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## Broadcast/Multicast Services – Stage 1

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## Revision History

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# Wireless Features Description: Broadcast/Multicast Services Functional Characteristics and Requirements

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## 2 Scope

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The objective is to define and to standardize the functionality of Broadcast/Multicast Services that can be incorporated into the operations of cdma2000 based wireless telecommunications networks. This document defines the functional characteristics and requirements of Broadcast/Multicast services.

## 3 References

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### 3.1 Normative Reference

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None

### 3.2 Informative References

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None

## 4 Abbreviations

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ack	Acknowledgement
kbps	kilobits per second
ms	milliseconds
nak	negative acknowledgement
RF	Radio Frequency
SMS	Short Message Service

## 5 Definitions

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- **Broadcast** – The service is defined by the ability to send information to a group of users based on their location. This could also be considered “un-addressed” messaging. Examples would be to broadcast local information such as traffic or weather alerts based on a cell/sector or specific paging zone. All users in that area that are capable of receiving broadcast information would receive it.
- **Multicast** – This is the ability to broadcast information to a specific set of users based on their subscription to the user group. The user group may be maintained by an administrator and may be closed to public subscription (i.e. corporate list) or may be publicly subscribable (i.e. sign-up for advertisement, stock quotes, etc.). The multicast list may also be configured to have the mobile device acknowledge receipt of the message as defined by the user group administrator. This could be considered addressable messaging.
- **Private User Group** – This is a closed group that requires the Administrator to input the member into the group.
- **Public User Group** – This is a user group that is available for subscription by any user that has a mobile device capable of receiving multicast messages. These groups are usually subscribed via an online or automated process.
- **Session Control Delay** – seizing the channel by a speaker after initial call setup
- **User Group** – A user group is a group of users willing to receive specific multicast information. Users may select to be a member of a user group (i.e. receive stock quotes), or may be subscribe to a user group (i.e. corporate multicast group).

- **User Group Administrator** – The User Group Administrator is the entity (i.e. company, person, department) responsible for maintaining a specific user group.

## 6 General Description

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Broadcast/Multicast services are services intended to provide flexible and efficient mechanisms to send common (the same) information to multiple users. The motivation for these services lie in the need to utilize the most efficient method of delivery for the use of air interface and network resources when sending the same information to multiple users. The type of information to be sent is not limited to text messages, but could be any type of data, including multimedia (e.g voice) and streaming services that might be sent to mobile stations. The information shall originate via SMS or packet data techniques. Broadcast services shall be delivered via the most effective and efficient technique (SMS or packet data methods) based on the information to be sent. Multicast information shall be delivered in the most efficient and effective technique (i.e. SMS or packet data) regardless of the origination source. This means that if a multicast is originated via SMS, but the best delivery is packet data due to content then there needs to be interworking between SMS and packet data. The services shall allow for both mobile terminated and mobile origination for multicast and mobile terminated only for broadcast. The service needs to be defined in such a way as to not limit the number of users in a user group, or the number of user groups available.

Multicast user groups are generally considered to be a closed group that a member either explicitly has to subscribe to the service (public multicast group) by sending a request to the administrator, by some web interface, or other mechanism. A private multicast group is restricted to membership explicitly by the administrator manually adding members.

Broadcast can also be divided into public and private groups. A public broadcast group is used for sending geographic specific information. All devices in the specific geographic area that have broadcast capability are in the public group and will receive this information. Broadcast information for this type of group is emergency weather alerts, traffic conditions, etc. Private broadcast groups are targeted to sending specific information to a specific group of devices in a specific area. ExamOples of this service would be location based advertising. A user my elect to receive specific advertisements when they are at the mall, but not at other times.

## 7 Broadcast/Multicast Services Requirements

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- (M/B-01) Operators shall have the ability to define Broadcast target areas on an adhoc basis depending on the specific target area needed. This process shall be able to span multiple cells/sectors and across multiple MSC's of the same Operator.
- (M/B-02) In the case of broadcast services, information is addressed to all users and all mobile stations in the target cell/sectors. All users and all mobile stations with broadcast capability may receive and display, or play the information.
- (M/B-03) In the case of Multicast services, information is addressed only to users who belong to specific 'user groups'.
- (M/B-04) Multicast messages shall be "processable" only by members of that specific multicast group
- (M/B-05) Broadcast/Multicast shall not significantly degrade the normal operation of paging channels in the system. .

- (M/B-06) It may be possible to use RF broadcast boundaries such as sectors, cells, clusters, paging zone, and systems to confine the distribution of information for both broadcast and multicast.
- (M/B-07) For multicast to registered users within a specific target geographic areas, information is only sent to those cell/sectors or paging zones where there are registered/active users who belong to the message-specific user group.
- (M/B-08) Multicast services have the ability to deliver information to Public and Private user groups regardless of the geographic location of the user within the service provider's network. This may imply that a user out of their normal geographic area will still receive the information.
- (M/B-09) In the case of 'private' user groups multicast shall support the optional capability for end-to-end encryption protocols.
- (M/B-010) There may be an option for the operator to provide additional encryption within its network for both multicast and broadcast services.
- (M/B-011) Operator provided encryption may not be able to provide end to end encryption if the group is not wholly contained within the operators network. To insure privacy end-to-end encryption must be used. .
- (M/B-012) The inclusion to a broadcast/multicast user group should not interfere or prevent a user from subscribing to and receiving Internet based broadcast services that the user may be subscribed to.
- (M/B-013) This service may work independent of Internet based broadcast services. This does not prevent the possible use of the cdma2000 Broadcast/Multicast feature from being utilized by Internet Multicast services.
- (M/B-014) The types of data that can be sent is not limited to text messaging, but encompasses any type of information that can reasonably be sent to the mobile station, including but not limited to video/audio, binary files, etc.
- (M/B-015) In general a level of QoS should be supported to allow voice capabilities and other dispatch services and real-time audio and video to be supported.
- (M/B-016) Multicast service shall also store the information, either on a server, message center, or device as appropriate for re-play and/or future playback.
- (M/B-017) The multicast originator shall be able to define if message storage is needed and for how long.
- (M/B-018) Multicast must allow for message storage if all members of the multicast group are not available to receive the information.
- (M/B-019) Both services shall support minimum delays that are divided into three categories.
- Call-Setup- Should not exceed 1 second.
  - Session Control-Should not exceed 500 milliseconds.
  - Transmission- Should not exceed 500 milliseconds.

## **7.1 User Group Management**

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- (UGM-01) All user group creation should be the responsibility of the Operator.

- (UGM-02) No unauthorized party should be able to create, delete, or modify user groups.
- (UGM-03) User groups should be divided into two types. Broadcast user groups and multicast user groups.
- (UGM-04) The Administrator should have both originate and terminate capabilities,
- (UGM-05) Users should only have terminate capabilities in multicast unless the Administrator specifically authorizes specific users origination capabilities.
- (UGM-06) Users shall only have terminate capabilities with broadcast services.

## **7.2 Broadcast User Groups**

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There are two basic types of Broadcast user groups.

The first is a Wireless Operator user group.

- (WOBUG-01) All devices that support broadcast should be in this Wireless Operator broadcast user group. This would be to provide services used to broadcast information to specific geographic areas and be used to send emergency information to the mobiles.
- (WOBUG-02) This (Wireless Operator) user group should be managed and maintained by the Operator due to the potential sensitivity of the information that could be sent to this group.

The other type of broadcast user group would be a volunteer broadcast group.

- (VBUG-01) This group (Volunteer) would be used to broadcast information to users in a specific area based on interest and agreements to receive specific information. Examples could be receiving advertisements based on location (being in a Mall), at a particular event, etc.
- (VBUG-01) The Administrator should have the ability to either sign-up users based on request, or make access publicly available.
- (VBUG-01) Broadcast User Groups are not required to support information delivery acknowledgement.
- (VBUG-01) Broadcast shall support message segmentation/re-assembly.
- (VBUG-01) Broadcast service shall support the ability to provide reliable delivery as appropriate for the type of data in the message.

## **7.3 Multicast User Groups**

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- (MUG-01) A public multicast user group would be a user group that is used by a specific organization to communicate public information to interested users. This could be stock information, sport scores, etc.
- (MUG-02) Public multicast groups should have an administrator that may or may not be the Wireless Operator.
- (MUG-03) The Administrator may allow individuals to subscribe/de-subscribe, to public multicast groups, to the service either by request, by selection, or by manual interaction (go to a web site and input your information, etc.).

- (MUG-04) A private multicast user group may be used for private communications within a specific area of interest, and an Administrator controls its access.
- (MUG-05) The only method for access into a private multicast group is by the Administrator adding the user.
- (MUG-06) Multicast service shall support the ability to provide reliable delivery as appropriate for the type of data in the message.
- (MUG-07) Multicast service shall support the ability to report message delivery to each individual terminal in the multicast group, if requested by the message sender.
- (MUG-08) Multicast service shall support the ability to report message delivery to selected terminals in the multicast group, if requested by the message sender
- (MUG-09) Multicast services shall be available to multicast group members while roaming in other networks that support the service and appropriate roaming agreements are in place.
- (MUG-010) Multicast group members not authorized to originate multicast shall not be allowed multicast origination access. They should be provided an indication that origination is not allowed.

## **7.4 Accounting Requirements**

### **7.4.1 Broadcast**

---

Broadcast services must provide the following accounting information:

- (BACCT-01) Ability to charge broadcast originator
- (BACCT-02) Billing based on area of broadcast
- (BACCT-03) Volume of information sent
- (BACCT-04) Time of day of broadcast

### **7.4.2 Multicast**

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Multicast services must provide the following account information:

- (MACCT-01) Ability to charge multicast originator
- (MACCT-02) Accounting based on number of multicast users that received the message
- (MACCT-03) Volume of information sent
- (MACCT-04) Time of day the information was delivered
- (MACCT-05) Type of information sent
- (MACCT-06) Amount of resources utilized

## 8 Procedures for Broadcast/Multicast Services

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### 8.1 Normal Procedures With Successful Outcome

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#### 8.1.1 Authorization

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The service may be generally available or may be provided after pre-arrangement with the service provider for all subscribers with properly equipped Mobile Stations.

#### 8.1.2 De-Authorization

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The service may be de-authorized at the subscriber's request or for administrative reasons.

#### 8.1.3 Registration

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The service shall be registered upon authorization.

#### 8.1.4 De-Registration

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8.1.5 The service shall be de-registered upon de-authorization.

#### 8.1.6 Activation

---

The service shall be activated upon authorization.

#### 8.1.7 De-Activation

---

The service shall be de-activated upon de-authorization.

#### 8.1.8 Invocation

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#### 8.1.9 Normal Operation with Successful Outcome

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Upon successful authorization, registration, and activation the user shall be able to receive multicast and/or broadcast information directed the their terminal.

#### 8.1.10 Call Detail Record

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CDR001 – Indicate if Multicast or Broadcast  
CDR002 – Charging Indicator (originator/terminator charging)  
CDR003 – Volume of information sent  
CDR004 – Time of Day, Date that message originated  
CDR005 – Time of Day, Date of message delivery  
CDR006 – Radio Resource Utilization Indicator  
CDR007 – Originator Identifier

CDR008 – Terminator identifier  
CDR009 – Type of Information Sent (data, video, audio, etc.)  
CDR010 - Broadcast area (if a broadcast service)

## **8.2 Exception Procedures or Unsuccessful Outcome**

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### **8.2.1 Registration**

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Devices that fail broadcast registration shall not receive broadcast services.  
Devices that fail multicast registration shall not receive multicast services  
Devices that fail either registration shall continue to receive other registered services

### **8.2.2 De-Registration**

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Devices the unsuccessfully de-register shall continue to be registered in the network

### **8.2.3 Activation**

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Devices that fail activation shall not be activated in the network

### **8.2.4 De-Activation**

---

Devices that fail de-activation shall continue to be activated in the network.

### **8.2.5 Invocation**

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None identified

### **8.2.6 Exceptions While Roaming**

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(EPUO-001) - Multicast services should continue to work while roaming, unless the serving network does not support multicast capability.  
(EPUO-002) - Broadcast services shall be available to roamers that have broadcast capable devices.

### **8.2.7 Exceptions During Intersystem Handoff**

---

None identified.

## **8.3 Alternate Procedures**

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None identified.

## **8.4 Interactions With Other Cellular Services**

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### **8.4.1 Asynchronous Data Service (ADS)**

---

None identified.

#### **8.4.2 Call Delivery (CD)**

---

None identified.

#### **8.4.3 Call Forwarding—Busy (CFB)**

---

None identified.

#### **8.4.4 Call Forwarding—Default (CFD)**

---

None identified.

#### **8.4.5 Call Forwarding—No Answer (CFNA)**

---

None identified.

#### **8.4.6 Call Forwarding—Unconditional (CFU)**

---

None identified.

#### **8.4.7 Call Transfer (CT)**

---

None identified.

#### **8.4.8 Call Waiting (CW)**

---

None identified.

#### **8.4.9 Calling Name Presentation (CNAP)**

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None identified.

#### **8.4.10 Calling Number Identification Presentation (CNIP)**

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None identified.

#### **8.4.11 Calling Number Identification Restriction (CNIR)**

---

None identified.

#### **8.4.12 Conference Calling (CC)**

---

Not applicable.

#### **8.4.13 Data Privacy (DP)**

---

None identified.

#### **8.4.14 Do Not Disturb (DND)**

---

None identified.

#### **8.4.15 Emergency Services Callback (9-1-1CB)**

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None identified.

#### **8.4.16 Emergency Services Reconnect (9-1-1RC)**

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None identified.

#### **8.4.17 Flexible Alerting (FA)**

---

None identified.

#### **8.4.18 Global Emergency Call Origination (GECO)**

---

None identified.

#### **8.4.19 Group 3 Facsimile (G3 FAX)**

---

Not supported.

#### **8.4.20 Incoming Call Screening**

---

None identified.

#### **8.4.21 Message Waiting Notification (MWN)**

---

None identified.

#### **8.4.22 Mobile Access Hunting (MAH)**

---

None identified.

#### **8.4.23 Network Directed System Selection (NDSS)**

---

None identified.

#### **8.4.24 Non-Public Mode Service (NP)**

---

None identified.

#### **8.4.25 Over-the-Air Service Provisioning (OTASP)**

---

None identified.

#### **8.4.26 Over-the-Air Parameter Administration (OTAPA)**

---

None identified.

#### **8.4.27 Password Call Acceptance (PCA)**

---

None identified.

#### **8.4.28 Preferred Language (PL)**

---

None identified.

#### **8.4.29 Priority Access and Channel Assignment (PACA)**

---

None identified.

#### **8.4.30 Remote Feature Control (RFC)**

---

None identified.

#### **8.4.31 Selective Call Acceptance (SCA)**

---

None identified.

#### **8.4.32 Service Programming Lock (SPL)**

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None identified.

#### **8.4.33 Speech Option Selection (SOS)**

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Not applicable.

#### **8.4.34 Subscriber PIN Access (SPINA)**

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None identified.

#### **8.4.35 Subscriber PIN Intercept (SPINI)**

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None identified.

#### **8.4.36 Three-Way Calling (3WC)**

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Not applicable.

#### **8.4.37 Tiered Services (TS)**

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None identified.

#### **8.4.38 User Group ID (UGID)**

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None identified.

#### **8.4.39 Voice Controlled Services (VCS)**

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None identified.

#### **8.4.40 Voice Message Retrieval (VMR)**

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None identified.

#### **8.4.41 Voice Privacy (VP)**

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None identified (include all media types).