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## **DGTv evolutionary guidelines for broadband support in HD receivers**

IDTVs capable of accessing audiovisual contents (and more) available on Open Internet through plain (best-effort) broadband lines are already a market reality. Several manufacturers allow customers to access branded portals from their iDTVs (i.e. Philips NetTV, Samsung Yahoo! Widget, Panasonic VieraCast, Sony AppliCast) acting as gatekeepers towards broadcasters and service providers. Thanks to the functionality available on such new "Connected TVs" broadcasters could be able to offer to their customers, directly on TV screen, all the emerging services they're already offering on PCs, like catch-up TV, content on-demand, enhancements related to broadcast programs, personalization, etc.

Technological pre-conditions for broadcasters to exploit, autonomously and fruitfully, these opportunities are:

- 1) possibility to direct retail receivers on broadcaster suggested sites;
- 2) standardization of audio/video formats and of the protocols used on broadband (streaming and/or download):
- 3) standardization of execution environment(s) (declarative and/or procedural) for broadband applications;
- 4) availability of harmonized DRM solutions, for broadband premium services or just as proper enforcement of the rights broadcasters have got by content providers.

Point 1) has been already covered by DVB through recently released specs which have extended and made more generic some signaling already used in MHP context (Blue Book A137).

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As far as point 2) is concerned, the industry is already converging on some key formats which are already widely adopted in broadcasting (H.264 for video, AAC and HE-AAC for audio) and on protocols widely used over Internet (HTTP progressive download). These formats and protocols are indeed supported on Connected TVs already in shops.

The scenario is instead very unstable and fragmented on point 3). In fact, even though a procedural solution fully standardized and tested does exist (GEM/MHP), most manufacturers and telco operators, plus several European broadcasters, are pushing for some declarative solution (XHTML + Javascript). But the level of interoperability between the different solutions is quite low, as witnessed by first Connected TV models on the market. On one side EBU has recently launched an initiative for harmonization in this space, based on the DAE (Declarative Application Environment) specified in Open IPTV Forum (OIPF). DAE is on turn based on CEA-2014 browser, aka CE-HTML or Web4CE (BTW to avoid certain deplorable licensing stories of the recent past, some IPR declarations on this browser shall be carefully verified in advance). German and French public broadcasters are the stronger supporters of this initiative, which is potentially applicable also to broadcast interactivity and which should materialize into an ETSI standard before 2009 ends. On the other side, BBC goes on alone with its own Canvas Project (pending Board of Trust approval).

Regarding point 4), OIPF has selected Marlin as native DRM solution (with well known Intertrust IPR), but OIPF toolbox includes also CI+, which has been already adopted by DGTv in HD-Book.



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In the promising but still open scenario depicted above, how is DGTv going to move? First still point is that in Italy, differently than in Germany and France, a middleware for broadcast interactivity already exists, with an installed base of 7M+ receivers: it is MHP. It will remain the middleware technology for broadcast-only data services (EPG, Teletext, content-related applications, ...) in Italy - for the disconnected receivers (i.e. receivers without a broadband port or not connected to broadband by its owner), likely the vast majority on the market - for the foreseeable future. Accessing these "legacy" data services also from a broadband receiver equipped with a browser (according to the prevailing industry trend) will at the end reward STBs and iDTVs having on board also MHP.

A reasonable assumption is that 2-3 years could pass by while points 3) and 4) (with possible related IPR issues) are clarified and related specs are turned into off-the-shelf products, which are both interoperable and affordable for mass adoption. In the meanwhile, to allow broadcasters early testing and promotion of new TV broadband services, DGTv proposes the following: a "broadband addendum" to HD-Book DTT 1.0, specifying formats and protocols linked to point 2) with relevant MHP APIs, will be issued shortly. It's worth reminding that HD-Book DTT 1.0 mandates an Ethernet port on STBs and recommends it on iDTVs.

Receivers complying with this addendum will be able to stream audiovisual contents through broadband directly from broadcasters' web sites, under control of suitable MHP applications downloaded Over The Air and/or via broadband.

It must be noted that the reference to HD-Book for contents streamed over Open Internet stems only from new HD receivers being the most natural target for the subject broadband services. In fact HD receivers are currently the only ones coming with an H.264 decoder and with enough memory and processing power to



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handle a powerful middleware (MHP plus, possibly in the future, a modern browser) and the sophisticated protocols which are needed for a satisfactory Internet (best-effort) streaming user experience.



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