

## Is SDV Ready for Primetime?

Cable operators slowly adopt switched digital video technology

by Claudia Kienzle, March 7, 2007

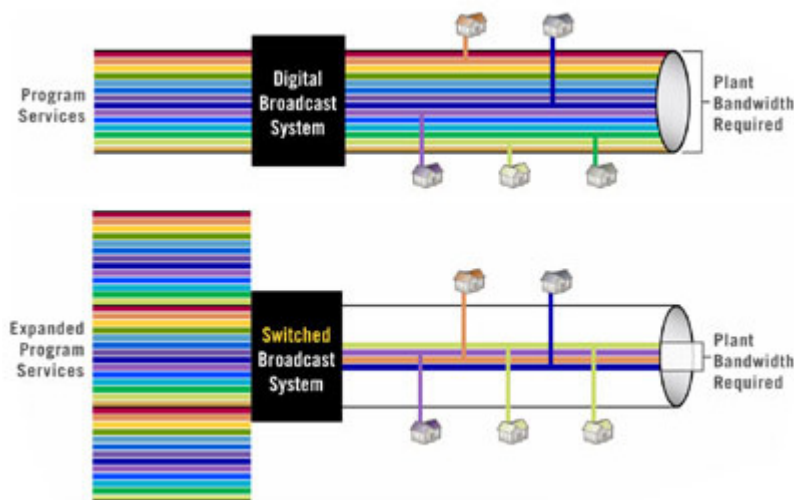
### HAMILTON, N.J.

Delivering video, voice, and data services is vital to cable's competitive edge and future growth. For this reason, many major cable operators want to expand their offerings to include hundreds of network choices, including HDTV channels, as well as high-speed Internet, video-on-demand and voice over IP services.

But cable operators face the reality that they do not have ample bandwidth to deliver all these exciting, new digital services, and continually expand their program offerings, over their existing HFC (hybrid-fiber coax) plants.

The reason is that the stretch of coax cable from the local headend to the subscribers' homes—the so-called “last mile”—is limited to just 750 MHz of bandwidth, which is divided up into 6 MHz channels.

To make matters worse, roughly half of those 6 MHz channels are spoken for because cable companies must honor their longstanding commitment to provide dozens of analog channels to millions of basic cable subscribers. So, cable operators have no choice but to deliver all their digital cable services in that remainder of that pipe; and even with digital video compression, they could possibly max out their network's bandwidth.



*This simplified diagram shows the expanded capabilities that switched digital video technology offer for cable and telco operators.*

### A NEW KIND OF VOD

SDV (switched digital video) promises to alleviate this bandwidth-challenged HFC infrastructure by using an innovative approach.

“What's brilliant about SDV is that, in the bandwidth that remains after sending all the basic analog channels, the cable operator can offer up to 1,000 [or more] digital channels without actually having to send them all down the pipe at one time,” said Gerry Kaufhold, principal analyst for In-Stat, in Scottsdale, Ariz., who has published several reports about SDV.

“With SDV, they can dynamically switch channels into those areas in which subscribers are actively requesting them so that only those programs being watched consume bandwidth,” Kaufhold said. “That frees up bandwidth that can be allocated to high-speed data and telephone services.”

Simply stated, if a channel has been selected by one viewer, and another viewer selects the same thing, the newcomer simply joins that existing stream, rather than having a second stream created which further consumes bandwidth. And the moment the last viewer in a service group or node has clicked away from a particular channel, it is no longer sent to that node, and the bandwidth is now free to be used for something else.

“Through intelligent, dynamic bandwidth management, SDV spares cable operators from having to rush into the huge capital expense of replacing all their coax cable with fiber to the home; or putting digital set-top boxes in all their basic cable homes,” Kaufhold said. “Many cable operators have begun testing, buying, and deploying SDV because it allows them to expand their offerings over the existing plant cost-effectively, without compromising the viewer experience.”

Of all the technology providers entering the SDV market, BigBand Networks is in the lead in terms of deploying its offering. Since 1999, when it delivered its first-generation product, the Redwood City, Calif.-based developer of technology for broadband media services has upgraded its SDV technology to its current fourth generation product, which it launched at SCTE Cable-Tec in June 2006.

BigBand Networks' end-to-end platform includes the BMR, Broadband Multimedia Service Router that conditions channels for switching; the BME Broadband Multimedia Service Edge server for receiving and processing programming on the network edge; server software for the set-top box; and a small piece of software in the set-top itself that can recognize a switched channel and interact with the head-end system.

“Our fourth-generation product, which supports HDTV and open standards protocols, is the one currently being deployed at several cable systems operated by two major MSOs. We’re also in trials at other cable systems,” said Biren Sood, vice president of marketing for BigBand Networks.

The only company Sood identified as using its SDV technology is Cablevision, the main cable provider to the New York City metropolitan area and the nation's fifth largest cable operator.

“Cablevision is using our fourth generation product to provide its new international programming channel package,” Sood said (see “Cablevision Uses SDV to Deliver International Channels”). “Our adoption of open standards protocols is a key differentiator of our product line.”

## **BUSINESS CASE FOR SDV**

BigBand Networks is not revealing many details about its marketing efforts because the company filed with the Securities and Exchange Commission Jan. 26, 2007 to do an initial public offering.

According to the 176-page filing, BigBand Networks discloses that they have “sold their products to six of the 10 largest service providers in the United States, including Cablevision, Comcast, Cox, Time Warner Cable, Charter and Verizon.”

Regarding the return on investment for service providers, the filing said, “Because our product applications are deployed at the network level, service providers can leverage their infrastructure investment across many subscribers and avoid the hardware and service costs associated with an upgrade of equipment in the homes of subscribers.”

According to Sood, “If you look at the economics of replacing coax with fiber in that last mile to the home, or giving all subscribers digital set top boxes and digital service, it becomes obvious that SDV is a very economically viable way to optimize that spectrum.”

BigBand Networks cites Kagan Research data that 50 percent of U.S. homes are still receiving analog cable programming, and that of the average three set-top boxes in the home, only 1.5 are digital.

“So it becomes a challenge for an operator to recoup the analog channels... because as you remove analog channels, you reduce the competitiveness of your offering,” Sood said.

## **END-TO-END SOLUTION**

Motorola also has an SDV solution ready to deploy sometime in 2007, but it is right now still in a trial phase with no current plans to announce specific customer deployments.

According to Bruce Bradley, director of product marketing for Motorola in Horsham, Pa., the company's first step is to re-architect the cable network for SDV, but the “last switch to throw” will be to download a new version of the electronic program guide software to the cable system's installed base of set-top boxes, which will enable them to support SDV.

“This new software enables the set-top box to report channel requests upstream to the headend so that the channel lineup can be dynamically reconfigured,” Bradley said. “Channels are switched onto the network and sent to the home in just a fraction of a second, but that requires a lot of complicated communications behind the scenes.”

The Motorola end-to-end solution is comprised of the Motorola Digital Headend, an SDV Manager that receives the channel change messages from the set top box; ERM1000 Edge Resource Manager; and the new SVM1000 Switched Video Manager.

“These components work together to ensure that programs are sent to the right node and that bandwidth is dynamically allocated between different services, such as video, high-speed data, VOD, and telephone,” Bradley said. “At a certain time of day, a neighborhood that is predominantly businesses might want more bandwidth for high-speed data services; while a residential neighborhood might want family channels or VOD. Any channel request can be ‘voted in’ by a single viewer in each node.”

## **PAINLESS EXPANSION**

When SDV solutions first appeared on the market a decade ago, many were based on proprietary protocols that ensured a reliable end-to-end solution but locked customers into buying products from a single vendor. Since then, companies have been striving to provide open architected solutions based on open standards, said Jeff Taylor, director of product strategy and management for Scientific-Atlanta, a Cisco company in Atlanta.

“In our latest, next-generation SDV solution, the communications protocols have been opened up and published,” Taylor said. “So if a customer preferred to use another vendor’s component, such as a QAM modulator, within our solution, as long as that vendor has implemented our published protocols and interfaces, their equipment should plug right into our architecture.”

Scientific-Atlanta is currently installing its SDV solution at three of the five major MSOs, but would not disclose which ones. The Scientific-Atlanta solution is designed for use with any of its Explorer Series set-top boxes, including the Explorer 8000 Series with built-in DVR and HDTV capability.

“Over the last five years, the cable industry has spent \$100 billion dollars overall to upgrade their infrastructures to support their new digital cable services,” Taylor said. “Now they're at the point where they still need additional bandwidth to expand their offerings again—to offer more HDTV content, ethnic channels, and new service levels for their high-speed data service. And they don't want to go back to Wall Street to seek additional funding, or assume more debt to upgrade again. SDV allows them to use the pipes they've already got, and it costs less compared to doing another expensive plant upgrade.”

Lastly, SDV can also be used by telephone companies to deliver their digital video services, and is being used already by Verizon's FiOS. But because of cable's legacy obligation to maintain analog channels for its basic subscribers, vendors said that the cable TV industry has a more pressing need for SDV technology to manage and maximize the limited bandwidth on their HFC networks.

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