DVB multicast ABR

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Introduction

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Overview
Unicast ABR

1 user = 1 video streaming session!
Quality of Experience at risk

CDN
Motivations

Multicast versus Unicast

ABR content to all screens

Source: British Telecom
Traffic levels on a UK mobile network on two consecutive days showing the bandwidth consumption peak on the second day when England played Wales in the Euro 2016 tournament.

Source: Streaming Video Alliance
“The Viability of Multicast ABR in Future Streaming Architectures” April 2019

Impact of mABR on GPON Delivery

Source: Streaming Video Alliance
“The Viability of Multicast ABR in Future Streaming Architectures” April 2019
Multicast ABR

Multicast Server

CDN

1 Channel = 1 video streaming session!

mABR

xDSL, HFC/Docsis, FTTH, SAT,…

Multicast Gateway

Unicast interface
Configuration interface

DVB/mABR Unicast interface
DVB/mABR Configuration interface
DVB/mABR Multicast interface

Broadcast/Multicast
System Operations
Multicast ABR - Multicast server configuration

What stream(s) to capture and how to transmit over multicast

- Multicast Server Configuration
- REST API

CDN - Multicast Server - Multicast Gateway - App

mABR
The mABR service supports CMAF low latency.
Multicast ABR – Multicast Gateway configuration 1/3

What multicast stream(s) to listen matching the player request

Multicast ABR

Multicast Server

Multicast Gateway Config.

Out-of-band configuration API

CDN

Player

Multicast Server Config.

Multicast Gateway

App
Multicast ABR – Multicast Gateway configuration 2/3

What multicast stream(s) to listen matching the player request

mABR

Server Configuration API

Multicast Server Config

Multicast Gateway

In-band configuration

Multicast Gateway Config

CDN

Player

App
Multicast ABR – Playout in regular mode

The rendezvous service routes the requests (HTTP Redirect) according to service plan, business rules, etc.
The multicast gateway is configured “Just-in-time” for the new media session.
Multicast ABR – HTTP unicast repair

HTTP Unicast Repair requires the support of byte-range requests

CDN

Rendezvous Service

Multicast Server

Multicast Gateway

Player

URL

App

mABR
Multicast ABR – HTTP unicast assistance 1/2
Multicast ABR – HTTP unicast assistance 2/2

HTTP Unicast assistance based on HTTP Redirect = CPU friendly
Multicast ABR – Playout in Co-located Mode

The Multicast gateway is configured using just-in-time combined with out-of-band. Could have been: Just-in-time combined with in-band methods.
Standard Scope
Multicast ABR – Specification Phase 1 Normative

- Multicast Gateway Configuration
  - Out-of-band REST API
  - In-band multicast or
  - Just-in-time (HTTP redirect)

- Multicast Server Configuration
  - REST API

- Multicast Server Operations
- Mandatory Unicast Repair

- Multicast Server

- Multicast Gateway

- Rendezvous Service

- Multicast Gateway Config.

- Optional [session] Request parameters

- System Operation

- Multicast Gateway Operations

- Multicast protocols
  - FLUTE profile or ROUTE profile

- XML Data model

- XML Data model

- XML Data model
Multicast ABR – Specification Phase 1 Informative

- Rendezvous Service
- Multicast Server
- Multicast Gateway
- Examples
- Local system Discovery
- Handling of presentation manifest
- Implementation guidelines: FLUTE profile, ROUTE profile
- Low latency operations

- Multicast Server Config.
- Multicast Gateway Config.
- Low latency operations
Multicast ABR - Format, Content, DRM agnostic
Multicast ABR – Specification Phase 2 (Phase 1 complements)

- Non Live delivery + Pre-caching
- Multicast Service Config
- Multicast Server
- Rendezvous Service
- Multicast Gateway Config
- Multicast Gateway
- Unicast Repair Service
- Unicast repair protocol
- Fully specified HTTPS
- Reporting Service
- Reporting analytics, Accounting
- Authentication
- Optional multicast protocols
- Player
- Fully specified HTTPS
Multicast ABR – Specification Phase 2
(Potential new Topics)
Deployments
Multicast ABR – Over broadband

The multicast gateway can be hosted in the home or in the ISP’s network.
The STB must be capable of receiving multicast traffic.
Multicast ABR – Over satellite

The satellite provides an IP multicast transport pipe

mABR
Multicast ABR – Over satellite / One way

Operator’s CDN

Multicast Server

Multicast Gateway

Rendezvous Service

mABR
Multicast ABR – Multicast gateway stacking

The satellite’s multicast gateway is one way only.
Multicast ABR – 3rd party content provider

1- Request the manifest

2- Redirect the request (peering agreement)

- Operator’s CDN
- Content Provider’s CDN
- Rendezvous Service
- Multicast Server
- Multicast Gateway
- Operator’s IP Network
- mABR