VBrick

Push vs. Pull

Reflecting VBrick WM

White Paper

Scaling video distribution over the public Internet and/or private networks without using multicast requires a basic understanding of "Push" and "Pull" techniques. This paper will explain the basics.

Client/Server

The most basic idea in the delivery of streaming video is the notion that there are clients that request a video stream from a server, and servers that deliver the video stream to the client.

This is the same as a web browser requesting a page from a web server, except the server delivers a stream of digital video to a video player.

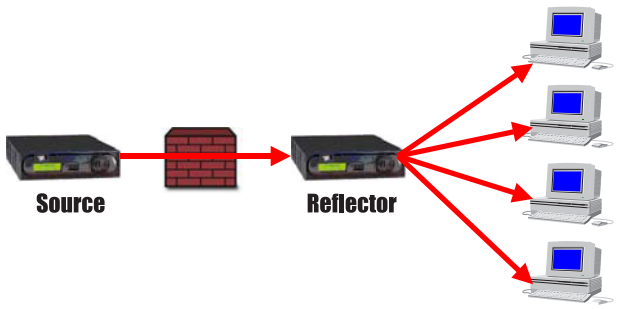
The interaction described above can be called "Pull" because the client requests ("pulls") the stream from the server.

But there is a problem with this classic client/server model. It presupposes that the client can reach the server. If the server is on a different network, such as inside a Local Area Network (LAN) and/or is behind a firewall, the client cannot reach the server. The client receives an error when attempting to reach the server in this case.

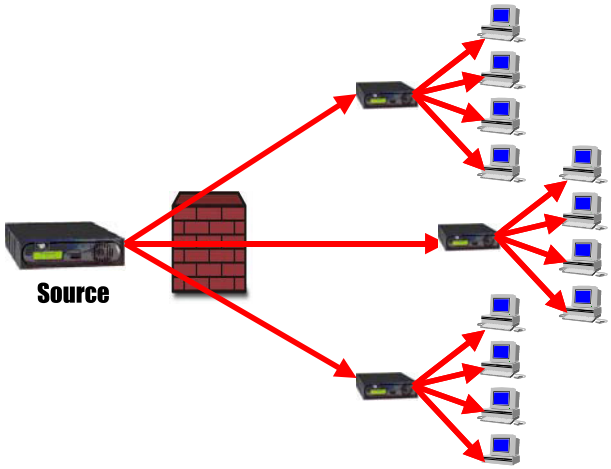
Push

To eliminate the need to have the server placed outside the firewall, push streaming is used. Here, the source VBrick appliance is located virtually anywhere and it is configured to send a single stream of video to a "Reflector" that is outside of the firewall. The Reflector is typically on a high bandwidth network while the source may not be. Thus, not only does the reflector eliminate the firewall issue, it is a "bandwidth "amplifier".

Each VBrick source can "push" to up to 25 destinations. This means that a Reflector may be located at multiple destinations such as corporate branch offices, school buildings, government offices, etc.



This is important because if a Reflector is not located at the remote location, then each viewer at that remote location must consume valuable Wide Area Network bandwidth each time they view live video. With the reflector local to the viewer, only one stream is "pushed" to the remote location.



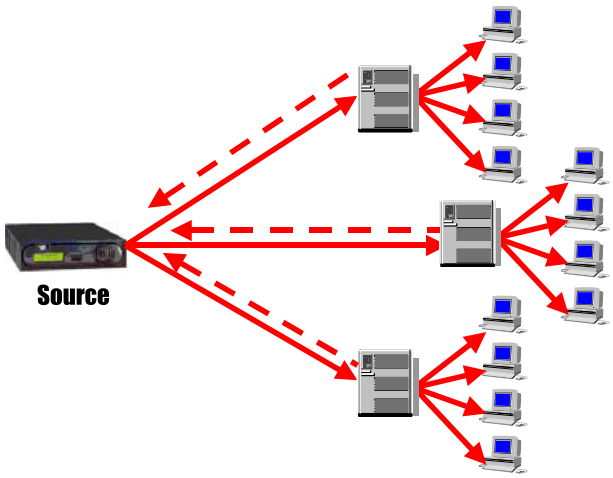
If the source video is 250 Kbps and there are 10 people at the branch office, it will require 2500 Kbps (2.5 Mbps) of WAN bandwidth. If there is a reflector located at the branch office, it will require only 250 Kbps regardless of how many viewers there are at the branch office.

Push Advantages & Disadvantages

- Advantages
  - o Video sources may be virtually anywhere
  - o The Reflector will only accept the video stream from a configured source via secure/authenticated connection
  - o Reflectors can be cascaded to increase scale
- Disadvantages
  - o Push uses bandwidth full time, whether there are viewers or not
  - o You must know in advance the destinations to push to

Pull

Pull is really no different from the classic client/server model. A client requests the video from a server, but instead of presenting the video to a player, the received video stream is presented to a server that reflects the stream. Note: The VBrick WM Appliance Reflector feature does not currently support "Pull".



Pull Advantages & Disadvantages

- Advantages
  - o The video source need not be aware of the server
  - o New Reflector servers can be added "on the fly"
  - o The server "pulls" the video stream from the source only when there is one or more viewers (saves bandwidth)
- Disadvantages
  - o There is less control over who may receive the stream from the source
  - o The video source must be "visible" to the server. It must be on an "outside" IP address and must not be blocked by a firewall.

When To Use Push

- The source VBrick is "inside" a LAN
- The VBrick WM Reflector appliance is used
- Converting a video stream that is received via "Push" to a local multicast via a VBrick appliance

When To Use Pull

- A 3rd party service provider is used that does not support push
- The source VBrick is on an outside address

Viewing Reflected Video Streams

Whether the video is reflected by "Push" or by "Pull", the viewing URL is different depending on your location or desire.

Consider a case where there is one VBrick source and three reflectors: you may view the video from each of the four locations by entering a different URL in your player! But what you want to do is ensure that the viewers at location "A" view the video with the "A" video URL, the viewers at location "B" use the "B" URL, and the viewers at location "C" use the "C" URL. This may be burdensome, or in some cases unworkable (e.g. VBPresenter only supports one viewing URL).

To "unify" the viewing such that a single viewing URL is available, a special dynamic redirect is used. By entering the IP address of each branch office, the redirector server will automatically return the video viewing URL that is right for each viewer. An automatic dynamic redirect tool is available from http://www.videoalive.com/redirectcreator/formmail/form.php

VBrick WM Appliance

The VBrick WM Appliance (Release 4 and above) includes the following capabilities:

- Live Encoding
  - o Simultaneous encoding at up to three audio/video bit rates ("Multiple Bit Rate" encoding)
  - o Up to 4 Mbps
  - o Up to 640 x 480 resolution
  - o Up to 30 fps
  - o Serving
- Up to 200 clients
  - o Multicast
- Direct IP Multicast
- Multicast Rollover
  - o Push
- Authenticated HTTP Push to up to 25 destinations
  - o Archive (Recording)
- Recording of live video on internal hard disk
- Automatic FTP of recorded video to up to eight destinations
- Reflector
  - o Accept one HTTP Push source
- Push to up to 25 publishing points
- Serving to up to 200 clients
- Direct IP Multicast with automatic .nsc and .asx generation and http hosting

About VBrick Systems, Inc.

VBrick is the leader in Enterprise IP Video solutions, with over 6,000 corporate, education and government customers and 60,000 installations worldwide. VBrick solutions work over standard IP networks and the Internet to deliver rich media communications that connect people everywhere – from employees and customers, to partners and shareholders. Our comprehensive product suite and end-to-end solutions are used in a wide range of live and on-demand applications including meeting and event broadcasts, distance learning, digital signage, TV distribution, video surveillance, and Web-based marketing campaigns. Headquartered in Wallingford, CT, VBrick's products and services are available through industry-leading value-added resellers.

For more information, visit www.vbrick.com

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