Application Gateway and Media Server Fragment

Contents

Introduction

One deployment scenario for Java based procedural application environments is devices such as gateways or routers. These do not normally include a display or any user input capability. Devices like these are called "headless" in Java – a historical term dating back to Unix workstations.

Some example applications which can be deployed in such headless devices could include the following;

EPG generating an HTML UI to devices using DLNA remote UI or similar

Application supporting proxying of signalling protocols when client and server are not in the same IP domain

Support for proprietary or non-standard content download protocols (where the headless device has content storage capabilities)

Operator provided non-TV services like collecting alarms from home devices

By defining a subset of GEM-IPTV for headless devices, the present document enables headless applications to be efficiently supported on a mixed deployment of headless devices and conventional set-top boxes. In the absence of such a subset, the options for a mixed deployment of headless devices and set-top boxes would be less efficient ones such as;

Deploy different software environments for headless devices and set-top boxes with different versions of each application.

Support 2 software environments on set-top boxes, GEM-IPTV and a second software environment for headless devices.

The fact that a device does not include a display or any user input capability does not exclude it from handling A/V media. The most obvious example is a headless device which includes media storage and can offer content to devices across a home network. Headless devices without media storage could perhaps act as a proxy, initiating A/V media delivery from the network and relaying the content to across a home network using home networking protocols. Both of these examples can be addressed by the present document.

One type of headless device is out of scope of the present document. These are devices which can support the full GEM user interface API using a remote UI protocol such as VNC. Such devices should be able to support the full GEM-IPTV specification.

1 Scope

The present document is intended to be used by entities writing system specifications and/or standards that support a Java based procedural application environment required to be used both in devices with a display and user input capability and in devices without those capabilities. It defines the fragments of GEM appropriate for devices without display and user input capabilities.

NOTE: The present document defines the interfaces visible to applications. Application developers should not assume that any related interface is available unless it is specifically listed. System standards or implementations may have other interfaces present.

The present document enables a number of different deployment scenarios. These include basic devices with no A/V media handling, devices with the ability to proxy A/V streams from an IPTV network onto a home network and devices including A/V media storage.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific.

- For a specific reference, subsequent revisions do not apply.

- Non-specific reference may be made only to a complete document or a part thereof and only in the following cases:

- if it is accepted that it will be possible to use all future changes of the referenced document for the purposes of the referring document;

- for informative references.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

For online referenced documents, information sufficient to identify and locate the source shall be provided. Preferably, the primary source of the referenced document should be cited, in order to ensure traceability. Furthermore, the reference should, as far as possible, remain valid for the expected life of the document. The reference shall include the method of access to the referenced document and the full network address, with the same punctuation and use of upper case and lower case letters.

NOTE: While any hyperlinks included in this clause were valid at the time of publication DVB cannot guarantee their long term validity.

2.1 Normative references

The following referenced documents are indispensable for the application of the present document. For dated references, only the edition cited applies. For non-specific references, the latest edition of the referenced document (including any amendments) applies.

[1] DVB Blue Book A103 Rev. 1 "Digital Video Broadcasting (DVB);Globally Executable MHP (GEM) Specification 1.2.1"

[2] JSR 217: "Personal Basis Profile 1.1"

[3] JSR 927: "Java TV^{TM} API 1.1"

[4] ETSI TS 102 817: "Digital Video Broadcasting (DVB);Digital Recording Extension to Globally Executable Multimedia Home Platform (GEM)".

2.2 Informative references

[5]   IETF RFC 3926 - "File Delivery over Unidirectional Transport"

[6]   ETSI TS 102 590: "Digital Video Broadcasting (DVB); Multimedia Home Platform (MHP) Specification 1.2".

NOTE: The preceding reference is currently only available as DVB Blue Book A107.

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in GEM [1] and the following apply:

headless device: a device which cannot support a display and some kind of input device

hybrid device: a device supporting both an IP interface and a classical RF and MPEG-2 transport stream based broadcast interface

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AIT	Application Information Table as defined in clause 10.4 of MHP 1.2 [6].
API	Application Program Interface, sometimes also referred to as Application Programming Interface
BCG	Broadband Content Guide
DVB	Digital Video Broadcasting
HTTP	Hypertext Transfer Protocol
MHP	Multimedia Home Platform as defined in MHP 1.2 [6].
XML	Extensible Markup Language

4 General considerations and conventions

Some of the clauses of GEM [1] required by this document include fine-grained references to features or APIs not applicable in headless devices. Those references shall be ignored and do not imply those features or APIs are in fact required.

5 Basic architecture

The present document does not mandate any specific architecture beyond that derived from JavaTV [3] and extended by GEM [1]. To summarise;

Applications are packaged into services.

Services may contain zero or more applications. There is no fixed limit on the number of applications which may be contained in a service.

Services are presented in service contexts (where "presented" means "executed" for an application)

A single environment will support multiple service contexts. There is no fixed limit on the number of these.

Applications may be deployed to a headless device by a number of means.

- Built into the basic software of the device at time of manufacture

- Updated as part of the basic software of the device using a software update mechanism

- Pushed into the device by signalling

- Pulled into the device by another application, (e.g. one built into the basic software of the device at time of manufacturer)

Interoperability / Upward compatibility:

An application, which is compliant with the mandatory APIs found in document, shall run on a GEM-IPTV compliant device without modification. It is a goal of this fragment to provide upward compatibility with the existing GEM-IPTV target.

6 Transport protocols

The present document does not require the use of any specific transport protocols for delivering applications.

For delivering applications via unicast IP transport, HTTP may be used as defined in GEM [1] and PBP [2].

For delivering applications via multicast IP transport, FLUTE may be used as defined in RFC 3926 [5].

For delivering applications via the classical RF and MPEG-2 transport stream based interface in a hybrid device, the DSMCC object carousel may be used as defined in GEM [1].

7 Content formats

The present document does not require the use of any specific content formats.

8 Void

This clause is intentionally void.

9 Application model

The following clauses from GEM [1] shall be supported.

Clause 9.2 "DVB-J Model" excluding 9.2.5.2 "Input Focus management" and 9.2.5.3 "Other resources management"

Clause 9.6 "Services and applications not related to conventional DVB services"

Clause 9.9 "Stored and Cached applications"
Support for cached applications is not required by the present document

Clause 9.13 Unbound Applications

The following clauses from GEM [1] may be supported.

Clause 9.11 Providers

In devices including the digital recording extension to GEM [4], support for application recording and application playback is not required.

10 Application signalling

The present document does not require the use of any specific application signalling.

Where XML based application signalling is appropriate, the XML encoding of the AIT defined in Annex AR of MHP 1.2 [6] MAY be used. This signalling may be embedded in a larger XML document (e.g. DVB SD&S) or carried stand-alone in a file.

Where headless applications are signalled using an AIT, the application type used shall be 9.

11 Java platform

11.1   All devices

The following clauses from GEM [1] shall be supported;

Clause 11.1 "The Java Platform"
NOTE: PBP support for headless devices is defined by the method GraphicsEnvironment.isHeadless.

Clause 11.2 "General issues" except for the following clauses from MHP [6] - 11.2.6 "Event model in DAVIC APIs", 11.2.8 "Tuning as a side-effect", 11.2.9 "Intra application media resource management" and "11.2.11.1 Text encoding in Service Information"

Clause 11.3 "Fundamental DVB-J APIs" except as follows;
references to object carousels,
references to images,
Clause 11.3.2 of MHP [6]
From clause 11.3.3 "Java TV", the present document only requires the following packages from JavaTV [3]
- javax.tv.service and sub-packages as defined by clauses 11.6.5 "Protocol Independent SI API" and 11.6.2 Service selection API (the latter only as needed for stored and abstract services)
- javax.tv.locator as defined by clause 11.7.6 "Content referencing"

NOTE: The present document is based on JavaTV [3] which offers functionalities beyond the requirements of this specification.The present document does not excuse implementers from other requirements of the JSR they are implementing. A future version of JavaTV or some possible future JSR may more directly address headless devices.

Clause 11.5.6 "Persistent Storage API" and annex K "DVB-J persistent storage API"

Clause 11.7.1 "APIs to support DVB-J application lifecycle"

Clause 11.7.2 "Application discovery and launching APIs" and annex S "Application listing and launching MHP"

Clause 11.8 "Security" excluding clause 11.8.6 "DVB Extensions for Cryptography".

Clause 11.9. 1 "Timer support"

Clause 11.9.3 "Profile and version properties"

Clause 11.9.5.1 "SAX"

Clause 11.10 "Java permissions" except for Permissions relating to features not required by the present document

Clause 11.11.12 "Support for the HTTP Protocol in DVB-J"

Clause 11.12.2 "Stored services" excluding references to the org.dvb.dsmcc package and including Annex AG "Stored application APIs"

Clause 11.15.3 "OCAP Annex P – the org.ocap.service package"

Annex X - "Test support"

From clause 11.7.6 "Content referencing", the following apply;

Support for the javax.tv.locator package is required (see above)

Support for the org.davic.net.Locator class is required

The remainder of this clause and the APIs referenced from it are not required by the present document.

Support for org.davic.net.dvb.DvbLocator and sub-classes may be considered in devices supporting both DVB SD&S and the handling of A/V media.

NOTE: The broadcast discovery record of SD&S supports the resolution of "dvb:" URIs.

The following clauses from GEM [1] may be supported.

Clause 11.7.9 "Provider API"

From clause 11.15 of GEM [1], the following packages SHALL either all be supported or none supported.

org.ocap.application, org.ocap.system, org.ocap and org.ocap system.event

11.2   Hybrid APIs

For hybrid devices, the following clauses from GEM [1] SHALL be supported;

Annex AV - "Extended service list API"

11.3   DVB-SD&S APIs

For devices supporting the DVB service discovery and selection mechanism, the following clauses from GEM [1] should be supported.

Clause 11.6.6 "Service discovery and selection for IPTV"

Annex AW "API to DVB service discovery and selection"

11.4   TV-Anytime and DVB-BCG APIs

For devices supporting TV-Anytime and/or the DVB broadband content guide, the following clauses from GEM [1] should be supported.

Clause 11.6.7 "Integration between protocol independent SI API and TV-Anytime"

Clause 11.7.11 "TV-Anytime content referencing and metadata"

Clause 11.9.5.2 "JDOM"

Annex AX "API to DVB broadband content guide"

Annex AY "TV-Anytime and Java TV Integration"

11.5   Media Related APIs

For devices supporting the handling of A/V media, the following clauses from GEM [1] shall be supported.

Clause 11.7.10 "Content referencing for IPTV"

Clause 11.11.4.3 "Content referencing for IPTV" for those APIs which are required by the present document

Annex AU : "IPTV content referencing API"

12 Security

Clause 12 from GEM [1] shall be supported except as follows;

Applications shall not include in their permission request file requests for access to features not included in the present document. Any such requests shall be silently ignored when the permission request file is parsed.

Support for clauses 12.17 "Authentication of unbound applications" is required in the present document.

Clause 12.6.2.6 "Credentials" is not required in the present document.

13 Graphics reference model

The present document does not define a graphics reference model.

14 System integration aspects

All of GEM [1] clause 14 shall be supported except as follows;

The entries in Table 7 "Addressable entities, locators and their text representation" for Service, Service domain, MPEG elementary stream and those applicable to broadcast devices do not apply.

The only URI scheme required by the present document is the HTTP URI.

Clause 14.9 is not required by the present document but may be supported in devices supporting the handling of A/V media and hybrid devices.

15 Detailed platform profile definition

All mandatory clauses of the present document apply to all implementations.