

# EP 2,670,109 B1

Method, system and devices for multimedia delivering in content delivery networks

Exemplary of:

## Hybrid Unicast-Multicast

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(54) **Method, system and devices for multimedia delivering in content delivery networks**  
Verfahren, System und Vorrichtungen zur Multimediabereitstellung in Inhaltsbereitstellungnetzwerken  
Procédé, système et dispositifs de distribution multimédia dans des réseaux de distribution de contenu

(84) Designated Contracting States: <b>AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR</b>	• <b>Ferguson, David</b> Cambridge, CB23 7AP (GB) • <b>Niven-Jenkins, Benjamin</b> Cambridge, CB4 0WG (GB) • <b>Villegas Nuñez, Alvaro</b> 28050 Madrid (ES)
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1. A method for delivering multimedia in content delivery networks, comprising:

- receiving requests directed to a content delivery network CDN for media objects,
- checking whether the media objects have associated a web resource which is enabled to be multicast,

**characterised in that**, if a configurable threshold of requests is reached, the method further comprising:

- retrieving the requested media objects and subsequent media objects associated with the same web resource,
- retrieving a set of cacheable objects to serve the received requests for media objects,
- packaging the retrieved media objects and cacheable objects into a multicast channel 300,
- associating the multicast channel 300 with the web resource,
- sending a notification 207 from the content delivery network CDN including response information 210 in order to enable a decision on whether to use the multicast channel 300 for delivering at least one of the retrieved media objects.

<https://patents.google.com/patent/EP2670109/en>

### 1. A method for delivering multimedia in content delivery networks, comprising:

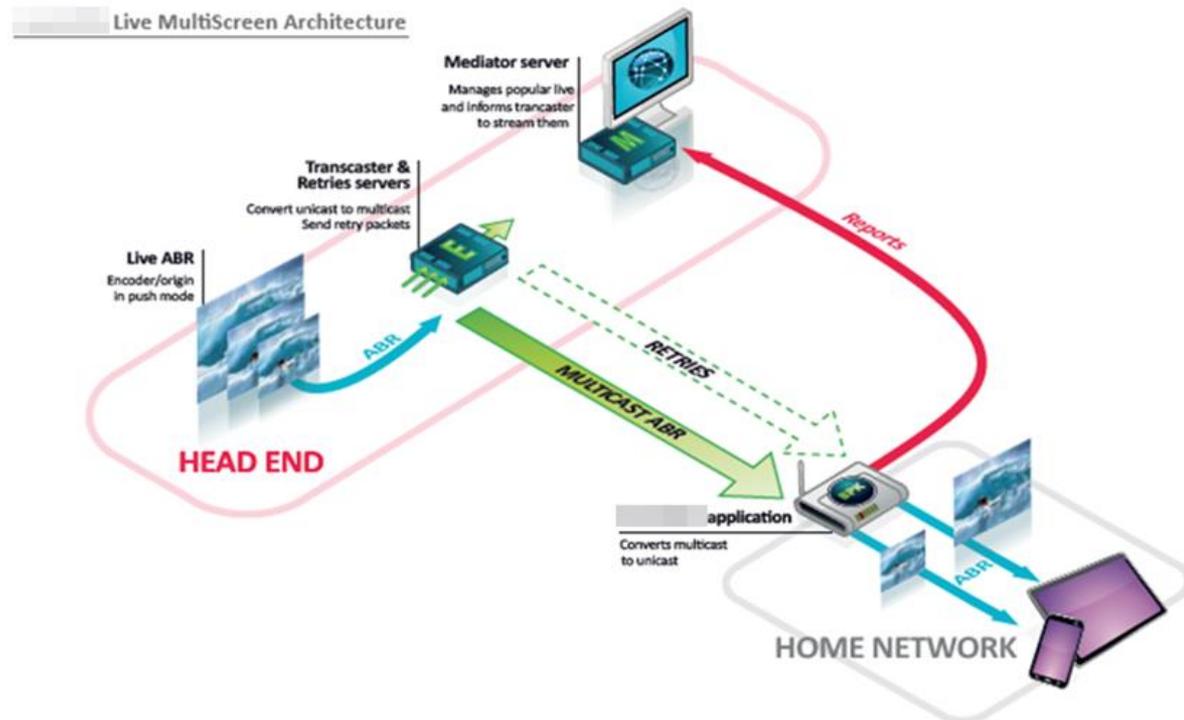
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### multicast ABR for Live MultiScreen

revolutionizes live multiscreen video delivery by removing all of the hurdles related to peak hour consumption: whatever the number of viewers, the same amount of bandwidth is used over the network. By using subscribers' Customer Premises Equipment (CPE), such as broadband gateways, cable modems, or STBs, as part of the content delivery network infrastructure this application of makes live multiscreen video delivery to any device truly scalable.



# EP 2,670,109 B1 Claim 1

## Exemplary of: Hybrid Unicast-Multicast

### 1. A method for delivering multimedia in content delivery networks, comprising:

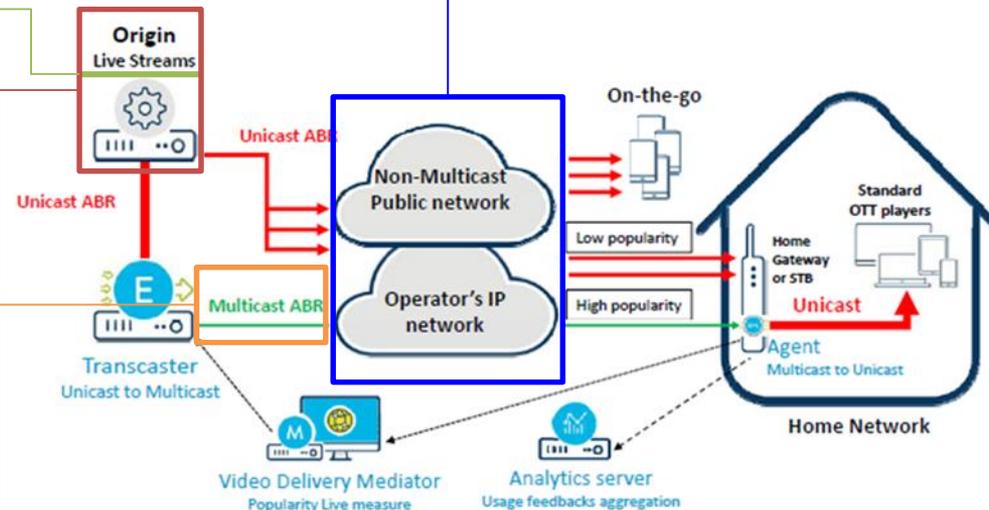
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### SOLUTION BRIEF: ██████████'S ██████████

██████████ technology empowers cable and telecom operators to deliver live OTT content in a scalable way to millions of users, leveraging their control over home network components – set-top-boxes or home gateways.



**Hosting the origin server:** ██████████'s ██████████ Origin Packager improves multiscreen video delivery on managed or open Internet networks through on-the-fly packaging and unique cache management capabilities.

**Comment:** The web resource is the URL or website where the media can be retrieved, e.g. the URL address pointing to the Origin server. In CDN network, the Origin server contains the original version of the content for which the cached version are distributed through, e.g. Edge servers in the network. The Origin server is addressable in the web by e.g. an IP address.



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### An Open Platform

Mediator was designed after the Open IPTV Forum specifications and benefits from a streamlined and evolutive architecture.

provides web services for integration with Service Platforms and Content Management Systems which makes it very easy to integrate into your network. Servers are already tested & certified with leading commercial or home grown service platforms.

### Secure Multilayered PoP Topology

The Topology Manager is embedded into Mediator, monitoring the network topology and updating each server's status. It is a central component, as it is the only element that has complete visibility of the location, availability and status of video streamers. This ensures that a subscriber's request will be fulfilled in the most cost-effective manner from the most suitable video streamer, based on the service requested and the customer's location.

### Content Popularity Mechanisms

Mediator continuously monitors the popularity of content based on usage patterns. features the unique ability to define, for each PoP, a minimum number of viewings before the content is cached. Popular content is automatically provisioned to the edge servers while long tail content remains in the larger central library. This automated process dramatically reduces the need for storage at the edge, tremendously increases disks lifetime and consequently diminishes the total cost of ownership of the global solution.

**Comment:** The mediator measures the popularity of contents. It can decide to cache the content when a minimum number of viewings are reached.

On the Internet, a point-of-presence (POP) is an access point from one place to the rest of the Internet

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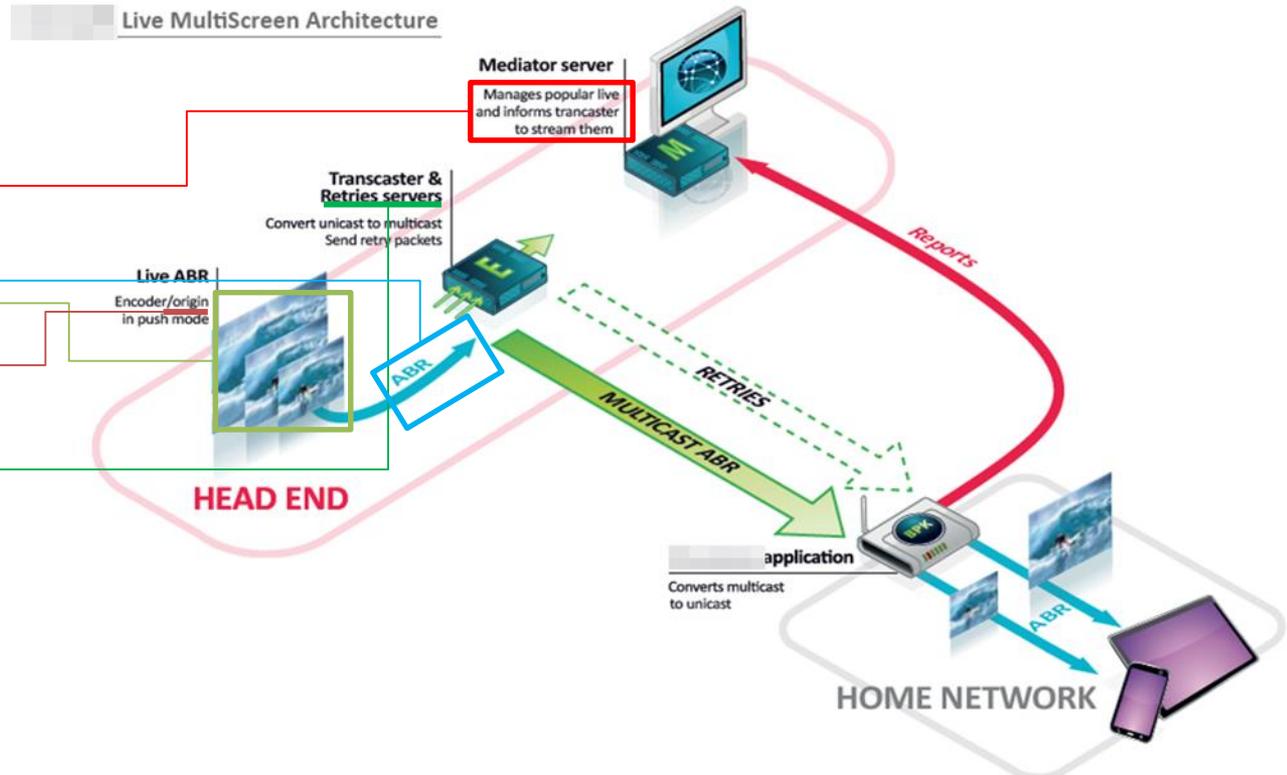
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Multicast resources are available in most operator networks that have deployed live TV services for cable or IPTV. **EP 2,670,109 B1** relies on them for carrying the most popular OTT channels as well. Channel popularity can be dynamically computed in order to allocate multicast channels based on usage.

### Live MultiScreen Architecture



**Comment:** The mediator measure the popularity of a live channel, and when it become popular (i.e. reach a threshold), it will inform the transcater to receive the unicast live ABR stream from origin server and covert to multicast. Retry packets is cached on the Retries Servers and is sent In response to retry request, e.g. due to packet loss.

In CDN network, the Origin server contains the original version of the content for which the cached version are distributed through, e.g. Edge servers in the network. The Origin server is addressable in the web by e.g. an IP address.

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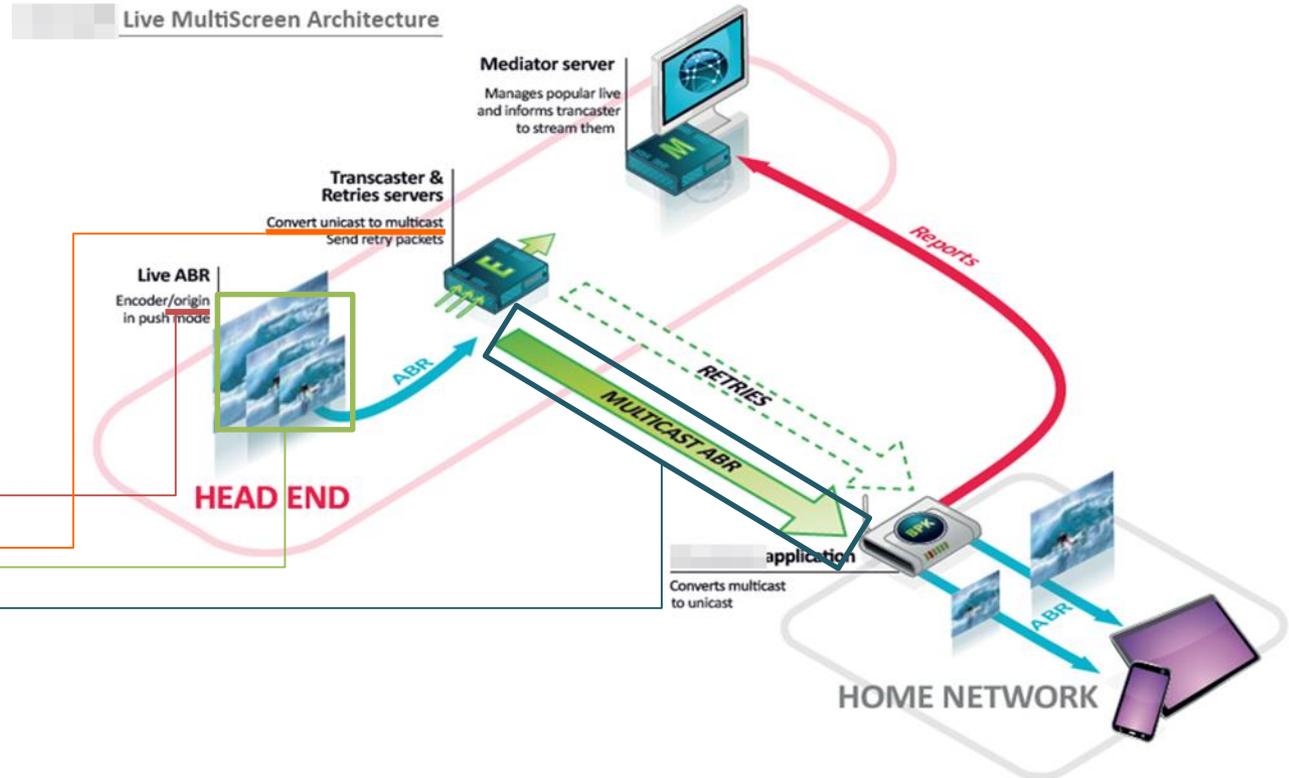
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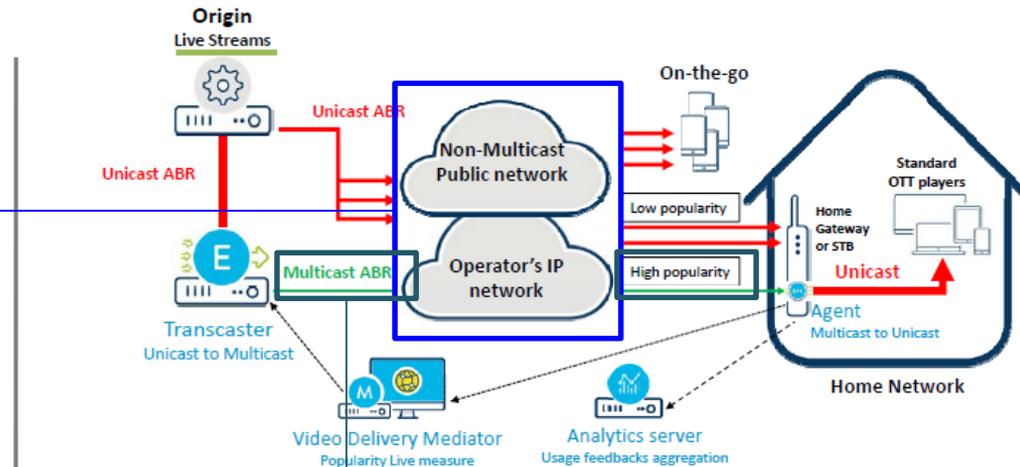
**Comment:** Transcaster servers convert the unicast streams from the origin server to multicast.

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The Video Delivery Mediator constantly measures the popularity of each channel and automatically allocates to the [redacted] the requests for the most popular ones. For these channels, a transcaster in the head-end converts the unicast streams into multicast, allowing the operator to serve millions of viewers with a single stream. In addition, it creates the conditions for resolving typical quality of experience issues related to http streaming such as high latency or recurrent buffering. An agent installed in the CPE receives the multicast stream and converts it back to unicast for delivery to individual devices across the residential environment. The compatibility with DRM and the Adaptive Bitrate policy remain unchanged.

At the end of each user's session, the [redacted] feeds back the system with information allowing the Video Delivery Mediator to update dynamically the channels popularity. The [redacted] CDN Mediator

[redacted] CDN Mediator

The [redacted] routes the requests to the home gateway if the channel is available in the [redacted] or to the traditional streaming server.

**Comment:** It is obvious that notification will be sent from the network when the multicast channel is available, e.g. the mediator server will be notified if the channel is available in the multicast mode, in order to route the content request.