What is Hybridcast

- Technology platform for broadcast and broadband hybrid service that uses HTML5 as an application service environment

- Hybridcast services have been already launched
  - Mar. 2013: IPTV FORUM JAPAN published technical specification Ver.1.0
  - Sep. 2013: NHK started Hybridcast service
  - Hybridcast-ready TV: Toshiba, Panasonic, Sharp, Mitsubishi, Sony
Update from TPAC2013

- Commercial broadcasters launched Hybridcast service
- Hybridcast technical specification Ver.2.0 was published

Service

- NHK launched
- Trial services by 16 commercial broadcasters
- TBS (Tokyo Broadcasting System) launched

Standardization (IPTV FORUM JAPAN)

- Technical Specification Ver. 1.0
- Operational Guideline Ver. 1.0
- Technical Specification Ver. 2.0

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
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<tbody>
<tr>
<td>2013/3</td>
<td>TPAC2013</td>
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<tr>
<td>7</td>
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Features of Hybridcast 2.0

- **Enhancement for broadcaster’s Hybridcast service**
  - For time-shifted viewing
    - Support video element for VOD (Video On Demand)
    - APIs for recorded content on PVR (Program Video Recorder)
  - Companion device interface
  - Accurate synchronized presentation

- **Expansion of Hybridcast platform for service providers other than broadcasters**
  - Non Broadcast-oriented managed application
For Time-shifted Viewing

- Invocation of applications when playing back of VOD or PVR content
- VOD
  - Support for video element (MSE, EME)
  - Video content of MP4 and MPEG-DASH can be played
- PVR
  - APIs for playback control
Companion Device Interface

- System model for communication with companion application (native or HTML5) on companion device is defined
  - App to App communication
  - Execution control from TV to companion device, and vice versa etc

TV

- Middleware
  - Broadcast Signal
  - Start-up Control
  - Transport Control

- App. Engine
  - Application Engine (HTML5 Browser)

- HTML
  - HTML for TV set

- TV decode Function

- Connection Certification

- Transfer Function

Companion Device (Smart phone, Tablet)

- Connect Handler
- Data Handler
- Transfer Function

- Platform of Companion Device
- Connector Application
  - Native Application (Android, iOS, etc)
  - HTML5 Application
Accurate Synchronized Presentation

- Architecture model for synchronization
- APIs
  - For starting synchronized playback of broadcast and broadband stream
  - For getting timestamp (System Time Clock) of broadcast stream
## Two Types of Hybridcast Application

<table>
<thead>
<tr>
<th></th>
<th>Broadcast-oriented Managed Application (BOM App.)</th>
<th>Non Broadcast-oriented Managed Application (N-BOM App.)</th>
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<tbody>
<tr>
<td>Application Provider</td>
<td>Broadcasters</td>
<td>Broadcasters Other service providers</td>
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<tr>
<td>Technical Specification</td>
<td>Ver. 1.0</td>
<td>Ver. 2.0</td>
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<td>Available</td>
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### Application Launch
- **By broadcast signal** (Broadcasters)
- **Other than broadcast signal** (User operation on TV, etc.)

### Cross-channel (Unbound) Services
- **NOT available** (Broadcast-oriented)
- **Available** (Non broadcast-oriented)
Features of Non Broadcast-oriented Managed App.

- **Cross-channel services** (Unbound services)
  - Service providers other than broadcasters can provide applications
  - Multiple applications may run at the same time

- **Consideration for security and content integrity**
  - Executable under the permission of broadcasters
  - Broadcasters can control API access

- **Standardization**
  - System model and receiver architecture model
  - Application lifecycle and application control information