MobAd Technical Specification

- BCAST Adaptation

Approved Version 1.0 – 20 Mar 2012

Open Mobile Alliance

OMA-TS-MobAd_BCAST_Adaptation-V1_0-20120320-A

Contents

Figures

1. Scope

This document specifies how the OMA Mobile Advertising (MobAd) Version 1.0 Enabler would interwork with the OMA Mobile Broadcast Services (BCAST) Enabler, so that BCAST can be used to support MobAd in the following ways:

1. Providing broadcast distribution of Advertisements (Ads) and Ad Metadata to BCAST-enabled MobAd terminals, and
2. Assisting the Ad Engine in selective Ad reception and storage, for subsequent delivery to Ad App(s).

The scope of this document comprises the following aspects:

- Interfaces and metadata required to achieve interoperability between the MobAd Ad Server operating over BCAST at the network side, and the MobAd Ad Engine operating beneath BCAST at the terminal side.
- Utilization of the BCAST Service Guide [BCAST11-SG] specification which defines an Ad service, for carrying Ads and Ad Metadata, and its file broadcast schedule. In the Ad service, the Service Guide also provides network-defined criteria for Ad filtering by the terminal.

2. References

2.1 Normative References

[BCAST11-Architecture] "Mobile Broadcast Services Architecture", Open Mobile Alliance™, OMA-AD- BCAST-V1_1, URL: http://www.openmobilealliance.org/

[BCAST11-SG] "Service Guide for Mobile Broadcast Services", Open Mobile Alliance™, OMA-TS-BCAST_ServiceGuide-V1_1, URL: http://www.openmobilealliance.org/

[BCAST11-Distribution] "File and Stream Distribution for Mobile Broadcast Services ", Open Mobile Alliance™, OMA-TS-BCAST_Distribution-V1_1, URL: http://www.openmobilealliance.org/

[MobAd-Core-TS] "Mobile Advertising Core Technical Specification", Version 1.0, Open Mobile Alliance™, OMA-TS-MobAd-V1_0, URL:http://www.openmobilealliance.org/

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

2.2 Informative References

[OMADICT] "Dictionary for OMA Specifications", Version x.y, Open Mobile Alliance™, OMA-ORG-Dictionary-V2_7, URL:http://www.openmobilealliance.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.

3.2 Definitions

Advertisement	See definition in [MobAd-Core-TS]
Ad Engine	See definition in [MobAd-Core-TS]
Ad Metadata	See definition in [MobAd-Core-TS]
Ad Server	See definition in [MobAd-Core-TS]
BCAST Client	In the context of this specification, the ‘BCAST Client’ is the BCAST-specific device-side function of the BCAST-enabled MobAd terminal. It corresponds to the ‘BCAST Terminal’ in BCAST specifications.
BCAST Server	In the context of this specification, the ‘BCAST Server’ is the BSD/A (BCAST Service Distribution/Adaptation) function as defined in [BCAST11-Architecture].
BCAST Service Application	See [BCAST11-Architecture]
BCAST Service Distribution/Adaptation	See [BCAST11-Architecture]
BCAST Subscription Management	See [BCAST11-Architecture]
Broadcast Channel	See [BCAST11-Architecture]
Broadcast Distribution System / Adaptation	See [BCAST11-Architecture]

3.3 Abbreviations

Ad	Advertisement
BDS	Broadcast Distribution System
BDS-SD	BDS Service Distribution
BDS-SD/A	BDS Service Distribution / Adaptation
BSA	BCAST Service Application
BSD/A	BCAST Service Distribution / Adaptation
BSM	BCAST Subscription Management
FA	File Application
FD	File Delivery (Function of BSD/A)
MBA	MobAd over BCAST Adaptation
OMA	Open Mobile Alliance
MobAd	Mobile Advertising
OMA BCAST	OMA Mobile Broadcast Enabler
SG	Service Guide

4. Introduction

The MobAd Enabler is intended to support the successful deployment of Mobile Advertising services by providing an interoperable framework for Advertisement (Ad) personalisation and contextualization, delivery and Ad Metrics data collection. The MobAd Enabler can make use of a variety of Ad delivery methods, including pull, push and broadcast delivery.

The OMA Mobile Broadcast Services (BCAST) Enabler provides a set of functions which enable the delivery of content over broadcast/multicast networks, including but not limited to service guide, file distribution, stream distribution, service protection, and content protection. The BCAST Enabler can be used by other OMA Enablers to distribute content over broadcast/multicast networks.

A broadcast Advertisement channel may not require explicit user subscription. This depends on the service provider policy. Nominally, delivered Ads on this service are selectively downloaded and stored by the terminal on the user's behalf according to user, Ad Engine and/or network defined parameters, for later display.

BCAST can be used as an optional Ad delivery mechanism for the MobAd Enabler. The BCAST Client can perform selective download and delivery of Ads to the Ad Engine.

This document defines the necessary metadata, interfaces, and interactions between the MobAd Enabler and BCAST Enabler to facilitate targeted Ad delivery (to the user via the Ad App) using broadcast distribution of Ads and Ad Metadata.

4.1 Version 1.0

This version specifies all functions, behaviors and message binding to enable MobAd V1.0 operations using and leveraging OMA BCAST V1.1 Enabler.

5. MobAd over BCAST Adaptation Mode

This section specifies the MobAd over BCAST Adaptation Mode, in which BCAST is used for providing Ad and Ad Metadata transmission/reception over a broadcast channel, and performing selective Ad(s) download based on filtering data, if any, provided by the Ad Engine.

5.1 Architecture Diagram

The following diagram represents the architecture of MobAd over BCAST adaptation (MBA).

The interfaces between the MobAd and BCAST Enablers are shown in the following architecture diagram:

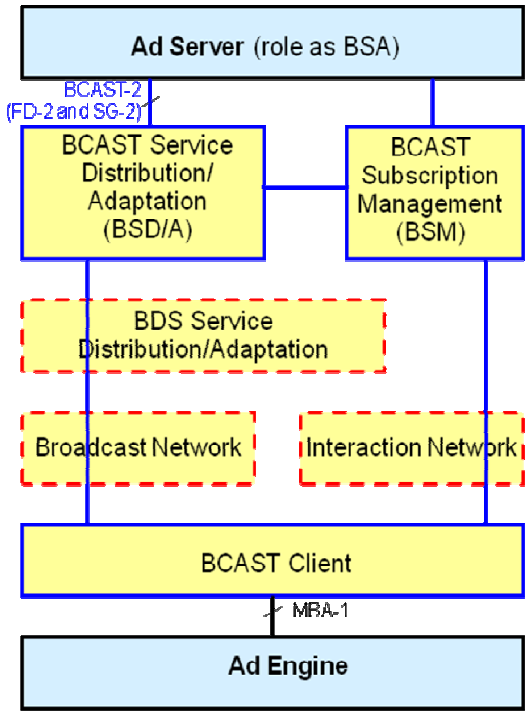


Figure 1: Overall MobAd over BCAST Architecture

The Ad Server SHALL operate as the Service Guide Application Source (SGAS) function of the BCAST Service Application (BSA) component in creating 'Service' fragment and/or 'Content' fragment using Ad Metadata. Subsequently, it delivers the created fragments to the Service Guide Generation (SG-G) function of the BCAST Service Distribution/Adaptation (BSD/A) component.

The Ad Server SHALL operate as the File Application (FA) function of the BSA in delivering Ad and Ad Metadata to the File Delivery (FD) function of the BSD/A component. The Ad Server SHALL provide Ad and Ad Metadata to the BCAST Server for Service Guide and Ad(s) broadcast channel creation.

The Ad Engine SHALL act as a client of the BCAST Client to a) discover and initiate Ad reception for the MobAd service, and b) rely upon the BCAST Client to perform selective Ad download, and provide the selected Ad contents to the Ad Engine. To assist/control Ad selection by the BCAST Client, the Ad Engine SHALL provide, as it deems appropriate, Ad filtering data to the BCAST Client that SHALL overwrite equivalent filtering data, or complement similar filtering data, known to the BCAST Client. Subsequently, the BCAST Client SHALL employ the appropriate Ad filtering data to selectively download broadcast Ad contents delivered over the broadcast channel, and pass those Ad contents to the Ad Engine.

Ad Metadata and Contextual Data transmitted from the BCAST Server and intended for the BCAST Client SHALL be carried in the Service and/or Content fragment of the BCAST Service Guide ([BCAST11-SG]), in the form of <TargetUserProfile> and/or <BroadcastArea>.

Ad Metadata and Contextual Data provided by the BCAST Service Guide are compared to the Ad filtering data known by the BCAST Client (i.e. those locally accessible to BCAST Client, or provided by the Ad Engine) to filter out irrelevant Ads.

5.2 Interfaces

The MobAd over BCAST adaptation includes a set of adaptation specific interfaces through which MobAd Enabler entities interact with BCAST entities to provision BCAST file delivery sessions and manage content delivery over BCAST. This section describes the adaptation specific interfaces and the degree of standardization of these interfaces in this release of the MobAd Enabler.

A description of each of the interfaces shown in Figure 1 and its roles in enabling the MobAd over BCAST Adaptation is provided in the following sections.

5.2.1 MBA-1 Interface

The MBA-1 interface SHALL enable the Ad Engine to interact with the BCAST Client to initiate and terminate content reception over BCAST.

This interface is expected to enable the Ad Engine to perform the following functions:

- Initiate Ad reception by the BCAST Client
- Provide Ad filtering data to the BCAST Client to further assist and control selective download by the BCAST Client
- Receive Ad(s) from the BCAST Client
- Terminate Ad reception by the BCAST Client

5.2.2 BCAST-2 Interface

The BCAST-2 interface SHALL enable the Ad Server to interact with the BCAST Service Distribution / Adaptation function to establish broadcast file delivery session(s) for the subsequent transmission of Ad(s) and the relevant Ad Metadata over the air interface. In addition, this interface SHALL enable the Ad Server to interact with the BSD/A to terminate such file delivery session(s) upon the completion of Ad(s) and Ad Metadata transmission.

This interface is expected to enable the Ad Server to perform the following functions:

- Establish a BCAST file delivery session
- Submit Ad(s) to be distributed
- Provide the relevant Ad Metadata in the Service Guide for BCAST Client filtering
- Terminate a BCAST file delivery session
- Provide file delivery session transmission parameters Transport Session Identifier (TSI) and multicast IP address and port, that are sent in for the Service Guide Access fragment

5.3 MobAd over BCAST high level end to end flow

The end-to-end flow in Figure 2 illustrates the operations performed by the MobAd Enabler to inter-operate with the BCAST Enabler.

Note that in the diagram below, the BCAST Server acts as BSD/A for the Service Guide creation and the Ad Server acts as BSA.

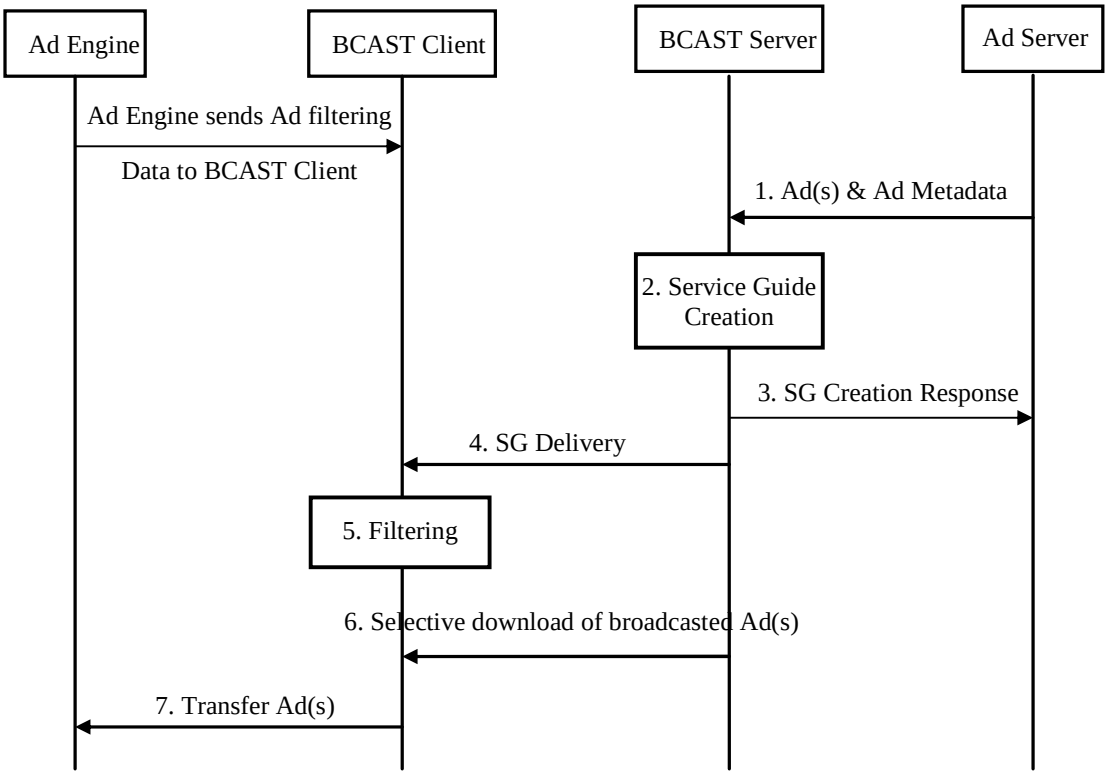


Figure 2: MobAd over BCAST high level end-to-end flow

It is assumed in the call flow that the Ad Engine has previously transmitted its own Ad filtering data to the BCAST Client to further assist and control Ad selection by the BCAST Client.

1. The Ad Server delivers the Ad(s) and Ad Metadata to the BCAST Server.
2. The Service Guide created by the BCAST Server contains the received Ad Metadata. The BCAST Server also creates the broadcast File Delivery channel(s).
3. The BCAST Server reports the Service Guide creation status to the Ad Server.
4. The BCAST Server broadcasts Service Guide to the BCAST Client.
5. The BCAST Client performs Ad filtering based on information available in the Service Guide (i.e. <TargetUserProfile> and/or <BroadcastArea>), any Ad filtering data passed by the Ad Engine and local information known by the BCAST Client.
6. The BCAST Client selectively downloads the Ad(s) from the broadcast File Delivery channel.
7. The BCAST Client passes the selected Ad(s) to the Ad Engine.

6. Network Side Operations

Network-side interactions between the MobAd and BCAST Enabler entities, i.e., the Ad Server and BSD/A SHALL occur over the BCAST-defined BCAST-2 reference point for the establishment, data transmission, and termination of broadcast file delivery sessions that carry Ad contents and/or Ad Metadata.

Note: The BCAST Service Guide TS [BCAST11-SG] does not explicitly define the SG-2 interface. However, it is required for the Ad Server to deliver Ad Metadata/Contextual Data to the BSD/A to provide the necessary Service Guide information pertaining to the delivery of Ad contents over FD-2. Sections 6.3 and 6.4 represent MobAd's specification of SG-2. In the scope of the MobAd over BCAST specification, the BSD/A SHALL support the SG-2 interface defined herein for interworking with the Ad Server.

6.1 Establishing a BCAST File Delivery Session

As indicated previously, the Ad Server SHALL operate as the File Application (FA) function of the BSA (BCAST Service Application) to create one or more broadcast file delivery session(s), for subsequent use in delivering Ads or Service Guide to the BCAST Client.

To establish a broadcast file delivery session for Ad contents, the Ad Server SHALL send over BCAST-2/FD-2 the 'SessionCreation' message as defined in Section 5.4.1.2.2 of [BCAST11-Distribution], as the payload of an HTTP POST message. The BSD/A SHALL return a SessionCreationRes message define in section 5.4.1.2.2 of [BCAST11-Distribution], upon successful creation of the file delivery session.

Upon successful creation of a file delivery session, Ad(s) or Service Guide fragment(s) can be sent as files over that session. This is accomplished by the Ad Server sending over BCAST-2/FD-2 another HTTP POST message containing the following payload: first, the 'FileInsertion' message as defined in Section 5.4.1.2.4 of [BCAST11-Distribution], immediately followed by the Ad file container or the appropriate Service Guide fragment(s).

The Ad file container SHALL consist of all parameters of the 'AdServerPushAds' message, as defined in Section 6.5.2.1 of the Core TS.

6.2 Terminating a BCAST File Delivery Session

To terminate a previously established broadcast file delivery session for transport of Ad(s) or Service Guide fragment(s), the Ad Server SHALL send to the BSD/A, over BCAST-2, a 'SessionDeletion' message as defined in Section 5.4.1.2.3 of [BCAST11-Distribution], as the payload of an HTTP message. Furthermore, if the Ad Server wishes for one or more Ad file(s) or Service Guide fragments that it had previously sent to the BSD/A to be deleted from scheduled broadcast transmission, it SHALL send to the BSD/A a 'FileRemoval' message as defined in Section 5.4.1.2.5 of [BCAST11-Distribution] in the payload of the corresponding HTTP message. In response to such deletion request, the BSD/A SHALL send to the Ad Server a 'FileRemovalRes' message as defined in Section 5.4.1.2.5 of [BCAST11-Distribution], in the payload of the HTTP response.

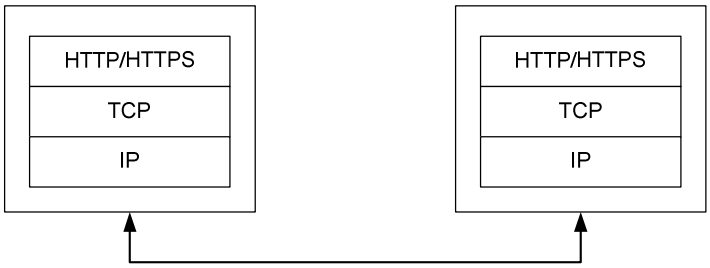
6.3 Delivery of Ad Metadata and Contextual Data (for filtering purposes)

The Ad Server SHALL send to the BSD/A, via BCAST-2/SG-2, Ad Metadata and Contextual Data to be carried in the associated containers in the BCAST Service Guide.

Ad Metadata and Contextual data transmitted from the BSD/A and intended for the BCAST Client SHALL be carried in the 'Service' and/or 'Content' fragment of the BCAST Service Guide ([BCAST11-SG]), in the form of <TargetUserProfile> and/or <BroadcastArea>.

6.3.1 Protocol Stacks

The following protocol stack SHALL be used for exchanging Service Guide (SG) delivery messages between the Ad Server and the BSD/A over BCAST-2/SG-2. HTTP, or HTTPS based on TLS 1.1 [RFC4346], over TCP/IP SHALL be used for the delivery of these messages.



Messages to and from BSD/A or Ad Server are transported using HTTP by placing both the requests and responses addressed to BSD/A or Ad Server in the payload of the HTTP messages. The requests SHOULD be transported using HTTP POST and the responses SHOULD be transported using the HTTP responses corresponding to the HTTP POST requests. The syntax for the requests SHOULD be as follows:

- `POST <host>/oma/bcast1.1/sg HTTP/1.1\r\n<request>`

where the <host> denotes the part of the URI representing the address of the host and the <request> denotes the XML element providing the request parameters.

Both the HTTP POST message and the corresponding HTTP response MAY also contain the following HTTP header fields:

- 'Content-Length',
- 'Content-Type' which if used SHALL be set to "text/xml" and
- 'Host' in case the 'Request-URI' is not in the absolute form specified in [RFC 2616].

6.3.2 Service Guide content delivery

This section specifies the delivery message for the 'Service' and/or 'Content' SG fragments from the Ad Server to the BSD/A over the BCAST-2/SG-2 interface.

6.3.2.1 Service Guide Delivery Message

The SG delivery message sent from Ad Server to BSD/A over the interface BCAST-2/SG-2 conforms to the 'SGDelivery' message defined in [BCAST11-SG], except the <BSMSelector>, <BSMSelectorID>, <PrivateExt> and <proprietary elements> parameters.. Note that the values for the 'type' parameter should be: 0 – Service Fragment, 2 – Content Fragment.

6.3.2.2 Response Message

The message returned from BSD/A to Ad Server is the response to the 'SGDelivery' request message, and it is delivered over interface BCAST-2/SG-2. This message conforms to the 'SGDeliveryRes' message defined in [BCAST11-SG], except the <PrivateExt> and <proprietary elements> parameters.

6.3.2.3 Mapping to Modified 'AdServerPushAds' Message

This section specifies the mapping of relevant parameters in the 'AdServerPushAds' message defined in Section 6.5.2.1 of the Core TS to those in the 'Service' and/or 'Content' fragments of the BCAST Service Guide as carried in the 'Body' E2 element of the Service Guide Delivery Message. The mapping below enables the Ad filtering performed by the BCAST Client.

Parameter in 'AdServerPushAds' message	Applicable to 'Body' in Service Guide Delivery Message?	Mapped parameter(s)
AdServerID	No	
PushProvidedAd	Yes (AdID)	
AdID	Yes	<globalContentID> in Content fragment

Outdated-AdID	No	
AdAppID	No	
AdUnit	No	
ContextualData	Yes (ContextKeyword)	'ContextKeyword' which are user preference or profile related are mapped to <TargetUserProfile> (in the Service and/or Content fragments) and SHALL be specified in terms of 'attributeName' and 'attributeValue' pairs 'ContextKeyword' which target a user's location are mapped to <BroadcastArea> in the Service and/or Content fragments. Furthermore, location-related contextual keywords SHALL be mapped to child elements of <BroadcastArea> in one of two ways: a) Specifying 'TargetArea', and which may be accompanied by 'lev_conf' to represent simple location filtering rule, or b) Specifying 'LocationFilter' to represent more complex location filtering rule. Note: The presence of <TargetUserProfile> and/or <BroadcastArea> in the Service and/or Content fragments imply the following content filtering behavior by the BCAST Client: • Presence of <TargetUserProfile> and/or <BroadcastArea> solely in the Service fragment means that these filtering data apply to all Ad Content items belonging to the Ad Service. • Presence of <TargetUserProfile> and/or <BroadcastArea> solely in the Content fragment means that these filtering data apply to the referenced Ad Content items belonging to the Ad Service. • Presence of <TargetUserProfile> and/or <BroadcastArea> in both the Service and Content fragments means that these filtering data applies to all Content items belonging to the Ad Service except for those Ad Content(s) which are additionally referenced by Content fragment(s) . The filtering data in those Content fragment(s) apply to the referenced Ad Contents, overriding the filtering data contained in the Service fragment. Note: It depends on Service Provider policy whether all or a subset of the relevant contextual keywords are mapped to the corresponding SG elements. The mechanism for mapping only a subset of contextual keywords to SG elements is implementation-specific and is outside the scope of this specification.
AdContentData	No	
AdUsage	No	

6.4 Schedule and Access Information Associated with Broadcast Ad and Ad Metadata Delivery

It is assumed that via out-of-band communication (which may involve negotiation), outside the scope of this specification, the Ad Server and BSD/A agree on the delivery schedule and access/transport parameters (e.g. TSI, IP address and port) of the broadcast file delivery session(s) carrying Ads and Ad Metadata. These parameters are not exchanged across the SG-2 interface. It is assumed that the BSD/A, in the role of the SG-G (Service Guide-Generation), forms and transmits over the air interface Schedule and Access fragments containing the schedule and access information associated with the Ad and Ad Metadata delivery.

7. Device Side Operations

Device-side interactions between the MobAd and BCAST Enabler entities, i.e., the Ad Engine and BCAST Client, occur over the MBA-1 interface. The details of this interface are left unspecified in this release of the MobAd Enabler. However, MBA-1 may be subject to specification in a future release of this Enabler.

7.1 Initiating Ad Reception using BCAST

To initiate Ad reception using BCAST, the Ad Engine SHALL inform the BCAST Client, over the MBA-1 interface, that it wishes to receive broadcast services/contents belonging to ServiceType value '128' as defined in the 'Service' fragment of the BCAST Service Guide [BCAST11-SG]. If there is no broadcast service corresponding to ServiceType '128', the BCAST Client SHOULD in turn provide an error response to the Ad Engine, over MBA-1. Otherwise, it is assumed that ServiceType '128' corresponds to one or more active broadcast file delivery Ad services, and the BCAST Client is expected to then perform selective download and subsequent delivery of those selected Ads to the Ad Engine, according to the mechanisms described in Sections 7.2 and 7.3.

Note that the provisioning of zero, one or more broadcast Ad services (corresponding to ServiceType value '128') is an implementation decision of the service provider.

7.2 Ad Filtering Data Exchange

The Ad Engine SHALL transmit its own Ad filtering data, if available and desired, to the BCAST Client to further assist and control Ad selection by the BCAST Client. Ad Engine MAY update the provided Ad filtering data to the BCAST Client.

The BCAST Client SHALL use the filtering data to perform selective downloading of broadcast Ad contents. Ad filtering data provided by the Ad Engine SHALL replace equivalent data, or complement other filtering data, known to the BCAST Client.

The local Ad filtering data SHALL be compared to information contained in Content and/or Service fragment of the BCAST Service Guide ([BCAST11-SG]), in the form of <TargetUserProfile> and/or <BroadcastArea>.

7.3 Ad Content Delivery

Upon selective file downloading of the broadcast Ad contents, the BCAST Client SHALL deliver those downloaded Ad(s) to the Ad Engine.

The Ad Engine MAY retrieve Ads in addition to those provided by the BCAST Client. For example, if the Ad delivered by BCAST Client contains 'AdLocationURI', the Ad Engine MAY choose to fetch the associated Ad.

7.4 Terminating Ad Reception using BCAST

To terminate Ad reception using BCAST, the Ad Engine SHALL inform the BCAST Client, over the MBA-1 interface, that it no longer wishes to receive broadcast services/contents belonging to ServiceType value '128'. The BCAST Client SHALL provide a response over MBA-1 to acknowledge the request. Subsequently, the BCAST Client is expected to terminate reception of contents pertaining to the MobAd service. The conditions or criteria that trigger the termination of Ad reception via BCAST are not defined in this specification.

Appendix A. Change History (Informative)

A.1 Approved Version History

Reference	Date	Description
OMA-TS-MobAd_BCAST_Adaptation-V1_0	20 Mar 2012	Status changed to Approved by TP: OMA-TP-2012-0116-INP_MobAd_V1_0_ERP_for_Final_Approval

Appendix B. Static Conformance Requirements (Normative)

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

The Mandatory and Optional features of this specification are conditional to the support of MobAd over BCAST Adaptation in accordance with the Requirement Column.

B.1 SCR for Ad Engine

Item	Function	Reference	Requirement
MobAd-BCAST-E-001-O	Support MobAd over BCAST Adaptation		
MobAd-BCAST-E-002-O	Support initiation of Ad reception with BCAST Client	Section 7.1	MobAd-BCAST-E-001-O
MobAd-BCAST-E-003-O	Support terminating of Ad reception with BCAST Client	Section 7.4	MobAd-BCAST-E-001-O
MobAd-BCAST-E-004-M	Support transmission of Ad filtering data to BCAST Client	Section 7.2	MobAd-BCAST-E-001-O
MobAd-BCAST-E-005-M	Support reception of Ad content from BCAST Client	Section 7.3	MobAd-BCAST-E-001-O

B.2 SCR for Ad Server

Item	Function	Reference	Requirement
MobAd-BCAST-S-001-O	Support MobAd over BCAST Adaptation		
MobAd-BCAST-S-002-M	Support establishing BCAST file delivery session	Section 6.1	MobAd-BCAST-S-001-O
MobAd-BCAST-S-003-M	Support terminating BCAST file delivery session	Section 6.2	MobAd-BCAST-S-001-O
MobAd-BCAST-S-004-M	Support delivery of Ads to BCAST Server	Section 6.3	MobAd-BCAST-S-001-O