

USB4 2.0 ENGINEERING CHANGE NOTICE FORM

Title: USB3 Gen T Isochronous Deprecation
Applied to: USB4 Specification Version 2.0

Brief description of the functional changes:
Deprecation of USB3 Gen T Isochronous support

Benefits as a result of the changes:
Reduce the complexity of implementing USB4 V2 Hosts and Devices

An assessment of the impact to the existing revision and systems that currently conform to the USB specification:
None – USB3 Gen T Isochronous not yet supported in the ecosystem

An analysis of the hardware implications:
Devices that need Isochronous Endpoints: Support using USB3 Gen X

An analysis of the software implications:
None

An analysis of the compliance testing implications:
None

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Actual Change

(a)Section 9.4.2.1 Transaction, Data, Isochronous Timestamp Packets

From Text:

The size of the *Seq Num* and *NumP* fields are increased in all TPs and DPHs when tunneling USB3 Gen T traffic. The *CRC-16* field in all TP, DPH, and ITP is deprecated and shall be set to zero.

To Text:

The size of the *Seq Num* and *NumP* fields are increased in all TPs and DPHs when tunneling USB3 Gen T traffic. The *CRC-16* field in all TP, DPH, and ITP is deprecated and shall be set to zero. **In addition, Isochronous Transfers are not supported in a USB4 Device tunneling USB3 Gen T traffic, the Transfer Type (TT) field setting for the Isochronous Transfer Type is deprecated and shall be Reserved.**

(b)Table 9 14. ACK TP Format

From Table:

Width (bits)	Offset (DW:bit)	Description
7	1:16	Number of Packets (NumP). This field is used to indicate the number of Data Packet buffers that the receiver can accept. The value in this field shall be less than or equal to the maximum burst size supported by the endpoint as determined by the value in the <i>bMaxBurst</i> field in the Endpoint Companion Descriptor (refer to Section 9.4.3.4).
8	1:23	Reserved.
7	2:16	Sequence Number (Seq Num). This field is used to identify the sequence number of the next expected data packet.
1	2:23	Reserved.
16	3:0	Reserved.

To Table:

Width (bits)	Offset (DW:bit)	Description																		
3	1:12	Transfer Type (TT). When operating in SuperSpeed mode, the value of this field is Reserved and shall be set to zero. When operating in SuperSpeedPlus mode, this field is defined as follows: <table><tr><th><u>Value</u></th><th><u>Meaning</u></th></tr><tr><td>100b</td><td>Control Transfer Type</td></tr><tr><td>101b</td><td>Reserved</td></tr><tr><td>110b</td><td>Bulk Transfer Type</td></tr><tr><td>111b</td><td>Interrupt Transfer Type</td></tr><tr><td>001b</td><td>Reserved</td></tr><tr><td>010b</td><td>Reserved</td></tr><tr><td>011b</td><td>Reserved</td></tr><tr><td>000b</td><td>Unknown for ACKs and deferred DPs originating from SuperSpeed bus instances. Reserved for all other ACKs and DPs. Refer to chapter 10.</td></tr></table>	<u>Value</u>	<u>Meaning</u>	100b	Control Transfer Type	101b	Reserved	110b	Bulk Transfer Type	111b	Interrupt Transfer Type	001b	Reserved	010b	Reserved	011b	Reserved	000b	Unknown for ACKs and deferred DPs originating from SuperSpeed bus instances. Reserved for all other ACKs and DPs. Refer to chapter 10.
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8	1:23	Reserved.
7	2:16	Sequence Number (Seq Num). This field is used to identify the sequence number of the next expected data packet.
1	2:23	Reserved.
16	3:0	Reserved.

(c)Section 9.4.2.4 USB3 Gen T Bulk/Interrupt IN and OUT Transactions From Text:

An Internal USB3 Gen T Component shall follow the rules defined in the USB 3.2 Specification for a SuperSpeedPlus Device with respect to Bulk and Interrupt IN/OUT transactions, except that the sequence number shall wrap around at 127 instead of 31.

To Text:

An Internal USB3 Gen T Component shall follow the rules defined in the USB 3.2 Specification for a SuperSpeedPlus Device with respect to Bulk and Interrupt IN/OUT transactions, except that the sequence number shall wrap around at 127 instead of 31.

Note: USB3 Gen T Interrupt endpoints can be allocated up to 70% of the total available bandwidth on the USB4 Link.

(d)Section 9.4.2.6 USB3 Gen T Isochronous Transactions From Text:

An Internal USB3 Gen T Component shall follow the rules defined in the USB 3.2 Specification for a SuperSpeedPlus Device with respect to Isochronous transactions, except for the following:

- The sequence number shall wrap around at 127 instead of 31.
- A USB3 Gen T Host Port shall be able to accept and send up to 96 DPs per endpoint per bus interval when tunneling USB3 Gen T traffic.

Note: Periodic endpoints can be allocated up to 70% of the total available bandwidth on the USB4 Link.

To Text:

Isochronous Transfers are not supported in a USB4 Device tunneling USB3 Gen T traffic, and this section is deprecated.

(e)Section 9.4.3.5 SuperSpeedPlus Isochronous Endpoint Companion Descriptor From Text:

An Internal USB3 Gen T Peripheral shall return a SuperSpeed Isochronous Endpoint Companion Descriptor as part of its Configuration Descriptor if it includes an Isochronous Endpoint. The SuperSpeed Isochronous Endpoint Companion Descriptor shall have the same definition as described in the USB 3.2 Specification with the maximum value in the *dwBytesPerInterval* field limited to (MAX_ISO_BYTES_PER_BI_GEN1 x 2).

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To Text:

An Internal USB3 Gen T Peripheral shall not return a SuperSpeed Isochronous Endpoint Companion Descriptor as part of its Configuration Descriptor.