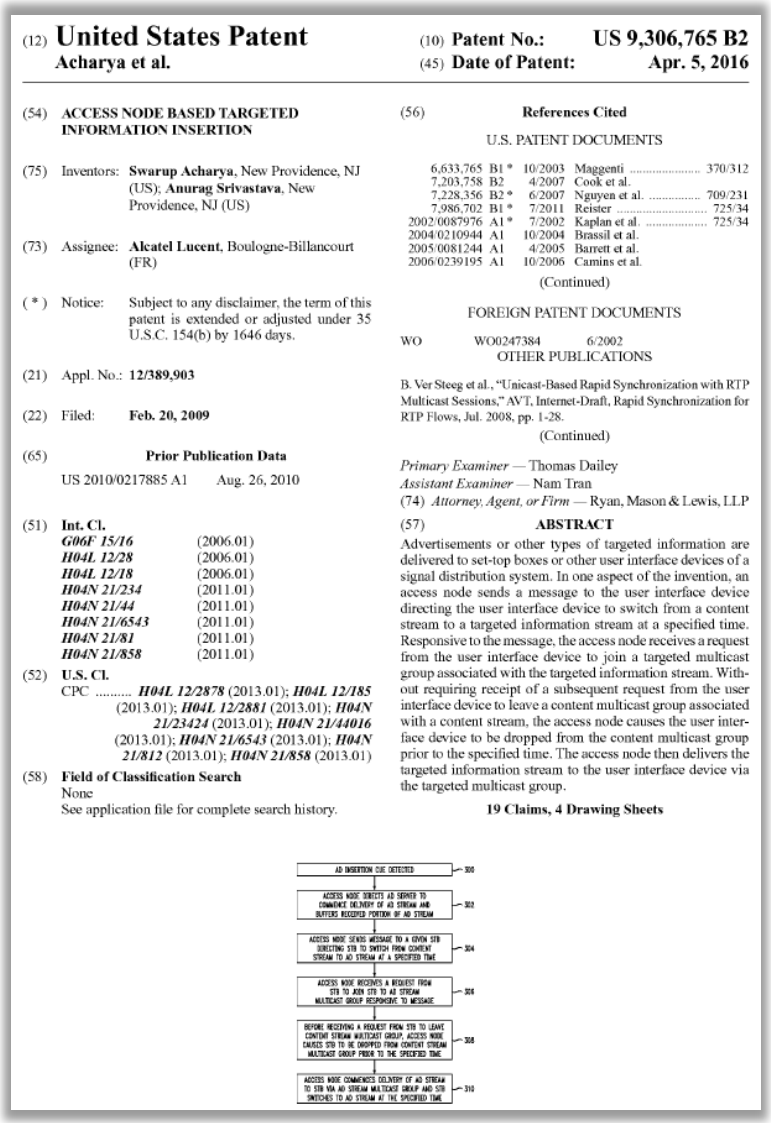
US 9,306,765 (Family ID: Acharya 35-21 (S))

Access node based targeted information insertion

Exemplary of:

Multicast Dynamic Ad Insertion



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Acharya et al.

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(45) **Date of Patent: Apr. 5, 2016**

(54) **ACCESS NODE BASED TARGETED INFORMATION INSERTION**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1646 days.

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(51) **Int. Cl.**

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H04N 21/44	(2011.01)
H04N 21/6543	(2011.01)
H04N 21/81	(2011.01)
H04N 21/858	(2011.01)

(52) **U.S. Cl.**

CPC ***H04L 12/2878*** (2013.01); ***H04L 12/185*** (2013.01); ***H04L 12/2881*** (2013.01); ***H04N 21/23424*** (2013.01); ***H04N 21/44016*** (2013.01); ***H04N 21/6543*** (2013.01); ***H04N 21/812*** (2013.01); ***H04N 21/858*** (2013.01)

(58) **Field of Classification Search**

None

See application file for complete search history.

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(57) **ABSTRACT**

Advertisements or other types of targeted information are delivered to set-top boxes or other user interface devices of a signal distribution system. In one aspect of the invention, an access node sends a message to the user interface device directing the user interface device to switch from a content stream to a targeted information stream at a specified time. Responsive to the message, the access node receives a request from the user interface device to join a targeted multicast group associated with the targeted information stream. Without requiring receipt of a subsequent request from the user interface device to leave a content multicast group associated with a content stream, the access node causes the user interface device to be dropped from the content multicast group prior to the specified time. The access node then delivers the targeted information stream to the user interface device via the targeted multicast group.

19 Claims, 4 Drawing Sheets

1. A method of providing targeted information to a user interface device in a signal distribution system, the system comprising an access node that is coupled between the user interface device and a server, the method comprising the steps of:

sending a message from the access node to the user interface device directing the user interface device to switch from a content stream to a targeted information stream at a specified time;

storing at least a portion of the targeted information stream received from the server in the access node;

receiving in the access node a request from the user interface device, responsive to the message from the access node, to join a targeted multicast group associated with the targeted information stream;

without requiring receipt in the access node of a request from the user interface device to leave a content multicast group associated with a content stream, the access node causing the user interface device to be dropped from the content multicast group prior to the specified time; and

delivering the targeted information stream from the access node to the user interface device via the targeted multicast group.

https://www.google.com/patents/US9306765

US 9,306,765 B2 Claim 1

Exemplary of:
Multicast Dynamic Ad Insertion

1. A method of providing **targeted information** to **a user interface device** in **a signal distribution system**, the system comprising **an access node that is coupled between the user interface device** and **a server**, the method comprising the steps of:

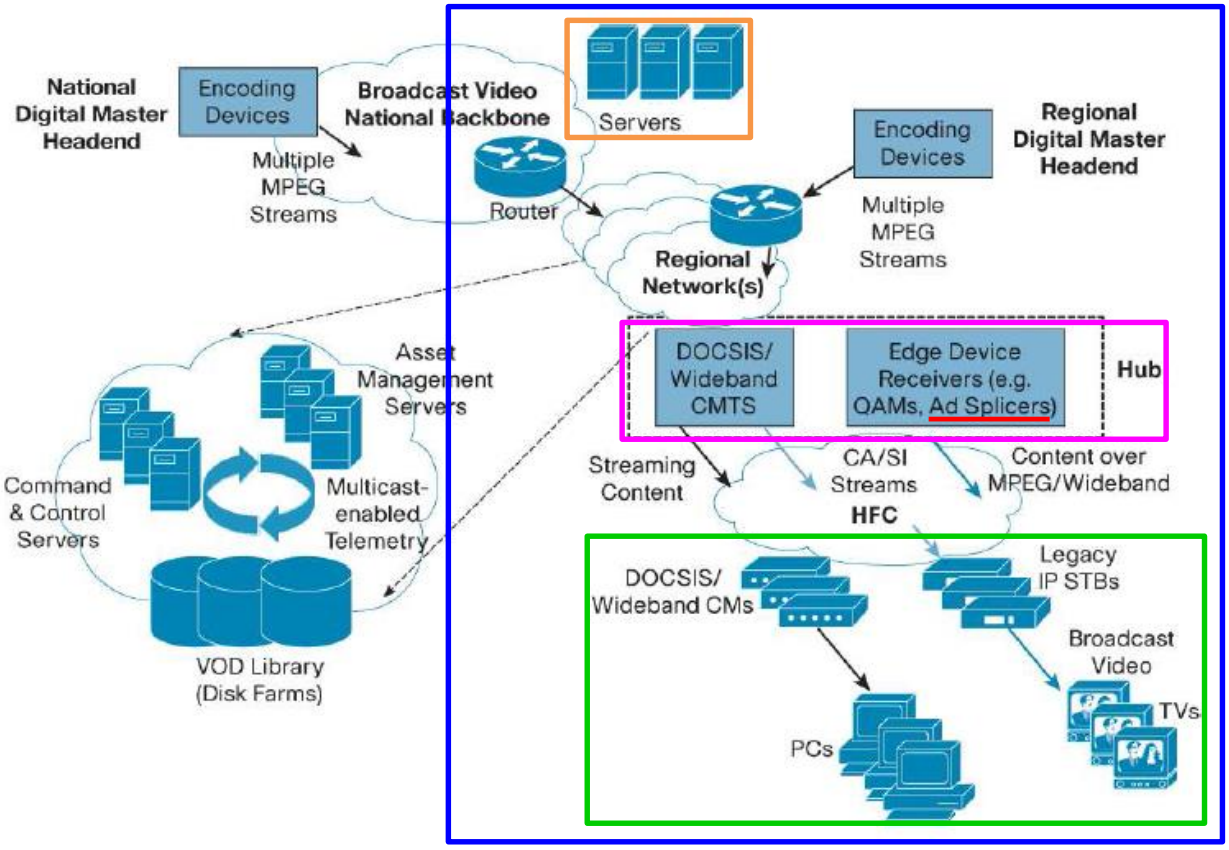
sending a message from the access node to the user interface device directing the user interface device to switch from a content stream to a targeted information stream at a specified time;

storing at least a portion of the targeted information stream received from the server in the access node;

receiving in the access node a request from the user interface device, responsive to the message from the access node, to join a targeted multicast group associated with the targeted information stream;

without requiring receipt in the access node of a request from the user interface device to leave a content multicast group associated with a content stream, the access node causing the user interface device to be dropped from the content multicast group prior to the specified time; and

delivering the targeted information stream from the access node to the user interface device via the targeted multicast group.



The IP multicast delivery of broadcast video works as follows. Encoding devices in digital master headends, encode one or more video channels into a Moving Pictures Expert Group (MPEG) stream which is carried in the network via IP multicast. Devices at each hub site are configured by the operator to request the desired multicast content via IGMP joins. The network, using PIM-SM as its multicast routing protocol, routes the multicast stream from the digital master headend to edge device receivers located in the hub sites. These edge devices could be edge QAM devices which modulate the MPEG stream for an RF frequency or ad insertion devices which splice ads into the MPEG stream and then re-originate the ad zone-specific content to a new multicast group. Edge devices within the ad zone would use IGMP joins to request this ad zone-specific multicast content.

US 9,306,765 B2 Claim 1

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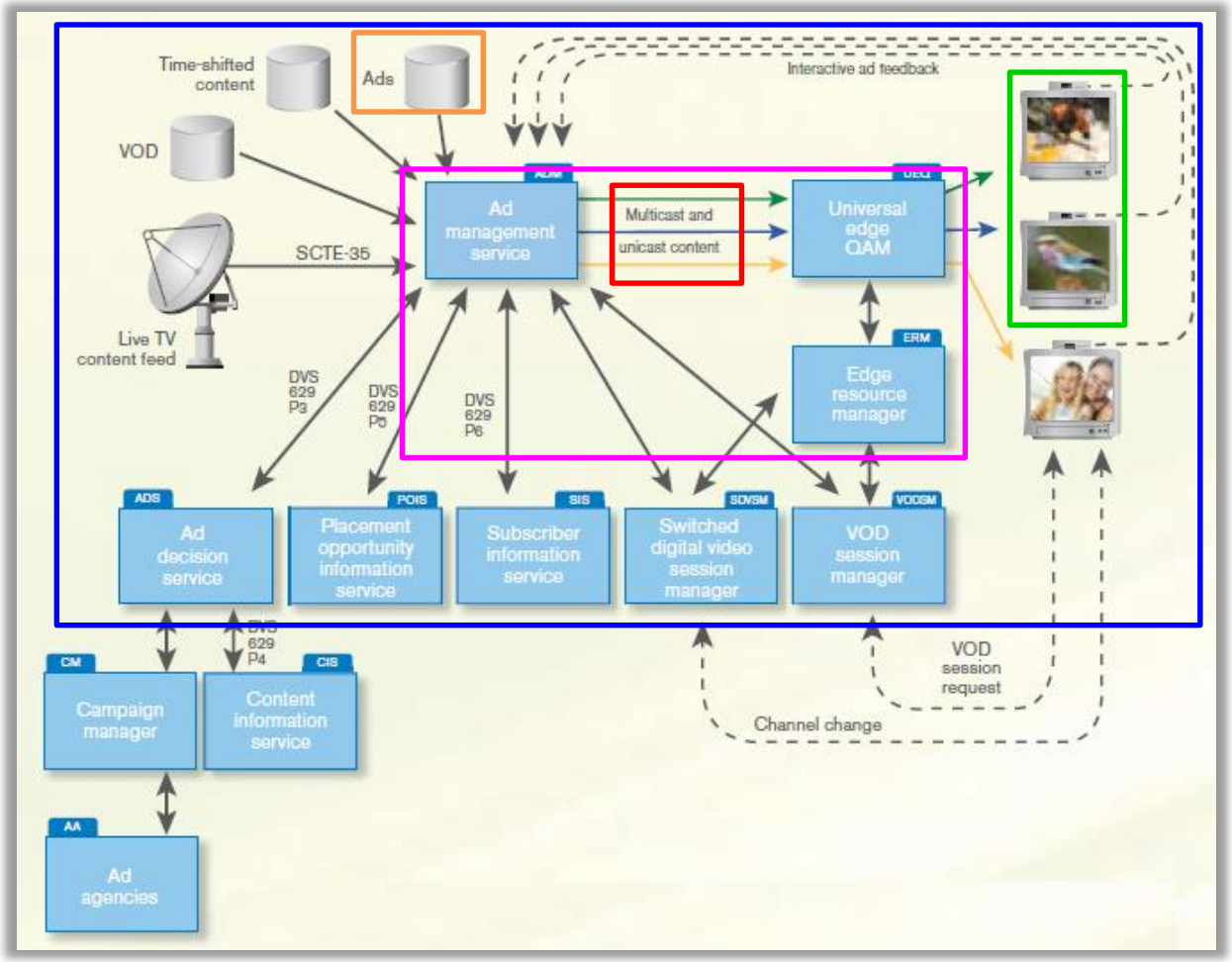
delivering the targeted information stream from the access node to the user interface device via the targeted multicast group.



This diagram highlights the targeted advertisement system components of the exemplary cable system in the previous slide.

US 9,306,765 B2 Claim 1

Exemplary of:
Multicast Dynamic Ad Insertion

1. A method of providing targeted information to a user interface device in a signal distribution system, the system comprising an access node that is coupled between the user interface device and a server, the method comprising the steps of:

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storing at least a portion of the targeted information stream received from the server in the access node;

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without requiring receipt in the access node of a request from the user interface device to leave a content multicast group associated with a content stream, the access node causing the user interface device to be dropped from the content multicast group prior to the specified time; and

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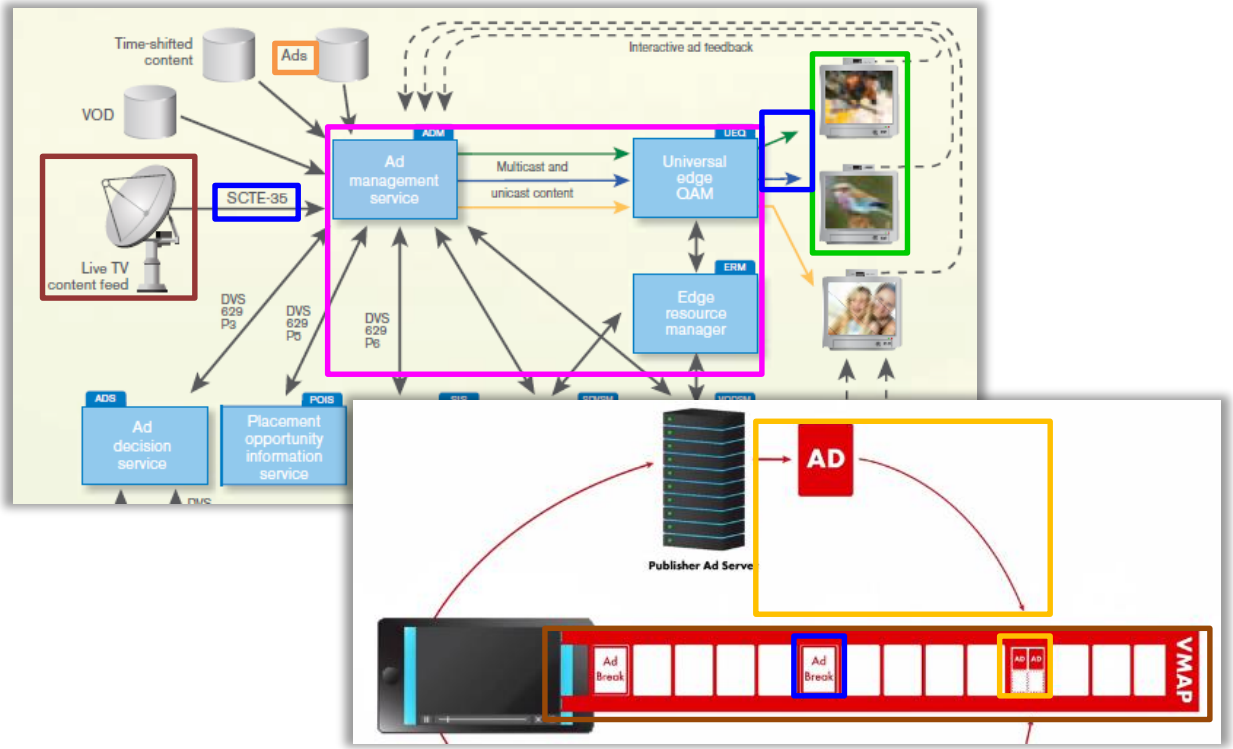

Most broadcast workflows and the accompanying ad insertion work ow rely on SCTE 35 cue messages passed through the MPEG-2 Transport Stream, or SCTE 104 in SDI (baseband) video, marking the placement of an ad pod. This pod usually is comprised of national ad payload, and also an ad replacement opportunity for a local broadcast affiliate. The video workflow components read this cue message and translate it to an ad marker format specific to HLS or DASH. The ad marker is read and the player client relays the ad break and user metadata to a VAST-compliant ad decisioning network. The ad decisioning network provisions the replacement ad, which is then seamlessly inserted into the video stream either server or client-side.

COMMENT: Messages for directing the user interface to displaying and/or replacing ads at specific points in a program are inserted in the program at the originating point and passed through from the access node to the user interface devices, e.g., according to the SCTE-35 or IAB VMAP standards.

US 9,306,765 B2 Claim 1

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without requiring receipt in the access node of a request from the user interface device to leave a content multicast group associated with a content stream, the access node causing the user interface device to be dropped from the content multicast group prior to the specified time; and

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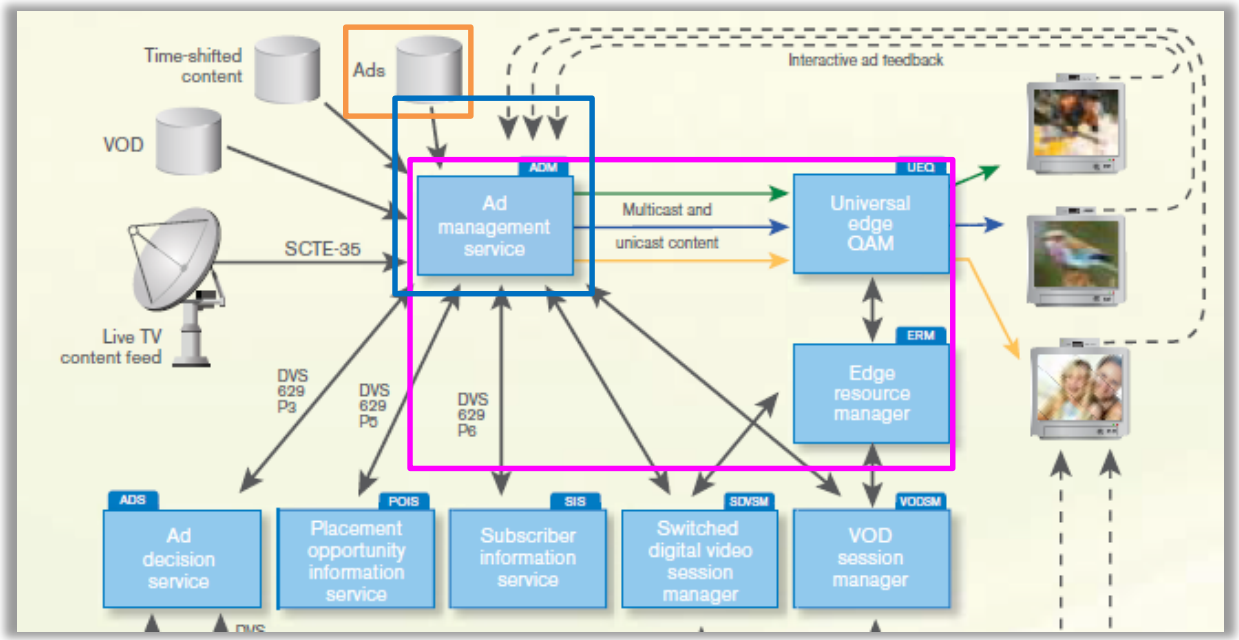

COMMENT: Targeted ads (information) determined by the Ad decision service are retrieved from the Ad server and **buffered (stored) in the Ad Management Service unit of the Access node** for insertion in the information stream for delivery to the targeted user interface.

US 9,306,765 B2 Claim 1

Exemplary of:
Multicast Dynamic Ad Insertion

1. A method of providing targeted information to a user interface device in a signal distribution system, the system comprising an access node that is coupled between the user interface device and a server, the method comprising the steps of:

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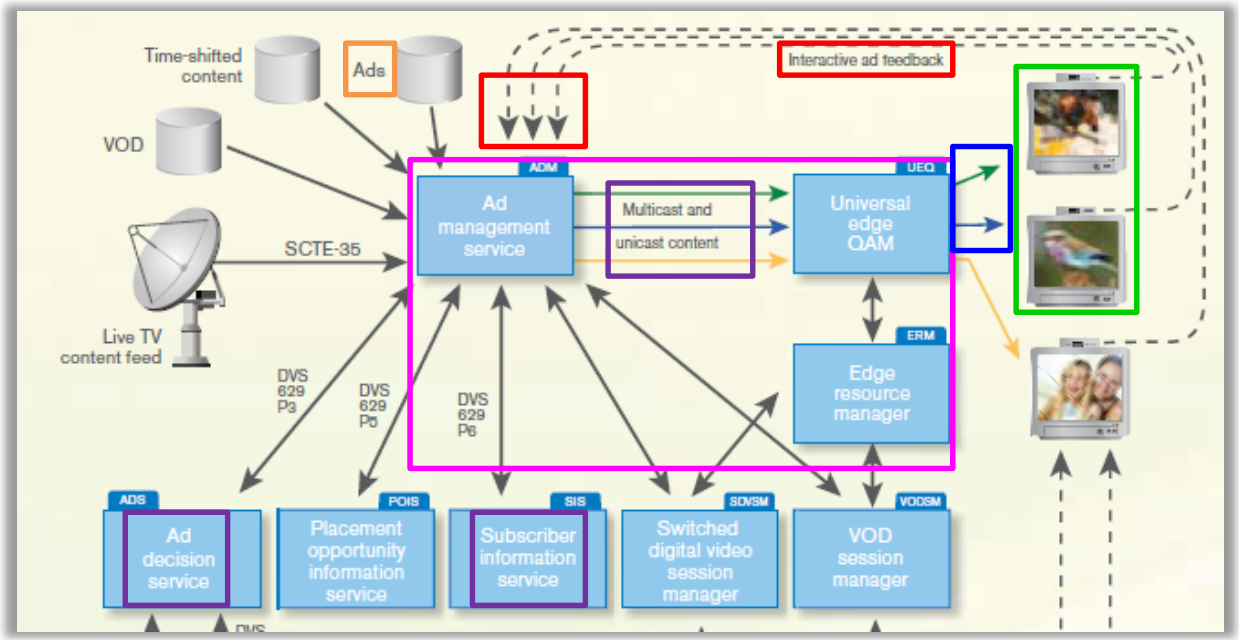

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COMMENT: The access node receives requests for ad insertion and user metadata from the user interface in response to ad break messages from the access node. The Ad management service in the access node determines targeted multicast groups associated with specific ads based on interactions with the Ad decision service and the Subscriber information service according to the user metadata.

US 9,306,765 B2 Claim 1

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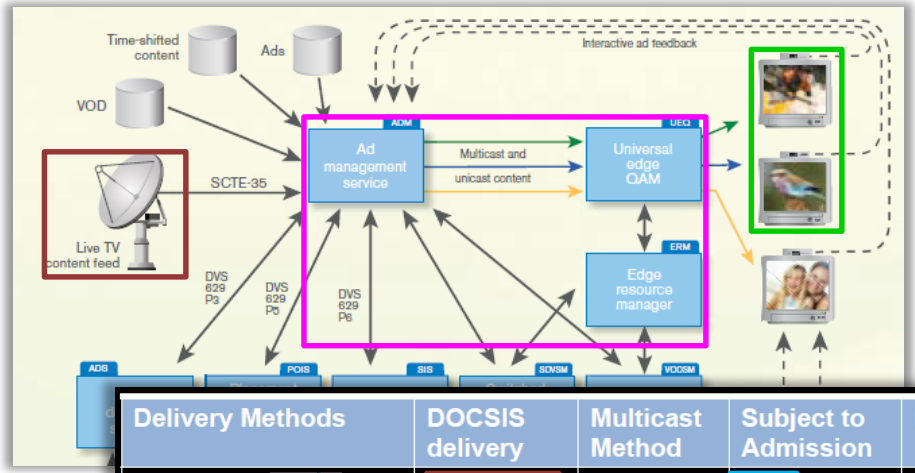

Delivery Methods	DOCSIS delivery	Multicast Method	Subject to Admission	Recommended Usage
Service Group	Broadcast	Static multicast	No	System wide scoping Low bandwidth control flow
Service Group	Narrowcast	Dynamic multicast	Yes	Per service group scoping Graceful handling of admission failure required
Service Group	Narrowcast	Static multicast	No	Per service group scoping Critical control flow Low bandwidth flow

COMMENT: The access node does not require node admission requests for joining a broadcast multicasting group to receives a content stream or a narrowcast group to receive targeted ads. As such, the access node does not requires a request to leave a content multicast group in order to be dropped from the group.

US 9,306,765 B2 Claim 1

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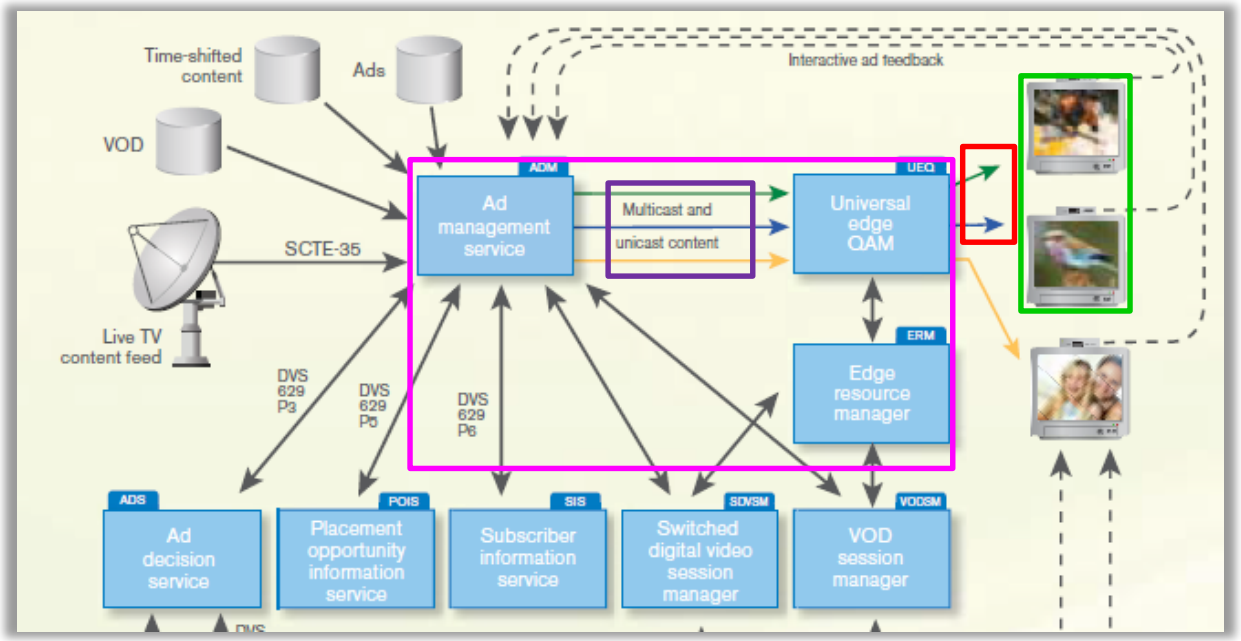

this cue message and translate it to an ad marker format specific to HLS or DASH. The ad marker is read and the player client relays the ad break and user metadata to a VAST-compliant ad decisioning network. The ad decisioning network provisions the replacement ad, which is then seamlessly inserted into the video stream either server or client-side.

To be clear, ad insertion has been a part of the streaming vernacular for the past few years. In early iterations, the request for an ad has taken place at the client, or player. This approach is referred to as client side ad insertion or CSAI. More recently, a move toward server side ad insertion (SSAI) has been an observed trend.