



Multiple Bit Rate Streaming

More Than Three In One

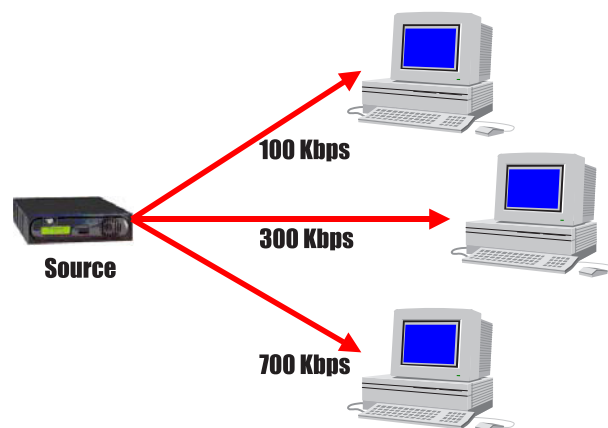
A decorative graphic consisting of a grid of squares. A diagonal line runs from the top-left corner to the bottom-right corner. The squares are shaded in various tones of green. One square in the middle of the grid is highlighted in a darker green and contains the text 'White Paper'.

White Paper

Internet Service Providers (ISP's) typically claim that their customers have high speed Internet access, but the term "High Speed" is quite variable. Not only is the maximum rate variable, but the amount of bandwidth an Internet subscriber has at any given instant depends on many factors, usually beyond the control of any single entity. This represents a dilemma for live video streaming. Sending live video at 700 Kbps may give a great viewing experience if you can really receive 700 Kbps and a terrible experience if you cannot. Sending live video at 300 Kbps may successfully reach more public Internet broadband viewers but does not do justice to those who can receive 700 Kbps. And viewers with mobile telephones are today best served with video that is well below 100 Kbps. While you can deploy multiple encoders to address this issue, you can now deploy a single VBrick appliance with a single encoder that supports Multiple Bit Rate (MBR) encoding and serving. It is more than three-in-one.

VBrick MBR

MBR enables the encoding of the live audio/video at up to three rates. In essence, a VBrick MBR encoder consists of three video encoders and three audio encoders that share a common analog audio/video input.



A viewer might explicitly enter a URL to view a particular rate, or they might enter the "MBR" URL that will automatically select the best rate for that viewer.

The VBrick allows you to configure up to three video encoding rates, video frame rates, and video resolutions. Similarly, you configure up to three audio rates. You can then apply these three audio/video streams to the VBrick Server, the VBrick HTTP Push, and the VBrick Multicast server.

VBrick Server

The VBrick WM Appliance internal streaming server can support up to 200 clients, and up to about 40 Mbps of total throughput¹.

The server allows you to include one, two, or three of your defined audio and video settings in a unified MBR stream.

¹Total throughput depends on many factors, including rates, server load, multicasts, push, etc.



With MBR, the VBrick appliance live streaming server offers four different viewing URLs:

- MBR – All three video rates are offered to the player in the initial player/server dialog, and the player “decides” which rate to use. The server then delivers this rate. The player can “downshift” and “upshift” as network conditions change. The viewing URL is <http://lp:port/name>.
- Group 1 – The audio/video defined as MBR Group 1. The viewing URL is <http://lp:port/name/Group1>
- Group 2 – The audio/video defined as MBR Group 2. The viewing URL is <http://lp:port/name/Group2>
- Group 3 – The audio/video defined as MBR Group 3. The viewing URL is <http://lp:port/name/Group3>

Having all four URL's available is extremely useful. For example, it would be pointless to offer the full MBR URL to known cell phone users, while enterprise Set Top Boxes may only request the highest rate.

MBR Push

Each VBrick WM Appliance can send to up to 25 WM Reflectors². The “contents” of the push stream may include one, two or three audio/video rates.

When pushing to a WM Server, the viewer behavior from the WM server is similar to viewing directly from the VBrick appliance: the viewer will automatically select the best video rate.

When pushing to a VBrick WM Appliance Reflector, all of the configured MBR rates will be delivered to the player. In this case, only one rate should normally be configured in the push to avoid bandwidth waste.

It is important to keep bandwidth usage in mind when configuring MBR for push: the stream that is pushed to a Reflector is approximately the sum total of the independent rates. For example, if you configure 100, 300, and 700 Kbps, then the push stream rate is approximately 1.1 Mbps. This rate is beyond the capacity of most conventional DSL lines, but well within the capacity of a T1/E1 line.

Happily, the VBrick allows you to include one, two, or three audio/videos in a “push” independently of how you configure the VBrick streaming server or multicast server.

Multicasting

The VBrick WM Appliance supports direct IP multicast, providing vast scale in any network that supports multicast. When configuring multicast, you may select any one of the three possible defined audio/video rates.

Commonly, the video sent via multicast may be at a high rate...higher than would be reasonable for any public Internet connection (e.g. 3 Mbps). Because the VBrick supports up to three MBR rates, you might configure Video 1 and Video 2 for “Internet” rates (e.g. <700 Kbps) and Video 3 for a high bandwidth rate. Then simply configure your VBrick server to deliver only Video 1 and Video 2, your push to include only Video 1 and Video 2, and select Video 3 as your multicast rate.

² A Reflector is a VBrick WM Appliance, or a WM Server.



Audio-Only / Video-Only

It is now possible to configure audio-only or video-only for any of the above described MBR Groups.

This is particularly useful when you wish to deliver live audio/video to broadband viewers, and audio-only to dial-up and/or cell phone viewers. Video-only is also very useful for security and monitoring applications because more bandwidth can be applied to the video rather than encoding audio as "silence".



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