

System Latency - Total Time Elapsed in Milliseconds, Encode to Decode

	Encoder Vendor Transport Stream
	Decoder Vendor
	Not Supported, no measurement
VALUE	System Latency reported in milliseconds
NS	Not supported
TS#	Transport Stream as defined in accompanying tables.
VBR	Variable Bit Rate Encoding in use.
CBR	Constant Bite Rate Encoding in use
(#)	Indicates a informational note related to the vendors transport stream or decoder results are at the bottom of table.

How to Interpret Results

Explanation of Results: TS2 refers to the Transport Stream 2. The parameters of TS2 may be found in the accompanying documents. TS2 was generated by the HD MPEG-4 encoders listed in the top row. The test results show the system latency result when the specified TS was received by the HD MPEG-4 decoders in the first column. Gray shaded boxes indicate that the encoder did not support the parameters of the TS to be tested.

LATENCY 38Mbps High Quality	Adtec	Ateme	Cisco	ComtechTV	Evertz	Fujitsu	Harmonic	NTT (1)	Tandberg	Thomson
Transport Stream 2 4:2:0, MPEG2 2 PIDs Vendor Latency Description TS Fill Rate	TS2 38 Mbps Normal ~10% fill VBR	TS2 38 Mbps Normal HQ >95% fill CBR	NS	NS	NS	NS	NS	TS2 38 Mbps Standard 22% fill VBR	NS	TS2 38 Mbps Low 94% fill CBR
ComtechTV	494	1095						807		585
Evertz (2,4)	1165	1785						1498		1303
Fujitsu (3)	663	1200						897		797
IDC	995	1568						1282		1086
NTT	718	1285						1005		785
Cisco	654	1231						932		733
Sencore	590	1180						874		705
Tandberg	555	1130						842		642
Thomson	594	1182						876		708

The Transport Stream 2 baseline setup was used with a 4:2:0 setting to maximize decoder numbers. Otherwise NTT was only vendor supporting 4:2:2 decode.

NS - Vendor does not support high bit rates with sufficient transport stream fill factor. VBR vendors do have sufficient fill factor with program video.

Note 1 : NTT Main Profile 4.0 setting used to get all decoders locked. HiP setting caused issues.

Note 2 : Evertz decode of Adtec TS was unusually low, found lip sync on this combination at -670ms. Corrected value = 495ms+670ms

Note 3 : All Fujitsu results measured using decoded video against source audio as MPEG audio decode problems with majority of vendors.

Note 4: Evertz advises firmware update issued in June 2009 to address issues.

LATENCY 20Mbps MidQ-Standard	Adtec	Ateme	Cisco	ComtechTV	Evertz	Fujitsu	Harmonic	NTT	Tandberg	Thomson
Transport Stream 11 4:2:0, MPEG2 2 PIDs Vendor Latency Description TS Fill Rate	TS11 20 Mbps Normal 20% fill VBR	TS11 20 Mbps Normal >95% fill CBR	TS11 20 Mbps Normal >95% fill CBR	TS11 20 Mbps Normal >95% fill CBR	TS11 20 Mbps Default >95% fill CBR	TS11 20 Mbps Standard >95% fill CBR	TS11 20 Mbps Normal >95% fill CBR	TS11 20 Mbps Standard 18% fill VBR	TS11 20 Mbps Standard >95% fill CBR	TS11 20 Mbps Low >95% fill CBR
ComtechTV (4)	523	1095	2413	883	1559	949	1728	786	1672	585
Evertz (1,2,5)	1165	1801	3129	1620	2245	1639	2385	1498	2365	1302
Fujitsu (3)	663	1167	2527	963	1665	1030	1842	897	1798	796
IDC	996	1584	2913	1346	2029	1424	2206	1282	2107	1087
NTT	719	1308	2613	1096	1734	1148	1934	1005	1825	785
Cisco	650	1223	2572	1026	1698	1071	1847	931	1810	734
Sencore	590	1181	2511	990	1628	1043	1807	875	1743	707
Tandberg	556	1145	2474	1258	1595	977	2107	842	1712	642
Thomson	618	1184	2512	996	1632	1044	1816	877	1748	708

Note 1 : Evertz decode of Adtec was unusually low, found lip sync on this combination at -670ms. Corrected value shown = measured value+670ms

Note 2 : Evertz decode of Harmonic was unusually low, visually verified >500ms lip sync component (decoder had pcr errors and offset video). 670ms correction factor applied to result.

Note 3 : All Fujitsu results measured using decoded video against source audio as MPEG audio decode problems with majority of vendors.

Note 4 : Comtech decode of Evertz stream used decoded video against source audio as MPEG audio decode problem.

Note 5 : Evertz advises firmware update issued in June 2009 to address issues.

LATENCY SNG-Low	Adtec	Ateme	Cisco	ComtechTV	Evertz	Fujitsu	Harmonic	NTT	Tandberg	Thomson
Transport Stream 21 4:2:0, MPEG2 2 PIDs Vendor Latency Description TS Fill Rate	TS21 10.3 Mbps Very Low 50% fill VBR	TS21 10.3 Mbps Normal HQ >95% fill CBR	TS21 10.3 Mbps Normal >95% fill CBR	TS21 10.3 Mbps Normal >95% fill CBR	TS21 10.3 Mbps Default >95% fill CBR	TS21 10.3 Mbps Standard >95% fill CBR	TS21 10.3 Mbps Low >95% fill CBR	TS21 10.3 Mbps Low 10-20% fill VBR	TS21 10.3 Mbps Low delay >95% fill CBR	TS21 10.3 Mbps Standard >95% fill CBR
ComtechTV	228	1095	2413	880	1491	949	618	319	914	2847
Evertz (1,3)	898	1795	3129	1589	2176	1645	1277	1013	1629	3540
Fujitsu (2)		1134	2528	997	1597	1030	771	363	997	2994
IDC	729	1578	2913	1240	1964	1429	1087	798	1373	3328
NTT	452	1302	2614	1096	1687	1153	828	522	1112	3020
Cisco	495	1226	2572	1014	1641	1077	759	433	1075	2982
Sencore	341	1179	2538	974	1562	1046	723	404	1019	2943
Tandberg	456	1145	2473	944	1528	977	660	342	989	2894
Thomson	351	1180	2510	982	1562	1045	728	394	1027	2934

Note 1 : Evertz decode of Adtec and Harmonic TS was unusually low, found lip sync on these combination at -670ms. Corrected value shown = measured value+670ms

Note 2 : All Fujitsu results measured using decoded video against source audio as MPEG audio decode problems with majority of vendors.

Fujitsu could not decode Adtec stream sufficiently to get a resultant value.

Note 3: Evertz advises firmware update issued in June 2009 to address issues.

Testing Methodology Note: System Latency measurements have a small lip sync component. This is the result of using the audio from the vendor measured against the source video. In cases where vendor audio decode was an issue, the vendor video was measured against the source audio. This variation in lip sync timing can be examined against the lip sync test results but is typically +/- 60ms of each total time measured. Future testing event measurements will use decoder video against source audio to eliminate this variance. Time restraints prevented retests at this years event.