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Part 4-2: Examples of IPTV protocol sequences

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IEC Central Office
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

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CONSUMER TERMINAL FUNCTION FOR ACCESS TO IPTV AND OPEN INTERNET MULTIMEDIA SERVICES –

Part 4-2: Examples of IPTV protocol sequences

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International Standard IEC 62766-4-2 has been prepared by IEC technical committee 100: Audio, video and multimedia systems and equipment.

The text of this International Standard is based on the following documents:

CDV	Report on voting
100/2547/CDV	100/2661/RVC

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

This International Standard is to be used in conjunction with IEC 62766-4-1.

A list of all parts in the IEC 62766 series, published under the general title *Consumer terminal function for access to IPTV and open internet multimedia services*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

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INTRODUCTION

The IEC 62766 series is based on a series of specifications that was originally developed by the OPEN IPTV FORUM (OIPF). They specify the user-to-network interface (UNI) for consumer terminals to access IPTV and open internet multimedia services over managed or non-managed networks as defined by OIPF.

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CONSUMER TERMINAL FUNCTION FOR ACCESS TO IPTV AND OPEN INTERNET MULTIMEDIA SERVICES –

Part 4-2: Examples of IPTV protocol sequences

1 Scope

This part of IEC 62766 provides informative examples of features defined in IEC 62766-4-1.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 62766-4-1, *Consumer terminal function for access to IPTV and open internet multimedia services – Part 4-1: Protocols*[1]

IETF RFC 3261, *SIP: Session Initiation Protocol*

IETF RFC 3455, *Private Header (P-Header) Extensions to the Session Initiation Protocol (SIP) for the 3rd-Generation partnership Project (3GPP)*

IETF RFC 3588, *Diameter Base Protocol*

IETF RFC 3611, *RTP Control Protocol Extended Reports (RTCP XR)*

IETF RFC 4825, *The Extensible Markup Language (XML) Configuration Access Protocol (XCAP)*

3GPP TS 29.199-4, *Open Service Access (OSA); Parlay X web services; part 4: Short messaging*

Broadband Forum TR-135, *Data Model for a TR-069 Enabled STB*

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3 Terms, definitions and abbreviations

For the purposes of this document, the terms, definitions and abbreviations given in IEC 62766-4-1 apply.

4 Examples of IPTV protocol sequences

4.1 General

All the examples in this document are based on the HNI-IGI HTTP option.

---

[1] Under preparation. Stage at time of publication: IEC CDV 62766-4-1:2016.

4.2 IPTV service functions protocol sequences

4.2.1 COD Sequences

4.2.1.1 RTSP specific usage on UNIS-11 and NPI-10 for the managed model

In this example, the RTSP delivery parameters have been obtained as indicated in IEC 62766-4-1.

The RTSP URI is: rtsp://Cluster.orangeCDN.net/chevaliers_du_ciel

The session ID is 940211290776250.

Figure 1 depicts an RTSP Procedure on UNIS-11 for managed model.

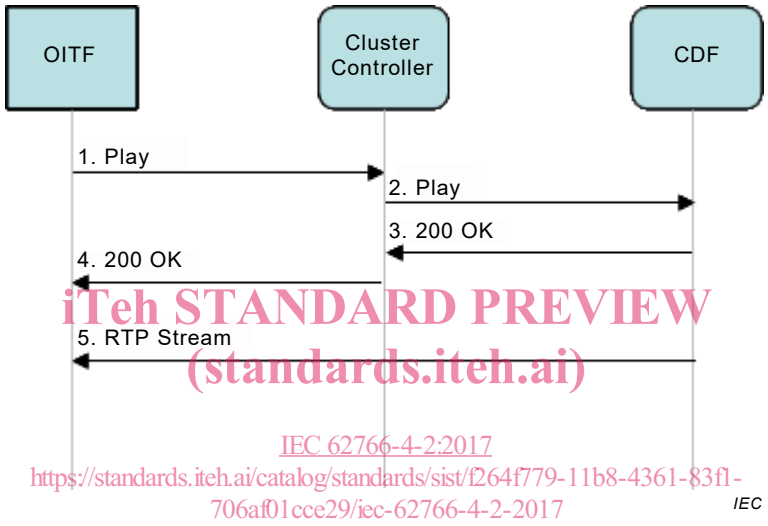

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Figure 1 – RTSP Procedure on UNIS-11 for managed model

The call flow steps shown in Figure 1 are described further as follows:

Step 1: The OITF sends an RTSP PLAY to the Cluster Controller

– PLAY rtsp://Cluster.orangeCDN.net/chevaliers_du_ciel
CSeq: 1981
Session: 940211290776250

Step 2: The Cluster Controller forwards the PLAY message to the CDF

– PLAY rtsp://server1.Cluster.orangeCDN.net/chevaliers_du_ciel
CSeq: 1981
Session: 940211290776250

Step 3: The CDF replies to the Cluster Controller

– 200 OK
CSeq: 1981
Session: 940211290776250

Step 4: The Cluster Controller replies to the OITF with the appropriate RTSP session ID

– 200 OK
CSeq: 1981
Session: 940211290776250

Step 5: The RTP media starts

4.2.1.2 RTSP specific usage on UNIS-11 and NPI-10 for the unmanaged model

The following example is only one example of performing redirection at initiation using the 303 Moved message. It does not take into account the effects of Network Address Translation (NAT).

Figure 2 depicts an RTSP Usage for COD on UNIS-11 and NPI-10.

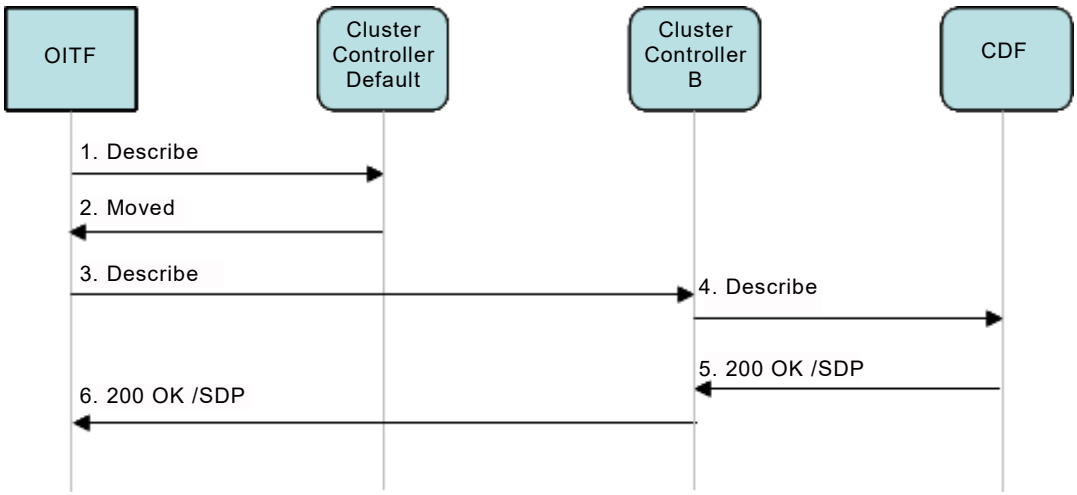

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Figure 2 – RTSP Usage for COD on UNIS-11 and NPI-10

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The call flow steps shown in figure 2 are described further as follows:

Step 1: The OITF to the Cluster Controller

– DESCRIBE rtsp://Cluster.orangeCDN.net/chevaliers_du_ciel RTSP/1.0

CSeq 1306

Accept: application/sdp

Step 2: The Cluster Controller responds to the OITF indicating redirection to Cluster Controller B

– RTSP/1.0 302 Moved Temporarily

CSeq 1306

Location: rtsp://Cluster_B.orangeCDN.net/ chevaliers_du_ciel RTSP/1.0

Step 3: The OITF sends a DESCRIBE to the indicated Cluster Controller

– DESCRIBE rtsp://Cluster_B.orangeCDN.net/chevaliers_du_ciel

CSeq: 1979

Accept: application/sdp

Step 4: The Cluster Controller chooses the appropriate CDF and forwards the DESCRIBE message to it

– DESCRIBE rtsp://Server1.orangeCDN.net/chevaliers_du_ciel RTSP/1.0

Cseq: 1979

Accept: application/sdp

Step 5: The CDF replies to the Cluster Controller with the appropriate SDP

– 200 OK

Cseq: 1979

content-Type: application/sdp

content length: .....

//// SDP////

Step 6: The Cluster Controller replies to OITF with the appropriate SDP

– 200 OK

CSeq: 1979

content-Type: application/sdp

content length: …

////SDP ////

4.2.2 Content reporting and content reporting management

4.2.2.1 Content reporting

Figure 3 shows a call flow for an OITF initiating content reporting. Below is a brief description of the call flow.

Step 1: It is assumed that the OITF established a regular scheduled content session, and that the IPTV Control FE indicated its willingness to receive content Reporting Info Package (through Recv-Info header in SIP 200 OK response to the INVITE). It is assumed that the timer for content reporting is pre-configured.

Step 2: If zapping is performed and stopped for the configured timer or in case of powerup without zapping and the user settled on a channel for the configured timer, the OITF issues a request to the IG for content reporting.

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Step 3: The IG validates the request then issues a SIP INFO to the network including the content Reporting Info Package to report the watched content.

Step 4: The ASM forwards the request to the IPTV control FE.

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Steps 5-7: The IPTV control FE generates a 200 OK that is proxied all the way to the IG, then from the IG to the OITF it is forwarded in an HTTP 200 OK response.

Step 8: The user performs channel zapping.

Step 9: The user stops zapping and finally settles on a channel for the configured timer.

Step 10: This step reports the watched content and is similar to steps 2-7.

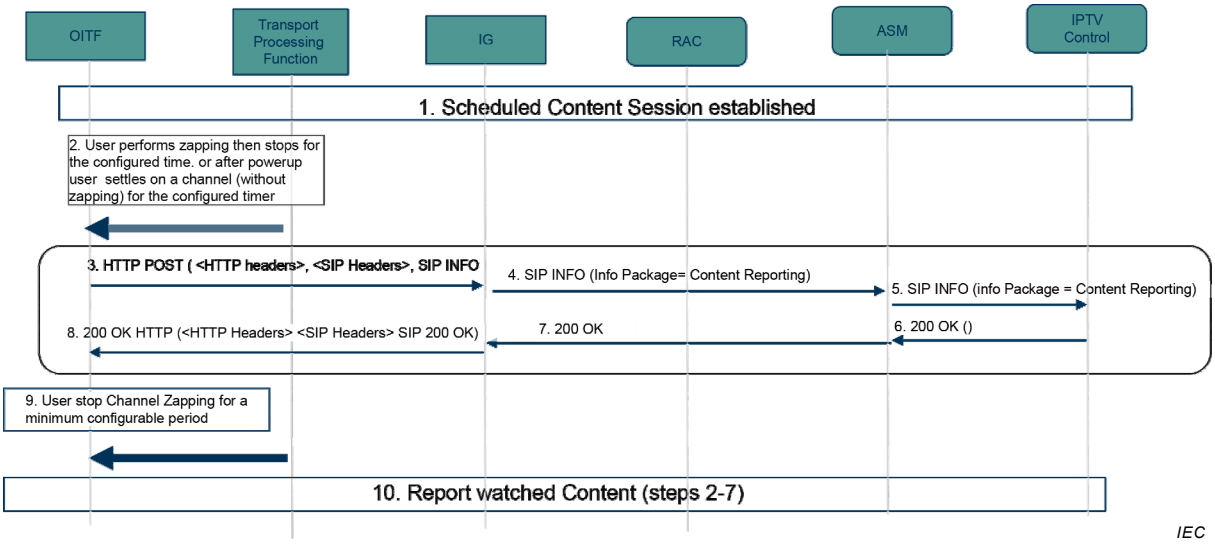

Figure 3 – Content reporting

4.2.2.2 Management of content reporting

Figure 4 shows a call flow for the management of content reporting. Below is a brief description of the call flow.

Step 1: The OITF established a scheduled content and performs content reporting as required by the IPTV Control FE.

Step 2: The OITF performs content reporting when user performs zapping then stops for the configured time.

Step 3: The OITF issues an HTTP HNI-IG PENDING_IG request to the IG. This request can be issued at any time after step 1.

Step 4: At some point in time, the IPTV control FE decided that it does not want any more content reporting. The IPTV control FE sends a SIP UPDATE with the Recv-Info header set to 'nil' to the ASM to that effect.

Step 5: The ASM forwards the SIP UPDATE to the IG.

Step 6: The IG forwards the SIP UPDATE in an HTTP 200 OK response to the OITF.

Steps 7-9: The OITF issues an HTTP POST request to the IG that includes the SIP 200 OK response. The SIP 200 OK is forwarded all the way to the IPTV control FE.

Step 10: The user performs channel zapping and no content reporting is performed.

Step 11: The OITF issues an HTTP HNI-IGI PENDING_IG request to the IG.

Steps 12-14: These steps request the OITF to start reporting the watched content and are similar to steps 4-6. The difference is that the Recv-Info header is set to content Reporting Info Package.

Steps 15-17: The OITF issues an HTTP POST request to the IG that includes the SIP 200 OK response. The SIP 200 OK is forwarded all the way to the IPTV Control FE.

Step 18: This step reports the watched content. See Figure 4 for the detailed call flow.

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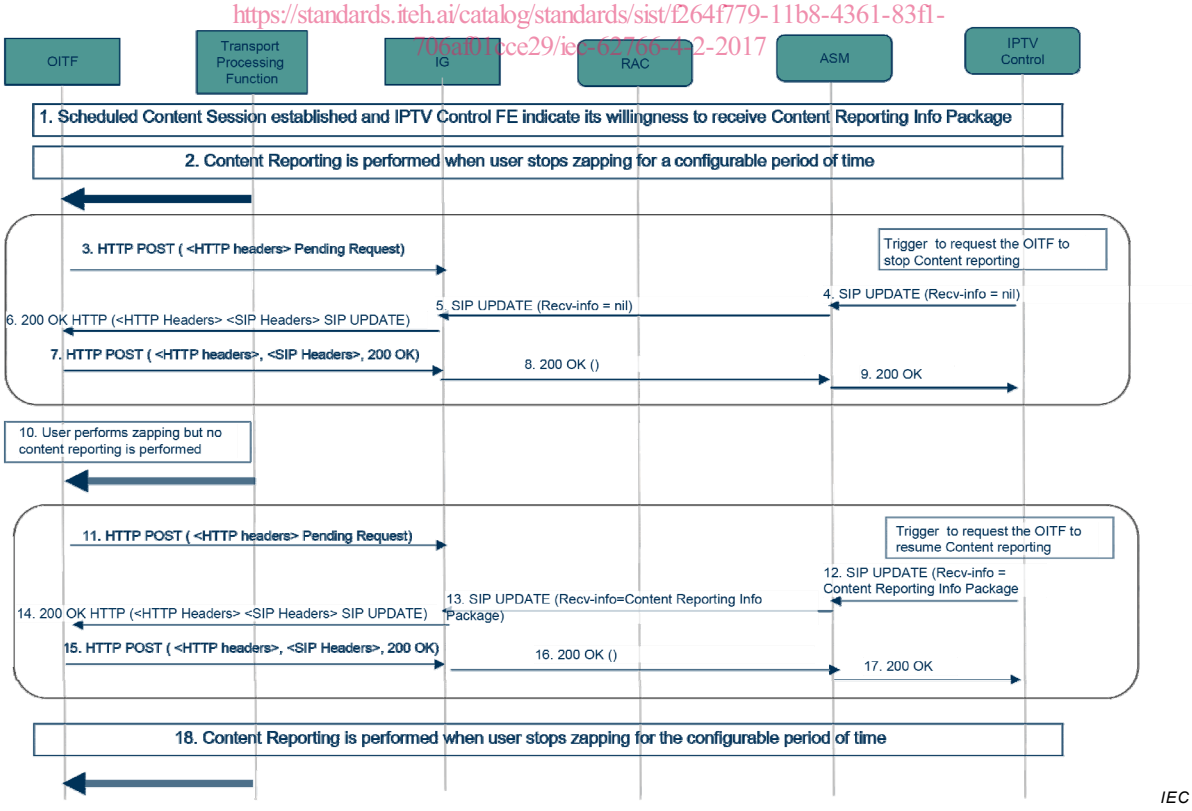

Figure 4 – Management of content reporting

4.2.3 Purchase of digital media
Purchase request procedure of selected digital media related to the content

Confirmation process: After retrieving and advertising the digital media, users can select the digital media they want to buy. When a user selects one digital media, the OITF pops up a dialog box to let the user confirm the selected digital media for purchase purpose.

Repeat billing check: Before sending the purchase request for digital media, the OITF shall check the user's profile first (in order to avoid repeat billing). If the requested digital media is already recorded in user's profile, the OITF pops up a dialog box to let user know the repeat billing, and then stop sending the purchase request.

If the requested digital media is not recorded in user's profile, the OITF sends the HTTP purchase request to IG, and IG generates a SIP request to IPTV Control FE through ASM FE, and then the IPTV Control FE sends the purchase request (ACR) to Charging FE.

After receiving the purchase response (ACA) from Charging FE, and if the purchase is successful, the IPTV Control FE sends digital Purchase Request to IPTV applications FE to update the user's profile, and then the IPTV applications FE sends the XCAP PUT to IPTV Service Profile FE to update the purchased digital media record.

After receiving the HTTP response sent from IPTV Service Profile FE, the IPTV applications FE sends the response to IPTV Control FE. The IPTV Control FE sends the SIP 200 OK response (with no message body) to IG through ASM FE if purchase request success; otherwise, the IPTV Control FE sends the SIP 403 Forbidden response (the message body is Result-Code that is defined in IETF RFC 3588) to IG through ASM FE. Finally, the IG sends the HTTP 200 OK to OITF with purchase result (it can be either "success" or Result-Code).

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Figure 5 shows the purchase request procedure of selected digital media related to the content.

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