

# OMA-TP-2009-0280-INP\_DMBCAST\_BoF\_Final\_Report

## DMBCAST BoF Final Report

**Submitted To: Technical Plenary**

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**Availability:**  **Public**  **OMA Confidential**

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**Source: DMBCAST BoF**

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# Outline of Presentation

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- Background Information
- Use Cases Considered
- Key Findings
- Recommendations

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# Introduction

# Background Information (1/2)

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- Objectives

- To study the technical feasibility of running DM over BCAST and PUSH 2.3
- To attempt to gauge the market need for running DM services over a broadcast bearer

- BoF Duration

- Original duration December 2008 to March 2009
- Final duration December 2008 to April 2009
  - Extension sought and granted during the Macau TP meeting

# Background Information (2/2)

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## • Meeting Info

- Three face-to-face meetings
  - Cancun, December 18th 2008
  - Macau, February 12th 2008
  - Helsinki, April 23rd, 2008
- Eleven Conference Calls
  - Generally 1300/1400 Hrs on Wednesdays
- Participants from 20 companies registered on the portal
- On an average 12 participants per meeting registered on the portal

# Requirements Guiding the Technical Gap Analysis

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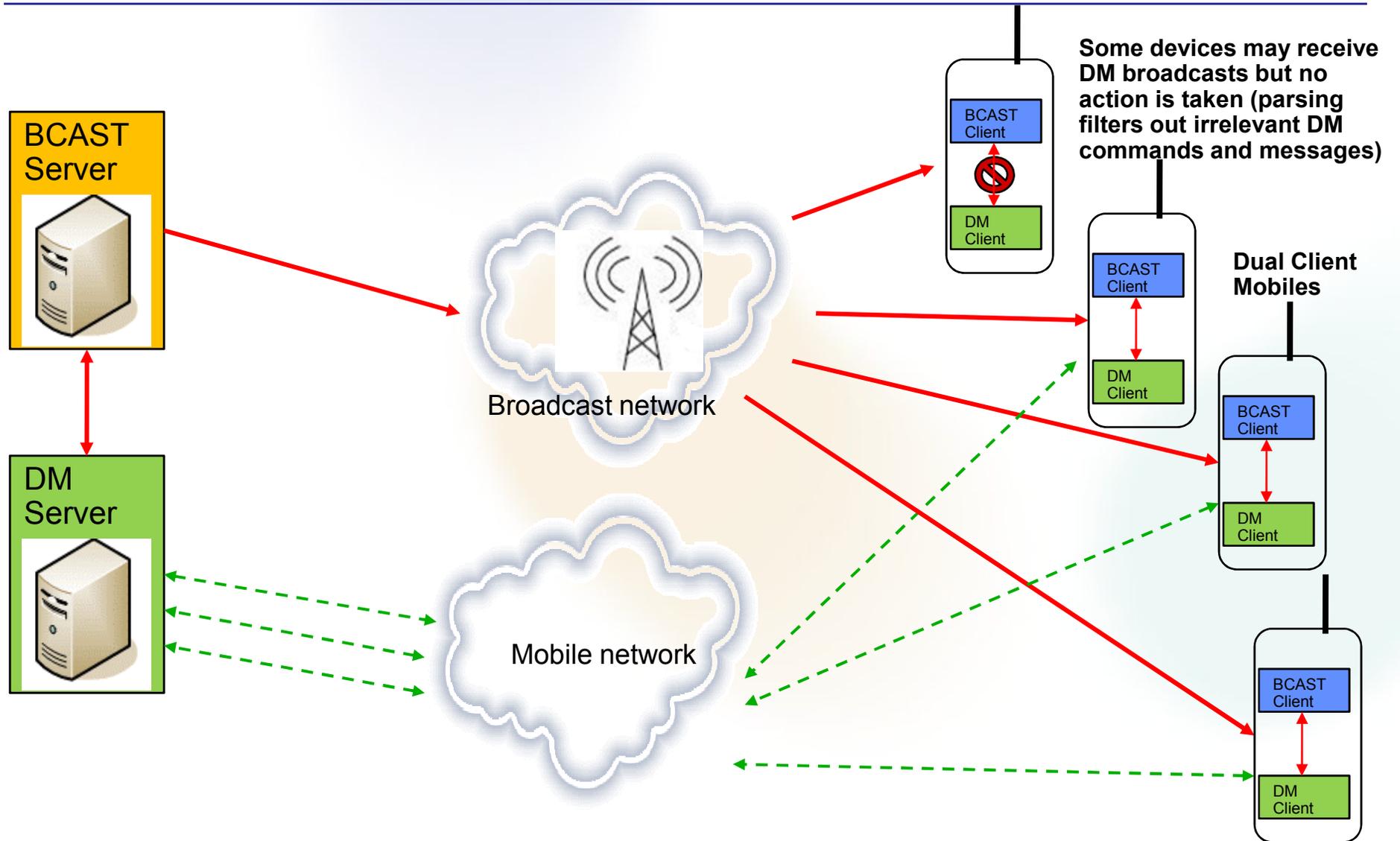
- Technical solutions that have the least impact on the existing DM and BCASST Enablers SHOULD be preferred
- Technical solutions that have the least impact on the proposed PUSH 2.3 Enabler SHOULD be preferred
- Authentication and integrity of the DM message MUST be guaranteed
- Devices MUST be able to determine if the data in the DM message is appropriate for their device
- Acknowledgements from client devices MUST NOT result in “message flooding” in the network
- Mechanisms MUST be specified so that the DM Server can gather the status of the DM operations on the devices

# Assumptions

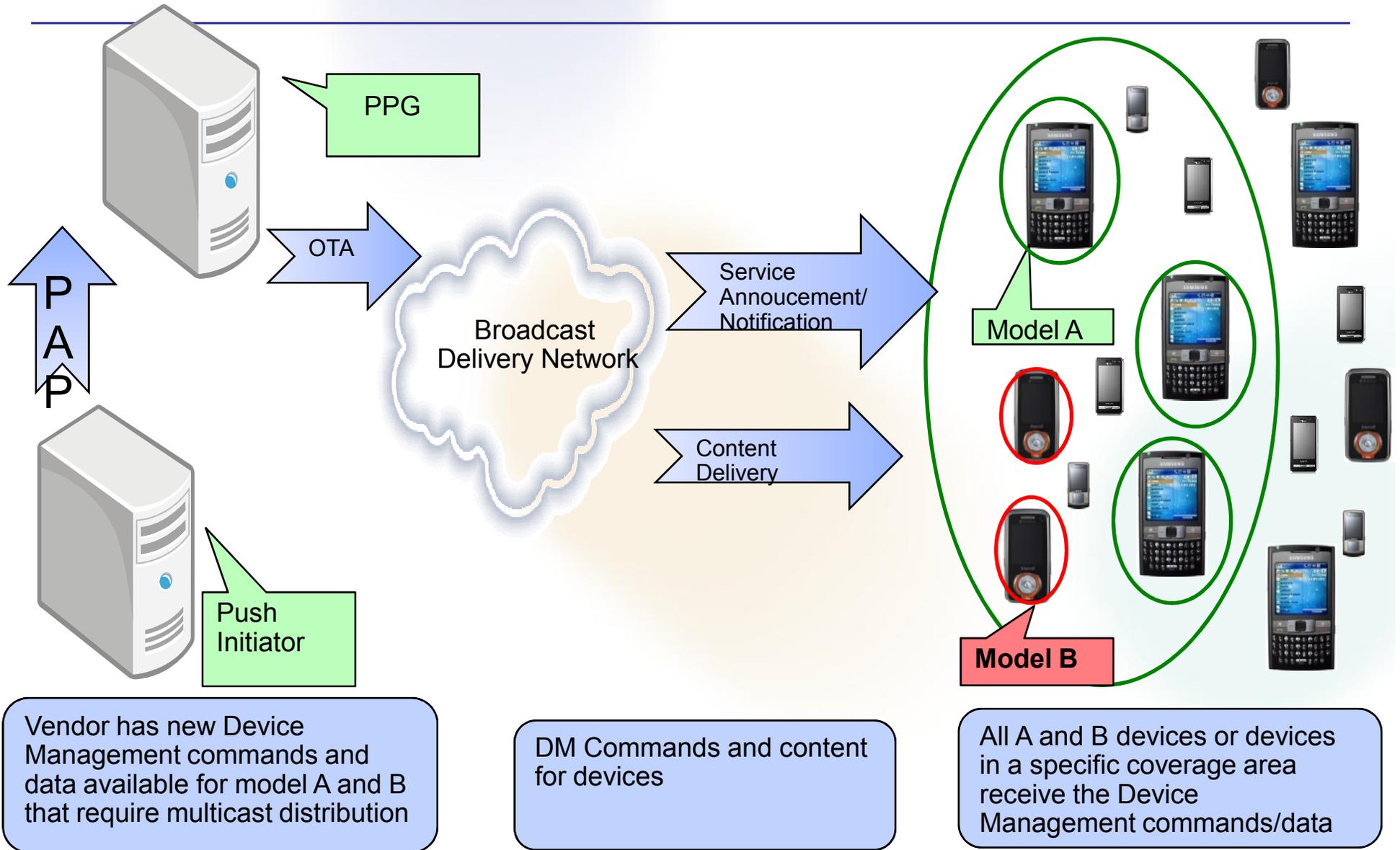
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- Mobile terminal devices are dual client devices
  - OMA DM client + OMA BCAST client
- OR
- OMA DM client + OMA PUSH 2.3 client
- There is some form of communication/interaction between the DM Server and the BCAST Server
- There is enhanced communication/interaction between the DM Server and the Push Proxy Gateway
  - Currently the DM Server only pushes Package 0 data to the PPG
- There is some form of communication/interaction between the DM Client and the BCAST/PUSH2.3 Client
- There may be one-way only devices that need DM functionality. At this point it is unclear how this can be resolved

# High Level DMBCAST Network Diagram



# Using PTM-Push for Device Management



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# Use Cases

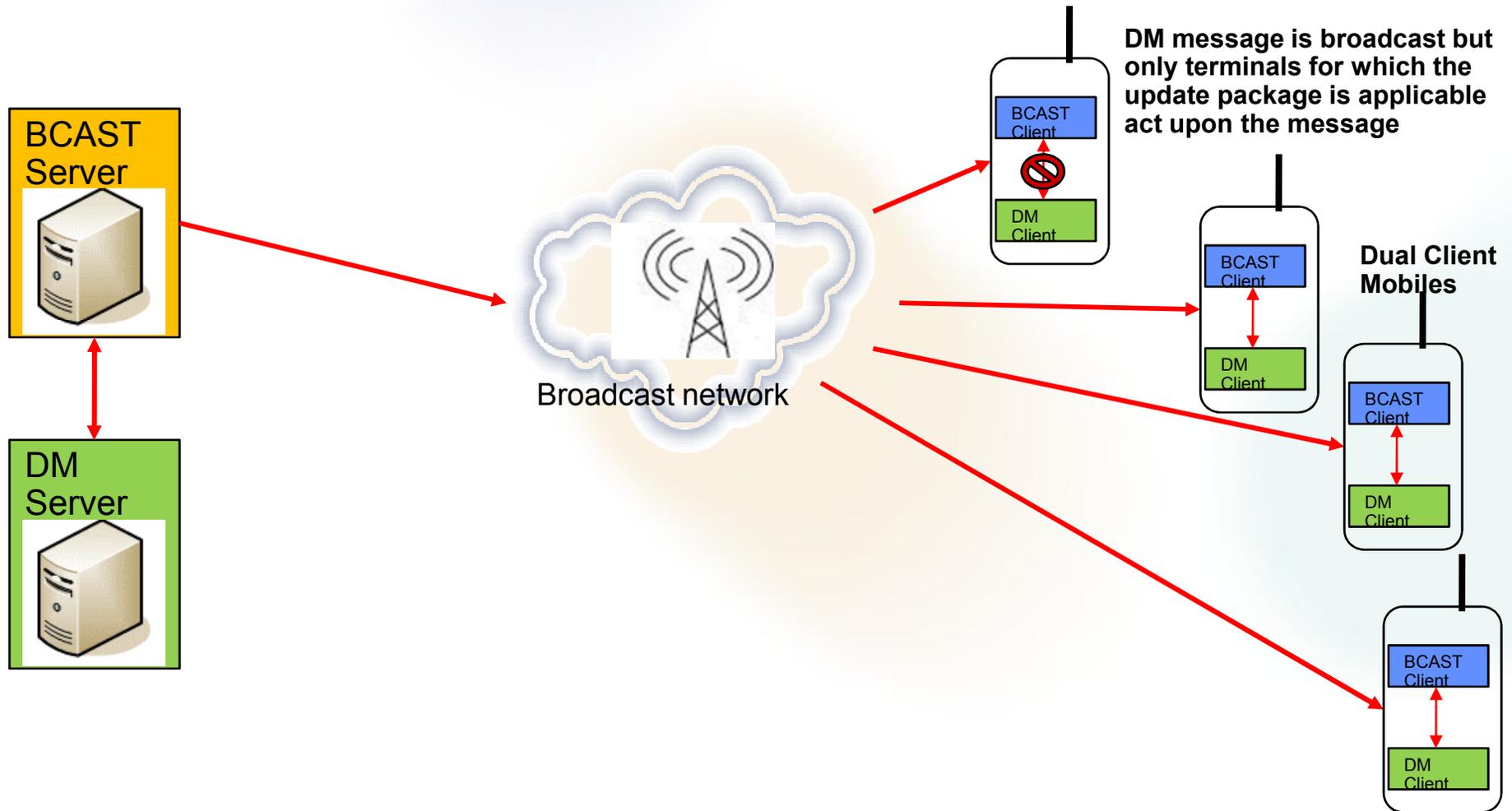
# Use Cases Considered

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- The BoF considered the following three categories of use cases
  1. **Software Update / Firmware Update**
    - Salient Feature: Bulk transfer of data from a download server to the client device
  2. **Network Measurement / Audience Measurement**
    - Salient Feature: Bulk upload of data from the client device to some server
  3. **Device Capability Control**
    - Salient Features:
      - DM Bootstrapping to some local DM server, that has jurisdiction over some geographical area
      - No bulk transfer of data between the server and the client

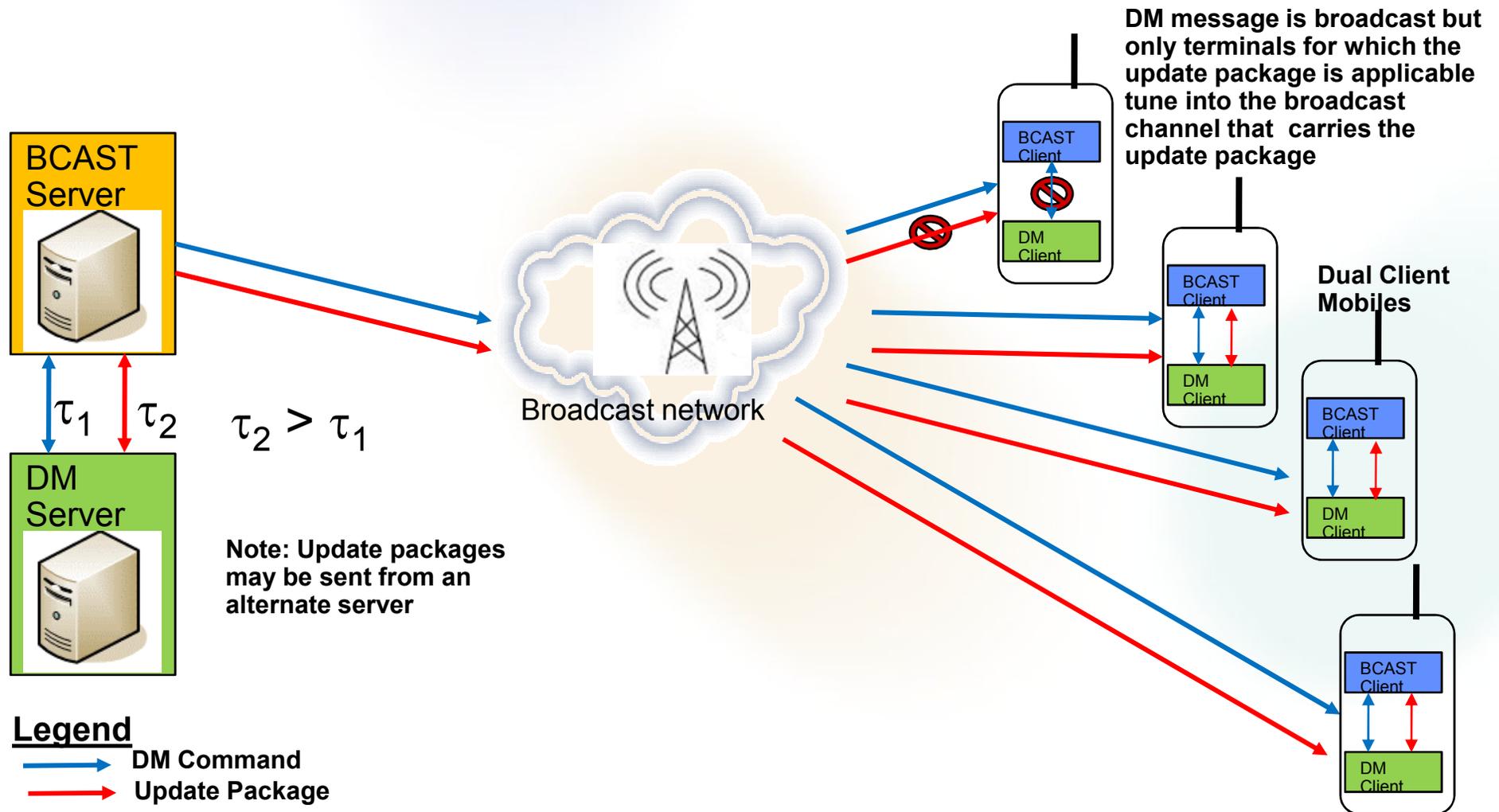
# Use Case Category 1: Firmware/Software Update (1/3)

## Case 1: Update package sent within DM message



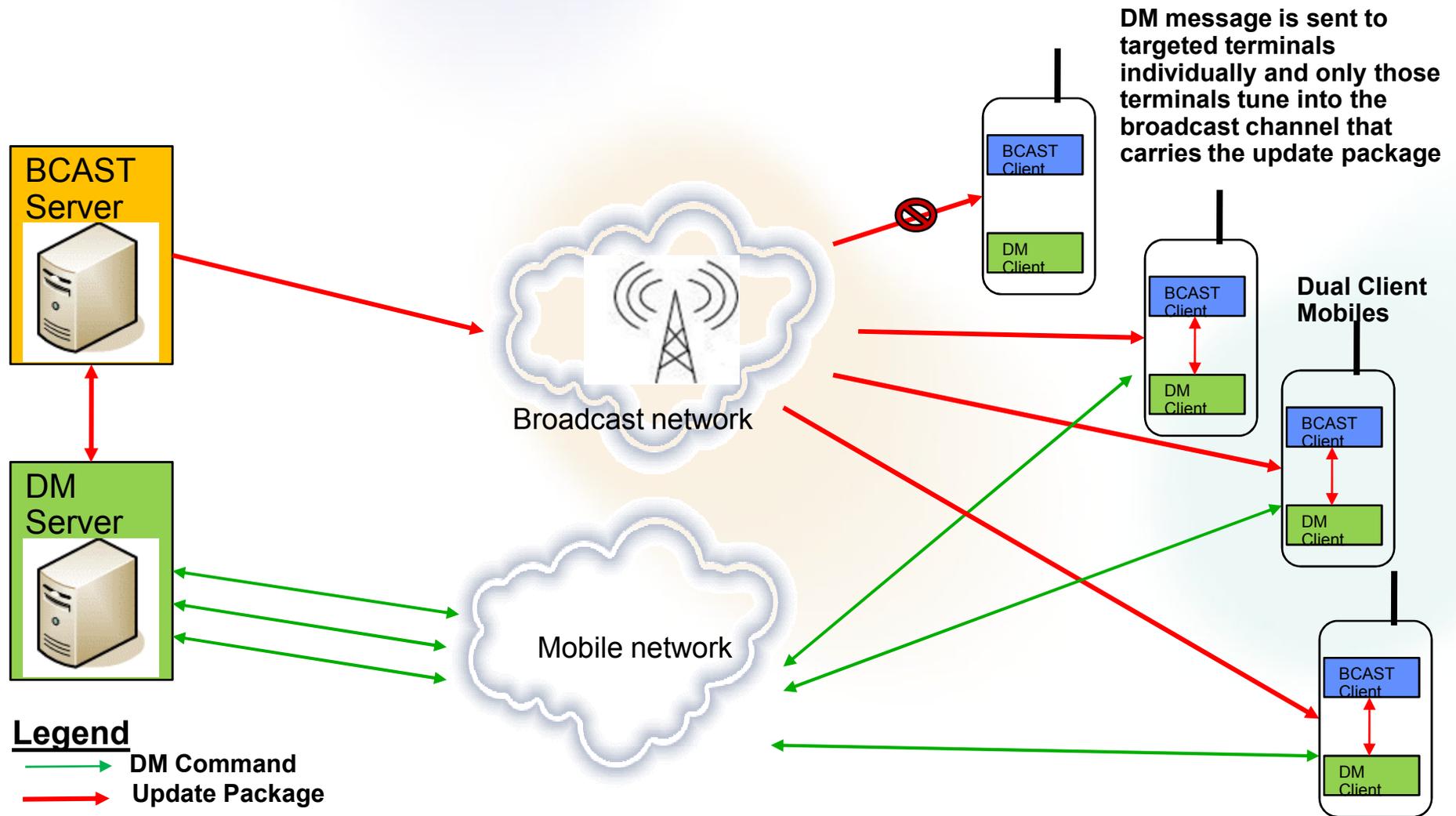
# Use Case Category 1: Firmware/Software Update (2/3)

## Case 2: DM command and update packages broadcast separately

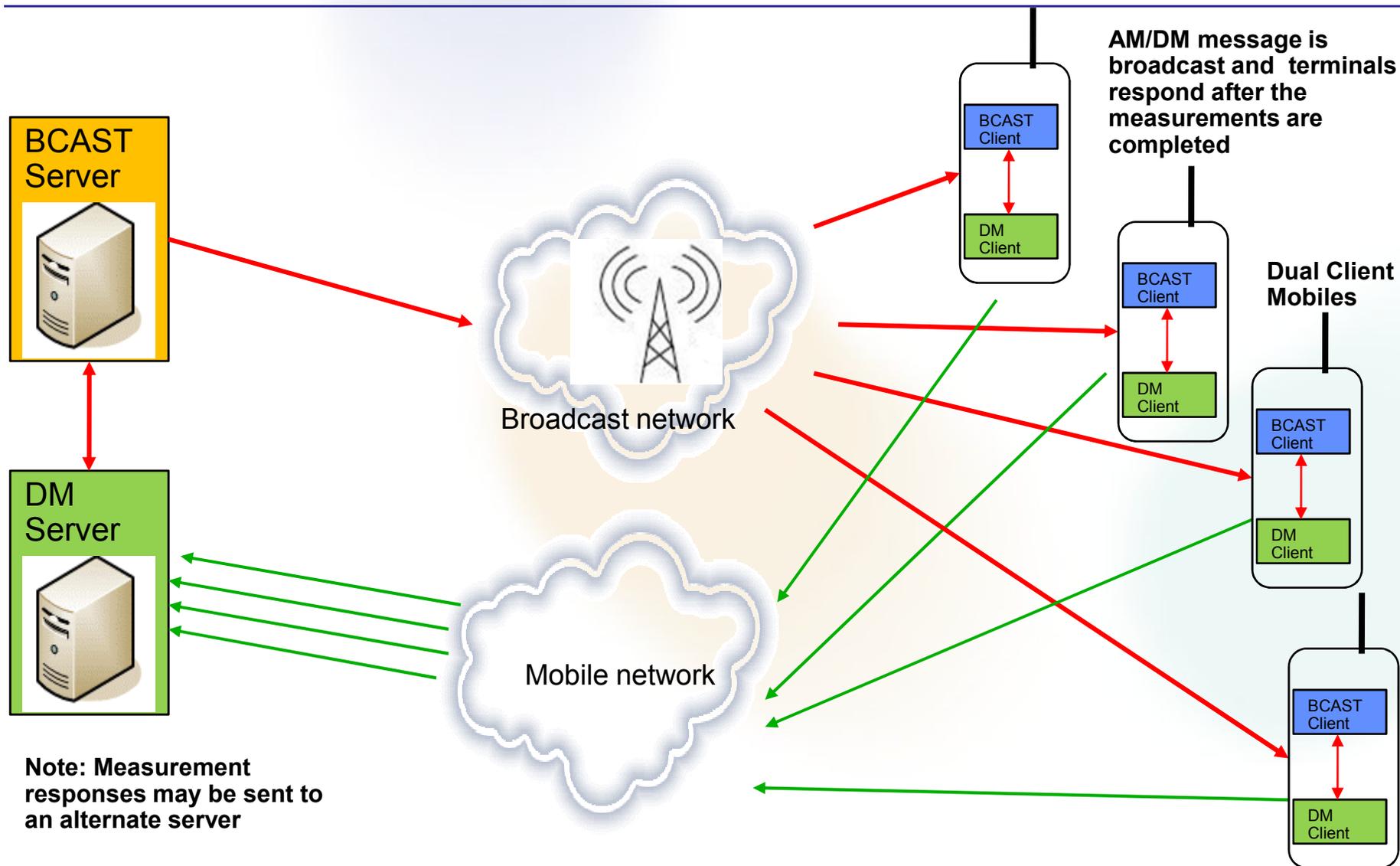


# Use Case Category 1: Firmware/Software Update (3/3)

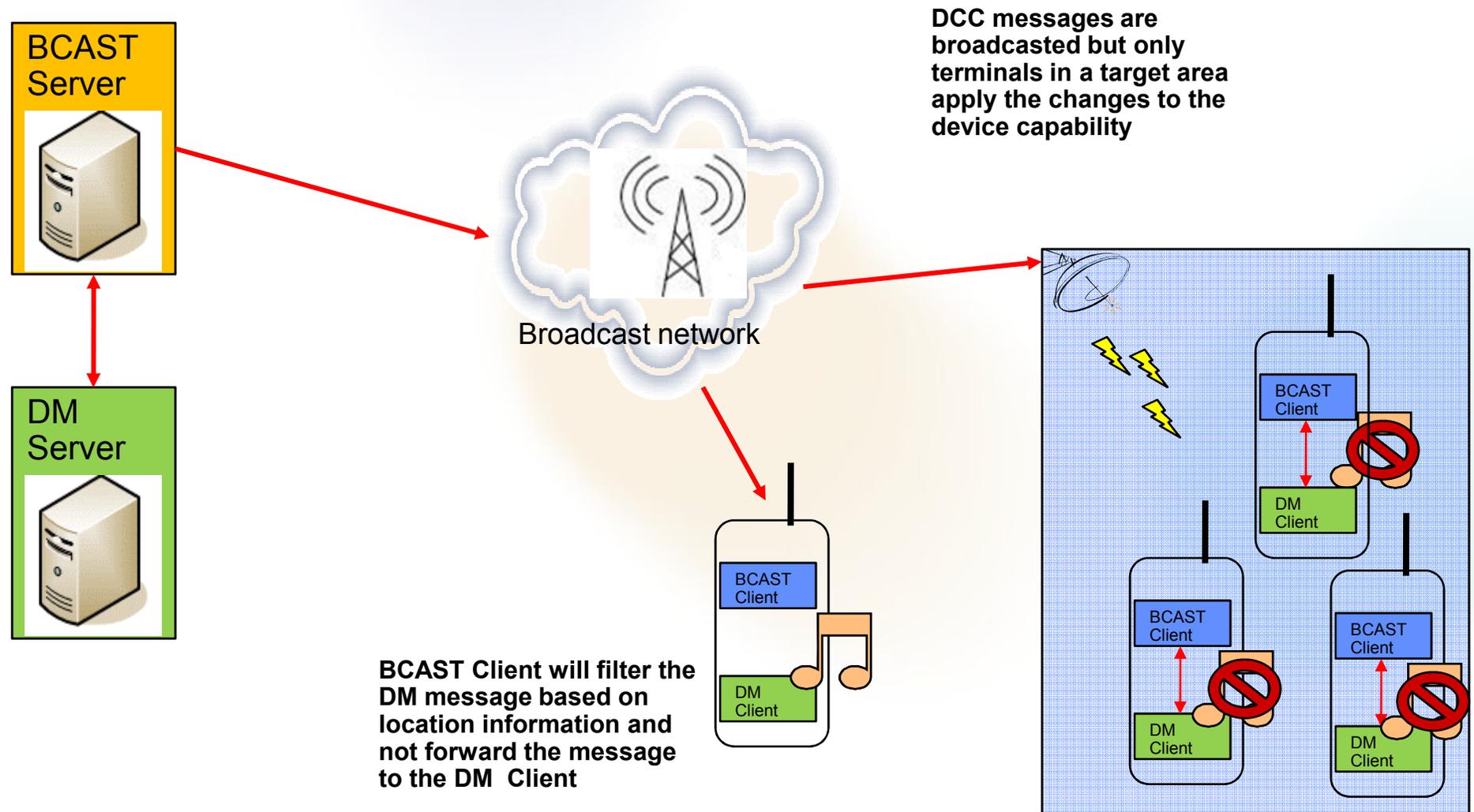
## Case 3: DM command over unicast and update packages over broadcast



# Use Case Category 2: Audience Measurement/Network Measurement



# Use Case Category 3 : Device Capability Control



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# Key Findings

# Use Case Realization (1/2)

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- The following DM capabilities, which are currently supported, can be put to use for realizing the three categories of use cases that the BoF investigated
  - **Bootstrap message**
    - Bootstrap messages are special messages that are not part of any ongoing DM session but rather a one-time transfer of information. The DM clients do not send a response back for a bootstrap message
    - These are mainly used for DM bootstrapping of the DM client by setting the values for the DMAcc MO
    - Since they do not generate any response, they are ideally suited for DMBCAST
  - **Inbox**
    - The Inbox addressing mechanism is used to address nodes within the scope of an MO using the MO identifier rather than the MO URI
    - For many MOs, the actual location within the DM Tree where the MO is rooted is defined in the device DDF and may vary from one device model to another

# Use Case Realization (2/2)

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- DM can use the following services from BCAST/PUSH for realizing the three categories of use cases that the BoF is investigating
  - Forward message delivery
    - It does not appear that there are any major challenges involved in sending the DM Bootstrap messages over BCAST or PUSH
  - File delivery
    - The file delivery service will be useful as an alternate download mechanism for the FUMO/SCOMO use case

# Gaps affecting all use case categories (1/4)

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## • DM

- Currently the DM protocol recommends that after a bootstrap message is processed, the client should initiate a session with the DM Server “at the next practical opportunity”. This is undesirable for DMBCAST
  - The DM bootstrap message structure needs to be modified to indicate to the client whether or not a session should be initiated upon successful processing of the bootstrap message
- OMA-DM does not currently support any mechanism to prevent the DM Server from getting overwhelmed with alerts and response messages
  - New mechanisms need to be developed to control the flow of messages from the client to the server. Possible approaches include:
    - A random back-off based mechanism for associated alert messages
    - A new Reporting MO that controls the status reporting criteria at the Client [e.g. report only on failure, report never (and store the status in the DM Tree for later retrieval) etc. ] as well as the URI where the associated alerts should be sent

# Gaps affecting all use case categories (2/4)

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## • DM (Cont'd)

- As per the current DM architecture, the DM Client only interfaces with the following functional entities: DM Server, OTA Provisioning Server, Smart Card, CP Enabler and MOs
  - The DM architecture needs to be updated to allow interaction between the DM Client and BCAST Client. However, this is not expected to be a significant issue
- As per the current DM architecture, the DM Server only interfaces with the following functional entities: DM Client and the Device Management Authority
  - The DM architecture needs to be updated to allow interaction between the DM Server and BCAST Server. However, this is not expected to be a significant issue

# Gaps affecting all use case categories (3/4)

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## • BCAST

- **Automatic Service Guide parsing and execution**
  - To provide system level automatic operations the BCAST client needs to be able to parse the SG, find the sigalling and act upon them.
    - E.g. the DM bootstrapping procedure may need to be processed whenever the terminal is powered on or only when there is an eminent DM session foreseen
- **Additional filtering parameters**
  - To provide fine level filtering BCAST needs to provide new filtering mechanisms to support DM as current mechanisms are specific for existing BCAST functions
    - If e.g. SG is used to convey information about DM commands, then additional information is required in the SG to represent the targeted devices
- **Interfaces for external enablers**
  - Communication between BCAST and DM is not specified in BCAST
    - Inter-enabler operation is considered implementation specific but as interactive signalling is required between the enablers, an interface may be required
- **Logging/cache management**
  - Currently implementation specific or provided as informative guidelines
    - E.g. download/storage rules may be required to receive scheduled DM commands

# Gaps affecting all use case categories (4/4)

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## • PUSH

1. The PI needs a mechanism to initiate a notification and file transfer via broadcast.
2. Needs to support delivery of Push Notifications and Content via broadcast services
3. The Push Client needs to be configured to access broadcast services.
4. Push Client needs to connect to and receive notification and content from the broadcast service and also deliver the content to DM Client
5. There is a need to assure the security for receiving content from the broadcast service
6. The broadcast channel is a unidirectional channel with no verification that the content sent have been correctly received
7. The sending of Broadcast notifications might be a security issue.

**Note:** *It was determined during the work of the BoF that identified gaps 1 to 6 will be supported by the Push 2.3 enabler. For issue 7, the concern was about sending the URLs of servers in the clear in Notification messages. However further investigation determined that no URLs are sent in the clear and that all application level information should be sent in secure manner.*

# Gaps affecting the FUMO/SCOMO Use Case

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## • DM

- Both FUMO and SCOMO support alternate download mechanisms. However, currently it is the client that has to initiate the download operation from a designated URL, when requested by the server
  - To leverage BCAST, the FUMO and SCOMO objects need to be enhanced so that downloading packages using the BCAST delivery mechanism can be supported, without the download operation being initiated by the client

## • BCAST

- Automatic sleep operation required
  - Sleep mode operation may be required to support scheduled operations
  - Current assumption is user controlled operation of BCAST application. If clients need to retrieve scheduled updates the user needs to execute the BACST application at the schedule time
- Content naming schema compatibility
  - BCAST and DM may have different naming schemes to access components
  - To support alternative download replacement scenarios consistency between the URIs is required

## • PUSH

- No gaps specific to this use case
  - Push functionality allows content to be delivered to specific groups, so that targeted devices can receive the FUMO/SCOMO commands destined to devices in that group

# Gaps affecting the AM/NM Use Case

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## • DM

- Standardized audience measurement and/or network measurement DiagMon functions, needed to support this use case category, have not been defined yet
  - DiagMon functions for audience measurement and network measurement need to be defined
  - These fall under the purview of DiagMon 1.1

## • BCAST

- No gaps specific to this use case

## • PUSH

- No gaps specific to this use case

# Gaps affecting the Device Capability Control Use Case

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## • DM

- A mechanism needs to be developed to automatically delete the DM Account object when a device moves outside the limited geographical area that falls within the jurisdiction of a local DM Server (e.g. a museum)
  - Currently the only way to “unbootstrap” a DM Client is by explicitly deleting the corresponding DM Account object
  - One possible approach is introducing the concept of limited-time bootstrapping of DM Servers

## • BCAST

- Coarse location filtering is not adequate
  - Currently only cell based filtering possible
    - Precise boundaries of buildings/areas would be required
- Precise location filtering is power-intensive
  - Terminal would need to take periodic fixes with GPS, i.e. every 5 mins.

## • PUSH

- No gaps specific to this use case

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# Recommendations

# Recommendations to interested members (1/4)

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## • DM

- Actively contribute to DM bootstrap enhancement as part of DM 1.3
- Consider modifications to SCOMO as part of SCOMO 1.1, and not SCOMO 1.0, so as not to delay Approved status for SCOMO 1.0
  - SCOMO 1.0 is currently in Candidate status
- Collaborate on new WIDs for FUMO 1.1 and SCOMO 1.1 to address the gaps that have been identified in this report
- Collaborate on developing new DiagMon functions for network and audience measurement
- Investigate various approaches for controlling client responses and share findings with the DM WG via Input Contributions
  - Seek input and guidance from the DM WG on this issue
  - If the recommended mechanism for controlling response messages from clients falls outside the scope of the DM 1.3 WID (e.g. a new Reporting MO), propose and seek approval for a new work item

# Recommendations to interested members (2/4)

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## • BCAST

- Consider closing the technical gaps presented in this report within the work scope of BCAST 1.1
  - Additional filtering mechanisms
  - Automatic operations
  - Storage management
  - Support for external interfaces
  - Content mapping schemas with external entities

# Recommendations to interested members (3/4)

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## • PUSH 2.3

- During the development phase of the Technical Specifications for Push 2.3, study DMBCAST use cases and determine if any of the identified use cases requires enhancements to the Push 2.3 specifications beyond those studied during the gap analysis phase of the BoF
- In case any enhancements are necessary, consult with the DM group
- During the development phase of the Push specifications the Push Group should communicate status and schedule of Technical Specifications to the DM group

# Recommendations to interested members (4/4)

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## • Common

- Coordinate the work flow across the different WGs involved so that the DMBCAST functionality can be rolled out in a timely manner

# Recommendations to TP

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- Approve DMBCAST BoF Final Report
- Close the DMBCAST BoF
- Publish the DMBCAST BoF Final Report as a publicly available document

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# Thank You