
# OIPF

# Release 1 Specification

# Profiles

# [V1.0] – [2009-10-08]

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# Figures

No figures are included.

# Tables

# Foreword

This specification has been produced by the Open IPTV Forum (OIPF).

This specification accompanies the set of specifications (Volumes 1-7) that define version 1.1 of the Open IPTV Forum Release 1 IPTV Solution.

This specification defines three profiles for the OIPF Release 1 IPTV Solution:

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

If additional profiles are defined for the Release 1 IPTV Solution, these will be included in future revisions of this specification.

# 1 Scope (Informative)

The Open IPTV Forum Release 1 IPTV Solution provides the specification for an end-to-end platform for the deployment of the set of Release 1 IPTV Services. The Open IPTV Forum has developed an end-to-end solution to allow any consumer end-device, compliant to the Open IPTV Forum specifications, to access enriched and personalised IPTV services either in a managed or a non-managed network.

The Release 1 IPTV Solution specification provides multiple options for some features. This specification complements the IPTV Solution specification by defining OIPF implementation and deployment profiles that remove uncertainty about what features are required in an implementation. Any implementation based on the Release 1 IPTV Solution specification must be in adherence to one of the profiles defined in the present specification in order to claim Open IPTV Forum compliance.

Profiles define the minimum set of features that a terminal must 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 this specification will be used as a key input to the interoperability and certification programs that will be defined for the Release 1 Solution by the Open IPTV Forum.

# 2 References

## 2.1 Normative References

### 2.1.1 Standard References

| | |
|---|---|
| **[RFC2119]** | RFC 2119 (1997-03), IETF, "Key words for use in RFCs to Indicate Requirement Levels". |
| **[TS102034]** | ETSI, TS 102 034 V1.4.1 / DVB Bluebook A086r8, "Digital Video Broadcasting: Transport of MPEG-2 Based DVB Services over IP Based Networks" |
| **[A137]** | DVB Blue Book A137, "Signalling and carriage of interactive applications and services in hybrid broadcast/broadband environments" |
| **[TS102539]** | ETSI, TS 102 539 V1.2.1 (2008-04), "Digital Video Broadcasting: Carriage of Broadband Content Guide (BCG) information over Internet Protocol" |

### 2.1.2 Open IPTV Forum References

| | |
|---|---|
| **[OIPF_SERV]** | Open IPTV Forum, "Services and Functions for Release 1", September 2007. |
| **[OIPF_REQS]** | Open IPTV Forum, "Service and Platform Requirements", V1.1, July 2008. |
| **[OIPF_ARCH]** | Open IPTV Forum, "Functional Architecture – V1.2", January 2009. |
| **[OIPF_OVIEW]** | Open IPTV Forum, "Release 1 Specification, Volume 1 - Overview", V1.1, October 2009. |
| **[OIPF_MEDIA]** | Open IPTV Forum, "Release 1 Specification, Volume 2 - Media Formats", V1.1, October 2009. |
| **[OIPF_META]** | Open IPTV Forum, "Release 1 Specification, Volume 3 - Content Metadata", V1.1, October 2009. |
| **[OIPF_PROT]** | Open IPTV Forum, "Release 1 Specification, Volume 4 – Protocols", V1.1, October 2009. |
| **[OIPF_DAE]** | Open IPTV Forum, "Release 1 Specification, Volume 5 - Declarative Application Environment", V1.1, October 2009. |
| **[OIPF_PAE]** | Open IPTV Forum, "Release 1 Specification, Volume 6 - Procedural Application Environment", V1.1, October 2009. |
| **[OIPF_CSP]** | Open IPTV Forum, "Release 1 Specification, Volume 7 - Authentication, Content Protection and Service Protection", V1.1, October 2009. |

## 2.2 Informative References

The present document makes no informative references.

# 3 Terminology and Conventions

## 3.1 Conventions

The key words “MUST”, “MUST NOT”, “REQUIRED”, “SHALL”, “SHALL NOT”, “SHOULD”, “SHOULD NOT”, “RECOMMENDED”, “MAY”, and “OPTIONAL” in this document are to be interpreted as described in [RFC2119].

All sections and appendixes are normative, unless they are explicitly indicated to be informative.

## 3.2 Definitions

| *Term* | *Definition* |
|---|---|
| **Access Network** | The network infrastructure used by the Access Provider to deliver IPTV services to the Consumer.<br>The access network infrastructure is used for the delivery of the content and may include quality of service management to ensure that appropriate network resources are available for the delivery of the content. |
| **Application** | Collection of assets and logic that together provide a Service to the User. Assets and logic may reside either in an application Server or in the ITF or both. |
| **Consumer Domain** | The domain where the IPTV services are consumed. A consumer domain can consist of a single terminal or a network of terminals and related devices for service consumption. |
| **Consumer Network** | The local area network in which the IPTV Terminal Function is located. Consumer Networks include Residential Networks, hot spots, hotel networks etc. |
| **Consumer(s)** | See End User(s). |
| **Content** | An instance of audio, video, audio-video information, or data. |
| **Content Guide** | An on-screen guide to Scheduled Content and Content on Demand, allowing a User to navigate, select, and discover content by time, title, channel, genre, etc. |
| **Content on Demand (CoD)** | A Content on Demand service is a service where a user can select the individual content items they want to watch from the list of available content. Consumption of the content is started upon user request. |
| **Content Protection** | Means to protect content from unauthorized usage such as re-distribution, recording, playback, duplication etc |
| **Content Provider** | Entity that provides Content and associated usage rights to the IPTV Service Provider. |
| **End User(s)** | The individual(s) (e.g., members of the same family) who actually use the IPTV Services. |
| **Internet** | The Internet is the worldwide, publicly accessible network of interconnected computer networks that transmit data by packet switching using the standard Internet Protocol (IP). |
| **IPTV Service Provider** | Entity that offers IPTV Services and which has a contractual relationship with the Subscriber. |
| **IPTV Solution** | Defined by the Forum’s specifications. |
| **IPTV Terminal Function (ITF)** | The functionality within the Consumer Network that is responsible for terminating the media and control for an IPTV Service. |
| **Local Storage** | Content storage within the administrative realm of the IPTV Service Provider, but not in their physical environment (for example, local storage could be a partition of storage located in the residential network and allocated to the Service Provider to pre-load CoD). |
| **native HNI-IGI function** | The procedures for interactions on the HNI-IGI interface are provided as part of the OITF implementation - typically in native code. |
| **non-native HNI-IGI function** | The procedures for interactions on the HNI-IGI interface are provided by a service provider in JavaScript as part of a DAE application. |
| **nPVR** | Network based Personal Video Recorder. Provision of PVR functionality whereby the content is stored in the IPTV Service Provider domain. The nPVR allows a user to schedule recording of scheduled content programs. The user can later select the content they want to watch from the recorded content. |
| **Portal** | A function of a Service Platform that provides an entry point to individual IPTV Services to Users via a GUI. |
| **Program** | A segment of Scheduled Content with a defined beginning and end. |

| *Term* | *Definition* |
|---|---|
| **Program Guide** | See Content Guide. |
| **Push CoD** | A type of Content on Demand where the content is pre-loaded to the ITF local storage by the Service Provider. The user has no direct control of what content is pre-loaded; however the Service Provider may make the choice based on user preferences and habits. Content is available for direct consumption after the user selection is confirmed. |
| **Residential Network** | The local network of devices (gateways and terminals) at the End User's premises. |
| **Scheduled Content** | An IPTV Service where the playout schedule is fixed by an entity other than the User. The Content is delivered to the user for immediate consumption. |
| **Service** | Content and Applications provided by Service Platform Providers and Service Providers. |
| **Service Access Protection** | Means to protect IPTV Services from unauthorized usage/access, such as<br>- Access from unauthorized users<br>- DOS attack |
| **Service Platform Provider** | Entity which, based on a contractual relationship with IPTV Service Providers, provides the supporting functions for the delivery of IPTV Services, such as charging, access control and other functions which are not part of the IPTV Service, but required for managing its delivery. |
| **Service Protection** | Means to protect Contents (files or streams) during their delivery. |
| **Session Portability** | Ability of a given Service/Application to be switched from one device to another for a continuation of a session in real time. |
| **Subscriber** | The individual that makes the contract (subscription) with a Service Provider for the consumption of certain Services. |
| **Subscriber Profile** | Information associated with a subscription. |
| **Trick Mode** | Facility to allow the User to control the playback of Content, such as pause, fast and slow playback, reverse playback, instant access, replay, forward and reverse skipping. |
| **User Profile** | Information (e.g., viewing preferences) associated with a specific User who is a part of a subscription. |
| **User(s)** | See End User(s). |

## 3.3 Abbreviations

| *Abbreviation* | *Definition* |
|---|---|
| **AG** | Application Gateway |
| **API** | Application Programming Interface |
| **A/V** | Audio and Video |
| **BCG** | Broadband Content Guide (specified by the DVB Project) |
| **BMP** | Baseline Managed Profile |
| **CAS** | Conditional Access System |
| **CDN** | Content Delivery Network |
| **CDNC** | CDN Controller |
| **CDS** | Content Directory Service |
| **CG** | Content Guide |
| **CoD** | Content on Demand |
| **CPE** | Customer Premise Equipment |
| **CSP** | Content and Service Protection |
| **CSPG** | CSP Gateway |
| **DAE** | Declarative Application Environment |
| **DHCP** | Dynamic Host Configuration Protocol |

| *Abbreviation* | *Definition* |
|---|---|
| **DRM** | Digital Rights Management |
| **DSCP** | DIFFServ Code Point |
| **DTCP-IP** | Digital Transmission Content Protection over Internet Protocol |
| **DVB-IP** | Digital Video Broadcasting (over) Internet Protocol |
| **ECMA** | European Computer Manufacturers Association, ECMA International - European association for standardizing information and communication systems |
| **EMP** | Enhanced Managed Profile |
| **EPG** | Electronic Program Guide |
| **FE** | Functional Entity |
| **GBA** | Generic Bootstrapping Architecture |
| **GCA** | Gateway-Centric Approach (for CSP) |
| **GUI** | Graphical User Interface |
| **HD** | High Definition |
| **HTTP** | Hypertext Transfer Protocol |
| **IG** | IMS Gateway |
| **IGMP** | Internet Group Management Protocol |
| **IMS** | IP Multimedia Subsystem |
| **IP** | Internet Protocol |
| **IPTV** | Internet Protocol Television |
| **ITF** | IPTV Terminal Function |
| **LAN** | Local Area Network |
| **MAC** | Message Authentication Code |
| **NAT** | Network Address Translation |
| **nPVR** | Network Personal Video Recorder |
| **OIP** | Open Internet Profile |
| **OIPF** | Open IPTV Forum |
| **OITF** | Open IPTV Terminal Function |
| **OMA** | Open Mobile Alliance |
| **PAE** | Procedural Application Environment |
| **PVR** | Personal Video Recorder |
| **QoS** | Quality of Service |
| **RTP** | Real Time Protocol |
| **RTCP** | Real Time Control Protocol |
| **RTSP** | Real Time Streaming Protocol |
| **RMS** | Remote Management System |
| **SD** | Standard Definition |
| **SD&S** | Service Discovery and Selection (specified by the DVB Project) |
| **SDP** | Session Description Protocol |
| **SIP** | Session Initiation Protocol |
| **SP** | Service Provider |

| *Abbreviation* | *Definition* |
|---|---|
| **SPI** | Service Provider Interface |
| **SPP** | Service Platform Provider |
| **SSO** | Single Sign-On |
| **STB** | Set Top Box |
| **SVG** | Scalable Vector Graphics |
| **TBD** | To Be Determined |
| **TCA** | Terminal-Centric Approach (for CSP) |
| **TCP/IP** | Transmission Control Protocol/Internet Protocol |
| **UI** | User Interface |
| **UNI** | User Network Interface |
| **URI** | Uniform Resource Identifier |
| **URL** | Uniform Resource Locator |
| **VoD** | Video on Demand |
| **WG** | WAN Gateway |
| **WAN** | Wide Area Network |
| **XML** | eXtensible Markup Language |
| **XHTML** | eXtensible Hypertext Markup Language |

# 4 Release 1 IPTV Solution Profiles (Informative)

An OIPF Release 1 IPTV Solution profile is a set of features and elements, as specified in the Open IPTV Forum Release 1 Solution specification, that will be used by any OIPF-defined interoperability and certification program to define equipment or services as being “OIPF compliant”.

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-subsidized) 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 Release 1 IPTV Services;
- Enabling a wide range of services to be accessible to the User.

Three profiles are specified in the present document:

- An Open Internet Profile (OIP). This profile is intended for “over-the-top” services that do not utilise any QoS provision or terminal management features.
- A Baseline Managed Profile (BMP). This profile adds support for the Scheduled Content and Streamed CoD services making use of certain managed-network capabilities for content delivery, compared to the OIP.
- An 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.

An OITF that is compliant with the BMP is required to be able to be upgraded to be compliant with the EMP.

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

Section 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 volumes in the Release 1 IPTV Solution specification.

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

# 5 Open Internet Profile

In the present document the Open Internet Profile is referred to as “OIP”.

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

In the Release 1 IPTV Solution specification, the terms “Unmanaged Network” and “Open Internet” are used interchangeably, to refer to the ability to access any Service Provider using any Access Network Provider without any quality of service guarantees.

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.

The following sub-sections summarise the features of the OIP.

## 5.1 IPTV Services

Support of the Scheduled Content Service is OPTIONAL.

The OIP-OITF SHALL support the Streamed CoD Service, using the HTTP transport method, as described in section 6.4. 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.

## 5.2 Residential Network

### 5.2.1 WAN Gateway

If a WAN Gateway is present then it MAY fulfill the relevant network attachment functions as specified in Vol. 4 [OIPF_PROT] section 12.1 in order to provide additional Service Provider discovery entry points as described in section 5.3.

### 5.2.2 IMS Gateway

The IMS Gateway (IG) functional entity is NOT REQUIRED for the OIP.

### 5.2.3 Application Gateway

The AG functional entity, as generally for the IPTV Release 1 Solution, is OPTIONAL in the OIP.

### 5.2.4 OITF

The REQUIRED features for the OIP-OITF are described in the following sub-sections, which deal with specific aspects of the IPTV Solution.

Section 8 provides details about the IPTV Solution features that SHALL be supported by the OIP-OITF.

## 5.3 Service Provider discovery entry points

The Release 1 IPTV Solution 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 Vol. 4 [PROT] section 12.1.1.1.3.

The OIP-OITF MAY provide pre-configured Service Provider discovery entry points, as specified in the Release 1 Architecture [OIPF_ARCH] section 6.2.1.2.

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, as specified in the Release 1 Architecture [OIPF_ARCH] section 6.2.1.2.

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 scope of the OIPF specifications.

## 5.4 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.

## 5.5 Authentication methods

The OIP-OITF SHALL support the following authentication methods specified in the indicated sections of Vol. 7 [OIPF_CSP]:

- HTTP basic and digest authentication (Vol. 7 [OIPF_CSP] section 5.4.1),
- Web based authentication (Vol. 7 [OIPF_CSP] section 5.4.3), and
- SAML web-based SSO authentication (Vol. 7 [OIPF_CSP] section 5.4.5).

## 5.6 Content and Service Protection

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

## 5.7 SVG Tiny V1.2

The support of SVG Tiny 1.2 is NOT REQUIRED in the OIP-OITF.

## 5.8 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 properties as specified in section 7.11.1.1 of Vol. 5 [DAE].

# 6 Baseline Managed Profile

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 some functions that make it useful for accessing services in a managed network environment. These functions are chosen in order to allow a BMP-OITF to be able to access a wider range of IPTV services, and act as a near-term intermediate step towards the full range of capabilities offered by the Enhanced Managed Profile (EMP), described in section 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, and where the ISP may offer network-side enhancements to improve QoS with certain service offerings;
- IMS-based managed network services where native support of IMS functions are not available in OITFs.

The following sub-sections summarise the features of the BMP.

## 6.1 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 section 6.4.

## 6.2 Residential Network

### 6.2.1 WAN Gateway

The WAN Gateway SHALL fulfill the relevant network attachment functions as specified in Vol. 4 [OIPF_PROT] section 12.1.

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.

### 6.2.2 IMS Gateway

The IMS Gateway (IG) functional entity is NOT REQUIRED in the OIP for access to services over unmanaged networks. However, if an IG is present, a BMP-OITF can access IMS-based managed network services.

### 6.2.3 Application Gateway

The AG functional entity, as generally for the IPTV Release 1 Solution, is OPTIONAL in the BMP.

### 6.2.4 OITF

The BMP-OITF SHALL implement those features needed to support the non-native HNI-IGI interface, as specified in Volume 4 and 5 of the Release 1.1 specification.

Further REQUIRED features for the BMP-OITF are contained in the following sub-sections, which deal with specific aspects of the IPTV Solution.

Section 8 provides details about the IPTV Solution features that SHALL be supported by the BMP-OITF.

## 6.3 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 section 5.3.

## 6.4 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 Vol. 4 [OIPF_PROT] section 7.1.1.1.

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.

## 6.5 Authentication methods

The provisions for authentication methods for the BMP-OITF are the same as those specified for the OIP-OITF in section 5.5.

## 6.6 Content and Service Protection

The BMP-OITF SHALL support at least one of the CSP solutions specified in Vol. 7 [OIPF_CSP], i.e. it SHALL support either the TCA and/or CSPG-DTCP and/or CSPG-CI+, in order to support compliant services that deliver protected content.

## 6.7 OITF capabilities

### 6.7.1 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 BMP-OITF is OPTIONAL.

A DAE application MAY use SVG Tiny 1.2 as specified in Vol. 5, but Service Providers SHOULD 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, just without the enhanced user interface

### 6.7.2 Multiple concurrent video stream decoding support

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 e.g. still picture, in case the OITF does not support multiple video stream decoding and rendering.

## 6.8 Remote Management

The remote management feature for the BMP facilitates the functions of basic inventory and performance monitoring of OITFs that are accessing services, without the presence of a Remote Management server that provisions the OITF.

The BMP-OITF SHALL support the Remote Management properties and methods specified in section 7.11 of Vol. 5 [DAE].

## 6.9 Profile support upgrade

The BMP-OITF SHALL be able to be upgraded, e.g. via firmware update, to equip all features of the EMP and convert the OITF to an EMP-OITF.

The actual upgrade mechanism is vendor-specific and is thus out of scope of the Release 1 IPTV Solution, but the upgrade process MAY be triggered by the “triggerSoftwareUpdate” API method specified in Vol. 5 [DAE] section 7.11.1.2.

# 7 Enhanced Managed Profile

The Enhanced Managed Profile is defined as the combination of both Open Internet and 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 and more extensive management capabilities of the residential network's functional entities.

The following sub-sections summarise the features of the EMP.

## 7.1 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 Vol. 4 [OIPF_PROT] section 5.4.

## 7.2 Residential Network

### 7.2.1 WAN Gateway

The WAN Gateway SHALL fulfill the relevant network attachment functions as specified in Vol. 4 [OIPF_PROT] sections 12.1 and G.3.

### 7.2.2 IMS Gateway

The IMS Gateway (IG) SHALL implement the relevant procedures specified in Vol. 4 [OIPF_PROT].

### 7.2.3 AG

The Application Gateway (AG) functional entity, as is the case generally for the IPTV Release 1 Solution, is OPTIONAL in the EMP.

### 7.2.4 OITF

The EMP-OITF SHALL implement the HNI-IGI interface natively, as specified in Vol. 4 [OIPF_PROT], 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 section 3.1 of Vol. 4 [OIPF_PROT].

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.

## 7.3 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 SHALL support the managed model protocol usages as specified in Vol. 4 [OIPF_PROT], namely:

- Service Provider Discovery, when the HNI-IGI interface is implemented natively.
- 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 Vol. 4 [OIPF_PROT] section 5.2.1;
- The HNI-IGI functions, either natively or non-natively, for supporting the initiation, modification and termination of a CoD service session, as as specified in Vol. 4 [OIPF_PROT] section 5.2.2;
- Support of 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 Vol. 4 [OIPF_PROT] section 7.1.1.2.
- Support the XCAP application usage for manipulating the data of the IPTV User profile, as specified in Vol. 4 [OIPF_PROT] section 5.3.4.1.1,.

## 7.4 Broadband Content Guide

The EMP-OITF SHALL support the DVB Broadband Content Guide (BCG), and extensions to it as specified in Vol. 3 [OIPF_META] section 3.3.

## 7.5 Authentication methods

The EMP-OITF SHALL support the GBA authentication method as per 5.3.6.2 when the HNI-IGI function is implemented natively in the EMP-OITF.

## 7.6 Content and Service Protection

The EMP-OITF SHALL support at least one of the CSP solutions specified in Vol. 7 [OIPF_CSP], i.e. it SHALL support either the TCA and/or CSPG-DTCP and/or CSPG-CI+, in order to support compliant services that deliver protected content.

## 7.7 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 Vol. 4 [OIPF_PROT] section 5.3.5.1.2.

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

Section 8.1 specifies the status of IPTV Services support for each of the profiles.

The subsequent sub-sections specify the status of features grouped according to the Volume of the Release 1 Solution specification in which the respective features are specified. The reference to the specific section in the respective specification volume is provided, along with the status of that service or feature in each of 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 |
| 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 |
| N/A | Feature is not applicable for the Profile |

Table 1 gives the legend used for denoting the service and feature status in the following sub-sections.

Requirements for the provision of IPTV Services are not described in sections 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.


| 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 |
| 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 |
| N/A | Feature is not applicable for the Profile |


**Table 1 Legend for status in the Profiles**

## 8.1 IPTV Services support in the OITF

Table 2 lists the status of each Release 1 IPTV Service with respect to its support by the OITF in each profile.

| IPTV Service | Status in OIP | Status in BMP | Status in EMP |
|---|---|---|---|
| Scheduled Content | O | M(1) | M |
| Hybrid broadcast-broadband | O(2) | O(2) | O(2) |
| PVR | O(3) | O(3) | O(3) |
| Streamed CoD | M(4) | M(1) | M |
| Download CoD | O(3) | O(3) | O(3) |
| Information services | M | M | M |
| Communication services | N/A | N/A | M |

**Table 2 IPTV Service support profiling**

Notes:

1. The Scheduled Content and Streamed CoD services are realised using a profiled set of service enablers for BMP, specified in sections 8.3, 8.4, and 8.5.
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 PVR and Download CoD services rely on the presence of persistent local storage in the OITF. The OITF MAY support the PVR and/or Download CoD services if persistent local storage is equipped in the OITF.
4. The Streamed CoD service is realised in the OIP using HTTP transport, as specified in section 8.4.

## 8.2 Media Formats

Table 3 lists the status of Media Formats support for each profile, referring to Vol. 2 [OIPF_MEDIA]. Note that Vol. 2 contains general Solution-wide stipulations for some of these features. The features subtitles, teletext, and supported video frame rate (25 or 30Hz) are orthogonal to the Profile definitions and thus retain their status as implementation choices.

| Feature | Reference in Vol. 2 | Status in OIP | Status in BMP | Status in EMP |
|---|---|---|---|---|
| **Systems layer** | | | | |
| MPEG-2 transport stream (TS) | 4.1, 10.1 | M | M | M |
| Time-stamped TS (TTS) | 4.1, 10.2.1.1 | O | O | O |
| MP4 file format (MP4) | 4.2, 10.1 | M | M | M |
| **Video** | | | | |
| H.264/AVC SD video | 5.1.2.1, 10.1 | M | M | M |
| H.264/AVC HD video | 5.1.1.1, 10.1 | O | O | O |
| MPEG-2 SD video | 5.1.2.2, 10.2.2.2 | O | O | O |
| MPEG-2 HD video | 5.1.1.2, 10.2.2.1 | O | O | O |
| **Subtitles** | | | | |

| Feature | Reference in Vol. 2 | Status in OIP | Status in BMP | Status in EMP |
|---|---|---|---|---|
| DVB subtitles | 6.1 | O | O | O |
| CEA-708-C subtitles | 6.1 | O | O | O |
| **Teletext** | | | | |
| EBU teletext | 7.1 | O | O | O |
| **Audio** | | | | |
| HE-AAC audio | 8.1.1, 10.1 | M | M | M |
| AC-3 audio | 8.1.2, 10.2.3.1 | O | O | O |
| MPEG-1 L2 audio | 8.1.3, 10.2.3.2 | O | O | O |
| MPEG-1 L3 audio | 8.1.4, 10.2.3.3 | O | O | O |
| WAV audio | 8.1.5, 10.2.3.4 | O | O | O |
| **Still pictures and graphics** | | | | |
| JPEG | 9.1.1 | M | M | M |
| GIF | 9.1.2 | M | M | M |
| PNG | 9.1.3 | M | M | M |

**Table 3 Media formats profiling**

## 8.3 Content Metadata

Table 4 lists the status of Content Metadata features as specified in Vol. 3 for each profile, referring to Vol. 3 [OIPF_META].

| Feature | Reference in Vol. 3, unless specified otherwise | Status in OIP | Status in BMP | Status in EMP |
|---|---|---|---|---|
| **DVB SD&S** | | | | |
| Service provider discovery record | 5.2.5 of [TS102034] | O | O | M |
| Broadcast discovery record – TS Optional SI | 5.2.6.2.2 of [TS102034] | O | M | M |
| ApplicationDiscovery record | [A137] | O | M | M |
| Package discovery record | 5.2.6.5 of [TS102034] | O | O | M |
| BCG (discovery) record | 5.2.6.6 of [TS102034] | N/A | O | M |
| Other records | [TS102034] | O | O | O |
| **Extension of DVB SD&S** | 3.2.2 | | | |
| Broadcast discovery record – TS Optional SI | 3.2.2.3 | O | O | M |

| Feature | Reference in Vol. 3, unless specified otherwise | Status in OIP | Status in BMP | Status in EMP |
|---|---|---|---|---|
| Purchasing Broadcast Services | 3.2.2.4 | N/A | O | O |
| Container Format Indication | 3.2.2.5 | O | O | O |
| **Application Announcement and Signaling** | 3.2.3 | | | |
| Service provider related application signaling | 3.2.3.1 | N/A | O | M |
| Broadcast related application signaling | 3.2.3.2 | O-H | M | M |
| **Platform specific Definitions** | 3.2.3.3 | | | |
| Type Element of ApplicationDescriptor | 3.2.3.3.1 | O | M | M |
| mhpVersion Element of Application Descriptor | 3.2.3.3.2 | O | O | O |
| Specific ApplicationUsage Element of ApplicationUsageDescriptor | 3.2.3.3.3 | O | M(1) | M(1) |
| Graphic format for application icons | 3.2.3.3.4 | O | M | M |
| Application extensions | 3.2.3.3.5 | O | O | O |
| ApplicationSpecificDescriptor extensions | 3.2.3.3.6 | O | M | M |
| DVB BCG and OIPF Extension | 3.3 | O | O | M |
| FLUTE FDT Extension | 3.4 | O | O | O |
| **Metadata Delivery Mechanism** | 4.1 | | | |
| Carriage of SD&S Metadata | 4.1.1 | O | M | M |
| Carriage of BCG Metadata | 4.1.2 | O | O | M(2) |
| Event Information Table (EIT) | 4.1.3 | O | O | O |
| **Metadata Control** | 4.2 | | | |
| CRID Location Resolution | 4.2.3, and [TS102539] | O | O | M |

**Table 4 Content Metadata profiling**

Notes:

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.

## 8.4 Protocols

| Feature | Reference in Vol. 4, unless specified otherwise | Status in OIP | Status in BMP | Status in EMP |
|---|---|---|---|---|
| HTTP Streaming (CoD Progressive) | 5.2.2.2 | M | M | M |
| HTTP Download | 5.2.3.1 | M-D | M-D | M-D |
| **Service provider discovery** | 5.3.1.1, 5.3.1.2 | | | |
| 1) Web Page | | M | M | M |
| 2) SD&S records | | O | See DVB SD&S section of Table 4 | See DVB SD&S section of Table 4 |
| **Service Discovery** | 5.3.2.1, 5.3.2.2 | | | |
| 1) Web Page | | M | M | M |
| 2) SD&S records | | O | See DVB SD&S section of Table 4 | See DVB SD&S section of Table 4 |
| XCAP Application Usage for IPTV Service (profile) | 5.3.4.1 | N/A | N/A | M |
| Subscription to notification of changes in the IPTV Service Profile | 5.3.4.2.1 | N/A | N/A | M |
| **Remote management of OITF** | 5.3.5; Annex M | | | |
| 1) TR-069 | 5.3.5.1.2 | O | O | M |
| 2) DAE App | 5.3.5.2 | M(7) | M | M |
| User Registration and authentication | 5.3.6 | N/A | N/A | M |
| **Protocols for Communication Services** | 5.4 | | | |
| Caller ID | 5.4.1 | N/A | N/A | M |
| Instant Messaging | 5.4.2 | N/A | N/A | M |
| Chatting | 5.4.3 | N/A | N/A | M |
| Presence | 5.4.4 | N/A | N/A | M |
| HNI-IGI | 5.5.1 | N/A | N/A(5) | M(1) |
| RTSP | 7.1.1.1 (BMP and EP), 7.1.1.2 (EP) | O | M | M |
| RTSP/RTCP Monitoring | 7.1.1.2 | O | O | O |
| IGMPv3 | 8.1.1 | O | M | M |
| Interactive application delivery using FLUTE (UNIS-6, UNIS-12) | 8.3.1.1 | O | O | O |

| Feature | Reference in Vol. 4, unless specified otherwise | Status in OIP | Status in BMP | Status in EMP |
|---|---|---|---|---|
| DVBSTP (UNIS-7, UNIS-15) | 8.2.1.1 | O | M | M |
| MPEG-2 TS RTP/UDP for Scheduled Content | 9.1.1 | O | M | M |
| MPEG-2 TS RTP/UDP for CoD | 9.1.2 | O | M | M |
| UPnP Discovery of the IG | 10.1.1.1 | O | O | M |
| UPnP Discovery of the AG | 10.1.1.2 | O | O | M |
| UPnP Discovery of the CSPG DTCP | 10.1.1.3 | O | O | M |
| DLNA Function | 11 | O | O | O |
| **Network Attachment (DHCP-based)** | 12.1.1 | M | M | M |
| DHCP options 1,6 | 12.1.1.1.1 | M | M | M |
| DHCP option 15 | 12.1.1.1.2 | M | M | M |
| DHCP options 43, 60, 61 | 12.1.1.1.1 | O | O | M |
| DHCP option 120 | 12.1.1.1.1 | O | O | M |
| DHCP options 124/125 | 12.1.1.1.3 | M(6) | M | M |
| **Service provider discovery entry points** | | | | |
| 1) Pre-defined by manufacturer | [OIPF_ARCH] 6.2.1.2 | O(2) | O(2) | O(2) |
| 2) Input from user | [OIPF_ARCH] 6.2.1.2 | O(3) | O(3) | O(3) |
| 3) DHCP configuration option 124/125 | 12.1.1.1.3 | M(4) | M(4) | M(4) |
| MPEG-2 TS UDP | 13.1.1.1, Annex M | O | O | M |

Table 5 specifies the status of Protocols features for each profile, referring to Vol. 4 [OIPF_PROT].

| Feature | Reference in Vol. 4, unless specified otherwise | Status in OIP | Status in BMP | Status in EMP |
|---|---|---|---|---|
| HTTP Streaming (CoD Progressive) | 5.2.2.2 | M | M | M |
| HTTP Download | 5.2.3.1 | M-D | M-D | M-D |
| **Service provider discovery** | 5.3.1.1, 5.3.1.2 | | | |
| 1) Web Page | | M | M | M |
| 2) SD&S records | | O | See DVB SD&S section of Table 4 | See DVB SD&S section of Table 4 |
| **Service Discovery** | 5.3.2.1, 5.3.2.2 | | | |

| Feature | Reference in Vol. 4, unless specified otherwise | Status in OIP | Status in BMP | Status in EMP |
|---|---|---|---|---|
| 1) Web Page | | M | M | M |
| 2) SD&S records | | O | See DVB SD&S section of Table 4 | See DVB SD&S section of Table 4 |
| XCAP Application Usage for IPTV Service (profile) | 5.3.4.1 | N/A | N/A | M |
| Subscription to notification of changes in the IPTV Service Profile | 5.3.4.2.1 | N/A | N/A | M |
| **Remote management of OITF** | 5.3.5; Annex M | | | |
| 1) TR-069 | 5.3.5.1.2 | O | O | M |
| 2) DAE App | 5.3.5.2 | M(7) | M | M |
| User Registration and authentication | 5.3.6 | N/A | N/A | M |
| **Protocols for Communication Services** | 5.4 | | | |
| Caller ID | 5.4.1 | N/A | N/A | M |
| Instant Messaging | 5.4.2 | N/A | N/A | M |
| Chatting | 5.4.3 | N/A | N/A | M |
| Presence | 5.4.4 | N/A | N/A | M |
| HNI-IGI | 5.5.1 | N/A | N/A(5) | M(1) |
| RTSP | 7.1.1.1 (BMP and EP), 7.1.1.2 (EP) | O | M | M |
| RTSP/RTCP Monitoring | 7.1.1.2 | O | O | O |
| IGMPv3 | 8.1.1 | O | M | M |
| Interactive application delivery using FLUTE (UNIS-6, UNIS-12) | 8.3.1.1 | O | O | O |
| DVBSTP (UNIS-7, UNIS-15) | 8.2.1.1 | O | M | M |
| MPEG-2 TS RTP/UDP for Scheduled Content | 9.1.1 | O | M | M |
| MPEG-2 TS RTP/UDP for CoD | 9.1.2 | O | M | M |
| UPnP Discovery of the IG | 10.1.1.1 | O | O | M |
| UPnP Discovery of the AG | 10.1.1.2 | O | O | M |
| UPnP Discovery of the CSPG DTCP | 10.1.1.3 | O | O | M |
| DLNA Function | 11 | O | O | O |
| **Network Attachment (DHCP-based)** | 12.1.1 | M | M | M |
| DHCP options 1,6 | 12.1.1.1.1 | M | M | M |

| Feature | Reference in Vol. 4, unless specified otherwise | Status in OIP | Status in BMP | Status in EMP |
|---|---|---|---|---|
| DHCP option 15 | 12.1.1.1.2 | M | M | M |
| DHCP options 43, 60, 61 | 12.1.1.1.1 | O | O | M |
| DHCP option 120 | 12.1.1.1.1 | O | O | M |
| DHCP options 124/125 | 12.1.1.1.3 | M(6) | M | M |
| **Service provider discovery entry points** | | | | |
| 1) Pre-defined by manufacturer | [OIPF_ARCH] 6.2.1.2 | O(2) | O(2) | O(2) |
| 2) Input from user | [OIPF_ARCH] 6.2.1.2 | O(3) | O(3) | O(3) |
| 3) DHCP configuration option 124/125 | 12.1.1.1.3 | M(4) | M(4) | M(4) |
| MPEG-2 TS UDP | 13.1.1.1, Annex M | O | O | M |

**Table 5 Protocols profiling**

Notes:

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 and triggerSoftwareUpdate methods are NOT REQUIRED.

## 8.5 Declarative Application Environment

Table 6 specifies the status of DAE features for each profile, referring to Vol. 5 [OIPF_DAE].

| Feature | Reference in Vol. 5 | Status in OIP | Status in BMP | Status in EMP |
|---|---|---|---|---|
| Gateway Discovery and Control | 4.2 | O | O | M(12) |
| Application Definition | 4.3 | M | M | M |
| Resource Management | 4.4 | M | M | M |
| Content Download | 4.6 | M-D | M-D | M-D |
| Streaming CoD | 4.7 | M(13), (14), (17) | M(13), (17) | M |
| Scheduled content | 4.8 | O | M | M |
| Application lifecycle | 5.1 | M | M | M |
| **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 |
| Event Notification Framework based on CEA 2014 | 5.3.1 | O | O | O |
| Outgoing request messages and in-session incoming request messages | 5.3.2.1, 5.3.2.2 | N/A(15) | N/A(15) | N/A(15) |
| Out of session incoming request messages | 5.3.2.3 | O | O | O |
| CE-HTML | 6.1 | M | M | M |
| CE-HTML Referenced Formats | 6.2 | M | M | M |
| Media Format | 6.3 | M | M | M |
| SVG | 6.4 | - | O | O |
| Object Factory API | 7.1 | M | M | M |
| Applications Management APIs | 7.2 | M | M | M |
| The application/oipfConfiguration embedded object | 7.3.1 | M | M | M |
| **Configuration and Setting APIs** | | | | |
| The Configuration class | 7.3.2 | M(1) | M(1) | M(1) |
| The LocalSystem class | 7.3.3 | O | M(2) | M(2) |
| **Content Download APIs** | | | | |
| Basic content download – the application/oipfDownloadTrigger embedded object | 7.4.1 | M-D | M-D | M-D |
| Extensions to application/oipfDownloadTrigger | 7.4.2 | O-D(3) | O-D(3) | M-D |

| Feature | Reference in Vol. 5 | Status in OIP | Status in BMP | Status in EMP |
|---|---|---|---|---|
| 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 | 7.8.1, 7.8.3, 7.8.4, 7.8.5, 7.8.6 | O | O | M |
| Extensions to application/oipfIMS for communication services | 7.8.2, 7.8.7, 7.8.8 | N/A | N/A | M |
| **Parental access control APIs** | | | | |
| application/oipfParentalControlManager embedded object | 7.9.1, 7.9.2, 7.9.3 | O(5) | O(5) | O(5) |
| ParentalRating and ParentalRatingCollection | 7.9.4, 7.9.5 | O-H(5) | O(5) | O(5) |
| **Scheduled Recording APIs** | | | | |
| Basic PVR support – the application/oipfRecordingScheduler embedded object | 7.10.1, 7.10.2, 7.10.3 | O-P | M-P | M-P |
| Advanced PVR support – Extension to application/oipfRecordingScheduler for control of recordings | 7.10.4, 7.10.5, 7.10.6, 7.10.7 | O-P(6) | M-P(6) | M-P(6) |
| Bookmark and BookmarkCollection | 7.10.8, 7.10.9 | O | O | O |
| Remote management APIs | 7.11 | M(16) | M | M |
| Metadata search APIs | 7.12 | O | O | M(7, 8) |
| **Broadcast video** | | | | |
| video/broadcast embedded object | 7.13.1, 7.13.4, 7.13.9, 7.13.10, 7.13.11 | O | M | M |
| Extensions for recording and timeshift | 7.13.2 | O-P | O-P | O-P |
| Access to DVB-SI EIT p/f | 7.13.3 | O | O | O |
| Extensions to video/broadcast for parental ratings errors | 7.13.5 | O(5) | O(5) | M |
| Extensions to video/broadcast for DRM rights errors | 7.13.6 | O | M | M |
| Extensions to video/broadcast for channel scan | 7.13.7, 7.13.14 | O-H(9) | O-H(9) | O-H(9) |
| Extensions to video/broadcast for creating Channel lists from SD&S fragments | 7.13.8 | O | M | M |
| Favourite lists | 7.13.12, 7.13.13 | O-H | O | O |
| **Media playback APIs** | | | | |
| Basics | 7.14.1.1, 7.14.1.2, 7.14.2, 7.14.3, 7.14.4, 7.14.8, 7.14.9 | M | M | M |

| Feature | Reference in Vol. 5 | Status in OIP | Status in BMP | Status in EMP |
|---|---|---|---|---|
| Using an A/V control object to play downloaded content | 7.14.1.3 | M-D | M-D | M-D |
| Using an A/V control object to play recorded content | 7.14.1.4 | M-P | M-P | M-P |
| Extensions to A/V object for parental rating errors | 7.14.5 | O[(5)] | O[(5)] | M |
| Extensions to A/V object for DRM rights errors | 7.14.6 | M | M | M |
| Extensions to A/V object for playing media objects (downloaded or recorded content or CoD via BCG) | 7.14.7 | M-D, M-P | M-D, M-P | M |
| Playback of memory audio | 7.14.10 | M | M | M |
| application/oipfMDTF embedded object | 7.15.1 | O | O | O |
| application/oipfStatusView embedded object | 7.15.2 | O | O | O |
| application/oipfCapabilities embedded object | 7.15.3 | M | M | M |
| The Navigator class | 7.15.4 | M | M | M |
| Debug Print API | 7.15.5 | M | M | M |
| The StringCollection class | 7.16.1 | M | M | M |
| **Programme** | | | | |
| Basics | 7.16.2.1, 7.16.2.2, 7.16.3 | M-H[(10)], M-P | M-H[(10)], M-P | M |
| Metadata extensions to Programme | 7.16.2.3 | O-H | M-H | M |
| DVB-SI extensions to Programme | 7.16.2.4 | O-H | M-H[(10)] | M-H[(10)] |
| Recording extensions to Programme | 7.16.2.5 | M-P | M-P | M-P |
| The DiscInfo class | 7.16.4 | M-D, M-P | M-D, M-P | M-D, M-P |
| HTTP User-Agent header | 8.1.1 | M | M | M |
| **Mapping from APIs to Protocols** | 8.2 | | | |
| Network (Common to Managed and Unmanaged Services) | 8.2.1 | M-D | M-D | M-D |
| OITF-IG Interface (Managed Services Only) | 8.2.2 | O | O | M[(12)] |
| Network (Unmanaged Services only) | 8.2.3 | M | M | M |
| URI Schemes and their usage | 8.3 | M[(11), (14)] | M[(11)] | M |
| Minimum DAE capability requirements | 9.1 | M | M | M |
| Multiple simultaneous applications | 9.1 | O | M | M |
| Default UI profiles | 9.2 | M | M | M |
| CEA-2014 Capability Negotiation and Extensions | 9.3 | M | M | M |
| Security | 10 | M | M | M |
| CE-HTML Profiling | Annex B | M | M | M |

| Feature | Reference in Vol. 5 | Status in OIP | Status in BMP | Status in EMP |
|---|---|---|---|---|
| **Content Access Descriptor Syntax and Semantics** | Annex E | | | |
| Content Access Download Descriptor Format | Annex E.1 | M-D | M-D | M-D |
| Basic content access descriptor | Annex E.2, Annex E-3 | M | M | M |
| Capability Extensions Schema | Annex F | M | M | M |
| Client Channel Listing Format | Annex G | O | O | O |
| DVB-MCAST URI scheme for services in a MPEG-2 TS delivered over IP Multicast | Annex H | O | M | M |

**Table 6 DAE features profiling**

Notes:

1. Read-only access to the following properties SHALL be supported – preferredAudioLanguage, preferredSubtitleLanguage and countryID. Read-write access to these properties, all the other properties and all methods are OPTIONAL.
2. The deviceID property SHALL be supported. Other properties and methods are OPTIONAL.
3. Only applicable where both BCG and download are supported.
4. API mandatory but fails where protocol is not supported by the OIP-OITF or BMP-OITF.
5. Aspects of this may be mandatory depending on applicable regulation.
6. Recordings made by applications from one service provider SHALL NOT be visible to applications from other service providers.
7. Mapping from this API to BCG SHALL be supported. Mapping from this API to DVB-SI MAY be supported in OITFs that support hybrid service.
8. Support for processing searches on a remote server using the SOAP based protocol is optional.
9. SHALL be supported if the OITF does not include a means for the user to initiate this manually, otherwise OPTIONAL.
10. SHALL be supported where DVB-SI is supported.
11. The crid URI scheme is OPTIONAL.
12. 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.
13. Only unicast mode streaming is REQUIRED to be supported.
14. The support of “rtsp” URLs is OPTIONAL.
15. Feature applies to DAE applications, rather than to the OITF.
16. The getParameter and triggerSoftwareUpdate methods are NOT REQUIRED.
17. Only “http” URLs are REQUIRED to be supported.
18. If CSPG-DTCP or CSPG-CI+ is supported then the CSP Gateway Discovery and URL properties SHALL be supported, however the CSP Gateway URL has no meaning in the case of CSPG-CI+.

## 8.6 Procedural Application Environment

Being the core component of the Application Gateway (AG) functional entity, the complete Procedural Application Environment is OPTIONAL in each of the defined profiles.

## 8.7 Authentication, Content Protection and Service Protection

Table 7 lists the status of OITF support of features as specified in Vol. 7 [OIPF_CSP] for each profile

| Feature | Reference in Vol. 7 | Status in OIP | Status in BMP | Status in EMP |
|---|---|---|---|---|
| **Terminal Centric Approach (TCA)** | 4.1 | O(1) | O(1) | O(1) |
| Marlin metering in OITF | 4.1 | O | O | O |
| **Protected formats** | | | | |
| OMA P/DCF | 4.1.4 | O | O | O |
| Marlin IPMP | 4.1.4 | O | O | O |
| Protected MPEG-2 TS | 4.1.4, 4.1.5 | M | M | M |
| **Gateway Centric Approach (GCA)** | 4.2 | O(1), (2) | O(1) , (2) | O(1) , (2) |
| CSPG-CI+ | 4.2.3 | O(1) | O(1) | O(1) |
| CSPG-DTCP | 4.2.4 | O(1) | O(1) | O(1) |
| **OITF Authentication** | 5.4 | | | |
| HTTP basic and digest authentication | 5.4.1 | M | M | M |
| Web based authentication | 5.4.3 | M | M | M |
| GBA authentication | 5.4.4 | N/A | N/A | M |
| SAML web-based SSO authentication | 5.4.5 | M | M | M |
| **IMS registration – OITF** | 5.5 | N/A | N/A | M |
| **Session management** | 5.6 | | | |
| Cookie session | 5.6.1 | M | M | M |
| HTTP authentication session | 5.6.3 | M | M | M |

**Table 7 Authentication and CSP profiling**

Notes:

1. At least one of TCA, GCA-CI+ or GCA-DTCP SHALL be supported.
2. Support for Vol. 7 [OIPF_CSP] sections 4.2.1 and 4.2.2 on DAE and CSPG interfacing are also OPTIONAL in the OITF if the GCA is not supported.