

SMIL

Learning to use SMIL

Synchronized Multimedia
Integration Language

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What is SMIL

SMIL : an XML-like language, looking much like HTML

* SMIL is a W3C standard

Objective :

◆ **Synchronize replay of multimedia clips in the Web**

* Texts, images, audio, vidéo

Players :

◆ **Real Player (from Real Networks)**

* The most widely used : PC Windows, Solaris ...

* The free version is enough. Downloadable from
www.Real.com

◆ **Other player players :**

* IE 6 (subset of SMIL only), GRiNS (from Oratrix, Netherlands) ...

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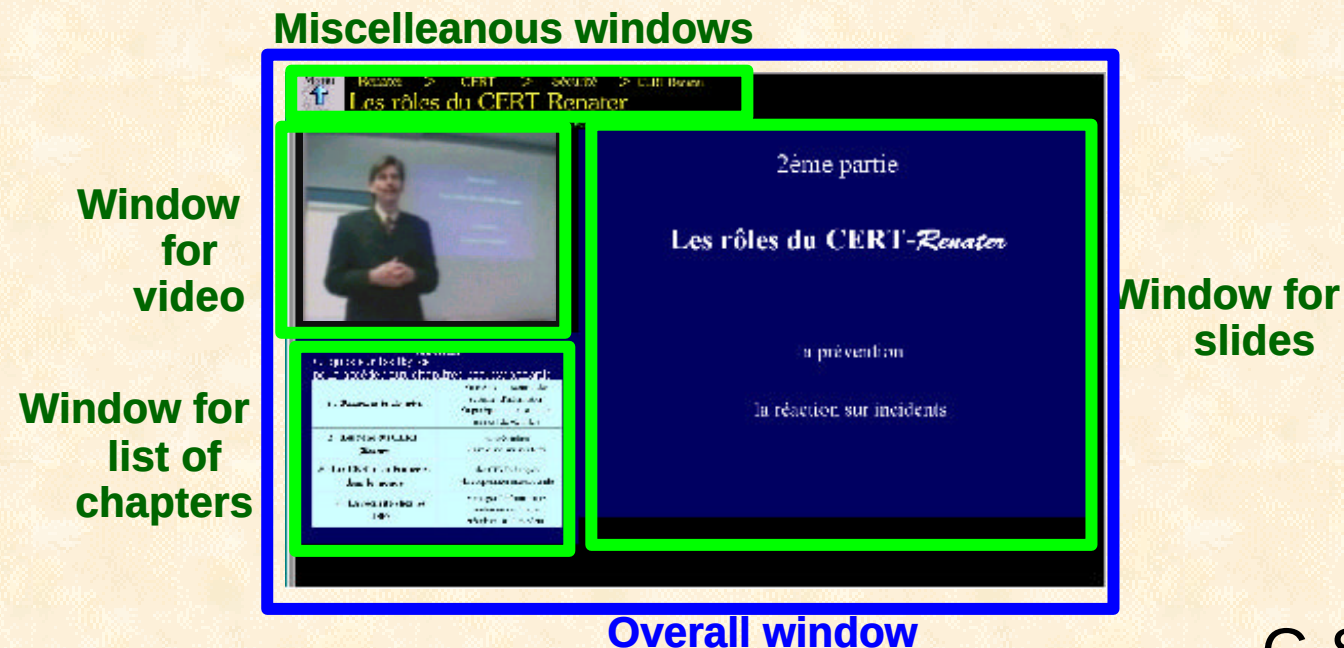
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SMIL deals with windows inside the screen area

SMIL describes linking of events each consisting in the replay of a multimedia clip :

* A clip : Images, texts, audio, vidéo ...

Each event is attributed to a window, and is played inside this window :



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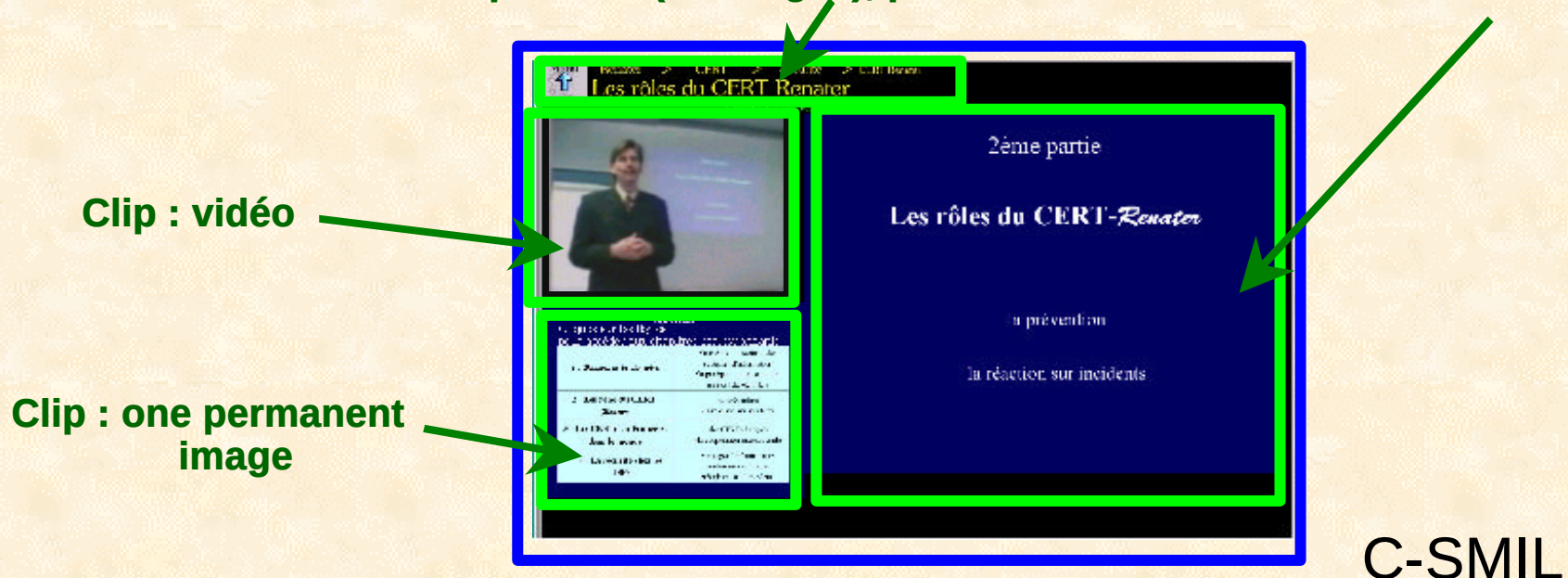
SMIL SMIL dealw with temporal linking of events :

***SMIL describes the time relationship between events
(replay of clips) :***

- * In parallel :
 - Several events simultaneously
- * And/or sequentially :
 - Several events one after the other

Clip : texts (or images), permanent

Clip : images one after the other



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SMIL gère des enchainements temporels :

SMIL describes the time relationship between events (replay of clips) :

- * In parallel :
 - Several events simultaneously
- * And/or sequentially :
 - Several events one after the other

Clip : texts (or images), permanent

Clip : images one after the other

In parallel :

Clip : vidéo

Clip : one permanent image



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Hypermedia links wuthin a SMIL document

When you click on them, sensitive areas activate hypertext (hypermedia) links :

- * They are windows, or pre-defined zones inside windows.
- * They cause : the end of the replay of the current SMIL document, and the start of replaying the document to which the link points

Several clickable windows

Clickable areas inside the same image



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SMIL, a « tag language »

*The syntax of SMIL is organised by « **tags** », that are in fact « commands for SMIL » :*

<NB tag parameters **/>**

* Where NB is the name of the tag

Or other format :

<NB parameters ... **>**

Other commands or data to which this tag is related

</NB>

Typology of tags

Declarations :

- * Mainly windows definitions
 - Size, position etc

Action inside a window :

- * Display an image during a given length of time
- * Replay an audio or video clip

Synchronization

- * Describe synchronization between different events (in the same or in different windows) :
 - In parallel
 - Or sequentially

Links

- * Describe actions in sensitive areas

Pour faire facilement un document SMIL

In the next slides, we shall explain how to build a simple SMIL document, that also is really usefull – such as the one you are looking at..

- * We shall describe only the SMIL commands or elements that are used in it.
 - When you are familiar with them, it is very easy to learn the others;
- * This refers to the version 1.0 of the SMIL standard : SMIL V1.
 - Version 1.0 is quite enough for a basic yet very usefull usage of SMIL.
 - You can learn version 2.0 easily afterwards when you do need it..

SMIL, is a text file !

A SMIL document is a text file.

* As is any HTML or XML document..

It is much simpler than HTML, so simple that any text editor is quite enough for producing a SMIL document such as this one

Organization of a SMIL document

<smil>

**<!-- Présentation SMIL : La sécurité dans Renater
Mars 2001. -->**

<head>

**<meta name="title" content="La sécurité dans
Renater"/>**

<layout>

**<region id="slides" left="350" top="70"
width="640" height="500" background-
color="black"/>**

</layout>

</head>

<body>

</body>

</smil>

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<smil>, <head>, <body> : mandatory

<smil>

- * Announces a SMIL V1 document : the 1st line of the document
- * End tag : </smil> : the last line of a document

<head>

- * Announces the part of the document that contains declarations
- * End tag : </head>

<body>

- * Announces the body of the document : the « executable » commands
- * End tag : </body>

<!-- : Comments : very usefull

<!-- : start of a comment zone

-- > : end of the zone.

May be put anywhere.

Example :

***<!-- Présentation SMIL : La sécurité dans
Renater Mars 2001. -->***

Metadata : optional but usefull

Where : within the declarations.

Optional but usefull. Are interpreted by the player.

Example :

```
<meta name="title" content="La sécurité  
dans Renater"/>
```

```
<meta name="author" content=" David  
Crochemore "/>
```

```
<meta name="copyright" content="(c) GIP  
Renater,david Crochemore 2001 "/>
```

<layout : windows definition. Mandatory

<layout> :

- * Start of the windows declaration zone
- * End tag : `</layout>`

Where : inside the declaration zone.

Must contain :

- * A definition of the global window : `<root-layout .... />`
- * One or several definitions of windows, which must fit inside the global window : `<region .... />`

<root-layout : global window definition. Mandatory

**`<root-layout width="1000" height="750"
background-color="black" />`**

- *Width=« valeur » : largeur de la fenêtre
- *Height=« valeur » : hauteur de la fenêtre
 - For these two parameters, value is in number of pixels
- *Background-color=« couleur » : couleur du fond de cette fenêtre
 - Couleur is a conventional name, or an hexadecimal value for RGB : #EAEAFF as an example.
 - Recommended : use « black », when you are not familiar with results of overlapping color windows.

<region : window definition. Mandatory.

```
<region id="video" left="0" top="70« width="350"  
height="250" fit="meet" />
```

- * **Id=« nom »** : the name you attribute to this window or region
- * **Left=« valeur1 » top=« valeur2 »** : coordinates of the left top corner of this window with respect to the left top corner of the global window, in pixels
- * **Width=« valeur3 » height=« valeur4 »** : width and height of this window, in pixels
 - Unités pour valeur1 ... valeur4 : pixels.
- * **Fit=« meet »** : telle the player to adjust the size of the image clip so that it fills at least one dimension of the window.
- * **All windows must fit inside the global window; Overlaps are not recommended..**

Simple example of declarations :

```
<smil>
  <!-- Présentation SMIL : La sécurité dans Renater Mars 2001. -
  ->
<head>
  <meta name="title" content="La sécurité dans Renater"/>
<layout>
  <!-- Width, height, and background color of entire
  presentation. -->
  <root-layout width="1000" height="750" background-
  color="black" />
  <!-- Image regions : 1 for slides, 1 for video -->
  <region id="slides" left="350" top="70" width="640"
  height="500" background-color="black"/>
  <region id="video" left="0" top="70" width="350" height="250"
  fit="meet" />
</layout>
</head>
```

* : display an image*

``

***src=« fichier »** : file containing the image that will be displayed. Formats : gif, jpg, maybe others depending on player and station.

***region=« nom »** : name of the window inside which the image will be displayed.

***dur=« durée »** : time length during which it will be displayed : ms (millisecond) ou s (second).

– At the end , the image disappears, unless you put :

***fill=« freeze »** : tells the player to keep the image visible after the end of its duration.

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<video ... /> : Replay a video clip

**<video src="V/FMCERT.rm" region="video"
/>**

***src=« fichier »** : video file to be played.
Formats : rm, avi, mpg, maybe others
depending on player and station. RM is
recommanded due to its compacity and
quality.

***region=« nom »** : name of the window inside
which the clip will be displayed.

<audio ... /> : Replay an audio clip

<audio src="V/FMCERT2.rm" />

**src=« fichier »* : fichier audio à jouer.

Formats : rm, avi, mp3, maybe others
depending on player and station. RM and MP3
are recommended due to their compacity and
quality.

– Does not need a window..

<seq> : *Play clips sequentially*

<seq>

.....

</seq>

- * Clips between <seq> and </seq> will be played one after the other.
- * Example : for displaying slides one after the other :

- *

```
<seq>
  
  
  
  
  
  
</seq>
```

<par> : Play clips in parallel

<par>

.....

</par>

- * Clips between <par> and </par> will be played simultaneously.
- * <par> ... </par> and <seq> ... </seq> can be combined at will, provided tis is done logically (one cannot extend outside an other one which began first).
- * Typical usage :
 - Play a video (or audio) clip while slides are shown sequentially
 - Fill all usefull windows inside the global window.

A simple example :

Video and slides synchronized :

```
<body>
<par>
  <video src="V/FMCERT.rm" region="video" />
  <seq>
    
    
    
    
    
    
  </seq>
</par>
</body>
</smil>
```


<a href= ... : clickable window

....

***Makes clickable the window where a clip is displayed,
for as long as it is displayed.***

* **URL** : hypertext link toward a new SMIL document .

* Example :

```
<a href="Menu.smi" >  
      
</a>
```

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<anchor ... > : clickable zone inside an image

<anchor href=« URL » coords=« x1,y1,x2,y2 » />

Makes clickable a zone inside an image, as long as this image is displayed

* **URL** : hypertext link towards a SMIL document that will be played as soon as the zone is clicked on;

* **x1,y1,x2,y2** : coordinates (in pixels) of the clickable zone within the image

– When there are several clickable zones, they must not overlap..

```

  <anchor href="RSEC.smi" coords="20,60,330,110" />
  <anchor href="ISEC.smi" coords="20,200,330,240" />
</img>
```

Absolute and relative URLs

Within hypertext links :

Relative URL : with respect to the directory of the SMIL document being played :

* Href=« isec.smi »

* src="P/img044.gif"

```
* <a href="../../../Menu.smi" >  
    
</a>
```

To be used for documents that are played locally : they reside on your station hard disk or on a CD-ROM.

Absolute and relative URLs

Within hypertext links :

Absolute URLs : Whole Url corresponding to Web server / directories / file :

```
* src="http://www.Renater.fr/Video/CERT/CauserieMars2001/P
  /Plan_Presentation.jpg"  region="titre2" dur="10s"
  fill="freeze" >
  <anchor
  href="http://www.Renater.fr/Video/CERT/CauserieMars2001/
  H_RSEC.smi"  coords="20,60,330,110" />
* 
```

Mandatory when the SMIL document is in a Web server.

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HTTP, RTSP

For audio and video clip files, there are 2 ways to put them into a server :

◆ Web mode : HTTP :

- * Protocol : http : HyperText Transfer Protocol :
- * Allows to put these files in an ordinary Web server.
- * The server sends the file as quickly as possible to the client, with error control (TCP). The client player plays it in parallel to the reception..
- * Example :
 - `<video
src="http://www.Renater.fr/Video/CERT/CauserieMars20
01/V/FMCERT.rm" region="video" />`

HTTP, RTSP

◆ Streaming mode : RTSP :

- * Protocol: RTSP : Real Time Streaming Protocol
- * When the file is put into a streaming server
 - Specialised server – different from a Web server !
- * Streaming sends the data on the fly, at the right speed, without error correction.
- * The player plays then (normally without needing to store them) as soon as it receives them.
- * Example :
 - ```
<video
src="rtsp://lac.diane.jussieu.fr:1554/xml/xml5.rm"
region="video" />
```

## ◆ Coding http or rtsp tells the player which mode to use to get the file.

## *http or rtsp ?*

---

### ***http : document in a Web server :***

- ◆ **Practical when there are very few simultaneous accesses.**
- ◆ **Avoids investing immediately into a streaming server**

### ***Rtsp : document in a streaming server :***

- ◆ **When many simultaneous users are expected**
  - \* More efficient at the server level.

## *Example of SMIL document (1 : start of declarations)*

---

Note : lines in vluue are not part of the document !

### **Comments ans metadata :**

```
<smil>
 <!-- Présentation SMIL : La sécurité dans Renater Mars 2001. -->
 <!-- Version 2 Septembre 2001 -->
<head>
 <meta name="title" content="La sécurité dans Renater"/>
 <meta name="author" content=" David Crochemore "/>
 <meta name="copyright" content="(c) GIP Renater,david Crochemore 2001 "/>
```

### **Global window declaration : 1000 by 750 pixels, black background**

```
<layout>
 <!-- Width, height, and background color of entire presentation. -->
 <root-layout width="1000" height="750" background-color="black" />
```



## Example of SMIL document (2 : windows)

---

### Windows declaration (regions) :

```
<!-- Image regions -->
<region id="retour" left="0" top="0" width="60" height="50" />
<region id="nlev1" left="60" top="0" width="90" height="20" />
<region id="nlev2" left="180" top="0" width="90" height="20" />
<region id="nlev3" left="300" top="0" width="90" height="20" />
<region id="nlev4" left="420" top="0" width="90" height="20" />
<region id="nlev5" left="540" top="0" width="90" height="20" />
<region id="flev1" left="150" top="0" width="30" height="20" />
<region id="flev2" left="270" top="0" width="30" height="20" />
<region id="flev3" left="390" top="0" width="30" height="20" />
<region id="flev4" left="470" top="0" width="30" height="20" />
<region id="titre" left="60" top="20" width="500" height="50" />
<region id="slides" left="350" top="70" width="640" height="500" background-
color="black"/>
<region id="video" left="0" top="70" width="350" height="250" fit="meet" />
<region id="titre2" left="0" top="320" width="350" height="300" fit="meet" />
</layout>
</head>
```

### End of declarations

## *Example of SMIL document ; executable part (3 : surfing area)*

---

### **Executable part : 1. A zone for surfing between related SMIL documents (clickable windows) :**

```
<body>
 <!-- Le retour au menu supérieur -->
 <par>


```

## *Example of SMIL document ; (3 : title and chapters)*

---

**Executable part : 3. Title and list of chapters (clickable zones inside the image that contains the list of chapters) :**

```
<!-- Le bandeau de titre -->

<!-- Le plan de la présentation et les liens vers les autres chapitres -->

 <anchor href="RSEC.smi" coords="20,60,330,110" />
 <anchor href="RCERT.smi" coords="20,120,330,150" />
 <anchor href="FMCERT.smi" coords="20,160,330,190" />
 <anchor href="ISEC.smi" coords="20,200,330,240" />

```

## *Example of SMIL document ; (4 : slides)*

---

**Executable part : 4. Slides, audio and video, then the end (back to last menu) :**

```
<!-- présentation -->
 <video src="V/FMCERT.rm" region="video" />
 <seq>

 <!-- Fin et retour au menu supérieur -->

 </seq>
</par>

</body>
</smil>
```

## *Liens et informations utiles :*

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### ***The SMIL course of Didier Courtaud (Univ. Evry) :***

- \* Aristote : [http://aristote1.aristote.asso.fr/Presentations/SMIL/H\\_Menu.smi](http://aristote1.aristote.asso.fr/Presentations/SMIL/H_Menu.smi)
  - Et il est en SMIL !

### ***Detailed documentation:***

- \* On the REAL Web site : the Real System Production Guide :
  - [http://www.realnetworks.com/devzone/documentation/index.html?src=homeintl\\_fr,prdcrl\\_030201,nosrc](http://www.realnetworks.com/devzone/documentation/index.html?src=homeintl_fr,prdcrl_030201,nosrc)
  - recommended

### ***The Web site of the SMIL club :***

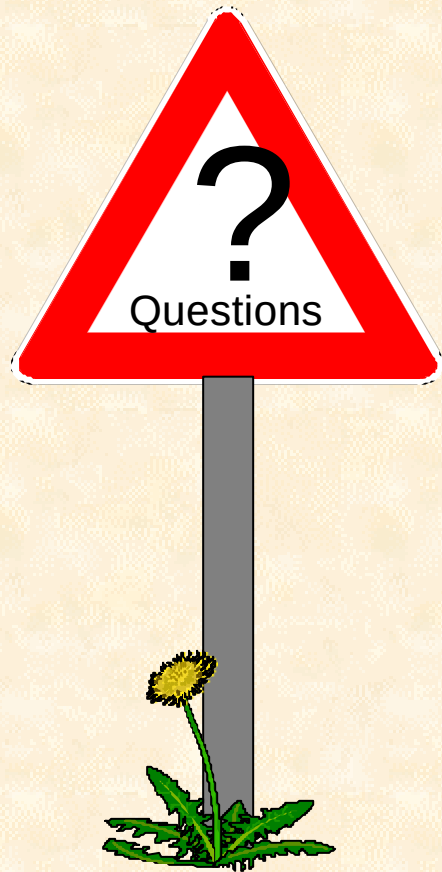
- \* <http://aristote1.aristote.asso.fr/CSMIL/>
  - informations,
  - Players,
  - news
  - Other links about SMIL..

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*Fin de la présentation*

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Fin