BCAST Distribution System Adaptation – IPDC over DVB-H

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1. Scope

This document specifies how the BCAST 1.2 Enabler is implemented over a specific BDS (BCASTDistribution System).

The BCAST 1.0 Enabler supports the global interoperability among different BCAST Distribution Systems, and can also be adapted according to the characteristics of BCASTDistribution Systems. In this document, two types of adaptations are presented.

The BCAST 1.0 Enabler includes nine functions and all nine functions can be implemented over any specific BDS with minimal adaptation. This is referred to as "generic adaptation", which can be applied for any kind of BDS.

The underlying BDS may already have a method for a function defined in the BCAST 1.0 Enabler. This specification defines how the BCAST functionality is adapted to the method selected in the underlying BDS. This is referred to as "BDS specific adaptation".

In addition to BCAST 1.0 ERP, BCAST 1.1and BCAST1.2 Enabler has a bunch of technical enhancements under the existing 9 functions. The new added features are well specified at [BCAST12-SG], [BCAST12-Services], [BCAST12-ServContProt] and [BCAST12-Distribution].

The specific changes on this document are further explained in Section 4 Introduction.

2. References

2.1 Normative References

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[BCAST12-ServContProt] "Service and Content Protection for Mobile Broadcast Services", Open Mobile Alliance™, OMA-TS-BCAST_SvcCntProtection-V1_2,
URL:http://www.openmobilealliance.org/

[BCAST12-Services] "Mobile Broadcast Services", Open Mobile Alliance™, OMA-TS-BCAST_Services-V1_2,
URL:http://www.openmobilealliance.org/

[BCAST12-SG] "Service Guide for Mobile Broadcast Services", Open Mobile Alliance™, OMA-TS-BCAST_ServiceGuide-V1_2,
URL:http://www.openmobilealliance.org/

[DRM20-Broadcast-Extensions] "OMA DRM v2.0 Extensions for Broadcast Support", Open Mobile Alliance™, OMA-TS-DRM-XBS-V1_2,
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[ETSI EN 300 468] ETSI EN 300 468 v1.x.x, “Digital Video Broadcasting (DVB); Specification for Service Information (SI) in DVB systems”,
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[IOPPROC] “OMA Interoperability Policy and Process”, Version 1.13, Open Mobile Alliance™, OMA-IOP-Process-V1_13,
URL:http://www.openmobilealliance.org/

[ISMACryp] "ISMA Encryption and Authentication v1.1.”**,** Internet Streaming Media Alliance**,**
URL:http://www.isma.tv/

[RFC1952] IETF RFC 1952 “GZIP file format specification version 4.3”, P. Deutsch, May 1996,
URL:http://www.ietf.org/rfc/rfc1952.txt

[RFC2119] IETF RFC 2119 “Key words for use in RFCs to Indicate Requirement Levels”, S. Bradner, March 1997,
URL:http://www.ietf.org/rfc/rfc2119.txt

[RFC3926] IETF RFC 3926 "FLUTE - File Delivery over Unidirectional Transport", T. Paila at al, October 2004,
URL:http://www.ietf.org/rfc/rfc3926.txt

[RFC4234] “Augmented BNF for Syntax Specifications: ABNF”. D. Crocker, Ed., P. Overell. October 2005,
URL:http://www.ietf.org/rfc/rfc4234.txt

[SCRRULES] “SCR Rules and Procedures”, Open Mobile Alliance™, OMA-ORG-SCR_Rules_and_Procedures,
URL:http://www.openmobilealliance.org/

[TVA-Metadata] ETSI TS 102 822-3-1 v1.3.1, "Broadcast and On-line Services: Search, select, and rightful use of content on personal storage systems (TV-Anytime)",
URL:http://portal.etsi.org/

2.2 Informative References

[ETSI TR 102 377] ETSI TR 102 377 v1.x.x, " Digital Video Broadcasting (DVB); DVB-H Implementation Guidelines",
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[ETSI TR 102 468] ETSI TR 102 468 v1.x.x, "Digital Video Broadcasting (DVB); IP Datacast over DVB-H: Set of Specifications for Phase 1",
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[ETSI TR 102 469] ETSI TR 102 469 v1.x.x, "Digital Video Broadcasting (DVB); IP Datacast over DVB-H: Architecture",
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[ETSI TR 102 473] ETSI TR 102 473 v1.x.x, "Digital Video Broadcasting (DVB); IP Datacast over DVB-H: Use Cases and Services",
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[ETSI TS 102 474] ETSI TS 102 474 v1.x.x, "Digital Video Broadcasting (DVB); IP Datacast over DVB-H: Service Purchase and Protection",
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[OMADICT] "Dictionary for OMA Specifications", Version 2.9, Open Mobile Alliance™,
OMA-ORG-Dictionary-V2_9,
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3. Terminology and Conventions

3.1 Conventions

The key words “MUST”, “MUST NOT”, “REQUIRED”, “SHALL”, “SHALL NOT”, “SHOULD”, “SHOULD NOT”, “RECOMMENDED”, “MAY”, and “OPTIONAL” in this document are to be interpreted as described in [RFC2119].

All sections and appendixes, except “Scope” and “Introduction”, are normative, unless they are explicitly indicated to be informative.

This is an informative document, which is not intended to provide testable requirements to implementations.

3.2 Definitions

BCAST Distribution System	A system typically but not necessarily containing the ability to transmit the same IP flow to multiple Terminal devices simultaneously. A BCAST Distribution System (BDS) typically uses techniques that achieve efficient use of radio resources. A BDS consists of Network functionality up to the IP layer and optional Service Distribution/Adaptation functionality above the IP layer. Most BDSs support broadcast/multicast distribution in the network. Some BCAST Distribution Systems have the capability to deliver the IP flows in the network via unicast.
Broadcast Service	A Broadcast Service is a “content package” suitable for simultaneous distribution to many recipients (potentially) without knowing the recipient. Either each receiver has similar receiving devices or the content package includes information, which allows the client to process the content according to his current conditions. Examples of Broadcast Services are: pure Broadcast Services: – mobile TV – mobile file downloading (mobile newspaper, clips, games, SW upgrades, other applications) combined broadcast/interactive Broadcast Services: – mobile TVwith file downloading and voting – betting Broadcast Services – auction Broadcast Services – trading Broadcast Services
Smartcard Profile	Alias for a set of Smartcard-based technologies and mechanisms which provide key establishment and key management, as well as permission and token handling for the Service and Content Protection solution for BCAST Terminals. In particular, subscriber key establishment and both short and long term key management may be based on GBA mechanisms and a Smartcard with (U)SIM/ISIM as defined by 3GPP, or based on a pre-provisioned shared secret key and a Smartcard with R-UIM/CSIM/ISIM or a UIM as defined by 3GPP2. The Smartcard Profile is described in [BCAST12-ServContProt] Section 6.

3.3 Abbreviations

3GPP	3rd Generation Partnership Project
BCAST	Mobile Broadcast Services
BCMCS	Broadcast Multicast Service
BDS	BCAST Distribution System
BSA	BCAST Service Application
BSD/A	BCAST Service Distribution and Adaptation

BSM	BCAST Subscription Management
DCF	DRM Content Format
DRM	Digital Rights Management
DVB	Digital Video Broadcast
DVB-H	Digital Video Broadcast – Handheld
DVB-T	Digital Video Broadcast – Terrestrial
EN	European Norm
ESG	Electronic Service Guide
ETSI	European Telecommunications Standards Institute
FDT	File Delivery Table
FEC	Forward Error Correction
FLUTE	File Delivery over Unidirectional Transport
GZIP	GNU zip
IC	Interaction Channel
INT	IP/MAC Notification Table
IP	Internet Protocol
IPDC	IP DataCast
IPsec	IP security
ISIM	IP Multimedia Services Identity Module
ISMACryp	Internet Streaming Media Alliance (ISMA) Encryption and Authentication
KMS	Key Management System
MBMS	Multimedia Broadcast / Multicast Service
MIKEY	Multimedia Internet KEYing
MPE	Multi-Protocol Encapsulation
OMA	Open Mobile Alliance
OSF	Open Security Framework
PSI/SI	Program Specific Information/Service Information
RTCP	Real Time Control Protocol
SDP	Session Description Protocol
SG	Service Guide
SG-C	Service Guide-Client
SG-D	Service Guide-Distibution
SGDU	Service Guide Delivery Unit
SRTP	Secure Real-time Transport Protocol
STKM	Short Term Key Message
TR	Technical Report
TS	Technical Specification
XML	Extensible Markup Language

4. Introduction

This technical specification specifies how the OMA Mobile Broadcast Services (BCAST) Enabler can be implemented in DVB-H Network.

4.1 Version 1.0

BCAST ERP 1.0 has to achieve two modes of adaptation for DVB-H:

1. Generic adaptation over an underlying DVB-H transport network

   In this mode, this Technical Specification explains how the BCAST Enabler has access to the IP transport layer so that BCAST services can be provided from BCAST Network entities to BCAST terminals. Furthermore, this allows a common behaviour across multiple BCAST enabled BCAST Distribution Systems (BDSes).

   However, in generic adaptation mode, it may be impossible to share broadcast services with a native DVB-IPDC server / terminal due to differences between the technologies selected in the particular BDS and the generic adaptation. For example, file delivery mechanisms may be different or service and content protection mechanisms may be different. In practice this means file delivery sessions and streaming sessions are most likely to be provided in parallel in order to cater for BCAST terminals and DVB-IPDC terminals.

2. BDS specific adaptation to DVB-IPDC functionality

   In this mode, this Technical Specification explains how various BCAST functionalities are adapted in a DVB-IPDC network taking into consideration specific technical aspects of the underlying BCAST Distribution System (BDS). In this mode, it is possible that broadcast services can be shared between BCAST terminals and DVB-IPDC terminals. Hence BCAST network entities and DVB-IPDC servers can provide services to both types of terminals.

   For example, file delivery mechanisms and protection mechanisms of BCAST Enabler are adapted to be in line with those defined by IP Datacast over DVB-H specifications as far as possible. In practice this means file delivery sessions and streaming sessions could cater for both BCAST terminals and DVB-IPDC terminals, without the need for providing sessions in parallel (unlike 1 above).

   A consequence of adaptation to the underlying BDS functionality is that the BCAST behaviour is profiled to each BDS, making it difficult or impossible to share BCAST services across multiple BDSes.

Note that the purpose of BDS specific adaptation is to enable sharing a service between BCAST terminals and native BDS terminals. In contrast, generic adaptation allows to share a BCAST service across different BDSes. As described above, BCAST Network entities and BCAST Terminals will be able to handle the two types of adaptation, providing maximum deployment flexibility for the Service Provider. This allows BCAST terminal to work automatically in both situations, as signalling is provided to indicate to the terminal the type of adaptation provided. As BCAST Enabler is adapted to or adopts only part of the underlying BDS functionality, BCAST Enabler may be adapted to both types, i.e. BDS specific adaptation (optimised for BDS) for certain functions whilst using generic adaptation (BCAST-specific functionality) for other functions.

Chapter 5 provides an informative overview of DVB-H and IP Datacast.

Chapter 6 provides specifications for the generic adaptation over a DVB-H transport network.

Chapter 7 provides specifications for BDS specific adaptation to DVB-IPDC functionality.

Chapter 8 provides an informative walkthrough explaining how BCAST services are distributed over DVB-H.

4.2 Version 1.1

In BCAST 1.1 ERP, two technical changes have been reflected. The first was to update the version of some normative references and the second was to add BDSSpecificEntryPointinfo for the efficient operation of BCAST enabler for DVB-H network.

4.3 Version 1.2

There are no changes to version 1.2, compared to version 1.1. Only the references in this document have been updated.

5. Overview of DVB-H and IP Datacast (Informative)

DVB-H is a transmission system [ETSI EN 302 304] using ETSI Digital Video Broadcasting standards to provide an efficient way of carrying multimedia services over digital terrestrial broadcasting networks to handheld terminals. Main physical and link layer features of DVB-H include time-slicing, forward error correction for multiprotocol encapsulated data (MPE-FEC), the additional (to DVB-T) 4K mode and in-depth interleavers, and DVB-H signalling.

IP Datacast over DVB-H is an end-to-end broadcast system for delivery of any types of digital content and services using IP-based mechanisms optimized for devices with limitations on computational resources and battery. An inherent part of the IPDC over DVB-H system is that it comprises of a unidirectional broadcast path that may be combined with a bi-directional mobile/cellular interactivity path. IP Datacast over DVB-H is thus a platform that can be used for enabling the convergence of services from broadcast/media and telecommunications domains (e.g., mobile/cellular).

The set of specification documents applicable to IP Datacast over DVB-H services are defined in an umbrella specification [ETSI TR 102 468].

- The use cases applicable to IPDC over DVB-H system Phase 1 are described in [ETSI TR 102 473].
- The end-to-end system architecture for an IPDC over DVB-H system is described in [ETSI TR 102 469].

The following documents define the DVB-H radio interface:

- The DVB-H transmission is specified in [ETSI EN 302 304].
- The DVB-H related system level signalling, applicable both to DVB-IPDC network and to DVB-IPDC receiver is specified in [ETSI TS 102 470-1].

The following documents define the IP Datacast service layer over DVB-H.

- The Electronic Service Guide is specified in [ETSI TS 102 471].
- The content delivery protocols is specified in [ETSI TS 102 472].
- The service purchase and protection is specified in [ETSI TS 102 474].
- Audio and video formats supported in IP Datacast systems over DVB-H are specified in [ETSI TS 102 005].

6. Generic adaptation over DVB-H IP transmission network

This Section describes how BCAST specifications (namely [BCAST12-Services], [BCAST12-SG], [BCAST12-ServContProt], [BCAST12-Distribution] and [DRM20-Broadcast-Extensions]) are used over a DVB-H network. The provisions in this Section thus complement the ones in the generic specifications so that BCAST services can be distributed over a DVB-H IP transmission network, without re-using the DVB-IPDC functionality and hence without the ability for sharing services with native DVB-IPDC terminals (unlike the BDS specific adaptation specified in Section 7 below).

All normative statements in this specification are only applicable to cases where OMA BCAST services are distributed over a DVB-H network specified in [ETSI EN 302 304].

The sentence "as defined by BCAST Enabler specifications" is a shorthand notation that indicates both BCAST server and terminal SHALL respect relevant BCAST specifications (listed above).

Generic adaptation MAY be supported by BCAST Network entities and SHALL be supported by BCAST Terminal.

6.1 Access to the IP layer

The specification of Section 5 of [ETSI TS 102 470-1] SHALL apply.

6.2 Generic adaptation related to OMA-TS-BCAST_Services

6.2.1 Interaction

OMA BCAST enables four cases of interaction specified in Section 5.3 of [BCAST12-Services] related to Mobile Broadcast Services. In all of these cases the interaction is supported by Interactive Channel. Since DVB-H is purely an unidirectional bearer and does not include a logical Interactive Channel itself, any bi-directional mobile system can be used as Interactive Channel with DVB-H. Therefore these four cases of interaction are directly applicable when DVB-H is the BDS, i.e., a terminal with access to an interactive channel SHALL support all of these four cases of interaction.

The specification in section 5.3 of [BCAST12-Services] SHALL apply.

6.2.2 Service Provisioning

The specification in section 5.1 of [BCAST12-Services] SHALL apply.

6.2.3 Terminal Provisioning

The specification in section 5.2 of [BCAST12-Services] SHALL apply.

Overriding the “status” definitions in [BCAST12-Services] Appendix F, terminal support for the <IPDC> node of the BCAST Management Object and its sub-nodes is defined as follows:

Node	Status
<X>/BDSEntryPoint/<X>/IPDC	Required
<X>/BDSEntryPoint/<X>/IPDC/Tuning	Optional
<X>/BDSEntryPoint/<X>/IPDC/Tuning/Frequency	Required
<X>/BDSEntryPoint/<X>/IPDC/Tuning/UseLPChannel	Required
<X>/BDSEntryPoint/<X>/IPDC/IPPlatformID	Required
<X>/BDSEntryPoint/<X>/IPDC/DVBNetworkID	Required
<X>/BDSEntryPoint/<X>/IPDC/ESGProviderID	Required

Table 1: BCAST Management Object and its sub-nodes

6.2.4 Notification

The specification in Section 5.14 of [BCAST12-Services] SHALL apply.

When using IPDC over DVB-H as the underlying BCAST Distribution System the Notification functionality is enabled as specified in [BCAST12-Services].

6.3 Generic adaptation related to OMA-TS-BCAST_ServiceGuide

6.3.1 Service Guide Delivery over Broadcast Channel

The provisions relevant to Service Guide delivery over Broadcast Channel in section 5.4.2 of [BCAST12-SG] SHALL apply, with the following extension: the Genre definition as specified in section 6.3.4.2 also applies to the GenreGroupingCriteria element in the SGDD.

6.3.2 Compression of Service Guide Delivery Units

The specification in section 5.4.1.4 of [BCAST12-SG] SHALL apply.

6.3.3 Session Description

The general provisions of specification in section 5.1.2.5 of [BCAST12-SG] SHALL apply with the modifications as detailed in the following sections.

6.3.3.1 SessionDescription for broadcast streamed media sessions

The SessionDescription SHALL provide the following parameters:

- The sender IP address
- List of media components in the session
- Initial buffering delay, using the ‘min-buffer-time’ attribute as specified in [ETSI 102 472] section 5.3.4.

The terminal MAY ignore the following parameters in the SessionDescription if they are present, as they are either not required or out of scope of IPDC over DVB-H BDS:

- FEC configuration and related parameters
- The mode of MBMS bearer per media

For all parameters composing the SessionDescription, rules defined in [ETSI TS 102 472] Section 5.2 SHALL apply.

6.3.3.2 SessionDescription for broadcast file delivery sessions

The specification in section 5.1.2.5.3 of [BCAST12-SG] SHALL apply.

Furthermore, Session Description is modified considering the characteristics of IPDC over DVB-H, as explained below.

The SessionDescription MAY provide the following parameters:

- FEC capabilities and related parameters
- Media type(s) (i.e. “application”) and fmt-list (i.e. “0”)
- Service language(s) per media
- Data rates using SDP bandwidth modifiers

The terminal MAY ignore the mode of MBMS bearer per media in the SessionDescription, as this parameter is out of the scope of IPDC over DVB-H.

For all parameters composing the SessionDescription, rules defined in [ETSI TS 102 472] Section 6.1.13 SHALL apply.

6.3.4 Service Guide Data Model

The specification in section 5.1 of [BCAST12-SG] SHALL apply.

6.3.4.1 CellTargetArea in DVB-H

Underlying DVB-H functionality is re-used, as explained below.

OMA BCAST Service Guide allows describing the target area for Service and Content in terms of BDS-specific cell identification in the “CellTargetArea” element.

OMA BCAST Service Guide allows terminal to request specific SGs based upon it’s BDSLocationID in terms of BDS-specific cell identification.

In the case of DVB-H, the value of the “CellArea” sub-element of the “CellTargetArea” element and BDSLocationID unlilised by terminal to request specific SGs as specified in secition 5.4.3.4 in BCAST 1.2 TS Service Guide are composed from the following parameters. Each parameter is signalled by an uppercase alpha character, immediately followed by a string of lowercase alphanumeric characters representing the value of a parameter, and immediately followed by the next parameter, if any, as defined in the table below. The parameters MUST be given in the order of appearance in the table below, starting with the network_id "N" parameter. All parameters defined below SHALL be supported by the Terminal. The Server SHALL support parameters with a cardinality of 1 or more and MAY support the remaining parameters.

6.3.4.1.1 CellArea/BDSLocationID based on Cell ID

When “BDSType” as specified in secition 5.4.3.4 in BCAST 1.2 TS Service Guide or “type” attribute of CellTargetArea element is set to value 11 (DVB-H Cell ID), the value of BDSLocationID and each “CellArea”element is composed from the following parameters:

Parameter name	Signalling	Value	Length [bytes]	Cardinality	Description
network_id	“N”	Hexadecimal representation of a 16bit unsigned integer	4	1	“network_id”, transmitted in the Network Information Table (NIT) according to [ETSI EN 300 468].
cell_id	“C”	Hexadecimal representation of a 16bit unsigned integer	4	1	“cell_id”, transmitted in the TPS bits of the DVB-H signal according to [ETSI EN 302 304].
hierarchy	“H”	“lp” or “hp” – other values are reserved	2	0..1	The logical channel (“lp” for “low priority” or “hp” for “high priority”) that is selected for reception when hierarchical modulation is used.
subcell_id	“S”	Hexadecimal representation of an 8bit unsigned integer	2 per entry	0..N	subcell id, transmitted as "cell_id_extension" in the Network Information Table (NIT) according to [ETSI EN 300 468].

The “type” attribute of the CellTargetArea element and “BDSType” are fixed to the value 11 (DVB-H Cell ID).

Examples (informative):

- The string "N12abC005aHlp" represents a target area defined by a network_id of 0x12ab, a cell_id of 0x005a and the use of the "lp" channel of hierarchical modulation. The subcell_id is not present.
- The string "N12abC005aS01S02" represents a target area defined by a network_id of 0x12ab, a cell_id of 0x005a, and a list of two subcell_id (0x01 and 0x02).

6.3.4.2 Genre Definition

BCAST terminals supporting the IPDC over DVB-H BDS

- SHOULD support the "type" and "href" attributes of the Genre elements
- SHOULD support levels 1 to 4 of the TV Anytime ContentCS classification scheme identified by urn:tva:metadata:cs:ContentCS:2005 as defined in Annex A.8 of [TVA-Metadata], for values "main" and "secondary" of the "type" attribute
- SHOULD support level 1 to 3 of the TV Anytime IntendedAudienceCS classification scheme identified by urn:tva:metadata:cs:IntendedAudienceCS:2005 as defined in Annex A.11 of [TVA-Metadata], for the value "other" of the "type" attribute.

6.3.4.3 BDSSpecificEntryPointInfo definition

Section 5.4.1.5.2 of [BCAST12-SG] specifies how SGDDs can include the definition of SGEntryPoints over BCAST BDS broadcast channels. Each broadcast SGEntryPoint (i.e. SG Announcement Channel) in a BCAST BDS is declared partially by generic parameters (such as 'srcIpAddress', 'port', etc.) and partially by BDS-specific parameters, provided in each BDS Adaptation TS via the extension by derivation of the abstract type of BDSSpecificEntryPointInfo element.

For the DVB-H BDS, the abstract type of BDSSpecificEntryPointInfo element is derived as follows:

Name	Type	Category	Cardinality	Description	Data Type
BDSSpecificEntryPointInfo	E5	NM/TM	0..1	The placeholder for the supplementary information that is required in order to retrieve the broadcast SG entry point in BCAST BDS, i.e. in DVB-H BDS for the present specification.	complexType deriving from abstract type of BDSSpecificEntryPointInfo element
frequency	E6	NM/TM	1..N	Center frequency in kHz of the DVB-H signal to tune to. This element MAY be instantiated multiple times in the case where the Transport Stream carrying the SG Announcement Channel is transmitted over different frequencies (same TS available on different cells).	unsignedInt
useLPChannel	E6	NM/TM	0..1	When DVB-H hierarchical modulation is used, present and set to True to signal the use of LP channel, or present and set to False to signal the use of HP channel.	boolean
IPplatformID	E6	NM/TM	1	Identifies the IP platform which the IP flow 'SG Announcement Channel' belongs to.	unsignedInt
networkID	A	NM/TM	0..1	When the IP Platform ID is not globally unique, identifies the DVB Network scoping the IP Platform ID value.	unsignedShort

6.3.5 Service Guide Discovery

Service Guide discovery in DVB-H networks SHALL be realized using DVB-IPDC standards, as explained below.

Except for the mechanism of discovering the Service Guide entry point specified in this Adaptation Specification, the specification in section 6 of [BCAST12-SG] SHALL apply.

The network provides PSI/SI information as specified in [ETSI TS 102 470-1]. The terminal MAY use PSI/SI information to find out if there is an ESG bootstrap session on an IP Platform by checking whether the INT signals the IP multicast address

reserved for ESG bootstrapping according to Section 9.2 of [ETSI TS 102 471]. It is assumed that there is an ESG bootstrap session where Service Guides are described with ESGProviderDiscovery Descriptors, as specified in Section 9 of [ETSI 102 471]. This also applies to describing OMA BCAST Service Guides.

The ESG bootstrap session SHALL be a FLUTE session as specified in [ETSI TS 102 471]. If bootstrap is used to signal an OMA BCAST Service Guide, then the bootstrap SHALL contain the description as specified in Section 6.3.5.1.1 below. There MAY be more than one OMA BCAST compliant Service Guide on an IP Platform.

The terminal SHALL be able to receive the ESG bootstrap session and process the contents (i.e. ESGProviderDiscovery descriptors and ESGAccessDescriptors) with the additions and changes described in this document.

In case there is no ESG bootstrap session, the existence of an OMA BCAST compliant Service Guide MAY be signalled otherwise. However, this is out of scope of BCAST.

6.3.5.1 Bootstrap descriptors

The following sections specify the ESGProviderDiscovery Descriptor and ESGAccessDescriptor that are used within the bootstrap session to allow the discovery of the provider of the service guide and the access to the service guide. In both cases, underlying DVB-IPDC functionality is re-used as explained below.

6.3.5.1.1 ESGProviderDiscovery Descriptor

An ESGProviderDiscovery Descriptor (see section 9.1.1 of [ETSI 102 471]) which references a Service Guide conforming to OMA BCAST 1.2

- SHALL be of version 1, signalled in the FDT by the MIME type “text/xml”. The terminal SHALL consider ESGProviderDiscovery Descriptors of other versions or MIME types being not compliant with OMA BCAST.
- SHALL have the attribute “format” of the ServiceProvider entry referencing the BCAST Service Guide set to the string “urn:oma:xml:bcast:sg:fragments:1.2”. The terminal SHALL consider ServiceProvider entries without this attribute or with this attribute having a different value being not compliant with OMA BCAST 1.2.

6.3.5.1.2 ESGAccessDescriptor

ESGAccessDescriptor gives the access information to the ESG sessions as specified in Section 9.1.2 of [ETSI TS 102 471].

In the ESGAccessDescriptor, ESG entries SHALL all be of version 1.

In addition, the field “MultipleStreamTransport” in the ESGAccessDescriptor has no meaning in this specification. Thus, it is reserved and SHALL be set to 0.

An OMA BCAST compliant ESGAccessDescriptor file is signalled in the FDT of the ESG bootstrap FLUTE session by setting the attribute Content-Type=”application/vnd.oma.bcast.sgboot”.

The session accessible with ESGAccessDescriptor SHALL be a Service Guide Announcement Channel as described in [BCAST12-SG].

6.4 Generic adaptation related to OMA-TS-BCAST_SvcCntProtection and OMA-TS-DRM-XBS

The provisions in the two specifications [BCAST12-ServContProt] and [DRM20-Broadcast-Extensions] SHALL apply.

For the Smartcard Profile, only the Session Description Method for Acquiring SEK/PEK as defined in section 6.10.1.2 of [BCAST12-ServContProt] SHALL be used to provide the entry point to the BSM.

6.5 Generic adaptation related to OMA-TS-BCAST-Distribution

6.5.1 File Distribution

The specification in section 5.2 of [BCAST12-Distribution] SHALL apply.

Note: The interface between BSD/A and DVB-IPDC network entity. i.e., FD-B1 is not defined in BCAST 1.2 Enabler because DVB-IPDC does not specify the external interface between DVB-IPDC network entities and 3rd party entity.

In addition the following SHALL apply as specified in [ETSI TS 102 472]

- Terminals SHALL support interpretation of source packets constructed according to the source packet construction and reception component of the Raptor FEC Scheme for the case where there is a single sub-block (i.e. N=1).
- Terminals MAY support the Repair packet construction and Raptor FEC decoding component of the Raptor FEC Scheme.

6.5.2 Associated Delivery Procedures

The specification in section 5.3 of [BCAST12-Distribution] SHALL apply.

6.5.3 Stream Distribution

The specification in section 6 of [BCAST12-Distribution] SHALL apply.

FEC RAPTOR scheme (FEC encoding ID 1) is not supported for Stream Distribution.

Note: The interface between BSD/A and DVB-IPDC network entity. i.e. SD-B1 is not defined in BCAST 1.2 Enabler because DVB-IPDC does not specify the external interface between DVB-IPDC network entities and 3rd party entity.

6.5.3.1 Buffer control

Due to the use of time-slicing, buffer control is required to enable the delivery of BCAST services over a DVB-H network.

Both the BDS Service Distribution and the Terminal SHALL support the Hypothetical Receiver Buffering Model as specified in [ETSI TS 102 472], Section 5.3.

6.5.4 Media codecs

The Terminal SHALL be able to receive, decode and render the codecs and payload types that are MANDATORY according to Annex B of [ETSI TS 102 005].

The Terminal SHOULD be able to receive, decode and render the codecs and payload types that are RECOMMENDED according to Annex B of [ETSI TS 102 005].

The Terminal MAY be able to receive, decode and render the codecs and payload types that are OPTIONAL according to Annex B of [ETSI TS 102 005].

7. BDS specific adaptation to DVB-IPDC functionality

This Section describes which DVB-IPDC technologies are deployed with BCAST technologies and how the nine BCAST functions are adapted to IPDC over DVB-H. The adaptation can be implemented via restrictions and extensions of the BCAST specifications (namely [BCAST12-Services], [BCAST12-SG], [BCAST12-ServCntProt], [BCAST12-Distribution] and [DRM20-Broadcast-Extensions]). The provisions in this section take precedence over the ones in the BCAST specifications to enable BCAST services distributed over DVB-H to be shared with DVB-IPDC terminals.

All normative statements in this specification are only applicable to cases where OMA BCAST services are distributed over a DVB-H network specified in [ETSI EN 302 304].

BDS Specific adaptation MAY be supported by BCAST Network entities and SHALL be supported by BCAST Terminal.

7.1 Access to the IP layer

Section 6.1 SHALL apply.

7.2 BDS specific adaptation related to OMA-TS-BCAST_Services

7.2.1 Interaction

For BCAST terminals with an interactive channel, Section 6.2.1 SHALL apply.

7.2.2 Service Provisioning

For BCAST terminals with an interactive channel, Section 6.2.2 SHALL apply.

7.2.3 Terminal Provisioning

Section 6.2.3 SHALL apply.

7.2.4 Notification

Section 6.2.4 SHALL apply.

7.3 BDS specific adaptation related to OMA-TS-BCAST_ServiceGuide

7.3.1 Service Guide Delivery over Broadcast Channel

Section 6.3.1 SHALL apply.

FLUTE SHALL be used by both SG-D in the network and SG-C in the terminal for the delivery of Service Guide over interface SG-5.

7.3.2 Compression of Service Guide Delivery Units

Section 6.3.2 SHALL apply.

7.3.3 Session Description

Section 6.3.3 SHALL apply.

7.3.3.1 SessionDescription for broadcast streamed media sessions

Section 6.3.3.1 SHALL apply.

7.3.3.2 SessionDescription for broadcast file delivery sessions

Section 6.3.3.2 SHALL apply.

7.3.4 Service Guide Data Model

Section 6.3.4 SHALL apply.

7.3.4.1 CellTargetAreain DVB-H

Section 6.3.4.1 SHALL apply.

7.3.4.2 Genre definition

Section 6.3.4.2 SHALL apply.

7.3.5 Service Guide Discovery

Section 6.3.5 SHALL apply.

7.4 BDS specific adaptation related to OMA-TS-BCAST_SvcCntProtection and OMA-TS-DRM-XBS

The provisions in the two specifications [BCAST12-ServContProt] and [DRM20-Broadcast-Extensions] SHALL apply, unless otherwise stated in the following sub-sections

7.4.1 Encryption Protocols

The specification in Section 9 "Encryption Protocols" of [BCAST12-ServContProt] with the constraints indicated below in Section 7.4.1.1 SHALL apply.

IPsec, SRTP and ISMACryp are the common content encryption methods included in both DVB-IPDC and BCAST specifications and hence OMA BCAST Terminals SHALL support IPsec, SRTP and ISMACryp.

7.4.1.1 Constraints on content encryption

This Section clarifies specific restrictions on the use of IPsec, SRTP and ISMACryp relative to what is described in [BCAST12-ServContProt] so that compliance to DVB-IPDC specifications is achieved, i.e., so that a common encryption layer is achieved, allowing both BCAST Terminals and DVB-IPDC Terminals to access the same encrypted stream.

IPsec

The specification in Section 9.1 of [BCAST12-ServContProt] SHALL apply.

SRTP

The specification in Section 9.2 of [BCAST12-ServContProt] with the following constraints SHALL apply:

A NULL Master Salt SHALL be used.

When the Smartcard Profile is used, MKI length SHALL be 2 bytes. Note that as DVB-IPDC provides a range of acceptable MKI lengths, the Service Provider must ensure this is applied.

When the Smartcard Profile is not used, the MKI length MAY be variable.

ISMACryp

The specification in Section 9.3 of [BCAST12-ServContProt] SHALL apply.

The Table 2 below summarises constraints required for IPsec, SRTP and ISMACryp to allow BCAST and DVB-IPDC Terminals to share access to a common encrypted data stream.

Parameter	DRM Profile	Smartcard Profile
TEK ID for IPsec	SPI (32 bits)	SPI (32 bits) = 0x0001 || MTK ID (2 bytes)
TEK ID for SRTP	MKI (2 bytes) for compatibility with Smartcard Profile, otherwise variable i.e. matching that used by DVB-IPDC	MKI = MTK ID (2 bytes) for BCAST
MK for SRTP	128 bits	128 bits
MS for SRTP	NULL	NULL
TEK ID for ISMACryp	key_indicator (2 bytes)	MTK ID (2 bytes)
TEK for ISMACryp	key_k (128 bits)	128 bits
MS for SRTP auth	112 bits in SDP	112 bits

Table 2: Encryption parameters for shared BCAST / DVB-IPDC encrypted content stream

7.4.2 Key Management

In both cases, specific constraints on layer 4 for streams are detailed in Section 7.4.1.1 above, to be compatible with DVB-IPDC terminals.

7.4.2.1 DRM Profile

As specified in [BCAST12-ServContProt] and [DRM20-Broadcast-Extensions].

STKMs and LTKMs MAY be shared between DRM Profile and DVB-IPDC 18Crypt devices.
Following constrains on STKM SHALL be followed:

- protection_after_reception SHALL be 0 (i.e content protection)
- the most significant bit of the traffic_key_lifetime SHALL be 0 (i.e the lifetime SHALL NOT exceed 128 seconds)
- next_master_key_index_flag, if present, SHALL be 0 (i.e. next_master_key_index field not present)
- next_master_salt_flag, if present, SHALL be 0 (i.e. next_master_salt field not present)
- master_salt_flag, if present, SHALL be 0 (i.e. master_salt field not present, and a NULL value SHALL be assumed)
- traffic_protection_protocol SHALL NOT be TKM_ALGO_DCF (i.e. DCF encryption protocol SHALL NOT be used)
- if traffic_protection_protocol is TKM_ALGO_ISMACRYP, then traffic_authentication_flag SHALL be 0 (i.e. traffic authentication SHALL NOT be used for ISMACryp)
- In parental_rating Access Criteria Descriptor, if available, the rating_type SHALL NOT be greater than 9. The rating_value SHALL only assume values that are specified in [ETSI TS 102 474], table B.6.

Note that DVB-IPDC 18Crypt devices will ignore the location_based_restriction_descriptor as defined in section 7.1.2 of [BCAST12-ServContProt].

Following constrains on LTKM SHALL be followed:

- BCRO SHALL NOT be signed, but MAC SHALL be used
- when broadcasting BCROs, other addressing modes than the following SHALL NOT be used:
    - Whole Fixed Subscriber Group Addressing (mode 0x0),

- Subset of Fixed Subscriber Group Addressing (mode 0x1),
- Unique Device Addressing (mode 0x2, 0x3),
- Domain Addressing (mode 0x4)

Following constrains on Token Delivery Response message SHALL be followed:

- BCRO SHALL NOT be signed, but MAC SHALL be used

7.4.2.2 Smartcard Profile

As specified in [BCAST12-ServContProt].

Only the Session Description Method for Acquiring SEK/PEK as defined in section 6.10.1.2 of [BCAST12-ServContProt] SHALL be used to provide the entry point to the BSM.

7.5 BDS specific adaptation related to OMA-TS-BCAST-Distribution

Section 6.5 SHALL apply.

7.5.1 File Distribution

The BSD/A SHALL use FLUTE [RFC3926] for file distribution

Note: The interface between BSD/A and DVB-IPDC network entity. i.e. FD-B1 is not defined in BCAST 1.2 Enabler because DVB-IPDC does not specify the external interface between DVB-IPDC network entities and 3rd party entity.

7.5.1.1 Signalling of parameters with FLUTE

FLUTE FDT Instances SHALL comply with [BCAST12-Distribution], with the following restrictions:

- Content-Type attribute SHALL be included either in the <FDT-Instance>, the <File> element or both;
- Content-Length attribute SHALL be included in each <File> element.

7.5.1.2 FDT Instance schema restrictions

FLUTE FDT Instances SHALL comply with BCAST FDT Instance schema defined in [BCAST12-Distribution].

In addition, DVB-H adaptation restrictions defined in section 7.5.1.1 SHOULD be enforced in BCAST FDT Instances, using the ‘xsi:type’ attribute as follows:

- Type of <FDT-Instance> element SHOULD be ’FDT-InstanceType-BdsDvb’ or ’FDT-InstanceType-BdsMbmsDvb’ from BCAST FDT namespace ;
- Type of <File> element type SHOULD be ’FileType-BdsMbmsDvb’ from BCAST FDT namespace.

7.5.2 Associated Delivery Procedures

Section 6.5.2 SHALL apply.

If the Associated Delivery Procedure is supported, a Terminal and BSD/A SHALL support the XML schema definitions for the associated delivery procedures as defined in [BCAST12-Distribution], and the BSD/A SHALL instantiate a ‘serverURI’ element.

7.5.3 Stream Distribution

Section 6.5.3 SHALL apply.

The BSD/A SHALL send RTCP sender reports as described in [ETSI TS 102 472].

Note: The interface between BSD/A and DVB-IPDC network entity. i.e. SD-B1 is not defined in BCAST 1.2 Enabler because DVB-IPDC does not specify the external interface between DVB-IPDC network entities and 3rd party entity.

7.5.3.1 Buffer control

Section 6.5.3.1 SHALL apply.

7.5.4 Media codecs

Section 6.5.4 SHALL apply.

7.6 BDS Specific adaptation related to operation without an Interactivity Channel

OMA BCAST Broadcast Services protected by the DRM profile, may be used with an Interactivity Channel or without an Interactivity Channel. The support for functionality from the DRM profile without the use of an Interactivity Channel is specified in this section.

- The Broadcast Mode of Operation is the mode of operation where the Broadcast Channel is used for device (re-) registration, domain management, token management and BCRO reception. For Broadcast Services that support Broadcast Mode of operation using DVB-H as a bearer, no particular addressing scheme defined by OMA BCAST is mandated.

For Devices, the following applies

- The support of device (re-) registration, domain management, token management and BCRO reception over the DVB-H Broadcast Channel is optional for Devices.
- Of all addressing modes defined by OMA BCAST, devices supporting the Broadcast Mode of operation SHALL support:
    - Whole Fixed Subscriber Group Addressing (mode 0x0),
    - Subset of Fixed Subscriber Group Addressing (mode 0x1),
    - Unique Device Addressing (mode 0x2, 0x3),
    - Domain Addressing (mode 0x4).

8. Walkthrough: Distribution of BCAST Services over DVB-H (Informative)

This section describes a walkthrough of all actions needed to receive a BCAST service distributed over DVB-H. It just describes the main actions and using selected functions and features. Not all possible options and variations are described here.

8.1 Power up, Network Attachment, Initial Procedures

When the receiver is powered up or enters a new network the receiver has to tune into the right frequency. This frequency can be either pre-provisioned or provisioned according to mechanisms described in service provisioning specification. If the frequency is not provisioned at all, the terminal performs a signal scan. DVB-H signals carry Time Slicing parameters. During the scan the receiver tests a frequency, tries to lock to the signal and when locked, inspects the Time Slicing indicator from TPS bits in the signal. If this is not available, the receiver discards the signal and proceeds to next one. Once a signal with Time Slicing Indicator is found the terminal looks up the network information in the signal (NIT table, see below). This table carries the lists of frequencies for the current network. When the terminal has performed a full signal scan the terminal has gathered all frequency information from the NIT tables and can now tune into any DVB-H signal.

In order to complete this step successfully the terminal has to know the “IP Platform” over which its service provider operates. The “IP Platform” identifies on which Transport Stream(s) – i.e. DVB-H signal(s) – the service provider’s data are being carried over. This “IP Platform” information can be pre-provisioned, provisioned according to mechanisms described in service provisioning specification or selected by the user when the BCAST application is launched on the terminal. Below the bootstrapping procedure is described.

Once it can access DVB-H signals the terminal starts to look for the proper “IP Platform” in the NIT table (platform_id parameter). When the IP Platform of his service provider is found the terminal starts with service guide bootstrapping. This is elaborated below.

8.2 Service Guide Bootstrapping

IPDC over DVB-H is a system where IP flows are carried in the form of IP streams inside MPEG-2 Transport Streams. When an end-user selects a service the terminal has to tune into an IP stream which provides the service. The importance of this step is twofold:

- Find the information which provides the mapping between IP flows and MPEG-2 TS (IP streams), so the terminal knows where to find the right IP stream of a service.
- Find the entry point of the SG, because the SG provides the mapping between end-user services and IP streams.

MPEG-2 Transport Streams are made up of packets of 188 bytes. Each packet is identified by its PID (Packet IDentifier) value in the header of the packet. There are special packets that provide information about what can be found in other packets. These packets are the PSI/SI packets and carry tables with information. MPEG-2 Transport Stream traffic is grouped in *programs*. A *program* is an MPEG-2 concept that resembles a TV channel. These *programs* consist out of *elementary streams* of audio, video and/or data. The PMT table lists the PIDs of the *elementary streams* that make up a single *program*. The PAT table has a list of all *programs* and the PID value of the PMT table. The PAT table is the root table and always carries PID#0, so can be easily found. This is illustrated in the figure below.

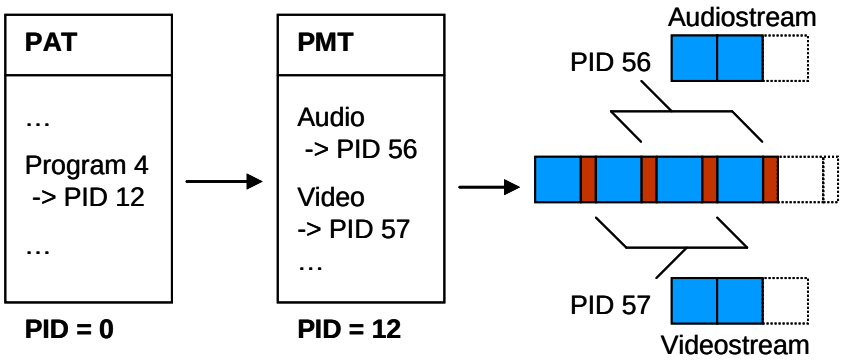

Figure 1: Illustration of the function of PAT and PMT tables in MPEG-2 TS

Illustration of the function of PAT and PMT tables in MPEG-2 TSInformation about the DVB network is written down in the NIT (Network Information Table). The NIT always carries PID#10. The NIT is the first table the terminal accesses when it parses a MPEG-2 TS. For bootstrapping purposes of DVB-H services the important part is that the NIT contains a list of IP platform ID's and for each IP platform ID it indicates where the INT (IP/MAC Notification table) can be found. So the terminal goes through the NIT and looks for it's Platform ID and gets the *program* number for the INT table. It then looks for this *program* in the PAT, finds the PID of the PMT and this PMT tells the PID of the *elementary stream* that carries the actual INT data. The INT data contains the important mapping between the IP streams and the MPEG-2 *programs* and *elementary streams*. For each IP stream it is listed in which *program* and which *elementary stream* the IP stream can be found.

When the content of the INT table is known by the terminal it can now start to receive the Electronic Service Guide. In order to do this it needs the SG entry point. This is the IP destination address of the IP flow which contains SG data. This SG entry point can be pre-provisioned or provisioned according to mechanisms described in the terminal provision function of the Services specification [BCAST12-Services].

8.3 Service Guide Reception and Update

The service guide provides the end-user with the information about all available services. The service guide consists of user readable data. The user can make a selection based on this data. When a user selects a service, it basically tells the terminal to tune into a certain IP flow, for which the terminal has to select the appropriate IP stream.

This step describes how the service guide is received and how updates are received. This step assures that the terminal has the correct information:

- about how to access the service (IP flow addresses, SDP information, service protection information etc)
- about the service itself form user presentation (title, language, length, start and end-time, price etc.)

The SG data is carried in SGDU's. Each SGDU is announced in a Descriptor Entry. A Descriptor Entry is carried inside the SGDD. The SGDD is the 'root' of the SG. There can be several SGDD's for the service guide, e.g. one which only carries the data of the next 2 hours, one which carries the SG of the day and one for the whole week. The terminal only collects those SGDU's, which belongs to his service provider. For this purpose the Descriptor Entries carries a BSMSelector in the Grouping criteria.

When certain portions of the ESG are not valid anymore, the terminal has the option to keep them for a while or throw them away.

8.4 Service Ordering

When the user received the service guide it can select a service it wishes to use. Before the user can use a broadcast service it needs to subscribe to this service. The services which do not require subscription are excluded. Such services are indicated by the omission of an associated Purchase Data fragment or which do have a purchase data fragment but the price is set to zero. Subscription basically means that the terminal receives the key to decrypt the service. The user can subscribe to items listed

in the PurchaseItems of the service guide. The PurchaseData informs the user what the prices and conditions for use are. The PurchaseChannel gives the user the location where subscriptions can be requested via the return channel.

For terminals supporting the DRM profile:
Upon subscription request the terminal sends a “purchase request” to the PurchaseURL. The terminal will receive a message in return, which triggers the terminal to start the required procedure to obtain a service key, the so called ROAP RO acquisition trigger.

For terminals supporting the smartcard profile:
Upon subscription the terminal immediately sends Service Registration Requests to the PermissionsIssuerURI.

Another option is that the user starts an acquisition procedure through the webshop. This is typically the portal of the service provider, where the user can select the items they want to subscribe to. When the user completed filling the shopping basket the subscription process is completed by using one of the two methods above depending on the service protection profile.

When this procedure is finalized, the terminal will be in possession of the service key required to decrypt the traffic.

8.5 Service Reception

8.5.1 Streaming Service

Streaming services like TV channels are delivered to the terminal as video and audio over RTP/UDP/IP. When the user selects a service the SG provides the terminal with required information to access the IP flow. The terminal first verifies in its internal database whether the user has subscribed himself to this service. If so, the terminal knows it has the required service key to decrypt the content.

The correct IP stream is found by the terminal by looking up the IP address in the INT table. Via PAT and PMT tables this gives the terminal the correct MPEG-2 *elementary stream*. In a typical scenario a single TV channel has an IP stream for each of its components: video, audio (multiple languages) and several key streams (for each service protection profile and for each service provider). The SDP parameters give the terminal the encoding type and format of the components of a service.

Streams can be delivered unprotected (FTA), protected at the IP layer, the SRTP layer or at the Access Unit layer.

8.5.2 Download Service

Receiving download services are basically the same as streaming services. However, files are delivered over FLUTE/ALC/UDP/IP. Files can be delivered either unprotected, protected at the IP layer or as OMA DRM type of files (DCF or PDCF).

Appendix A. Change History (Informative)

A.1 Approved Version History

Reference	Date	Description
OMA-TS-BCAST_DVB_Adaptation-V1_0-20090212-A	12 Feb 2009	Status changed to Approved by TP TP Ref # OMA-TP-2009-0071-INP_BCAST_V1_0_ERP_for_Notification_and_Final_Approval
OMA-TS-BCAST_DVB_Adaptation-V1_0_1-20130109-A	09 Jan 2013	Status changed to Approved by TP TP Ref # OMA-TP-2013-0001-INP_BCAST_V1_0_1_ERP_for_notification
OMA-TS-BCAST_DVB_Adaptation-V1_1-20131029-A	29 Oct 2013	Status changed to Approved by TP TP Ref # OMA-TP-2013-0332-INP_BCAST_V1_1_ERP_for_final_Approval
OMA-TS-BCAST_DVB_Adaptation-V1_2-20170131-A	31 Jan 2017	Status changed to Approved by TP TP Ref # OMA-TP-2017-0002-INP_BCAST-V1_2_ERP_for_Final_Approval

Appendix B. Static Conformance Requirements (Normative)

The notation used in this appendix is specified in [IOPPROC].

B.1 SCR for BCAST Terminal

Item	Function	Reference	Status	Requirement
BCAST-DVBIPDC-C-001	Support DVB-IPDC adaptation		O	BCAST-DVBIPDC-C-002 OR BCAST-DVBIPDC-C-005
BCAST-DVBIPDC- C-002	Support Broadcast Channel reception over IP Bearer	Sections 6 and 7	O	BCAST-DVBIPDC-C-006 AND BCAST-DVBIPDC-C-009 AND BCAST-DVBIPDC-C-020 AND BCAST-DVBIPDC-C-021
BCAST-DVBIPDC-C-003	Support the adaptation of Service Protection Function for broadcast reception only		O	BCAST-DVBIPDC-C-016 AND BCAST-DVBIPDC-C-017 AND BCAST-DVBIPDC-C-018 AND BCAST-DVBIPDC-C-019 AND BCAST-DVBIPDC-C-004
BCAST-DVBIPDC-C-004	Support DVB-H adaptation related to operation without an interactivity channel	Section 7.6	O	
BCAST-DVBIPDC- C-005	Support Broadcast Channel and Interaction Channel for BCAST DVB-IPDC Adaptation	Sections 6 and 7	O	BCAST-DVBIPDC-C-006 AND BCAST-DVBIPDC-C-007 AND BCAST-DVBIPDC-C-008 AND BCAST-DVBIPDC-C-009 AND BCAST-DVBIPDC-C-020 AND BCAST-DVBIPDC-C-021
BCAST-DVBIPDC-C-006	Support DVB-IPDC Media Codecs	Sections 6.5.4 and 7.5.4	O	
BCAST-DVBIPDC-C-007	Support Service interaction between BSA and BSM and Terminal	Sections 6.2.1 and 7.2.1	O	
BCAST-DVBIPDC-C-008	Support for the BCAST MO IPDC sub nodes	Sections 6.2.3 and 7.2.3	O	
BCAST-DVBIPDC-C-009	Support the adaptation of Service Guide Function for DVB-IPDC Network	Sections 6.3 and 7.3	O	BCAST-DVBIPDC-C-010 AND BCAST-DVBIPDC-C-011 AND BCAST-DVBIPDC-C-012
BCAST-DVBIPDC-C-010	Support Service Guide Delivery over Broadcast Channel	Sections 6.3.1 and 7.3.1	O	
BCAST-DVBIPDC-C-011	Support Session Description	Sections 6.3.3 and 7.3.3	O	
BCAST-DVBIPDC-C-012	Support Service Guide Discovery by Terminal	Sections 6.3.5 and 7.3.5	O	
BCAST-DVBIPDC-C-013	Support Adaptation of BCAST Service Protection Function for interactive and broadcast reception	Sections 6.4 and 7.4	O	(BCAST-DVBIPDC-C-014 OR BCAST-DVBIPDC-C-015) AND BCAST-DVBIPDC-C-017 AND BCAST-DVBIPDC-C-018 AND BCAST-DVBIPDC-C-019
BCAST-DVBIPDC-C-014	Adaptation of DRM Profile DVB-IPDC	Sections 6.4 and 7.4	O	BCAST-DVBIPDC-C-016

Item	Function	Reference	Status	Requirement
BCAST-DVBIPDC-C-015	Support Smartcard Profile	Sections 6.4 and 7.4	O	
BCAST-DVBIPDC-C-016	Support LTKM and STKM restrictions for Service Protection	Sections 6.4 and 7.4.2.1	O	
BCAST-DVBIPDC-C-017	Support SRTP	Sections 6.4, 7.4.1 and 7.4.1.1	O	
BCAST-DVBIPDC-C-018	Support IPSEC	Sections 6.4, 7.4.1 and 7.4.1.1	O	
BCAST-DVBIPDC-C-019	Support ISMACryp	Sections 6.4, 7.4.1 and 7.4.1.1	O	
BCAST-DVBIPDC-C-020	Support File Distribution extensions	Sections 6.5.1 and 7.5.1	O	
BCAST-DVBIPDC-C-021	Support Buffer Control	Sections 6.5.3.1 and 7.5.3.1	O	

B.2 SCR for BCAST BSM

Item	Function	Reference	Status	Requirement
BCAST-DVBIPDC-BSM-001	Support BCAST Adaptation on DVB-IPDC Network		O	BCAST-DVBIPDC-BSM-002 OR BCAST-DVBIPDC-BSM-005
BCAST-DVBIPDC-BSM-002	Support DVB-IPDC Generic Adaptation	Section 6	O	BCAST-DVBIPDC-BSM-003 AND BCAST-DVBIPDC-BSM-004
BCAST-DVBIPDC-BSM-003	Support Broadcast and interactive communication between BSM and Terminal		O	
BCAST-DVBIPDC-BSM-004	Support for the BCAST MO IPDC sub nodes	Section 6.2.3	O	
BCAST-DVBIPDC-BSM-005	Support DVB-IPDC Specific Adaptation	Section 7	O	(BCAST-DVBIPDC-BSM-003 AND BCAST-DVBIPDC-BSM-004) OR BCAST-DVBIPDC-BSM-006
BCAST-DVBIPDC-BSM-006	Broadcast only support between BSM and Terminal		O	
BCAST-DVBIPDC-BSM-007	Adaptation of DRM Profile for DVB-IPDC		O	BCAST-DVBIPDC-BSM-008 OR (BCAST-DVBIPDC-BSM-008 AND BCAST-DVBIPDC-BSM-009)
BCAST-DVBIPDC-BSM-008	Support LTKM and STKM restrictions for Service Protection	Section 7.4.2.1	O	
BCAST-DVBIPDC-BSM-009	Support DVB-H adaptation related to operation without an interactivity channel	Section 7.6	O	

B.3 SCR for BCAST BSD/A

Item	Function	Reference	Status	Requirement
BCAST-DVBIPDC-BSDA-001	Support BCAST Adaptation on DVB-H IPDC Network		O	BCAST-DVBIPDC-BSDA-002 AND (BCAST-DVBIPDC-BSDA-003 OR BCAST-DVBIPDC-BSDA-010)
BCAST-DVBIPDC-BSDA-002	Support IP bearer	Sections 6.1 and 7.1	O	
BCAST-DVBIPDC-BSDA-003	Support DVB-H IPDC Generic Adaptation	Section 6	O	(BCAST-DVBIPDC-BSDA-004 AND BCAST-DVBIPDC-BSDA-005 AND BCAST-DVBIPDC-BSDA-009) OR (BCAST-DVBIPDC-BSDA-005 AND BCAST-DVBIPDC-BSDA-009)
BCAST-DVBIPDC-BSDA-004	Support Interactive communication between BSDA and Terminal		O	
BCAST-DVBIPDC-BSDA-005	Support adaptation of Service Guide Function for DVB-H IPDC Network	Section 6.3	O	BCAST-DVBIPDC-BSDA-006 AND BCAST-DVBIPDC-BSDA-007 AND BCAST-DVBIPDC-BSDA-008
BCAST-DVBIPDC-BSDA-006	Support Service Guide Delivery over Broadcast Channel extensions	Section 6.3.1	O	
BCAST-DVBIPDC-BSDA-007	Support Session Description	Section 6.3.3	O	
BCAST-DVBIPDC-BSDA-008	Support Service Guide Discovery by Terminal	Section 6.3.5	O	
BCAST-DVBIPDC-BSDA-009	Support Buffer Control	Section 6.5.3.1	O	

Item	Function	Reference	Status	Requirement
BCAST-DVBIPDC-BSDA-010	Support DVB-H IPDC Specific Adaptation	Section 7	O	(BCAST-DVBIPDC-BSDA-004 AND BCAST-DVBIPDC-BSDA-005 AND BCAST-DVBIPDC-BSDA-020 AND BCAST-DVBIPDC-BSDA-011 AND BCAST-DVBIPDC-BSDA-012 AND BCAST-DVBIPDC-BSDA-009) OR (BCAST-DVBIPDC-BSDA-005 AND BCAST-DVBIPDC-BSDA-020 AND BCAST-DVBIPDC-BSDA-011 AND BCAST-DVBIPDC-BSDA-012 AND BCAST-DVBIPDC-BSDA-009)
BCAST-DVBIPDC-BSDA-011	Support FLUTE for File Distribution	Sections 7.5.1, 7.5.1.1 and 7.5.1.2	O	
BCAST-DVBIPDC-BSDA-012	Support RTCP sender reports for Stream Distribution	Section 6.5.3	O	
BCAST-DVBIPDC-BSDA-013	Support the specific adaptation of Service Protection Function and Content Protection Function		O	BCAST-DVBIPDC-BSDA-014
BCAST-DVBIPDC-BSDA-014	Support Encryption Protocol	Section 7.4.1	O	BCAST-DVBIPDC-BSDA-015 OR BCAST-DVBIPDC-BSDA-016 OR BCAST-DVBIPDC-BSDA-017
BCAST-DVBIPDC-BSDA-015	Support SRTP constraints	Section 7.4.1.1	O	
BCAST-DVBIPDC-BSDA-016	Support IPSEC	Section 7.4.1.1	O	
BCAST-DVBIPDC-BSDA-017	Support ISMACryp	Section 7.4.1.1	O	
BCAST-DVBIPDC-BSDA-018	Support for Associated Delivery Procedure adaptation		O	BCAST-DVBIPDC-BSDA-019
BCAST-DVBIPDC-BSDA-019	Support XML schema for Associated Delivery Procedure and instantiate a ServiceURI element	Section 7.5.2	O	

Item	Function	Reference	Status	Requirement
BCAST-DVBIPDC-BSDA-020	Service Guide delivery using FLUTE	Section 7.3.1	O	

B.4 SCR for BCAST BSA

Item	Function	Reference	Status	Requirement
BCAST-DVBIPDC-BSA-001	Support BCAST Adaptation on DVB-H IPDC Network		O	BCAST-DVBIPDC-BSA-002 OR BCAST-DVBIPDC-BSA-003
BCAST-DVBIPDC-BSA-002	Support DVB-H IPDC Generic Adaptation	Section 6	O	BCAST-DVBIPDC-BSA-004 OR (BCAST-DVBIPDC-BSA-004 AND BCAST-DVBIPDC-BSA-005)
BCAST-DVBIPDC-BSA-003	Support DVB-H IPDC Specific Adaptation	Section 7	O	BCAST-DVBIPDC-BSA-004 OR (BCAST-DVBIPDC-BSA-004 AND BCAST-DVBIPDC-BSA-005)
BCAST-DVBIPDC-BSA-004	Support DVB-H IPDC MEDIA CODEC	Section 7.5.4	O	
BCAST-DVBIPDC-BSA-005	Support the interactive communication between BSA and Terminal	Section 7.2.1	O	

Appendix C. MIME type registration for Service Guide Bootstrap

The MIME type is used to signal an OMA BCAST compliant Access Descriptor in the Service Guide bootstrap session over DVB-IPDC. This section provides the registration request fort his MIME type according to [RFC 2048].

Name: Uwe Rauschenbach

Email: uwe.rauschenbach@nsn.com

MIME media type name: application

MIME subtype name: Vendor Tree - vnd.oma.bcast.sgboot

Required parameters: none

Optional parameters: none

Encoding considerations: binary

Security considerations: The binary structure does neither carry executable code nor active content which may represent a security threat. Furthermore, no confidential fields are included. The information present in this media format is used to configure the receiving application. Thus, the usage of the format may be vulnerable to attacks modifying or spoofing the content of this format. Depending on the system architecture, it is recommended to use source authentication and integrity protection.

Interoperability considerations:
This content type carries session setup parameters which allow a terminal to determine an ALC session from which it can acquire a Service Guide. The OMA BCAST enabler specification includes static conformance requirements and interoperability test cases for this content.

Published specification:
OMA BCAST 1.0 Enabler Specification – BCAST Distribution System Adaptation – IPDC over DVB-H. Available from http://www.openmobilealliance.org

Additional information: none

1. Magic number(s): n/a
2. File extension(s): n/a
3. Macintosh file type code: n/a
4. Object Identifiers: n/a

Person to contact for further information:

1. Name: Uwe Rauschenbach
2. Email: uwe.rauschenbach@nsn.com

Intended usage: Limited use
This MIME media type is registered for use with the OMA BCAST Enabler

Author/Change controller: OMNA – Open Mobile Naming Authority, OMA-OMNA@mail.openmobilealliance.org