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LTE;  
Transparent end-to-end  
Packet-switched Streaming Service (PSS);  
3GPP SMIL language profile  
(3GPP TS 26.246 version 16.0.0 Release 16)**



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# Foreword

This Technical Specification has been produced by the 3<sup>rd</sup> Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

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where:

- x the first digit:
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  - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

The 3GPP transparent end-to-end packet-switched streaming service (PSS) specification consists of five 3GPP TSs: 3GPP TS 22.233 [1], 3GPP TS 26.233 [2], 3GPP TS 26.234 [3], 3GPP TS 26.244 [4], 3GPP TS 26.245 [5], and the present document.

The TS 22.233 contains the service requirements for the PSS. The TS 26.233 provides an overview of the PSS. The TS 26.234 provides the details of protocol and codecs used by the PSS. The TS 26.244 defines the 3GPP file format (3GP) used by the PPS and MMS services. TS 26.245 defines the Timed Text format used by the PSS.

The TS 26.244, TS 26.245, and Ts 26.246 (present document) start with Release 6. Earlier releases of the 3GPP file format, the Timed text format, and the 3GPP SMIL Language Profile can be found in TS 26.234.

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# 1 Scope

The present document includes the specification of the 3GPP SMIL Language Profile. The 3GPP SMIL Language Profile is also referred to as "3GPP PSS SMIL Language Profile" [3] and also just "3GPP SMIL".

The 3GPP SMIL Language Profile is based on SMIL 2.0 Basic [7] and SMIL Scalability Framework. It is a clean subset of SMIL 2.0 Full profile [7], and a clear superset of SMIL 2.0 Basic [7].

The 3GPP SMIL Language Profile is used by the PSS [2][3] and MMS [6] services.

The 3GPP SMIL Language Profile is in no way restricted to be used with only these services, but can also be used for other services.

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# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] 3GPP TS 22.233: "Transparent End-to-End Packet-switched Streaming Service; Service aspects; Stage 1".
- [2] 3GPP TS 26.233: "Transparent end-to-end Packet-switched Streaming Service (PSS); General description".
- [3] 3GPP TS 26.234: "Transparent end-to-end Packet-switched Streaming Service (PSS); Protocols and codecs".
- [4] 3GPP TS 26.244: "Transparent end-to-end Packet-switched Streaming Service (PSS); 3GPP file format (3GP)".
- [5] 3GPP TS 26.245: "Transparent end-to-end Packet-switched Streaming Service (PSS); Timed-text format".
- [6] 3GPP TS 26.140: "Multimedia Messaging Service (MMS); Media formats and codecs".
- [7] W3C Recommendation: "Synchronized Multimedia Integration Language (SMIL 2.0)-[Second Edition]", <http://www.w3.org/TR/2005/REC-SMIL2-20050107/>, January 2005.
- [8] W3C Recommendation: "Cascading Style Sheets, level 2, CSS2 Specification, <http://www.w3.org/TR/1998/REC-CSS2-19980512>, 12.05.1998

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## 3 Definitions and abbreviations

### 3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

**continuous media:** media with an inherent notion of time. In the present document speech, audio, video and timed text

**discrete media:** media that itself does not contain an element of time. In the present document all media not defined as continuous media

**PSS client:** client for the 3GPP packet switched streaming service based on the IETF RTSP/SDP and/or HTTP standards, with possible additional 3GPP requirements according to the present document

**PSS server:** server for the 3GPP packet switched streaming service based on the IETF RTSP/SDP and/or HTTP standards, with possible additional 3GPP requirements according to the present document

**scene description:** description of the spatial layout and temporal behaviour of a presentation. It can also contain hyperlinks

### 3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [3] and the following apply.

HTML	Hyper Text Markup Language
MIME	Multipurpose Internet Mail Extensions
MMS	Multimedia Messaging Service
PSS	Packet-switched Streaming Service
SMIL	Synchronised Multimedia Integration Language
UCS-2	Universal Character Set (the two octet form)
UTF-8	Unicode Transformation Format (the 8-bit form)
UTF-16	Unicode Transformation Format (the 16-bit form)
W3C	WWW Consortium
XHTML	eXtensible Hyper Text Markup Language
XML	eXtensible Markup Language

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## 4 3GPP SMIL Language Profile Outline

3GPP SMIL is a markup language based on SMIL Basic [7] and SMIL Scalability Framework.

3GPP SMIL consists of the modules required by SMIL Basic Profile (and SMIL 2.0 Host Language Conformance) and additional MediaAccessibility, MediaDescription, MediaClipping, MetaInformation, PrefetchControl, EventTiming and BasicTransitions modules. All of the following modules are included:

- SMIL 2.0 Content Control Modules -- BasicContentControl, SkipContentControl and PrefetchControl
- SMIL 2.0 Layout Module -- BasicLayout
- SMIL 2.0 Linking Module -- BasicLinking, LinkingAttributes
- SMIL 2.0 Media Object Modules -- BasicMedia, MediaClipping, MediaParameter, MediaAccessibility and MediaDescription
- SMIL 2.0 Metainformation Module -- Metainformation
- SMIL 2.0 Structure Module -- Structure
- SMIL 2.0 Timing and Synchronization Modules -- BasicInlineTiming, MinMaxTiming, BasicTimeContainers, RepeatTiming and EventTiming

- SMIL 2.0 Transition Effects Module -- BasicTransitions

---

## 5 Document Conformance

A conforming 3GPP SMIL document shall be a conforming SMIL 2.0 document.

All 3GPP SMIL documents use SMIL 2.0 namespace.

```
<smil xmlns="http://www.w3.org/2001/SMIL20/Language">
```

3GPP SMIL documents may declare requirements using `systemRequired` attribute:

```
EXAMPLE 1: <smil xmlns="http://www.w3.org/2001/SMIL20/Language"
            xmlns:EventTiming="http://www.w3.org/2000/SMIL20/CR/EventTiming "
            systemRequired="EventTiming">
```

- Namespace URI `http://www.3gpp.org/SMIL20/PSS4/` identifies the version of the 3GPP SMIL profile defined in Release 4 of [3].
- Namespace URI `http://www.3gpp.org/SMIL20/PSS5/` identifies the version of the 3GPP SMIL profile defined in Release 5 of [3].
- Namespace URI `http://www.3gpp.org/SMIL20/PSS6/` identifies the version of the 3GPP SMIL profile defined in Release 6 in the present document.

Authors may use these URIs to indicate requirement for exact 3GPP SMIL semantics for a document or a subpart of a document:

```
EXAMPLE 2: <smil xmlns="http://www.w3.org/2001/SMIL20/Language"
            xmlns:pss5="http://www.3gpp.org/SMIL20/PSS5/"
            systemRequired="pss5">
```

The content authors should generally not include the PSS requirement in the document unless the SMIL document relies on PSS specific semantics that are not part of the W3C SMIL. The reason for this is that SMIL players that are not conforming 3GPP PSS user agents may not recognize the PSS URI and thus refuse to play the document.

---

## 6 User Agent Conformance

A conforming 3GPP SMIL user agent shall be a conforming SMIL Basic User Agent.

A conforming user agent shall implement the semantics 3GPP SMIL as described in clauses 7 and 8 (including subclauses).

A conforming user agent shall recognise

- the URIs of all included SMIL 2.0 modules;
- the URI `http://www.3gpp.org/SMIL20/PSS6/` as referring to all modules and semantics of the version of the 3GPP SMIL profile described in Release 6 in the present document;
- the URI `http://www.3gpp.org/SMIL20/PSS5/` as referring to all modules and semantics of the version of the 3GPP SMIL profile described in Release 5 of document [3];
- the URI `http://www.3gpp.org/SMIL20/PSS4/` as referring to all modules and semantics of the 3GPP SMIL profile defined in Release 4 of document [3].

NOTE: The difference between release 4 and release 5 is that the BasicTransitions module has been added in release 5. Releases 4 and 5 are defined in [3].

NOTE: The difference between release 5 and release 6 is that the MediaParameter module and additional specification on the ContentControl module systemComponent test attribute have been added in release 6. Release 5 is defined in [3].

---

## 7 3GPP SMIL Language Profile definition

3GPP SMIL is based on SMIL 2.0 Basic language profile [7]. This chapter defines the content model and integration semantics of the included modules where they differ from those defined by SMIL Basic.

### 7.1 Content Control Modules

3GPP SMIL includes the content control functionality of the BasicContentControl, SkipContentControl and PrefetchControl modules of SMIL 2.0. PrefetchControl is not part of SMIL Basic and is an additional module in this profile.

All BasicContentControl attributes listed in the module specification shall be supported. Annex B extends the SMIL 2.0 BasicContentControl specification [7] by additional definitions on the **systemComponent** test attribute.

NOTE: The SMIL specification [7] defines that all functionality of PrefetchControl module is optional. This means that even although PrefetchControl is mandatory user agents may implement semantics of PrefetchControl module only partially or not to implement them at all.

PrefetchControl module adds the **prefetch** element to the content model of SMIL Basic **body**, **switch**, **par** and **seq** elements. The **prefetch** element has the attributes defined by the PrefetchControl module (**mediaSize**, **mediaTime** and **bandwidth**), the **src** attribute, the BasicContentControl attributes and the **skip-content** attribute.

### 7.2 Layout Module

3GPP SMIL includes the BasicLayout module of SMIL 2.0 for spatial layout. The module is part of SMIL Basic.

Default values of the width and height attributes for root-layout shall be the dimensions of the device display area.

### 7.3 Linking Module

3GPP SMIL includes the SMIL 2.0 BasicLinking and LinkingAttributes modules for providing hyperlinks between documents and document fragments. The BasicLinking module is from SMIL Basic.

When linking to destinations outside the current document, implementations may ignore values "play" and "pause" of the 'sourcePlaystate' attribute and values "new" and "pause" of the 'show' attribute, instead using the semantics of values "stop" and "replace" respectively. When the values of 'sourcePlaystate' and 'show' are ignored the player may also ignore the 'sourceLevel' attribute since it is of no use then

### 7.4 Media Object Modules

3GPP SMIL includes the media elements from the SMIL 2.0 BasicMedia module and attributes from the MediaAccessibility, MediaDescription and MediaClipping modules. MediaAccessibility, MediaDescription and MediaClipping modules are additions in this profile to the SMIL Basic.

MediaClipping module adds to the profile the ability to address sub-clips of continuous media. MediaClipping module adds **clipBegin** and **clipEnd** (and for compatibility **clip-begin** and **clip-end**) attributes to all media elements.

MediaAccessibility module provides basic accessibility support for media elements. New attributes **alt**, **longdesc** and **readIndex** are added to all media elements by this module. MediaDescription module is included by the MediaAccessibility module and adds **abstract**, **author** and **copyright** attributes to media elements.

MediaParameter module allows passing additional parameters to the rendering of a media object. This specification extends the SMIL 2.0 specification [7] by defining some values for the **name** and **value** attributes of MediaParameter module and the expected behaviour of a 3GPP SMIL player when these are used:

A 3GPP SMIL player should render the content as specified whenever one of the following name value pairs are encoded as a parameter to a media object of one of the listed MIME types:

NOTE: The behaviour of the 3GPP SMIL player is undefined for all other cases.

MIME type of the media object	value of the 'name' attribute	value of the 'value' attribute	Intended rendering of the media content.
application/text, application/xhtml+xml, application/vnd.wap.xhtml+xml	color or foreground-color	Any legal value for the CSS2 color attribute [8] (eg. "#ff000", "red")	The text document is rendered with the given (default) color.  Note: Attribute name="foreground-color" is included for compatibility.
application/text, application/xhtml+xml, application/vnd.wap.xhtml+xml	font-size or textsize	Any legal value for the CSS2 font-size attribute [8] (e.g. "medium", "12pt")	The text document is rendered with the given (default) text size. The size values are interpreted as in CSS2 [8],  Note: Attribute name="fontsize" is included for compatibility.

## 7.5 Metainformation Module

The MetaInformation module of SMIL 2.0 is included to the profile. This module is addition in this profile to the SMIL Basic and provides a way to include descriptive information about the document content into the document.

This module adds **meta** and **metadata** elements to the content model of SMIL Basic **head** element.

## 7.6 Structure Module

The Structure module defines the top-level structure of the document. It is included by SMIL Basic.

## 7.7 Timing and Synchronization modules

The timing modules included in the 3GPP SMIL are BasicInlineTiming, MinMaxTiming, BasicTimeContainers, RepeatTiming and EventTiming. The EventTiming module is an addition in this profile to the SMIL Basic.

For 'begin' and 'end' attributes either single offset-value or single event-value shall be allowed. Offsets shall not be supported with event-values.

Event timing attributes that reference invalid IDs (for example elements that have been removed by the content control) shall be treated as being indefinite.

Supported event names and semantics shall be as defined by the SMIL 2.0 Language Profile. All user agents shall be able to raise the following event types:

- activateEvent;
- beginEvent;
- endEvent.

The following SMIL 2.0 Language event types should be supported:

- focusInEvent;
- focusOutEvent;

- inBoundsEvent;
- outOfBoundsEvent;
- repeatEvent.

User agents shall ignore unknown event types and not treat them as errors.

Events do not bubble and shall be delivered to the associated media or timed elements only.

When using delivery mechanisms such as streaming, the setup time, connection time and buffering time shall be excluded from the computation of the simple duration.

## 7.8 Transition Effects Module

3GPP SMIL profile includes the SMIL 2.0 BasicTransitions module to provide a framework for describing transitions between media elements.

NOTE: The SMIL specification [7] defines that all functionality of BasicTransitions module is optional: "Transitions are hints to the presentation. Implementations must be able to ignore transitions if they so desire and still play the media of the presentation". This mean that even although the BasicTransitions module is mandatory user agents may implement semantics of the BasicTransitions module only partially or not to implement them at all. Content authors should use transitions in their SMIL presentation where this appears useful. User agents that fully support the semantics of the Basic Transitions module will render the presentation with the specified transitions. All other user agents will leave out the transitions but present the media content correctly.

User agents that implement the semantics of this module should implement at least the following transition effects described in SMIL 2.0 specification [7]:

- barWipe;
- irisWipe;
- clockWipe;
- snakeWipe;
- pushWipe;
- slideWipe;
- fade;

A user agent should implement the default subtype of these transition effects.

A user agent that implements the semantics of this module shall at least support transition effects for non-animated image media elements. For purposes of the Transition Effects modules, two media elements are considered overlapping when they occupy the same region.

BasicTransitions module adds attributes 'transIn' and 'transOut' to the media elements of the Media Objects modules, and value "transition" to the set of legal values for the 'fill' attribute of the media elements. It also adds transition element to the content model of the head element.

---

## 8 Content Model

This table shows the full content model and attributes of the 3GPP SMIL profile. The attribute collections used are defined by SMIL Basic ([7], SMIL Host Language Conformance requirements, chapter 2.4). Changes to SMIL Basic are shown in **bold**.

Table 1: Content model for the 3GPP SMIL profile

Element		
	Elements	Attributes
smil	head, body	COMMON-ATTRS, CONTCTRL-ATTRS, xmlns
head	layout, switch, <b>meta</b> , <b>metadata</b> , <b>transition</b>	COMMON-ATTRS
body	TIMING-ELMS, MEDIA-ELMS, switch, a, <b>prefetch</b>	COMMON-ATTRS
layout	root-layout, region	COMMON-ATTRS, CONTCTRL-ATTRS, type
root-layout	EMPTY	COMMON-ATTRS, backgroundColor, height, width, skip-content
region	EMPTY	COMMON-ATTRS, backgroundColor, bottom, fit, height, left, right, showBackground, top, width, z-index, skip-content, regionName
ref, animation, audio, img, video, text, textstream	area, <b>param</b>	COMMON-ATTRS, CONTCTRL-ATTRS, TIMING-ATTRS, repeat, region, MEDIA-ATTRS, <b>clipBegin(clip-begin)</b> , <b>clipEnd(clip-end)</b> , alt, longDesc, readIndex, abstract, author, copyright, transIn, transOut
<b>param</b>	EMPTY	<b>name, value</b>
a	MEDIA-ELMS	COMMON-ATTRS, LINKING-ATTRS
area	EMPTY	COMMON-ATTRS, LINKING-ATTRS, TIMING-ATTRS, repeat, shape, coords, nohref
par, seq	TIMING-ELMS, MEDIA-ELMS, switch, a, <b>prefetch</b>	COMMON-ATTRS, CONTCTRL-ATTRS, TIMING-ATTRS, repeat
switch	TIMING-ELMS, MEDIA-ELMS, layout, a, <b>prefetch</b>	COMMON-ATTRS, CONTCTRL-ATTRS
<b>prefetch</b>	EMPTY	COMMON-ATTRS, CONTCTRL-ATTRS, mediaSize, mediaTime, bandwidth, src, skip-content
<b>meta</b>	EMPTY	COMMON-ATTRS, content, name, skip-content
<b>metadata</b>	EMPTY	COMMON-ATTRS, skip-content
<b>transition</b>	EMPTY	COMMON-ATTRS, CONTCTRL-ATTRS, type, subtype, startProgress, endProgress, direction, fadeColor. skip-content, dur

---

# Annex A (informative): SMIL authoring guidelines

## A.1 General

This is an informative annex for SMIL presentation authors. Authors can expect that PSS clients can handle the SMIL module collection defined in this document, with the restrictions defined in this Annex. When creating SMIL documents the author is recommended to consider that terminals may have small displays and simple input devices. The media types and their encoding included in the presentation should be restricted to what is described in clause 7 of the present document. Considering that many mobile devices may have limited software and hardware capabilities, the number of media to be played simultaneous should be limited. For example, many devices will not be able to handle more than one video sequence at the time.

---

## A.2 BasicLinking

The Linking Modules define elements and attributes for navigational hyperlinking, either through user interaction or through temporal events. The BasicLinking module defines the "a" and "area" elements for basic linking:

- a Similar to the "a" element in HTML it provides a link from a media object through the href attribute (which contains the URI of the link's destination). The "a" element includes a number of attributes for defining the behaviour of the presentation when the link is followed.
- area Whereas the a element only allows a link to be associated with a complete media object, the area element allows links to be associated with spatial and/or temporal portions of a media object.

The area element may be useful for enabling services that rely on interactivity where the display size is not big enough to allow the display of links alongside a media (e.g. QCIF video) window. Instead, the user could, for example, click on a watermark logo displayed in the video window to visit the company website.

Even if the area element may be useful some mobile terminals will not be able to handle area elements that include multiple selectable regions within an area element. One reason for this could be that the terminals do not have the appropriate user interface. Such area elements should therefore be avoided. Instead it is recommended that the "a" element be used. If the "area" element is used, the SMIL presentation should also include alternative links to navigate through the presentation; i.e. the author should not create presentations that rely on that the player can handle "area" elements.

---

## A.3 BasicLayout

When defining the layout of a SMIL presentation, a content author needs to be aware that the targeted devices might have diverse properties that effect how the content can be rendered. The different sizes of the display area that can be used to render content on the targeted devices should be considered for defining the layout of the SMIL presentation. The root-layout window might represent the entire display or only parts of it.

Content authors are encouraged to create SMIL presentations that will work well with different resolutions of the rendering area. As mentioned in the SMIL2 recommendation content authors should use SMIL ContentControl functionality for defining multiple layouts for their SMIL presentation that are tailored to the specific needs of the whole range of targeted devices. Furthermore, authors should include a default layout (i.e. a layout determined by the SMIL player) that will be used when none of the author-defined layouts can be used.

Using relative position and size attributes in the definition of a region is also helpful for making SMIL presentations more portable across different display sizes; these features should also be used.

A 3GPP SMIL player should use the layout definition of a SMIL presentation for presenting the content whenever possible. When the SMIL player fails to use the layout information defined by the author it is free to present the content using a layout it determines by itself.

The "fit" attribute defines how different media should be fitted into their respective display regions.

The rendering and layout of some objects on a small display might be difficult and all mobile devices may not support features such as scroll bars. Therefore "fit=scroll" should not be used except for text content.

Due to hardware restrictions in mobile devices, operations such that scaling of a video sequence, or even images, may be very difficult to achieve. According to the SMIL 2.0 specification SMIL players may in these situations clip the content instead. To be sure of that the presentation is displayed as the author intended, video content should be encoded in a size suitable for the targeted terminals and it is recommended to use "fit=hidden".

---

## A.4 EventTiming

The two attributes "endEvent" and "repeatEvent" in the EventTiming module may cause problems for a mobile SMIL player. The end of a media element triggers the "endEvent". In the same way the "repeatEvent" occurs when the second and subsequent iterations of a repeated element begin playback. Both these events rely on that the SMIL player receives information about that the media element has ended. One example could be when the end of a video sequence initiates the event. If the player has not received explicit information about the duration of the video sequence, e.g. by the "dur" attribute in SMIL or by some external source as the "a=range" field in SDP. The player will have to rely on the RTCP BYE message to decide when the video sequence ends. If the RTCP BYE message is lost, the player will have problems initiate the event. For these reasons is recommended that the "endEvent" and "repeatEvent" attributes are used with care, and if used the player should be provided with some additional information about the duration of the media element that triggers the event. This additional information could e.g. be the "dur" attribute in SMIL or the "a=range" field in SDP.

The "inBoundsEvent" and "outOfBoundsEvent" attributes assume that the terminal has a pointer device for moving the focus to within a window (i.e. clicking within a window). Not all terminals will support this functionality since they do not have the appropriate user interface. Hence care should be taken in using these particular event triggers.

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## A.5 MetaInformation

Authors are encouraged to make use of meta data whenever providing such information to the mobile terminal appears to be useful. However, they should keep in mind that some mobile terminals will parse but not process the meta data.

Furthermore, authors should keep in mind that excessive use of meta data will substantially increase the file size of the SMIL presentation that needs to be transferred to the mobile terminal. This may result in longer set-up times.

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## A.6 XML entities

Entities are a mechanism to insert XML fragments inside an XML document. Entities can be internal, essentially a macro expansion, or external. Use of XML entities in SMIL presentations is not recommended, as many current XML parsers do not fully support them.

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## A.7 XHTML Mobile Profile

When rendering texts in a SMIL presentation, authors are able to use XHTML Mobile Profile [47] that contains thirteen modules. However, some of the modules include non-text information. When referring to an XHTML Mobile Profile document from a SMIL document, authors should use only the required XHTML Host Language modules : Structure Module, Text Module, Hypertext Module and List Module. The use of the Image Module, in particular, should not be used. Images and other non-text contents should be included in the SMIL document.

**NOTE:** An XHTML file including a module which is not part of the XHTML Host Language modules may not be shown as intended. Also, an XHTML file which uses elements or attributes from the required XHTML Host Language modules and which uses elements or attributes that are not included in XHTML Basic Profile [28], may not render correctly on legacy handsets which implement only XHTML Basic. These are:

- The start attribute on the 'ol' element in the List module

- The value attribute on the 'li' element in the List module
- The 'b' element in the Presentation module
- The 'big' element in the Presentation module
- The 'hr' element in the Presentation module
- The 'i' element in the Presentation module
- The 'small' element in the Presentation module

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## Annex B (normative): Additional specification on the systemComponent Test Attribute

### B.1 General

This annex includes additional normative specification on the encoding of the SMIL 2.0 BasicContentControl Module **systemComponent** test attribute value. The purpose is to allow a SMIL presentation to test if a 3GPP SMIL player supports a media type.

### B.2 Definition of Attribute Encoding

To test support for a certain media type the value of the **systemComponent** attribute must be encoded as a URI as follows:

```
systemComponentAttrValue --> "ContentType:" mimeMediaTypeName "/"  
mimeSubTypeName options?  
  
options --> "?" parameters
```

where

- "ContentType:" is a static pre-fix that must always be encoded,
- '*mimeMediaTypeName*' and '*mimeSubtypeName*' are a MIME type and subtype. These two must be encoded and must be separated by a dash ( "/" ), and
- encoding '*options*' is optional.
- '*parameters*' stands for any parameter to the MIME type that can optionally be encoded. When encoded, parameters must be separated from the MIME type and sub-type names by a question mark ( "?" ).

For all content formats mandated by [3] the '*mime-media-type-name*' and '*mime-subtype-name*' must be encoded as defined in section 5.4 of [3]. For all other content types established MIME types must be used.

NOTE: This specification intentionally does not define a format for parameters.

### B.3 Behaviour of a 3GPP SMIL Player

For any **systemComponent** test attribute value that is prefixed with the string 'ContentType:' a 3GPP SMIL player is required to evaluate the **systemComponent** test attribute based on '*mimeMediaTypeName*' and '*mimeSubtypeName*' as follows.

- evaluation of the test attribute returns true whenever the 3GPP SMIL player supports rendering media content of this MIME type,
- in all other cases the evaluation returns false.

A 3GPP SMIL player must be able to ignore any encoded parameters for performing this evaluation. A 3GPP SMIL player is allowed but not required to also include parameters into the evaluation.

NOTE: The specification on parameters makes a 3GPP SMIL player forward compatible with any future version of the specification that will possibly define how to encode MIME type parameters and how to evaluate the **systemComponent** test attribute when parameters are included into its value.

NOTE: This specification intentionally leaves it open how those **systemComponent** test attribute values evaluate that are not prefixed with the string "ContentType:". Again, this makes a 3GPP SMIL player forward compatible with any future version of the specification that will possible define other URI schemes for the **systemComponent** attribute value.

## Annex C (informative): Change history

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
2004-06	24	SP-040345			Approved at 3GPP TSG SA#24	2.0.0	6.0.0
2004-09	33	SP-060596	0001	2	Fix to the SMIL timing modules and to the references	6.0.0	6.1.0
2007-06	36				Version for Release 7	6.1.0	7.0.0
2008-12	42				Version for Release 8	7.0.0	8.0.0
2009-12	46				Version for Release 9	8.0.0	9.0.0
2011-03	51				Version for Release 10	9.0.0	10.0.0
2012-09	57				Version for Release 11	10.0.0	11.0.0
2014-09	65				Version for Release 12	11.0.0	12.0.0
2015-12	70				Version for Release 13	12.0.0	13.0.0

Change history							
Date	Meeting	TDoc	CR	Rev	Cat	Subject/Comment	New version
2017-03	75					Version for Release 14	14.0.0
2018-06	80					Version for Release 15	15.0.0
2020-07	-	-	-	-	-	Update to Rel-16 version (MCC)	<b>16.0.0</b>

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# History

<b>Document history</b>		
V16.0.0	August 2020	Publication