Universal Digital Clock

Jan 07, 2011

Universal Digital Clock

▸ This SMIL example provides user an advanced SMIL schedule usage.

▸ In this example , it implement a universal digital clock with the following features:

a. Shows time for Los Angeles, New York, Amsterdam, Tokyo and Taipei.

b. Shows time in HH:MM:SS AM/PM format , Daylight saving time (DST) is correctly reflected

c. Shows date in YY/M/D format

d. Animation clock background

Compose the clock interface

▶ The digital clock interface is composed by images as below , each digit is a independent PNG image file:

0123456789PMAM

▶ To display 5 clocks, define region for each clock as below.

INDEX.SMIL
Line9:
```
<region id="CLK1" left="160" top="60" width="960"
height="64" z-index="1"/>
<region id="CLK2" left="160" top="188"
width="960" height="64" z-index="1"/>
<region id="CLK3" left="160" top="316"
width="960" height="64" z-index="1"/>
<region id="CLK4" left="160" top="444"
width="960" height="64" z-index="1"/>
<region id="CLK5" left="160" top="562"
width="960" height="64" z-index="1"/>
```
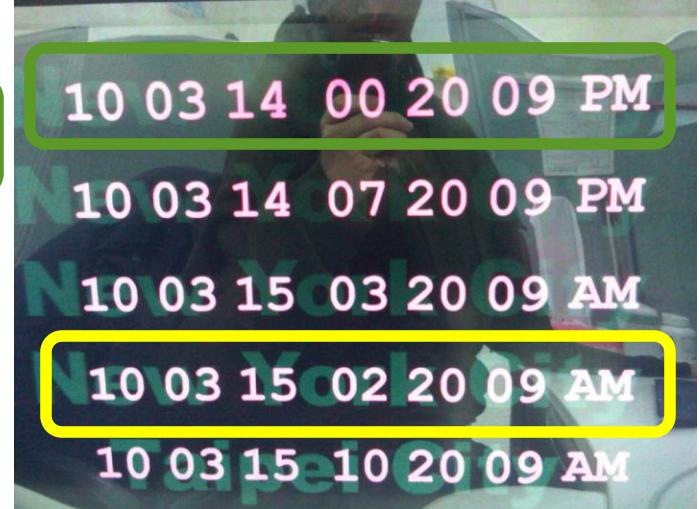
Display Digit in the clock

▸ The digit display position is controlled by image "left" attribute.

▸ Below is an example for displaying first digit of year.

INDEX.SMIL
Line106:

```
<img begin="wallclock(2000-01-01T00:00:00{STD1})"
src="0.png" region="CLK1" left="{W*Y10}"
dur="indefinite"/>
    <img begin="wallclock(2010-01-01T00:00:00{STD1})"
src="1.png" region="CLK1" left="{W*Y10}"
dur="indefinite"/>
    <img begin="wallclock(2020-01-01T00:00:00{STD1})"
src="2.png" region="CLK1" left="{W*Y10}"
dur="indefinite"/>
    <img begin="wallclock(2030-01-01T00:00:00{STD1})"
src="3.png" region="CLK1" left="{W*Y10}"
dur="indefinite"/>
```

YY MM DD
10 03 14 00 20 09 PM
10 03 14 07 20 09 PM
10 03 15 03 20 09 AM
10 03 15 02 20 09 AM
10 03 15 10 20 09 AM

W=42
Y10=3

Define Schedule

▸ The wallclock module has been widely adapted to implement the schedule setting for updating the clock.

▸ The following code provides an example on how to update the "day" value on the clock.

▸ **INDEX.SMIL**

▸ Line106:

```
<excl dur="indefinite">
    <par begin="wallclock(R/2000-01-01T00:00:00{STD1}/P1M)">
      <img src="0.png" region="CLK1" left="{W*D10}" dur="indefinite"/>
      <img src="1.png" region="CLK1" left="{W*D1}" dur="indefinite"/>
    </par>
.....
    <par begin="wallclock(R/2000-01-31T00:00:00{STD1}/P1M)">
      <img src="3.png" region="CLK1" left="{W*D10}" dur="indefinite"/>
      <img src="1.png" region="CLK1" left="{W*D1}" dur="indefinite"/>
```

> Display day "01" on 1st day of every month,
> Started from 2001/01/01, 00:00.
> Repeat Period 1 month.

Deal with Daylight Saving Time (DST)

▸ It is necessary to know the DST time change date first since this is vary with location and year.

▸ Detail information please check :
http://en.wikipedia.org/wiki/Daylight_saving_time

▸ In United States:
  ◦ Starting in 2007, most of the United States and Canada observe DST from the second Sunday in March to the first Sunday in November [wiki].

▸ In Europe :
  ◦ Since 1996 European Summer Time has been observed from the last Sunday in March to the last Sunday in October [wiki].

Implement DST scheduling (1/3)

▸ Define the DST timezone offset , Ex. New York City

- ▸ **INDEX.SMIL**
- ▸ Line44:

```
<!-- time zone offsets -->
    <STD1>-05:00</STD1>
    <DST1>-04:00</DST1>
    <DST1-BEGIN>wallclock(R/2007-03-08+w7T02:00:00-
    05:00/P1Y)</DST1-BEGIN>
    <DST1-END>wallclock(R/2007-11-01+w7T02:00:00-04:00/P1Y)</DST1-
    END>
```

DST begins from 2nd Sunday in March

DST last to 1st Sunday in November

Implement DST scheduling (2/3)

When DST begin , time zone offset switch to -04:00

▸ **INDEX.SMIL**

▸ Line272:

```
<par begin="{DST1-BEGIN}">
      <excl dur="indefinite">
<img begin="wallclock(R/2000-01-01T00:00:00{DST1}/P1D)" src="AM.png" region="CLK1" left="{W*AMPM}"
    dur="indefinite"/>
……
     <excl dur="indefinite">
      <img begin="wallclock(R/2000-01-01T00:00:00{DST1}/P1D)" src="0.png" region="CLK1"
    left="{W*h10}" dur="indefinite"/>
……
</excl>
```
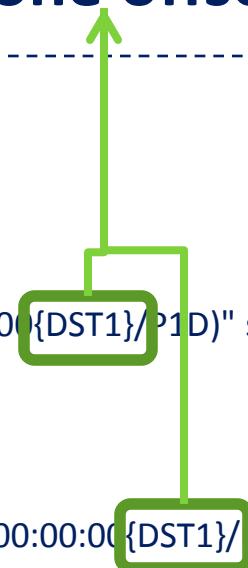
Implement DST scheduling (3/3)

When DST end , time zone offset switch to -05:00

- **INDEX.SMIL**
- Line299:

```
<par begin="{DST1-END}">
    <excl dur="indefinite">
     <img begin="wallclock(R/00:00:00{STD1}/P1D)" src="AM.png" region="CLK1" left="{W*AMPM}"
    dur="indefinite"/>
…….
    <excl dur="indefinite">
     <img begin="wallclock(R/00:00:00{STD1}/PT12H)" src="0.png" region="CLK1" left="{W*h1}"
    dur="indefinite"/>
………
</excl>
```
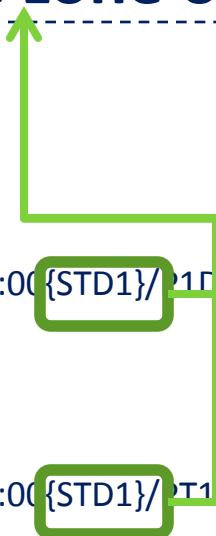
Create Clock Animation

▸ The clock background animation is done by using SMIL animation module.

▸ Animation applied to clock background (city name) :
  ◦ Fade in and fade out by changing the **mediaOpacity** attribute.
  ◦ Shrink and Grow by changing the **left , top ,width and height** attribute.

▸ **INDEX.SMIL**

▸ Line371:

```
<seq repeatCount="indefinite" expr="enableAnimation">
<img src="{CITY1}.png" region="CLK1-BG" dur="10s" mediaAlign="center" mediaOpacity="0.2">
    <animate attributeName="mediaOpacity" values="0;30;45;50;45;30;0" dur="10s" />
    <animate targetElement="CLK1-BG" attributeName="width" values="960;240;960" dur="10s"/>
    <animate targetElement="CLK1-BG" attributeName="height" values="128;32;128" dur="10s"/>
    <animate targetElement="CLK1-BG" attributeName="left" values="160;520;160" dur="10s"/>
    <animate targetElement="CLK1-BG" attributeName="top" values="28;76;28" dur="10s"/>
```