

Globally Executable MHP (GEM)

DVB's Open Middleware for Interactive Applications



What is DVB-GEM?

DVB-GEM (Globally Executable MHP) is the open middleware specification of the DVB Project. It enables the deployment of interactive applications over broadcast and broadband networks as well as for packaged media, such as Blu-ray discs. It is based on Java and offers a platform-independent application execution environment which is used to create interactive content for different devices and markets. The platform is built on the widely used Java Micro Edition (JavaME) with additional APIs, which offer TV specific functionalities.

GEM is not restricted to specific broadcast signaling but defines an abstraction of concepts common to various TV systems. This common core is a set of APIs and semantic guarantees, which is available in all GEM terminals. It is extended with APIs for target-specific markets which are called profiles. GEM has now been adopted by a number of other organisations including CableLabs, the ATSC, ARIB and the Blu-ray Disc Association. GEM is the ITU-T recommended middleware standard for interactive television.

Background

The migration from analogue to digital TV offers the opportunity to deliver interactive applications to viewers. The use of an open middleware standard allows receiver/terminal manufacturers to target multiple markets and enables a horizontal market in the development of applications. GEM, which was first published in January 2003, grew out of the collaboration between the DVB Project and CableLabs, which develops specifications for the cable market in North America. It was developed as a common interoperable core middleware platform whereby it was essentially the overlap between OCAP (Open Cable Application Platform) and MHP (DVB's Multimedia Home Platform - see separate Fact Sheet). In June 2009 GEM and MHP have been refactored (version 1.2.2) with MHP now referencing GEM, the primary DVB specification.

How does it work?

GEM is a common core of APIs and semantic guarantees which define the behavior of these APIs. They can be used by content authors to create globally useable interactive content that works on all GEM deployments.

GEM currently defines three different "targets" designed for the different deployment scenarios: a "broadcast target" for broadcast TV using cable, terrestrial or satellite; an "IPTV target" for IPTV based set-top boxes; and a "packaged media target" for use in disc-based services. All of these targets share a common application model and a common set of core classes. The diagram below shows how the different GEM based specifications interact. Some specifications are more closely related to each other than others. For example ACAP and OCAP were designed to be quite similar.

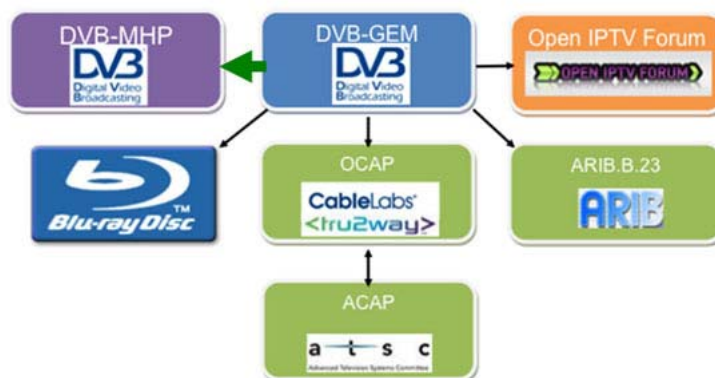


Figure 1. Relationship between GEM and GEM-based specifications

For each target and profile a GEM terminal specification defines the following, separated into mandatory and optional parts:

- > Content formats (audio, video, images)
- > Transport protocols (broadcast, Internet Protocol)
- > An application model
- > A mechanism for application signaling
- > A Java based application platform

It is permitted to define functional equivalents for certain parts of the above.

In general, the differences between different GEM flavours essentially come down to the support necessary for the differences in network signaling between the different environments, DVB, US cable/terrestrial, ISDB-T, IPTV and Blu-ray Disc. The GEM specification offers an abstraction for services without introducing any signaling or network dependency of the underlying transmission system. This allows writing iTV or web-2.0 style applications that don't need to know anything specific about the network on which they are carried. The fact that GEM is essentially network independent makes it particularly useful in an IPTV environment.

In addition, a wealth of GEM applications are available for more traditional iTV applications, such as EPGs/IPGs, ESGs, email, chat, SMS, enhanced TV, news tickers, weather, games, etc. These GEM applications can be run directly from standard web servers and can easily support web 2.0 features like RSS feeds, P2P, user-contributed content etc.

With GEM at the core of Blu-ray's BD-J specification, interactive features and extras for a movie title originally written for an optical disc can be easily moved to a VOD network via Cable or Broadband.

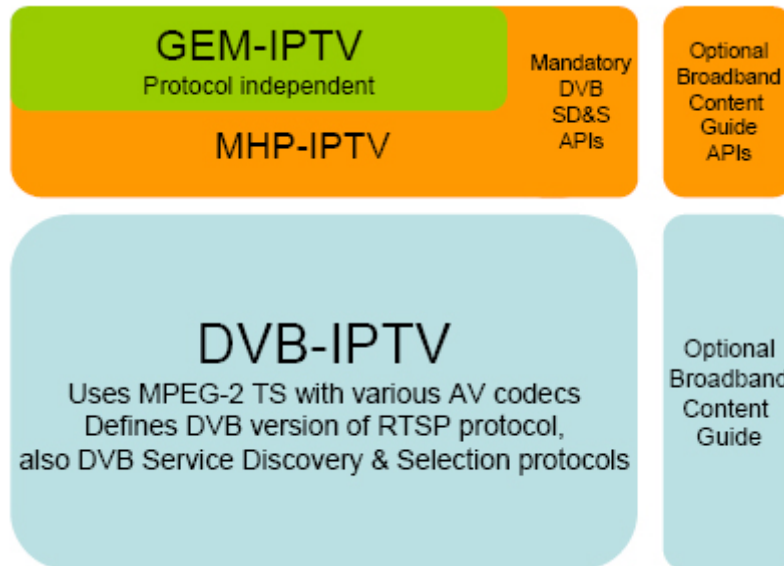


Figure 2. Relationship between DVB-IPTV, MHP-IPTV and GEM-IPTV specifications

Market Deployment

There are more than 35 million GEM-compatible devices already deployed, including 23 million Blu-ray Disc players and 10 million MHP receivers. GEM deployments include OCAP on cable networks in the USA (now marketed as tru2way) and South Korea, ACAP on terrestrial networks in the USA and South Korea and ARIB B.23 in Japan. South Korea is also the location for the first rollout of GEM-IPTV with more than 900,000 subscribers. In Brazil, where the Japanese ISDB-T transmission system has been adopted, GEM was the basis for the development of the GINGA-J specification.

Next Steps for DVB-GEM

The referencing order between GEM and MHP has now been swapped and GEM will evolve to cover the needs of new markets.

Links

- www.mhp.org – the official MHP/GEM website, maintained by the DVB Project Office.
- www.etsi.org – all DVB standards are available for download directly from the ETSI website
- www.dvb.org – the main website of the DVB Project
- www.cablelabs.org – GEM grew out of collaboration between the DVB Project and CableLabs
- www.tru2way.com – OCAP, for the US cable market, is now branded tru2way
- www.arib.or.jp/english – Japanese terrestrial system has also adopted GEM-based middleware
- www.blu-raydisc.com – GEM is at the core of the Blu-ray Disc's BD-J specification