USB Type-C ENGINEERING CHANGE NOTICE

Title: FSM figure to text discrepancies
Applied to: USB Type-C Specification Release 1.1.

Brief description of the functional changes:

Correct discrepancies between State Machine figures and text. For 1 & 5, change text. For 2, 3, 4 & 6, change figure. There is no figure to text discrepancy for #7. It is simply wrong. Correct example sequence case 2 text.

1. When in AudioAccessory state and AudioAcc Removed, Figure 4-16, DRP with Accessory, shows a transition to Unattached.SRC then to Unattached.SNK. Section 4.5.2.2.13.2 states that the transition should be directly to Unattached.SNK.

2. When in AudioAccessory and AudioAcc Removed, Figure 4-14, Sink with Accessory, shows a transition to Unattached Sink with no debounce. Section 4.5.2.2.13.2 states that the transition must be debounced for at least tCCDebounce.

3. When in Try.SRC state and sink detected, Figure 4-16, DRP with Accessory, shows a transition to Attached.SRC with no debounce. Section 4.5.2.2.9.2 states that the transition should be debounced for at least tPDDebounce.

4. When in AttachWait.SNK as DRP with Accessory shown in figure 4-16, and the Source is Removed -> The transition to Unattached.SRC indicates tPDDebounce in text but not in figure.

5. When in DebugAccessory state and DebugAcc Removed, Figure 4-16, DRP with Accessory, shows a transition to Unattached.SRC then to Unattached.SNK. Section 4.5.2.2.13.2 states that the transition should be directly to Unattached.SNK.

6. The exit from TryWait.SNK to Unattached.SNK shown in figure 4-16 includes VBUS as a condition, but the text in section 4.5.2.2.10.2 does not.

7. Correction to example sequence case 2 defined in 4.5.3.1.4.

Benefits as a result of the changes:

Ensure desired implementation, especially when connecting a Sink to a Source that implements Power Delivery or when connecting as Source from Try.SRC.

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

none.

An analysis of the hardware implications:

Any Sink or DRP State Machine that does not debounce a disconnect from AttachWait.SNK for at least tPDDebounce or DRP that does not wait tPDDebounce when transitioning from Try.SRC to Attached.SRC will need to be updated. Otherwise, there should be no impact.

An analysis of the software implications:

None

USB Type-C ENGINEERING CHANGE NOTICE

An analysis of the compliance testing implications:

Depends whether compliance tests follow text or figures. Recommend only flagging failures related to discrepancies as warnings.

USB Type-C ENGINEERING CHANGE NOTICE

Actual Change

Change #1.
Section 4.5.2.2.13.2 Exiting from AudioAccessory State

From Text:
If the port is a Sink or DRP, the port shall transition to Unattached.SNK when the state of the monitored CC pin(s) is SRC.Open for at least tCCDebounce.

If the port is a Source, the port shall transition to Unattached.SRC when the state of the monitored CC pin(s) is SRC.Open for at least tCCDebounce.

To Text:
If the port is a Sink, the port shall transition to Unattached.SNK when the state of the monitored CC pin(s) is SRC.Open for at least tCCDebounce.

If the port is a Source or DRP, the port shall transition to Unattached.SRC when the state of the monitored CC pin(s) is SRC.Open for at least tCCDebounce.

Change #5.
Section 4.5.2.2.14.2 Exiting from DebugAccessory State

From Text:
If the port is a Sink or DRP, the port shall transition to Unattached.SNK when the SRC.Open state is detected on the monitored CC pin(s).

If the port is a Source, the port shall transition to Unattached.SRC when the SRC.Open state is detected on the monitored CC pin(s).

To Text:
If the port is a Sink, the port shall transition to Unattached.SNK when the SRC.Open state is detected on the monitored CC pin(s).

If the port is a Source or DRP, the port shall transition to Unattached.SRC when the SRC.Open state is detected on the monitored CC pin(s).

Change #7.
Section 4.5.3.1.4 DRP to DRP Behavior
Case 2.

From Text:
6. DRP #1 transitions from Attached.SRC to Unattached.SNK to AttachWait.SNK
   - DRP #1 in Attached.SRC no longer detects DRP #2's pull-down on CC and transitions to Unattached.SNK.
   - DRP #1 in Unattached.SNK turns off VBUS and VCONN and applies a pull-down on CC

- DRP #2 in Unattached.SNK detects pull up on a CC and enters AttachWait.SNK
7. DRP #2 transitions from Try.SRC to Attached.SRC via AttachWait.SRC
    - DRP #2 in Try.SRC detects the DRP #1 in Unattached.SNK's pull-down on CC and enters AttachWait.SRC
    - DRP #2 in AttachWait.SRC times out (tCCDebounce) and transitions to Attached.SRC
    - DRP #2 in Attached.SRC turns on VBUS and VCONN

To Text:

6. DRP #1 transitions from Attached.SRC to Unattached.SNK to AttachWait.SNK
    - DRP #1 in Attached.SRC no longer detects DRP #2's pull-down on CC and transitions to Unattached.SNK.
    - DRP #1 in Unattached.SNK turns off VBUS and VCONN and applies a pull-down on CC
    - DRP #~~2~~ 1 in Unattached.SNK detects pull up on a CC and enters AttachWait.SNK
7. DRP #2 transitions from Try.SRC to Attached.SRC ~~via AttachWait.SRC~~
    - DRP #2 in Try.SRC detects the DRP #1 in Unattached.SNK's pull-down on CC for tPDDebounce and enters ~~AttachWait.SRC~~
    - ~~DRP #2 in AttachWait.SRC times out (tCCDebounce) and transitions to~~ Attached.SRC
    - DRP #2 in Attached.SRC turns on VBUS and VCONN

USB Type-C ENGINEERING CHANGE NOTICE

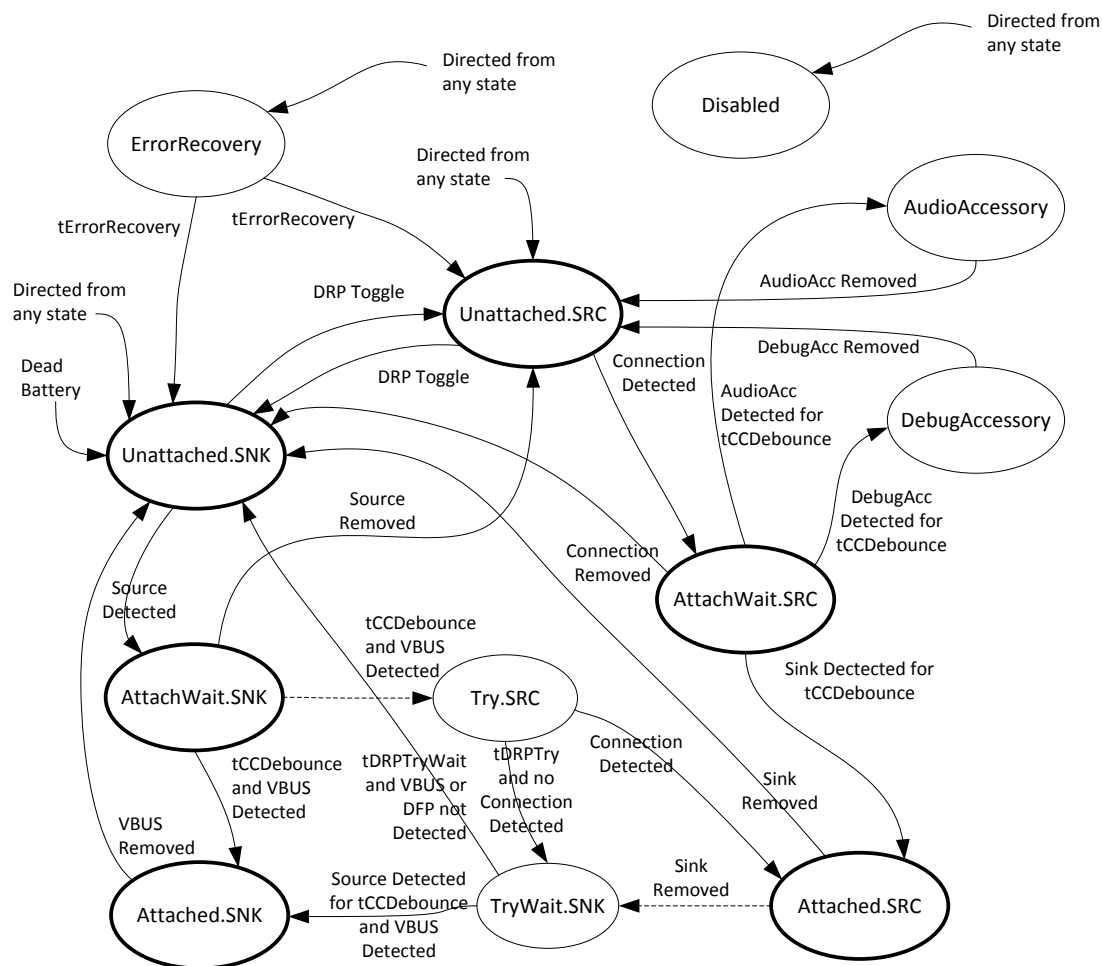## Changes 2, 3, 4 & 6.
Figure 4-16 DRP with Accessory

From:

Figure 4-16, DRP with Accessory, shows the transition from Try.SRC to Attached.SRC with no debounce.

Figure 4-16, DRP with Accessory, shows the transition from AudioAccessory to Unattached.SRC with no debounce.

Figure 4-16, DRP with Accessory, includes VBUS not detected for exit from TryWait.SNK to Unattached.SNK.

Figure 4-16, DRP with Accessory, shows the transition from AttachWait.SNK to Unattached.SRC with no debounce.

USB Type-C ENGINEERING CHANGE NOTICE

Add tPDDebounce to Figure 4-16, DRP with Accessory, for the transition from Try.SRC to Attached.SRC.

Add tCCDebounce to Figure 4-16, DRP with Accessory, for the transition from AudioAccessory to Unattached.SRC.

Remove VBUS not detected from Figure 4-16, DRP with Accessory, for exit from TryWait.SNK to Unattached.SNK.

Add tPDDebounce to Figure 4-16, DRP with Accessory, for the transition from AttachWait.SNK to Unattached.SRC.