



Broadcast Distribution System Adaptation – Forward Link Only

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1. Scope

This document specifies how the BCAST 1.1 enabler is implemented over a specific BDS (Broadcast Distribution System).

The BCAST 1.1 Enabler supports the global interoperability among different Broadcast Distribution Systems, and can also be adapted according to the specific characteristics of Broadcast Distribution Systems for BCAST 1.1 enabler implementation over a certain BDS.

The BCAST 1.1 Enabler includes nine functions and all nine BCAST functions can be implemented over the Forward Link Only BDS with minimal adaptation needed to achieve this. This is referred to as "generic adaptation", which can be applied for any kind of BDS.

The underlying BDS may already have methods for some functions defined in the BCAST 1.1 Enabler. In this case the BCAST adaptation mode is referred to as a "BDS-specific adaptation". A BDS-specific adaptation is out of scope in BCAST 1.1.

This is further explained in Section 4 - Introduction.

2. References

2.1 Normative References

- [BCAST11-Services] “Mobile Broadcast Services,” Version 1.1, Open Mobile Alliance™, URL: <http://www.openmobilealliance.org>
- [BCAST11-Architecture] “Mobile Broadcast Service Architecture,” Version 1.1, Open Mobile Alliance™, URL: <http://www.openmobilealliance.org>
- [BCAST11-Distribution] “File and Stream Distribution for Mobile Broadcast Services,” Version 1.1, Open Mobile Alliance™, URL: <http://www.openmobilealliance.org>
- [BCAST11-ServContProt] “Service and Content Protection for Mobile Broadcast Services,” Version 1.1, Open Mobile Alliance™, URL: <http://www.openmobilealliance.org>
- [BCAST11-SG] “Service Guide for Mobile Broadcast Services,” Version 1.1, Open Mobile Alliance™, URL: <http://www.openmobilealliance.org>
- [DRM20-XBS] “OMA DRM v2.0 Extensions for Broadcast,” Version 1.1, Open Mobile Alliance™, OMA-TS-DRM_XBS-V1_1 URL: <http://www.openmobilealliance.org>
- [IOPPROC] “OMA Interoperability Policy and Process”, Version 1.1, Open Mobile Alliance™, OMA-IOP-Process-V1_1, URL: <http://www.openmobilealliance.org>
- [IOPSCR] “SCR Rules and Procedures”, Version 1.0, Open Mobile Alliance™, OMA-ORG-SCRRulesAndProcedures-V1_0, URL: <http://www.openmobilealliance.org>
- [ITU H.264] “SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS: Infrastructure of audiovisual services – Coding of moving video”, ITU H.264 specification, May 2003. URL: <http://www.itu.int>
- [OMA MLP] “Mobile Location Protocol,” Version 3.2, Open Mobile Alliance™, URL: <http://www.openmobilealliance.org>
- [Rec. ITU-R BT.1833] Recommendation ITU-R BT.1833, “Broadcasting of multimedia and data applications for mobile reception by handheld receivers”, December 2008. URL: <http://www.itu.int/>
- [RFC 2119] “Key words for use in RFCs to Indicate Requirement Levels”, S. Bradner, March 1997, URL: <http://www.ietf.org/rfc/rfc2119.txt>
- [RFC 2234] “Augmented BNF for Syntax Specifications: ABNF”. D. Crocker, Ed., P. Overell. November 1997, URL: <http://www.ietf.org/rfc/rfc2234.txt>
- [RFC 3711] “The Secure Real-time Transport Protocol (SRTP)”, M. Baugher, D. McGrew, M. Naslund, E. Carrara, K. Norrman, URL: <http://www.ietf.org/rfc/rfc3711.txt>
- [RFC 4566] “SDP: Session Description Protocol”, M. Handley, V. Jacobson and C. Perkins, July 2006, URL: <http://www.ietf.org/rfc/rfc4566.txt>
- [RFC3095] “RObust Header Compression (ROHC): Framework and four profiles: RTP, UDP, ESP, and uncompressed”, C. Bormann, C. Burmeister, M. Degermark, H. Fukushima, H. Hannu, L-E. Jonsson, R. Hakenberg, T. Koren, K. Le, Z. Liu, A. Martensson, A. Miyazaki, K. Svanbro, T. Wiebke, T. Yoshimura, H. Zheng, July 2001, URL: <http://www.ietf.org/rfc/rfc3095.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/>

- [TIA-1099a] TIA-1099, Revision A, "Forward Link Only Air Interface Specification for Terrestrial Mobile Multimedia Multicast", April 2009.
URL: <http://global.ihs.com>
- [TIA-1102a] TIA-1102, Revision A, "Minimum Performance Specification for Terrestrial Mobile Multimedia Multicast Forward Link Only Devices", April 2009.
URL: <http://www.tiaonline.org>
- [TIA-1103a] TIA-1103, Revision A, "Minimum Performance Specification for Terrestrial Mobile Multimedia Multicast Forward Link Only Transmitters", April 2009.
URL: <http://www.tiaonline.org>
- [TIA-1120] TIA-1120, "Forward Link Only Transport Specification", July 2007.
URL: <http://www.tiaonline.org>
- [TIA-1130] TIA-1130, "Forward Link Only Media Adaptation Layer Specification", May 2008.
URL: <http://www.tiaonline.org>
- [TIA-1132a] TIA-1132, Revision A, "Minimum Performance Specification for Terrestrial Mobile Multimedia Multicast Forward Link Only Repeaters", April 2009.
URL: <http://global.ihs.com>

2.2 Informative References

- [OMADICT] "Dictionary for OMA Specifications", Version 2.8, Open Mobile Alliance™,
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>

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

Broadcast Distribution System	A system containing the ability to transmit the same IP flow to multiple Terminal devices simultaneously. A Broadcast Distribution System typically uses techniques that achieve efficient use of radio resources.
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 TV with file downloading and voting - betting Broadcast Services - auction Broadcast Services - trading Broadcast Services
Generic Terminal	A terminal that complies with [TIA-1099a], [TIA-1120] and [TIA-1130], and employs the service layer functionalities specified in the OMA BCAST Enabler.
Native Terminal	A terminal that complies with [TIA-1099a], [TIA-1120] and [TIA-1130], and additionally, service layer functionalities specified in TIA.
Specific Terminal	A terminal that complies with [TIA-1099a], [TIA-1120] and [TIA-1130], and additionally, service layer functionalities specified in both TIA and BCAST.

3.3 Abbreviations

BDS	BCAST Distribution System
BSD/A	BCAST Service Distribution and Adaptation
MLC	Multicast Logical Channel
MLP	Mobile Location Protocol
OMA	Open Mobile Alliance
SG	Service Guide
SGDD	Service Guide Delivery Descriptor
SGDU	Service Guide Delivery Unit
SRTP	Secure Real Time Protocol
TIA	Telecommunications Industry Association

4. Introduction

This technical specification specifies how the OMA Mobile Broadcast Services (BCAST) Enabler can be implemented in a Forward Link Only network, as standardized by TIA TR47.1.

4.1 Version 1.1

BCAST Enabler Release Package (ERP) 1.1 allows two modes of adaptation for the Forward Link Only system:

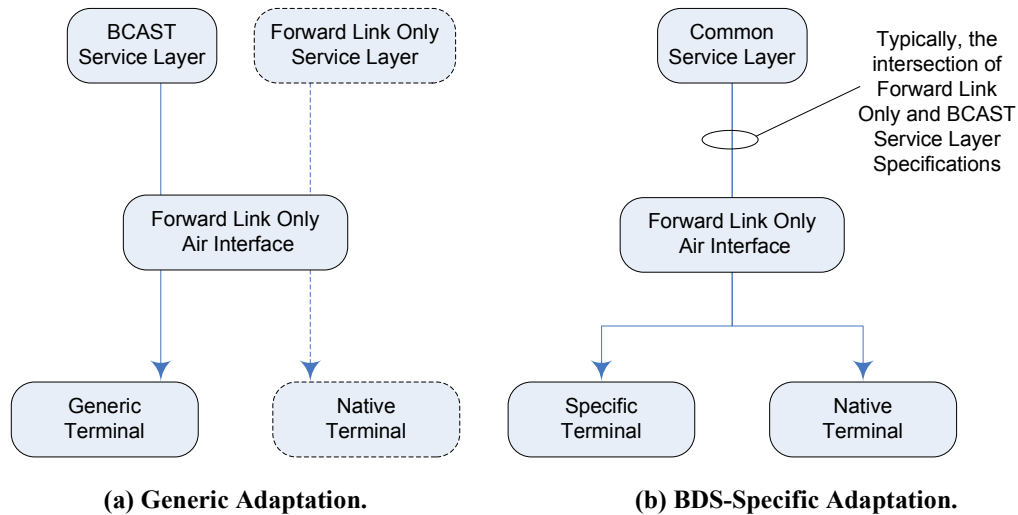


Figure 1: The difference between a generic and specific adaptation.

1. Generic adaptation over an underlying Forward Link Only transport network

In this mode, this Technical Specification explains how the BCAST Enabler may access the IP transport layer so that BCAST services can be provided transparently from BCAST Network entities to BCAST Terminals. In generic adaptation mode, BCAST Network entities and Generic Terminals conform to BCAST main specifications. This allows a common, harmonised behaviour across multiple BCAST enabled Broadcast Distribution Systems (BDSes) over which BCAST services are deployed.

However, in Generic adaptation mode, it may be impossible to share broadcast services between a Generic terminal and a Native terminal (a terminal that supports Forward Link Only as specified in TIA) due to differences between the technologies selected in the specific BDS and the Generic adaptation. For this reason, the services in Figure 1 of a Native terminal are shown in dashed lines to emphasize that its services are separate from a Generic terminal. For example, file delivery mechanisms may be different or service and content protection mechanisms may be different. In practice this means that file delivery sessions and streaming sessions are most likely to be provided in parallel in order to cater for Generic Terminals and Native terminals.

2. BDS-specific adaptation to Forward Link Only functionality

The BDS-specific adaptation to Forward Link Only functionality is out of scope of BCAST 1.1.

Note that the purpose of BDS-specific adaptation is to enable sharing of services between Generic terminals and Specific terminals. In contrast, generic adaptation allows sharing a BCAST service across different BDSes.

5. Overview of Forward Link Only System (Informative)

The Forward Link Only Air Interface is the OFDM bearer technology standardized by TIA TR47.1 as a mobile broadcast technology for the efficient transmission of multiple multi-media streams to mobile devices using TV and multi-media channel bandwidths. Forward Link Only is also designated as Multimedia System “M” in [Rec. ITU-R BT.1833].

The Forward Link Only specification for “Mobile Multimedia Multicast” standardized within the Telecommunications Industry Association (TIA) as TIA-1099a defines all aspects of Forward Link Only physical and link layers.

Forward Link Only systems target transmission over channel bandwidths of 5, 6, 7, and 8 MHz.

A Forward Link Only system enables the efficient multicasting of many types of multimedia services, including real-time (video/audio/teletext), non real-time (i.e., cachecasting, which downloads content for later viewing), and IP datacast, to mobile devices.

Forward Link Only is targeted to achieve a capacity of 1 bit per second per hertz (i.e., 8 Mbps in a RF bandwidth of 8 MHz). Since the Forward Link Only device typically uses a small display; it is possible to use a low bit rate of 200 – 250 Kbps for a real time video/audio service with the use of advanced compression techniques, such as H.264/AVC and its variants.

A Forward Link Only system can support multiple constellation modes including QPSK, 16QAM and two layered modes by which a given application may divide a data stream into a base layer and an enhancement layer.

Additionally, a Forward Link Only system can support wide-area and local-area services in the same RF allocation under Single Frequency Network (SFN) operation. This is enabled by broadcasting different wave forms for different local and wide coverage areas (transmission in the same wide area may not be identical in its local portions). A Local-area service is multicast for reception within a metropolitan area. By contrast, Wide-area services are multicast in one or more metropolitan areas.

A Forward Link Only service is an aggregation of one or more independent data components. Each independent data component of a service is called a flow. For example, a flow can be the video component, audio component, or the text or signalling component of a service.

Forward Link Only services are carried over one or more logical channels. These logical channels are called Multicast Logical Channels or MLCs.

An MLC may be divided into a maximum of three logical sub-channels. These logical sub-channels are called streams. Each flow is carried in a single stream.

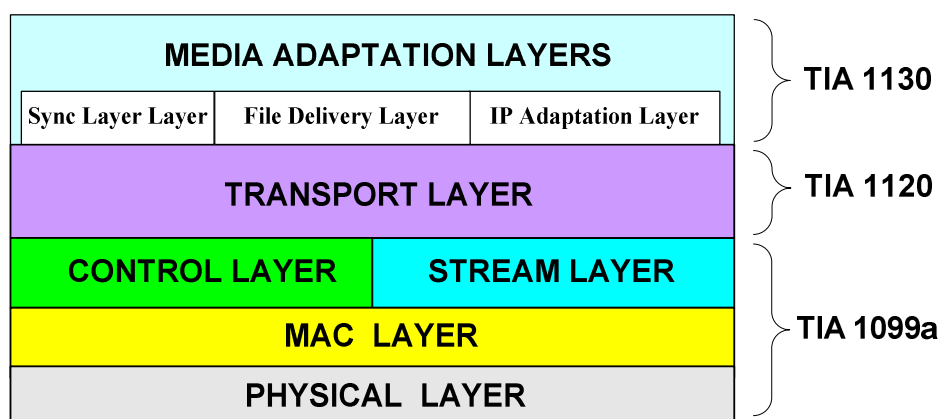


Figure 2: Forward Link Only Layering Architecture.

The protocols and layers specified in Figure 2 are:

1. Media Adaptation Layers. Media Adaptation protocols supply protocol adaptations that are specific to the class of content being transported. Accordingly, they are classified according to service type. The Media Adaptation Layers are the Sync Layer, the File Delivery Layer, and the IP Adaptation Layer. The Sync Layer carries real-time applications and provides synchronization within and between video, audio and timed data when transmitted by the network. The File Delivery Layer delivers files reliably over the network. The IP Adaptation Layer manages the transport of IP packets over the Transport Layer and the mappings of IP addresses to flow IDs used to deliver IP datacast services over the network. The Media Adaptation Layers are specified in [TIA-1130].
2. The Transport Layer provides the Devices with access to a set of flows. Each flow transports the packets for a logical data stream delivered over the Transport Layer, and provides in-order delivery. The Transport layer provides framing, fragmentation, transportation, and reassembly. The Transport Layer also provides optional error protection by CRC, and optional encryption and decryption services which may be used to support Conditional Access. The Transport Layer is specified in [TIA-1120].
3. Control Layer: This layer is used by the network to disseminate information to facilitate device operation in a Forward Link Only system. The device uses the Control Layer to obtain a mapping between the flows and streams, and also to obtain network topology information. The Control Layer is specified in [TIA-1099a].
4. Stream Layer: The Stream layer provides for binding of upper layer flows to streams on an MLC-by-MLC basis. The Stream layer is at the same level as the Control layer in the air interface layering architecture. The Stream Layer is specified in [TIA-1099a].
5. MAC Layer: This layer does multiplexing of packets belonging to different streams associated with MLCs. The MAC (Medium Access Control) layer defines the procedures used to receive and transmit over the Physical layer. The MAC Layer is specified in [TIA-1099a].
6. Physical Layer: The Physical layer provides the channel structure, frequency, modulation and encoding specification for a Forward Link Only system. The Physical Layer is specified in [TIA-1099a].

The following table describes the TIA standards on Forward Link Only technology:

TIA-1099a	Control Layer, Stream Layer, MAC Layer, PHY Layer for Forward Link Only air interface
TIA-1120	Transport Layer (Framing, Encryption, Fragmentation)
TIA-1130	Real-Time Delivery, File Delivery, IP Packet Delivery.
TIA-1102a	Minimum Performance Specification for Forward Link Only Devices
TIA-1103a	Minimum Performance Specification for Forward Link Only Transmitters
TIA-1132a	Minimum Performance Specification for Forward Link Only Repeaters

Table 1: List of documents describing TIA TR-47.1.

6. Generic Adaptation over the Forward Link Only IP Transmission Network

This section describes how BCAST specifications (namely, [BCAST11-Services], [BCAST11-SG], [BCAST11-ServContProt], [BCAST11-Distribution] and [DRM20-XBS]) are used over a Forward Link Only network. The provisions in this section thus complement the ones in the generic specifications so that BCAST services can be distributed over the Forward Link Only IP transmission network, without re-using the Forward Link Only functionality and hence without the ability for sharing services with native Forward Link Only terminals.

All normative statements in this specification are only applicable in the case where OMA BCAST services are distributed over Forward Link Only's IP transmission network specified in [TIA-1130].

The sentence "as defined by BCAST Enabler specifications" is a shorthand notation that indicates both BCAST server and terminal SHALL respect the relevant BCAST specification (listed in the first paragraph of this section.)

Generic adaptation SHALL be supported by BCAST Network entities and SHALL be supported by a Forward Link Only-BCAST Terminal.

The BDS-specific adaptation to Forward Link Only functionality is out of scope of BCAST 1.1. Therefore, the terminal SHALL assume that the adaptation is generic in this version of the specification.

6.1 Access to the IP layer

This functionality is specified in Chapter 6 of [TIA-1130]. The Terminal SHALL support a ROHC-U profile [RFC3095], as described in Appendix G of [BCAST11-Services]. Note that changes to the ROHC-U profile SHALL be done using the Initialization and Reset state of ROHC to maintain synchronization between the BDS and Terminal.

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 [BCAST11-Services] related to Mobile Broadcast Services. In all of these cases the interaction is supported by the Interaction Channel. Since Forward Link Only is purely a unidirectional bearer and does not include a logical Interaction Channel itself, any bi-directional communications system can be used as an Interaction Channel with Forward Link Only. Therefore these four cases of interaction are directly applicable when Forward Link Only is the BDS, i.e., a terminal with access to an interaction channel SHALL support all four cases of interaction.

The specification in Section 5.3 of [BCAST11-Services] SHALL apply.

6.2.2 Service Provisioning

The specification in Section 5.1 of [BCAST11-Services] SHALL apply.

6.2.3 Terminal Provisioning

The specification in Section 5.2 and Appendix F of [BCAST11-Services] SHALL apply. Note that SG bootstrap may be statically provisioned, as described in Section 6.3.6. of this document.

6.2.4 Notification

The specification in Section 5.14 of [BCAST11-Services] SHALL apply.

When using Forward Link Only as the underlying Broadcast Distribution System the Notification functionality is enabled as specified in [BCAST11-Services].

6.3 Generic adaptation related to OMA-TS-BCAST_ServiceGuide

6.3.1 Service Guide Encoding

As defined by [BCAST11-SG] (Section 5.4.1.)

6.3.2 Service Guide Delivery over Broadcast Channel

As defined by [BCAST11-SG] (Section 5.4.2).

The provisioning of IP multicast address and port, and the transmitter IP address, as specified in Appendix F of [BCAST11-Services], SHALL apply.

6.3.3 Service Guide Delivery over Interaction Channel

As defined by [BCAST11-SG] (Section 5.4.3.)

6.3.4 Session Description

As defined by the generic BCAST Enabler specifications (namely, [BCAST11-SG], Section 5.1.2.5), with the following restrictions:

- The session information SHALL be provided using an SDP-formatted file contained in the Access fragment or in a Session Description referenced by the Access fragment.
- The MBMS User Service Bundle Description/User Service Description SHALL NOT be used.

A BCAST Terminal supporting Forward Link Only SHALL support SDP [RFC 4566].

6.3.4.1 Session Description for broadcast streamed media sessions

As defined by the generic BCAST Enabler specifications (namely, [BCAST11-SG], Section 5.1.2.5.2). The terminal MAY ignore the following parameters in Section 5.1.2.5.2 of [BCAST11-SG] should these be present in the SG, as they are either not required or out of the scope of Forward Link Only:

- The mode of MBMS bearer per media

6.3.4.2 Session Description for broadcast file delivery sessions

As defined by the generic BCAST Enabler specifications (namely, [BCAST11-SG], Section 5.1.2.5.3) but with qualifications as indicated below.

6.3.4.2.1 Session Descriptors for ALC Sessions

The terminal MAY ignore the following parameter, should it be present in the SG, as it is outside the scope of Forward Link Only:

- The mode of MBMS bearer per media

6.3.4.2.2 Session Descriptors for FLUTE Sessions

The terminal MAY ignore the following parameter, should it be present in the SG, as it is outside the scope of Forward Link Only:

- The mode of MBMS bearer per media

6.3.5 Service Guide Data Model

As defined by the generic BCAST Enabler specifications (namely, [BCAST11-SG], Section 5.1).

6.3.5.1 CellTargetArea/BDSLocationID in Forward Link Only

As defined by the generic BCAST Enabler specifications (namely, [BCAST11-SG], Sections 5.1.2.1 and 5.1.2.3).

OMA BCAST Service Guide allows the description of the target area for Service and Content and specific SG request from terminal based upon its BDSLocationID as specified in [BCAST11-SG] in terms of a BDS-specific cell identification. In the case of Forward Link Only, the value of the “CellTargetArea” sub-element of the “TargetArea” element and “BDSType” as specified in [BCAST11-SG] MUST be expressed as defined in [BCAST11-SG]. For a Forward Link Only cell, “type”: 15 (Forward Link Only CellTargetArea) is used. The identifiers “Network ID”, “WOI_ID” and “LOI_ID” are defined in [TIA-1099a].

In the case of a Forward Link Only cell, the “value” of the “CellArea” sub-element of the “CellTargetArea” element and BDSLocationID as specified in [BCAST11-SG] MUST consist of a text string with one or more parameters given in the table below. Each parameter is signalled by an uppercase alphanumeric character, immediately followed by a string of lowercase hexadecimal characters representing the value of a parameter, as defined in the table below. The parameters MUST be given in the order defined in the table below.

The WOI_ID and LOI_ID parameters are network-dependent. Therefore, in a Forward Link Only cell, if a WOI_ID or a LOI_ID (or both) are present the NetworkID SHALL be present.

Parameter name	Signalling	Value	Length in Hex [bytes]	Cardinality	Description
NetworkID	“N”	Hexadecimal representation of a 16 bit unsigned integer	4	0..1	Identifier of the particular network defining the WOI_ID and LOI_ID, according to [TIA-1099a], Section 1.11.
WOI_ID	“W”	hexadecimal representation of a 16 bit unsigned integer	4	0..1	“WOI_ID” (Wide-Area Infrastructure ID), transmitted in Wide-Area OIS Channel, according to [TIA-1099a], Section 1.11.
LOI_ID	“L”	hexadecimal representation of a 16 bit unsigned integer	4	0..1	“LOI_ID” (Local-Area Infrastructure ID), transmitted in Wide-Area OIS Channel or RF Channel Description Message, according to [TIA-1099a], Section 1.11.

Table 2: Structure of a CellArea String

So for example, a transmitter with NetworkID=0x0001, WOI_ID=0x43, and LOI_ID=0x22 would be represented as “N0001W0043L0022”. One or more of these fields may be absent. If a field is absent, the associated letter is absent as well.

6.3.5.2 BDSSpecificEntryPointInfo definition

Section 5.4.1.5.2 of [BCAST11-SG] specifies how SGDDs can include the definition of SGEEntryPoints over BCAST BDS broadcast channels. Each broadcast SGEEntryPoint (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. Note that the BDSSpecificEntryPointInfo is typically a subset of the BDSEntryPoint of the OMA BCAST Device Management (DM) Tree defined in the appendix of [BCAST11-Services].

For the FLO 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 FLO BDS for the present specification. Contains the following elements Tuning ROHCU	complexType deriving from abstract type of BDSSpecificEntryPointInfo element

Tuning	E6	NM/TM	0..1	This element gives the tuning parameters for the BDS. Contains the following elements TuningPriority Frequency Bandwidth	
Tuning Priority	E7	NM/TM	1	The priority (lower values signal higher priority) that is used to select the proper frequency for tuning, when two or more frequencies are available.	integer
Frequency	E7	NM/TM	1	The center frequency of the Forward Link Only channel to tune. The value represents the frequency in units of 50 Hz.	unsignedInt
Bandwidth	E7	NM/TM	1	The bandwidth of the Forward Link Only transmission system (e.g. 5000, 6000, 7000 or 8000 kHz.) The value represents the bandwidth in units of 50 Hz.	unsignedInt
ROHC-U	E6	NM/TM	0..1	This element carries parameters for the ROHC Unidirectional Protocol. Contains the following attributes largeCIDs Contains the following elements MaxCID MaxHeaderSize MRRU	
largeCIDs	A	NM/TM	0..1	True when large CIDs (1 or 2 bytes) are used, otherwise it is false and small CIDs (0 or 1 bytes) are used. If this is absent it is assumed to be false.	boolean
MaxCID	E7	NM/TM	1	The maximum number of CIDs used by ROHC-U	unsignedint
MaxHeader Size	E7	NM/TM	1	The maximum header size, in octets, that can be compressed	unsignedInt
MRRU	E7	NM/TM	1	The size of the Maximum Reconstructed Reception Unit, in octets, that the decompressor is expected to reassemble from segments. Value 0 means that no segment headers are allowed on the channel	unsignedInt

Table 3: BDSSpecificEntryPointInfo Definition

6.3.6 Service Guide Bootstrap for SG Delivery over Broadcast Channel

The entry point information according to [BCAST11-SG] Section 6.1.1 MAY be provisioned to the terminal using OMA DM as specified by the BCAST MO in Appendix F of [BCAST11-Services]. The provisioning information for a single Forward Link Only system is determined by a Forward Link Only node.

The Tuning MO interior node that contains the highest priority (lowest numerical value) MAY indicate the preferred system to use. The center frequency and bandwidth are configured via the related leaf nodes of the Tuning interior node.

Once the receiver chain has detected a Forward Link Only system, the ROHCU interior node MAY provide IP header compression profiles for the BCAST over Forward Link Only adaptation.

The IP information for the FLUTE/ALC download of the service guide is taken from SG interior node. The IP address of the SG server (represented logically by the BCAST BSD/A) providing the SG announcement information MAY be pre-provisioned in the terminal, along with the service guide multicast target address and port. This information is provisioned in the IPSourceAddress, IPMulticastAddress, and IPMulticastPort leaf nodes.

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

The provisions in the two specifications [BCAST10-ServContProt] and [DRM20-Broadcast-Extensions] SHALL apply.

6.4.1 Generic Adaptation related to Broadcast-Only operation

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

The Broadcast-Only Mode of Operation is the mode of operation where the Broadcast Channel is used for device (re-) registration, domain management, token management, and DRM Profile BCRO reception. For Broadcast Services that support Broadcast-Only Mode of Operation using Forward Link Only 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 Forward Link Only Broadcast Channel is optional for Devices.
- Following constrains on LTKM SHALL be followed:
 - BCRO SHALL NOT be signed, but MAC SHALL be used
- As specified in [BCAST10-ServContProt] and [DRM20-XBS], of all the DRM Profile BCRO addressing modes defined by OMA BCAST, devices supporting the Broadcast-Only 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).

To summarize, modes 0x5 and 0x6, having to do with Flexible Subscriber groups, NEED NOT be supported.

- Following constrains on Token Delivery Response message SHALL be followed:
 - BCRO SHALL NOT be signed, but MAC SHALL be used

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

6.5.1 File Distribution

The specification in Section 5.2 of [BCAST11-Distribution] SHALL apply.

Note: Specification of the FD-B1 interface between BSD/A and Forward Link Only network entity for file distribution is TBD.

6.5.2 Associated Delivery Procedures and File Distribution over Unicast Channel

The specification in Section 5.3 and 5.5 of [BCAST11-Distribution] SHALL apply.

6.5.3 Stream Distribution

The specification in Section 6 of [BCAST11-Distribution] SHALL apply.

Note: Specification of the SD-B1 interface between BSD/A and Forward Link Only network entity for stream distribution is TBD.

6.5.4 Media codecs

The BCAST Enabler does not define any media codecs and formats, but references those specified in the underlying BDSs.

Therefore, for Forward Link Only adaptation, BCAST Terminal support for media codecs SHALL comply with [ITU H.264].

7. BDS-Specific Adaptation to Forward Link Only Functionality

The BDS-specific adaptation to Forward Link Only functionality is out of scope of BCAST 1.1.

8. Location based broadcast

Location based broadcasting in OMA BCAST is based on two types of parameters: one set relying on Cell identifier information provided by the underlying network, and one set relying upon MLP. In the case of MLP, some minor adaptation may be needed as described in this chapter, and as described in the static conformance requirements of Appendix B.

8.1 Packet switched CDMA networks

The [3GPP2 X.S0024-0] specification defines IP-Based Location and specifies the use of OMA MLP as an optional mechanism for defining the target area and shape and does not mention any other mechanism for defining target area and shape.

If the Forward Link Only terminal does not support [3GPP2 X.S0024-0], it SHOULD support the ‘CellTargetArea’ parameters defined in the Service and Content fragments of the Service Guide for location based broadcasting.

If the Forward Link Only terminal supports [3GPP2 X.S0024-0], it SHALL support the MLP based parameters as defined in OMA Service Guide for location based broadcast. Such terminals SHOULD support the ‘CellTargetArea’ parameters if they support [3GPP2 X.S0024-0].

8.2 Circuit switched CDMA networks

The [3GPP2 X.S0002-0] specification defines Location Services Authentication/Privacy/Security and Enhancements. This specification uses shape and level of confidence to define the concept of target area. The MLP derived parameters such as country code and name_area are replaced in the BCAST Service Guide by zip code, since [3GPP2 X.S0002-0] does not support MLP.

If the Forward Link Only terminal does not support [3GPP2 X.S0002-0], it SHOULD support the ‘CellTargetArea’ parameters defined in the Service and Content fragments of the Service Guide for location based broadcasting.

If the Forward Link Only terminal supporting OMA BCAST Services supports [3GPP2 X.S0002-0] parameters, it SHOULD support following Service Guide mapping scheme in the table below for location based broadcasting. Such terminals MAY support the ‘CellTargetArea’ parameters if they support [3GPP2 X.S0002-0].

Name	Mapped to: Name (in 3gpp2)	Type	Category	Cardinality	Description	Data Type
Broadcast Area	broadcast_area_3gpp2	E1	NO/TO	0..1	Broadcast area to include location information for BCAST contents. Sub-elements: TargetArea lev_conf	
polarity	N/A	A	NO/TO	0..1	Indication of whether the associated target area is intended for positive or negative terminal reception of the content item. If polarity = TRUE, this indicates the associated content item is intended for reception by terminals located within the corresponding geographical area. (Default) If polarity = false, this indicates the associated content item is not intended for reception by terminals located within the corresponding geographical area.	boolean
TargetArea	target_area	E2	NO/	0..N	The target area to distribute contents	

a	_3gpp2		TM		(Position information as specified in the [3GPP2 X.S0002-0] with modifications) Sub-elements: Shape Cc name_area ZipCode	
shape	Shape_3gp p2	E3	NO/ TM	0..1	Shapes used to represent a geographic area that describes (as specified in the [3GPP2 X.S0002-0])	See [3GPP2 X.S0002-0]
cc	Cc_3gpp2	E3	NO/ TM	0..1	Country code, 1-3 digits e.g. 355 for Albania (as an area as specified in the [OMA MLP] and implemented as an area as defined in the [3GPP2 X.S0002-0])	See [OMA MLP] and [3GPP2 X.S0002-0]
name_area	name_area_ 3gpp2	E3	NO/ TM	0..N	Name of area such as 'Seoul' (as specified in the [OMA MLP] and implemented as an area as defined in the [3GPP2 X.S0002-0])	See [OMA MLP] and [3GPP2 X.S0002-0]
ZipCode	zip_code_3 gpp2	E3	NO/ TM	0..1	Zip code (implemented as an area as defined in the [3GPP2 X.S0002-0])	String
lev_conf	lev_conf_3 gpp2	E2	NO/ TM	0..1	Level of confidence expressed in an integer scale of 0..100 (as specified in the [OMA MLP] and implemented as as defined in the [3GPP2 X.S0002-0])	See [OMA MLP] and [3GPP2 X.S0002-0]

Appendix A. Change History

(Informative)

A.1 Approved Version History

Reference	Date	Description
n/a	n/a	No prior version

A.2 Draft/Candidate Version 1_1 History

Document Identifier	Date	Sections	Description
Draft Versions OMA-TS-BCAST-FLO_Adaptation-V1_1	02 Feb 2009	All	First empty version of version 1.1 of this specification
	09 Mar 2009	1,2,3,4,5,6,7,8	Incorporated the following agreed CRs: OMA-BCAST-v1_1-2009-0022R04-CR_BCAST_FLO_Adaptation
	10 Aug 2009	2,6,7,8	New Sections 6, 8. OMA-BCAST-v1_1_2009-0114R03-CR_FLO_Adaptation_Chapters_6_to_8
	27 Oct 2009		New Section 8 and Appendix. OMA-BCAST-v1_1-2009-0194-CR_FLO_SCRs_and_Chapter_8 OMA-BCAST-v1_1-2009-0214-CR_BDSLocationID_Specified_In_FLO_Adaptation
	23 Nov 2009	All	Clean-up by DSO
	02 July 2010	2,6	Incorporate the following agreed CRs: OMA-BCAST-v1_1-2010-0098R01-CR_FLO_Adaptation_I013_BDSSpecificEntryPointInfo OMA-BCAST-v1_1-2010-0093-CR_FLO_References_Update
	27 July 2010	6.3.5.2	Incorporated the following agreed CR: OMA-BCAST-v1_1-2010-0098R02-CR_FLO_Adaptation_I013_BDSSpecificEntryPointInfo Editorial changes
	20 Aug 2010	4.1	Incorporated the following agreed CR: OMA-BCAST-v1_1-2010-0126-CR_Editorial_Change_FLO_Adaptation_Section4_1 Editorial changes
Candidate Version OMA-TS-BCAST-FLO_Adaptation-V1_1	14 Sep 2010	n/a	Approved by TP as candidate TP ref# OMA-TP-2010-0371- INP_BCAST_V1_1_ERP_and_ETR_for_Candidate_approval

Appendix B. Static Conformance Requirements (Normative)

The notation used in this appendix is specified in [IOPPROC]. For details on SCR specification, please refer to [IOPSCR].

Note: The SCR entries shown below for the Forward Link Only Adaptation specification may overrule, or may be used to adapt to Forward Link Only, those requirements of SCR entries in the generic BCAST specifications.

B.1 SCR for BCAST Terminal

Item	Function	Reference	Status	Requirement
BCAST-FA-C-001	Support for generic mode of adaptation of BCAST to Forward Link Only	Section 6	O	BCAST-FA -C-002 AND BCAST-FA -C-003 AND BCAST-FA -C-013 AND BCAST-FA -C-018 AND BCAST-FA -C-023
BCAST-FA-C-002	Signaling of ROHC parameters achieved using BCAST MO	Section 6.1	O	
BCAST-FA-C-003	Support for either broadcast-only operation or broadcast/unicast operation.	Section 6.2	O	BCAST-FA-C-004 OR BCAST-FA-C-006
BCAST-FA-C-004	Support for Broadcast-Only operation in Forward Link Only	Section 6.2	O	BCAST-FA-C-005 AND BCAST-FA-C-009
BCAST-FA-C-005	Out-of-band (web or phone-based) subscription and ROAP broadcast provisioning	Section 6.6	O	DRM-XBS-C-003
BCAST-FA-C-006	Support for Interaction channel functionality in Forward Link Only	Section 6.2	O	BCAST-FA-C-007 AND BCAST-FA-C-008 AND BCAST-FA-C-009 AND BCAST-FA-C-010
BCAST-FA-C-007	Support for SMS transport of Interaction functionality to Forward Link Only	Section 6.2.1	O	
BCAST-FA-C-008	Support for adaptation of Interaction functionality to Forward Link Only	Section 6.2.1	O	BCAST-SERVICES-C-001
BCAST-FA-C-009	Support for adaptation of Service Provisioning functionality to Forward Link Only	Section 6.2.2	O	BCAST-SERVICES-C-006 AND BCAST-SERVICES-C-007 AND BCAST-SERVICES-C-008
BCAST-FA-C-010	Support for adaptation of Service Guide TS functionality to Forward Link Only	Section 6.3	O	BCAST-FA-C-011 AND BCAST-FA-C-012
BCAST-FA-C-011	Support for adaptation of Service Guide delivery, over interaction channel, to Forward Link Only	Section 6.3.3	O	BCAST-SG-C-006 AND BCAST-SG-C-011 AND BCAST-SG-C-013
BCAST-FA-C-012	Support for adaptation of	Section 6.3.4	O	

Item	Function	Reference	Status	Requirement
	Session Description Information to Forward Link Only			
BCAST-FA-C-013	Support for adaptation of SPCP and XBS TS functionality to Forward Link Only	Section 6.4	O	BCAST-FA-C-014 AND BCAST-FA-C-015 AND BCAST-FA-C-016 AND BCAST-FA-C-017
BCAST-FA-C-014	Support SRTP	Section 6.4	O	
BCAST-FA-C-015	Support IPSEC	Section 6.4	O	
BCAST-FA-C-016	Support ISMACryp	Section 6.4	O	
BCAST-FA-C-017	Support DRM Profile	Section 6.4	O	
BCAST-FA-C-018	Support for adaptation of File and Stream Distribution functionality to Forward Link Only	Section 6.5	O	BCAST-FA-C-019 AND BCAST-FA-C-020 AND BCAST-FA-C-021 AND BCAST-FA-C-022
BCAST-FA-C-019	Support for adaptation of File Distribution functionality over interaction channel to Forward Link Only	Section 6.5.1	O	BCAST-FD-C-016 AND BCAST-FD-C-018 AND BCAST-FD-C-019 AND BCAST-FD-C-020
BCAST-FA-C-020	Support for associated delivery procedures (I.e. retransmission, etc.)	Section 6.5.2	O	
BCAST-FA-C-021	Support for adaptation of Stream Distribution functionality over interaction channel to Forward Link Only	Section 6.5.3	O	BCAST-SD-C-016 AND BCAST-SD-C-020 AND BCAST-SD-C-021
BCAST-FA-C-022	Support for Media CODECs and Formats	Section 6.5.4	O	
BCAST-FA-C-023	Support for adaptation of Location-based Broadcast Services to Forward Link Only on CDMA terminals	Section 8	O	BCAST-FA-C-024 OR BCAST-FA-C-025 OR BCAST-FA-C-026 OR BCAST-FA-C-027
BCAST-FA-C-024	Support for target location areas according to OMA MLP syntax if the terminal is operating in a packet-switched cdma2000 network and it supports [3GPP2 X.S0024-0]	Section 8.1	O	
BCAST-FA-C-025	Support for target location areas defined by 'CellTargetArea' in Service Guide, if the terminal is operating in a packet-switched cdma2000 network and it supports [3GPP2 X.S0024-0]	Section 8.1	O	

Item	Function	Reference	Status	Requirement
BCAST-FA-C-026	Support for target location areas defined by 'CellTargetArea' in Service Guide, if the terminal is operating in a circuit-switched cdma2000 network and it supports [3GPP2 X.S0002-0]	Section 8.2	O	
BCAST-FA-C-027	Support for the Service Guide mapping scheme table of Section 8.2 for location based broadcasting if the terminal is operating in a circuit-switched cdma2000 network and it supports [3GPP2 X.S0002-0].	Section 8.2	O	

B.2 SCR for BCAST BSD/A

Item	Function	Reference	Status	Requirement
BCAST-FA-BSDA - 001	Support for generic mode of adaptation of BCAST to Forward Link Only	Section 6	O	BCAST-FA-BSDA-002 AND BCAST-FA-BSDA-006 AND BCAST-FA-BSDA-011
BCAST-FA-BSDA - 002	Support for adaptation of Service Guide TS functionality to Forward Link Only	Section 6.3	O	BCAST-FA-BSDA-003 AND BCAST-FA-BSDA-004 AND BCAST-FA-BSDA-005
BCAST-FA-BSDA - 003	Support for adaptation of Service Guide delivery over interaction channel to Forward Link Only	Section 6.3.2	O	BCAST-SGGAD-S-002 AND BCAST-SGGAD-S-022 AND BCAST-SGGAD-S-024
BCAST-FA-BSDA - 004	Support for adaptation of Session Description Information to Forward Link Only	Section 6.3.4	O	
BCAST-FA-BSDA - 005	Support for adaptation of Service Guide Discovery to Forward Link Only	Section 6.3.6	O	
BCAST-FA-BSDA-006	Support for adaptation of File and Stream Distribution functionality to Forward Link Only	Section 6.5	O	BCAST-FA-BSDA-007 AND BCAST-FA-BSDA-008 AND BCAST-FA-BSDA-009 AND BCAST-FA-BSDA-010
BCAST-FA-BSDA-007	Support for BCAST-enabled Services delivered as separate Forward Link Only Programs	Section 6.5.1	O	
BCAST-FA-BSDA-008	Support for adaptation of File Distribution	Section 6.5.3	O	BCAST-FD-S-025 AND BCAST-FD-S-027 AND

Item	Function	Reference	Status	Requirement
	functionality over interaction channel to Forward Link Only			BCAST-FD-S-028 AND BCAST-FD-S-029
BCAST-FA-BDSA-009	Support for adaptation of Stream Distribution functionality over interaction channel to Forward Link Only	Section 6.5.3	O	BCAST-SD-S-025 AND BCAST-SD-S-029 AND BCAST-SD-S-030
BCAST-FA-BDSA-010	Support for Media CODECs and Formats	Section 6.5.4	O	
BCAST-FA-BSDA-011	Support for adaptation of Location-based Broadcast Services to Forward Link Only	Section 8	O	BCAST-FA-BSDA-012 AND BCAST-FA-BSDA-013
BCAST-FA-BSDA-012	Support for delivery in Service Guide of target location areas according to OMA MLP syntax	Section 8.1 and Section 8.2	O	
BCAST-FA-BSDA-013	Support for delivery in Service Guide of target location areas defined by 'CellTargetArea	Section 8.1 and Section 8.2	O	

B.3 SCR for BCAST BSM

Item	Function	Reference	Status	Requirement
BCAST-FA-BSM-001	Support a Forward Link Only adaptation mode	Section 6	O	BCAST-FA-BSM-002
BCAST-FA-BSM-002	Support Generic Adaptation Mode	Section 6	O	BCAST-FA-BSM-003 AND BCAST-FA-BSM-004 AND BCAST-FA-BSM-005 AND BCAST-FA-BSM-006
BCAST-FA-BSM-003	Support system bootstrap and SG bootstrap via BCAST MO Forward Link Only sub-nodes	Section 6.2.3, 6.3.6	O	
BCAST-FA-BSM-004	Support BCAST Forward Link Only MO provisioning		O	BCAST-FA-BSM-007 OR BCAST-FA-BSM-008
BCAST-FA-BSM-005	Support service provisioning		O	BCAST-FA-BSM-009 OR BCAST-FA-BSM-010
BCAST-FA-BSM-006	Support CellTargetArea for Forward Link Only System	Section 6.3.5	O	
BCAST-FA-BSM-007	Broadcast DM provisioning of BCAST MO Forward Link Only sub-nodes		O	
BCAST-FA-BSM-008	Support DM provisioning of BCAST MO Forward Link Only sub-nodes	Sections 6.2.3, 6.3.6	O	
BCAST-FA-BSM-009	Support broadcast-only subscription and service and bootstrap provisioning	Sections 6.3.1, 6.3.2, 6.3.4	O	BCAST-FA-BSM-009
BCAST-FA-BSM-010	Support unicast and broadcast subscription and	Sections 6.3.1, 6.3.2,	O	

Item	Function	Reference	Status	Requirement
	service provisioning	6.3.3, 6.3.4		
BCAST-FA-BSM-012	Out-of-band subscription and ROAP broadcast provisioning (web or phone-based)	Section 6.6	O	DRM-XBS-C-003