

Combining TV service, Web, and Home Networking for Enhanced Multi-screen User Experience

A Position Paper for the Third W3C Web and TV workshop

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Abstract

This paper provides Ericsson's views on various areas of interest from the TV, Web, and Home Networking standardization efforts and solutions, as well as Use Cases we think are particularly important to ensure a seamless rich and user-friendly Multi-Screen experience.

Introduction

Today's state-of-the-art TV solutions introduce Multi-Screen capabilities to allow users access to interactive entertainment and social networking services, live and on-demand multimedia content on various types of devices, such as on TVs via a Set Top Box, on connected TVs, on PCs, and via mobile phones and tablets.

However, there are still many challenges remaining on the path to providing a seamless and user-friendly quality experience on any device at any time:

- Most of the TV solutions use vertically integrated proprietary clients that are either tied to a specific hardware (STB) or require a proprietary client installation and configuration. Such solutions usually do not allow place-shifting or use of retail, off-the-shelf consumer electronics devices
- Over the top (OTT) or Internet TV solutions are usually vertically integrated and require (download and installation of) proprietary clients for multimedia playback
- Mobile TV solutions require integration of mobile infrastructure and proprietary or standardized clients
- Multimedia sharing in home networks is being standardized in the whole-home networking fora, e.g. DLNA and UPnP, but usually have a scope limited to the home (local area) network
- The convergence of television, social networking, and other entertainment services has been demonstrated, but convergent solutions have not yet been widely deployed

Consumers today are looking for a solution that can offer the freedom of choice to enjoy a high quality seamless on-demand service delivery to devices like connected TVs, set-top boxes, PCs, tablets, netbooks, handheld devices, mobile phones, and gaming consoles.

Ericsson believes that a complementary combination of efforts in standardization organizations will help provide such a rich and exciting experience to consumers, using vertically integrated clients and devices, as well as off-the-shelf consumer electronics devices and web browsers that can be used in a variety of networking and deployment scenarios.

Position on Web and TV convergence for Multi-screen delivery

Ericsson's position is that aligning ubiquitous web technologies with other standards (perhaps developed elsewhere, in other standards bodies) covering related parts of the Multi-Screen TV solution will result in a healthy ecosystem serving the interests of both consumers and Service Providers. It will also become possible to create entirely new ecosystems and service experiences, such as social television, games integrated with TV shows, and similar. Such ecosystems will be based on the use of off-the-shelf browsers, clients based on standards, and retail consumer electronics devices based on standards.

It is important not to standardize the applications themselves, but the platform on which they run. Attempting to standardize applications stifles innovation. Many different business models and content management mechanisms must also be enabled.

Ericsson believes that without a combination of complementary efforts in standardization and expertise in various areas of current vertical solutions, the Multi-Screen proposition will not be commercially viable and will fail to satisfy the needs of consumers and service providers – the key participants of the ecosystem. In addition we need to identify gaps in the overall Multi-Screen solution to be covered by specific Standards Development Organizations, based on their specific domain expertise and representation.

W3C's focus on its areas of strength – development of presentation and the “glue” that ties this to the underlying functional layers (e.g. recording APIs, APIs for discovery and interaction with DLNA devices, and extension of the video element) – will ensure such success for Multi-Screen solutions.

Use Cases and Scenarios

Ericsson considers the following scenarios as essential to ensure that the Multi-Screen solution is market-viable. The scenarios utilize a combination of web and other relevant standard components to deliver Web and TV multimedia content:

1. Premium content across home networks

IPTV content is terminated in the dedicated (vertically integrated, or based on a standard such as defined by the OIPF) client device in consumer's home network. Browsers and off the shelf consumer electronics devices can access the premium content streamed from the dedicated client device in the home.

This scenario utilizes a combination of OIPF specifications for premium end-to-end service delivery to the home, DLNA/UPnP for interoperable control and distribution of the content within consumer home networks to the off the shelf consumer electronics devices, and the HTML5 family of protocols for presentation and clients' alignment.

2. IPTV Remote Control in home networks

In scenario 1, an additional (e.g. tablet) device is used as a Remote Control for the TV service in the home using a combination of web browser with HTML5 protocols and home networking control protocols (e.g. DLNA/UPnP).

More precisely, in the Home Network, presentation and control functionality could be split between several devices, e.g. a tablet could use HTML5-based browser to render EPG and UI, provide a video preview capability via the video element, as well as use of a JavaScript API to interact with add-on applications enriching end user's TV experience, share and view user-generated content.

3. Internet / OTT TV integration with IPTV service

Thanks to the use of standardized web protocols and specifications, OTT services and video

content can easily and seamlessly be integrated into IPTV programming and displayed on dedicated (STB/TV) as well as retail consumer devices (web browsers, tablets, mobile / smart phones)

4. Place-shifting of TV service

Users can access TV service programming on any of their devices (TVs, PCs, Tablets, Smartphones, in web browsers) and in any of the access network modalities: when dedicated infrastructure is available, a preferred integrated transport is used, when not – best effort delivery based on Internet protocols is used.

5. Integration of device and content controls with web browsers:

Using the HTML5 family of protocols, users can integrate control and discovery of their home networked devices (e.g. Media servers, STBs, and Connected TVs) from a web application / browser window.

6. Integration of ConnectedTVs and end-to-end TV services

Integrated TV services can be packaged for consumption on retail connected TVs either distributed from the dedicated premium device in the Home or in the best effort manner over the public Internet infrastructure.

Standardization

Ericsson believes that essential parts of the solution have already been implemented in various standardization fora, and alignment and reuse of those parts in a coordinated manner would be beneficial to the entire Web and TV ecosystem.

OIPF

Open IPTV Forum provides an end-to-end integrated standardized solution for the delivery of premium quality TV services and content to end users.

The OIPF's TV solution delivers multimedia content over the dedicated (often to the last mile) network from a Service Provider to the device types they deem appropriate for consumption of commercial content. Such clients are usually integrated TVs/STBs, or a Gateway, in turn connected to the home network and other dedicated clients. Each Multi-Screen connection requires a separate hop (infrastructure), e.g. content delivery to a PC client (or browser plugin) can be realized by the OIPF-enabled network when at home or over public Internet when roaming out of home.

Such vertically integrated solutions have the best characteristics in terms of Quality of Service and Experience and allow rapid deployment, significantly lowering Time to Market.

HbbTv

Broadcast service providers expect to deliver video content such as catch-up TV or access to previously broadcasted content from their portals using the public Internet infrastructure utilizing specialized services (e.g. CDN providers). In the past, this was done in a vertically integrated (proprietary server, transport, and client) infrastructure requiring customers to install a proprietary client / browser plugin. The HbbTV has specified a standardized solution, based on a subset of the OIPF specification, to allow the development of a common client for such hybrid scenarios.

DLNA

Whole-home networking standards, such as UPnP and DLNA, contain protocols, specifications, and

guidelines for interoperable multimedia content sharing, distribution, and control in the consumer home networks between Consumer Electronics devices. Typically these standards focus on the local area home network and do not develop specifications for the integration with content and interaction with services and systems residing outside of the home.

W3C

W3C standards are enabling the web evolution for rich social interaction, communications, and knowledge sharing regardless of the devices or context.

Ericsson believes that by focusing on W3Cs expertise in those areas, W3C will enhance TV services and modes of delivery and interaction for the Multi-Screen solutions by evolving presentational and interaction elements, as well as providing glue APIs to the other parts of the solution.

IETF

IETF develops Internet protocols enabling and tying together Internet and Home Networking infrastructures.

We consider IETF efforts as key for the development of underlying network protocols and architecture to power and enable the delivery of TV content and realization of Multi-Screen solutions in a seamless and technically and economically viable manner.

Ericsson believes that the IETF will enable the Multi-screen solutions by evolving networking technology and protocols in homes and on the Internet to allow efficient and feasible heterogeneous networking and connectivity solutions.

Conclusion

Ericsson believes that the collaboration and harmonization of efforts in major Standards Development Organizations will ensure the creation of successful, business-viable and flexible feature rich Multi-Screen IPTV solutions. This will enable:

- The best possible flexible and high quality user experience on multiple devices (dedicated and off the shelf) in a multitude of connectivity contexts (fixed, home, mobile, and nomadic)
- The most efficient operation for operators, content and service providers

Significant work has already been done by other standards bodies, and we believe that such work should be integrated, reused, and built upon.

W3C should focus on the following components of the Multi-Screen solution:

- Standardized User Interface: control and rendering elements (e.g. HTML5 markup, video, audio and similar elements and controls for multimedia and interactive content), alignment with RUI efforts in other organizations
- APIs to underlying functional layers (e.g. home devices discovery and control, recording API), including alignment with application environments such as OIPF DAE
- Alignment with efforts for optimized media delivery – e.g. Dynamic Adaptive Streaming

Ericsson believes that the W3C focusing on such components of a Multi-Screen solution will accelerate the realization of interesting use cases highly valued by end-users and beneficial for all participants of the Web and TV ecosystem.