OMA Service Enablers for Broadcast 2.0

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Broadcast 2.0

• “A wide field”
  – a mix of different services related to “a/v media content”
  – innovative services over classic broadcast bearers
  – digital media content and related interactive applications
  – anytime, anywhere, any device, any network

• Focus of this talk: Related enablers as defined by the Open Mobile Alliance
  – Mobile Broadcast Services – OMA BCAST
    • Mobile TV services: free vs. encrypted, linear vs. podcast-type
    • Simple interactivity
    • Broadcast and Unicast convergence
  – Interactive Broadcast Services – OMA RME
    • Interactive applications synchronized with linear content
### OMA Enablers for Interactive Mobile TV – Landscape

<table>
<thead>
<tr>
<th>Layer</th>
<th>Enabler</th>
<th>Status</th>
<th>Specification</th>
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<tbody>
<tr>
<td><strong>Service Enabler for Mobile TV</strong></td>
<td>OMA BCAST</td>
<td>Spec in Candidate status, IOP Testing ongoing</td>
<td>“Mobile Broadcast”</td>
</tr>
<tr>
<td><strong>Distribution System</strong></td>
<td></td>
<td>Optimized for mobility, battery efficiency, error resilience</td>
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### BCAST – Functions and Structure

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<th>BCAST Main Functions</th>
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<td>File Distribution</td>
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<td>Service Provisioning</td>
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<td>Coding Formats</td>
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<td>Notification</td>
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<tr>
<td>Service Interaction</td>
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</tbody>
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**Adaptation Specifications**
- Unicast / Interaction
- IPDC over DVB-H
- MBMS
- BCMCS
- WIMAX
- IPDC over DVB-SH

**Distribution Systems**
- planned for BCAST 1.1
BCAST – Service Guide

Describes all aspects of the service offering
- information describing the service, displayed to the user
- information about how to purchase access to the service
- technical information for the terminal to access the service

Datamodel allows different Services
- Broadcast streaming
- 3G Unicast streaming
- “Cachecast” (broadcasted files)
- Service Previews
- Simple interactions

Technical realization:
- Representation as XML fragments
- Packetized fragments transmitted via FLUTE/ALC

BCAST – Service Protection

Broadcast service can be received by all terminals in the covered area.
→ protect revenue by access control and restriction
   – Encrypting the service
   – Delivering the rights (keys) to authorized (i.e. usually paying) users only

OMA BCAST defines two Profiles for Service Protection.

OMA DRM Profile
leverages OMA DRM 2.0 (with extensions) for rights acquisition

Smartcard Profile
integrates the 3GPP/3GPP2 Smartcard into the rights acquisition process, tying it to MNOs’ user management
BCAST – Key Hierarchy for Service Protection

Key Management

- DK or SCK
- REK
- LTK
- STK₁..STKₙ

Stream Encryption

Media Streams

Protected Media Streams

Service System

Air I/F

Terminal

- Encrypt Media using STK
- Decrypt Media using STK

- Encrypt LTK using REK
- Decrypt LTK using REK

- Encrypt STK using LTK
- Decrypt STKs using LTK

User/Device Specific

Service Access Keys
- Purchaseable
- usually unicast

Key Stream
- usually broadcasted

OMA DRM2 / Smartcard

Interactivity in Mobile TV – BCAST vs. RME

BCAST: Basic Interactivity

- Send SMS
- Enable basic voting (SMS or Web page)
- Display web pages
- Slow updates: 10s of seconds up to several minutes

RME: Rich Media Interactivity

- Streaming service with integrated interactive multimedia objects
- Appealing screen layout
- Tightly synchronized with video
- Server-driven fast updates

Wann ist dein nächster Wettbewerb?
BCAST – Basic Interactivity Support

Metadata in Service Guide and Services support basic interactivity (like following a link or selecting a voting option in a template)

Service Guide related, mostly static

Service related, dynamic with very lose time relation

RME – Architecture for Rich Media Interactivity Support

DOM level3, ECMAScript

LaSeR scene updates

SVG Tiny 1.2 scene

Rich Media Server

- Rich Media Content
  - scenes
  - scene updates
  - media

- Container Format / Transport Packets / Compression

Rich Media Client

- Local Interaction
- Rich Media Player
- Remote Interaction

Transport Mechanisms

- Forward Transmission (Unicast/Multicast/Broadcast)
- Download, Streaming

Is the player’s request remote in nature?

Yes

Send request

No

SVG Tiny 1.2 scene

LaSeR scene updates
RME – Basic Principle

**Ingredients:** SVG Scene Tree + LASeR Update Commands + ECMAScript + Remote Interactivity

![Diagram of RME Basic Principle]

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**RME Example – Rendering of service specific, interactive menu**

![RME Example Diagram]

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*Courtesy of Toni Paila, Nokia*
RME – Scalability across consumption environments

Same OMA RME stream
- author once, consume any
- full scalability
- any screensize
- any delivery method
  (cellular, WiMAX/WLAN, IPTV)

Summary and Outlook

• Two OMA Enablers for interactive Mobile TV exist or are nearing completion
  – OMA BCAST – support for Mobile TV Services
  – OMA RME – with the potential to revolutionize interactive Mobile TV

• OMA BCAST is currently starting the work on the next releases (BCAST 1.1 and 2.0).

• Upcoming challenges
  – integrate BCAST and RME for improved user experience
  – bring mobile and fixed line TV closer together
  – support advertisements in the mobile (TV) world
  – add support for more IP-based distribution network technologies
Thank You!

BCAST Functions

<table>
<thead>
<tr>
<th>Function group</th>
<th>Description</th>
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<tr>
<td>Audio/Video Codecs</td>
<td>High compression ratio codecs for audio and video</td>
</tr>
<tr>
<td>Service Guide</td>
<td>Service Discovery, Service List, Service Metadata</td>
</tr>
<tr>
<td>Stream Distribution</td>
<td>Protocols for Live Streaming</td>
</tr>
<tr>
<td>File Distribution</td>
<td>Protocols for File broadcast point to multipoint</td>
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<tr>
<td>Service Protection</td>
<td>Encryption methods to control access to services</td>
</tr>
<tr>
<td>Content Protection</td>
<td>Encryption methods to control access to content</td>
</tr>
<tr>
<td>Notifications</td>
<td>Real-time messages about events</td>
</tr>
<tr>
<td>Service Provisioning</td>
<td>Methods to buy access to services and content</td>
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<tr>
<td>Terminal Provisioning</td>
<td>Methods to provide configuration parameters to terminals</td>
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<tr>
<td>Service Interaction</td>
<td>Methods to enrich services with interactivity</td>
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</table>
BCAST – Content Delivery Protocols

Different protocols for
• real-time content (audio/video streaming)
• non-real-time content (file carousels)