

Spirent Avalanche

HTTP Adaptive Bitrate Streaming (ABR) with Video Quality Analysis

Applications and Security Testing Solutions

Video over IP represents an ever growing percentage of internet and mobile data. HTTP Adaptive Bitrate Streaming (ABR) technologies deliver a seamless video viewing experience by adapting to bandwidth constraints and endpoints resources. The Avalanche HTTP ABR Video testing solution provides scalability, performance, functional, and interoperability testing of Over-The-Top (OTT) streaming video servers and video delivery networks to ensure the Internet will support bandwidth-consuming video traffic.

Applications

Video over IP is not a new technology, but recent developments have brought it to the forefront of possible solutions to a range of challenges facing MSOs, content providers, service providers and network equipment manufacturers. Packet video lowers the barrier to entry for alternate providers servicing a niche market, but even established MSOs now look to OTT to address challenges such as the “cut the cord” phenomenon, where consumers cancel cable contracts for other sources of video perceived as less expensive, such as broadband or over-the-air broadcasts.

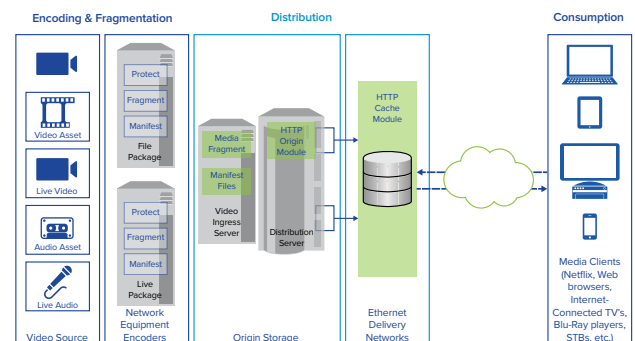
In addition, content owners with billions of dollars in video distribution contracts in traditional cable, satellite, and broadcast markets, see OTT streaming as a new distribution platform for reducing operating costs and increasing profitability. NEMs continue to find ways to push the boundaries of performance and scalability with devices designed to make it possible to address the challenges and meet these goals.

Unlike traditional video delivery technologies, Video over IP is subject to quality-of-experience (QoE) degradation due to latency, jitter, buffering and packet loss. The picture is further complicated by the wide disparity between end-user devices, from huge flat screen televisions to mobile phone screens. HTTP ABR was designed to improve user QoE for video over the Internet. As client devices encounter video transport and processing bottlenecks, the video server adapts to client requests for streaming video at different bitrates, adjusting quality based on available resources and delivering an uninterrupted viewing experience.

Video Test Methodology

Spirent’s Layer 4-7 test methodologies enable those developing HTTP ABR solutions to validate scalability, performance, functionality, and interoperability of their solutions under a wide range of deployment scenarios to ensure high user QoE in real networks.

- Video server performance testing
- Verify video transport KPI (Key Performance Index)
- Benchmark user load server performance testing
- Video bitrate shifting testing
- Video network device testing
- Video content availability testing
- Built-in ABR quality scoring
- Apple HLS server emulation for end-to-end testing capabilities



Spirent Services

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Features & Benefits

HTTP ABR Video Client Emulations:

Avalanche ABR streaming clients emulate real-world video clients that test server functionality, from sending manifest/playlist files to streaming video over TCP to the clients.

ABR Over TLS - Encrypted ABR Video:

Avalanche ABR is encrypted using TLS encryption options that can be used while testing.

- Adobe Zeri VOD client
- Apple HTTP live streaming (client and server support)
- Apple HLS VOD (client and server support)
- Apple HLS encrypted client
- Microsoft Smooth live client
- Microsoft Smooth VOD client
- DASH VOD client
- DASH live streaming client

Avalanche ABR streaming emulation also support DVR and user activities with trick play commands such as play, seek, pause, and GO-Live.

Bitrate Adaptation/Shifting: The Spirent-owned proprietary Smart algorithm allows Avalanche ABR streaming clients to automatically shift to different video bit streams based on network conditions, including bandwidth, delays, and various network impairments. The adaptive bitrate application also allows users to set criteria for shifting or test at a constant bitrate.

Adaptive Streaming Statistics: On top of Avalanche standard HTTP statistics, new ABR statistics allow users to assess the quality of video transport by measuring video manifest/playlist and fragments transport delays, keeping count of bit rates requests and receives, and Spirent patent-pending Adaptive Streaming score. Adaptive streaming score is a QoE index providing an effective indicator of a video server providing a client with a seamless video viewing experience.

Authentic Testing: Avalanche ABR clients emulate actual user transactions and provide control over TCP/IP stack characteristics such as maximum segment size, delayed ACKs, IP fragmentation and TCP time-out behavior. Avalanche ABR clients can emulate video client browsers, decompress gzips, encode URLs and apply realistic user level attributes.

Multi-Play Performance Testing with ABR Video: Spirent Avalanche can perform Triple Play testing, validate Triple Play service from the user's point of view, with realistic voice calling, unicast/multicast and ABR streaming video, and simulate Internet data traffic using static IP address or IP address assign by DHCP over PPPoE, VLAN and Stacked VLANs (e.g., Q-in-Q).

Technical Specifications

- Adobe Flash Video Specification 10.1
- Microsoft IIS Smooth streaming client 1.1
- HTTP Live Streaming draft-pantos-http-live-streaming-06

Supported Modules & Platforms

- Supports all Avalanche appliances: Spirent C1, Spirent C100 and Avalanche Virtual
- Supports compatible mX2 modules