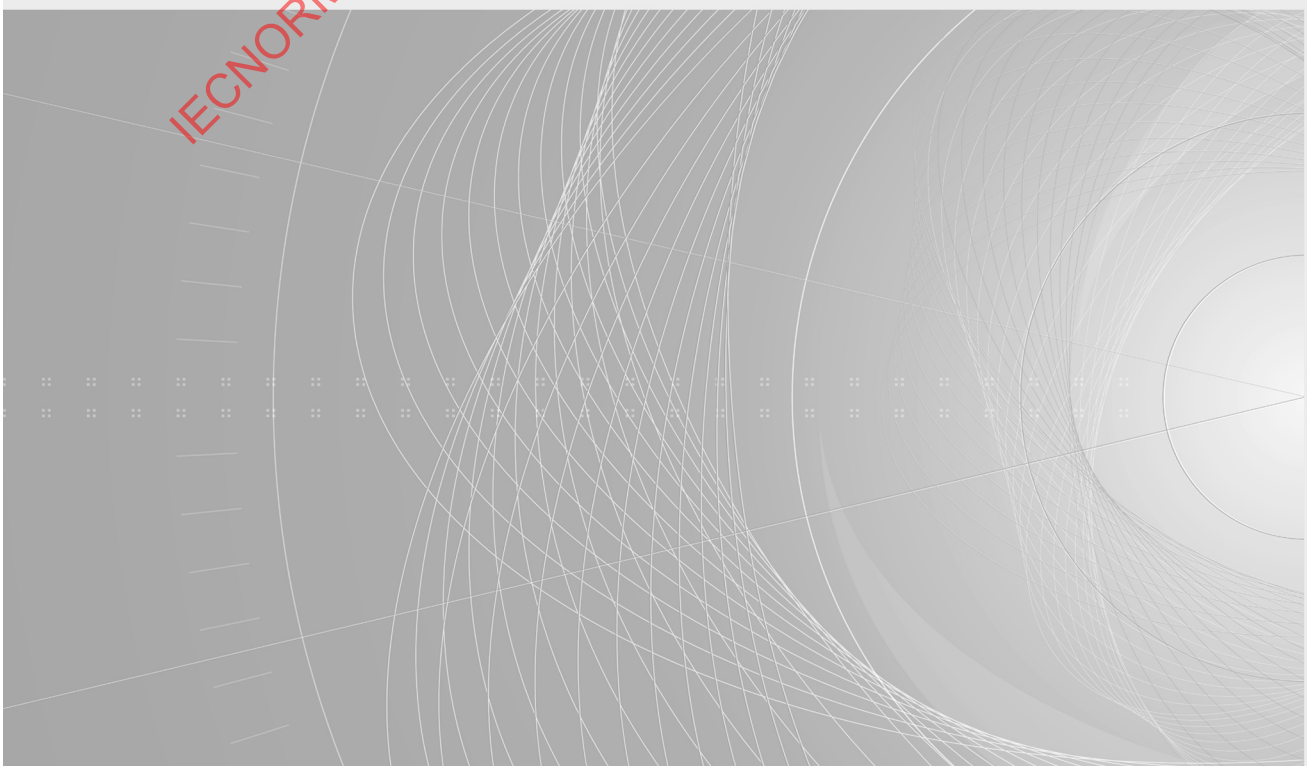
IEC 62766-8

Edition 1.0 2017-07

INTERNATIONAL STANDARD

Consumer terminal function for access to IPTV and open internet multimedia services –
Part 8: Profiles



IEC 62766-8:2017-07(en)

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

About the IEC
The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications
The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

IEC Catalogue - webstore.iec.ch/catalogue
The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

IEC publications search - www.iec.ch/searchpub
The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,…). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished
Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and also once a month by email.

Electropedia - www.electropedia.org
The world's leading online dictionary of electronic and electrical terms containing 20 000 terms and definitions in English and French, with equivalent terms in 16 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - std.iec.ch/glossary
65 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

IEC Customer Service Centre - webstore.iec.ch/csc
If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: csc@iec.ch.

IEC 62766-8

Edition 1.0 2017-07

INTERNATIONAL STANDARD

Consumer terminal function for access to IPTV and open internet multimedia services –
Part 8: Profiles

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 33.170 35.240.95

ISBN 978-2-8322-4623-8

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

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

Part 8: Profiles

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62766-8 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
100/2552/CDV	100/2666/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.

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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

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.

This document specifies three profiles of the features contained in the IEC 62766 series, namely:

- the open internet profile;
- the baseline managed profile; and
- the enhanced managed profile.

The three profiles are heirarchical in the sense that the open internet profile is formed of a sub-set of the features of the baseline managed profile, and that the baseline managed profile is formed of a sub-set of the features of the enhanced managed profile.

NOTE These profile names are defined as technical terms and as such are not intended to be used for any logo mark or similar purpose.

Profiles define the minimum set of features that a terminal need to support in order to be able to claim compliance to that profile, and the maximum set of features that a service can rely on being present in the OITF. Some features are optional within a profile, and a service can use capability exchange protocols to determine if a terminal supports such features. Some features are mandatory or optional depending on the configuration of the OITF, for example whether the OITF is equipped with local storage or a broadcast tuner.

It is expected that the profiles could be used as the basis for interoperability and certification programs.

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

Part 8: Profiles

1 Scope

This part of IEC 62766 defines three example profiles that may be adopted for implementation in suitable devices.

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 62766-2-1:2016, *Consumer terminal function for access to IPTV and open Internet multimedia services - Part 2-1: Media Formats*

IEC 62766-2-2, *Consumer terminal function for access to IPTV and open Internet multimedia services - Part 2-2: HTTP Adaptive Streaming*

IEC 62766-3:2016, *Consumer terminal function for access to IPTV and open Internet multimedia services - Part 3: Content Metadata*

IEC 62766-4-1:2017, *Consumer terminal function for access to IPTV and open Internet multimedia services - Part 4-1: Protocols*

IEC 62766-5-1:2017, *Consumer terminal function for access to IPTV and open Internet multimedia services - Part 5-1: Declarative Application Environment*

IEC 62766-7:2017, *Consumer terminal function for access to IPTV and open Internet multimedia services - Part 7: Authentication, Content Protection and Service Protection*

ETSI, TS 102 034 V1.5.1, *Digital Video Broadcasting (DVB); Transport of MPEG-2 Based DVB Services over IP Based Networks*

ETSI, TS 102 809, V1.2.1, *Digital Video Broadcasting (DVB); Signalling and carriage of interactive applications and services in hybrid broadcast/broadband environments*

ETSI, TS 102 539 V1.3.1, *Digital Video Broadcasting (DVB); Carriage of Broadband Content Guide (BCG) information over Internet Protocol (IP)*

3 Terms, definitions and abbreviated terms

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1 Terms and definitions

3.1.1
unmanaged network
open internet
ability to access any service provider using any access network provider without any quality of service guarantees.

3.2 Abbreviated terms

For the purposes of this document, the terms and definitions given in IEC 62766-1, as well as the following apply.

BMP	Baseline Managed Profile
EMP	Enhanced Managed Profile
OIP	Open Internet Profile

4 Release 2 IPTV solution profiles

A profile in the context of the present part is a set of features and elements, as specified in the other parts of the IEC 62766 series, which could be used by an interoperability and certification program to define equipment or services as being compliant with this document.

The overall objective is to enable the best possible capability and flexibility for service providers to deploy services to terminals that are available in the horizontal (i.e., non-subsidised) market in the near-term time frame. In selecting a set of features and elements that constitute a profile, a balance is made between the following factors:

- time to market of the compliant OITF within a non-subsidised, horizontal-market device;
- viability of implementation of the selected technologies;
- flexibility in the provision of the envisaged IPTV services;
- enabling a wide range of services to be accessible to the user.

Three profiles are specified in the present document.

- The Open Internet Profile (OIP): this profile is intended for "over-the-top" services that do not use any QoS provision or terminal management features.
- The Baseline Managed Profile (BMP): this profile adds support for multicast and unicast content streaming services, including all associated features that facilitate QoS provision for content delivery in a managed network, compared to the OIP.
- The Enhanced Managed Profile (EMP): this profile adds native support for advanced managed-network features like IMS, Broadband Content Guide and TR-069 based remote management, compared to the BMP.

Clauses 5, 6 and 7 provide normative descriptions of the OIP, BMP and EMP respectively.

Clause 8 provides a normative specification of the set of features of each profile in tabular form, with cross-references to the relevant clauses of the other parts of IEC 62766.

It is believed that Clauses 5, 6 and 7 are consistent with Clause 8, but in the case of an inadvertent discrepancy, the normative requirements in Clause 8 shall take precedence.

5 Open internet profile

5.1 General

An OITF that is compliant with the OIP is referred to as an OIP-OITF.

Open internet IPTV services are accessed via the internet, without QoS guarantees. They may be accessed via a service platform (e.g., a portal).

The OIP-OITF enables access to compliant services that do not provide QoS guarantees over at least one network segment between the IPTV service provider and the OITF, independently from their ISP – i.e. “over the top” (OTT) mode.

The OIP is a sub-set of the BMP and of the EMP in terms of the features included.

Subclauses 5.2 to 5.9 summarise the features of the OIP.

5.2 IPTV Services

The OIP-OITF shall support the scheduled content service, using the HTTP transport method. Support of the multicast and unicast streamed via RTSP/RTP variants is optional.

The OIP-OITF shall support the streamed CoD service, using the HTTP transport method. Support of the streamed CoD service via RTSP/RTP is optional.

The OIP-OITF shall support information services, which are realised as DAE applications.

Support for the download CoD and local PVR services in the OIP-OITF is optional and depends on the provision of persistent storage in the OITF.

Support for the hybrid broadcast broadband service in the OIP-OITF is optional and depends on the provision of at least one broadcast tuner in the OITF.

5.3 Residential network

5.3.1 WAN gateway

If an OIPF-compliant WAN gateway is present, then it may fulfill the relevant network attachment functions as specified in 13.2 of IEC 62766-4-1:2017 in order to provide additional service provider discovery entry points as described in 5.4.

5.3.2 IMS gateway

The IMS gateway (IG) functional entity is not necessary for access to services not relying on IMS using an OIP-OITF. However, if an IG is present, an OIP-OITF may use it to access some IMS-based managed network services.

5.3.3 Application gateway

The AG functional entity, as is generally valid, is optional in the OIP.

5.3.4 OITF

The required features for the OIP-OITF are described in 5.4 to 5.9, which deal with specific aspects of the overall IPTV solution.

Clause 8 provides details about the IPTV solution features that shall be supported by the OIP-OITF.

5.4 Service provider discovery entry points

The present document defines three methods for the provision of service provider discovery entry points to the OITF. The availability of these various methods enables the user to access various service providers' IPTV services in a convenient manner, namely entry points that are pre-configured in the OITF, manually entered or acquired entry points, and entry points provided by the access network service provider.

The WAN gateway may provide service provider discovery entry points via DHCP, as specified in 13.2.2 of IEC 62766-4-1:2017.

The OIP-OITF may provide pre-configured service provider discovery entry points.

The OIP-OITF may provide means by which the user is able to enter his own chosen service provider discovery entry points via the OITF user interface.

The OIP-OITF shall offer the complete set of service provider discovery entry points acquired by all of the three above methods, if any are provided, but the method of presentation and relative positioning of the various service provider discovery entry points in the user interface is out of the scope of the present document.

5.5 Service discovery and content metadata

If the OIP-OITF provides persistent storage and supports the download CoD service, then it shall support the provision of content metadata via the content access descriptor for that service, otherwise all service discovery data and content metadata shall be embedded within the DAE application CE-HTML pages.

5.6 Authentication methods

The OIP-OITF shall support the following authentication methods specified in the indicated subclauses of IEC 62766-7:2017:

- HTTP basic and digest authentication (IEC 62766-7:2017, 5.4.1), and
- web-based authentication (IEC 62766-7:2017, 5.4.3).

5.7 Content and service protection

The OIP-OITF shall support at least one of the CSP solutions specified in IEC 62766-7, i.e. it shall support the TCA and/or CSPG-DTCP and/or CSPG-CI+, in order to support compliant services that deliver protected content.

5.8 SVG tiny V1.2

The use of SVG tiny 1.2 enables advanced graphics capabilities within a DAE application, but it is expected that not all terminals will be able to support SVG tiny 1.2; hence, the support of SVG tiny 1.2 in the OIP-OITF is optional.

A DAE application may use SVG tiny 1.2 as specified in IEC 62766-5, but it is recommended that service providers ensure that an OITF that does not support SVG tiny 1.2 is nevertheless able to offer the full functionality of the service to the user, except for the enhanced user interface.

5.9 Remote management

The remote management feature for the OIP facilitates the function of basic inventory of OITFs that are accessing services, without the presence of a remote management server that provisions the OITF.

The OITF shall support the remote management API as specified in 7.11 of IEC 62766-5-1:2017.

The OITF shall support an upgrade process that can be triggered via the DAE remote management API. The upgrade process remains manufacturer-specific and the provision of upgrades is subject to deployment needs.

6 Baseline managed profile

6.1 General

In the present document, the baseline managed profile is referred to as “BMP”.

An OITF that is compliant with the BMP is referred to as a BMP-OITF.

The BMP is a super-set of the OIP, and a sub-set of the EMP in terms of the features included. All features that are mandatory in the OIP are also mandatory in the BMP.

The BMP-OITF extends the functions needed to provide the pure "over-the-top" (OTT) service support of the OIP with functions that make it able to access content delivery services with full QoS provision in a managed network environment. These functions are chosen in order to allow a BMP-OITF to be able to access the full range of IPTV content services, and act as a near-term intermediate step towards the full range of capabilities offered by the Enhanced Managed Profile (EMP), described in Clause 7.

Thus, the BMP-OITF enables access to several kinds of IPTV service:

- compliant services that do not provide QoS guarantees over at least one network segment between the IPTV service provider and the OITF, independently from their ISP – i.e. "over-the-top" (OTT) mode;
- services where the ISP is also an IPTV service provider that offers compliant services making use of network-side enhancements, including multicast and unicast content streaming with full QoS provision.

Subclauses 6.2 to 6.9 summarise the features of the BMP.

6.2 IPTV services

IPTV services support in the BMP is the same as for the OIP except that, in addition to those services, the BMP-OITF shall support the scheduled content and streamed CoD services, using the tools described in 6.5.

6.3 Residential network

6.3.1 WAN gateway

The WAN gateway shall fulfill the relevant network attachment functions as specified in 13.2 of IEC 62766-4-1:2017.

If an OIPF compliant WAN gateway is not present, for example when a non-OIPF compliant home broadband router is deployed instead, then the BMP-OITF might not be able to access the scheduled content and streamed CoD services.

6.3.2 IMS gateway

The IMS Gateway (IG) functional entity is not necessary for access to services using a BMP-OITF. However, if an IG is present, a BMP-OITF MAY use it to access IMS-based managed network services.

6.3.3 Application gateway

The AG functional entity, as is generally valid, is optional in the BMP.

6.3.4 OITF

A DAE application in a BMP-OITF shall implement the non-native HNI-IGI interface, as specified in IEC 62766-4 and IEC 62766-5, if it intends to make to use of IMS-based services.

Further required features for the BMP-OITF are contained in 6.4 to 6.9, which deal with specific aspects of the IPTV solution.

Clause 8 provides details about the IPTV solution features that shall be supported by the BMP-OITF.

6.4 Service provider discovery entry points

The provisions for service provider discovery entry points for the BMP-OITF are the same as those specified for the OIP-OITF in 5.4.

6.5 Scheduled content and streamed CoD service enablers

The scheduled content and streamed CoD services are generally associated with managed networks, where the streamed content is provided within a distribution and delivery network that is managed by the service provider, so that the necessary level of QoS can be assured for those services.

The BMP-OITF includes support of the features that enable the reception of such services. These include:

- mandatory support of multicast (IGMPv3) or unicast delivery of content carried in MPEG-2 TS over RTP/UDP or unicast delivery of content carried in MPEG-2 TS or MP4FF over HTTP;
- mandatory support of RTSP as specified in 8.2 of IEC 62766-4-1:2017;
- mandatory support of Fast Channel Change (FCC), DVB packet retransmission protocol (RET), and DVB base level application-layer FEC.

The service list for the scheduled content service in the BMP may be provided by various methods:

- embedded within the DAE application CE-HTML pages;
- delivery within the DVB SD&S broadcast discovery information record, which may be transported by unicast (HTTP) or multicast (DVBSTP).

The service provider may use either or both of these methods. The BMP-OITF shall support both of these methods.

Content metadata in addition to the service list may be provided within the DAE application or via in-band DVB Service Information (EIT), which shall be supported by the BMP-OITF.

6.6 Authentication methods

The provisions for authentication methods for the BMP-OITF are the same as those specified for the OIP-OITF in 5.6.

6.7 Content and service protection

The provisions for content and service protection for the BMP-OITF are the same as those specified for the OIP-OITF in 5.7.

6.8 OITF capabilities

It is recommended that the BMP-OITF support the concurrent decoding and rendering of one HD video stream and one SD video stream.

Services and DAE applications that foresee the concurrent rendering of more than one video stream (e.g. EPG with embedded video preview) should make provision for replacing the video display with an alternative asset, for example, a still picture, in case the OITF does not support multiple video stream decoding and rendering.

6.9 Remote management

The provisions for remote management for the BMP-OITF are the same as those specified for the OIP-OITF in 5.9.

7 Enhanced managed profile

7.1 General

The enhanced managed profile is defined as the combination of both open Internet and IMS-based managed network models of IPTV service operation. In the present document, the Enhanced Managed Profile is referred to as "EMP".

An OITF that is compliant with the EMP is referred to as an EMP-OITF.

The EMP is a super-set of the BMP (also of the OIP), i.e. all features that are mandatory in the BMP are also mandatory in the EMP. The EMP adds IMS-based functionality, enhanced content delivery features, and more extensive management capabilities of the residential network's functional entities.

Subclauses 7.4 to 7.9 summarise the features of the EMP.

7.2 IPTV services

In addition to the requirements around IPTV services support in the BMP, the EMP-OITF shall support the communications services, namely messaging, chat sessions and presence as specified in 6.5 of IEC 62766-4-1:2017. The support of audio and audio/video communication services in an OITF implementation are optional, also depending on the integration of corresponding audio and video input devices on the OITF.

7.3 Residential network

7.3.1 WAN gateway

The WAN gateway shall fulfill the relevant network attachment functions as specified in 13.2 of IEC 62766-4-1.

7.3.2 IMS gateway

The IMS Gateway (IG) shall implement the relevant procedures specified in IEC 62766-4-1.

7.3.3 AG

The Application Gateway (AG) functional entity, as is the case generally, is optional in the EMP.

7.3.4 OITF

The EMP-OITF shall implement the HNI-IGI interface natively, as specified in IEC 62766-4-1, except in the case that a device implements both the OITF and the IG, where the use of the HNI-IGI interface is optional, as specified in 4.1 of IEC 62766-4-1:2017.

The EMP-OITF shall provide the capability for user input of text in order to use the messaging and chat services. A facility for text input may be included in DAE applications.

7.4 Service provider discovery entry points

The provisions for service provider discovery entry points for the EMP-OITF are the same as those specified for the OIP-OITF in 5.4.

7.5 Scheduled content and streamed CoD service enablers

The scheduled content and streamed CoD services for the EMP are associated with the IMS control layer for managed networks. Therefore, the necessary level of QoS is assured transparently (for the OITF) for those services.

The EMP-OITF includes support of the features that enable the reception of such services, namely:

- service provider discovery and user registration with the natively implemented HNI-IGI interface;
- the HNI-IGI functions, either natively or non-natively, for supporting the initiation, modification and termination of a scheduled content service session, as specified in 6.3.1 of IEC 62766-4-1:2017;
- the HNI-IGI functions natively for supporting the initiation, modification and termination of a CoD service session, as specified in 6.3.2 of IEC 62766-4-1:2017;
- support for multicast (IGMPv3) delivery of content carried in MPEG-2 TS, both over RTP/UDP, and via direct encapsulation on UDP;
- support of unicast delivery of content carried in MPEG-2 TS, both over RTP/UDP, and via direct encapsulation on UDP;
- support of RTSP as specified in 8.2 of IEC 62766-4-1:2017;
- support the XCAP application usage for manipulating the data of the IPTV user profile, as specified in 6.4.4 of IEC 62766-4-1:2017;
- support for integration of scheduled content and streamed CoD with communication services (caller ID, messaging (chat, presence)) implemented natively, as specified in 6.5 and 7.2.4 of IEC 62766-4-1:2017.

7.6 Broadband content guide

The EMP-OITF shall support the DVB Broadband Content Guide (BCG), and extensions to it as specified in 4.4 IEC 62766-3:2016.

7.7 Authentication methods

In addition to the authentication methods mentioned for the OIP, the EMP-OITF shall support the GBA authentication method as specified in 5.4.5 of IEC 62766-7:2017 when the HNI-IGI function is implemented natively in the EMP-OITF.

7.8 Content and service protection

The provisions for content and service protection for the EMP-OITF are the same as those specified for the OIP-OITF.

7.9 Remote management

In addition to the "DAE method" mentioned for the OIP, remote management shall be supported also via the Broadband Forum TR-069 based approach, as specified in 6.4.5 of IEC 62766-4-1:2017.

The TR-069 based method defines a similar level of monitoring and diagnostics capability as that specified in the DAE method, but it allows more convenient re-use of existing TR-069 based remote management infrastructure commonly used by managed network service providers.

8 Specification of profile features

8.1 General

Subclause 8.2 specifies the status of IPTV services support for each of the profiles.

Subclauses 8.2 to 8.9 specify the status of features grouped according to the part of the present standard in which the respective features are specified. The reference to the specific clause in the respective part of IEC 62766 is provided, along with the status of that service or feature in each of the profiles.

Table 1 gives the legend used for denoting the service and feature status in 8.2 to 8.9.

Requirements for the provision of IPTV Services are not described in Clauses 5, 6 and 7. Unless explicitly stated otherwise, a compliant IPTV Service (as listed in Table 2) shall support at least one of the options for each feature necessary to run the IPTV service on the correspondingly profiled OITF.

Table 1 – Legend for status in the profiles

Status in profiles	Meaning
M	Feature is mandatory for the profile
M-D	Feature is mandatory for the profile if the download CoD service is supported
M-H	Feature is mandatory for the profile if the hybrid broadcast-broadband service is supported
M-P	Feature is mandatory for the profile if the PVR service is supported
M-C	Feature is mandatory for the profile if audio/video communication services are supported
O	Feature is optional for the profile
O-D	Feature is optional for the profile if the download CoD service is supported
O-H	Feature is optional for the profile if the hybrid broadcast-broadband service is supported
O-P	Feature is optional for the profile if the PVR service is supported
O-C	Feature is optional for the profile if audio/video communication services are supported

8.2 IPTV services support in the OITF

Table 2 lists the status of each release 2 IPTV service with respect to its support by the OITF in each profile.

Table 2 – Release 2 IPTV service support profiling

IPTV Service	Status in OIP	Status in BMP	Status in EMP
Scheduled Content	M(4)	M(1)	M
Hybrid broadcast-broadband	O(2)	O(2)	O(2)
Local PVR and time-shift	O(3)	O(3)	O(3)
Network PVR and time-shift	O	O	M
Streamed CoD	M(4)	M(1)	M
Download CoD	O(3)	O(3)	O(3)
Information services	M	M	M
Communication services (text-based - Caller ID, Chat messaging, Presence status)	O(5)	O(5)	M
Communication services (audio and audio/video communications)	O(5)	O(5)	O(6)

1) The scheduled content and streamed CoD services are realised using a profiled set of service enablers for BMP, specified in 8.5, 8.6, and 8.7.

2) The hybrid broadcast-broadband service relies on the presence of a broadcast tuner in the OITF. The OITF may support the hybrid broadcast-broadband service if a broadcast tuner is equipped in the OITF.

3) The local PVR, local time-shift and download CoD services rely on the presence of persistent local storage in the OITF. The OITF may support the local PVR and/or local time-shift and/or download CoD services if persistent local storage is equipped in the OITF.

4) The scheduled content and streamed CoD services are realised in the OIP using HTTP transport, as specified in 8.6.

5) Communication services may be provided natively or non-natively within a DAE application.

6) Communication services are provided via IMS.

8.3 Media formats

Table 3 lists the status of media formats support for each profile, referring to IEC 62766-2-1. Note that IEC 62766-2-1 contains general solution-wide stipulations for some of these features. The features subtitles, teletext, and supported video frame rate (25 Hz or 30 Hz) are orthogonal to the profile definitions and thus retain their status as implementation choices.

IEC 62766-2-1 also identifies audio and video codecs for IPTV services delivered to mobile terminals via mobile networks. These, however, are not considered in the present document.

Table 3 – Media formats profiling

Feature	Reference in IEC 62766-2-1:2016	Status in OIP	Status in BMP	Status in EMP
Systems layer				
MPEG-2 transport stream (TS)	5.2	M	M	M
Time-stamped TS (TTS)	5.2	O	O	O
MP4 file format (MP4)	5.3	M	M	M
Application signaling (TS)	5.2	M-H(1)	M	M
DAE application delivery via DSM-CC (TS)	5.2	M-H(1)	M	M
"Do it now" DSM-CC streaming events (TS)	5.2	M-H(1)	M	M
Media zones (TS and MP4)	5.2, 5.3	O	O	O
Video for content services				
H.264/AVC HD video	6.2.2.1, 6.2.7	M	M	M
H.264/AVC 3D video	6.2.8.1	O	O	O
H.264/AVC SD video	6.2.3.1, 6.2.7	M	M	M
H.264/AVC SP video	6.2.5.2	M	M	M
MPEG-2 HD video	6.2.2.2	O	O	O
MPEG-2 SD video	6.2.3.2	O	O	O
MPEG-2 SP video	6.2.5.3	O	O	O
Video for communication services	6.2.4			
H.264/AVC video	6.2.4.1	M-C	M-C	M-C
MPEG-4 part-2 video	6.2.4.2	O-C	O-C	O-C
H.263 video	6.2.4.3	O-C	O-C	O-C
Subtitles				
DVB subtitles	7.2	O	O(2)	O(2)
CEA-708-C subtitles	7.2	O	O(2)	O(2)
EBU teletext	7.2	O	O(2)	O(2)
Teletext				
EBU teletext	8.2	O	O	O
Audio for content services				
HE-AAC audio	9.2.1	M	M	M
HE-AAC v2 audio	9.2.1	O	O	O
HE-AAC metadata	9.2.1.4	O	O	O
AC-3 audio	9.2.2	O	O	O

Feature	Reference in IEC 62766-2-1:2016	Status in OIP	Status in BMP	Status in EMP
Enhanced AC-3 audio	9.2.3	O	O	O
MPEG-1 L2 audio	9.2.4	O	O	O
MPEG-1 L3 audio	9.2.5	O	O	O
WAV audio	9.2.6	O	O	O
DTS-HD audio	9.2.7	O	O	O
MPEG surround with HE-AAC audio	9.2.8	O	O	O
MPEG surround with MPEG-1 L2 audio	9.2.8	O	O	O
Audio description	9.3.2	O	O	O
Clean audio	9.3.3	O	O	O
Audio for narrowband communication services	9.2.9			
G.711 audio	9.2.9.1	M-C	M-C	M-C
AMR audio	9.2.9.1	M-C	M-C	M-C
G.729 audio	9.2.9.1	O-C	O-C	O-C
Audio for wideband communication services	9.2.9.1			
G722 audio	9.2.9.1	M-C	M-C	M-C
AMR-WB/G.722.2 audio	9.2.9.1	M-C	M-C	M-C
G.729.1 audio	9.2.9.1	O-C	O-C	O-C
Audio for super-wideband communication services	9.2.9.1			
MPEG-4 AAC LD	9.2.9.2	O-C	O-C	O-C
MPEG-4 AAC ELD	9.2.9.2	O-C	O-C	O-C
G.719	9.2.9.1	O-C	O-C	O-C
Still pictures and graphics				
JPEG	10.2	M	M	M
GIF	10.3	M	M	M
PNG	10.4	M	M	M

[1] Shall be supported where DVB-SI is supported.

[2] Subtitle formats are region-specific. The BMP-OITF and the EMP-OITF shall support at least one of the subtitle formats, possibly also as dictated by applicable regional requirements.

8.4 HTTP adaptive streaming

Table 4 specifies the status of HTTP adaptive streaming features for each profile, referring to IEC 62766-2-2:2016.

Table 4 – HTTP adaptive streaming profiling

Feature	Reference in IEC 62766-2-2:2016	Status in OIP	Status in BMP	Status in EMP
MPEG-DASH for MPEG-2 TS	5.2	O	O	O
MPEG-DASH for MP4	5.3	O	O	O
OIPF HAS for MPEG-2 TS	6.6.2	O	O	O
OIPF HAS for MP4	6.6.3	O	O	O

8.5 Content metadata

Table 5 lists the status of content metadata features as specified in IEC 62766-3 for each profile, referring to IEC 62766-3:2016.

Table 5 – Content metadata profiling

Feature	Reference in IEC 62766-3:2016, unless specified otherwise	Status in OIP	Status in BMP	Status in EMP
DVB SD&S				
Service provider discovery	5.2.13.7 of TS 102 034	O	M	M
Broadcast discovery – TS optional SI	5.2.13.2 of TS 102 034	O	M	M
Application discovery record	5.4.5 of TS 102 809	O	M	M
Package discovery	5.2.13.4 of TS 102 0304	O	M	M
BCG discovery	5.2.13.1 of TS 102 034	O	O	M
Other SD&S types	TS 102 034	O	O	O
Extension of DVB SD&S				
Service provider discovery extensions				
Emergency notification service	4.3.2.2, B.4	O	O	O
Service discovery extensions				
Bandwidth renegotiation	4.3.3.2, B.7	O	O	M
Purchasing broadcast services	4.3.3.3, B.7	O	O	O
Container format indication	4.3.3.4, B.7	O	O	M
FCC/RET attribute definition	4.3.3.5	O	M	M
Application announcement and signalling				
Service provider related application signaling	4.3.4.2	O	M	M
Broadcast related application signaling	4.3.4.3	O	M	M
Platform specific definitions				
Type Element of application descriptor	4.3.4.4.2	O	M	M
mhpVersion element of application descriptor	4.3.4.4.3	O	O	O

Feature	Reference in IEC 62766-3:2016, unless specified otherwise	Status in OIP	Status in BMP	Status in EMP
Specific applicationUsage Element of ApplicationUsageDescriptor	4.3.4.4.4	O	M(1)	M(1)
Graphic format for application icons	4.3.4.4.5	O	M	M
Application extensions	4.3.4.4.6	O	O	O
ApplicationSpecificDescriptor extensions	4.3.4.4.7	O	M	M
DVB BCG and OIPF extension	4.4	O	O	M
Metadata delivery mechanism				
Carriage of SD&S metadata	5.2.2	O	M	M
Carriage of BCG metadata	5.2.3	O	O	M(2)
Event information table (EIT)	5.2.4	O	M	M
CRID location resolution	5.4 and TS 102 539	O	O	M

1) Mandatory for service providers who signal applications providing the defined services. Service discovery and non-native HNI-IGI applications shall be supported by the OITF; other applications may be supported by the OITF.

2) Support for metadata searches via SOAP protocol is optional.

8.6 Protocols

Table 6 specifies the status of protocols features for each profile, referring to IEC 62766-4-1:2017.

IEC 62766-4-2 is informative, hence the profiles do not make any reference to that part.

Table 6 – Protocols profiling

Feature	Reference in IEC 62766-4-1:2017, unless specified otherwise	Status in OIP	Status in BMP	Status in EMP
Multicast content streaming	9.2.1, 10.2.1	O	M	M
Multicast content streaming with SIP session management	6.3.1, 7.2.3, 9.2.1, 10.2.1	O	O	M
Multicast content streaming with FCC	10.6, Annex N	O	M	M
Unicast content streaming over RTP	8.2.1, 10.2.2	O	M	M
Unicast content streaming over RTP with SIP session management	6.3.2, 8.2.1, 10.2.2	O	O	M
Unicast and multicast content streaming with retransmission (RET)	10.5, Annex N	O	M	M
Unicast content streaming with SIP session management	6.3.2, 7.2.2	O	M	M
HTTP content streaming (CoD progressive)	6.3.2	M	M	M
Forced play out control with SIP session management	6.3.3, 7.2.3	O	O	O
HTTP content download	6.3.4	M-D	M-D	M-D
Purchase of digital media using SIP	6.3.5, 7.2.3	O	O	O
Pay per view multicast content service with SIP session management	6.3.1, 7.2.3	O	O	O
Parental control for content using SIP	6.3.7, 7.2.4	O[8]	O[8]	O[8]
Network-based user notification services	6.3.8, 7.2.3.7, 7.3.3.5	O	O	O
Network-centric content bookmarking	6.3.9, 7.2.3.8, 7.3.3.6	O	O	O
Local PVR using SIP	6.3.10, 7.2.3.9, 7.3.3.7	O[9]	O[9]	O[9]
Network PVR using SIP	6.3.11, 7.2.3.10, 7.3.3.8	O	O	M
Personalised channel	6.3.12, 7.2.3.11, 7.3.3.11	O	O	O
Unicast content streaming session transfer with SIP session management	6.3.13, 7.2.3.12, 7.3.3.9	O	O	M
Service provider discovery	6.4.1			
1) Web page		M	M	M
2) SD&S records		O	See DVB SD&S clause of Table 5	See DVB SD&S clause of Table 5
Service Discovery	6.4.2			
1) Web page		M	M	M
2) SD&S records		O	See DVB SD&S clause of Table 5	See DVB SD&S clause of Table 5
XCAP application usage for IPTV ervice (profile)	6.4.4.1	O	O	M

Feature	Reference in IEC 62766-4-1:2017, unless specified otherwise	Status in OIP	Status in BMP	Status in EMP
Subscription to notification of changes in the IPTV Service Profile	6.4.4.3.1	O	O	M
Remote management of OITF	6.4.5			
1) TR-069	6.4.5.1	O	O(10)	M
2) DAE App	6.4.5.2	M(7)	M	M
User registration and network authentication	6.4.6	O	O	M
Protocols for communication functions using SIP	6.5, 7.2.5			
Caller ID	6.5.1, 7.2.5.1	O(5)	O(5)	M
Instant messaging	6.5.2, 7.2.5.3	O(5)	O(5)	M
Chat using MSRP	6.5.3, 7.2.5.5	O(5)	O(5)	M
Presence	6.5.4, 7.2.5.4	O(5)	O(5)	M
A/V telephony	7.3.5.6, 10.7	O(5)	O(5)	O
Content sharing	6.5.5, 7.2.5.5	O	O	O
HNI-IGI – HTTP option	6.6	O(5)	O(5)	M(1)
HNI-IGI – SIP option	7.3	O	O	M
RTSP profile without SIP session management	8.2.1.1	O	M	M
RTSP profile with SIP session management	8.2.1.2	O	O	M
RTSP/RTCP monitoring	8.3, 10.3	O	O	O
IGMPv3	9	O	M	M
DVBSTP (UNIS-7, UNIS-15)	9.3.1.1	O	M	M
Interactive application delivery using FLUTE (UNIS-6, UNIS-12)	9.4	O	O	O
MPEG-2 TS RTP/UDP for multicast content streaming	10.2.1	O	M	M
MPEG-2 TS RTP/UDP for unicast content streaming	10.2.2	O	M	M
DVB-IPTV base-layer AL-FEC	10.4	O	M	M
UPnP Discovery of the IG	11.2	O	O	M
UPnP Discovery of the AG	11.3	O	O	M
UPnP Discovery of the CSPG-DTCP	11.4	O	O	M
DLNA Function	12	O	O	O
Network attachment (DHCP-based)	13.2	M	M	M
DHCP options 1, 6, 61	13.2.2.1	M	M	M
DHCP option 15	13.2.2.2	M	M	M
DHCP options 43, 60	13.2.2.1	O	O	M
DHCP option 120	13.2.2.1	O	O	M
DHCP options 124/125	13.2.2.3	M(6)	M	M
Service provider discovery entry points				
1) Pre-defined by manufacturer		O(2)	O(2)	O(2)

Feature	Reference in IEC 62766-4-1:2017, unless specified otherwise	Status in OIP	Status in BMP	Status in EMP
2) Input from user		O[3]	O[3]	O[3]
3) DHCP configuration option 124/125	13.2.2.3	M[4]	M[4]	M[4]
MPEG-2 TS UDP	14	O	O	M
Diameter	16	O	O	M
NAT Traversal	Annex E.5	O	M	M

1) The feature is optional for communication between the IG and OITF when integrated into a single device. The IG shall nevertheless provide HNI-IGI for other OITFs in the residential network.

2) The OITF may include pre-configured service provider discovery entry points.

3) The OITF may include a facility for the User to acquire service provider discovery entry points via the OITF UI.

4) The OITF shall acquire service provider discovery entry points provided via this method and shall make these available to the user.

5) Feature is however provided non-natively via DAE APIs.

6) DHCP options 124/125 apply only to web page URLs in the OIP.

7) The getParameter method is optional.

8) Regulatory requirements might imply this feature to be mandatory to be implemented.

9) The local PVR, local time-shift and download CoD services rely on the presence of persistent local storage in the OITF. The OITF may support the local PVR and/or local time-shift and/or download CoD services if persistent local storage is equipped in the OITF.

10) The remote management feature is mandatory, but TR-069-based remote management of the OITF is optional when a functionally equivalent solution is implemented in the OITF, allowing a remote call of the methods and properties as specified in 6.4.5.1.2.

8.7 Declarative application environment

Table 7 specifies the status of DAE features for each profile, referring to IEC 62766-5-1:2017.

Table 7 – DAE features profiling

Feature	Reference in IEC 62766-5-1:2017	Status in OIP	Status in BMP	Status in EMP
Gateway discovery and control	4.3	O	O	M[12]
Application definition	4.4	M	M	M
Widgets	4.4.10, 5.2.8, 7.2.2, 7.2.9, 9.3.21, 11	O	O	O
Resource management	4.5	M	M	M
Content download	4.7	M-D[19]	M-D[19]	M-D[19]
Streaming CoD	4.8	M[13], [14], [17]	M[13], [17]	M
Scheduled content	4.9	O	M	M
Remote control function	4.10, 7.17, 8.5, 9.3.19, 10.3, Annex H	O	O	O
Power management	4.11, 7.3.4, 9.3.20	O	O	O
Display model	4.12, Annex F	M	M	M
Application lifecycle	5.1	M[20]	M[20]	M[20]
Application announcement & signalling	5.2	M	M	M
Basics	5.2.1, 5.2.2, 5.2.5, 5.2.6	M	M	M
Broadcast related applications	5.2.3, 5.2.7	O	M	M
Service provider related applications	5.2.4, 5.2.7	O	O	M
Extended hybrid support	5.2.7.2	M-H[10]	M	M
Event notification framework based on CEA 2014	5.3.2	O	O	O
Outgoing request messages and in-session incoming request messages	5.3.2.1, 5.3.2.2	O[15]	O[15]	O[15]
Out of session incoming request messages	5.3.2.3	O	O	O
Web standards TV profile	6.1	M	M	M
Still image formats	6.2	M	M	M
Media formats	6.3	M	M	M
SVG	6.4	O	O	O
Object factory API	7.1	M	M	M
Applications management APIs	7.2	M	M	M
The application/oipfConfiguration embedded object	7.3.2	M	M	M
Configuration and setting APIs				
The configuration class	7.3.3	M[1]	M[1]	M[1]
The LocalSystem class	7.3.4	O	M[2]	M[2]
The NetworkInterface class, the NetworkInterfaceCollection class	7.3.5, 7.3.7	O	O	O
The AVOutput class, the AVOutputCollection class	7.3.6, 7.3.8	O	O	O
The TunerCollection class, the Tuner class, the SignalInfo class, the LNBInfo class	7.3.9, 7.3.10, 7.3.11, 7.3.12	O	O	O
The StartupInformation class	7.3.13	O	O	O

Feature	Reference in IEC 62766-5-1:2017	Status in OIP	Status in BMP	Status in EMP
Content download APIs				
Basic content download – the application/oipfDownloadTrigger embedded object	7.4.2	M-D	M-D	M-D
Extensions to application/oipfDownloadTrigger	7.4.3	O-D[3]	O-D[3]	M-D
The application/oipfDownloadManager embedded object, The Download class, The DownloadCollection class	7.4.4, 7.4.5, 7.4.6	O-D	O-D	O-D
The DRMControlInformation class, The DRMControlInfoCollection class	7.4.7, 7.4.8	O-D	O-D	O-D
Content On Demand Metadata APIs	7.5	O	O	M
Content Service Protection API	7.6	M	M	M
Gateway Discovery and Control APIs	7.7	O[18]	M[4]	M[12]
IMS Related APIs				
application/oipfIMS embedded object	7.8.2, 7.8.4, 7.8.5, 7.8.6, 7.8.7	O	O	M
Extensions to application/oipfIMS for presence and messaging services	7.8.3, 7.8.8, 7.8.9	O	O	M
Extensions to application/oipfIMS for voice telephony service	7.8.10	O	O	O
Extensions to application/oipfIMS for video telephony service	7.8.11	O	O	O
The DeviceInfo class, the DeviceInfoCollecion class, the CodecInfo class, the CodecInfoCollection class	7.8.12, 7.8.13, 7.8.14, 7.8.15	O	O	O
Parental access control APIs				
application/oipfParentalControlManager embedded object	7.9.2, 7.9.3, 7.9.4	O[5]	O[5]	O[5]
ParentalRating and ParentalRatingCollection	7.9.5, 7.9.6	O-H[5]	O[5]	O[5]
Scheduled Recording APIs				
Basic PVR support – the application/oipfRecordingScheduler embedded object	7.10.2, 7.10.3, 7.10.4	O-P	M-P	M-P
Advanced PVR support – Extension to application/oipfRecordingScheduler for control of recordings	7.10.5, 7.10.6, 7.10.7, 7.10.8	O-P[6]	M-P[6]	M-P[6]
OITF-centric Bookmark and BookmarkCollection	7.10.9, 7.10.10	O	O	O
Remote management APIs	7.11	M[16]	M	M
Metadata search APIs	7.12	O	O	M[7, 8]
Synchronisation to video	7.13.22	M-H[10]	M	M
Broadcast video				
video/broadcast embedded object	7.13.2, 7.13.5, 7.13.10, 7.13.11, 7.13.12	O	M	M