USB 3.2 ENGINEERING CHANGE NOTICE

Title: UFP Exit Condition Clarification
Applied to: USB 3.2_r1.0 Sep. 22, 2017

Brief description of the functional changes:

Incorrect description of Hub UFP behavior from eSS.Disabled to Rx.Detect.
Adding a new transition condition to peripheral UFP behavior from eSS.Disabled to Rx.Detect to accommodate for PD USB data reset.

Benefits as a result of the changes:

Match hub description in chapter 10 and PD data reset.

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

None. Hub implementations follow chapter 10.
Peripheral device compliant to PD should add this transition condition.

An analysis of the hardware implications:

Most likely none since hub implementations follow chapter 10.

An analysis of the software implications:

None

An analysis of the compliance testing implications:

None. Hub UFP tested in hub compliance. Peripheral device tested in Type C functional compliance test.

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Actual Change

(a). From Text: Section 7.5.1.1

7.5.1.1   eSS.Disabled for Downstream Ports and Hub Upstream Ports

eSS.Disabled for Downstream Ports and Hub Upstream Ports does not contain any substates.

7.5.1.1.1   eSS.Disabled Requirements

- V_{BUS} may be present during eSS.Disabled.
- The port's receiver termination shall present high impedance to ground of $Z_{RX\text{-}HIGH\text{-}IMP\text{-}DC\text{-}POS}$ defined in Table 6-21.
- The port shall be disabled from transmitting and receiving LFPS and Enhanced SuperSpeed signals.

7.5.1.1.2   Exit from eSS.Disabled

- A downstream port shall transition to Rx.Detect when directed.
- An upstream port shall transition to Rx.Detect only when V_{BUS} transitions to valid or a USB 2.0 bus reset is detected.

(a). To Text: Section 7.5.1.1

7.5.1.1   eSS.Disabled for Downstream Ports and Hub Upstream Ports

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7.5.1.1.2   Exit from eSS.Disabled

- A downstream port shall transition to Rx.Detect when directed.
- An upstream port shall transition to Rx.Detect when V_{BUS} transitions to valid or when directed.

(b). From Text: Section 7.5.1.2

7.5.1.2   eSS.Disabled for Upstream Ports of Peripheral Devices

eSS.Disabled of a peripheral device operates similarly to hub upstream ports, except that it only attempts a limited number of Enhanced SuperSpeed attempts upon USB 2.0 bus reset.

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7.5.1.2.1   eSS.Disabled Substate Machine

eSS.Disabled of a peripheral device has two substates shown in Figure 7-15.

- eSS.Disabled.Default
- eSS.Disabled.Error

eSS.Disable.Default is a logical power-off state for a self-powered peripheral device.

7.5.1.2.2   eSS.Disabled Requirements

The requirements of a peripheral upstream port are the same as defined in Section 7.5.1.1.1. In addition, a peripheral upstream port shall implement a tDisabledCount counter. The operation of the tDisabledCount counter shall meet the following requirement.

- The tDisabledCount counter shall be reset to zero upon one of the following two conditions:
    1. Invalid V$_{BUS}$
    2. Successful port configuration exchange
- The tDisabledCount counter shall be incremented upon entry to eSS.Disabled.Default.

7.5.1.2.3   Exit from eSS.Disabled.Default

- A peripheral upstream port shall transition to Rx.Detect if one of the following conditions are met:
    1. When V$_{BUS}$ transitions to valid.
    2. When a USB 2.0 bus reset is detected and tDisabledCount is less than 3.
- A peripheral upstream port shall transition to eSS.Disabled.Error if tDisabledCount is 3.

(b). To Text: Section 7.5.1.2

7.5.1.2   eSS.Disabled for Upstream Ports of Peripheral Devices

eSS.Disabled of a peripheral device operates similarly to hub upstream ports, except that it only attempts a limited number of Enhanced SuperSpeed attempts upon USB 2.0 bus reset.

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    2. Successful port configuration exchange

- The tDisabledCount counter shall be incremented upon entry to eSS.Disabled.Default.

7.5.1.2.3   Exit from eSS.Disabled.Default

- A peripheral upstream port shall transition to Rx.Detect if one of the following conditions are met:

  1. When V_{BUS} transitions to valid.

  2. When a USB 2.0 bus reset is detected and tDisabledCount is less than 3.

  3. When directed.

- A peripheral upstream port shall transition to eSS.Disabled.Error if tDisabledCount is 3.