

## VOD over IP

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- **Open, flexible, on demand technology integrates smoothly with existing operations**
- **Optimal TCO with cost-effective scalability and management simplicity**
- **Codec-agnostic for transparent movement to next-generation codecs such as MPEG-4**
- **Package digital advertising with on demand programming to increase revenues and promote VOD**

### Overview

Telecommunications operators concerned over a competitive triple threat are turning to video on demand (VOD) programming for a triple win: competitive advantage, subscriber loyalty, and new revenue streams. As the per-stream cost of VOD drops, increasing numbers of operators are seeing VOD as a way to maximize the value of their networks through new services and advertising revenues. Deploying VOD infrastructure now also positions them for early advantage in the emerging "digital home" market. The key to profitable VOD deployment is to choose technology with the scalability to meet growing demand and the flexibility to adapt to developing standards—from a vendor with extensive experience and success delivering VOD over IP or ATM via DSL or FTTH. With its open, highly scalable VOD platform and more than a decade of VOD-over-IP experience, C-COR is the VOD vendor of choice for telecommunications operators.

### Convergence Creates Competition and Opportunity

Voice, data, and entertainment are converging: data services are available over wireless phones; radio and television are available over the Internet and voice-over-IP promises to make more and more voice services available as well; and cable operators are eyeing the IP space. With so many companies competing for the consumer, VOD offers telecommunications operators a tool to win and retain customers with on demand programming. In addition to revenues for content and bandwidth, VOD also opens the way for new advertising revenues. In fact, advertising-supported VOD helps attract on demand customers and generates ad revenue at the same time.

### From ADSL to the Digital Home

Today, ADSL services can deliver on demand programming (mainly in MPEG-2 format) via the digital set-top box (STB). In the next few years, consumers will increasingly look to higher speed SDSL/ADSL and FTTH (home, curb, or premises) to deliver VOD and other programming to a wireline or wireless media appliance that can deliver television programming and other media content to televisions, stereos, personal computers, and other digital devices in the home.

Our experience in telecommunications VOD deployments includes:

- 1993—British Telecom: 1,200 stream VOD over DSL via ATM/DSL at E1 rates (2Mbps)
- 1994—Bell Atlantic Stargazer Trial: ADSL at T1 rates
- 1997—Yes Television: VOD system over IP via Ethernet
- 2000—Kingston Communications: 6,600 streams commercial VOD over DSL via IP/ATM
- 2001—Telefonica: 2,000 stream commercial trial over DSL via IP/ATM
- 2002—Telenor and Swisscom: trials over VDSL
- 2003—Telefonica selects C-COR nABLE's back-office management software for VOD service offering in Madrid, Barcelona, and Alicante regions
- 2004—Siemens deploys C-COR On Demand platform on Belgacom's DSL service
- 2004—TeliaSonera selected C-COR's n4x On Demand Server
- 2004—Iceland Telecom selected C-COR's n4x On Demand Server

### **Success from the Start**

Now is the time for operators to claim their share of the converging voice, data, and entertainment market. VOD and digital advertising offer telecommunications operators the opportunity to gain revenue and competitive advantage with new services, and positions them to participate in the emerging digital home marketplace. With the right infrastructure in place, operators can deploy VOD and digital advertising today that can carry them through business growth and market evolution.

C-COR's open, flexible on demand technology integrates smoothly with existing operations, offers optimal TCO with cost-effective scalability and management simplicity, and adapts to emerging formats and standards. With more than a decade of success in IP VOD systems, C-COR has the technology and the experience to help operators start with success in the VOD marketplace.

Telecommunications operators of all sizes can safely and easily transition to profitable, predictable, on demand IP services by choosing exactly the technologies they need at each phase of the network lifecycle. By working with C-COR they achieve reliable delivery of multiple converged, packet-based networks supported by a full suite of interoperable back-office tools and network assurance solutions. Include the added value of C-COR Network Services—delivering expertise for outsourced technical and operational resources—and operators can recognize benefits from network design to elements selection, from system integration to back office automation and technical services. C-COR's breadth of capabilities are second to none.

## Planning for Evolution

The on demand market is evolving quickly. The key for telecommunications providers entering the market is to deploy infrastructure now that can handle future growth and change. For example, the industry now is built around MPEG-2 encoded content. But as consumer demand for digital video grows, operators are recognizing the need for next-generation codecs (such as MPEG-4 Advanced Video Coding/H.264) as an efficient means to deliver digital content. The new codecs are capable of delivering high quality digital video using roughly half the bandwidth of MPEG-2 video compression. With a number of competing next-generation codecs on the horizon, operators are watching carefully to see which emerge as industry standards and whether VOD delivery vendors will support them with the functionality needed to meet consumer expectations. C-COR's flexible VOD delivery systems will insulate operators' infrastructure from future codec changes.

C-COR Video Server (nVS) software runs on Intel-based hardware, including C-COR's n4xR3 On Demand Server, providing the means to deliver video streams to MPEG-capable STBs. C-COR's nABLE On Demand management software platform handles the daily responsibilities of telecommunication providers, including session management, transport bandwidth management, asset management, digital rights management, and business management. C-COR on demand solutions are codec-agnostic, so the move to next-generation codecs such as MPEG-4 will be completely transparent to systems and subscribers.

Operators also need to plan now for user and content growth. Licensing of on demand content may be limited today, but as voice, data, and entertainment converge, content owners and aggregators will be turning to IP as the conduit to the digital consumer. Operators need to build infrastructure today to handle the usage and content demands of the converged market. Some of today's VOD server platforms are inherently limited to as few as 600–700 hours of content storage, with the largest scaling to fewer than 5,000 hours.

C-COR on demand solutions incorporating C-COR's open, centralized n4xR3 On Demand Server enable operators to expand on demand content and offerings at a competitive price. With a physical infrastructure that allows streaming, storage, and real-time digital feed ingest to scale separately, and with the capability to support fully distributed, fully centralized, and hybrid transport environments, the C-COR n4xR3 On Demand Server offers operators maximum architectural flexibility. A single n4xR3 On Demand Server can store as much as 350,000 hours of on demand content (or 84,000 hours of HD content) without duplicating content. A single n4xR3 server also can stream a single copy of content, or entirely independent copies of content, to more than 120,000 subscribers (120,000 SD streams; 30,000 HD streams) simultaneously, eliminating the need to purchase and manage multiple servers to meet streaming bandwidth requirements.

Operators also need to consider how to integrate VOD delivery and management with their existing operations. C-COR's nABLE On Demand management software platform is designed to integrate smoothly with existing business operations and to lower system management costs. Adherence to open standards throughout the nABLE architecture allows smooth integration with existing business and IP infrastructure. nABLE's browser-based interface gives operations staff a global real-time view of geographically distributed and diverse on demand systems from a single console or remote web browser, and the intuitive graphical interface simplifies operations processes and reduces training requirements.

C-COR has designed the nABLE On Demand management software system to help operators contain costs and simplify operations as they grow their VOD business. nABLE gives operators the simplicity of one management platform for all VOD operations, the flexibility to manage any kind of on demand content, and the power to choose the best VOD servers and applications for each market.

## Advertising with On Demand

Along with VOD revenues comes a new potential revenue source for telecommunications providers. Digital advertising can be packaged with on demand programming to bring in revenue, or ad-supported programming can be used to promote VOD. VOD programming creates natural consumer segmentation because viewers have greater freedom to choose programming that matches their specific interests (sports, health, cooking, sci-fi, etc.). VOD advertising (or "AdVOD") is multidimensional: it reaches on demand viewers, it enables relevant ads to be matched to viewers, and it supports interactivity allowing viewers (i.e., prospects) and advertisers to communicate directly.

Unlike any other medium, VOD gives advertisers and operators the ability to segment TV ads demographically (a given program or network appeals to women age 30 and over, average annual income <\$120,000), geographically (by neighborhood), and "psychographically" (the consumer with this STB number views a lot of romantic comedy movies and buys baby products at a national grocery store chain). These pre-qualified viewers are attractive to national and local advertisers, as well as to content providers and operators who can use advertising to promote related programming and services, and to create branding. Through its industry-leading VOD and digital advertising insertion systems, C-COR offers the features operators need to begin generating revenue and competitive advantage with AdVOD. C-COR AdVOD solutions leverage C-COR's SkyVision digital ad insertion and our vendor-neutral nABLE On Demand management software platform to provide:

- Scalable, reliable VOD delivery and digital ad insertion
- Reporting and analysis tools to help segment efficiently and measure performance
- Support for long form ads such as branded "advertainment" content on free VOD
- Geographically targeted and household addressable advertising
- Interactive advertising

AdVOD can support free programming that builds subscribership and viewer loyalty. Growing subscribership, in turn, attracts more advertisers, creating new revenue. Only VOD can deliver one-to-one advertising to the households most likely to buy advertisers' products, an approach that will fundamentally change the business model for on demand programming and create high value revenue streams for operators. Selecting a VOD solution vendor is arguably the most important choice an operator will make when moving into VOD. C-COR powers the world's most sophisticated on demand media and digital advertising systems. The company has been building and developing scalable media technology and back-office management software on the widest range of broadband delivery systems—DSL, IP, and cable—for more than 12 years.

Customers choose C-COR to power the most demanding markets in the world because of our proven on demand and digital advertising insertion platforms, our commitment to reducing the complexity of business and technical operations through our open nABLE On Demand management software platform, our expert project management, and our continued commitment to providing the world's most scalable and efficient on demand platforms thereby assuring operators the lowest total cost of operations in the industry.

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