

Requirements for the Standardization of Hybrid Broadcast/Broadband (HBB) Television Systems and Services

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Introduction

European Public Service Broadcasters are aiming to harmonize the standardization of a new generation, interactive television system termed Hybrid Broadcast/Broadband (HBB).

HBB is an end-to-end system combining both broadcast (e.g. terrestrial, cable, satellite) and broadband (open internet) environments and using broadband-connected consumer electronics (CE) devices such as Set-Top Boxes (STBs) and integrated television sets¹.

HBB is essentially an enhanced broadcast system that includes some on-demand services, interactive elements and other features and functionalities that cannot easily be accommodated within traditional linear broadcast (one-way) environments.

Note that in this document:

- The acronym "HBB" is used generically and does not imply a specific technology solution.
- Only "high level" technical requirements are addressed; detailed technical or operational issues are not addressed.
- No reference to specific technical issues such as the codecs, transport mechanisms, etc. are made - it is technology agnostic.
- All components of the value chain including the content, services, networks and end devices are implicated.
- Only the requirements associated with an open horizontal market² are addressed (as opposed to vendor-specific and proprietary vertical market requirements).
- The underlining business model of HBB is not considered.
- An agreed set of values and interests of Public Service Broadcasters' (PSB) media is addressed.
- The existing market realities of the television and internet media environments in Europe are taken into consideration.

¹ A more precise definition of HBB is: "HBB is a DVB-compliant content distribution platform for signalling, transport and presentation of enhanced and interactive television services and related applications designed for using both a broadcast and internet networks and running on hybrid terminals that include both a broadcast and internet connection."

² A horizontal market is defined as one that meets a given need of a wide variety of industries, rather than that of a specific industry (source: Wikipedia).

- Editorial integrity and presentation consistency across different television delivery platforms is called for.
- A secure future for PSB systems and services is a basic aim.

Based on the Requirements given in this document, it is expected that Public Service Broadcasters shall make appropriate efforts to integrate their TV and web production workflows in order to allow for a consolidated and cost-efficient HBB production environment.

HBB has the potential to provide an involving choice of attractive content, so that end-users will be able to enjoy new interactive services and applications not otherwise available on conventional broadcast channels. Using this technology, Public Service Broadcasters could extend the reach of their programmes and attract larger audiences.

Notation:

In the following tables, Gen. 1 refers to first generation HBB devices available up to the end of 2010 and Gen. 2 refers to second (and subsequent) generation HBB devices available after 2010.

M = mandatory, O = optional and NA = not applicable

1. General Requirements

#	Requirement
1.1	An HBB system shall be an open (non-proprietary) standard adopted by a competent international standardization body such as ETSI.
1.2	Intellectual Property Rights (IPR) and patent issues related to the HBB system shall be resolved prior to rolling out HBB services.
1.3	The legal and regulatory arrangements set out in the European Audio Visual Media Services Directive ³ shall apply.
1.4	European broadcasters and CE manufacturers should jointly agree on those functionalities and features to be implemented in first generation HBB devices and those to be implemented in any subsequent generation. Where applicable, aggregators or platform providers (e.g. cable operators) should be included in the agreement process.

2. HBB System-Related Requirements

#	Requirement	Gen. 1	Gen. 2
2.1	An HBB technical specification shall be based on existing international standards and specifications, such as those defined by the Open IPTV Forum, DVB, UPnP, DLNA, W3C, IETF, etc.	M	M
2.2	HBB functionalities and capabilities shall be presented as minimum (or core) functionalities with extensions to higher level functionalities.	M	M
2.3	The HBB system architecture shall be layered logically in distinct functional blocks (modules) in order to allow for some flexibility in design and to avoid interdependence of layers.	M	M

³ http://ec.europa.eu/avpolicy/req/avms/index_en.htm

#	Requirement	Gen. 1	Gen. 2
2.4	The HBB system shall support some hooks to accommodate advanced features such as adaptive streaming and enhanced video graphics. ⁴	NA	M
2.5	HBB should enable standalone broadcast services (i.e. no internet connection) and standalone Internet services (i.e. no broadcast channel) ⁵ .	M	M

3. HBB Content-Related Requirements

#	Requirement	Gen. 1	Gen. 2
3.1	Broadcasters should be able to develop and publish innovative interactive HBB content independent from other actors in the value chain. ⁶	M	M
3.2	Broadcasters shall have total and exclusive control of the content and services that are superimposed (totally or partially) on or around their broadcast services, thus pursuing a principle of the "editorial integrity" for HBB. ⁷	M	M
3.3	Broadcasters shall be responsible for ensuring that the content-related regulatory constraints in force are respected and that the rights of the copyright owners are respected.	M	M
3.4	As broadcasters are responsible for the coherence of the TV experience and all its associated data, they must be the only parties entitled to enrich their programmes if they see fit (or to authorize others so to do). This could be done, for example, by exploiting the broadband channel and by means of appropriate application signalling.	M	M
3.5	Based on the HBB specification, which defines CE equipment features and functionalities, broadcasters and content providers should be able to adjust their production facilities, technical equipments and workflows to create the interactive HBB content and services.	O	O
3.6	Repurposing of content to cope with different formats and protocols shall be avoided in order to reduce the HBB content production costs. HBB shall enable broadcasters to use the same production tools and formats for any HBB CE device.	M	M
3.7	Interactive content produced by broadcasters shall be controllable by the signalling data carried within the audio-visual stream that is broadcast.	M	M
3.8	Content security issues relating to both linear and non-linear content services shall be resolved in such a way that content owners and end users will not be disadvantaged.	M	M

⁴ Implementation of advanced features will depend on the market requirements.

⁵ In case of a standalone broadband HBB system, users should be able to access any web offer and render its content on the TV screen.

⁶ The word "independent" means that no other portal (e.g. manufacturer's one) and no software verification from another actor is required.

⁷ The editorial integrity principle should apply to the HBB services operated by EBU members. It does not, however, necessarily apply to the HBB services provided by manufacturers and other players in the value chain.

#	Requirement	Gen. 1	Gen. 2
3.9	HBB should permit end-users to upload their content in order to allow the broadcaster to publish it in a suitable format (UGC - user generated content).	O	O
3.10	Broadcasters shall require that redirecting the television viewer from their programmes to other content and services without prior agreement is not allowed.	M	M
3.11	HBB should be able to accommodate high quality linear and non-linear services and allow for the evolution towards HD quality.	M	M

4. HBB Services-Related Requirements

#	Requirement	Gen. 1	Gen. 2
4.1	HBB should accommodate local, national or international TV services. ⁸	M	M
4.2	The broadcast brands and logos embedded in the content to identify the content owner shall remain visible to the end user regardless of whether the content is sent via the broadcast or broadband path.	M	M
4.3	Any legacy middleware systems ⁹ that may be used presently by broadcast services shall be taken into account to allow for a co-existence with HBB.	M	M
4.4	In countries where middleware systems are already in operation on broadcast channels and a coexistence of HBB with such middleware is required, the introduction of HBB shall not cause disruption to the services based on those middleware systems.	M	M
4.5	HBB shall offer an alternative to some broadcast middleware technologies, principally in countries where no interactive broadcast legacy is present.	M	M
4.6	HBB should allow for personalised and individually addressable services as well as targeted-group and localised services.	O	M
4.7	If required, a suitable geo-location system should be used on the broadband path, restricting access to content only to those territories with copyright privileges	O	M
4.8	If required, a secure, open, platform-agnostic and efficient Digital Rights Management (DRM) should be applied. It should allow sharing across multiple CE devices and in the connected home domain.	O	O
4.9	Both traditional teletext and enhanced teletext (by means of HBB technology) shall be available via a HBB system.	M	M
4.10	Audience research and tracking of audience behaviour should be possible ¹⁰ . Methodologies for traffic benchmarking should be developed by a competent international body.	M	M

⁸ For example, Internet TV services should match the coverage area of, say, a terrestrial broadcast service, e.g. local news, local weather reports, local traffic reports and local sport results. To this end, regional signalling shall be provided.

⁹ Examples of legacy middleware are DVB MHP (GEM), MHEG-5, etc.

¹⁰ User data shall not be used for commercial ends and should be protected according to European and national legislation.

5. HBB Delivery-Related Requirements

#	Requirement	Gen. 1	Gen. 2
5.1	Broadband HBB services shall meet the requirements for mass audiences (typically measured in millions of concurrent viewers) that are usually encountered in the broadcast world.	M	M
5.2	The HBB system (particularly its broadband portion) should cope with the "flash crowds" that may occur when a large number of users send concurrent requests to the server in order to access services (examples: live streaming, VoD streaming, download services).	O	M
5.3	The HBB system should provide for suitable synchronisation of the service components travelling concurrently via the broadcast and broadband paths.	O ¹¹	O
5.4	To keep the distribution costs as low as possible, a cost-efficient distribution system should be devised and standardized.	M	M

6. HBB Consumer Electronics Device-Related Requirements

#	Requirement	Gen. 1	Gen. 2
6.1	The same CE device shall be used for any HBB compatible service offered by different service providers.	M	M
6.2	Given the economies of scale and mass market production for integrated TV displays, the incremental cost of the HBB Internet-enabled end-user device should be negligible (compared to the conventional CE TV device).	M	M
6.3	All services shall be accessible using a remote control and shall be displayable on any modern TV (typically a flat panel display) of any size.	M	M
6.4	Broadband HBB applications provided by the broadcasters should, depending on national broadcast requirements, be accessible via a dedicated or re-configurable button on a remote control.	M	M
6.5	Home network connectivity should be enabled in the HBB CE device, either wired or wireless, or both.	O	O
6.6	When content is recorded for private copying or time shifting purposes, access to associated applications shall be preserved if editorially relevant. ¹²	O	O
6.7	HBB device shall be upgradable/updatable via broadcast and/or broadband paths.	M	M
6.8	HBB devices shall have sufficient memory/storage capabilities to support finding, organizing, scheduling and recording TV shows.	M	M

¹¹ It is assumed that a tight synchronisation of e.g. two video streams is not imminently foreseen in the market.

¹² Meaning that links to information shall be recorded or relevant web pages shall be stored alongside content.

7. End-User-Related Requirements

#	Requirement	Gen. 1	Gen. 2
7.1	HBB shall allow the end-user to use the system functions in a user-friendly and intuitive manner.	M	M
7.2	HBB shall allow the end-user to find, organize, schedule and record TV shows, including single episodes and series, taking into account broadcast and broadband content.	M	M
7.3	End-users shall be able to save visited URLs and portals (e.g. bookmarks and favourites).	M	M