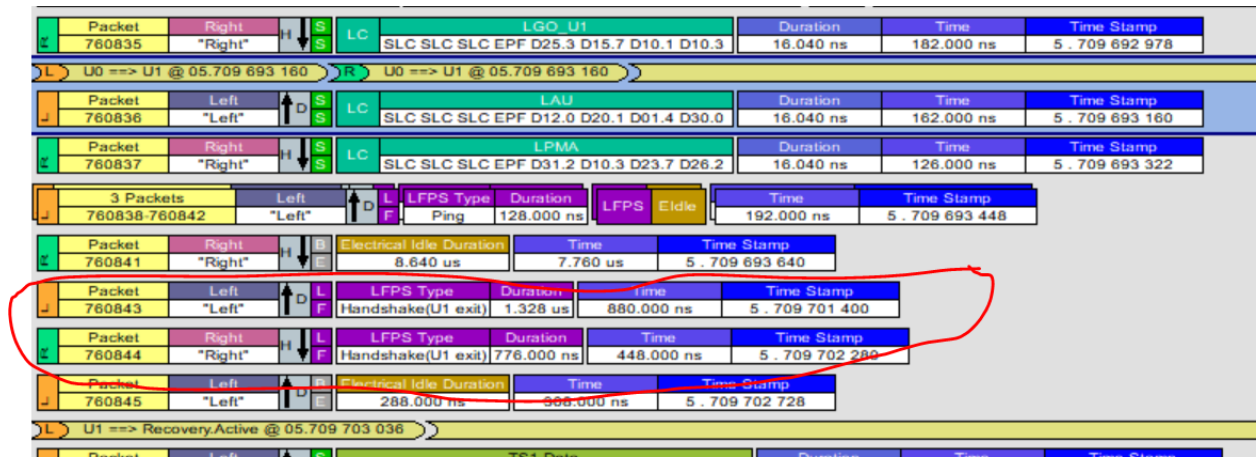


We have analyzed a typical working case and your case as follows:

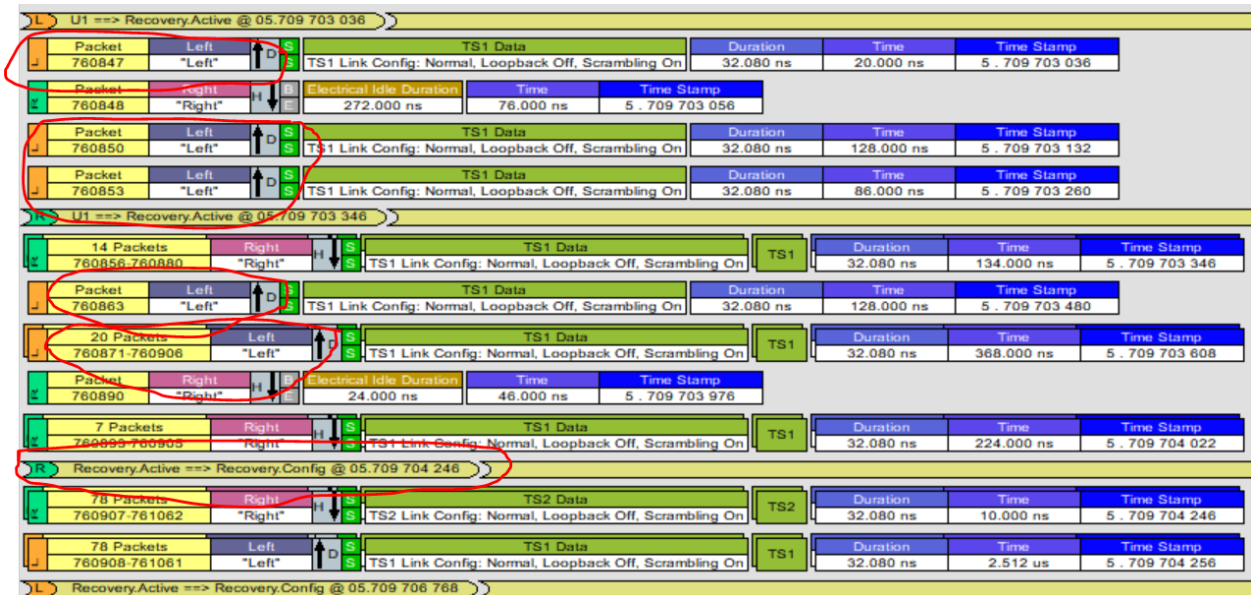
A typical U1 to U0 Sequence is mentioned below:

- Both the ports (UpStream and DownStream) exit from the U1 state after exchanging the LFPS handshake (U1_Exit) and enter to Recovery.Active. The following snapshots are taken with FX3 Explorer Kit and Intel Host Controller.

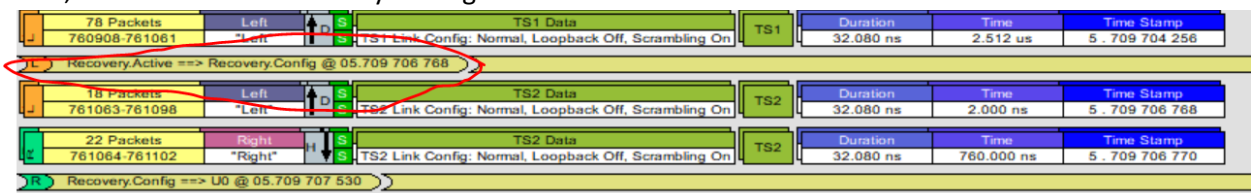
Note that either device or host can initiate the U1 Exit. Hence, either device or host can start sending TS1 and enter into Recovery.Active state. In this case, device initiated the U1 exit hence device started sending TS1 first. (Here, R is the host and L is the device)



- The port in SuperSpeed operation shall transition to Recovery.Configuration after eight consecutive and identical TS1 or TS2 ordered sets are received. In this, the host entered to Recovery. Configuration first as shown below.



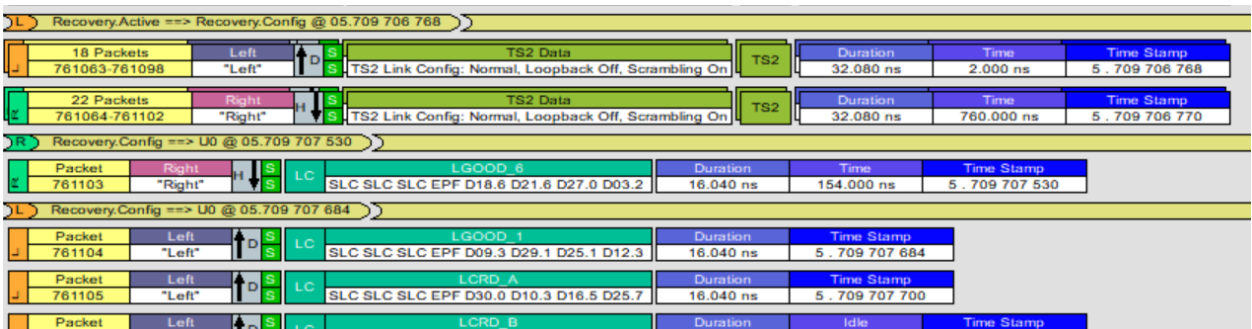
3. Later, device enters to Recovery. Configuration as shown below



4. The port in SuperSpeed operation shall transition to Recovery.Idle after the following two conditions are met:

- Eight consecutive and identical TS2 ordered sets are received.
- Sixteen TS2 ordered sets are sent after receiving the first of the eight consecutive and identical TS2 ordered sets.

5. Note that we cannot see Recovery.Idle in the Trace. We can see that the device and host enter into U0 instead. Below is snapshot showing the same.



Let us analyze your case.

1. In your case, host initiated U1 Exit then start sending TS1 and enter into Recovery.Active state.
The snapshot is shown below:

Packet	Direction	Protocol	Duration	Time	Time Stamp
10792285	Left	LAU	16.040 ns	194.000 ns	19.148.723.420
10792286	Right	LPMA	16.040 ns	284.000 ns	19.148.723.614
10792288	Right	Electrical Idle Duration	94.688 us	168.000 ns	19.148.723.898
10792290	Left	Electrical Idle Duration	94.984 us	94.520 us	19.148.724.066
10792291	Right	LFPS Type Handshake(U1 exit)	960.000 ns	464.000 ns	19.148.818.586
10792292	Left	LFPS Type Handshake(U1 exit)	800.000 ns	496.000 ns	19.148.819.050
10792293	Right	Electrical Idle Duration	288.000 ns	304.000 ns	19.148.819.546
10792295	Left	Electrical Idle Duration	254.000 ns	4.000 ns	19.148.819.850

2. Device has seen 8 consecutive and identical TS1 from the host and entered into Recovery.Config. Then Device started sending TS2s.

Packet	Direction	Protocol	Duration	Time	Time Stamp
10792304	Right	TS1 Data	32.080 ns	276.000 ns	19.148.819.854
10792306-10792504	Left	TS1 Data	32.080 ns	12.000 ns	19.148.820.130
10792307-10792505	Right	TS1 Data	32.080 ns	3.208 us	19.148.820.142
10792306-10792504	Left	TS2 Data	32.080 ns	20.000 ns	19.148.823.350
10792506-10793045	Left	TS2 Data	32.080 ns	20.000 ns	19.148.823.350
10792507-10793044	Right	TS1 Data	32.080 ns	8.660 us	19.148.823.370

3. Later, host seen 8 consecutive and identical TS1 from device then entered into Recovery.Config. Then Host started sending TS2s

Packet	Direction	Protocol	Duration	Time	Time Stamp
10793046-10793080	Right	TS2 Data	32.080 ns	28.000 ns	19.148.832.050
10793047-10793086	Left	TS2 Data	32.080 ns	588.000 ns	19.148.832.078
10793083-10979078	Right	TS1 Data	32.080 ns	2.005 ms	19.148.832.666
10855255	Left	Electrical Idle Duration	29.346 ms	3.994 ms	19.150.838.018

4. In above snapshot, we can see that the host has sent TS2 after entering into Recovery. Config. Then it sent TS1, which is abnormal behavior of the host controller. Once the port starts sending TS2s after entering Recovery.Config, it should not send TS1 again. You can also see that the device is continuously sending TS2s as expected.

The work around for this host problem is – Disabling the Low Power Entry using LpmDisable in the right place in the firmware:

If you call LPMDisable in SET_CONFIG as done USB Bulkloop example FW, the device will fail the compliance test.

You need to call LPMDisable just before the data transfer starts. You can send a vendor command for the doing the same OR you can handle it in DMA Producer Event based on Timer (Start the timer in application start and reset in the DMA_Producer Event. If the timer expires, it means there is no data transfer, then enable the LPM by calling LPMEnable API) in the case of USB Bulk Loop example. You need configure the DMA as Manual DMA Channel to get DMA_Producer Event.

However, since your application is UVC, please refer to AN75779 example firmware. Here, we have called LPMDisable in `CyFxUvcAppLnStart`, which is called when there is STREAM_START Event from the host.