

PEG Web Streaming

Public, Education, and Government (PEG) TV channels have been going through an evolution. Once the exclusive domain of "cable TV", PEG's have evolved to become Community Media Centers, serving their community with locally produced television programs that are delivered by whatever means the audience desires.

Community

Because PEG's seek to serve their local community, there is usually no real desire to attract a world-wide audience. Even if there were such a desire, it is unlikely that people outside of the community would be interested in a High School event, a town hall meeting, a local community event, a local citizen's rant, a local political campaign, or even an award-winning production.

Yet our society is mobile. It is not commonly possible to view your home town PEG channel when you are visiting an adjacent town, let alone traveling out of town on business or holiday.

Streaming your PEG station solves many problems and creates many new opportunities and mechanisms to serve the community. And streaming is clearly the primary means to reach a younger audience and to attract the next-generation PEG broadcasters.

New Sponsors

Attracting new sponsor/donors for any PEG station is always a challenge. First, it is difficult to tell a donor that their sponsorship is acknowledged by viewers because cable-TV provides no viewing demographics. Moreover, commercial businesses (e.g. the local Car Dealership or Pizza Restaurant) typically become sponsor/donors both to support their community and to increase their visibility in the community.

"The Discover Video Streaming packages for PEGs make it remarkably simple and affordable for any station to simulcast their station."

Streaming presents new sponsor/donor opportunities because the streaming viewing page can easily be branded with the sponsor's logo, and a optional "click through" link. Such

sponsor/donor acknowledgement can be done with much less controversy than when such sponsorship is included in an actual video program. Moreover, the sponsor/donor can easily track the results of their sponsorship, and can even promote the PEG station by including a link to your live station on their web site. "Streaming Sponsored By" is a great way to gain additional sponsors.

About Streaming

Streaming should not be confused with Video-on-Demand (VoD). YouTube, for example, does not provide streaming¹. Rather, streaming is the delivery of audio/video in real time, such as a live or "simulcast" program. In our case, we will describe streaming as a live audio/video feed delivered to viewers via the only network that has far more subscribers than any cable-TV system: the public Internet.

The Basics

Streaming consists of three basic components: the encoder, the network, and the viewer.

The encoder converts a live video signal into a digital format at a rate that the network and viewers can reliably receive.

The network is what transports the digital video, and typically includes a streaming service (more on this later).

The viewer is the receiver to the digital video. The viewer may use a home computer, a dedicated receiver box (e.g. "Set Top Box" or "decoder" connected to a TV monitor), a mobile device (e.g. iPhone), or something else.

Streaming is a *system*. An encoder without network has no value, and a decoder without a source to view has no value. Each element must be compatible with the other elements, and they must operate in the real world that must deal with bandwidth, reliability, and cost.

Bandwidth

There is more misunderstanding about bandwidth than any other streaming topic. Simply put, each viewer of a stream will use bandwidth at a rate equal to the rate of encoding. So if your video is encoded at 100,000 bps and you have one viewer, then 100,000 bps is needed. If you have two viewers, 200,000 bps is used, and so on.

Few PEG operators have very high speed Internet connections, and even fewer have the wherewithal to host

sophisticated streaming servers. This is why streaming services are used.

Streaming Service

With streaming service, the source encoder sends one stream to the service, and viewers receive the stream from the service rather than directly from the actual source encoder. This "bandwidth amplifier" service allows an operator with only consumer-class Internet access to stream high quality audio/video to millions of viewers.

Reliability

Because streaming is a system, reliability depends on all of the elements in the system. Modern encoders are highly reliable, and streaming services are built using redundancy. The most fragile part of a streaming system is the not the public Internet but the connections to it (both from the encoder to the Internet and from the Internet to the viewer). Today, such on-ramps and off-ramps are remarkably reliable too.

Quality

Modern compression techniques provides excellent video quality at relatively low streaming rates (e.g. 300 to 700 Kbps). Compression standards such as VC-1 and H.264 are common and represent the state of the art in high quality video compression. Generally, the higher the bit

rate used, the higher the quality achieved -- but higher bit rates are a problem for some potential viewers. The most common and reliable rates used to reach typical PEG viewers is approx 300 Kbps, which provides very good audio/video quality.

Viewing

Video viewing is commonly via a web page viewed in a browser. Importantly, the viewer (and the video format) should support Windows PC and Apple MAC. Increasing, there is desire to also support mobile devices such as iPhone/iPad.

But viewing is also possible via "Set Top Boxes", newer "Internet Ready TVs", and similar devices. For example, a PEG wishing to deliver their channel to a dedicated TV in a remote location can do so by simply using a dedicated Set Top Box decoder connected to the public Internet. This allows fixed locations, such as a hotel lobby or local community center to display the live PEG channel full time and without needing cable-TV.

Discover Video PEG Streaming

The most common streaming system for PEGs is to simply "simulcast" an existing cable-TV channel. This is accomplished typically in less than 15 minutes following these steps:

1. "T" the audio and video that is currently connected to your cable-TV modulator and also connect it to the streaming encoder².
2. Plug the streaming encoder into an Ethernet connection that has adequate Internet access.
3. View your live simulcast on the public Internet.
4. Put a link to the video on your web page, or embed the video in your web page using provided "embed code" instructions.

Encoder Choices

Most live streaming is event-based, meaning a stream has a beginning, middle and end. Systems designed for event-based streaming are usually less reliable than systems designed for 7 x 24 operation. Encoders designed for continuous operation are more reliable but also more costly; but you can expect many years of continuous operation.

Discover Video offers several choices for streaming packages that include:

1. VBrick Appliance -- while relatively expensive, the appliance provides very reliable opera-

tion for many years of care-free use.

2. Discover Video Appliance -- less costly than a VBrick, the Discover Video appliance provides higher quality video at any given bit rate, supports Flash and MPEG2. This solution is Discover Video Multimedia Encoder Software installed on a compact "brick" size computer that has been optimized for streaming.
3. Discover Video Multimedia Encoder Software -- inexpensive software for your Windows computer. Audio/Video input is via USB adapter, and you may stream live using H.264, Flash, Windows Media or MPEG-2.

When used with the Discover Video service, the setup and operation of the encoder is automatic.

Streaming Service

The Discover Video Streaming packages for PEGs make it remarkably simple and affordable for any station to simulcast their station. Here is what is included:

- Unlimited live streaming, 24 hours a day, 7 days a week³.
- Free viewing page with your station title, description, and logo.
- Free embed code for inserting the live video feed in your own web site.
- Free program listing at <http://pegstreaming.com>
- Access to private log files showing "hits" and information about who viewed and when.
- 10 GB of video file storage for Video-on-Demand. This is sufficient storage for about 100 hours of online content⁴.
- Simple embed code for your web site to list your VoD content on your web site.



Pricing (as of August 2010, subject to change without notice)

Item	Description	PEG Price
Streaming Option 1A	<ul style="list-style-type: none"> • Simulcast one PEG channel • VBrick WM Appliance, Single Channel • 1 Year PEG Streaming Service (one stream) 	\$5,295
Streaming Option 1B	<ul style="list-style-type: none"> • Simulcast two PEG channels • VBrick WM Appliance, Dual Channel • 1 Year PEG Streaming Service (two streams) 	\$8,695
Streaming Option 2	<ul style="list-style-type: none"> • Simulcast one PEG channel • Discover Video Appliance (Digital Engine Computer w/DVME software installed w/USB input device) • 1 Year PEG Streaming Service 	\$2,995
Streaming Option 3	<ul style="list-style-type: none"> • Simulcast one PEG channel from PEG-provided PC • DVME Software for your PC w/USB input device • 1 Year PEG Streaming Service 	\$695
PEG Streaming Service	<ul style="list-style-type: none"> • For renewals of existing service or unbundled new service • Unlimited live streaming service for PEGs • Up to 10 GB delivered for VoD • 10 GB of file storage for streaming 	\$495 / year

Notes and Disclaimers:

- PEG Streaming service provides unlimited 7 x 24 live streaming for simulcasting PEG channels on the public Internet to any number of live viewers. Discover Video reserves the right to restrict the number of simultaneous viewers in the unlikely event of a streaming "hijack" or where the live content is displayed on a web page or device other than the PEG web site or Discover Video provided viewing page.
- 10 GB of file storage provides approximately 100 hours of VoD storage at the typical video encoding rate. This means that you can upload up to 10 GB of content to your account and you can remove older content to preserve disk space. You will be charged \$2.00 per GB for storage beyond 10 GB per month. For example, if you have 11 GB on your account for 12 months, your additional charge will be \$24.00.
- VoD viewing bandwidth is up to 10 GB per month. This provides VoD streaming of approx 100 hours per month at the typical video encoding rate. You will be charged \$2.00 per GB for usage over 10 GB per month. For example, if you use 11 GB in any month, your additional charge will be \$2.00 for that month.
- Non-renewal of service or non-payment will result in loss of service and removal of any VoD content after a grace period set at Discover Video's sole discretion.
- Streaming Service may only be used for PEG purposes. You may not use the service for commercial content or for revenue-generating purposes, except for PEG-related functions such as non-profit fund-raising events produced at the PEG studio.



- You are solely responsible for the content delivered via the Streaming Service. Discover Video disclaims any and all liability for your content, and we reserve the right to remove any content we determine to be illegal.
- Streaming services depends on many element, many of which are beyond our control including your local conditions, the condition of the public Internet, and certain 3rd party networks. While Discover Video products and services are believed to be very reliable, we must disclaim any liability for failure to deliver any live or VoD content. We will make every reasonable effort to resolve any outage.
- PEG customers that wish to conduct live remote broadcasts back to their stations that also use Discover Video PEG Streaming service have an included remote broadcast streaming account at no additional cost.

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¹ YouTube uses what is called "Progressive Download" to deliver video files to your computer. This is not to suggest there is anything wrong with this, but to draw the distinction with true streaming.

² If the studio has a switching system with additional audio/video outputs, simply connect to these.

³ Certain restrictions apply. For example, the streaming service can be used only by the station and only for simulcasting a PEG channel. Service is only available in conjunction with encoder or Transcoder provided by Discover Video.

⁴ Storage depends on bit rate. See calculator at <http://discovervideo.com/calculators/calculatorcatalog.htm>