TBS Encoder NDI | HX Latency Testing

Preparing:

1.Source Device: Android box and installed "clock" app

2.2x Encoder/Decoder TBS2603au, unit 1, unit 2

3.PC/Laptop, Monitor (TV set may built-in operating system, and this will increase the latency)

4.Gigabit Network switch

Software Decoding

Testing:

1.Start clock app in Android box side and HDMI out to Splitter, Android box sets to 1080P_60HZ out

2.After Splitter, one signal to Monitor 1, and one as source to TBS2603au

3.Configure TBS2603au to 1080P_60fps, bitrate 10Mbps and NDI | HX out

4.PC/Laptop install "NDI tools---Studio Monitor" to decode TBS2603au NDI | HX stream

5.Compare the clock between "Monitor 1" and "Monitor 2". And this is the TBS2603au NDI | HX latency.
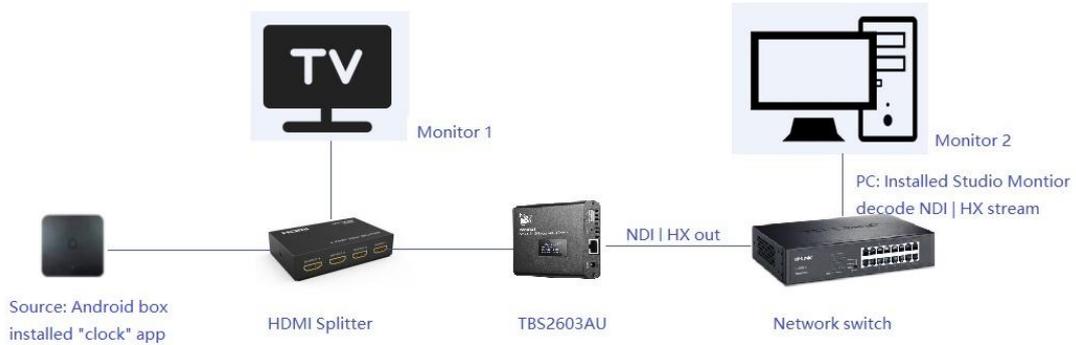
Result:

We'll take 4 samples

Software decoding (Studio Monitor)			
	Source (Monitor 1) clock	Studio Monitor (Monitor 2) clock	latency
sample 1	00:15:34.522	00:15:34.405	117 ms
sample 2	00:16:45.972	00:16:45.845	127 ms
sample 3	00:17:14.338	00:17:14.235	103 ms
sample4	00:32:15.848	00:32:15.721 (hour:minute:second.milisecond)	127 ms
latency (average)			118.5 ms

Hardware Decoding

Testing:

1.Start "clock" app in Android box side, HDMI out to HDMI Splitter, Android box sets to 1080P_60HZ out

2.After "HMDI Splitter", one signal   to Monitor 1, and one as source to TBS2603au

3.Configure TBS2603au unit 1 to 1080P_60fps, bitrate 10Mbps and NDI | HX out

4.TBS2603au unit 2 to decode TBS2603au unit 1 NDI | HX stream and HDMI out to display on Monitor 2

5.Compare the clock between "Monitor 1" and "Monitor 2". And this is the TBS2603au NDI | HX latency.

We'll take 4 samples:

Hardware decoding			
	source (Monitor 1)	decode out (Monitor 2)	latency
sample 1	00:03:07.609	00:03:07.525	84 ms
sample 2	00:05:50.377	00:05:50.292	85 ms
sample 3	00:06:58.742	00:06:58.659	83 ms
sample 4	00:22:34.474	00:22:34.391 (hour:minute:second.milisecond)	83 ms
latency (average)			83.75 ms

In the same network environment, the latency has a close relation with decoder you choose: Software decode or Hardware decode. Compared with software decode, independent hardware decode has enough dedicated resources to complete the decoding processing, which is not affected by the system scheduling and CPU occupation caused by other computer programs. Latency will be greatly reduced.

Normally, "low-latency" is talking about local network. Internet transport is difficult to measure the latency, because that network is complicated. There're too many factors may increase the latency.

For users who have "very low-latency" demand, we recommend TBS Encoder (NDI | HX out) and Decoder (decode NDI | HX).

It should be noted that the latency can be further optimized by reasonably setting the buffer time of the decoder.

The above testing result is suitable for Encoder TBS2603SE, TBS2603au, TBS2605/TBS2650 NDI | HX out.