White Paper

Public, Education, Government TV

Reaching Your Audience

By Rich Mavrogeanes

The cable-TV industry was long ago required to provide cable-TV access for use by the local community in the franchise areas it serves. Community access is commonly three "cable channels": one for Public access, one for Education, and one for Government, collectively known as "PEG". Public cable access dates back to the late 1960's and has grown though the years. The Cable Franchise and Communications Act of 1984 act allowed local governments to require cable operators to provide PEG channels, prevented cable operators from exerting editorial control over the content of programs carried on PEG channels, and it also exempted cable systems from liability for PEG channel content.

Cable systems were permitted to fund PEG channels with revenues from the franchise fee, and this is what many cable systems chose to do. The act also allowed franchise agreements to carry additional fees of up to 3 percent of cable television revenues for PEG channels. Such dedicated fees accelerated the deployment and expansion of PEG channels.

Cable PEG channels are conventional channel numbers in the local cable-TV lineup, such as channel 18, 19, and 20 and are available *only* to cable subscribers, and *only* in one franchise area (e.g. one town).

Internet Broadcasting

It is no secret that the public Internet is rapidly becoming the dominant source of media consumption, especially for the younger generation who view TV on computer screens, cell phones, PDA, and personal Set Top Boxes. Clearly, distribution of PEG channels via the public Internet was not envisioned back in 1984, and Internet broadcasting is new to many PEG operators. Nevertheless, PEG channels that have not embraced Internet distribution run the risk of losing their audience as the migration to the Internet and to "IPTV" accelerates. Happily, putting a PEG channel on the public Internet is very easy and you don't even need to know how to spell "IP" to do it.

Bigger, Mobile Audiences

Americans are always on the go and many of us are not at home or in the local cable-TV franchise area when an important town council meeting is held, when a weather emergency is announced, or when a local citizen voices their views. What's more, the public is commonly interested in what's going on in adjoining communities and in distant towns. Citizens with access to many PEG channels may benefit from a more efficient democracy as they learn how other communities discuss and solve their problems and share their views. While a global broadcasting footprint via the public Internet allows PEGs to compete for viewers based on the quality of their content, it serves the more important purpose of reaching citizens regardless of their physical location.

After all, the spirit of PEG is not to deliver local content to citizens via cable, but to deliver local content to citizens.

Drawing The Audience

While it may be true that much of PEG viewership occurs via accidental "channel surfing" on cable-TV, and the number of web "hits" to a PEGs web page is minimal (if they have one at all), making a PEG channel a true destination takes some doing.

In the cable-TV world, viewers vote with their TV remote; in the Internet world, they vote with their mouse. For Internet broadcasting, viewership can be measured very accurately, unlike conventional cable-TV where you have no idea if anyone is tuned-in. And PEG Internet broadcasting can suddenly reach a very important demographic: the next generation of PEG broadcasters.

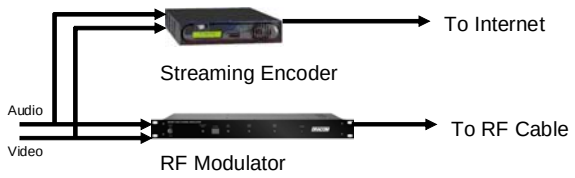
PEG Internet broadcasters can elect to share a common web page directory where your PEG channel is listed with others, thus "channel surfing" occurs as prospective viewers select the PEG channel they wish to view -- whether from Washington State, Connecticut, or Florida. For those PEG channels that elect to keep their content more local, they can display the live channel on their web site via simple cut-and-paste web code or use an automatically hosted web page dedicated to their channel.

In any case, letting the public know the Internet channel is now available is easy: simply put a banner on your cable-TV channel and word-of-mouth is likely to do the rest.

You my find an increase in viewership as viewers rapidly email your Internet video page to their friends and family.

Hooking It Up

PEG channels today use a video modulator to send modulated Radio Frequency (RF) signals over the cable system. These devices simply take in audio/video and deliver RF on a particular frequency (channel).



For Internet broadcasting, an encoder sends IP packets that contain compressed video to a special hosted server that is also connected to the public Internet. This server, also known as a "reflector" or "CDN", then delivers your video to viewers. Like the RF modulator, the encoder accepts audio/video so it is commonly a simple matter to split the audio/video so that it is presented to both devices. Or sometimes the encoder is fed from an additional audio/video output on the studio equipment.

Unlike Cable-TV, the encoder sends the video over the public Internet, so you must have a connection that can support the upload speed. Happily, gaining Internet access today is usually quite simple, and a consumer-grade cable modem service or DSL connection is all that is needed.

Care should be taken if you elect to use existing Internet access (for example, a municipal Internet connection) because you must have sufficient full time uplink speed of approximately 300 to 700 Kbps.

With these two connections made (audio/video + Internet via standard Ethernet), you are instantly "on the air" and you and your viewers can watch your PEG channel from anywhere in the world.

AT&T U-verse

AT&T's U-verse is an "IPTV" system, not a "cable" system. It serves the same purpose as "cable" (delivering entertainment and services to consumers), but with different technology.

PEGs send their channel to U-verse in almost exactly same way (and indeed with the exact same product and technology) as sending video for Internet viewing. Like cable, U-verse is a closed system – only those authorized can send a channel to it, and only subscribes can view content from it.

Because U-verse is a closed system, it can support a higher bit rate IP video stream than the public Internet can universally support.

To feed a PEG channel to U-verse, AT&T commonly installs a "T1 line[1]" at the PEG location. The T1 line connects to a "CSU/DSU" (provided by the installer), and this connects to an access router, which provides an Ethernet port, which in turn is connected to the encoder. U-verse then "pulls" the video stream from the encoder's built-in server via this Ethernet port.

In the current U-verse system, all PEG channels appear in a common channel location, and the viewer navigates to the one they wish to view.

A Good Deal

It appears to be a very good deal for PEGs: AT&T will help to purchase the equipment needed to feed U-verse, and the PEG (outside of U-verse) gets a branded live video Internet presence. AT&T is not involved in the public Internet part of this equation, but if the PEG elects to use the proper equipment, the Internet side of the proposition comes along almost for free.

Not Broadcast Quality?

Video on the public Internet can certainly deliver broadcast quality, including HD. However, don't be confused by *file* download and *file* streaming vs. *live* video.

Most consumers don't understand the difference between live and stored video, but with a file there is ample opportunity for a player to buffer and do various tricks to achieve a good result.

A 10-minute video file that is encoded at, say, 4 Mbps will almost certainly take more than 10-minutes to buffer and play when accessed over consumer-grade Internet connections. A *live* video has no such opportunity so its encoding rate has to be within the range of the target audience. Experience shows that most DSL/cable modem broadband users are successful with video in the 300 Kbps range, and success rates fall rapidly above 700 Kbps.

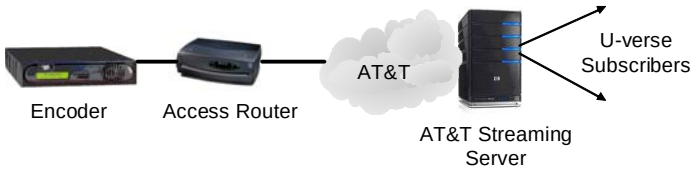
In the U-verse case, the selected streaming rate and resolutions (which are much higher than what you would do on the public Internet), are optimum for the target U-verse "Set Top Box" that consumers use to access PEG and other channels. To be clear, U-verse does not put your PEG channel on the public Internet: Discover Video does this for you.

In the public Internet case, Discover Video ensures best possible video quality given the target audience and available bandwidth.

[1] For data, a T1 line can support up to 1.536 Mbps. It is commonly provisioned using DSL technology.

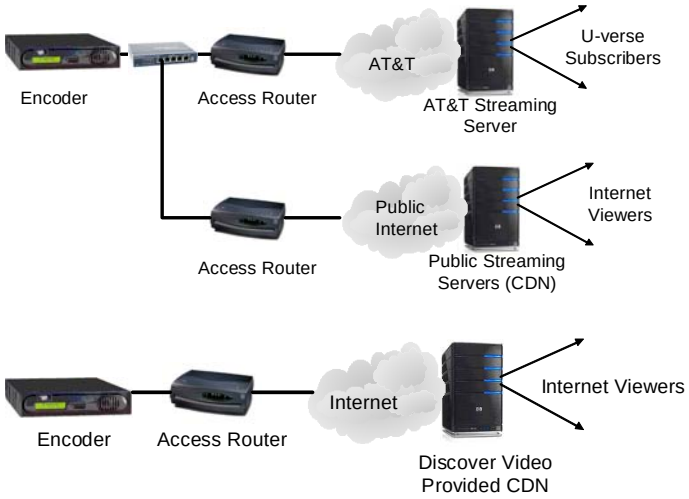
Hooking It Up

To send your PEG channel to U-verse, you need an encoder, an Access router, and a T1 connection. AT&T provides the T1 connection and may pay for the encoder and router.



Depending on your "Designated Provider" status, the monthly fees provided by AT&T ("subscriber fees") may offset any additional costs for ongoing maintenance, support, and even public Internet streaming costs.

To send your PEG channel to U-verse and also to the public Internet, you need the above, plus an Internet access router and an Internet access line. The same encoder hardware allows you to feed U-verse but also to feed the public Internet via a service. To send your PEG channel to the Internet only, you need an encoder, an optional Access Router (cable or DSL modem), and an Internet connection.



Automatic Encoder & Streaming Configuration

The streaming and IP technology has many possible settings, and some can be difficult to fully understand. Thankfully, the Discover Video PEG kit includes automatic configuration. The on-site technology automatically "phones home" to obtain configuration information, allowing for automatic optimum performance and vastly reducing complexity for PEG operators.

Frequently Asked Questions About Internet Broadcasting

- How much Internet bandwidth do I need do I need for Internet Streaming?
    - For Internet streaming, you need at least 300 Kbps for reasonable quality. Don't assume that the bandwidth you have for email and general browser uses is sufficient. A good guide is available at www.speedtest.net -- pay special attention to uplink bandwidth.

- A conventional DSL Internet access connection with uplink rates over 1 Mbps are easily installed, and costs are in the $25 to $50 / month range.

- How much Internet streaming service is included in the Discover Video PEG kit?
  - 10 GB/month, 120 GB per year. This is more than enough for the average PEG channel. This is over 900 viewing hours at the 300 Kbps rate. Bandwidth usage is measured on viewer consumption, so you can stream 7 x 24 and incur no usage when no one is watching, and you use 0.12 GB if someone views for one hour. Experience shows that most Internet viewers come-and-go and rarely watch for extended periods.
- Is there a cost for going over 120 GB in a year?
  - Yes. If you go over the allocation, the service does not stop but you will be invoiced for bandwidth used in excess of your allocation. The bandwidth rates are low, and tend to go down over time. Online usage statistics are provided.
- What happens at the end of the first year?
  - You may renew your service to continue broadcasting on the public Internet. Generally, you can budget approximately $120/month.
- Can I get a higher initial Internet bandwidth allocation for broadcasting on the web?
  - Yes. Contact Discover Video for rates
- I understand that the service allows me to "simulcast" the PEG channel on the public Internet. Can I record programs and make them available for video-on-demand too?
  - Yes, with a small additional cost. While you can certainly record video and upload it to popular video sites such as YouTube, these free sites do not generally support long-form content (i.e. 1-hour programs).
- Does the public Internet live video web page include my station information, logo, etc.
  - Yes. The provided web page allows you to customize it with your station name and you can include your station logo. The web page includes both Windows Media player version and Silverlight version, thus assuring compatibility with Windows, MAC, and IE, Firefox, and Safari browsers.
  - The PEG operator is provided with simple "cut and paste" code to display the live video on your own web page.
- My PEG station has access to the town's high-speed fiber network. Can I deliver my live content to every desktop in town government without using Internet access bandwidth?

- Yes! The technology includes built-in multicast. A virtually unlimited number of local viewers may view the live video without bandwidth concerns. This is an ideal way for key town employees and officials to view important events and meetings that the PEG broadcasts, without having to run expensive "cable TV" everywhere.

- How reliable is the Discover Video kit?
  - Modern encoders are carefree and typically require no maintenance or operator intervention.
- Can I just purchase the encoder from Discover Video without Internet service and "roll my own"?
  - Yes. If you are technically sophisticated, you can negotiate bandwidth with a CDN supplier, build your own video web page, and manage the technology locally.
- What is the audio/video input to the encoder?
  - Video is standard composite via BNC, or S-Video (cables/adapters provided)
  - Audio is standard line-level via audio jacks (cables/adapters provided)
- Where do I put the encoder?
  - The device is small and can be located virtually anywhere, but commonly it is co-located with existing RF modulators. A 19" rack adapter is included.
- What support is provided?
  - Discover Video provides installation and support, and extends the service to include streaming services, remote configuration and monitoring, and web services.
- Is it possible to digitally record all or some of my PEG broadcast?
  - Yes. Discover Video has software solutions that allow you to record your content and to digitally archive it.
- What does the web viewing page look like?

  - See the illustration. You control the title and can insert your own logo. There are two viewing pages, allowing your viewers to select Windows Media Player or Silverlight. Silverlight provides a more sophisticated interface and supports PC and MAC, Internet Explorer, Firefox, and Safari browsers.

- What encoder is used for Internet broadcasting?
    - The Discover Video kit uses the best-in-class encoders.

Frequently Asked Questions About PEG and U-verse

- What do I need to send to AT&T to get started with U-verse?
    - AT&T has a form to complete. Please check the Discover Video web site for forms and for more information.
    - Discover Video will work with the PEG operator and AT&T to ensure a smooth installation
- What will AT&T pay for?
    - Generally, AT&T pays for the T1 access line, the router, and the encoder. They do not pay for support or installation. Contact AT&T for more information.
- Are there particular encoders that AT&T allows?
    - Yes. Discover Video provides encoders authorized by AT&T.
- Does the Internet Streaming interfere with feeding U-verse or visa-versa?
    - No, there are separate feeds on separate networks, and they operate at different streaming rates.
- What encoder is used for feeding U-verse?
    - Discover Video provides the Digital Rapids 1-U rack-mount encoder, or the VBrick encoder, depending on AT&T's evolving list of eligible products. Both products can simultaneous feed both the public Internet and U-verse.

About Discover Video
Discover Video is a private corporation located in Connecticut. The company is an independent supplier of world-class software and hardware solutions for better human communications and is focused on video streaming, personal videoconferences, digital signage, and related media. www.discovervideo.com

About Rich Mavrogeanes
Rich Mavrogeanes founded VBrick Systems and served as the CEO, President, and Chief Technology Officer for many years. He serves on the board of the MPEG Industry Forum, was selected as one of "the most influential person in Streaming Media", received Computer World's "Hero" medal, and serves on the board of several other industry, government, and non-profit boards and councils. He has published many articles on streaming media and technology, many are available online via web search and at www.discovervideo.com.