

HIGH DEFINITION INTERNET STREAMING VIDEO

Although downloading of full-quality high definition video files has been technically possible for some time, various issues, including rights management, codec availability, and the length of time needed to download large files, have discouraged broadcasters from distributing full-length programs over the Internet using this technology. For nearly a decade, various streaming technologies have been used for Internet video delivery but quality has usually compared poorly to conventional broadcast distribution. In recent years, improvements in coding and streaming technologies, coupled with broadband data connections to the home, have resulted in better quality for Internet video. Broadcast networks and some local stations have taken advantage of this and many full-length shows, as well as short-form material, are now available on line. The following Web sites provide video streaming for programs from the major commercial networks, based on advertiser-supported business models: ABC.com <http://abc.go.com/>, CBS Innertube <http://www.cbs.com/innertube/>, Fox On Demand <http://www.myspace.com/fox>, NBC Video <http://www.nbc.com/video/rewind/>.

Until recently, such streaming services have not supported high definition video and quality has still been very variable. In some cases, programs can be viewed only in a small on-screen window.

On July 24, ABC became the first network to launch Internet streaming of full-length programming in high definition, with a player providing full-screen 16:9 images at significantly higher quality than previously available. The service was launched in beta form, with episodes of *Desperate Housewives*, *Grey's Anatomy*, *Lost*, and *Ugly Betty*, with more programs to follow in the new season later in the year. The ABC HD service is available free of charge to consumers at: <http://dynamic.abc.go.com/streaming/landing>.



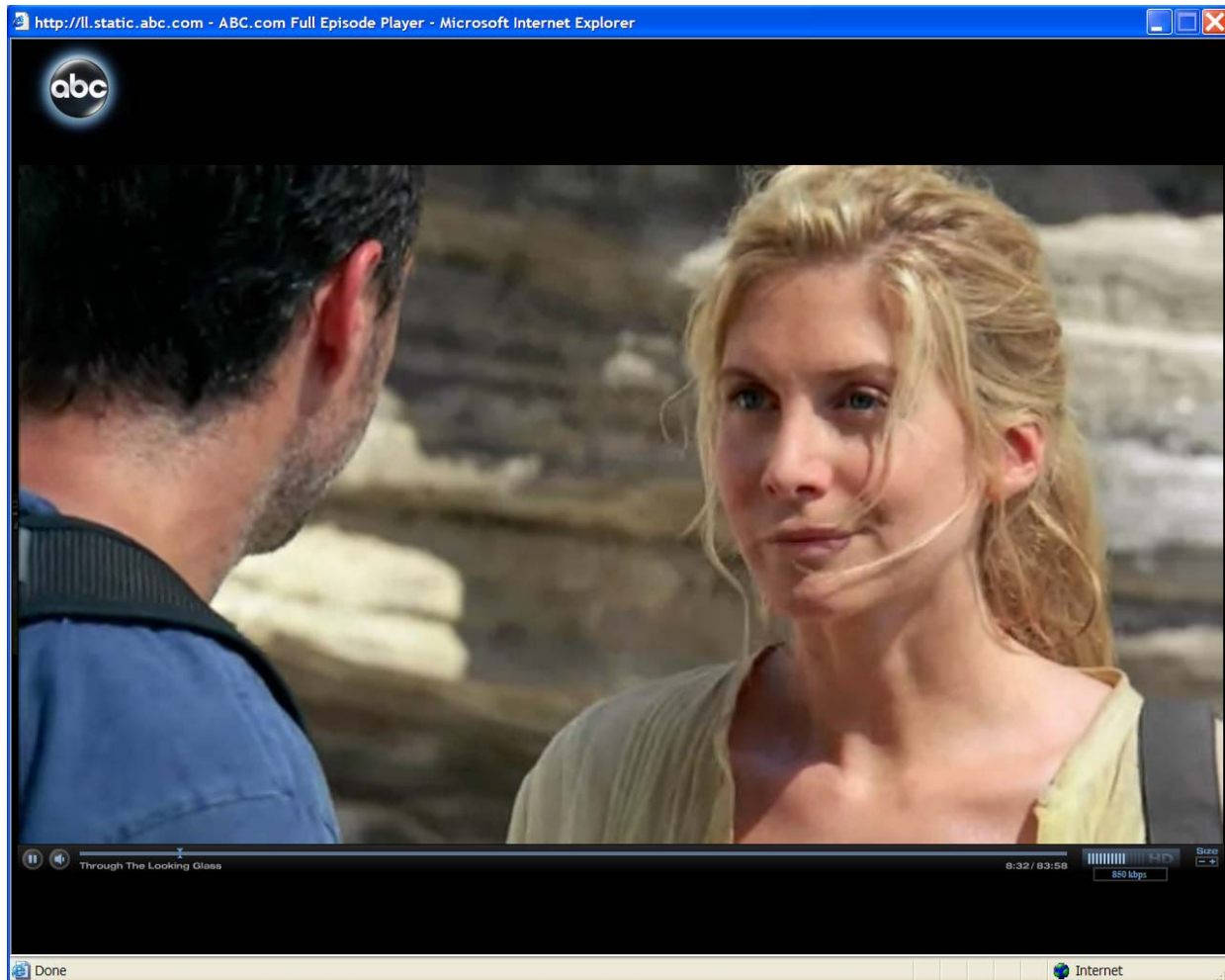


Image from “Lost” captured from HD streaming video on ABC.com

Images from the ABC Web site are shown in the pictures above which were captured on a standard 2.4 GHz Pentium 4 computer, with 500 MB RAM, connected to the NAB office network. The image from *Lost* is a frame captured by Print-Screen from the HD streaming video. For optimum performance, the ABC site recommends a “fast” computer with dual-core processor, 1 GB RAM, 128 MB video RAM and minimum screen resolution of 1300×770, with a large monitor and a minimum Internet connection speed of 2 Mbps.

Video for the HD streaming service is coded at the regular ABC 720p HD resolution of 1280 x 720, 60 frames per second, and is believed to use a bit rate in the 2 Mbps range. A bitrate meter is provided below the picture and shows 850 kbps at the time the image above was captured; the rate varied widely throughout the program, with a maximum indicated of about 2 Mbps. As monitored at the NAB offices, the quality was remarkably good although various artifacts were apparent at random intervals, including visible reductions in image resolution. While not equal to the best quality available from over-the-air distribution, this new streaming format being used by ABC is an indication of a major improvement in the video experience that can now be delivered over the Internet.

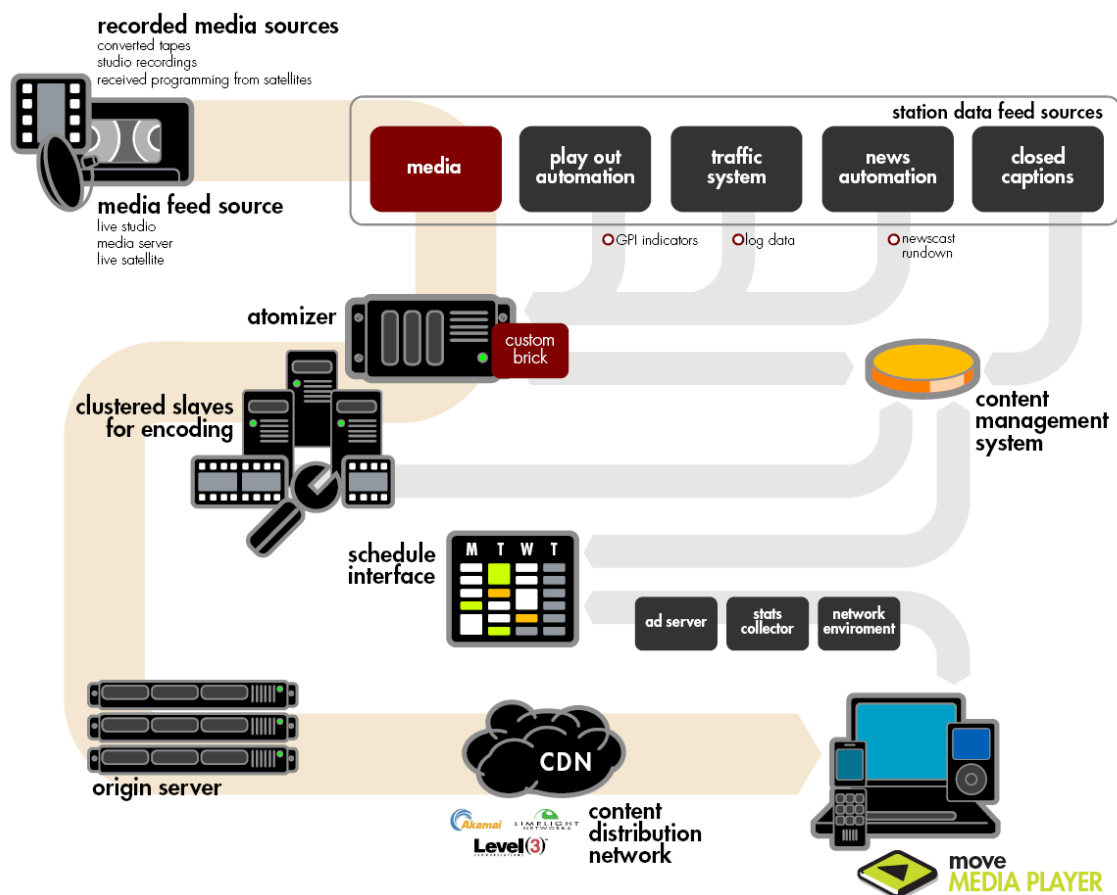
The HD Media Player used by ABC is part of the Move Media System from Move Networks, Inc., using the TrueMotion VP7 software codec developed by On2 Technologies. HD program selection uses an Adobe Flash user-interface and the player reverts to Flash for commercial breaks in HD programming. ABC currently uses Adobe Flash Player 9 for its SD video streaming, using the On2 VP6 codec.

The Move Networks system requires a small player applet to be downloaded to the computer, but the delay for this, and program loading, before the selected HD program starts to play, is only a few seconds. The Media Player allows viewers to pause programming, rewind, and jump to other points in the program. Viewers can also join an ongoing live broadcast and optionally begin viewing from the beginning of a program.

Move Networks Quantum Streaming Technology

Information from Move Networks indicates that their system streams video from standard Web servers rather than specialized media servers, and uses the same HTTP protocol employed for standard Web pages. The video stream is broken up into short fragments cached in small pieces using a system that Move Networks calls Quantum Streaming, which aims to avoid the negative effects of Internet congestion and packet loss. The player automatically adjusts stream quality based on network conditions and the local environment of each media consumer.

The Move system has various other related capabilities including simultaneous coding for multiple platforms, editing and publishing control, and digital rights management. System flow for implementation in a broadcast station environment is shown in the diagram provided by Move Networks and used with permission. For more information, see www.movenetworks.com.



Move Networks flow diagram for streaming video content

The On2 TrueMotion VP7 codec used by Move Networks is DCT-based with other proprietary algorithms. For more information, see <http://www.on2.com/>.

MSTV Launches Equipment Exchange Website

The Association for Maximum Service Television has launched a classified ads Web site www.mstvads.org, where television broadcasters can sell and buy station equipment. MSTV charges a flat fee of \$75.00 for each listing which will stay on the site for one year. Buyers and sellers communicate directly with each other to complete sales transactions. For further information contact April Lee, actlee@mstv.org.

ATSC Digital Television 8-VSB Transmission System Fundamentals & Measurement Seminar

Thursday and Friday, August 9 & 10

Hilton Orlando / Altamonte Springs, FL

A 1½-day seminar will be presented on the ATSC's digital television (DTV) vestigial sideband (VSB) transmission system *fundamental concepts & measurement methodologies*. This seminar, a combination of the original VSB Fundamentals seminar and the new VSB Measurements seminar, is aimed at broadcasters, broadcast consultants, equipment manufacturers (broadcast, consumer, & test), translator/LPTV operators, and cable operators. The seminar will help you develop a basic understanding of 8-VSB transmission system basics as well as measurement techniques in the *laboratory*, at a *transmitter* site, and at remote *field* test sites. Practical test equipment information such as features, options, specs, & other performance requirements will be covered. For additional information contact Gary Sgrignoli, Meintel, Sgrignoli & Wallace at (847) 259-3352 or Gary.Sgrignoli@IEEE.org or Cheryl Hartline, WKMG-DT, (407) 521-1263 or chartline@wkmq.com.

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