Satellites provide a great infrastructure for broadcasting live content to large geographical areas, but scarce bandwidth resources make it very expensive and therefore unfit for delivering unicast content, which requires resources that can grow linearly with the number of users. Since next-generation devices (e.g., tablets, smartphones, connected TVs, and OTT STBs) mainly receive adaptive bitrate unicast streams, one would think that it would be impossible to use satellites for addressing them. However, even if the satellite is not adapted to unicast delivery, it is perfectly suitable for mutualized delivery. The solution is multicast.

This whitepaper explains how Broadpeak’s technologies use satellites to deliver live content to a wide range of devices, in a way that is transparent to the existing components (i.e., encoders, players, DRM systems). Two different use cases are detailed: satellite multicast distribution and satellite multicast contribution.

Satellite multicast distribution

Delivering multiscreen content in the home network leveraging satellite connectivity

Satellite operators are facing a big dilemma today. While they can send live content to connected devices such as smartphones and tablets, it is only possible through unicast. With the satellite link being very expensive, it is nearly impossible for content providers to use unicast for the distribution of their live content, as it would require the use of a separate unicast stream for each subscriber’s device.

Broadcast is the resolution to that problem. Mutualizing the content delivery, the cost of the satellite resources can be drastically reduced, allowing satellite operators to access the market of content providers who want to distribute their live content to ABR devices. But what is the best method for supporting multiscreen delivery when the devices do not support multicast?

Broadpeak’s technologies are the perfect solution for satellite operators. Content providers can convert the unicast stream into multicast leveraging Broadpeak’s BkE200 transcaster server installed in the headend. Broadpeak’s nanoCDN application is installed in the indoor unit (IDU) equipment of the subscriber and converts the multicast stream into unicast.

Broadpeak’s solution revolutionizes live multiscreen video delivery via satellite by removing all of the hurdles related to peak hour consumption. Regardless of the number of viewers, the same bandwidth is used over the network. By using subscribers’ home IDU equipment as part of the content delivery network infrastructure, the nanoCDN makes live multiscreen video delivery to any device truly scalable.
What about security?

The multilayer streams used for ABR formats are protected by DRM as opposed to CAS, which is traditionally used for satellite distribution. Broadpeak’s solution is compliant with all DRM solutions and transparent with respect to the encryption.

The LNB equipment of the satellite operator, installed in the subscriber’s home, provides a satellite return channel with the key to decrypt the content. Thus, the content is perfectly secured from the headend to the end-user player without any interruption.

Analytics/audience

In the satellite and broadcasting world, it is difficult to have a feedback on the usage of the service. Thanks to the return channel, Broadpeak’s application is able to send detailed statistics and reports on end-user behavior.

This valuable information can be used to promote the service. For example, by providing content providers with important information on peak hours, it enables them to generate additional advertising revenue.

Major benefits:

- Live multiscreen unique scalability (1 million viewers → 1 multicast stream)
- Maintains the benefits of adaptive streaming technology for a superior quality of experience
- Addresses any type of device at the subscriber’s home
- Supports live pause TV mode
- No extra delay
- LNB allows use of current DRM technologies for content protection
Satellite: a valuable resource for telecom and cable operators

Broadpeak’s solution is not only intended for satellite operators, but also addresses telecom and cable operators who use a satellite contribution link.

Given that the satellite link between the central headend and local headend is expensive, using unicast at this level when content has to be streamed to several local headends can be very costly. For example, operators who distribute content to several points such as Indonesian Islands need to use multicast because a unicast link for each point would be too expensive.

Relying on the power of multicast, Broadpeak’s solution dramatically reduces operators’ costs and makes live multiscreen delivery possible. Broadpeak’s technologies first convert the unicast stream into multicast. The multicast stream is then sent to different local headends and converted back into unicast. Telecom operators can use each local headend as a delivery PoP.

For each PoP, Broadpeak provides a streaming server with the nanoCDN application that allows operators to convert the incoming multicast stream into unicast and to deliver it in the distribution network. The unicast stream is distributed to subscribers’ homes, and live content can be watched on any device.

Major benefits:
- Live multiscreen unique scalability (1 million viewers => 1 multicast stream)
- Maintains the benefits of adaptive streaming technology for a superior quality of experience
- Addresses any ABR device (including televisions with ABR set-top boxes)
- Supports time-shifting
- No extra latency at startup
- No extra delay
Broadpeak’s products involved in its Satellite solution

**BkE200**

Transcaster servers

Broadpeak’s BkE200 series help operators optimize their network to manage new end-users’ habits.

BkE200 servers can convert unicast ABR protocols into multicast and deliver them over the network.

**nanoCDN application**

Multicast to unicast converter

Installed in the subscriber’s home Indoor Unit equipment or in a video server, Broadpeak’s nanoCDN application converts the multicast stream in unicast, making the multiscreen delivery possible.

**BkS400**

HTTP video cache servers

Broadpeak’s BkS400 family of video cache servers offers massive streaming capacity over open internet networks.

Using HTTP adaptive streaming technology, the BkS400 video cache system is the most efficient way to deliver live and VOD content while ensuring the best Quality of Service for end-users.
Broadpeak designs and manufactures video delivery components for Content Providers and Network Service Providers deploying IPTV, Cable, OTT and Mobile services. Its portfolio of solutions and technologies powers the delivery of movies, television programming and other video content over managed networks and the internet for viewing on any type of device. The company’s systems and services help operators increase market share and improve subscriber loyalty with superior quality of experience.

Broadpeak supports all of its customers worldwide, from simple installations to large delivery systems reaching capacities of several million of simultaneous streams.

Broadpeak systems leverage the long legacy of Technicolor’s excellence in broadcast and broadband content delivery from where the founders and technology originated.

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