English Translation

IPTV STANDARD

Specifications of IPTV Service Approach by Integration with Broadcasting

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1 General Information

1.1 Introduction

This volume summarizes the technical feasibility examination results of services due to the integration with digital broadcasting in addition to functions mainly stipulated in IPTV Standard IPTVFJ STD-0003 “Download Specifications” (hereinafter referred to as DL Specifications) and IPTV Standard IPTVFJ STD-0002 “VOD Specifications” (hereinafter VOD Specifications) in the implementation of On Demand Services (download and VOD are generically referred to as On Demand Services in this volume) of various contents comprised basically of HDTV via communication.

It is expected that the integration of On Demand Services with digital broadcasting through communication will lead to the realization of better services from the utilization of each respective characteristic. For example, if the transition to a communication environment is made easier as the start point of broadcasting, the development of On Demand Services through communication can also be expected, and it will also become possible to provide various contents that respond to viewer requests using broadcasting as a trigger.

Digital broadcasting is already in an environment that enables more types of various information to be provided than broadcasting by accessing the initial broadcasting BML server link via communication from data broadcasting; however, the provision of moving pictures has not yet been realized. Among the On Demand Services through communication, VOD has already begun and downloading has yet to begin. Therefore, various requirements can be assumed regarding the service of providing HDTV by On Demand integrated with broadcasting, and this volume sorts out these requirements in the following three phases.

(1) Phase when realization is possible at the launch of the download service.
(2) Phase when nearly all the On Demand Service functions are usable from broadcasting BML
(3) Phase when downloaded contents are usable from broadcasting BML

The purpose of these specifications is to define methods (service approach methods) for basically using On Demand Services from digital data broadcasting. At the present stage, technical contents that can be realized early on corresponding to (1) were described. However, with regards to this matter, specific operations of broadcasting BML functions which are main technical specifications, etc. are basically stipulated in ARIB and Dpa, and it is appropriate from both the operation aspect and management aspect that specific broadcasting BML operations, etc. be sorted out/described together with the broadcasting BML function already stipulated in ARIB standard specifications and operation rules. Therefore, this volume sorts out requirement conditions and concepts only, and uses a format of referring to relevant documents for details. In addition, with respect to stipulations corresponding to (2) and (3), since there are parts that require further examination, the requirements for these parts are mainly sorted out and treated as reference information. It is assumed that specific technical specifications for these matters will be stipulated in the future.

Figure 1 shows the positioning of these specifications and framework concept at the present stage.
1.2 Reference Documents
  IPTV Standard IPTVFJ STD-0002 “VOD Specifications”
  IPTV Standard IPTVFJ STD-0003 “Download Specifications”
  IPTV Standard IPTVFJ STD-0006 “CDN Scope Service Approach Specifications”
  IPTV Standard IPTVFJ STD-0007 “Internet Scope Service Approach Specifications”
  ARIB STD-B24 Version 5.2
  Operational Guidelines for Digital Terrestrial Television Broadcasting Technical Documents
  ARIB TR-B14
  Operational Guidelines for BS/Wideband CS Digital Broadcasting Technical Documents ARIB
  TR-B15
1.3 Glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AV Player</td>
<td>An application to play back AV contents.</td>
</tr>
<tr>
<td>CRID</td>
<td>Content Reference Identifier. Identifier of contents not dependent on location.</td>
</tr>
<tr>
<td>ECG</td>
<td>Electronic Contents Guide. One of the receiver's resident applications. The ECG searches, displays,...</td>
</tr>
<tr>
<td>ECG Metadata</td>
<td>The set of meta information documents that specifies processing contents such as display and starting...</td>
</tr>
<tr>
<td>ERI</td>
<td>Entry Resource Information. Control information for starting contents.</td>
</tr>
<tr>
<td>URI</td>
<td>Uniform Resource Identifier. Description format to display the resource location.</td>
</tr>
<tr>
<td>VOD Service</td>
<td>Video On Demand Service. Contents are viewed in streaming according to user requests.</td>
</tr>
<tr>
<td>Web Server</td>
<td>Server that delivers web contents for navigating contents to be downloaded.</td>
</tr>
<tr>
<td>Export</td>
<td>Copy function of contents based on conditions of use.</td>
</tr>
<tr>
<td>On Demand Service</td>
<td>A generic term for VOD service and download service.</td>
</tr>
<tr>
<td>Contents</td>
<td>Data that the video signal, audio signal, and subtitle signal, etc. for providing service are multiplexed. Contents are downloaded to storage by the downloader and played back in an AV player. Contents are usually encrypted and provided.</td>
</tr>
<tr>
<td>Contents server</td>
<td>A server that delivers video contents.</td>
</tr>
<tr>
<td>Storage</td>
<td>Large-capacity nonvolatile memory device for storing contents to be downloaded. Hard disk drive.</td>
</tr>
<tr>
<td>Sell through contract</td>
<td>When the viewing period allocated to contents is unlimited, viewing is possible as long as the contents have been stored within the receiver.</td>
</tr>
<tr>
<td>Select</td>
<td>Among the sets of contents within a certain fixed range, a determined number of sets are viewable.</td>
</tr>
<tr>
<td>Downloader</td>
<td>An application that performs scheduling, execution, and status updating of contents downloading.</td>
</tr>
<tr>
<td>Download</td>
<td>Download is the forwarding of contents stored in the server to the receiver via a broadband line.</td>
</tr>
<tr>
<td>Download navigation</td>
<td>A means to search, select, and purchase contents delivered on a broadband network, and to direct execution of the download. Download navigation is realized by web contents on a browser.</td>
</tr>
<tr>
<td>Download control information</td>
<td>A control information document that sets the processing of download and other that should be executed in the downloader. it is acquired by the browser and download control information transferring to the downloader.</td>
</tr>
<tr>
<td>Download unit</td>
<td>A unit that the user directs the download of contents.</td>
</tr>
<tr>
<td>Chapter</td>
<td>Information to display specific parts of contents.</td>
</tr>
<tr>
<td>Trick Playback</td>
<td>When contents are played back, trick playback refers to playback other than normal constant speed playback such as fast-forwarding, fast-rewinding, skip playback, and chapter playback.</td>
</tr>
<tr>
<td><strong>Jump</strong></td>
<td>A contract type which the viewer can watch multiple specific contents.</td>
</tr>
<tr>
<td><strong>Pack</strong></td>
<td>Content billing unit.</td>
</tr>
<tr>
<td><strong>Package</strong></td>
<td>Content billing unit.</td>
</tr>
<tr>
<td><strong>Browser</strong></td>
<td>An application software program for viewing HTML and broadcasting BML documents.</td>
</tr>
<tr>
<td><strong>Progressive download</strong></td>
<td>The name of download function that can begin contents playback before download is completed.</td>
</tr>
<tr>
<td><strong>Portal</strong></td>
<td>HTML/broadcasting BML contents intended mainly to conduct navigation of services used. A website aimed at a content navigation of IPTV service.</td>
</tr>
<tr>
<td><strong>Multimedia contents</strong></td>
<td>Service format that can carry out various displays by using downloaded contents with link and playback control, etc. from the broadcasting BML. The name of showing broadcasting BML/HTML contents that composed of video, audio, still picture and character, etc.</td>
</tr>
<tr>
<td><strong>License</strong></td>
<td>A license is the data indicating the right to use of the user and allows the contents to be used in an AV player. Licenses are comprised of the contents key (Kc) for encrypting contents and the conditions for use of contents information (RMPI) for using the contents. The license is acquired from the DRM server by the DRM client in the instructions from the downloader or the AV player.</td>
</tr>
<tr>
<td><strong>Link state</strong></td>
<td>Status where receiver units can receive/play both BML contents from a server managed by a broadcasting station and video/audio resources which are being broadcast, together.</td>
</tr>
<tr>
<td><strong>Removable media</strong></td>
<td>A detachable portable storage device that can copy/move contents from the receiver. Removable media includes optical disks, memory cards, and removable HDDs, etc.</td>
</tr>
<tr>
<td><strong>Resident application</strong></td>
<td>An application preinstalled in the receiver.</td>
</tr>
<tr>
<td><strong>Rental contract</strong></td>
<td>A contract type that makes each content freely viewable for as many times as possible until the viewing period specified for each content expires. Viewing becomes impossible when the viewing period expires.</td>
</tr>
<tr>
<td><strong>Local contents</strong></td>
<td>Contents that are downloaded and stored within the receiver.</td>
</tr>
<tr>
<td><strong>Local navigation</strong></td>
<td>A function that searches contents downloaded and stored within the receiver according to operations by user and that refers to detailed information of the contents.</td>
</tr>
<tr>
<td><strong>Batch download</strong></td>
<td>A method to collectively download multiple contents in the download unit specified by the user.</td>
</tr>
<tr>
<td><strong>Subscription contract with a fixed term</strong></td>
<td>A contract that enables the viewing of contents downloaded by contract period unit (normally in units of months) stipulated in advance. The viewing period of contents is also basically limited by the contract period unit.</td>
</tr>
<tr>
<td><strong>All-you-can-view</strong></td>
<td>A contract type for making contents unrestrictedly viewable in a certain specific contents group (Example: Monthly).</td>
</tr>
<tr>
<td><strong>Update download</strong></td>
<td>A means of downloading multiple contents sequentially in download units specified by the user. Since the configuration of contents included in the download unit can be added to or updated, the update of each download unit is monitored, and contents added in the download unit are downloaded.</td>
</tr>
<tr>
<td><strong>Conditions of use information during playback (RMPlp)</strong></td>
<td>An element of the playback license. Includes the expiration date and output control information.</td>
</tr>
<tr>
<td>Playback control information</td>
<td>The set of control information downloaded into storage by the downloader that specifies the start and playback of contents or the display of information during playback, etc. in the AV player.</td>
</tr>
<tr>
<td>------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Viewing</td>
<td>Contents are played back by the main receiver unit for the stipulated period, and are basically displayed to other display units via the main receiver unit, copyright protected digital video output such as HDMI, or analog video output.</td>
</tr>
<tr>
<td>Single unit download</td>
<td>A means to download single contents in the download unit specified by the user.</td>
</tr>
<tr>
<td>Single content</td>
<td>A single specific viewable content.</td>
</tr>
<tr>
<td>Unlimited subscription contract</td>
<td>A contract that enables viewing of contents downloaded by contract period unit (normally in units of months) stipulated in advance. Normally, the contract is automatically updated as long as the contract is not canceled. Viewing becomes impossible when contract period ends when the contract is terminated.</td>
</tr>
<tr>
<td>Billing prior to use</td>
<td>after previously being downloaded contents, A billing means where the purchase is fixed when the playback of downloaded contents is selected/purchased in local navigation by ECG The playback is carried out later.</td>
</tr>
</tbody>
</table>
2 Integration with Broadcasting

2.1 Outline

Standard receivers compatible with services assumed in these specifications shall possess a broadband line connection function to obtain contents from a broadband network and shall reproduce streams received via broadband networks. Furthermore, for compatibility with downloading, standard receivers shall possess storage media to store obtained contents such as a hard disk (HDD), etc. or a function for external connections. In addition, generally, the receivers shall have the capability to receive digital broadcasts. Therefore, On Demand Services within the IPTV function using digital data broadcasting during viewing as a start point can also be used in addition to the IPTV function to receive various services after entering the portal site of On Demand Services in a broadband environment. As a result, various contents integrating broadcasting and communication can be used. These specifications describe the function of integration with broadcasting that is expected to significantly improve the convenience of On Demand Services as above.

2.2 Requirements for the Integration of On Demand Services with Broadcasting

Requirements for the integration of On Demand Services with broadcasting are as follows.

(1) Starting the On Demand Services communication browser from data broadcasting contents and the initial broadcasting BML contents link and then moving to the portal site, etc. shall be possible.

For example, in receivers compatible with On Demand Services, an “On Demand Services” button is displayed in normal digital data broadcasting. As a result, moving to the On Demand Services portal is possible. In other words, it means giving data broadcasting a function equivalent to the portal button on a remote controller (IPTV service). Specifying the URI at this time allows direct moving to exclusive portals prepared by broadcasters as well.

This function to move to On Demand Services shall be possible in broadcasting BML obtained either from data broadcasting carousels or a broadcasting BML server.

Since this function realizes moving from broadcasting to On Demand sites on a communication network, this function is a minimal function for integration with broadcasting of On Demand Services, therefore, it is expected that this function will be realized even in initial receivers.

It is desirable that specified URI contents or the last channel of broadcasting be the return destination from moved communication environments. However, it is also conceivable that returning to the last channel before moving may not be possible due to the implementation of the receiver since the digital reception function begins recording reservations during the use of On Demand Services, therefore, cases not necessarily satisfying this requirement are allowed.

(2) Equivalent functions to functions that can be realized in the On Demand Services communication browser shall be usable from data broadcasting contents and the initial broadcasting BML contents link.

First, it is required that downloading and VOD execution from the broadcasting BML also be possible in the same way as downloading and VOD execution on the portal by specifying contents is possible. In other words, the operations of,

- Instructing contents in broadcasting BML and downloading in the background
- Instructing contents in broadcasting BML and executing and presenting VOD are possible.

In execution, for downloading, only display/control is conducted with broadcasting BML until the start of downloading, while the same method as communication is used for the processing functions afterwards. In addition, the broadcasting BML browser continues operating even when the download function is used. Basically, downloaded contents according to this method are managed in the ECG and use such as playback is conducted from the ECG in the same way as contents downloaded from communication.

Moreover, in VOD, the AV player function switches to VOD from broadcasting up until that time. VOD video for playback is also expected to be displayable on the full-screen or sub-window in broadcasting BML. In addition, other browsers for communication shall not startup during VOD operation.

In addition to the above, as functions required for On Demand Services implementation,
contents contract processing and purchase settlement processing for example are conceivable. It is desirable for these functions to also be possible.

(3) Use of AV contents stored as multimedia contents such as reference and playback control shall be possible.

Contents after storage are managed by the CRID described in playback control information. It is desirable that contents after storage be recognized from broadcasting BML by using the above, furthermore, it is also desirable that a list of stored contents be displayable on broadcasting BML and that playback starting from there be possible. With respect to these behaviors, requirements shall be sorted out as multimedia contents in a separate section.

Requirements (1) to (3) above also show the 3 evolution phases of On Demand Services integration with broadcasting. Below, these phases may be called phase 1 to phase 3 respectively. In other words, the requirements for (1) above are requirements expected to be implemented in the initial On Demand Service-compatible receivers as the first phase. In the second phase, functions related to (2) are expected to be implemented in accordance with the progress of future On Demand Services. Furthermore, in the third phase, implementation of (3) above is expected. With respect to (3) above, downloaded contents stored in storage media are targeted. These relationships are summarized in Table 1.

Table 1 Outline of On Demand Services Integration with Broadcasting

<table>
<thead>
<tr>
<th>Phase</th>
<th>Download</th>
<th>VOD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1st Phase</strong></td>
<td>Moving from broadcasting BML to the On Demand Services portal on a communication network</td>
<td>The download service can be used after moving.</td>
</tr>
<tr>
<td></td>
<td>The VOD service can be used after moving.</td>
<td></td>
</tr>
<tr>
<td><strong>2nd Phase</strong></td>
<td>Use of the On Demand Services portal on a communication network function from broadcasting BML</td>
<td>Necessary functions for download implementation can be realized by using the broadcasting BML function. The download behavior is implemented in the background.</td>
</tr>
<tr>
<td><strong>3rd Phase</strong></td>
<td>Use of contents after storage</td>
<td>Playback from the ECG is possible. As multimedia contents, reference and playback from broadcasting BML are possible. At this time, video for playback is expected to be displayable in a sub-window in broadcasting BML.</td>
</tr>
</tbody>
</table>
2.3 Basic Procedure Up to On Demand Services Viewing Where Broadcasting is the Start Point

In On Demand Services, while the basic procedure from download to viewing is described in IPTVFJ STD-0003 “Download Specifications”, the basic procedure from portal to VOD viewing is described in the IPTVFJ STD-0002 “VOD Specifications”. Below, the entire system is sorted out from the viewpoint of integration with broadcasting and requirements to be added are described.

Figure 2 shows this relationship. In this figure, the encircled numbers correspond to each item below.

In addition, since processing within the receiver is implementation-dependent, similar implementation is not necessarily conducted.

1. Moving to Portal

In addition to the startup of portal sites on the communication network in the receiver (for example, startup by the portal button (tentative name) on the remote controller), moving to portal sites on the communication network from broadcasting BML becomes possible.

2. Contents Purchase

Contents purchase is conducted according to the sequence stipulated in IPTVFJ STD-0003 “Download Specifications”. Note this process is separately conducted in billing prior to use.

3. Download/VOD Viewing

The downloader of receivers starts up by giving instructions to download a content from the contents list presented in broadcasting BML, as well as starting up HTML plug-in described in IPTVFJ STD-0003 “Download Specifications”.

However, in case of re-purchase of downloaded contents and billing prior to use, since the contents already exist on the HDD, this processing is omitted. In addition, the direct use of the receiver storage function from broadcasting BML is also expected.

For downloading, there are two methods of executing downloading. One is downloading in the background while viewing broadcasting and the other is downloading while the receiver is on stand-by. For more information, see IPTVFJ STD-0003 “Download Specifications”.

Playback due to progressive downloading (progressive playback) is possible together with downloading. For this sequence, see DL Specification (TBD).

For VOD viewing, see Appendixes A1 and A2. Basically, in addition to VOD viewing stipulated by the IPTVFJ STD-0002 “VOD Specifications”, switching of the AV player behaviors to VOD from broadcasting on BML is necessary. (TBD)

4. ECG (Local Navigation)

Local navigation such as the management and playback of stored contents is done using/from ECG. Playback of VOD contents is also available using/from ECG (option).

5. Playback of Contents (AV Player)

Contents are played back according to the sequences stipulated by IPTVFJ STD-0003 “Download Specifications” and IPTVFJ STD-0002 “VOD Specifications”.

6. Playback Stop/Break

The playback of contents is stopped/broken according to the sequences stipulated by the IPTVFJ STD-0003 “Download Specifications” and IPTVFJ STD-0002 “VOD Specifications”. Returning to the broadcasting channel which was the start point after playback stops is desirable; however, this is implementation-dependent. Generally, returning to broadcasting is possible with the broadcast selection button on the remote controller.

7. Multimedia Contents

Contents stored in the receiver can be used from broadcasting BML placed on the server. For more information, see Appendix A4.
In addition, Figure 3 shows the flow of moving to a portal from broadcasting. In other words,
(1) The data broadcasting screen is displayed, and the button to download (written as “To DL over network” in the figure) is displayed.
(2) This button enables moving from broadcasting to the download service site. Procedures up to this point are processed with broadcasting BML.
(3) For later procedures, processing continues in the portal on the communication network. This procedure is equivalent to services in the 1st phase.

In addition, the flow from broadcasting to the communication service indicated in Figure 3 is described in case of downloading; however, for VOD, the figure must be read by regarding downloading (DL) as VOD.
Figure 3  Flow from Broadcasting to Communication Services (Implementation Example of 1st Phase Functions)
(For the broadcasting BML-API in the figure, see Chapter 4 “Extension of Broadcasting BML”)

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3 Functionality of the Receiver to Realize IPTV Service Approach by Integration with Broadcasting

3.1 Receiver Configuration
Specification in this volume target receivers equipped with On Demand Services functions in the terrestrial/BS/CS 110 digital broadcasting reception function.

Necessary functionality for On Demand Services by IP network is specified in the IPTVFJ STD-0003 “Download Specifications” and Chapter 3 “Receiver Model” in the IPTVFJ STD-0002 “VOD Specifications”.

The receiver types can be categorized broadly into the recorder type and TV type. For each respective necessary function, see Annotation B3.

Applications installed in the receiver are described in IPTVFJ STD-0003 “Download Specifications” and IPTVFJ STD-0002 “VOD Specifications” 3.1.1 “Receiver Reference Model”. These applications are conceivable functions required in receivers in the realization of services, however, practical implementations depend on the service operation and manufacturer’s consideration, therefore, receivers are not necessarily implemented with all functions.

Receiver models adapted to IPTV service approach by integration with broadcasting have the structure shown in Figure 4 that includes the broadcast signal path.

3.2 Functionality of IPTV Service Approach by Integration with Broadcasting
Functionality of IPTV service approach by integration with broadcasting can be defined as the functions which broadcasting BML documents on broadcast or the link state link to HTML documents on portal sites for On Demand Service, or they control On Demand video contents directly. These functions are described in 3.3.2 BML Browser.
3.3 Browser

Browsers are used for navigation such as the search, selection, and launching downloaded/VOD contents provided on a network. Downloading/VOD navigation are conducted by using a broadcasting BML or HTML browser.

3.3.1 HTML Browser

HTML browsers are used for executing web contents in order to conduct downloading/VOD contents navigation. For more information, see IPTVFJ STD-0003 “Download Specifications” and IPTVFJ STD-0002 “VOD Specifications” 3.2.4 “Browser”.

3.3.2 BML Browser

The receivers adapted to the IPTV service approach by integration with broadcasting will be implemented with a browser for broadcasting BML. This browser is originally used for realization of multimedia contents on broadcasting based on BML.

For the realization of IPTV service approach by integration with broadcasting, the following functions are necessary to be added to broadcast BML specification.

- To Link to HTML document or broadcasting BML document based on IPTV forum specification.
- To Access and Control On Demand Video service.
- To Access and Control Download service.
  (including the function that broadcasting BML document refers downloaded AV contents in the future)

More information on this functionality is specified in ARIB STD-B24, ARIB TR-B14 and ARIB TR-B15.

Furthermore, the browser may also be adapted to broadcasting BML for IPTV. For more information on the functionality of broadcasting BML for IPTV, see CDN Scope Service Approach Specification.

3.4 Downloader

The downloader executes downloading of contents in download service. For more information, see IPTVFJ STD-0003 “Download Specifications” In addition, display function of downloading status is assumed to be implemented as a function of receivers.

3.5 Downloaded Content Format

The downloaded content format of AV contents is assumed to be same as content format on server. For more information, see IPTVFJ STD-0003 “Download Specifications”

3.6 Local Navigation

Contents are independently managed by ECG which is one application equipped in receivers.. There is no difference whether the downloading is triggered by broadcast or not. ECG are also used to start playing downloaded contents. This functionality is called Local Navigation. Local navigation is realized by downloaded AV contents and ECG metadata. For more information, see IPTVFJ STD-0003 “Download Specifications”

3.7 AV Player

The AV player realizes playback function of downloaded AV contents and VOD streaming contents (including trick playback control.) For more information on operating an AV player, see IPTVFJ STD-0003 “Download Specifications” and IPTVFJ STD-0002 “VOD Specifications” 3.2.6 “VOD Playback Control”.

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4 Extensions of Broadcasting BML

4.1 Functionality to Launch IPTV Services from Broadcasting

Extensions of the broadcasting BML browser to support requirement (1) described in 2.2 are shown below.

These extensions aim to check the existence and functionality of On Demand Services browsers installed in a receiver from broadcasting BML and start the targeted browser if this functionality is implemented.

In addition, when starting the corresponding browser by using the functionality in these extensions, the broadcasting BML browser generally closes; therefore, it appears like switching from broadcasting to On Demand Services from users’ viewpoint.

(1) Specification of New Functions

The function startExtraBrowser() is added to start the On Demand Services browser from the broadcasting BML browser.

- For the definition of this function, see ARIB STD-B24 Volume 2 7.6.8.
- For the operation of this function, see ARIB TR-B14 Volume 3 Section 2 Operational provisions related to Profile A 5.9.4, 5.12.6.9, 6.3, and Appendix-14, TR-B15 Part 1 Volume 3 Table 10-4 and Table 10-5, and Part 2 Volume 3 Table 11-4 and Table 11-5.

(2) Extensions to check the implementation of the above function in a receiver

- Add arguments to the existing getBrowserSupport() function and check whether or not the new startExtraBrowser() function is implemented in the receiver.
- It is desirable that this function is supported in a receiver implemented with an On Demand Services browser.
- For added arguments and their operations, see ARIB TR-B14 Volume 3 Section 2 Operational provisions related to Profile A 5.12.6.9, 6.3 and Appendix-14.

(3) Extensions to check On Demand Services functionality implemented in a receiver

a) Adding arguments to the existing getBrowserSupport() function

- The implementation and functionality of the On Demand Services browser in the receiver are checked by using this function.
- For added arguments and their operations, see ARIB TR-B14 Volume 3 Section 2 Operational provisions related to Profile A 5.12.6.9, 6.3, and Appendix-14.
- The browsers and functionality that can be checked by this function are indicated in the arguments described in ARIB TR-B14 Volume 3 Section 2 Appendix-14 and only when the corresponding browser is started from broadcasting BML contents in the corresponding receiver, the functionality can be available.

b) Adding arguments to the existing getResidentAppVersion() function

- The implementation of proprietary functionality defined by each service provider and cannot be checked with the means in a) above is checked by using these arguments.
- For the operation of arguments, see ARIB TR-B14 Volume 3 Section 2 Operational provisions related to Profile A 5.12.6.9, 6.3, and Appendix-14.
- The functionality defined by each service provider that can be checked by this function are indicated by the arguments described in ARIB TR-B14 Volume 3 Section 2 Appendix-14 and only when the corresponding browser is started from broadcasting BML contents in the corresponding receiver, the functionality can be available.

4.2 Extensions for Using the On Demand Services Functionality within Broadcasting BML Contents

Extensions of broadcasting BML browser in order to correspond to requirement (2) indicated in 2.2 above are shown below.

(TBD)

For extension functionality examples, see Appendix A3. For more information on Integration with Broadcasting, see Appendixes A1 and A2.

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4.3 Extensions to Realize Multimedia Contents

Extensions of broadcasting BML browser in order to correspond to requirement (3) described in 2.2 are shown below.

(TBD)

For extension functionality examples, see Appendix A3. For more information on integration with broadcasting, see Appendixes A4 and A5.
A1 On Demand Functionality Use from Broadcasting BML

Assumed Specifications of IPTV Service Approach by Integration with Broadcasting (2nd phase) that provide instructions of executing downloading and VOD from broadcasting BML are shown below.

(Basic Requirements)

- The specifications are for the digital broadcasting receivers which have VOD and download functions specified by IPTV forum.
- In the integration with broadcasting specification, the basic requirement is that the execution of downloading and VOD can be done from broadcasting BML browser without other IPTV browsers.
- Integration with broadcasting specifications are based on specifications described in ARIB TR-B14 and describe additional specifications.
- In order to facilitate implementation of receivers, integration with broadcasting specifications place importance on consistency with the Internet Scope Service Approach Specifications and CDN Scope Service Approach Specifications, and additional specifications should be minimized.

(Hereinafter, TBD)

1. Outline and Presuppositions
2. Receiver Functionality
3. Broadcasting BML Browser
4. Metadata
5. Operation of Communication
6. DRM
7. Authentication
A2 Issues of VOD in Integration with Broadcasting Specifications

A2.1 Issues to be Confirmed as Presuppositions of Specification Discussions

- In addition to providing integration with broadcasting services as broadcasters’ own services, integration with broadcasting services specifications shall be standardized so broadcasters can provide services by using service infrastructure provided by other IPTV services.

- Even when broadcasters provide integration with broadcasting services as an independent service, in order to facilitate implementation of receivers and commercialization of services, IPTV Service Approaches by Integration with Broadcasting shall be standardized to match other IPTV services as much as possible.

- Options that should be determined as to where and what level the specifications of integration with broadcasting services shall be standardized to match the specifications of other IPTV services
  - Device authentication and subscriber management as a portal function
  - User authentication, subscriber management, billing and DRM conducted by IPTV service providers, etc. as ASP
  - Download/VOD material delivery server

- Functionality that shall be possible within integration with broadcasting services
  - User registration/user information modification
  - Product display and selection
  - Purchasing
  - Confirmation of purchase history and billing information
  - Download instructions
  - Presentation of VOD

- Whether or not the following within the functionality assumed to be possible by integration with broadcasting services are necessary
  - Member registration in the IPTV service portal
  - Member information modification in the IPTV service portal

- Selection of the network used in integration with broadcasting services
  - CDN is assumed.
  - Internet is assumed.
  - Both are assumed.

A2.2 Issues with Respect to BML

- Broadcasting BML browser status definition during VOD presentation: Discussion on the necessity of new status definition when VOD video is presented by the broadcasting state/link state

- Operation of the broadcasting BML browser during VOD presentation: Discussion on the necessity of continuing to monitor broadcasting TS.

- Sorting out the relationship between domains such as the application server and stream server, and browser state: Discussion on the necessity of using servers outside the link state

- Sub-window display of VOD: Discussion on whether or not sub-window display should be essential
- In addition to the above, discussion on the necessity of the following functionality
  - Device authentication: When integration with broadcasting services is conducted as part of a specific IPTV service
  - User authentication: Discussion on the storage method, etc. of various IDs and acquisition of the DRM_ID, etc.
  - Purchase procedure: Mechanism to maintain sessions
A3 Extension Functionality Examples of Broadcasting BML

IPTV Service Approach Specification by Integration with Broadcasting enables transition to communication On Demand Services from broadcasting BML as the 1st phase, furthermore, more advanced functionality is realized in the 2nd and 3rd phases. Extended functionality examples in both phases are shown below.

A3.1 Functionality examples required in the 2nd phase (TBD)

<table>
<thead>
<tr>
<th>Functionality Classification</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authentication/Purchase /Reservation</td>
<td>• API for obtaining the device ID</td>
</tr>
<tr>
<td></td>
<td>• User registration mechanism</td>
</tr>
<tr>
<td></td>
<td>• Purchase procedure and mechanism to maintain sessions</td>
</tr>
<tr>
<td>Download</td>
<td>• API for obtaining download control information from the server and transferring it to the downloader</td>
</tr>
<tr>
<td>VOD</td>
<td>• API for obtaining playback control information from the server and executing VOD</td>
</tr>
</tbody>
</table>

A3.2 Functionality examples required in the 3rd phase (TBD)

| Reference of stored contents        | • API for obtaining download completion                                   |
|                                     | • API for referring to stored contents (CRID definition necessary)         |
|                                     | • API for creating a list of stored contents from the ECG metafile        |
|                                     | • API for obtaining metadata such as the contents name, synopsis, license information from the ECG metafile |
|                                     | • API for reacquiring the licenses that have expired                      |
| Playback of storage contents        | • API for reproducing the reproducible file                                |
|                                     | • API for referring to chapter information in the ERI and carrying out chapter playback |
|                                     | • API for trick playback such as fast-forwarding and fast-rewinding       |
|                                     | • API for playlist control of multiple files                               |
| Others                              | • Definition of link state                                                |
|                                     | • NVRAM access                                                            |
A4 Concept of Multimedia Contents

A4.1 Outline

Multimedia contents is an extension service method that considers integration with broadcasting where AV files stored in hard disks are presented in various ways and used by use of broadcasting BML.

In present digital data broadcasting, video during broadcasting is inserted (sub-window display) into broadcasting BML contents and information related to the broadcasting such as information on the characters in a drama or recipes in a cooking program are presented to viewers using text and graphics. Furthermore, by accessing the broadcasting BML server of the link state via the communication network, a wider variety of information that could not be provided by broadcasting only can be used by viewers in the same format as above in the data broadcasting part while the video part remains unchanged in broadcasting.

“Multimedia contents” aiming for realization as one download service is assumed to be presented similarly. However here, video on a sub-window in broadcasting BML is not broadcasting but stored contents. Moreover, the aim is to display a list of stored contents, and furthermore, to enable playback control from broadcasting BML.

These services are considered in the 3rd phase of the integration with broadcasting of On Demand Services.

A4.2 Multimedia Contents Configuration (TBD)

The basic components of multimedia contents are broadcasting BML contents on the communication server and AV contents stored on the HDDs of receivers.

In other words, the CRIDs that can be referred to from broadcasting BML are allocated to AV contents (TTS file configured with video, audio, and subtitles) downloaded beforehand. At this time, broadcasting BML contents are not stored in the receiver but are stored on the communication server for starting the stored AV contents where the broadcasting BML being viewed in the broadcasting and link state is the start point. Moving from broadcasting BML to BML as the navigator of these contents is conducted. Therefore, by referring to the AV contents stored in the receiver from this broadcasting BML (contents navigator), multimedia contents are configured.

In addition, it is desirable that multimedia contents, in other words the target broadcasting BML, can be started from ECG; however the method requires separate discussion.

A4.3 Multimedia Contents Playback Control (TBD)

Stored AV contents can be started by multimedia contents from broadcasting BML. The concept is as follows.

(1) AV Contents Startup
Due to the broadcasting BML function single AV contents can be started or multiple AV contents can be consecutively started.

In case of continuous playback of multiple AV contents, smooth switching is desirable; however, if this proves difficult, it is desirable that a black screen is inserted or the screen is frozen so that switching over is not very noticeable as much as possible. However, simultaneous startup of multiple AV contents is not necessary.

In addition, stored AV contents can be individually referred to and started from the ECG not only as multimedia contents but as normal download contents also.

(2) Use of Chapter Information
It is expected that playback from a chapter point and jumping to a chapter point will be possible from broadcasting BML also by using the chapter in the playback control information of the AV contents. In other words, broadcasting BML presents a chapter list based on chapter information obtained from playback control information, and the broadcasting BML can start playback and jump from arbitrary chapters.

(3) Multimedia Contents Protection (TBD)
Stored AV contents are the target of protection as with normal downloading contents, in addition, the target of billing is also these stored AV contents.

For broadcasting BML contents that realize multimedia contents, protection measures are not
specially prepared; however, it is assumed that servers which provide broadcasting BML contents are used after server authentication with the receivers. By doing so, broadcasting BML contents are protected from forgery and tampering.

In addition, for export, the area is the area that can be used by the media at the export destination. Export of AV contents only is conceivable in the meantime.

Figure A7 shows a multimedia contents service image. Here, broadcasting BML contents used as the contents navigator on the broadcasting BML server are started from broadcasting or the link state server. In this phase, what is broadcast is video.

Next, from this display, contents (here video of a cooking program as AV2 is displayed) stored on the HDD of the receiver is started. The functionality for chapter playback is also displayed on the broadcasting BML of multimedia contents.

On the other hand, this content is started solely from the ECG and the export of AV contents only to removable media according to the license is also possible.
A5 Operation of CRIDs in Multimedia Contents
A5.1 Basic Concept of CRID Operation

Contents are identified with CRIDs.

Although CRID operation is used for the management of single content within the receiver at the beginning of service launch, CRIDs need to be operated under a rule where CRID operation does not end up as a legacy operation when referencing from broadcasting BML as multimedia contents becomes possible. For this reason, the following points must be considered from the service launch phase for the allocation of CRIDs.

- As parts that should be unique for other operators, a domain name (DNS Name) whose uniqueness is internationally guaranteed by each management organization is used. For example, the URL (www.iptv.com, etc.) used in the delivery server of operators can be used as is.
- The contents/file specification part is limited to 2 levels only.
- CRID operation shall be standardized to match other On Demand Services standard systems. In addition, cross referencing with communication contents is not essential.

A5.2 Relationship between the Storage Location and Reference (TBD)

CRIDs are originally allocated to identify and playback stored contents from the ECG, however, in multimedia contents, CRIDs are used in multimedia contents for reference from the broadcasting BML.

At this time, the domain name of the download site does not need to match the authority of the CRID. Therefore, when the CRID is used as multimedia contents, the convenience improves depending on the CRID use method. For example, contents downloaded from different servers (sites) can also be managed as contents in the same series. In other words, for example, in case the first episode of a drama could not be obtained during the download period of a broadcaster, the episode can be obtained from the Archive server later while the second and third episodes, etc. can be obtained from the regular server of the broadcaster. In this case, by using the same authority CRID for these episodes, these episodes can be handled as contents in the same series on multimedia contents.

Figure A8 shows the concept. Contents of the first episode, dorama1, are obtained from the Archive server. At this time, the CRID is different from the authority of the Archive server. On the other hand, contents of the second episode, dorama2, are obtained from the AAA server. This authority is same as the first episode. Later, the broadcasting BML server describes dorama1 and dorama2 in parallel and can present both as series contents.
A5.3 Whether or not Stored Contents can be Referenced from BML (TBD)

Multimedia contents that refer to AV contents stored via CRID from broadcasting BML shall technically be able to refer to arbitrarily stored contents unless a special authentication functionality is set and if contents of the CRID are clear. However, there are cases where referring to contents by other operators is not desired.

For permitting/prohibiting the reference of AV contents, for example, the receiver must be notified of operator names, etc. that should be permitted and possess functionality to conduct confirmation/control in accordance with the notification. However, in consideration of receiver implementation, the following response shall be taken.

- For now, the assumption is that broadcasters conduct this service, and this service is operated under a gentleman’s agreement among operators engaged in download services without setting technical limits on reference in particular.
- In the future, in case telecommunication companies launch similar services for example and if they refer to contents of broadcasters, separate discussions will be held.
Figure A9 Reference of Stored Contents from Communication Sites

*The above file storage type is an example and logical file storage. It is different from the physical storage type within the receiver.*
A6 Concept of Trick Playback Prohibition Control in Download Services

A6.1 Contents Provision Method including the Trick Playback Prohibition Section (TBD)

When free viewing services are conducted along with the delivery of CM together with video contents, it is necessary to set a trick playback prohibition section in download contents. Requirements for the above purpose are outlined below.

Here, the following names are used.

P Content (Prohibit): A content for which trick playback is totally prohibited. For example, CM, display of copyright information, etc.

N Content (Normal): Normal content for which trick playback is allowed to use. For example, regular programs, etc.

P+N Content: A content that a P content and an N content are joined in this order.

Figure A10 Classification of Contents from the Viewpoint of Trick Playback Prohibition

As methods of providing contents which include the trick playback prohibition sections, the following two methods are conceivable.

(1) Use of P+N Contents

Setting a prohibition section is realized by integrating a P content and an N content into single content in advance. Changing the trick playback prohibition section must be prepared at the contents provider side in advance and whole content must be updated.

(2) Combination of P Contents and N Contents

Prohibition is realized by specifying the playback order of P contents and N contents. The trick playback prohibition section can be changed by content, and contents need to be played in the order specified.; In P+N contents, a P content must be placed before an N content, so this is the only method to put a P content after an N content.

A6.2 Trick Playback Prohibition Control Requirements (TBD)

In order to realize trick playback prohibition control, it is desirable that the following requirements be satisfied.

(1) Viewing order of “P contents” and “N contents” can be specified.
(2) Contents are delivered in P+N contents, or in a combination of P contents and N contents with viewing order specified. In latter case relay playback of delivered contents is possible in the specified viewing order.
(3) During the relay playback of contents, switch over between contents should be as smooth as possible.

In addition, for contents viewing, viewing with the receiver that downloaded the contents as well as viewing via a home network and writing to removable media are conceivable. The following requirements must be satisfied in these situations.

(a) When viewing P+N contents

(1) Viewing downloaded contents with the receiver that downloaded the contents

- Trick playback prohibition can be specified for all contents.
- A trick playback prohibition section can be specified.
- It is desirable to show a message like “trick playback is impossible,” when trick playback is conducted within the trick playback prohibition section.
- It is desirable to encrypt the information about for which sections trick playback is
prohibited. However, this is implementation-dependent in consideration of the burden on implementation.

(2) Viewing downloaded contents of the receiver remotely via DLNA
   - This is related to the DLNA specification, and when remote viewing is conducted via DLNA, the direction including whether or not realization is possible shall be given.

(3) Viewing exported media with a different receiver
   - Currently, the viewing management method is determined by the specification of destination media at the time of export. It does not seem realistic to request prohibition of trick playback judging from current standardization trends.

(b) When viewing the combination of “P contents” and “N contents”
(1) When viewing contents with the receiver that downloaded the contents
   - Trick playback prohibition can be specified in relay playback where the viewing order is specified.
   - Trick playback prohibition can be specified by including P contents.
   - Specifying trick playback prohibition sections is not mandatory; however, if it is specified, the conditions are the same as those in (a)(1) above.
   - It is desirable to show a message like “trick playback is impossible” when a trick playback operation is conducted within the trick playback prohibition section.
   - It is desirable to encrypt the information about for which sections trick playback is prohibited. However, this is implementation-dependent in consideration of the burden on implementation.

(2) Viewing of downloaded contents of the receiver remotely via DLNA
   - This is related to the DLNA specification, and when remote viewing is conducted via DLNA, the direction including whether or not realization is possible shall be given.

(3) Viewing exported media with a different receiver
   - Currently, the viewing management method is determined by the specification of destination media at the time of export. It does not seem realistic to request prohibition of trick playback judging from current standardization trends.
There are various issues in realizing download services, and in particular, the following issues are difficult to stipulate as specifications; however, they should be clarified by content providers prior to the launch of services not to confuse users.

(1) Export Guarantee
How can we guarantee that writing is completed successfully when outputting contents to removable media, etc. with an export service?
More specifically, writing downloaded contents to approved removable media by an export service is possible if an export license is obtained. For export licenses, fees are stipulated per content/export. On the other hand, exports may be incomplete due to defects in the media or electrical blackouts during export. Handling of these situations must be clarified by content providers that implement export services.
In addition, the handling of licenses during export in assumed RMP environments is specified as “the license is regarded as consumed when even part of the contents becomes viewable in the removable media at the export destination” in IPTVFJ STD-0003 “Download Specifications”.

(2) Differentiation from personal video recording
Recorder type receivers discussed here are assumed to have a function to record digital broadcast contents. When download services provide the same content as privately recorded from broadcast, they will have little difference in functionality if exported to the same removable media. In such a case, download services need something to make themselves attractive to users.

(3) Handling of paid downloaded contents
To make contents downloading a charged service, there will be various requirements such as license conditions of contents and restrictions on handling of downloaded contents, which are different from personal video recording. Therefore, the service will be provided after a contract on terms of use is concluded with users. The conditions of the contract need to be discussed in detail separately.
B2 Advantages of Download

Thanks to widespread broadband service, download services create a new environment for provision of contents. It will bring following advantages.

- Secure content acquisition
  - Even if the bandwidth of the transmission path is narrow and the QoS is insufficient, contents can be obtained with certainty but it may take some time.
  - When a higher bandwidth is available, contents can be obtained within a short time.

- Enables new ways of viewing contents
  - After downloading, contents can be viewed anytime within the scope of the contract terms regardless of network conditions.
  - If network bandwidth is high enough, viewing is possible while downloading by progressive downloading.
  - Desired contents can be found easily using metadata.
  - Even if downloaded contents are deleted by mistake, contents can be re-downloaded and viewed while the contract is valid.
  - Metadata and chapter information from content producers will allow advanced usage of contents.

- Viewing via home networks

- Various uses are possible with appropriate DRM systems
  - DRM is conducted on the server side; therefore, various functionality can be realized relatively easily.
  - Various types of viewing such as all-you-can-view, single item, pack, and select are provided.
  - Writing to removable media multiple times is possible.
  - Understanding is easy to obtain even from contents copyright holders.

- Reduction of the burden on transmission facilities
  - Regular file servers can be used instead of expensive streaming servers.
B3 Receiver Types that Support Download Services

As typical types of receivers supporting download services, recorder type and TV type are conceivable. Features included in each respective type are shown in Table B1. For options, various combinations are conceivable depending on the implementation.

<table>
<thead>
<tr>
<th>Table B1 Receiver Type</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outline</strong></td>
</tr>
<tr>
<td>Digital TV display</td>
</tr>
<tr>
<td>Digital Receiver Function (Terrestrial/BS/CS110)</td>
</tr>
<tr>
<td>Network Connection Function</td>
</tr>
<tr>
<td>Hard disk</td>
</tr>
<tr>
<td>Removable Media (Blu-ray equivalent)</td>
</tr>
<tr>
<td>Memory Card I/F</td>
</tr>
<tr>
<td>External Output Terminal (iLINK, DTCP/IP, etc.)</td>
</tr>
</tbody>
</table>

*This is an example only to aid readers’ understanding of receiver types and does not limit implementation in particular.*
B4 Network Transmission Rate/File Size/Required Download Time Relationship

Download services can be classified as follows depending on the network transmission rate.

(1) Low speed long time type: When the transmission bandwidth of the line is narrower than the transmission bandwidth of the contents

As a feature, even if the QoS is not guaranteed, this type of download service is possible in this environment but it takes time during the stand-by period of the receiver.

For download services where contents are not consecutively viewed, service provision is possible even in environments like this.

(2) High speed short time type: When the transmission bandwidth of the line is wider than the playback rate of the contents

As a feature, downloading can be completed in a short period of time. Therefore, wait times for download completion are not only shorter but multiple contents can be also stored per unit time.

In addition, using this type of download service, before the download of all targeted contents files is complete, contents saved in a buffer can be played back. This is progressive downloading or progressive playback, and it is desirable that receivers are implemented with this functionality. However, if the QoS of the line is not sufficient, the data volume of contents to be received falls below the data volume of contents to be played back and progressive playback cannot be conducted stably.

The relationship among the network transmission rate of the line, file size to be downloaded, and required download time is shown in Figure B1.
B5 Classification of Use and Billing by Each License Model

B5.1 Image of the Classification on Contents Management and Billing Prior to Use Service

Contents on HDD can be classified into four kinds from (1) to (4) below based on the management. Realization examples of these models are shown below.

Among the four, for more information on (1) to (3), see contents use described in IPTVFJ STD-0003 “Download Specifications”. For more information about the concept of DRM and licenses related to downloading, see IPTVFJ STD-0003 “Download Specifications”.

(1) Subscription Model (With/Without a Validity Term)
- For example, if a user is registered as a member and a monthly membership fee is paid, contents provided for downloading within the term can be downloaded freely.
- If there is no validity term, the license is updated up until contract cancellation.

(2) Rental Model
- Purchase processing (billing processing) is performed before downloading.
- For a specified number of days from the start of viewing after downloading, contents can be viewed freely.
- If the specified number of days is exceeded, the contents cannot be viewed.
- By re-purchasing the license, viewing may be extended without downloading again.

(3) Sell-through (Buy-out) Model
- By buying out the contents, the contents within the receiver can be used forever.

(4) Billing Prior to Use Model
- Purchase processing is performed when viewing after downloading (Billing prior to use).
- For example, a service is possible where the user is billed when their favorite content is selected from among contents downloaded beforehand and viewed.
- The validity term of use is not limited or limited.

For (1) to (3) above, the billing process is performed before downloading; however, in case of (4), the billing process is different since downloading is conducted beforehand and the billing process is performed immediately before viewing.

Users instruct the downloading of contents recommended by operators easily with broadcasting BML while viewing broadcasting for example or users complete the download beforehand in times when traffic is light such as midnight. In this service, if the billing process is performed when users would like to view one of the already downloaded files, viewing is possible without having to wait.

A typical processing example of billing prior to use of the service is shown below.

(1) Download recommended contents.
(2) Implement update download based on download control information.
(3) During the period the contents can be used, the contents are displayed as license not acquired on the ECG. (ECG meta use)
(4) When the user instructs the file to be played back on the ECG, the ECG acquires the license and executes the billing process at the same time.
(5) In the future, a method of performing the billing process with broadcasting BML as multimedia contents will also be possible.
(6) After license acquisition, viewing is possible in the same way as viewing other contents. Details of billing prior to use will be stipulated separately.
B5.2 Billing Prior to Use and License Re-acquisition

When the valid term of ECG metadata is longer than the validity term of the license, the viewing period can be reset by reacquiring the license. As a result, the viewing period of downloaded contents can be extended and the downloaded contents can be viewed again. In this case, downloading the contents again is not necessary; therefore, it is advantageous since there is no waiting for downloading.

An example of the flow of re-acquisition processing is shown in Figure B3.
B5.3 Basic Concept with Respect to Expired License Contents Processing
When the validity term of the license expires, the corresponding contents cannot be used. At this time, "Expired" is displayed on the ECG.

Display of the contents on the ECG depends on their validity term of ECG metadata. It means that the contents with an expired license are not deleted from the HDD automatically. Therefore the usable capacity of the HDD for users decreases due to these expired contents.

Thus, users will eventually notice such a situation and will release the unusable area for the users resulting in recovery of HDD capacity. Presentation of the HDD capacity decrease to users is receiver implementation-dependent.

All these are basic concepts and each operation is dependent on receiver implementations.

Guidelines for the concept on automatic deletion of contents in the receiver will be established separately.
B6 Combination Case Examples of Download Operation Types and Billing Methods

Actual download operation types and billing methods can be sorted out into the combinations shown in Table B2 from the business perspective. The following points require consideration for operation.

- Update download is applied to the reservation of single contents
- It is assumed that the viewing period in the latest news delivery service in a Rental-Pack lasts until delivery of the next news and that the most recent news is added by update downloading (automatic).
- When contents providers require download completion confirmation, such confirmation becomes possible by automatic acquisition of the license by the ECG after the completion of downloading.

<table>
<thead>
<tr>
<th>Table B2 Sorting of Download Operation Types and Billing Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operation Type</strong></td>
</tr>
<tr>
<td>--------------------</td>
</tr>
<tr>
<td>Subscription (Monthly, etc.) Ex.) All-you-can-view with 1,000 yen</td>
</tr>
<tr>
<td>Rental Ex.) Viewing period is 3 days with 300 yen per program. Viewing period is one week with 1,000 yen for 5 programs.</td>
</tr>
<tr>
<td>Sell-through (buying out) Ex.) Buying out with 500 yen per program or 3,000 yen for 10 programs for example (No setting of viewing period)</td>
</tr>
</tbody>
</table>

* The combination of package types and operation types are consistent with the assumed contents as package meta.
* All are viewed within the control of the receivers that downloaded the contents, and the license for the export service is purchased separately for external output.
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