

# INTERNATIONAL STANDARD



**Consumer terminal function for access to IPTV and open internet multimedia services –  
Part 6: Procedural application environment**

**IEC 62766-6:2017**  
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**CONSUMER TERMINAL FUNCTION FOR ACCESS  
TO IPTV AND OPEN INTERNET MULTIMEDIA SERVICES –****Part 6: Procedural application environment**

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

CDV	Report on voting
100/2550/CDV	100/2664/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.

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## INTRODUCTION

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

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

## Part 6: Procedural application environment

### 1 Scope

This part of IEC 62766 specifies the procedural application environment (PAE) component of the OIPF terminal function (OITF). It also defines the UNI reference point UNIS-12 of the OIPF functional architecture summarised in Annex B of IEC 62766-1:2017.

The PAE is an application environment for IPTV services based on Java<sup>1</sup>. Like other specifications such as OCAP, ACAP and Blu-ray<sup>2</sup>, which are, or include, GEM terminal specifications, this document follows the structure of ETSI TS 102 728.

### 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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IEC 62766-1:2017, *Open IPTV Forum (OIPF) consumer terminal function and network interfaces for access to IPTV and open Internet multimedia services – Part 1: General*

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IEC 62766-2-1, *Open IPTV Forum (OIPF) consumer terminal function and network interfaces for access to IPTV and open Internet multimedia services – Part 2-1: Media Formats*

IEC 62766-2-2, *Open IPTV Forum (OIPF) consumer terminal function and network interfaces for access to IPTV and open Internet multimedia services – Part 2-1: HTTP Adaptive Streaming*

IEC 62766-3:2016, *Open IPTV Forum (OIPF) consumer terminal function and network interfaces for access to IPTV and open Internet multimedia services – Part 3: Content Metadata*

IEC 62766-4-1:2017, *Open IPTV Forum (OIPF) consumer terminal function and network interfaces for access to IPTV and open Internet multimedia services – Part 4-2: Protocols*

IEC 62766-5-1:2017, *Open IPTV Forum (OIPF) consumer terminal function and network interfaces for access to IPTV and open Internet multimedia services – Part 5-1: Declarative Application Environment*

ISO/IEC 14496-18, *Information technology – Coding of audio-visual objects – Part 18: Font compression and streaming*

<sup>1</sup> Javascript is a programming language that has been standardised by ECMA as ECMAScript® and as ISO/IEC 16262

<sup>2</sup> Blu-ray is a trademark owned by the Blu-ray Disc Association. This information is given for the convenience of users of this document and does not constitute an endorsement by IEC of the product named. Equivalent products may be used if they can be shown to lead to the same results.

ETSI EN 300 468, *Digital Video Broadcasting (DVB); Specification for Service Information (SI) in DVB systems*

ETSI TS 101 211 v1.9.1, *Digital Video Broadcasting (DVB); Guidelines on implementation and usage of Service Information (SI)*

ETSI TS 101 600 V1.1.1 (2012-05), *Digital Video Broadcasting (DVB); GEM Profile for Plano-Stereoscopic 3DTV*

ETSI TS 102 727 V1.1.1 (2010-01), *Digital Video Broadcasting (DVB); Multimedia Home Platform (MHP) Specification 1.2.2*

ETSI TS 102 728 V1.2.1 (2011-09), *Digital Video Broadcasting (DVB); Globally Executable MHP (GEM) Specification 1.3 (including OTT and hybrid broadcast/broadband)*

ETSI TS 102 539 V.1.1.1, *Digital Video Broadcasting (DVB); Carriage of Broadband Content Guide (BCG) information over Internet Protocol (IP)*

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

ETSI, TS 102 816 V1.1.1, *Digital Video Broadcasting (DVB); Personal Video Recorder (PVR)/Personal Data Recorder (PDR) Extension to the Multimedia Home Platform*

ETSI TS 102 817 V1.1.1, *Digital Video Broadcasting (DVB); Digital Recording Extension to Globally Executable Multimedia Home Platform (GEM)*

3GPP TS 26.234, *Transparent end-to-end Packet-switched Streaming Service (PSS) Protocols and codecs (Release 9)*

DAVIC 1.4.1, *Specification part 9, Information Representation*

Available from

<http://docbox.etsi.org/Reference/DAVIC/DAVIC%201.4.1%20Specification%20part%209.pdf>

DVB, Blue Book A127, *Application Gateway and Media Server Fragment*

Available from

[http://www.mhp.org/specs/a127.application\\_gateway\\_and\\_media\\_server\\_fragment.pdf](http://www.mhp.org/specs/a127.application_gateway_and_media_server_fragment.pdf)

Java Community Process, Java Specification Request JSR-217, *Personal Basis Profile (PBP) 1.1 (or later)*

The latest release of JSR 217 is available at <http://www.jcp.org/en/jsr/detail?id=217>

Java Community Process, Java Specification Request JSR-218, *Connected Device Configuration (CDC) 1.1 (or later)*

The latest release of JSR 218 is available at <http://www.jcp.org/en/jsr/detail?id=218>

Java Community Process, Java Specification Request JSR-219, *Foundation Profile (FP) 1.1 (or later)*

The latest release of JSR 219 is available at <http://www.jcp.org/en/jsr/detail?id=219>

Java Community Process, Java Specification Request JSR-927, *Java TV, Version 1.1.1 (or later)*

The latest release of JSR 927 is available at <http://www.jcp.org/en/jsr/detail?id=927>

Java Community Process, JAR File Specification, part of Java SDK 1.4.2 specification, 1999  
Available from <http://java.sun.com/j2se/1.4.2/docs/guide/jar/jar.html>

CableLabs, OpenCable Application Platform (OCAP) Version 1.1.2, September 2009, Available from <https://apps.cablelabs.com/specification/opencable-application-platform-ocap/>

### 3 Terms, definitions and abbreviated terms

No terms and definitions are listed in this document.

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 Abbreviated terms

For the purposes of this document the abbreviated terms given in IEC 62766-1:2017 as well as the following apply.

DSMCC Digital Storage Media Command and Control

FP Foundation Profile

GEM Globally Executable MHP

HAS HTTP Adaptive Streaming

JSSE Java Secure Sockets Extension

MHP Multimedia Home Platform

MPD Media Presentation Description

PBP Personal Basis Profile [IEC 62766-6:2017](https://standards.iteh.ai/catalog/standards/sist/20c22e48-96c9-467d-b403-2d7460198511/iec-62766-6-2017)

### 4 General considerations and conventions

#### 4.1 Overview

Subclause 4.2 covers general considerations and conventions, in particular the relationship with DVB-GEM.

Clause 5 explains the relationship between DVB-GEM and the PAE platform, the basic architecture and positioning of the procedural application environment in the OIPF landscape.

Clause 6 includes details on the supported transport protocols by cross-referencing the OIPF protocols specification IEC 62766-4-1.

Clause 7 defines static and streaming media formats for the representation of images, sound, videos, colours and fonts by cross-referencing the OIPF media formats specification IEC 62766-2-1.

Clause 8 is intentionally void.

Clauses 9 and 10 describe the application model for Java applications for the PAE and application signalling.

Clause 11 describes features of the Java platform, such as class loading behaviour, event model and specifies all APIs that are contained in the platform.

Clause 12 deals with security aspects of the platform such as the security framework for applications, application authentication, secure network connections and certificate management.

Clause 13 deals with the graphics reference model.

Clause 14 deals with system integration aspects.

Clause 15 defines which parts of the specification are mandatory or optional for the 3 different device types addressed by this volume.

Clause 16 deals with PVR functionalities.

Clause 17 defines the minimum terminal capabilities.

Clause 18 deals with HTTP Adaptive Streaming support.

The annexes contain API definitions at class and method level and clarifications of referenced specifications.

## 4.2 Relation between DVB-GEM and PAE definitions

### 4.2.1 General

The GEM/MHP notion of "broadcast application" should be interpreted as meaning applications that are bound to a specific scheduled content service or a content-on-demand item.

Unbound applications are persistent applications that are not tied to any service.

The GEM term "interaction channel" is the network connection channel of the OIPF architecture summarised in Annex B of IEC 62766-1:2017.

### 4.2.2 DVB-GEM Compliance

All mandatory requirements for the GEM IPTV target shall be supported by the PAE.

The following optional parts of the GEM IPTV target shall be supported by the PAE:

- OpenType;
- internet access applications;
- stored applications, stored services and corresponding APIs;
- unbound applications and corresponding APIs;
- content referencing for IPTV;
- service discover and selection for IPTV.

The following optional part of the GEM IPTV target shall be supported by the PAE under specific circumstances:

- TV-Anytime content referencing and metadata.

The following optional parts of the GEM IPTV target may be supported by this document:

- file storage API;
- Smart Card API (JSR177);
- providers ;
- privileged applications.

Where a service provider is specifying a device including the PAE, the service provider may choose to require these optional features.

The following optional parts of the GEM IPTV target should not be supported by the PAE:

- DVB-HTML;
- the MHP functional equivalent called application authentication;
- section filtering API (org.davic.mpeg.sections), tuning API, basic MPEG concepts and common error reporting;
- MPEG 2 video drips and corresponding APIs;
- MPEG 2 I-frames and corresponding APIs;
- credentials;
- certificate revocation mechanism of ETSI TS 102 727;
- root certificate management mechanism defined in ETSI TS 102 727;
- externally authorized applications.

#### 4.2.3 Functional equivalents

The functional equivalents to GEM-IPTV are listed in Table 6.

The main concepts are as follows:

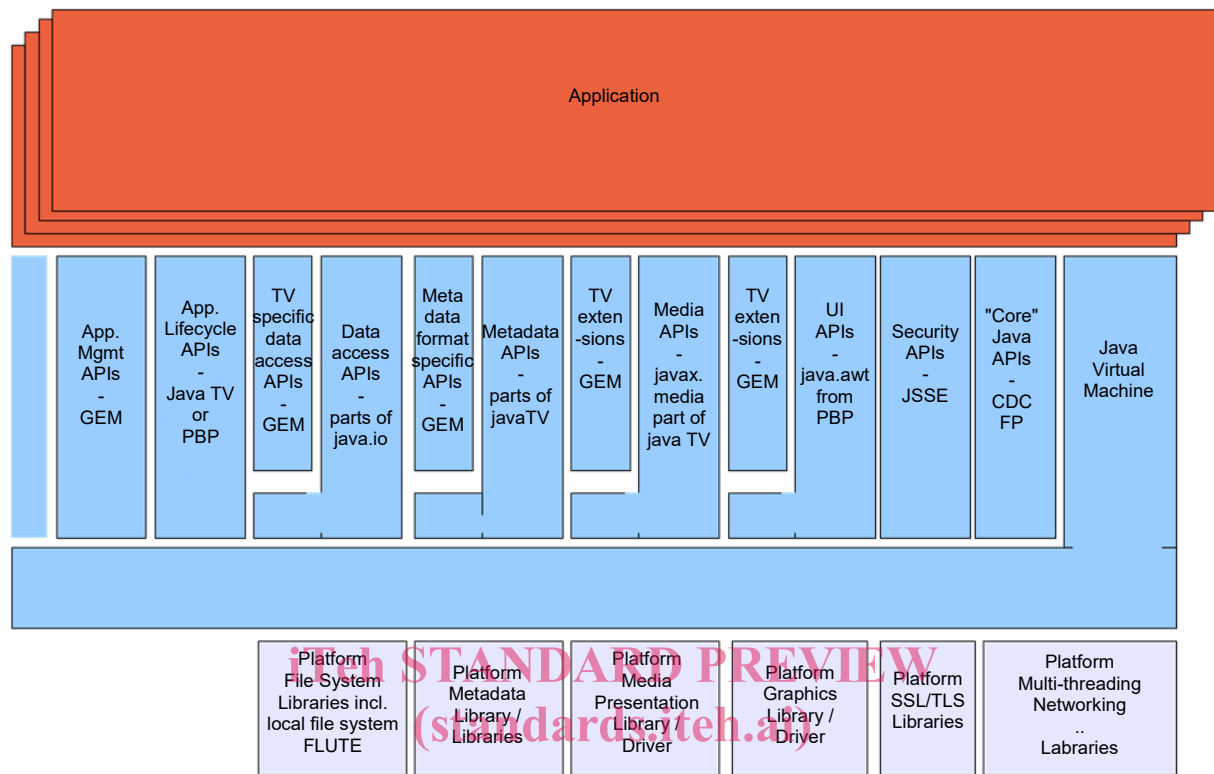
- DVB Service Discovery and Selection and Broadband Content Guide are used for SI.
- Applications are distributed in JAR files, using HTTP for unicast and FLUTE for multicast.

NOTE FLUTE is conceptually different from DSMCC object carousel and cannot be considered a functional equivalent.

- Application authentication is based on the signing capabilities for JAR files.

## 5 Architecture and deployment options

### 5.1 Architecture



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**Figure 1 – PAE architecture block diagram**

Figure 1 shows a number of the key components of the architecture and indicates their origin – GEM, JavaTV, PBP or components of PBP (JSSE, CDC or FP). Below is a short summary of each component ordered from left to right of Figure 1.

- App. Mgmt APIs: these enable one application to obtain lists of other applications and start or stop other them.
- App. Lifecycle APIs: these are the first APIs to be called by the implementation when starting an application.
- TV specific data access APIs: these provide access to data in ways which are specific to TV environments.
- Data access APIs: these provide generic access to data – files, sockets, streams, etc.
- Metadata format specific APIs: these provide access to the details of metadata in a format dependent way.
- Metadata APIs: these provide access to metadata and are independent of any specific metadata format.
- TV extensions: these provide control over A/V media in ways which are specific to TV environments.
- Media APIs: these provide access to and control over A/V media.
- TV extensions: these provide UI features specific to TV environments.
- UI APIs: these provide the basic UI capabilities.
- Security APIs: these provide the basic security capabilities.
- Core Java APIs: these provide the basic capabilities of the Java language.