Vx30 Streaming Video Technologies

By Jonathan Miller

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Executive Summary

This white paper introduces the capabilities of Vx30, a disruptive new technology in video streaming.

Introduction

Until this time, the supply of video on the Internet has not reach the demand. Video Services have been unable to keep pace with the exponential growth of the World Wide Web largely because of bandwidth limitations, expensive scalability and the complexity involved with producing and presenting streaming media.

Bandwidth Costs. Video streams require lots of data even to display short clips. The overhead cost associated with providing enough bandwidth for users to enjoy a high quality video experience has kept many businesses from streaming video.

Scalability. Most Video Streaming Server technologies charge expensive annual licensing per dedicated video server. Compounded by the fact that Video Servers cannot support a high number of clients the costs associated with scalability (additional hardware, software and management) has left streaming video almost completely unaffordable.

Complexity. The process of installing, configuring and maintaining a video server (or network of servers) and than authoring and encoding video content requires a dedicated professional or team of professionals.

Security. Serving Streams requires the use of many protocols including HTTP, UDP, RTSP, TCP and RCP. This increases network vulnerability because each of these protocols requires their own ports on the firewall to be opened. This has also affected market penetration for you cannot stream to offices who only have the HTTP port open on their firewall.

Vx30 Encoding Technology

Vx30's offers unmatched video compression rates, is easy to use, requires no special server configuration for delivery, uses only HTTP and is player-less.

Video Compression. Vx30 uses a patented, revolutionary new approach to encoding video. This allows for the highest quality image coupled with unmatched compression. Lowering one of the prohibitive costs associated with streaming video by reducing the bandwidth requirement to display high quality video. Vx30 can even display high quality video to users on a narrowband connection.

Easy to use. Vx30 Encoder is a MS Windows application that has an intuitive user interface. This easy to use encoder allows even the novice to quickly be able to create all the files necessary to stream video from their website.

Scalability/Server Technology. Vx30 Video Streams require no specialized server configuration or software to operate. Vx30 video files sit on demand much like a jpeg or gif image, simply load the files onto your server and link your web page to them. A Vx30 Video Server can also support a much higher number of clients while still being used as a regular web server.

Encode once, play anywhere. The Vx30 stream plays through a tiny java applet that is downloaded to the users computer at the beginning of the session. As of today over 90% of the world's browsers are java enabled. In addition java is becoming integrated into the micro-device market allowing for the potential of streaming video even to wireless micro-devices.

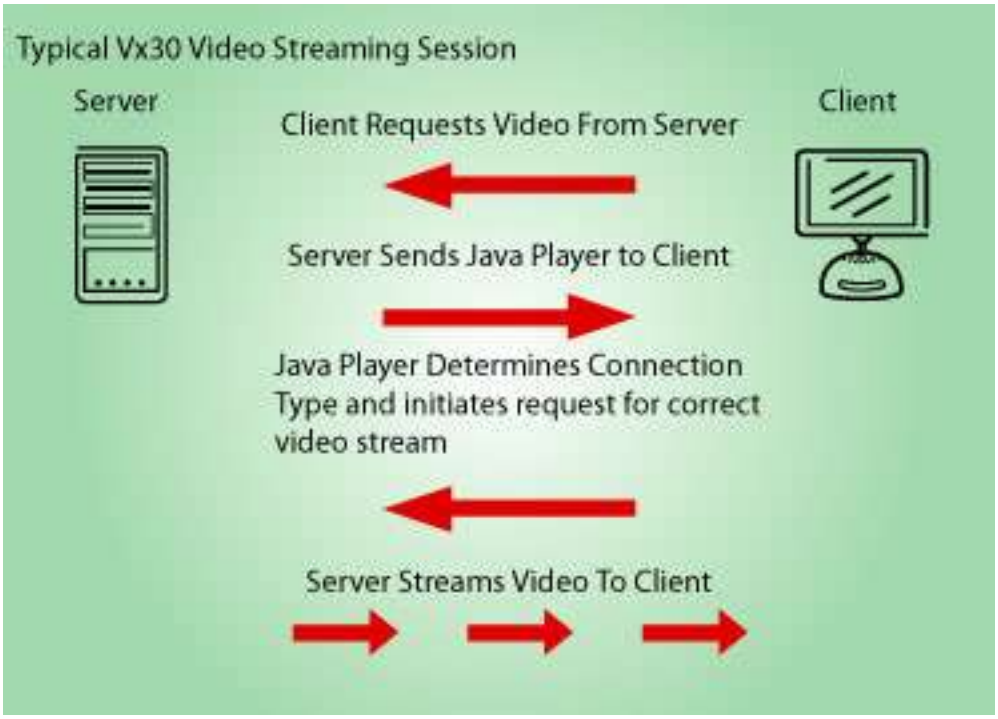
Security/Penetration. Since Vx30 only uses the standard Internet protocol networks can be hardened by reducing the number of ports open for streaming. In addition you are guaranteed that your streams will be viewable by anyone who can access the Internet.

Vx30 Components

Vx30 is comprised of two main components necessary for encoding and serving. These components are:

1. **The Vx30 Encoder.** An application that takes digital video files and converts them into a format where they are ready to be streamed from any standard web server. The Encoder application also creates a tiny Java Player that is placed with the Vx30 Streaming Files on the web server. When a client requests a video this tiny Java Player is transparently downloaded onto the users machine and lives only for the cycle of the video. This completely eliminates the need for the client to install any player, upgrade or plug-in to view video over the Internet.

The Encoder application has an easy to use Graphical Interface that allows for batch processing, editing and previewing of source files. From the interface you can create separate profiles for varying data rates (i.e. dial-up, DSL, Cable…), the Java Player determines which profile to use at the beginning of the session based upon the client's Internet connection type.



2. **The Vx30 Player Applet (Decoder).** This Video Player decodes the streaming video on the end users computer. This ultra small player applet is downloaded as the end users need it. The java jar file resides on your web server and uses typical TCP/IP for delivery making the compatible server platforms available to Vx30 almost limitless.

Typical Implementation

Vx30 is very easy to implement in just **4 Easy Steps**:

1. Capture Video
2. Encode It
3. Add Applet Code
4. Upload Files to Server

Capture Video

To process video with Vx30 it must be in a digital format. Taking a video from its source format and storing in on your computer is called Capturing. Video can come from a variety of sources, such as a DVD, VHS cassette, Hi-8 Cassette, Beta-Max, Beta-Cam, DV, Mini DV, CD-Rom and the list goes on. If however you are creating your video in digital format (i.e. from a DigiVideo Camera), you may be able to skip the capturing process and go straight to Encoding.

There are many options for capturing video and according to your budget and needs you will find a solution that is right for you. As an alternative you can always outsource the capturing process to a video editing house in your area. Once you have captured your video, save it in an uncompressed format. Currently the Vx30 Encoder works with a variety of formats including AVI, MOV or MPEG.

Encode It

Once you have captured your video you are ready to create your Vx30 files. The Vx30 Encoder is a purely software based application that is easy to use and allows for extensive customization. With the Vx30 Encoder you can:

Set variable bit rates for different Internet Connection Types.
Set in and out points.
Manually Crop.
Set video image size.
Auto-generate Applet HTML code.
Preview Source Video
Set Loading and End Images.

At the end of the encoding process the Player Applet is created. Your video can only be played back with this Applet (or another Applet created by the same Encoder). This protects your content from file sharing or other unauthorized use.

Add Applet Code

Vx30 allows web designers to have the freedom of using video inside web pages much like they would use flash animation or image files. Simply embed the applet code wherever you would like the video to appear in your web page. During the encoding process you can choose to have the Applet Code to be automatically created. Use this option in the beginning until you understand the different parameters that you can use to customize the play back of your video. Parameters include:

Setting the background color.
Auto start.
Enable player controls (stop, start, time line etc…)
Title and End images.
On “click” URL location.
Mute audio.
Loop.
Code base (allows you to store your video files in a separate location from web page).

Upload Files

Vx30 does not require any special server configuration nor does it require a dedicated video server. Simply upload the files onto your preferred platform and than you are ready to start streaming video files. Vx30 uses the standard Internet protocol, HTTP, so you are not required to open any additional ports on your firewall.

Introducing the Vx30 Product Suite

Whether your needs are for real time encoding, on demand video, corporate video mail or simply placing a couple streams on your family website – Vx30 has a product that is right for you.

Simple Streaming. Is Vx30's low cost video authoring tool that allows even the novice to quickly create video content for their website. Some features of Simple Streaming:

- 100 to 1 Video Compression with 1% lossless,
- High quality streams even to dial-up connection.
- Only uses standard Internet Protocols HTTP, TCP/IP.
- Works with any combination of server software and hardware platform.
- Eliminates need for Media Player installation.
- No downloading.
- Encoder supports batch processing.
- Editing tools within Encoder application.
- Simplifies end user experience.
- Single format to reach largest possible audience.

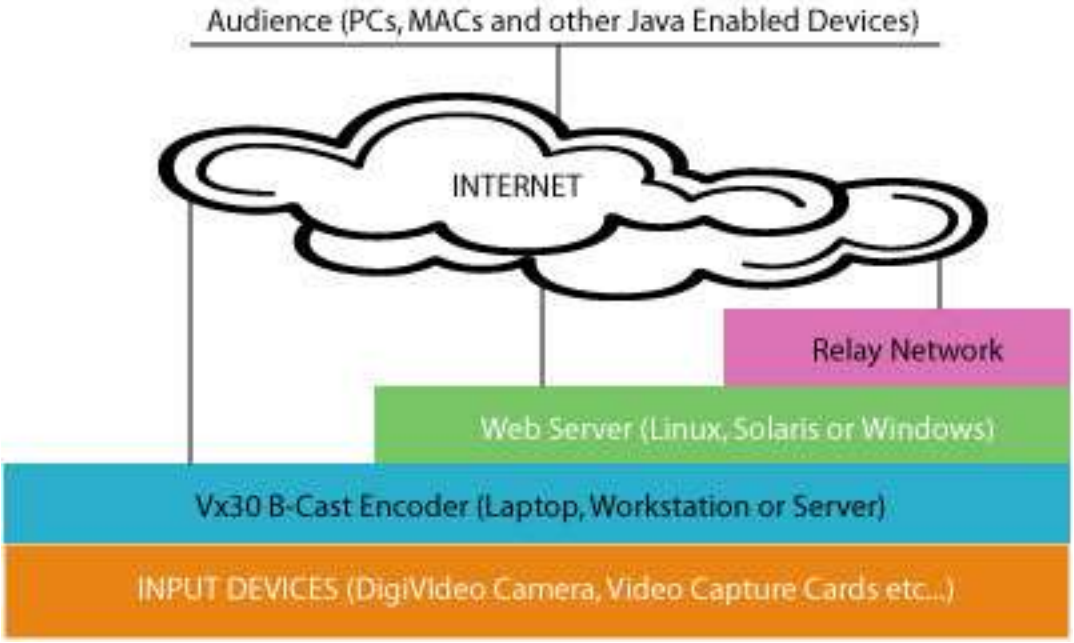
Corporate Edition. All the software your company needs for on demand video applications. Designed to produce significant bandwidth savings while not compromising quality. Features include:

- All the encoding features associated with Simple Streaming.
- Advanced tracking software.
- Mirroring, clustering and load balancing software.
- Video Mail template generator.
- Free upgrades.
- 5 Encoding stations (additional stations are $300 per station).
- Digital Rights Management.

Vx30 B-Cast. A system for Real Time Encoding of Digital Video for Live Presentation on the web. B-Cast can encode live video from a variety of Digital Video Formats including MPEG, MOV or AVI. B-Cast is fully integrated with the Vx30 3rd profile Codec allowing for the highest quality of video at the lowest possible data rates while still using a player-less system.

B-Cast is the most secure and has the greatest possible market penetration of any Web Casting technology because it relies only on the standard Internet protocols TCP/IP and HTTP for transport. B-Cast's Web Interface allows for easy administration of streams and is integrated with Vx30 Live-Stat for extensive auditing and reporting. B-Cast can work as a stand-alone server or can be relayed to a network of web servers for distribution to large audiences. Individual streams make use of available bandwidth, to give each client the best quality stream possible for their Internet connection type.

B-CAST LAYER DIAGRAM



- Works at dial up speeds.
- Java Based Player.
- Encodes MPEG, AVI or MOV formats.
- D1 Resolution starting at 300kbps.
- Only uses port 80 (standard internet port).
- Supports forward caging and server to server streaming.
- Web-based Administrator Interface.
- Extensive tools for auditing and reporting.

Hardware and Software Requirements

Viewer Computer Requirements

Vx30 was designed to reach the largest possible audience. We did this by building our player off of the Java Platform and by lowering the bandwidth requirement. A complete list of End User requirements:

- Any device with a Java Enabled Browser.
- Pentium II (500 Mhz) or equivalent (PC).
- PowerPC G4 (500 Mhz) (Mac).
- 64 MB RAM.
- 28 Kb Internet connection.

Encoding Station Requirements

Depending on your needs and the size of your shop you may or may not want to make your Encoding Station a dedicated machine. If you plan to do daily intensive encoding you should consider a newer machine to handle the task. However if you plan to encode only once in a while it is not necessary to have a dedicated machine. A complete list of an Encoding Station's requirements:

- Windows 2000 or newer.
- Pentium III (800 Mhz) or equivalent.
- 20 GB Hard Drive.
- 256 MB RAM.

B-Cast Real Time Encoding Server Requirements

Since the B-Cast Server will be capturing video and doing real time encoding it is necessary to equip your server with a professional video capture card. Also depending on the number of streams you will be supporting you may want to install a Gigabit Ethernet adapter.

- Windows 2000 or newer Operating System.
- Pentium III1 Ghz processor or faster.
- A/V rated hard disk (able to sustain at least 20 MB data throughput, using a stripe or raid) - disk size depends on how much uncompressed video storage you need. Preferably a separate drive from system drive.
- 256 MB RAM.
- 64 bit PCI slot.
- Video Capture Card (if encoding from analog).
- Firewire or USB port (if encoding from DigiVideo Camera).