit a Notification Packet until a Notification Acknowledgment is received for it.

A Router shall not send a Notification Packet for a different event that requires a Notification Acknowledgment while a previous packet that requires a Notification Acknowledgment is pending (i.e. before a Notification Acknowledgment Packet or an Enhanced Notification Acknowledgment Packet is received).

A Router may send Notification Packets that do not require a Notification Acknowledgment while a previous packet that requires a Notification Acknowledgment is pending.

To Text:

A Router shall retransmit a Notification Packet that requires a Notification Acknowledgment if a Notification Acknowledgment Packet is not received within the time specified by the *Notification Timeout* field in Router Configuration Space. A Router shall retransmit a Notification Packet **that requires a Notification Acknowledgment until a Notification Acknowledgment is received for it when the Notification Retry Limit Capability is Disabled or not supported. When the Notification Retry Limit Capability is Enabled, a Router shall retransmit a Notification Packet that requires a Notification Acknowledgment until either a Notification Acknowledgment is received for it or the *Notification Retry Limit* is reached (see Section 8.3.1.3.2.4).**

A Router shall not send a Notification Packet for a different event that requires a Notification Acknowledgment while a previous packet that requires a Notification Acknowledgment is pending (i.e. before a Notification Acknowledgment Packet or an Enhanced Notification Acknowledgment Packet is received).

A Router may send Notification Packets that do not require a Notification Acknowledgment while a previous packet that requires a Notification Acknowledgment is pending.

(b). Section 6.8 Hot Plug and Hot Unplug Events

From Text:

A Router expects a Hot Plug Acknowledgment Packet from the Connection Manager in response to a Hot Plug Event Packet. A Router shall retransmit a Hot Plug Event Packet if a Hot Plug Acknowledgment Packet acknowledging the Hot Plug or the Hot Unplug Event is not received within the time specified by the Notification Timeout field in Router Configuration Space.

A Router only reports one Hot Plug or Unplug event at a time. A Router shall not send a Hot Plug Event Packet for a new Hot Plug Event from any Adapter until it receives a Hot Plug Acknowledgment Packet for the previous Hot

USB4 2.0 ENGINEERING CHANGE NOTICE FORM

Plug/Unplug Event. A Router shall not send a Hot Unplug Event Packet for a new Hot Plug Event from any Adapter until it receives a Hot Plug Acknowledgment Packet for the previous Hot Plug/Unplug Event.

After receiving a Hot Plug Acknowledgment Packet, a Router shall not send any additional Hot Plug Event Packets for that Hot Plug/Unplug Event. A Router shall ignore a Hot Plug Acknowledgment Packet for a Hot Plug/Unplug Event that was already acknowledged.

To Text:

A Router expects a Hot Plug Acknowledgment Packet from the Connection Manager in response to a Hot Plug Event Packet. A Router shall retransmit a Hot Plug Event Packet if a Hot Plug Acknowledgment Packet acknowledging the Hot Plug or the Hot Unplug Event is not received within the time specified by the *Notification Timeout* field in Router Configuration Space, **when the Notification Retry Limit Capability is Disabled or not supported. When the Notification Retry Limit Capability is Enabled, a Router shall retransmit a Hot Plug Event Packet until either a Hot Plug Acknowledgment Packet is received for it, or the *Notification Retry Limit* is reached (see Section 8.3.1.3.2.4).**

A Router only reports one Hot Plug or Unplug event at a time. A Router shall not send a Hot Plug Event Packet for a new Hot Plug Event from any Adapter until it receives a Hot Plug Acknowledgment Packet for the previous Hot Plug/Unplug Event. A Router shall not send a Hot Unplug Event Packet for a new Hot Plug Event from any Adapter until it receives a Hot Plug Acknowledgment Packet for the previous Hot Plug/Unplug Event.

After receiving a Hot Plug Acknowledgment Packet, a Router shall not send any additional Hot Plug Event Packets for that Hot Plug/Unplug Event. A Router shall ignore a Hot Plug Acknowledgment Packet for a Hot Plug/Unplug Event that was already acknowledged.

(c). Section 8.3.1.3.2 Get Capabilities (Conditional)

From Text:

Table 8-51. List of Capabilities

Capability Index	Capability Name	# of Data DWs returned	Default State	Reference
01h	Hot Plug Failure Indication	0	Disabled	Section 8.3.1.3.2.1
02h	Sequence bit in Notification Packet	0	Disabled	Section 8.3.1.3.2.2
03h	Buffer Allocation Per USB4 Port	0	Disabled	Section 8.3.1.3.2.3
04h – FFh	Reserved	--	--	N/A

To Text:

USB4 2.0 ENGINEERING CHANGE NOTICE FORM

Table 8-51. List of Capabilities

Capability Index	Capability Name	# of Data DWs returned	Default State	Reference
01h	Hot Plug Failure Indication	0	Disabled	Section 8.3.1.3.2.1
02h	Sequence bit in Notification Packet	0	Disabled	Section 8.3.1.3.2.2
03h	Buffer Allocation Per USB4 Port	0	Disabled	Section 8.3.1.3.2.3
04h	Notification Retry Limit	1	Disabled	Section 8.3.1.3.2.4
05h-FFh	Reserved	--	--	N/A

(d). Section 8.3.1.3.2.4 Notification Retry Limit

This capability enables to limit the number of retry attempts for Notification Packets and Hot Plug Event Packets that require an Acknowledgment.

This capability returns a single Data DW as described in the table below:

Field	Bit(s)	Description
Notification Retry Limit	7:0	The value in this field represents the number of retry attempts performed for Notification Packets that require an Acknowledgment. The value of 0 is used for having no retry attempts. Note: disabling this Capability results in infinite retry attempts.
Reserved	31:8	

(e). Section 8.3.1.3.3 Set Capabilities (Conditional)

From Text:

Table 8-53. List of Capabilities

Capability Index	Capability Name	# of Data DWs written	Reference
01h	Hot Plug Failure Indication	0	Section 8.3.1.3.2.1
02h	Sequence bit in Notification Packet	0	Section 8.3.1.3.2.2
03h	Buffer Allocation Per USB4 Port	0	Section 8.3.1.3.2.3
04h – FFh	Reserved	--	N/A

To Text:

USB4 2.0 ENGINEERING CHANGE NOTICE FORM

Table 8-53. List of Capabilities

Capability Index	Capability Name	# of Data DWs written	Reference
01h	Hot Plug Failure Indication	0	Section 8.3.1.3.2.1
02h	Sequence bit in Notification Packet	0	Section 8.3.1.3.2.2
03h	Buffer Allocation Per USB4 Port	0	Section 8.3.1.3.2.3
04h	Notification Retry Limit	1	Section 8.3.1.3.2.4
05h-FFh	Reserved	--	N/A