

Importance of the IEEE 1394 Interface in Cable Operator-Provided High- Definition Set-Top Boxes

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Background: FCC Requirements for 1394

- Section 629 of the Act directs the Commission to “adopt regulations to assure the commercial availability, to consumers of multichannel video programming systems, of ... interactive communications equipment, and other equipment ... from manufacturers, retailers and other vendors not affiliated with any multichannel video programming distributor.”
- “Effective July 1, 2005, [cable operators shall] include both a DVI or HDMI interface and an IEEE 1394 interface on all high-definition set-top boxes (STBs) acquired by a cable operator for distribution to customers.” Section 76.640(b)(4)(ii), adopted in *Cable Plug and Play, Second Report and Order* (2003).
- Service providers have no incentive to provide a standards-based recording interface, or any recording interface at all, absent an FCC mandate. Without such a mandate, consumers would be dependent on cable operator-provided digital recording devices.

Why Maintain IEEE 1394 Mandate?

- **1394 interface is the only interface in the market today that allows consumers to easily record and play back high-definition digital video content to and from retail-purchased digital recording devices via MSO-provided set-top boxes**
 - **Quality of service**
 - 1394 was designed from the ground up to stream video and audio content with guaranteed real-time delivery
 - Ethernet/USB: designed for file sharing, not for audio and video transmission
 - Ethernet/USB requires much greater (and more expensive) processing power and storage in the set-top box, and relies on an expensive host device, such as a computer.
 - **Security**
 - 1394 provides unparalleled content protection.
 - It has never been hacked.
 - MPAA Reply Comments: “...it would be premature for the Commission to choose DLNA over other potential home networking solutions because DLNA cannot guarantee that content will be protected across a home network.”

Why Maintain IEEE 1394 Mandate?

- 1394 is agnostic to the method used for navigation: it supports content from both OCAP and DCR+ bi-directional navigation devices
- 1394 is fully compatible with IP
- 1394 enables consumers to digitally record HD programming to a device with a removable disk, thereby allowing consumers to watch their recorded programming anywhere and anytime
- HDMI and DVI are inadequate
 - Consumers cannot record from an HDMI or DVI interface
 - HDMI and DVI do not support bi-directional services

Will Consumers Use 1394?

- More than 25 million high-definition STBs with 1394 have been deployed already
- 1394 ports are provided in hundreds of millions of other consumer electronics devices
- Consumer usage of 1394 in set-top boxes to date has been disappointing, but not surprising
- Cable operator-provided set-top box does not fully enable 1394 capabilities

Digital Video Recorder (DVR)

Purchased at Retail by the Consumer

- **Uni-Directional**

- Consumer purchases DVR at retail
 - DVR can be either disk-based or hard drive
- MSO provides High-Definition Set-Top Box
- Consumer connects 1394 port in HD STB to 1394 port in DVR
- 1394 port on STB outputs to the DVR
 - *But*, consumer cannot access any of the control functions for the 1394 port from the STB
 - *Thus*, consumer cannot instruct the DVR as to what and when it should record

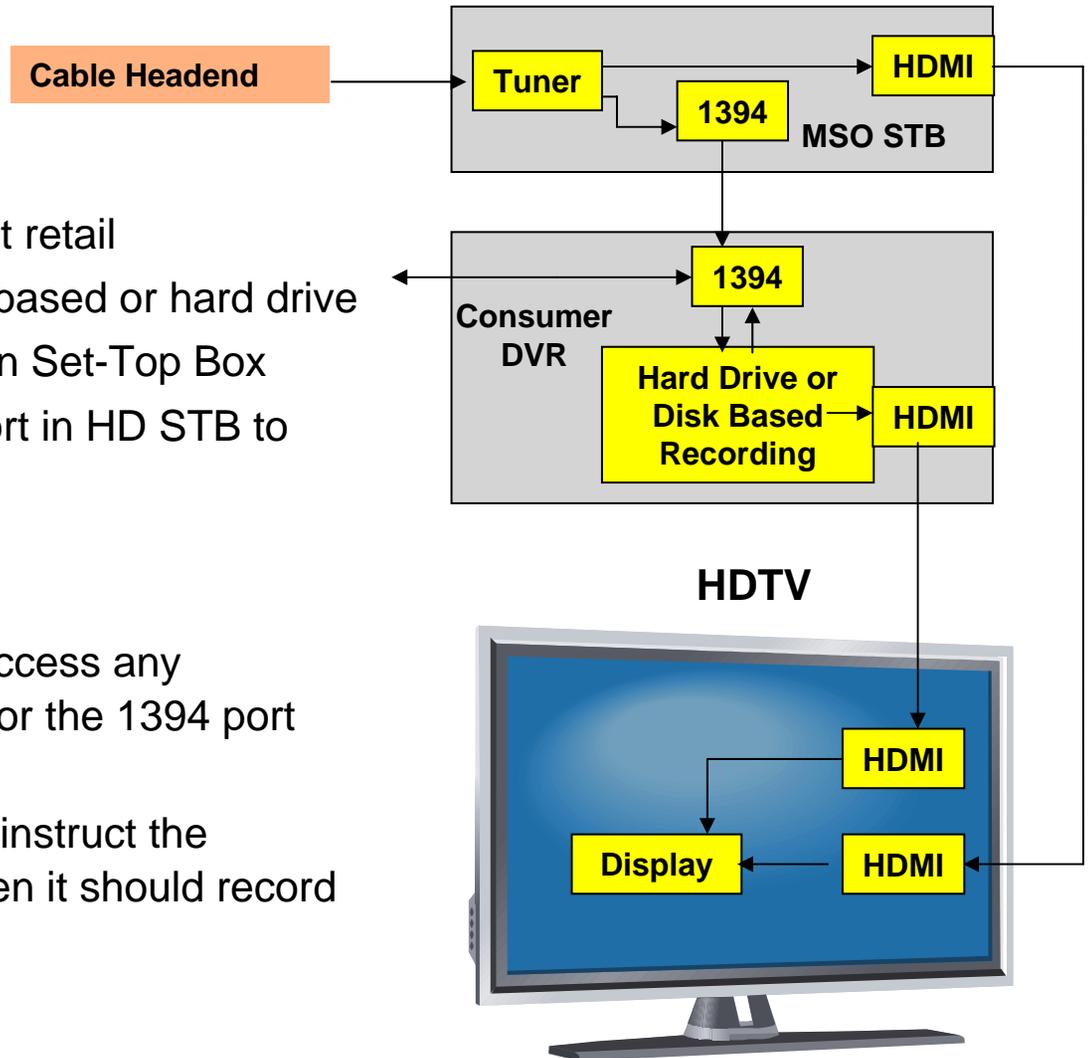


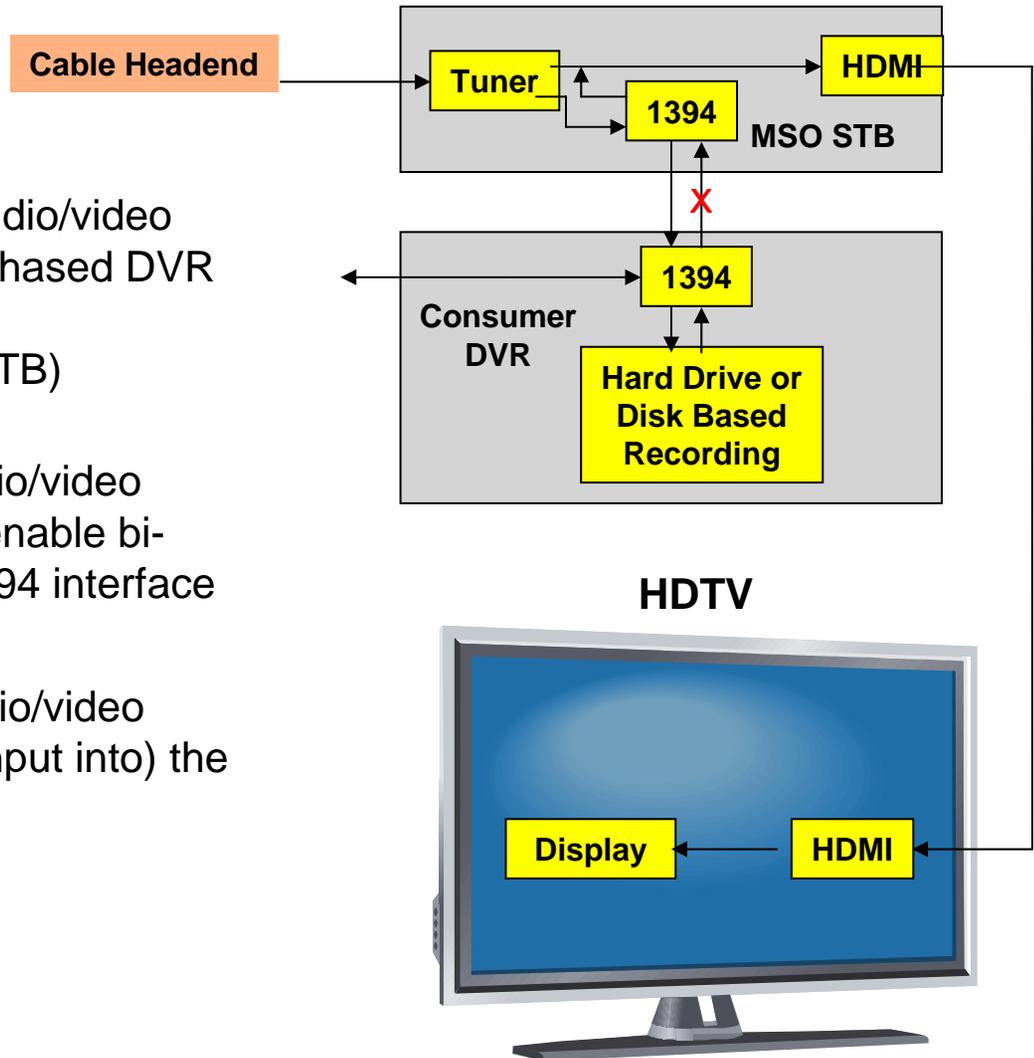
Diagram 1

Digital Video Recorder (DVR)

Purchased at Retail by the Consumer

- **Bi-Directional (Interactive)**

- Consumer seeks to play back audio/video content recorded onto retail purchased DVR on consumer's HDTV (which is attached to the MSO-provided STB)
- Consumer cannot play back audio/video content because STB does not enable bi-directional functionality of the 1394 interface
 - STB does not allow any audio/video content to be received by (input into) the STB via the 1394 port



Will Consumers Use 1394?

Key factors that will drive consumer usage of 1394

- **Interactive (bi-directional) cable services:** maintaining 1394 mandate for two-way plug and play devices is critical. Consumers gain enormous functionality by being able to use the STB to record and play back content recorded on their retail-purchased digital video recording (DVR) devices.
 - With full STB functionality, consumers do not even require a 1394 interface on their TV
- **More content:** content providers are now much more comfortable with security/content protection, and are eager to make more video programming available – iTunes model
- **BluRay wins high-definition DVD format battle:** Consumer uptake of HD digital recording devices should now accelerate rapidly. Consumers will want to record to and play back from their BluRay devices.
 - BluRay recording devices with 1394 are already available in Japan

Conclusion

- The Commission should maintain the requirement that cable operator-provided high-definition set-top boxes include an IEEE 1394 interface for uni-directional and bi-directional (interactive) digital cable services.