

# 'Over The Top' Radio

Using Adaptive Bitrate (ABR) for streaming Audio

## *Abstract*

When it comes to Radio, Broadcasters face the same challenge as with video: scale, protection, many different devices and how to monetize. To address this two major European Broadcasters initiated the move to audio only adaptive bitrate to stream their radio channels.

The presentation will discuss setup and experiences, including MPEG-DASH, and future developments.

# Quality

encoding, audio, adaptive

# Protection

control, encryption, drm

# Scale

edges, cdn, cloud

# RTL

# BBC



# Quality



## Audio

AAC LC  
HE-AAC

HE-AAC v2 (Fraunhofer)  
Dolby Digital Plus (EAC3)  
DTS Express

## Adaptive

Multiple bitrates  
All protocols, all devices  
Dynamic switching

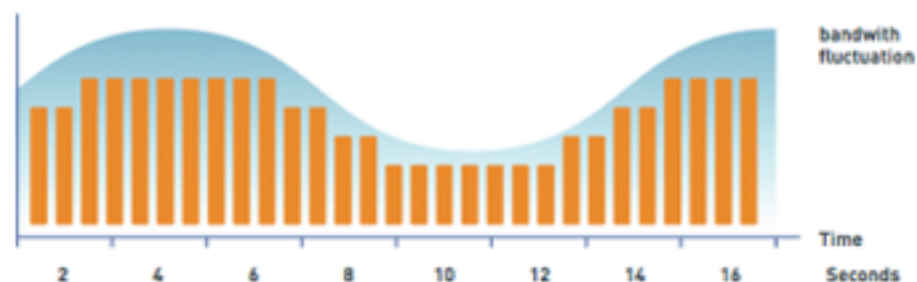
## Highlight

HLS still images  
Visual Radio

## Reliable

Adapts to any changes in  
each user's network and  
playback conditions

HTTP Adaptive  
bit rate Streaming  
GoE



# Encoding



## Highlight

Encode ABR and RTMP/ICY at the same time

### Broadcast Audio Processing

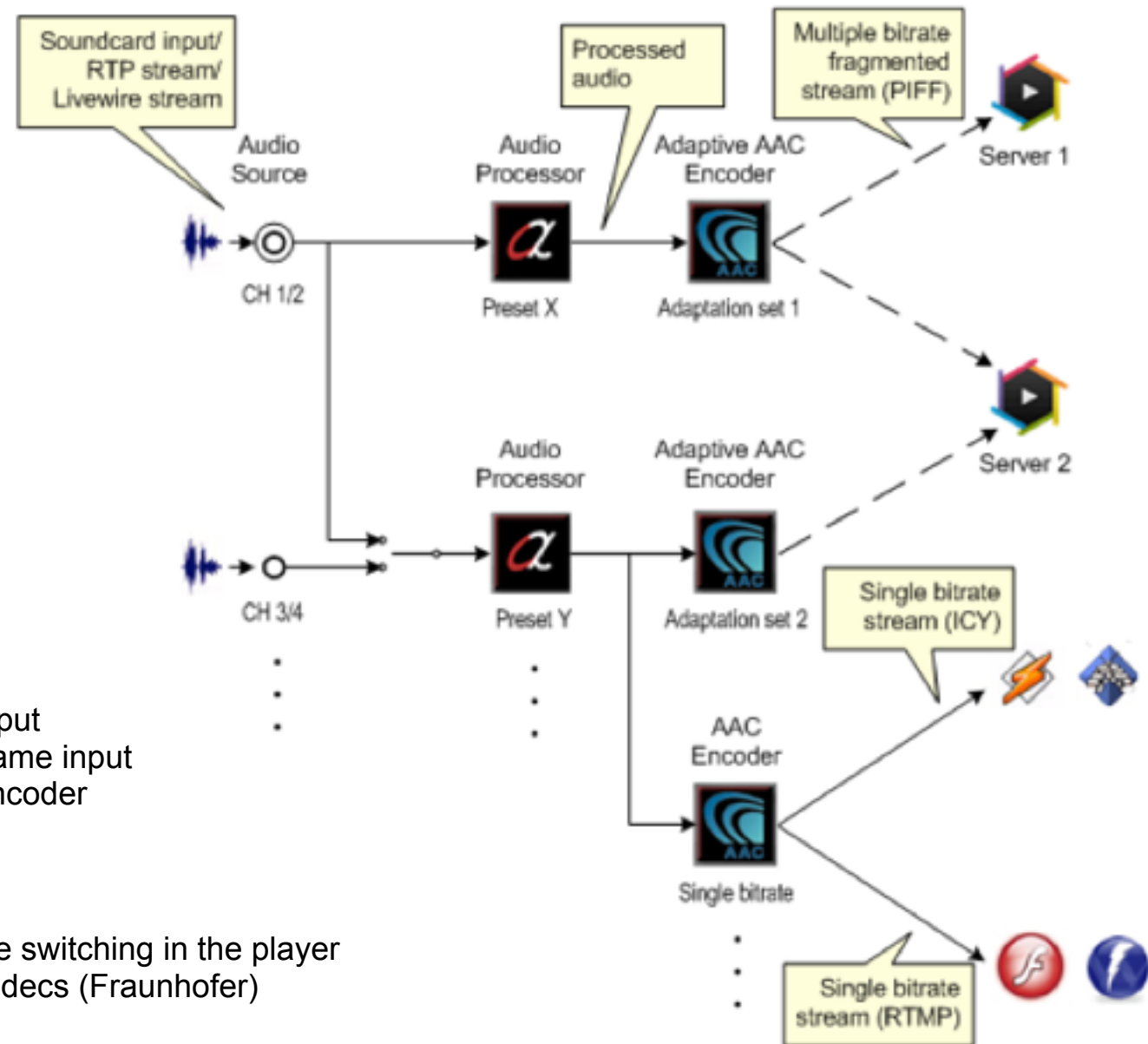
- eliminates level variations and provides consistent level and loudness, for best user experience
- dynamically re-equalizes audio and can be used to create signature 'radio' sound
- protects the encoder and reduces coding artifacts

### Stream Encoding

- single bitrate encoder (ICY/HTTP and RTMP outputs)
- multiple bitrate 'adaptive' encoder (currently PIFF output)

# Encoding

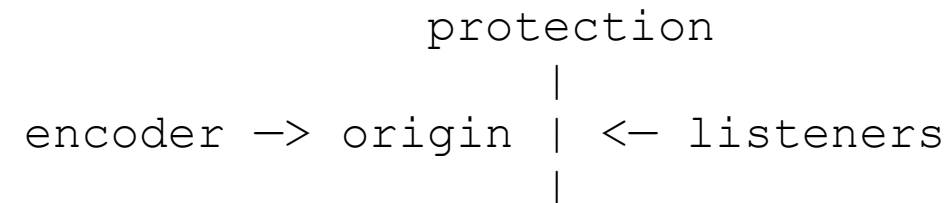
encoder → origin ← listeners



- Multiple audio inputs
- Multiple audio processors for each audio input
- Multiple adaptive bitrate encoders for the same input
- Multiple destination servers for the same encoder

Bitrates are sample-aligned for imperceptible switching in the player  
AAC LC, HE-AAC, HE-AAC v2 and MP3 codecs (Fraunhofer)

# Protection



## *Highlight*

Different layers

No hot linking

## Control

Current protocols for streaming radio have no 'protection' concept. Aggregators may use the stream regardless.

For commercial broadcasters this means loss of revenue. It also it means knowing less about your audience.

No hot linking of streams as for instance with Icecast/Shoutcast.

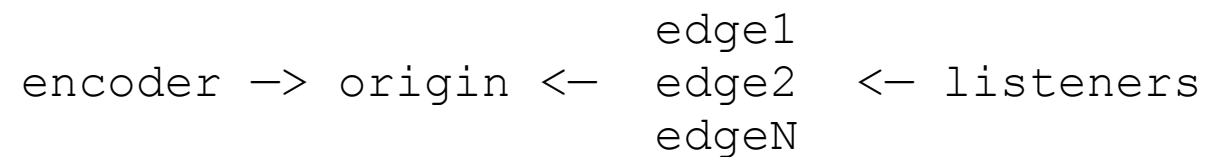
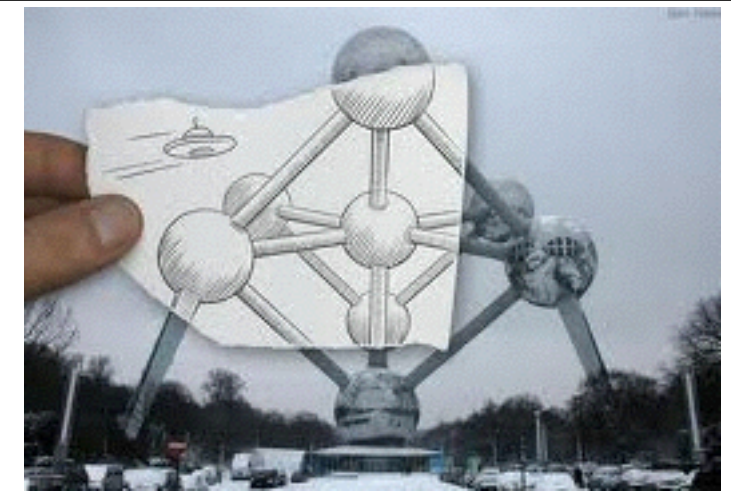
## Security

Token/Session based access  
Geo blocking

## Encryption

AES 128  
DRM (PlayReady, Access, Marlin)

# Scale



## Highlight

Cheaper: buy  
bandwidth not  
listeners

In typical setups viewers do not connect directly to a streaming origin: caching is employed.

Caching can be setup in-house by adding edges, or by using an external CDN.

With ABR edges can be standard HTTP servers:

- use of existing infrastructure
- generic HTTP caches and proxies
- use existing CDN's without complex setup
- event overflow

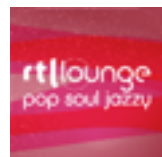
## Cloud

When there are peaks and lows in the nr of listeners is is not efficient to have servers idle but payed for in case of that one event.

In the cloud it's easy to scale and pay by use.

Nodes can be spawned from existing archives, keeping the timeline.

# RTL



RTL Lounge: HLS  
2000 parallel streams

<http://podcast.rtloungeaudio.nl/>



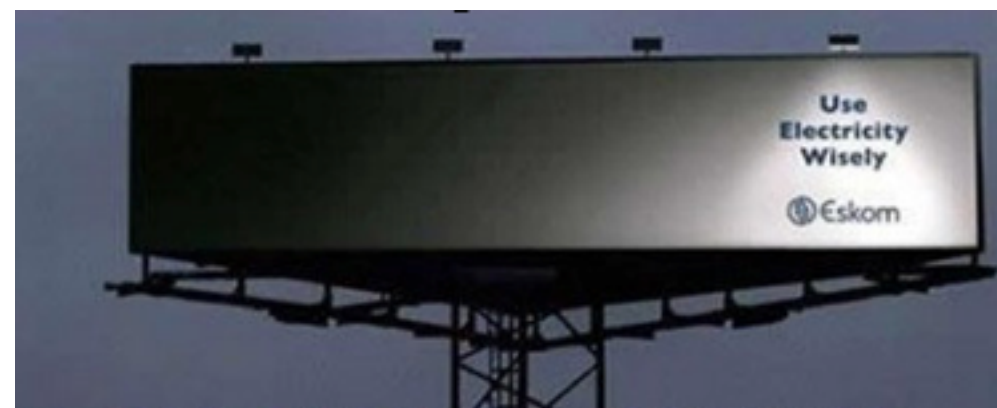
Germany: regional  
Radio Berlin: 6000 parallel streams



RTL France: 40.000 parallel streams  
France: take control over play out

## Advertisement

More control over ad placement (client side)





# RTL

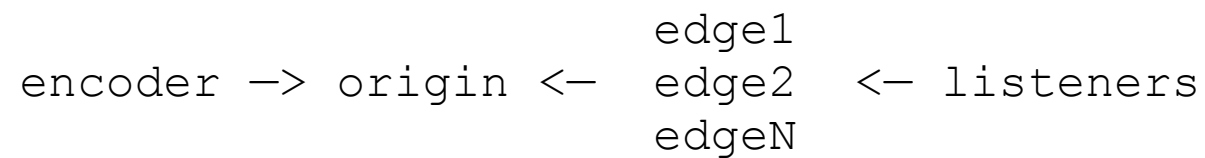
Radio 538 / Sky  
15.000 parallel streams



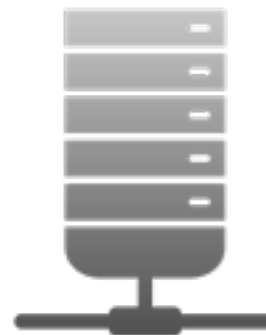
*Highlight*  
One edge handles  
15.000 listeners

Hilversum → Amsterdam (AMS-ix)

Omnia at Radio 538



Edge ARR 20Gb/s



# BBC



## Video Factory

Roll-out Q1/2 2014  
30 simulcast channels

Live events:

- Football
- Commonwealth Games
- Music Festivals

Peak 30 to 35 events streamed  
simultaneously

Currently 200.000 viewers, expected to  
rise two or threefold with the events

More functionality planned



## Audio Factory

Massive uptake on mobile and  
tablets

Top-end online radio  
programme has 100.000  
listeners

Even the 10th program had  
50.000 listeners

30 channels that broadcast BBC  
1, 2 and 3 and 40 regional  
channels

## Highlight

100.000 listeners  
at 128Kb/s equals  
12.8 Gb/s

# BBC

## Cloud



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### SESSION 5: USING THE CLOUD IN A PUBLICATION WORKFLOW

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09.30-10.00

**Using a hybrid setup for encoding to distribution**  
*First results of an optimised BBC workflow*

Marina Kalkanis and  
Henry Webster

BBC

# MPEG-DASH

## Built-in

Unified Streaming has built-in DASH support since early 2011.

## Formats

Both ISO-BMFF (fragmented mp4) and MPEG2-TS transport formats are supported as well as static and dynamic profiles

## Encryption

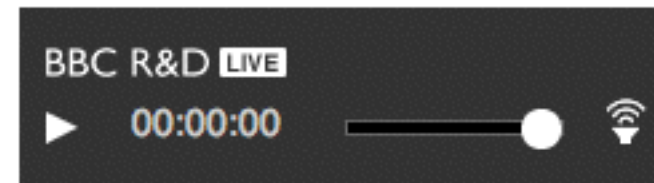
Supports Common Encryption, PlayReady and Marlin for DASH

## Audio

DTS Express  
Dolby Digital Plus  
Fraunhofer HE-AAC v2

## On-the-fly

MPEG-DASH content is generated on-the-fly.



HTML5 with Media Source Extensions  
Chrome and IE11 on Windows 8.1

## Metadata

DASH play out should not only ingest and streaming but also in-stream meta data (track, artist or other information).



**Cheaper**  
**More functionality**  
**Better experience**

