

Activity of HTML5 Working Group, IPTV Forum JAPAN

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Outline



- Background
- Objectives and Expected outcomes
- System architecture
- Specification development plan
- Conclusion

Background



- Development of next-generation TVs, such as a hybrid broadcast and broadband system, draws the attention around the world, as seen in the active discussion on Web and TV.
- In Japan, long standing experience of more than ten years of digital broadcasting has brought the expectations towards breaking-through Broadcast services which make full use of the broadband functions.

HTML5 WG Objectives and Expected outcomes



- Objectives

To investigate and develop specifications of HTML5-based common platform technologies for services that combine broadcast and broadband.

- Expected outcomes

- ▣ Specifications for hybrid broadcast and broadband system

- Requirements, overall architecture, application model, signaling, transmission method, source coding, and receiver functions

- ▣ HTML5 browser specifications for TV

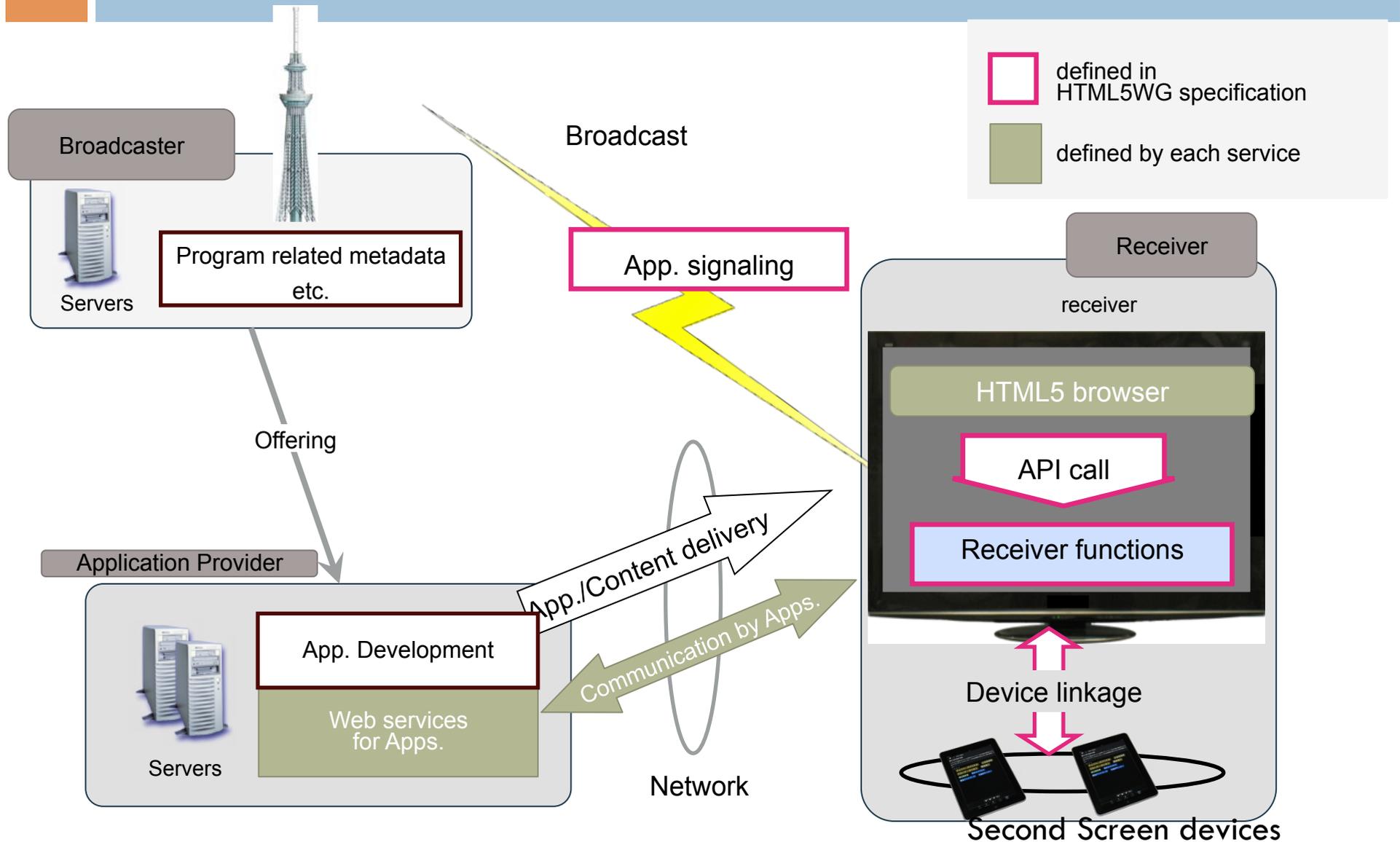
- Specifications and guidelines for applying HTML5 to TV including security consideration on specific to broadcast environment

System Architecture

Broadcasters' fundamental approach toward hybrid broadcast and broadband services

- ❑ Broadcasters have intention to deploy attractive hybrid services through both broadcast channel and the broadband network.
- ❑ Open environment to access a variety of data, such as broadcast meta-data, is required to build hybrid broadcast and broadband services.
- ❑ A system for the hybrid services should provide such an open environment, which is expected to bring new business opportunity for broadcasters, manufactures and application developers.
- ❑ It should keep taking a role that broadcasters provide information on safety and security to viewers.

Overall architecture of the hybrid broadcast and broadband system



Providing safe and secure services

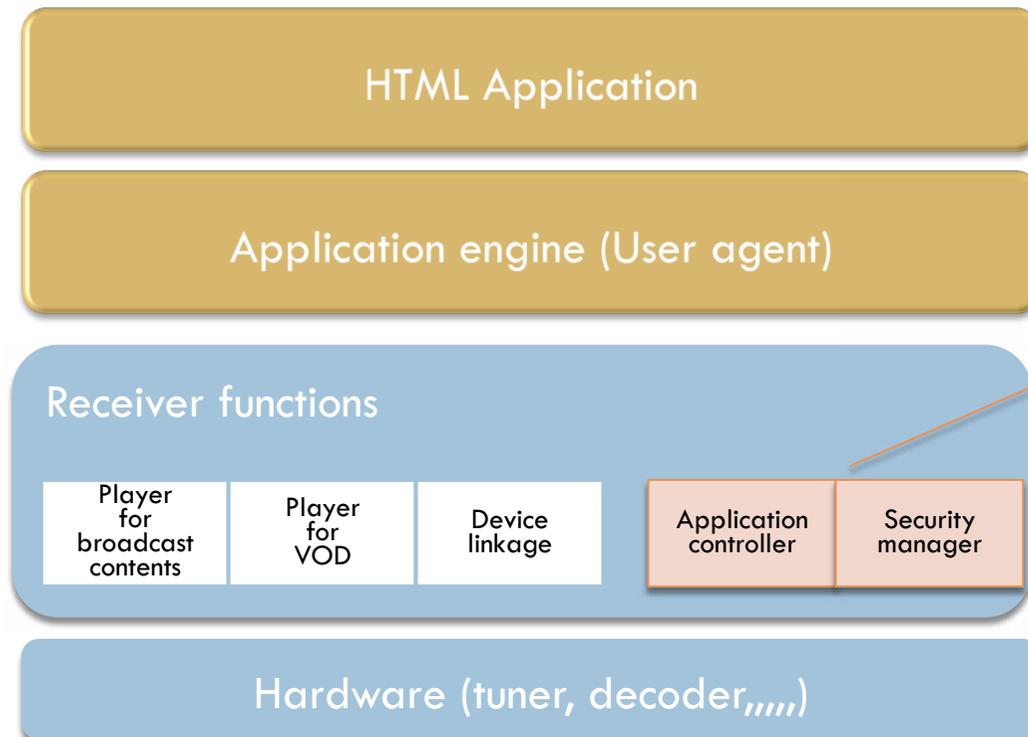
- Use of wide range of functions of HTML5 by application developer may improve convenience for viewers
- Involvement of broadcast content into the applications has to be properly managed to maintain broadcaster's intention
- A system for managing HTML applications and controlling their scope of operations is essential in protecting the integrity of broadcasting content and the security of viewers:
 - ▣ Avoiding interference in emergency warnings and consecutive news program in case of disasters and emergencies
 - ▣ Avoiding danger from applications cheating somebody else such as fraud.
- Mechanisms to ensure the above has higher priority in the service requirements off the specification.

Types of applications

- Managed applications
Applications that enable the use of broadcasting functions
 - **Broadcast managed applications:** applications that are eligible to use broadcasting functions authenticated by broadcasting signals (E.g. applications that operate in conjunction with broadcast programs)
 - **Non-broadcast managed applications:** applications that are eligible to use broadcast functions under the authentications other than broadcasting signals, such as application certification.
(E.g. Timer recording reservation application with EPG-like UI launched by viewers)

- **Unmanaged applications**
Applications that do not enable the use of broadcasting functions (E.g. game applications that are not related to broadcast programs)

Receiver model



- Determination of the type of application (managed or unmanaged)
- Application life cycle control
- Control of resources and functions accessible to the application
- Presentation management of HTML application

Typical use cases of the hybrid broadcast and broadband system



- Use of a html application associated with a broadcasting channel
- Retrieval of program-related information by an html application over channel switching
- Use of Broadcast event signal
- Synchronized presentation of broadcasting content and html application
- Use of the second screen

APIs should be designed to accept the use cases above.

Use of a html application associated with a broadcasting channel

<Scenario>

- A viewer starts watching a TV program, selecting the 'channel one' with a remote.
- A web content associated with the broadcasting channel is downloaded from the net before displayed on the same screen with the TV program.
- The viewer follows some links from the first web content to transit to other content, during which the presentation (both video and audio) of the TV program is uninterrupted.
- The viewer switches to the 'channel two' with the remote. Web content being shown until then terminates immediately before the TV tuned to the new channel. Then the new content associated with the 'channel two' is downloaded and displayed.

<Requirement>

- No interruption of presentation of broadcast content.
 - As long as tuning is being kept, video and audio must be presented uninterruptedly even in a time of document transition.
- Application lifecycle control in accordance with channel switching and broadcast signalling.
 - Auto-start when tuned in and auto-terminate when tuned out.
 - Document url is determined and notified by the broadcaster for each channel. Manipulation of a html application with a TV remote controller.
 - The user input should be handled to follow context properly. For example, sometimes number keys are used for direct channel selection and sometimes they are used for inputting digits into a form of a a document running on a browser.

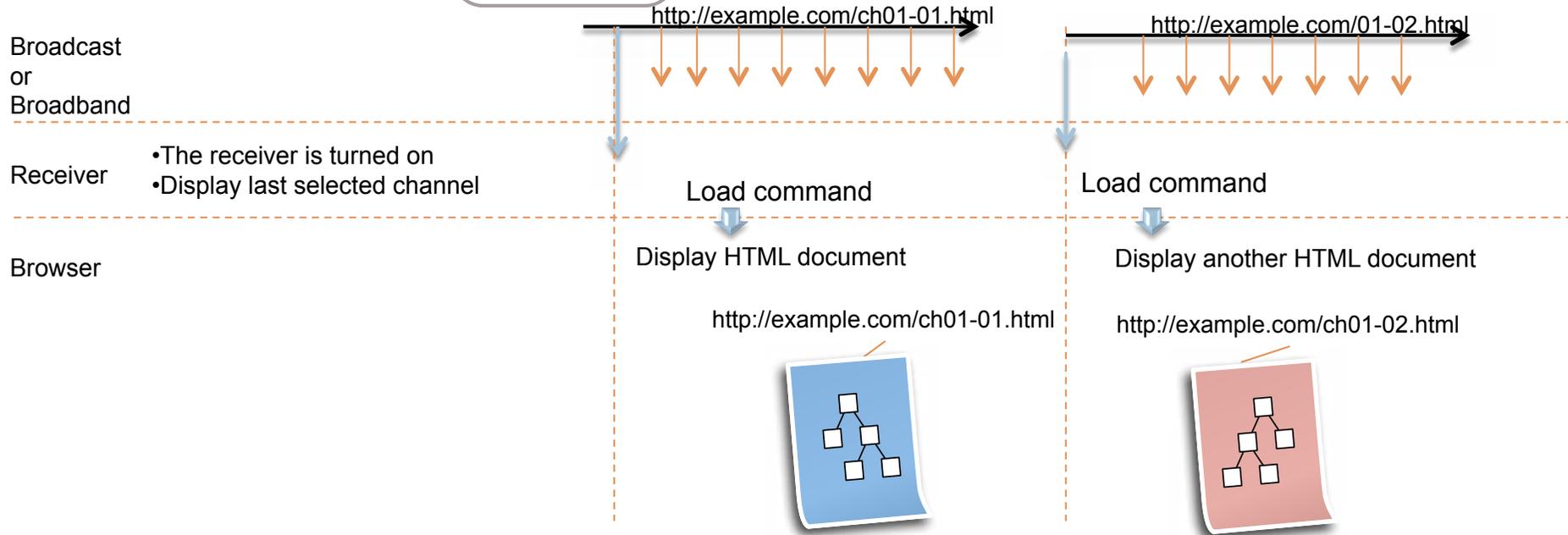
Document transition with full screen broadcast video scenario



Indicate showing HTML document by broadcast signal

No interruption

Transition by Anchor, indication of a new app etc.



Retrieval of program related information by a html application over channel switching.

<Scenario>

- While a viewer is watching a broadcast program, the viewer loads web content manually (by means of inputting a url or using a bookmark function).
- Web content is displayed on the same screen with the broadcasting video.
- Web content displays information related to a TV program being shown.
- The viewer flips channel, during which a presentation of the web content continues.
- Information displayed on the web content changes automatically in accordance with a newly selected channel.

<Requirement>

- A mechanism to notify the document on channel switching should be provided.
- The document should be able to obtain metadata (such as a broadcaster ID and a program ID) contained in a receiving broadcast stream.

Broadcast related event handling

<Scenario>

- A viewer loads web content manually while watching a broadcast program.
- Web content is displayed on the same screen with the broadcast video.
- Scheduled broadcasting program is interrupted and a breaking news starts.
- At the same time, by the signal contained in a broadcast stream, the web content becomes temporarily invisible.
- By a viewer's action or a control signal from the broadcaster, web content becomes visible again.

<Requirement>

- A mechanism to immediately notify the document of data changes or event triggers in a broadcast stream (such as SI updates and stream events) should be provided.
- In some cases (e.g. Emergency early warning), a browser should be capable to take an appropriate action against such a special signaling.
- A mechanism to notify the document should also be provided when the browser takes such actions including change of the display area.

Synchronized presentation of broadcasting content and html application

<Scenario>

- A viewer is watching a broadcasting program. Web content associated with the watching channel is being displayed.
- The viewer operates the web content and select “additional caption” (or additional video/audio).
- The web content starts to receive caption data (or video/audio stream) via the Internet and display it synchronizing with the broadcast program.
- The viewer operates the web content to stop displaying captions.
- The caption stops displaying while presentation of the broadcasting program continues.

<Requirement>

- Clarification is required on how to handle clock information in a broadcast stream such as mapping of the PCR clock in the MPEG-2 transport stream to the media timeline of the corresponding video element.
- A time-offset should be able to be given to adjust synchronizing point of each media.
- Broadcast program presentation should not be interrupted due to fluctuation of data transfer rate over the internet.
- A document should be able to detect that synchronization cannot be maintained due to an underflow in any of synchronized streams or any other reasons to manage the situation.

Use of the second screen

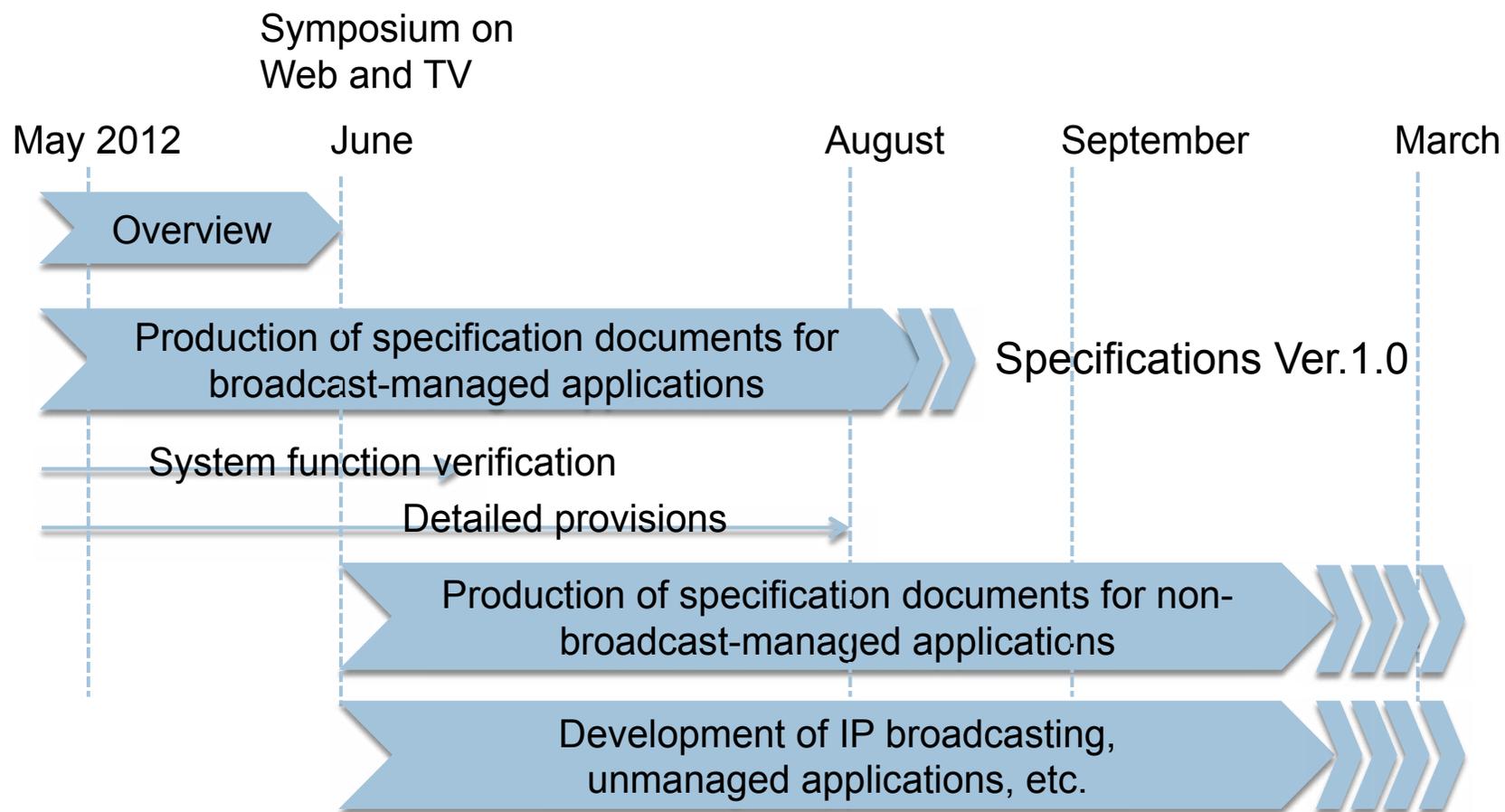
<Scenario>

- A viewer is watching a broadcasting program. Web content associated with the watching channel is being displayed.
- The viewer launches an application on his/her tablet device and operates it to let it connect to the web content on the TV.
- The viewer looks up the social network service with the tablet application, and operates it to let the TV play a VoD program recommended by his/her friend.
- The tablet application sends a command to the web content, then the VoD program starts showing on the TV.

<Requirement>

- An html application on a TV set should be able to communicate with companion devices, which are connected via LAN or similar network.
- To do this, the application may be required to be capable of discovering and identifying such devices as well.

Specification development plan



Request and coordinate with other WGs as necessary.

Conclusion



- Introduction of specifications the HTML5 WG is dealing with
 - Overall architecture of the hybrid broadcast and broadband system
 - Definitions of application types for providing safety and security
 - Broadcast managed applications
 - Non-broadcast managed applications
 - Unmanaged applications
 - Typical use cases on the hybrid broadcast and broadband system

- Toward establishment of common service environment between TV and Web, IPTV-F Japan encourages its member companies to contribute the knowledge obtained via its standardization activity to W3C.

Thank you for your kind attention.