



Mobile Domain SMIL Requirements

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Open Mobile Alliance

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1. Scope

(Informative)

The Synchronized Multimedia Integration Language (SMIL, pronounced "smile") enables the simple authoring of interactive audiovisual presentations.

This requirement addresses the need for adopting SMIL in the domain of mobile devices.

2. References

2.1 Normative References

- [RFC2119] “Key words for use in RFCs to Indicate Requirement Levels”, S. Bradner, March 1997, URL:<http://www.ietf.org/rfc/rfc2119.txt>
- [OMA-MMS-CONF13] “MMS Conformance Document, Version 1.3”, Open Mobile Alliance™, OMA-TS-MMS-CONF-V1_3-20050708-C. URI: <http://www.openmobilealliance.org/>
- [OMA-SVG-RD] “SVG in the Mobile Domain Requirements, Version 1.0”, Open Mobile Alliance™, OMA-RD-SvgMobileDomain-V1_0-20050112-C URI: <http://www.openmobilealliance.org/>
- [CS0050] “3GPP2 File Formats for Multimedia Services”, 3rd Generation Partnership Project 2, C.S0050-0 v1.0, URI: <http://www.3gpp2.org/>
- [TS26246] [TS26246] "Transparent end-to-end packet switched streaming service (PSS); 3GPP SMIL Language Profile", 3rd Generation Partnership Project, TS 26.246 Release 6. URI: <http://www.3gpp.org/ftp/Specs/>

2.2 Informative References

- [SMIL20] “Synchronized Multimedia Integration Language (SMIL 2.0)”, W3C Recommendation 07 August 2001, URL: <http://www.w3.org/TR/smil20/>
- [SMIL21] “Synchronized Multimedia Integration Language (SMIL 2.1)” W3C Candidate Recommendation 28 September 2005, <http://www.w3.org/TR/2005/PR-SMIL2-20050928/>

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

Multimedia Synchronization	The process of temporal coordination of multiple multimedia objects for the purpose of ensuring that each object is rendered according to the predefined rules
Synchronized Multimedia Content	Multimedia content capable of multimedia synchronization
Synchronized Multimedia Object	A multimedia object capable of multimedia synchronization

3.3 Abbreviations

OMA	Open Mobile Alliance
W3C	World Wide Web Consortium
SMIL	Synchronized Multimedia Integration Language
SVG	Scalable Vector Graphics
MMS	Multimedia Messaging Service

4. Introduction

(Informative)

Multimedia synchronization is a temporal behavior of a multimedia presentation.

Interactive multimedia presentations need synchronization to coordinate presentation and events on multiple media presentations. Description of synchronization needs temporal description and layout description to coordinate multiple media presentations.

When multiple enablers deal with this aspect of multiple presentations, it easily ends up with different multimedia synchronization features in different enablers. Such diversity brings increased implementation cost and increased complexity in authoring content. In order to avoid unnecessary overhead and complexity, it is desirable to produce single multimedia synchronization profile in the market.

Considering the universal property of multimedia synchronization, it is necessary to define enabler function that is reusable among applications, e.g. browsers, messaging applications, game applications and others.

Synchronized Multimedia Integration Language (SMIL) as defined by W3C is a language for integrating multiple XML applications in a synchronized manner..

W3C issued SMIL 2.1[SMIL21] as W3C Proposed Recommendation to give a stable specification to be based on, in September 2005.. In order to guarantee that these profiles meet the requirements of OMA members, it is important to define OMA requirements and liaise with W3C to insure OMA requirements are met.

OMA requirements for SMIL fall into three main areas:

1. What is the subset of features and modules of full SMIL2.1 that are appropriate for the mobile environment and resource limited devices.
2. What are the requirements for SMIL 2.1 usable in a wide range of OMA clients from browsers to MMS [OMA-MMS-CONF13][CS0050][TS26246]
3. What are the features of SMIL2.1 that are aligned to OMA SVG for Mobile Domain for its SMIL Animation use? [OMA-SVG-RD]

OMA user agents that may support SMIL are the browser user agent and the MMS user agent. Mobile Domain SMIL works fine in a standalone environment or in a messaging environment like MMS.

The goal of this RD is to produce a OMA-wide single multimedia synchronization requirement which lead to a single synchronization profile in the mobile markets. It is used to determine the selection of modules defined in external organizations or to feed additional requirements to external organizations for a industry-wide single profile.

5. Use Cases

(Informative)

5.1 Use Case 1. Multi-frame Multimedia Viewing

5.1.1 Short Description

This use case describes a scenario where a Content Provider provides a service empowered by multiple multimedia data with a window with multiple frames synchronized each other. Content Provider can prepare multiple video, audio, richtext content and simultaneous present them in an integrated manner with synchronization among multiple frames.

Frame is an independent subwindow which can render a content or media object. When multiple frames are supported, it enables the end user to interact with multiple media objects simultaneously.

5.1.2 Actors

End-user:

- The end-user consumes the served content)

Service-provider:

- Provide a content delivery service to the end users.

Content Provider:

The Content Provider develops the content with multiple multimedia data to be presented to end user in a synchronized manner (audio, video, multiple videos, ...)

5.1.2.1 Actor Specific Issues

End-user issues:

- The end user expects multiple multimedia contents (audio, video) to be presented in a synchronized manner.
- The end user has a mobile device which can display multimedia content (video, audio, and rich text).

Content Provider:

- The Content Provider provides multiple multimedia content and description about the synchronization among them.

5.1.2.2 Actor Specific Benefits

End user

The end user browses is provided with a rich multimedia experience with the multiple multimedia content with synchronization. The experience simulates the ones that the end users have in viewing TV.

Content Provider:

- The Content Provider can provide richer multimedia experience and create a new revenue source.
- The Content Provider can provide richer multimedia user experience to compensate the small display screen with motion and synchronization effects.

5.1.3 Pre-conditions

- The end user has the mobile device which can display the multimedia content;
- The Content Provider are willing to convert their multimedia content to a specific synchronization format.

5.1.4 Post-conditions

- The end-user can view the synchronized multimedia content offline.

5.1.5 Normal Flow

The following flow shows the interaction for a direct request case:

End User	Content Provider
<p>1. The End User requests a synchronized multimedia content</p>	<p>2. The Content Provider returns a synchronization description content</p> <ul style="list-style-type: none"> • The content provider describes the temporal relations among media objects and events in content. <p style="margin-left: 40px;">Temporal information includes duration, activation events, and stop events.</p> <p style="margin-left: 40px;">Temporal information includes exclusive play.</p> • The content provider describes the layout of the multiple media objects in content • The content provider describes the descriptions of the multiple media objects in content <p style="margin-left: 40px;">Parameters include object customisations.</p> • The content provider describes the processing at the end of duration including repeat. <p style="margin-left: 40px;">Layout includes visual properties</p>

3. The player receives the synchronization content and requests multimedia content.

5. The End User receives multimedia contents them in multiple frames according to the synchronization description.

6. The End User enjoys the synchronized multiframe content on their mobile device.

like height, width.

Layout includes background image information to efficiently decorate the layout.

Layout includes hypertext linking to invoke other objects.

Layout includes clipping and other media operations to effect the media without complicated editing.

- The content provider describes how the user action will be synchronized with media playing (e.g. clicking event processing)

4. The Content Provider sends requested multiple content.

Note: The delivery methods (Pull, Push, Asynchronous update, messaging) are independent to the content format requirements.

5.1.6 Alternative Flow

None

5.1.7 Operational and Quality of Experience Requirements

The Enabler provides a multiframe synchronization to enable smooth synchronization among multimedia content without making end users feel any awkwardness in frame synchronization.

5.2 Use Case 2. Usage of Temporal synchronization in other OMA Enablers (MMS)

5.2.1 Short Description

This use case describes a scenario with compatibility requirements in OMA existing standards, e.g. MMS1.3.

MMS1.3 uses subset of SMIL 2.0[SMIL20] for the language for its message.

5.2.2 Actors

End-user:

- The end-user sends and receives messages using MMS.

Service-provider:

- Provide a content delivery service to the end users or MMS delivery service.

5.2.2.1 Actor Specific Issues

End-user issues:

- The end user has a mobile device which can display MMS message with animation content

5.2.2.2 Actor Specific Benefits

End user:

- The end user can enjoy MMS messaging with minimum resource overhead..

Service Provider:

- The service provider expects the minimum device overhead when the MMS service and SMIL service coexist in a mobile device.

5.2.3 Pre-conditions

- The end user has the mobile device which can display the multimedia content;

5.2.4 Post-conditions

- The end-user can view the synchronized multimedia content offline.

5.2.5 Normal Flow

The following flow shows the MMS.

End User	Service Provider
1. The End User A sends an MMS message with synchronized multimedia message to the End User B	2. Service Provider receives the send request from the End User A and receives the synchronized multimedia message

4. The End User B receives the synchronized multimedia MMS

3. The service provider delivers the MMS message to the End User B

5.2.6 Alternative Flow

None

5.2.7 Operational and Quality of Experience Requirements

None

5.3 Use Case 3. Usage of Temporal synchronization in other OMA Enablers (SVG)

5.3.1 Short Description

This use case describes a scenario with compatibility requirements in OMA existing standards, e.g. SVG for Mobile Domain. This use case is applicable to future OMA standards with compound document capabilities, when the compound document framework enables a combination of XHTML and SVG or XHTML and SMIL

5.3.2 Actors

End-user:

- The end-user consumes the served SVG content with animation

Service-provider:

- Provide a content delivery service to the end users.

Content Provider:

- The Content Provider develops the content with SVG with animation

5.3.2.1 Actor Specific Issues

End-user issues:

- The end user has a mobile device which can display SVG with animation content.
- The end user has a mobile device which can display multimedia content (video, audio, and rich text).

Content Provider:

- The Content Provider provides SVG content with animation.

5.3.2.2 Actor Specific Benefits

End user:

- The end user can enjoy the SVG with animation with minimum resource overhead.

Service Provider:

- The service provider expects the minimum device overhead when the SVG service and SMIL service coexist in a mobile device.

Content Provider:

- The Content Provider can use SMIL animation in SVG with a compatible manner to the standalone SMIL content.

5.3.3 Pre-conditions

- The end user has the mobile device which can display the multimedia content;
- The Content Provider is willing to specify their SVG content using SMIL animation.

5.3.4 Post-conditions

- The end-user can view the synchronized multimedia content offline.

5.3.5 Normal Flow

The following flow shows the use case with SMIL animation use in SVG content.

End User	Content Provider
1. The End User requests an SVG content with animation <ul style="list-style-type: none"> • SVG uses a temporal description reusable for all XML applications 	
	2. The Content Provider delivers a SVG content with animation
3. The End User receives the SVG content with animation	
4. The End User enjoys the SVG content with animation.	

Note: This normal flow can be applied with a Compound document framework-based document when the compound document framework which combines XHTML and SVG is standardized in the OMA.

5.3.6 Alternative Flow

None

5.3.7 Operational and Quality of Experience Requirements

None

5.4 Use Case 4. synchronizedKaraoke

5.4.1 Short Description

This use case describes a scenario where a Content Provider provides a service with synchronized Karaoke.

Karaoke service shows a video clip with background tune to aid singing and the song words. The song words highlight shows which word/character to be sung in align to the playing music.

5.4.2 Actors

End-user:

- The end-user consumes the served content)

Content Provider:

- The Content Provider develops the content with karaoke content to be presented to end user in a synchronized manner

5.4.2.1 Actor Specific Issues

End-user issues:

- The end user expects karaoke content to be presented in a synchronized manner.
- The end user has a mobile device which can display karaoke content with audio.

Content Provider

- The Content Provider provides karaoke content with audio visual synchronization

5.4.2.2 Actor Specific Benefits

End user:

- The end user can enjoy the Karaoke experience using the multimedia content synchronization among audio, video and text.

Content Provider:

- The Content Provider can provide richer karaoke experience using authoring of audio, video and text synchronization.

5.4.3 Pre-conditions

- The end user has the mobile device which can display the multimedia content;
- The Content Providers are willing to convert their multimedia content to a specific synchronization format

5.4.4 Post-conditions

- The end-user can view the synchronized karaoke content offline.

5.4.5 Normal Flow

The following flow shows the interaction for a direct request case:

End User	Content Provider
1. The End User requests a Karaoke content with audio and video	
	2. The Content Provider returns a Karaoke content with audio and video
3. The End User receives the karaoke content	
4. The End User enjoys the karaoke content, singing it.	

Note: The Karaoke delivery methods (message, pull, push, asynchronous delivery) are independent to this use case.

5.4.6 Alternative Flow

None

5.4.7 Operational and Quality of Experience Requirements

The Enabler provides a smooth audio and text synchronized karaoke experience to an end user.

5.5 Use Case 5. Usage of Temporal Information in Video Clip

5.5.1 Short Description

This use case describes a scenario where a Content Provider provides a service empowered by video clip Content Provider can prepare video clip with visual effects in order to enhance the promotion or visual impacts of the content.

5.5.2 Actors

End-user:

- The end-user consumes the served video clip content

Content Provider:

- The Content Provider develops the content with visual effects

5.5.2.1 Actor Specific Issues

End-user issues:

- The end user expects video clip contents (audio, video) to be presented in a synchronized manner.
- The end user has a mobile device which can display video clip content.

Content Provider:

- The Content Provider provides video clip content.

5.5.2.2 Actor Specific Benefits

End user:

- The end user is provided with a rich multimedia experience with the video clip content. The experience simulates the ones that the end users have in viewing TV.

Content Provider:

- The Content Provider can provide richer multimedia experience and create a new revenue source.
- The Content Provider can provide richer multimedia user experience to compensate the small display screen with video clip content.

5.5.3 Pre-conditions

- The end user has the mobile device which can display the video clip content;
- The Content Provider is willing to convert their video clipcontent to a specific synchronization format.

5.5.4 Post-conditions

- The end-user can view the video clip content offline.

5.5.5 Normal Flow

The following flow shows the interaction for a direct request case:

End User	Content Provider
<p>1. The End User requests a video clip content</p>	<p>2. The Content Provider returns a video clip content</p> <ul style="list-style-type: none"> • The content provider describes temporal relations in content <ul style="list-style-type: none"> It includes time duration It includes event handling on time and user activation • The content provider describes layout information in content <ul style="list-style-type: none"> It includes special allocation of media objects Layout information includes visual properties like height, width. Layout

3. The player receives the video clip content
4. The End User enjoys the video clip content on their mobile device.

information includes background image information to efficiently decorate the layout.

Layout information includes hypertext linking to invoke other objects.

Layout includes clipping and other media operations to effect the media without complicated editing.

5.5.6 Alternative Flow

None

5.5.7 Operational and Quality of Experience Requirements

The Enabler provides a smooth and non-awkward video clip experience to an end user.

6. Requirements

(Normative)

6.1 High-Level Functional Requirements

Label	Description	Enabler Release
FUN-SMILMFS-001	The Enabler MUST support the easy addition of new types of multimedia content.	
FUN-SMILMFS-002	The Enabler MUST support a capability to describe a layout using multiple different audio, video, and text information.	
FUN-SMILMFS-002-01	The Enabler MUST support a capability to describe visual layout, e.g. height, width, background color of a frame	
FUN-SMILMFS-002-02	The Enabler MUST support a capability to describe background images in a layout in order to facilitate easy content creation with a consistent background image.	
FUN-SMILMFS-002-03	The Enabler MUST support a capability to describe alignments among frames.	
FUN-SMILMFS-003	The Enabler MUST support synchronization among multiple media objects in different frames using time duration description provide.	
FUN-SMILMFS-003-01	The Enabler MUST support a capability to describe the duration and other timing information to control each frame.	
FUN-SMILMFS-003-02	The Enabler MUST support a capability to describe how a frame is displayed when the fixed duration specified passes.	
FUN-SMILMFS-003-03	The Enabler MUST support a capability to describe the minimum and maximum time duration to play.	
FUN-SMILMFS-003-04	The Enabler MUST support a capability to describe repeat active duration.	
FUN-SMILMFS-004	The Enabler MUST support a capability to describe exclusive play, which means only one of the frame can be actively played. Only one frame is actively played.	
FUN-SMILMFS-005	The Enabler MUST support a capability to describe event handling for synchronized with user activation	
FUN-SMILMFS-005-01	The Enabler MUST support a capability to describe how to stop playing with end conditions in order to control active duration.	
FUN-SMILMFS-006	The Enabler MUST support a capability to describe user action (e.g. click) for each frame to control display.	
FUN-SMILMFS-006-01	The Enabler MUST support a capability to describe start and stop of active duration based upon the useraction (e.g. clicking accesskey).	
FUN-SMILMFS-007	The Enabler MUST support a capability to describe conditional test to choose the media content on user preferences or system capabilities for a frame.	
FUN-SMILMFS-008	The Enabler MUST support a capability to describe hypertext or hypermedia linking in a frame.	
FUN-SMILMFS-009	The Enabler MUST support a capability to describe parameters to render a media object in a frame (e.g. provide mood and accessory to facial animation plug-in).	

FUN-SMILMFS-010	The Enabler MUST support a capability to describe media operations like media clipping clipping (other media operation examples include brushing, tiling) .	
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Table 1: High-Level Functional Requirements

6.1.1 Security

Label	Description	Enabler Release
	None	

Table 2: High-Level Functional Requirements – Security Items

6.1.2 Charging

Label	Description	Enabler Release
	None	

Table 3: High-Level Functional Requirements – Charging Items

6.1.3 Administration and Configuration

Label	Description	Enabler Release
	None	

Table 4: High-Level Functional Requirements – Administration and Configuration Items

6.1.4 Usability

Label	Description	Enabler Release
USA-SMILMFS-001	The way to specify the synchronization among media objects MUST be comprehensive and media-independent for easy adoption for content providers.	
USA-SMILMFS-002	The Enabler MUST provide a capability to describe control the fetching of content from a server in a manner that will improve the media object rendering performance of the document (e.g. a method to describe ignoring or skipping unknown media objects).	

Table 5: High-Level Functional Requirements – Usability Items

6.1.5 Interoperability

Label	Description	Enabler Release
INT-SMILMFS-001	The Enabler MUST conform to the open standard to describe synchronization.	

INT-SMILMFS-003	The Enabler MUST provide a capability to describe skip control in order to gracefully accommodate the future extension.	
INT-SMILEOC-001	The Enabler MUST provide interoperability to the existing OMA MMS1.3 standard.	
INT-SMILEOC-002	The Enabler MUST provide easy migration from the existing OMA MMS 1.3 standard.	
INT-SMILEOC-003	The Enabler SHOULD minimize the footprint increase when it coexists with MMS 1.3 Enabler[OMA-MMS-CONF13] on a handset...	
INT-SMILEOC-004	The Enabler MUST provide the easy migration to the animation module in the coming OMA SVG specification[OMA-SVG-RD].	
INT-SMILEOC-005	The Enabler SHOULD have minimum discrepancy with existing industrial multimedia synchronization standards [CS0050] [TS26246]	

Table 6: High-Level Functional Requirements – Interoperability Items

6.1.6 Privacy

Label	Description	Enabler Release
	None	

Table 7: High-Level Functional Requirements – Privacy Items

6.2 Overall System Requirements

Label	Description	Enabler Release

Table 8: High-Level System Requirements

Appendix A. Change History (Informative)

A.1 Approved Version History

Reference	Date	Description
OMA-RD-MobileDomainSMIL-V1_0	09 Apr 2013	Status changed to Approved by TP Ref #: OMA-TP-2013-0102-INP_SMIL_V1_0_RRP_for_final_Approval