



**Programando para o Ginga-NCL**

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# Programando em NCL Modelo Conceitual

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## Entidades Básicas

O quê? objetos de mídia

como? propriedades

onde? propriedades

quando? relacionamentos e relações

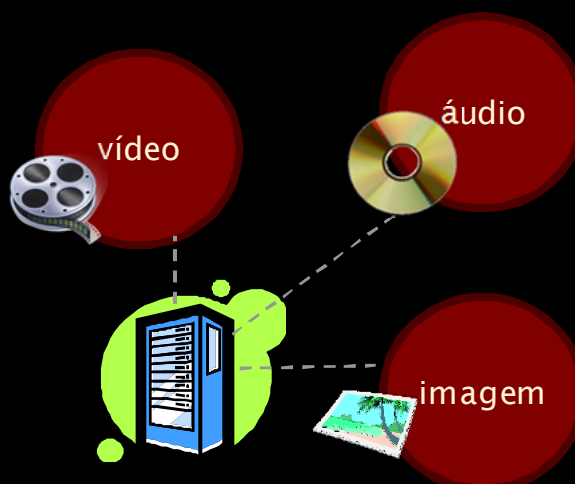


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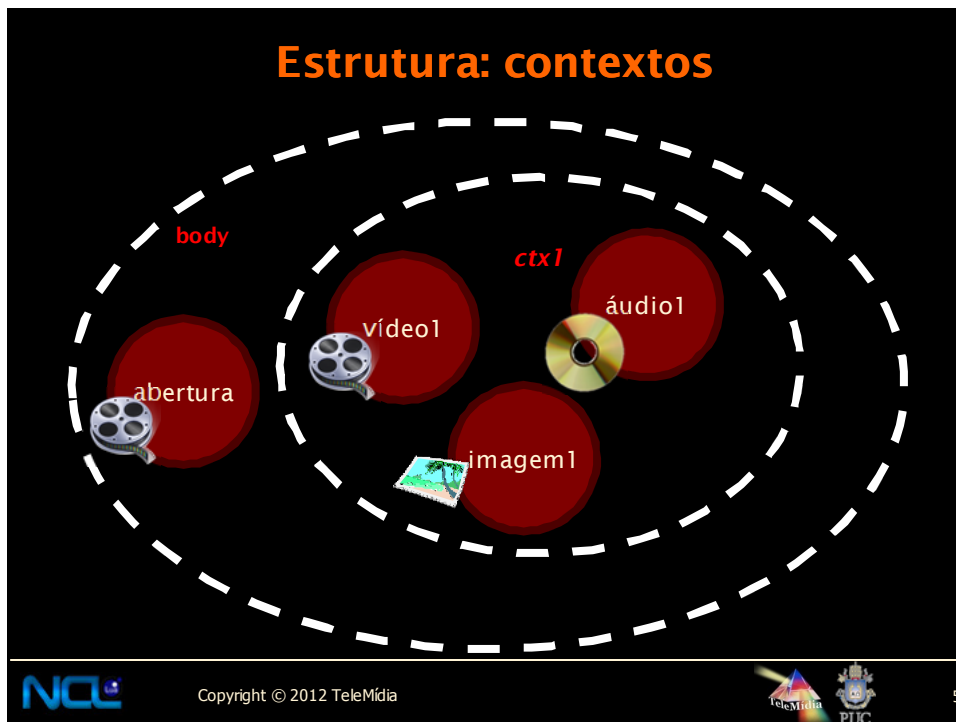
## O quê? Objetos de Mídia



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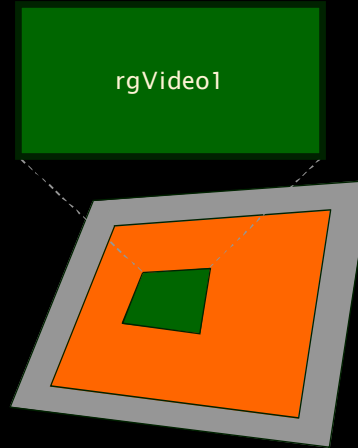


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## Onde?

Regiões  
em um dispositivo específico

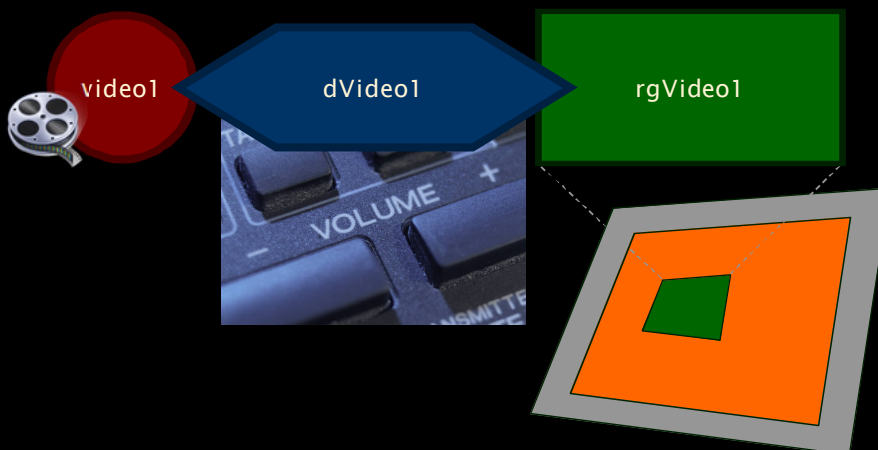


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## Como?

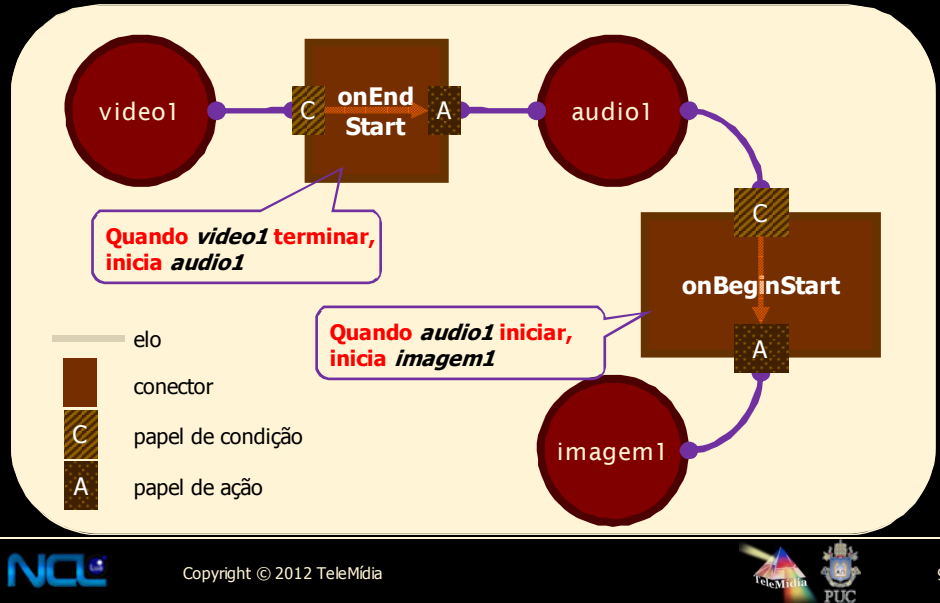


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## Quando? Elos e Conectores



## Programando em NCL A Linguagem

## Planejando uma aplicação NCL

- visões
  - storyboard
  - estrutural
  - leiaute
  - temporal



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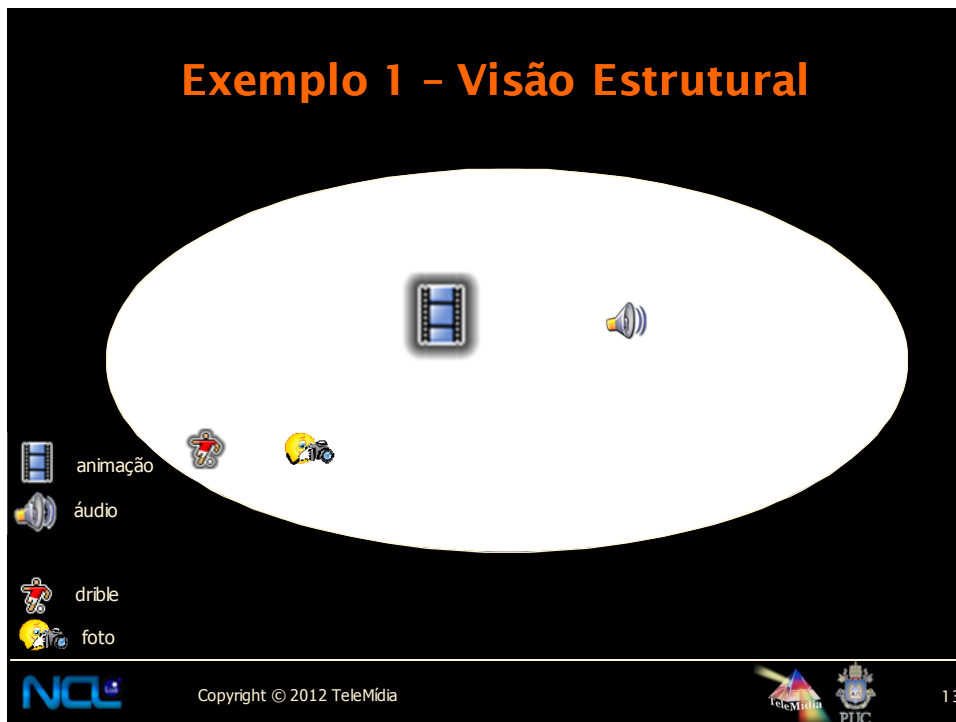
## Exemplo 1 – Storyboard



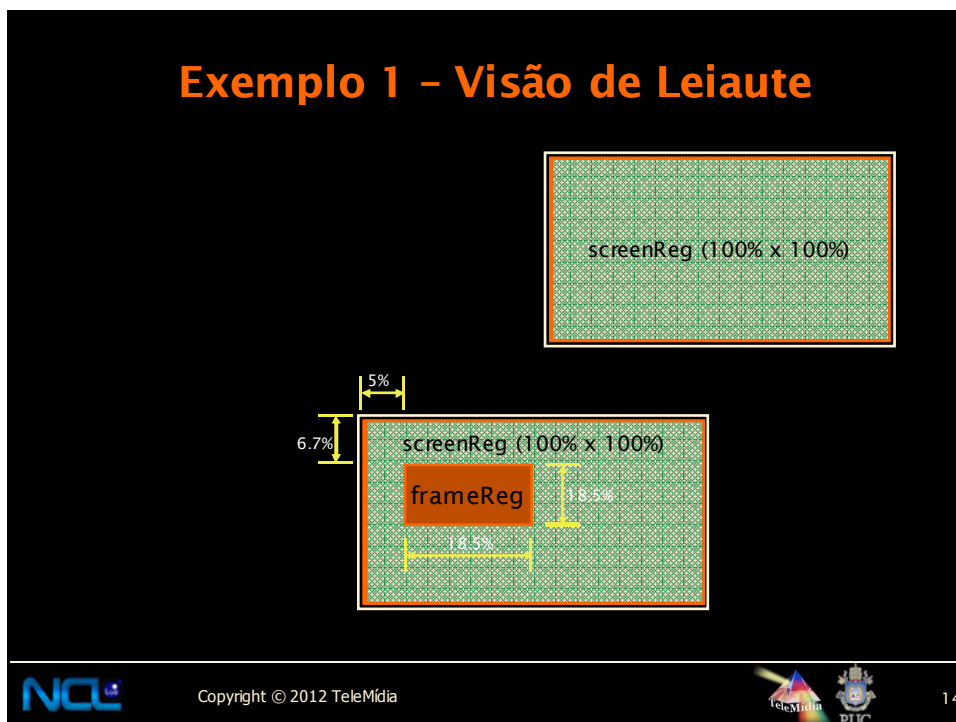
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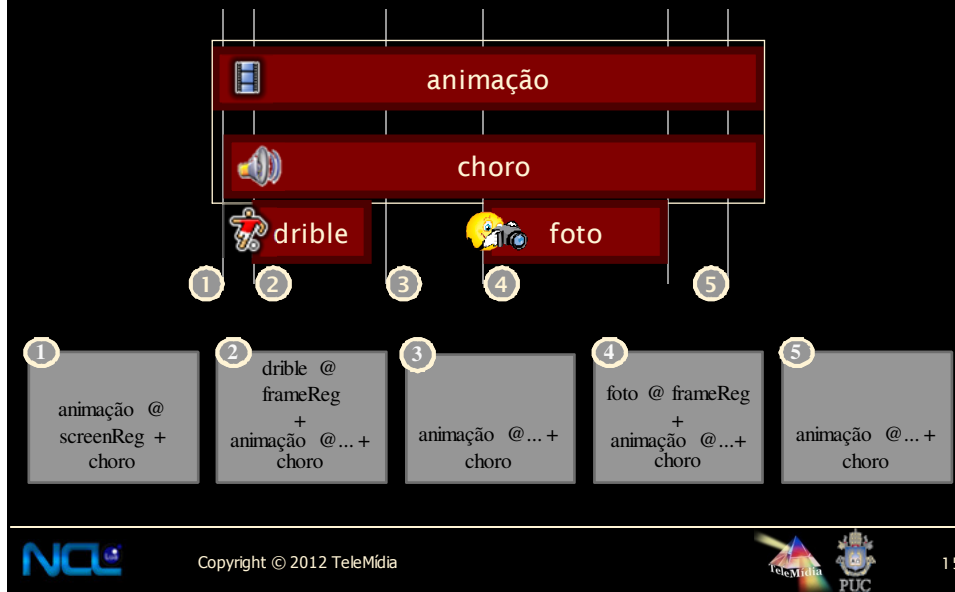
## Exemplo 1 - Visão Estrutural



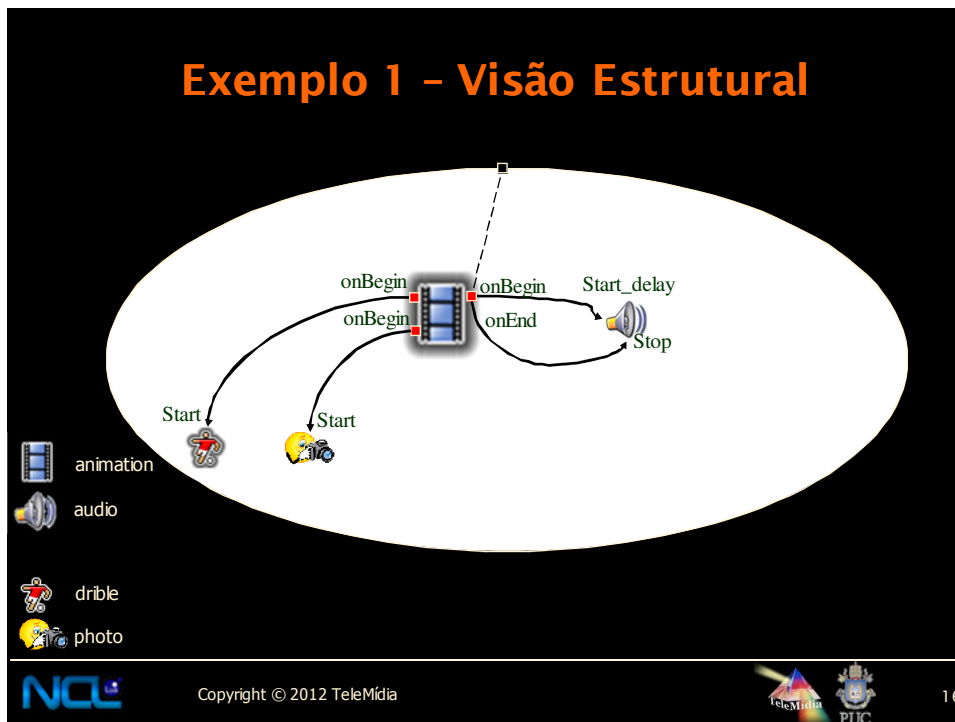
## Exemplo 1 - Visão de Leiaute



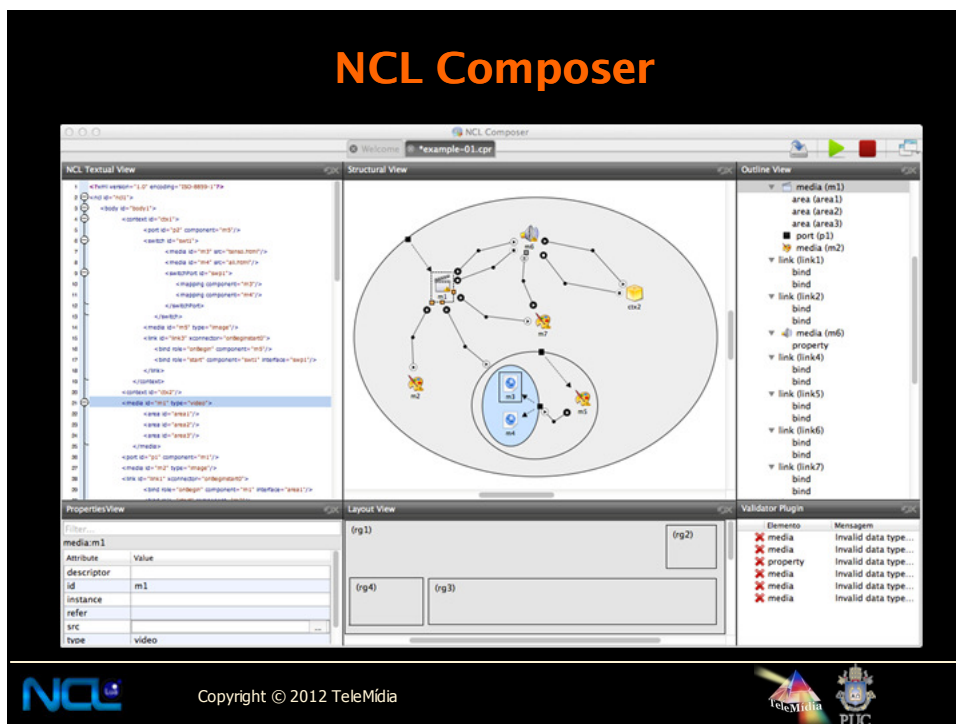
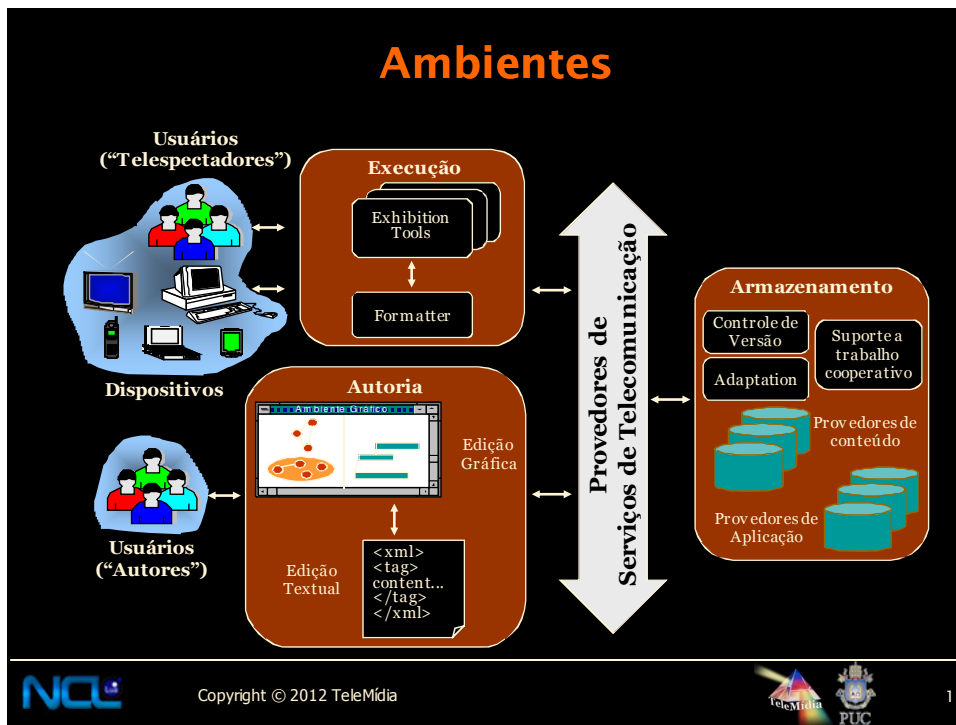
## Exemplo 1 - Visão Temporal



## Exemplo 1 - Visão Estrutural







## NCL Eclipse

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<!-- Exemplo de sincronismo sem a interacao do usuario -->
<ncl id="sync" xmlns="http://www.ncl.org.br/NCL3.0/ESTVProfile"
  <head>
    <regionBase>
      <region id="backgroundReg" width="100%" height="100%" sIndex="1"/>
      <region id="screenReg" width="100%" height="100%" sIndex="2">
        <region id="frameReg" left="5%" top="6.7%" width="18.5%" height="18.5%" sIndex="3"/>
      </region>
    </regionBase>
    <descriptorBase>
      <descriptor id="backgroundDesc" region="backgroundReg"/>
      <descriptor id="screenDesc" region="screenReg"/>
      <descriptor id="photoDesc" region="frameReg" explicitDur="5s"/>
      <descriptor id="audioDesc"/>
      <descriptor id="drivableDesc" region="frameReg"/>
    </descriptorBase>
    <connectorBase>
      <importBase documentURI="..causalConnBase.ncl" alias="conEx"/>
    </connectorBase>
  </head>
  <body>
    <port id="entry" component="background"/>
    <media id="background" src="..media/background.png" descriptor="backgroundDesc"/>
    <media id="animation" src="..media/animGar.mp4" descriptor="screenDesc"/>
  </body>
</ncl>
```

Errors (4 items)	Resource	Path	L
Papal <var> nDio definido no elemento <connector (conEx:forBeginWarStat)>	07settings.nd	Livro TV/Exemplos	8
Papal <var> nDio definido no elemento <connector (conEx:forBeginWarStat)>	08animation.nd	Livro TV/Exemplos	8
Papal <var> nDio definido no elemento <connector (conEx:forBeginWarStat)>	09animation.nd	Livro TV/Exemplos	8
Papal <var> nDio definido no elemento <connector (conEx:forBeginWarStat)>	10menu.nd	Livro TV/Exemplos	8

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## Linguagem de Marcação XML

- TAG ou Elemento XML (<tag>...</tag> OU <tag />):
  - <media id="video1" descriptor="dVideoWholeScreen">  
...  
</media>
  - <media id="video1" descriptor="dVideoWholeScreen"/>
- Atributo (formato: atributo="valor")
  - id
  - descriptor
- Valor de atributo (entre aspas "")
  - "video1"
  - "dVideoWhole Screen"

## Construindo uma aplicação NCL

```
<?xml version="1.0" encoding="ISO-8859-1"?>
```

```
<ncl id="exemplo01" xmlns="http://www.ncl.org.br/NCL3.0/  
EDTVProfile">
```

```
<head>
```

cabeçalho do documento

1

```
</head>
```

```
<body>
```

corpo do documento

2

```
</body>
```

```
</ncl>
```

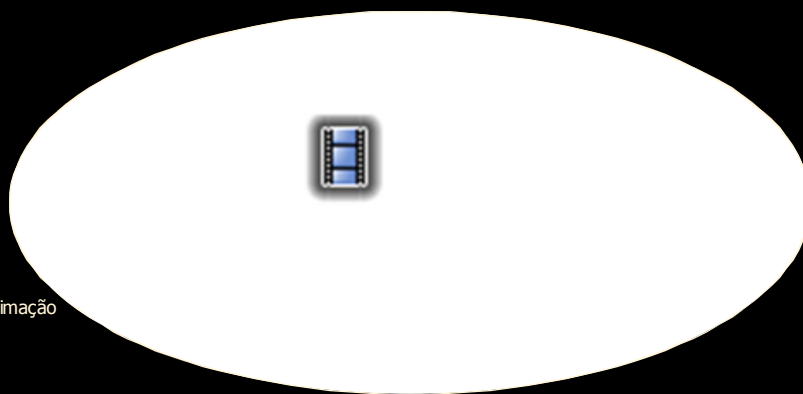


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## Exemplo 1 - Visão Estrutural



animação



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## Exemplo 1

```
<body>
  <media id="animation" src="../../media/animGar.mp4" >
  </media>
```



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Esquema	Parte específica do esquema	Uso
file:	///file_path/#fragment_identifier	Para arquivos locais
http:	//server_identifier/file_path/#fragment_identifier	Para arquivos remotos buscados pelo canal de interatividade usando o protocolo http
https:	//server_identifier/file_path/#fragment_identifier	Para arquivos remotos buscados pelo canal de interatividade usando o protocolo https
rtsp:	//server_identifier/file_path/#fragment_identifier	Para fluxos ( <i>streams</i> ) obtidos pelo canal de interatividade usando o protocolo rtsp
rtp:	//server_identifier/file_path/#fragment_identifier	Para fluxos ( <i>streams</i> ) obtidos pelo canal de interatividade usando o protocolo rtp
ncl-mirror:	//media_element_identifier	Para um fluxo de conteúdo idêntico a um que esteja em apresentação por um outro elemento de mídia
sbtvd-ts:	//program_number.component_tag	Para fluxos elementares recebidos pelo fluxo de transporte (TS)

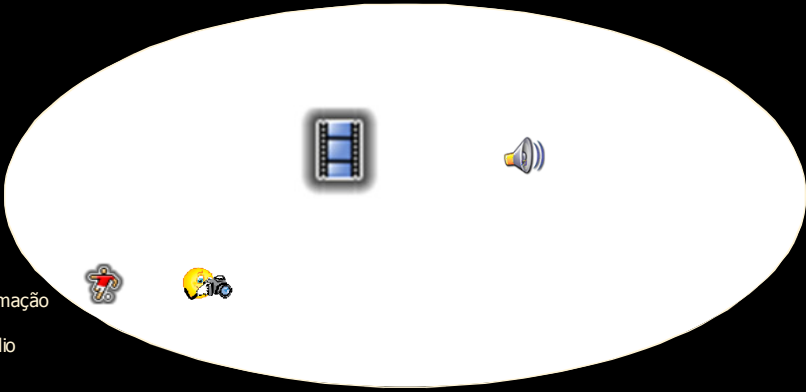


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## Exemplo 1 – Visão Estrutural



animação

áudio

drible

foto

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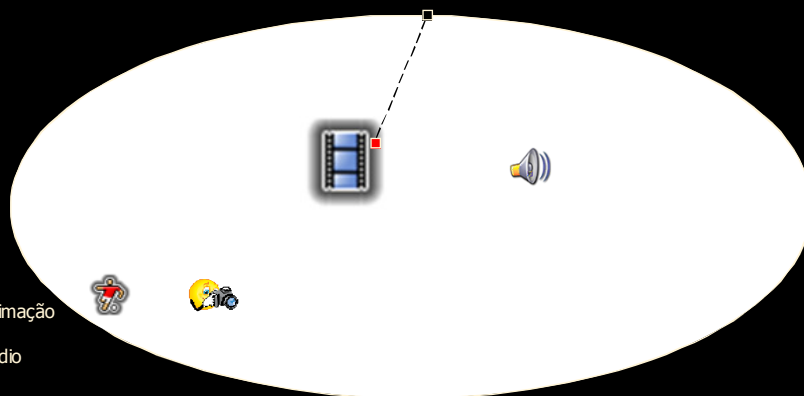
## Exemplo 1

```
<body>  
  <media id="animation" src="../../media/animGar.mp4" >  
    <property name="width" value="100%"/>  
    <property name="height" value="100%"/>  
    <property name="zIndex" value="2"/>  
  </media>  
  <media id="choro" src="../../media/choro.mp3"/>  
  <media id="drible" src="../../media/drible.mp4">  
    <property name="left" value="5%"/>  
    <property name="top" value="6.7%"/>  
    <property name="width" value="18.5%"/>  
    <property name="height" value="18.5%"/>  
    <property name="zIndex" value="3"/>  
  </media>
```

## Exemplo 1

```
<media id="photo" src="../media/photo.png">  
  <property name="left" value="5%"/>  
  <property name="top" value="6.7%"/>  
  <property name="width" value="18.5%"/>  
  <property name="height" value="18.5%"/>  
  <property name="zIndex" value="3"/>  
  <property name="explicitDur" value="5s"/>  
</media>
```

## Exemplo 1 - Visão Estrutural



animação

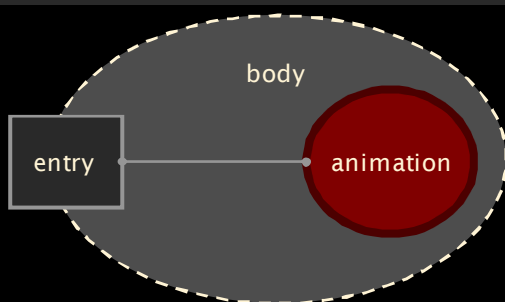
áudio

drible

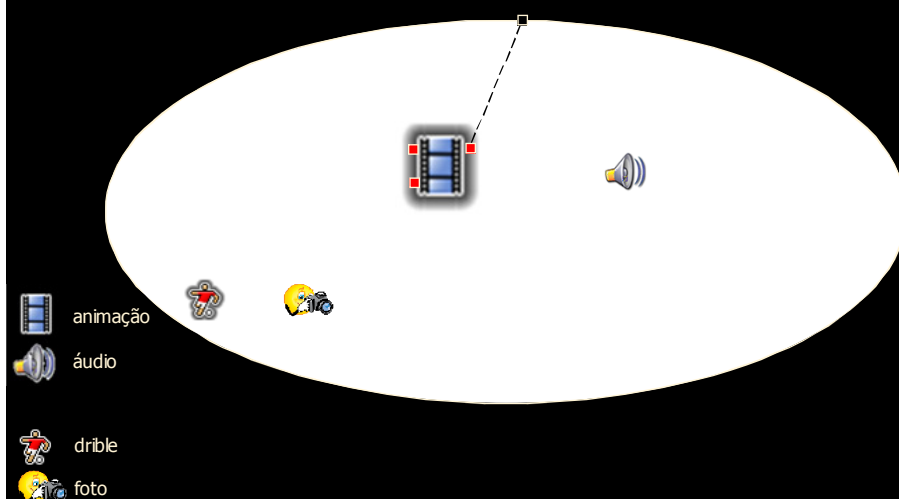
foto

## Exemplo 1 - Contexto *body* e port

```
<body>  
  <port id="entry" component="animation" />  
  ...  
</body>
```



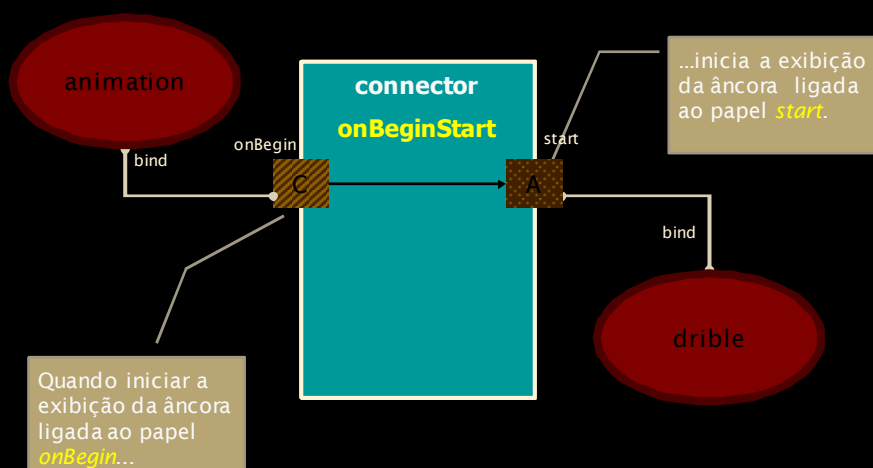
## Exemplo 1 - Visão Estrutural



## Exemplo 1

```
<body>
  <port id="entry" component="animation"/>
  <media id="animation" src="../media/animGar.mp4" >
    <area id="segDrible" begin="12s"/>
    <area id="segPhoto" begin="41s"/>
    <property name="width" value="100%"/>
    <property name="height" value="100%"/>
    <property name="zIndex" value="2"/>
  </media>
  <media id="choro" src="../media/choro.mp3"/>
  <media id="drible" src="../media/drible.mp4">
    <property name="left" value="5%"/>
    <property name="top" value="6.7%"/>
    <property name="width" value="18.5%"/>
    <property name="height" value="18.5%"/>
    <property name="zIndex" value="3"/>
  </media>
</body>
```

## Connector *onBeginStart*





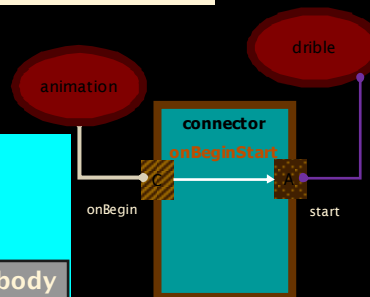
## Connector *onBeginStart*

```
<causalConnector id="onBeginStart">  
  <simpleCondition role="onBegin"/>  
  <simpleAction role="start" max="unbounded" qualifier="seq"/>  
</causalConnector>
```

Elo que utiliza o conector *onBeginStart*:  
Iniciando o vídeo *dribble*

```
<link xconnector="onBeginStart">  
  <bind role="onBegin" component="animation"  
    interface="segDribble"/>  
  <bind role="start" component="dribble" />  
</link>
```

na seção *body*



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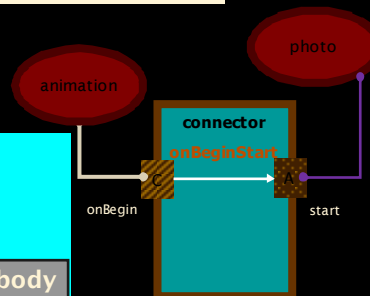
## Connector *onBeginStart*

```
<causalConnector id="onBeginStart">  
  <simpleCondition role="onBegin"/>  
  <simpleAction role="start" max="unbounded" qualifier="seq" />  
</causalConnector>
```

Elo que utiliza o conector *onBeginStart*:  
Iniciando a imagem da *foto*

```
<link xconnector="onBeginStart">  
  <bind role="onBegin" component="animation"  
    interface="segPhoto"/>  
  <bind role="start" component="photo" />  
</link>
```

na seção *body*

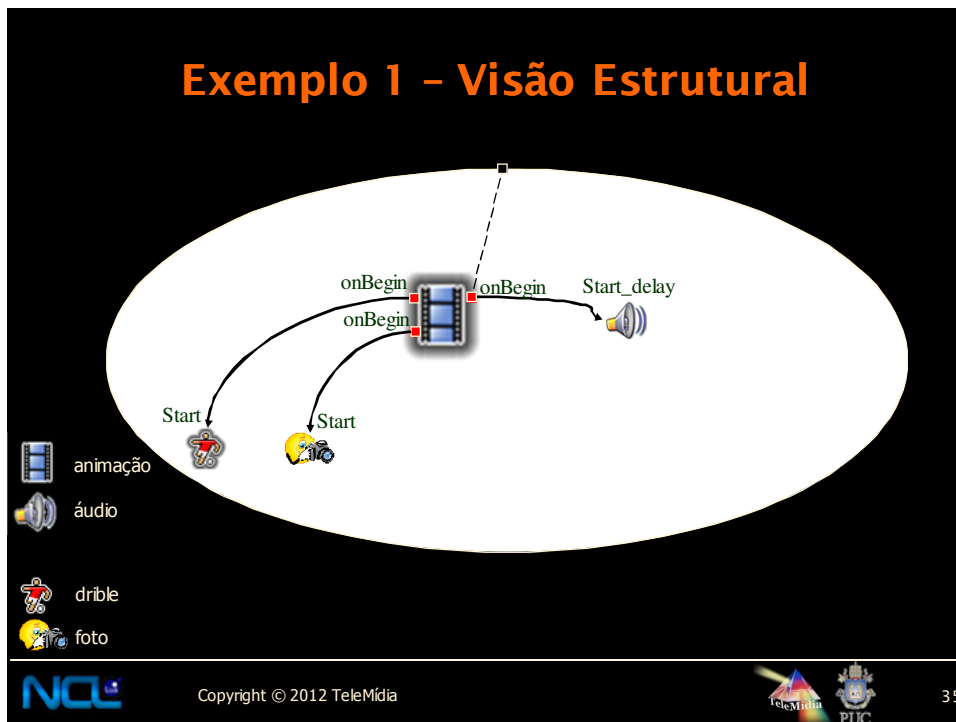


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## Exemplo 1 – Visão Estrutural



## Connector *onBeginStart\_delay*

```

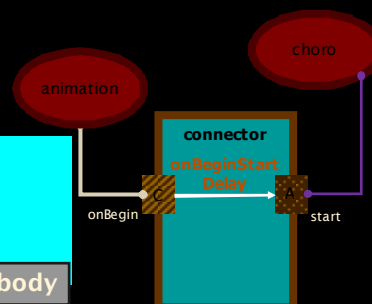
<causalConnector id="onBeginStart_delay">
  <simpleCondition role="onBegin"/>
  <simpleAction role="start" delay="5s" max="unbounded" qualifier="seq"/>
</causalConnector>
  
```

Elo que utiliza o conector *onBeginStart*:  
Iniciando o áudio *choro*

```

<link xconnector="onBeginStart_delay">
  <bind role="onBegin" component="animation"/>
  <bind role="start" component="choro" />
</link>
  
```

na seção body



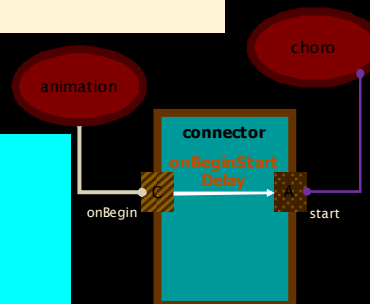
## Connector *onBeginStart\_delay*

```
<causalConnector id="onBeginStart_delay">
  <connectorParam name="xyz"/>
  <simpleCondition role="onBegin"/>
  <simpleAction role="start" delay="$xyz" max="unbounded" qualifier="seq"/>
</causalConnector>
```

Elo que utiliza o conector *onBeginStart*:  
Iniciando o áudio *choro*

```
<link xconnector="onBeginStart_delay">
  <bind role="onBegin" component="animation"/>
  <bind role="start" component="choro">
    <bindParam name="xyz" value="5s"/>
  </bind>
</link>
```

na seção *body*

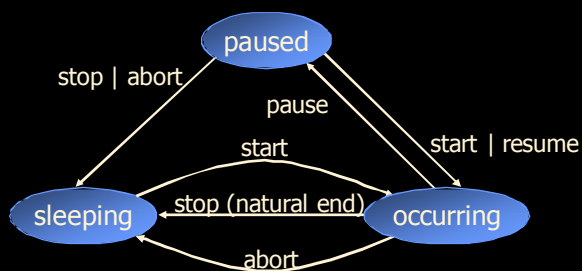


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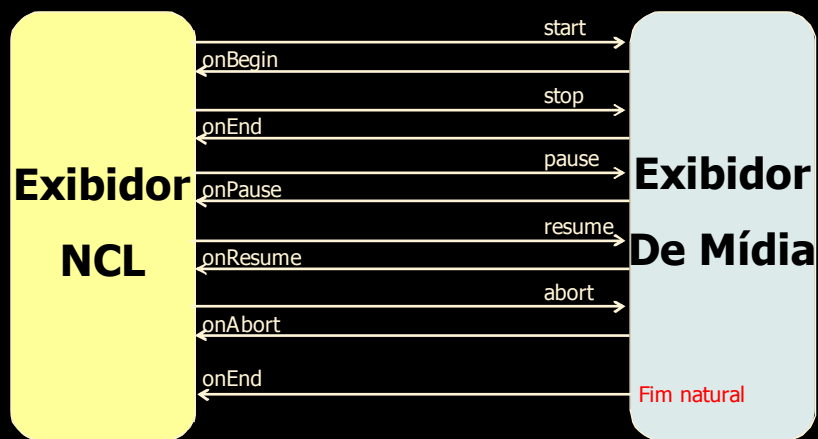
## Máquina de Estado de Evento



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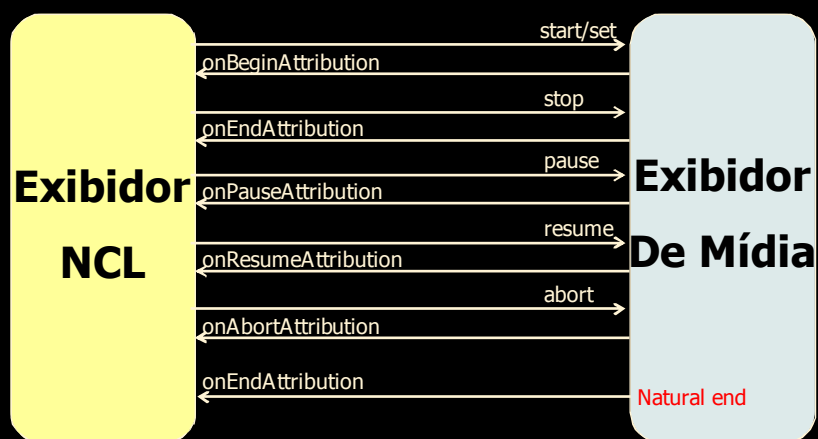
## Eventos de Apresentação



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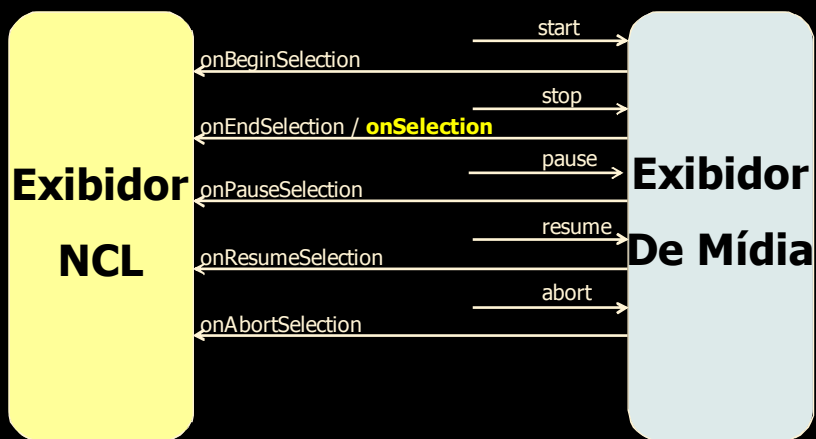
## Eventos de Atribuição



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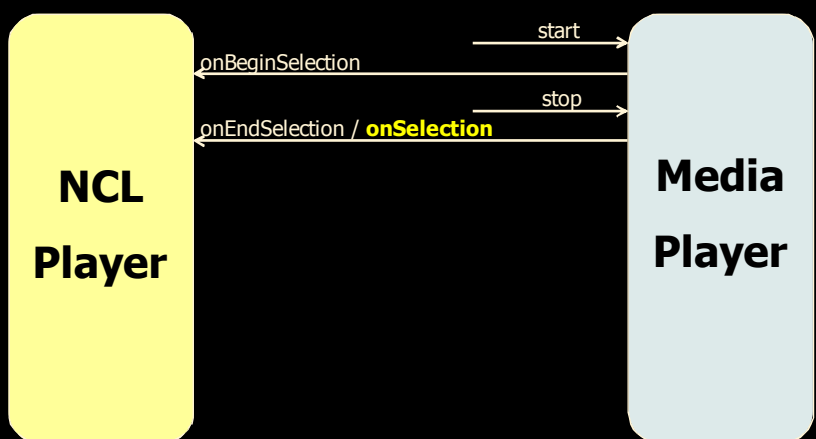
## Eventos de Seleção



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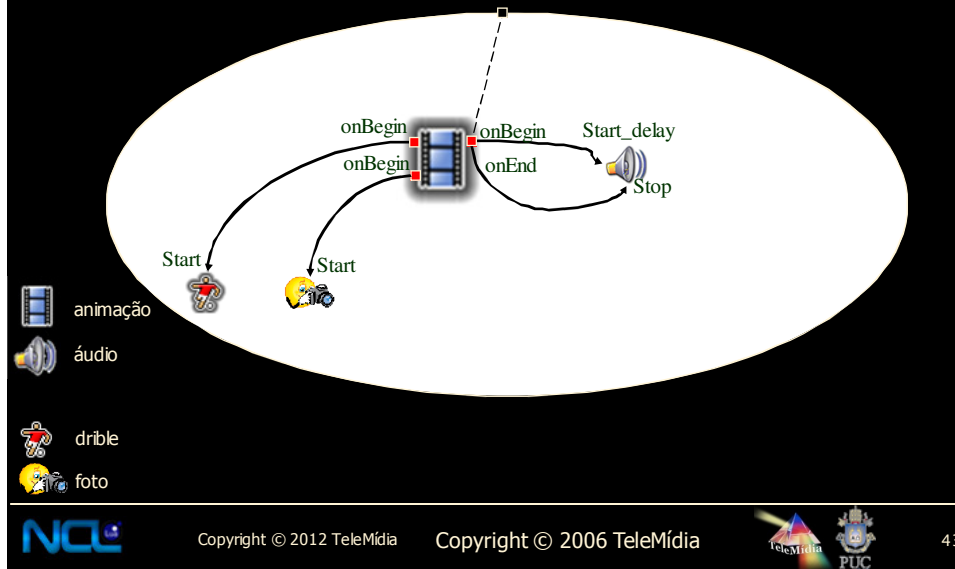
## Eventos de Seleção



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## Exemplo 1 – Visão Estrutural



## Connector *onEndStop*

```

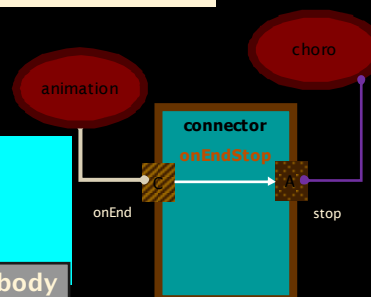
<causalConnector id="onEndStop">
  <simpleCondition role="onEnd"/>
  <simpleAction role="stop" max="unbounded" qualifie="seq" />
</causalConnector>
  
```

Elo que utiliza o conector *onBeginStart*:  
Terminando o áudio *choro*

```

<link xconnector="onEndStop">
  bind role="onEnd" component="animation"/>
  <bind role="stop" component="choro" />
</link>
  
```

na seção *body*



## Exemplo 1

```
<link id="IMusic" xconnector="onBeginStart_delay">
  <bind role="onBegin" component="animation" />
  <bind role="start" component="choro">
    <bindParam name="xyz" value="5s"/>
  </bind>
</link>

<link id="IDrible" xconnector="onBeginStart">
  <bind role="onBegin" component="animation" interface="segDrible"/>
  <bind role="start" component="drible"/>
</link>

<link id="IPhoto" xconnector="onBeginStart">
  <bind role="onBegin" component="animation" interface="segPhoto"/>
  <bind role="start" component="photo"/>
</link>

<link id="IEnd" xconnector="onEndStop">
  <bind role="onEnd" component="animation"/>
  <bind role="stop" component="choro"/>
</link>

</body>
</nc!>
```

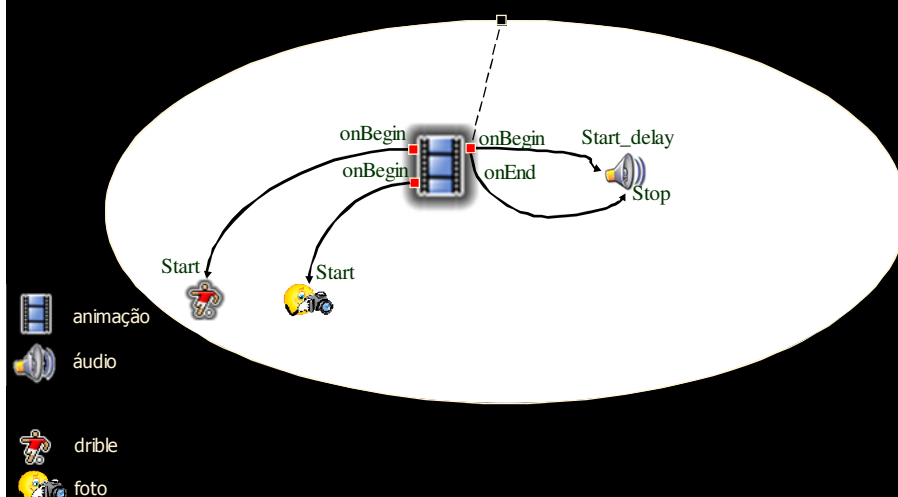


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## Exemplo 2 - Visão Estrutural



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## Entidades Básica

o quê?      objetos de mídia

como?      propriedades  
ou descritores

onde?      propriedades  
ou regiões

quando?      relacionamentos e relações



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## cabeçalho 1

```
<head>
```

```
<regionBase>
```

```
...
```

```
</regionBase>
```

regions - *onde*

```
<descriptorBase>
```

```
...
```

```
</descriptorBase>
```

descriptors - *como*

d3

```
<connectorBase>
```

```
...
```

```
</connectorBase>
```

connectors - *quando*

```
</head>
```

## corpo 2

```
<body>
```

```
<port id="plnicio" component="video1" />
```

```
<!-- context and media objects -->
```

context e media - *o quê*

```
<!-- elos -->
```

links - *quando*

```
</body>
```



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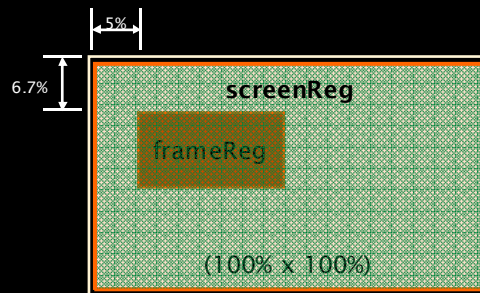


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## Regions

```
<regionBase>  
  <region id="screenReg" height="100%" width="100%" zIndex="2">  
    <region id="frameReg" left="5%" top="6.7%" height="18.5%" width="160"  
                                             zIndex="3"/>  
  </region>  
</regionBase>
```



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## Exemplo 2 - Descriptors

```
<descriptorBase>  
  <descriptor id="screenDesc" region="screenReg"/>  
  <descriptor id="photoDesc" region="frameReg" explicitDur="5s"/>  
  <descriptor id="audioDesc"/>  
  <descriptor id="dribleDesc" region="frameReg"/>  
</descriptorBase>
```



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## Exemplo 2

```
<body>
{
  <port id="entry" component="animation"/>
  {
    <media id="animation" src="../media/animGar.mp4" descriptor="screenDesc">
      <area id="segDrible" begin="12s"/>
      <area id="segPhoto" begin="41s"/>
    </media>
    <media id="choro" src="../media/choro.mp3" descriptor="audioDesc"/>
    <media id="drible" src="../media/drible.mp4" descriptor="dribleDesc"/>
    <media id="photo" src="../media/photo.png" descriptor="photoDesc"/>
  }
}
```



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```
<?xml version="1.0" encoding="ISO-8859-1"?>
<!-- Exemplo de sincronismo sem a interacao do usuario -->
<ncl id="sync" xmlns="http://www.ncl.org.br/NCL3.0/EDTVProfile">
  <head>
    <regionBase>
      <region id="screenReg" height="100%" width="100%" zIndex="1">
        <region id="frameReg" left="5%" top="6.7%" height="18.5%" width="18.5%"
          zIndex="3"/>
      </region>
    </regionBase>
    <descriptorBase>
      <descriptor id="screenDesc" region="screenReg"/>
      <descriptor id="photoDesc" region="frameReg" explicitDur="5s"/>
      <descriptor id="audioDesc"/>
      <descriptor id="dribleDesc" region="frameReg"/>
    </descriptorBase>
    <connectorBase>
      <importBase documentURI="causaIConnBase.ncl" alias="conEx"/>
    </connectorBase>
  </head>
```



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## Exemplo 2

```
<link id="lMusic" xconnector="conEx#onBeginStart_delay">
  <bind role="onBegin" component="animation" />
  <bind role="start" component="choro">
    <bindParam name="xyz" value="5s"/>
  </bind>
</link>

<link id="lDrible" xconnector="conEx#onBeginStart">
  <bind role="onBegin" component="animation" interface="segDrible"/>
  <bind role="start" component="drible"/>
</link>

<link id="lPhoto" xconnector="conEx#onBeginStart">
  <bind role="onBegin" component="animation" interface="segPhoto"/>
  <bind role="start" component="photo"/>
</link>

<link id="lEnd" xconnector="conEx#onEndStop">
  <bind role="onEnd" component="animation"/>
  <bind role="stop" component="choro"/>
</link>

</body>
</ncl>
```



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## Exemplo 3 – Storyboard

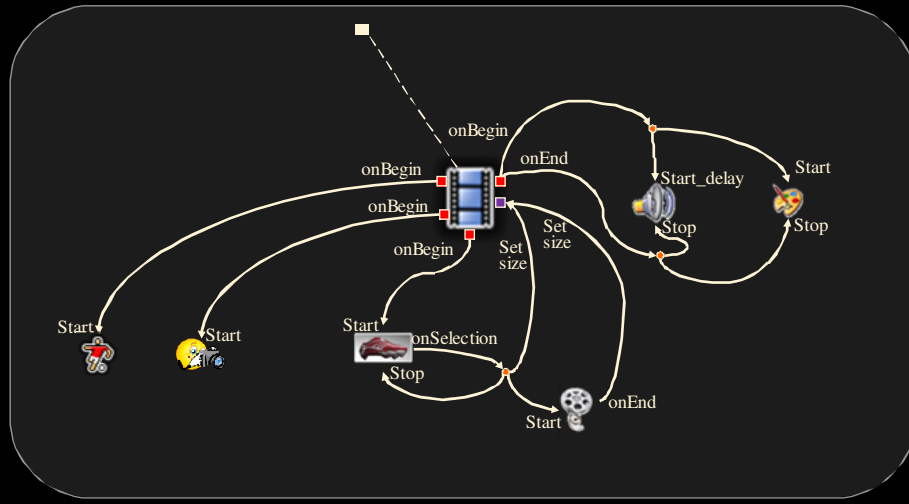


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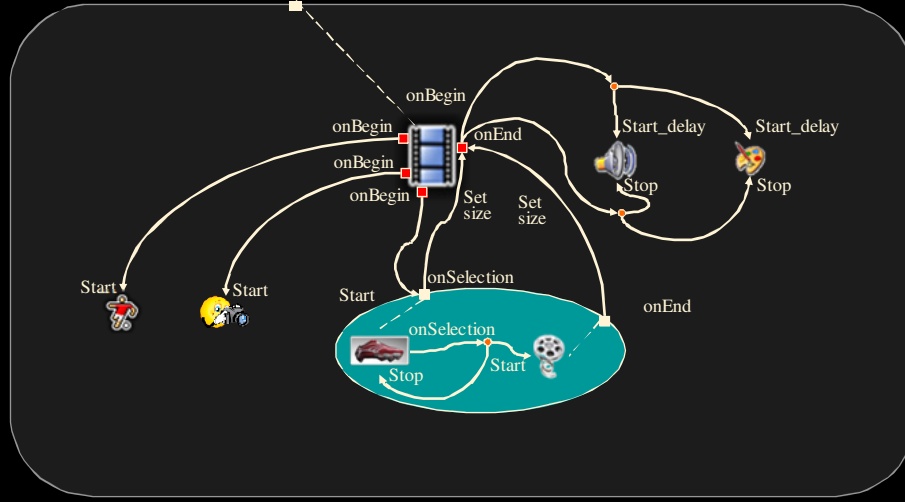
## Exemplo 3



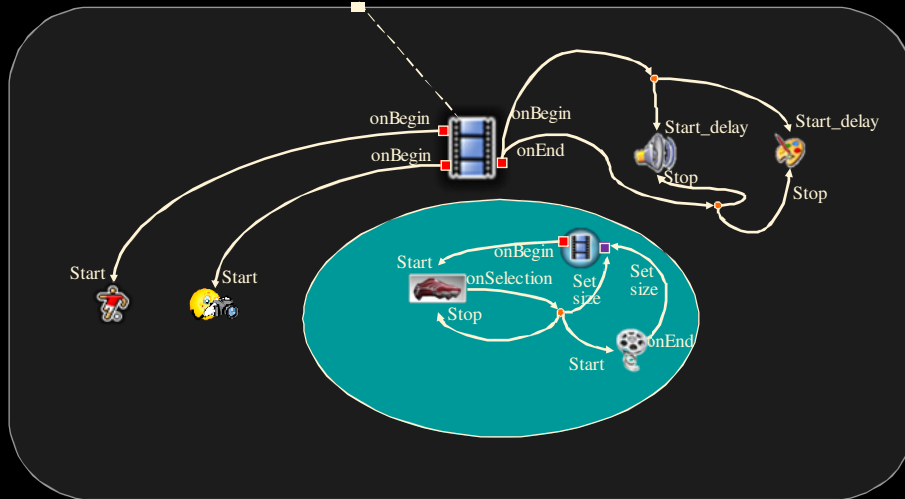
## Conector onKeySelectionStopSet\_varStart

```
<causalConnector id="onKeySelectionStopSet_varStart">
  <connectorParam name="var"/>
  <connectorParam name="keyCode"/>
  <simpleCondition role="onSelection" key="$keyCode"/>
  <compoundAction operator="seq">
    <simpleAction role="stop" max="unbounded" qualifier="seq"/>
    <simpleAction role="set" value="$var"/>
    <simpleAction role="start" max="unbounded" qualifier="seq"/>
  </compoundAction>
</causalConnector>
```

## Exemplo 4



## Exemplo 5



## Exemplo 6 – Storyboard

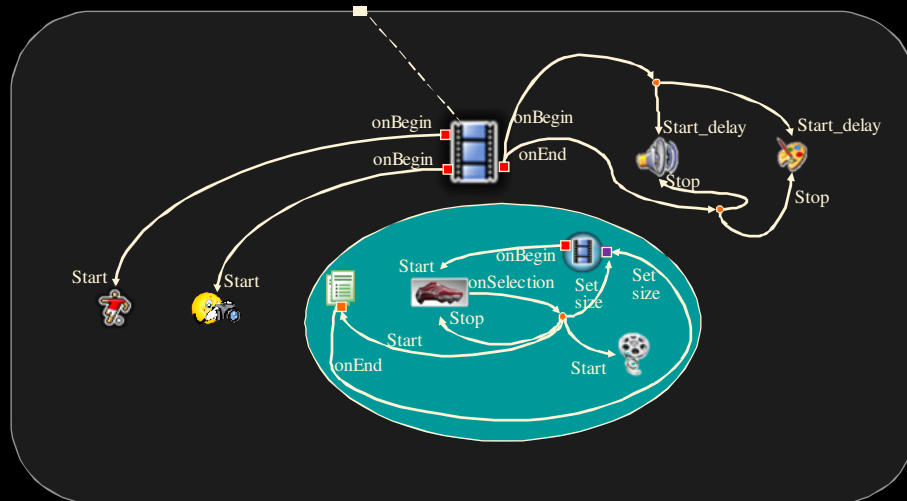


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## Exemplo 6

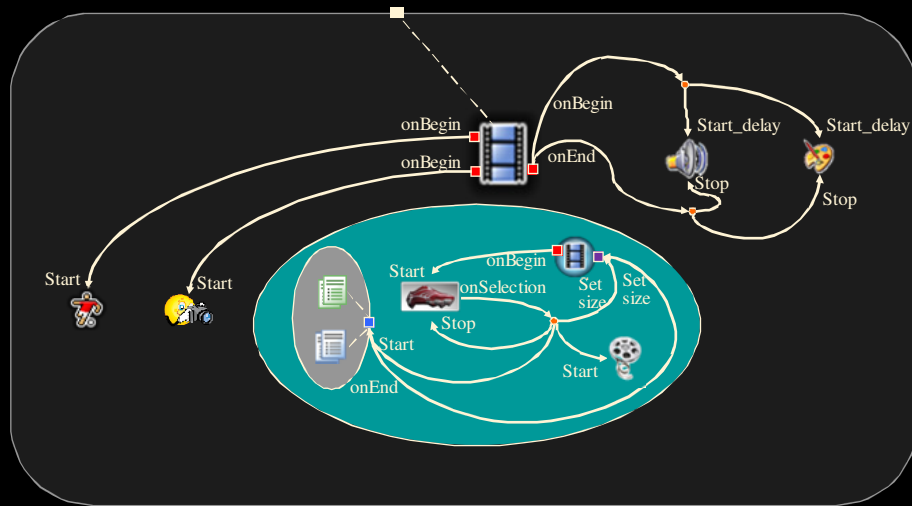


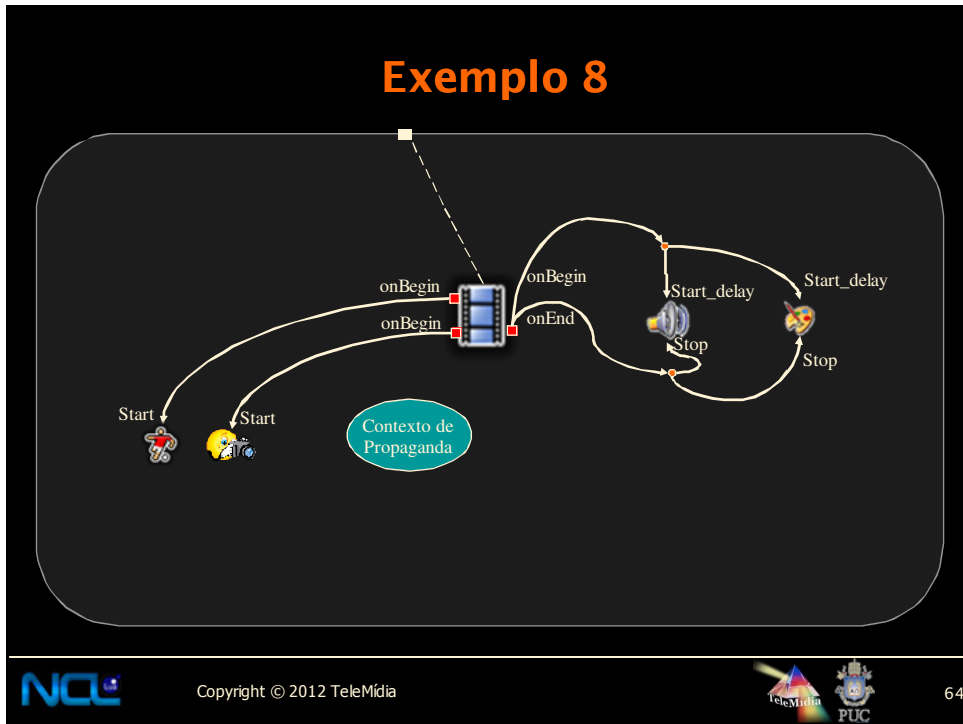
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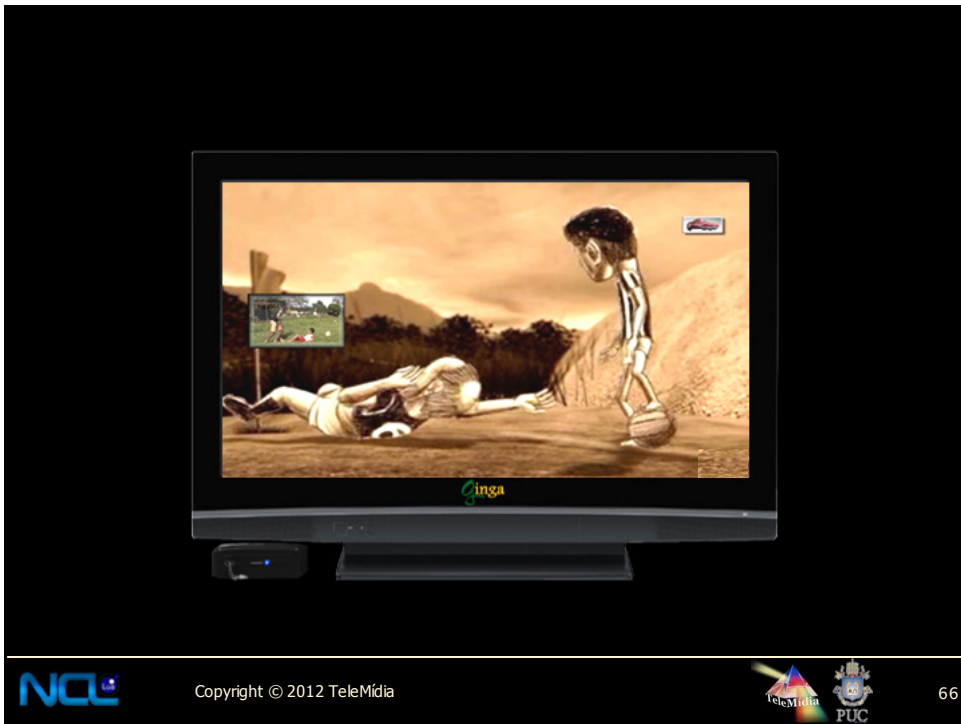
60

## Exemplo 7

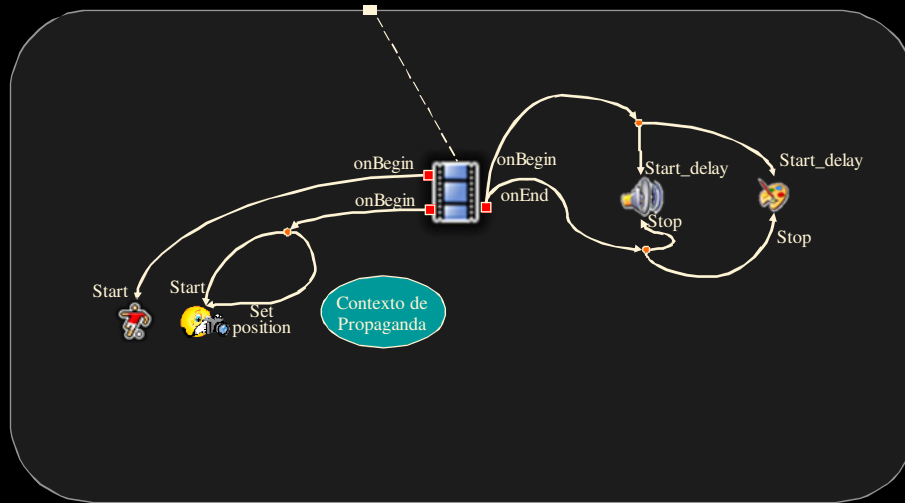








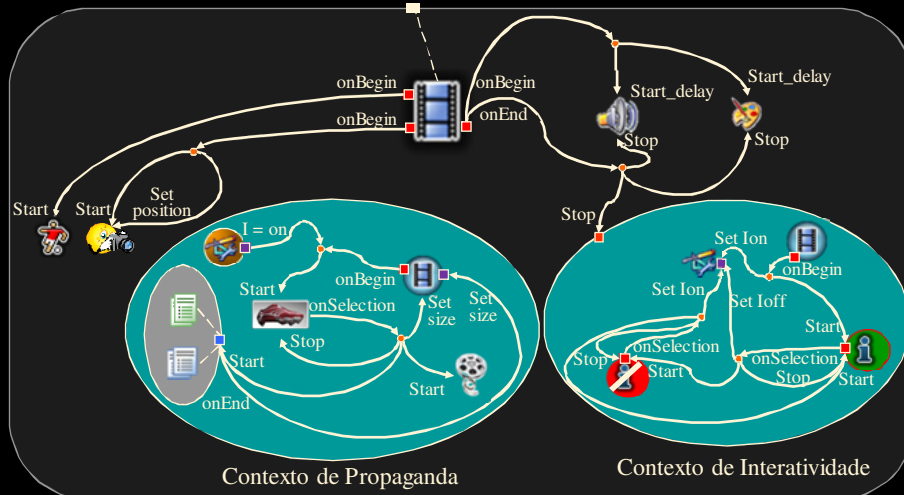
## Exemplo 9

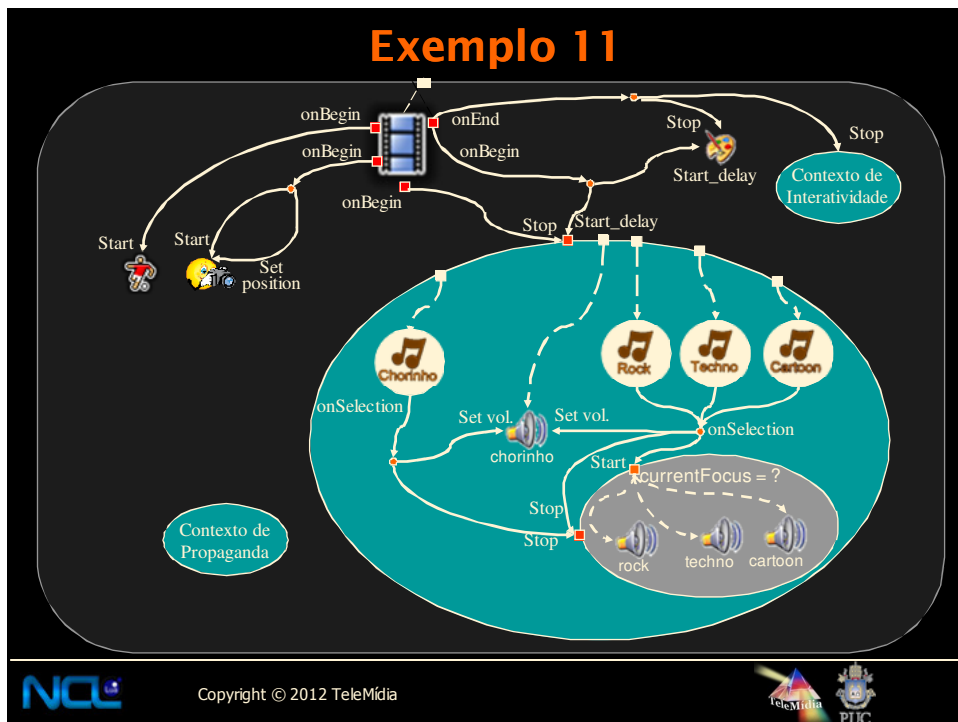


# NCL Composer



## Exemplo 10





## Conector *onSelection\_orSet\_varStopStart*

```
<causalConnector id="onSelection_orSet_varStopStart">  
  <connectorParam name="var"/>  
  <simpleCondition role="onSelection" qualifier="or" max="unbounded"/>  
  <compoundAction operator="seq">  
    <simpleAction role="set" value="$var" max="unbounded"  
      qualifier="par"/>  
    <simpleAction role="stop"/>  
    <simpleAction role="start"/>  
  </compoundAction>  
</causalConnector>
```



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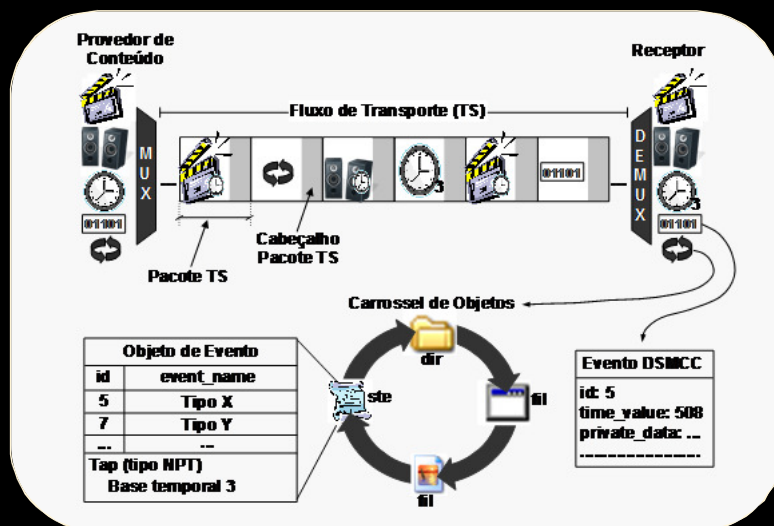
Fluxo de Mídia Contínua



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## Fluxo TS



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## Streaming

- Como um conteúdo pode ser localizado?
  - programNumber?
  - componentTag?
  - O que mais?



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## Streaming

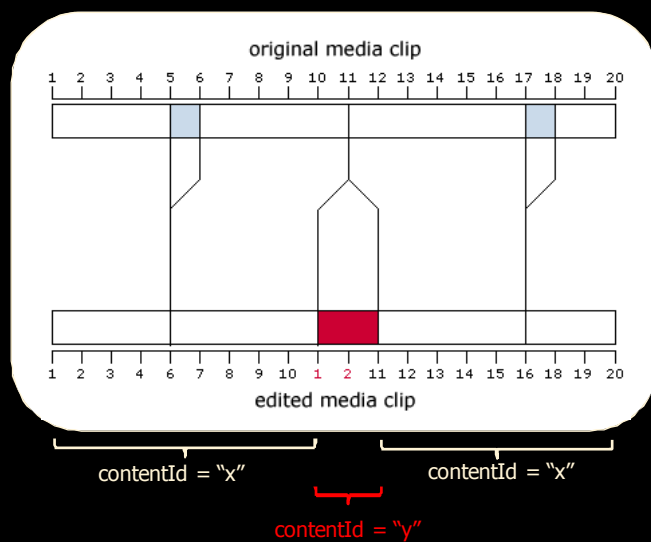
- Como um conteúdo pode ser localizado?
  - programNumber
  - componentTag
  - contentId
  - Como obter o contentId?



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## NPT



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## Sincronismo

- Controle do NPT
- Controle da aplicação



Applical      Application's object

Application      Application's object

NPT de partida ↑



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## Objetos NCLua Embutidos



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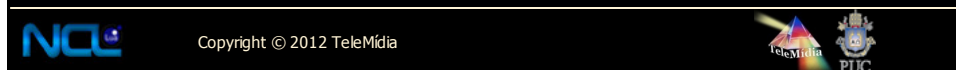


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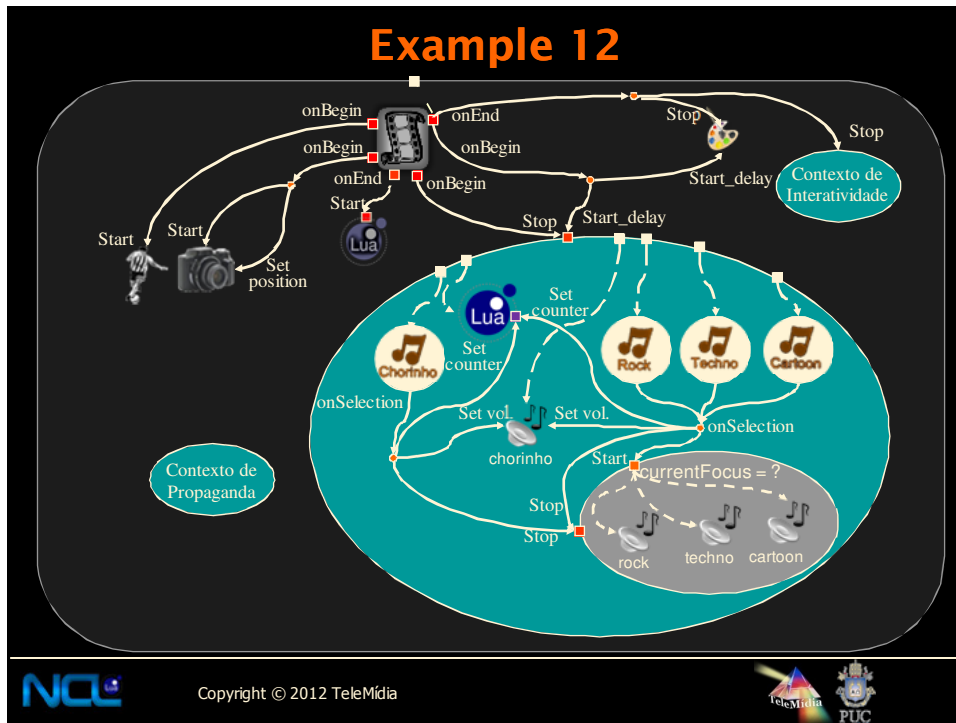


## Interfaces

- `<area id="a1" label="função interna">`
- `<property name="função interna" value="parametro">`



## Example 12



```

local counter = 0
local dx, dy = canvas:attrSize()    -- dimensoes do canvas

function handler1 (evt)
  if evt.class=='ncl' and evt.type=='attribution' and evt.action=='start' and evt.name=='add' then
    counter = counter + evt.value
    event.post {
      class = 'ncl',
      type = 'attribution',
      name = 'add',
      action = 'stop',
      value = counter,
    }
  }
end

function handler2 (evt)
  canvas:attrColor ('black')
  canvas:drawRect('fill',0,0,dx,dy)
  canvas:attrColor ('yellow')
  canvas:attrFont ('vera', 24, 'bold')
  canvas:drawText (10,10, 'O número de vezes que você trocou de ritmo foi: '..counter)
  canvas:flush()
  event.post {
    class = 'ncl',
    type = 'presentation',
    label = 'fim',
    action = 'stop',
  }
}

event.register(handler1)
event.register(handler2,'ncl','presentation','fim','start')

```

# Importação



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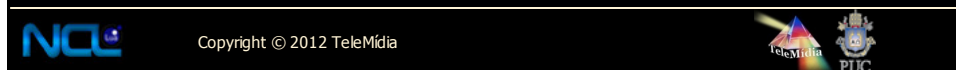
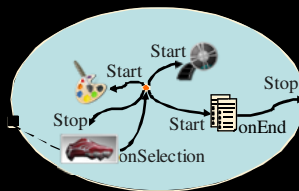


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## Exemplos 14, 15

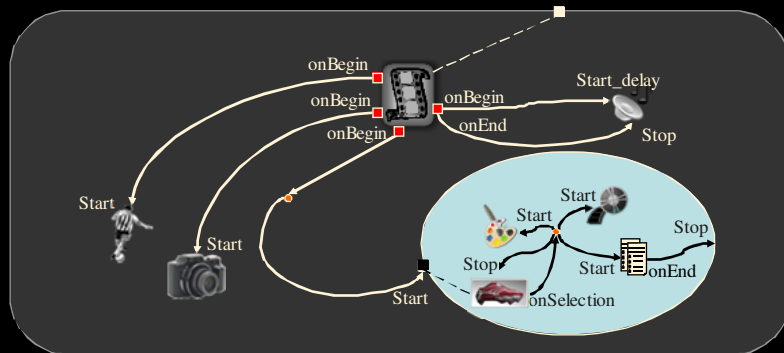








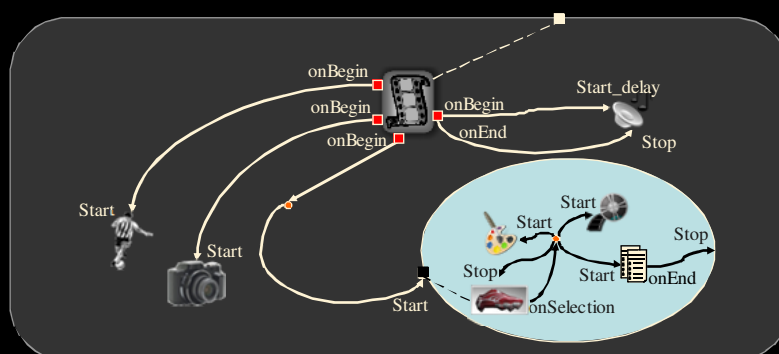
## Exemplo 13, 14





## Objeto de Mídia NCL Embutido

## Exemplo 15 (embutido)



## Interfaces

- `<area id="a1" label="porta interna do body">`
- `<property name="porta interna do body">`



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## Múltiplos Dispositivos de Exibição



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## Modelo Hierárquico de Controle



Aplicações NCL se referem a dispositivos por meio de classes



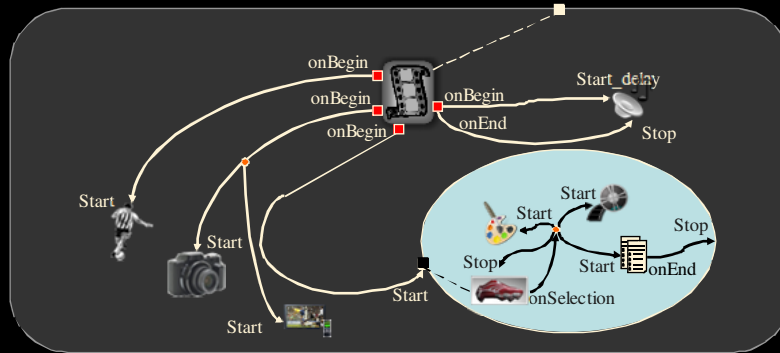
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## Exemplo 16



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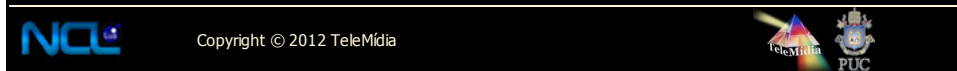
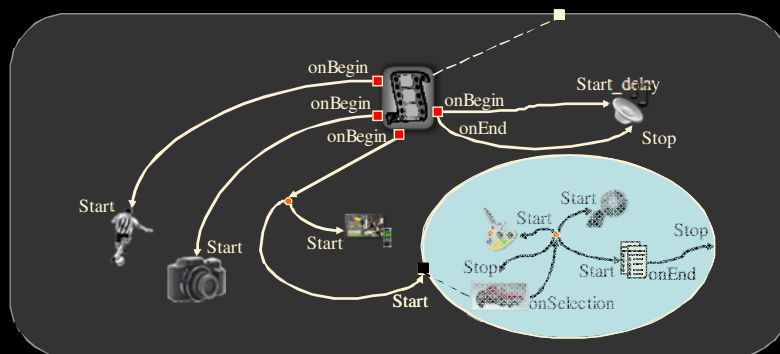


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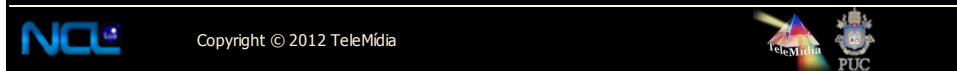
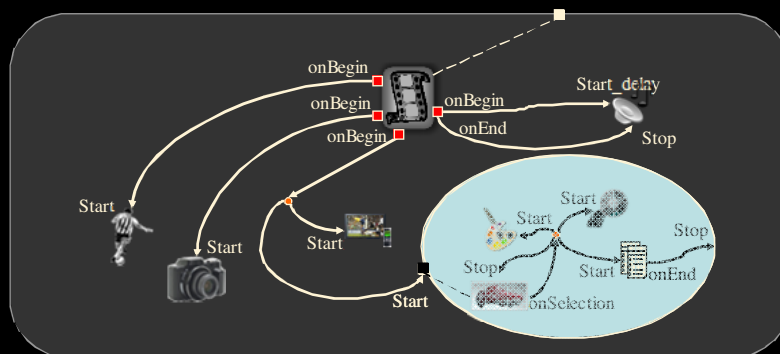


## Exemplo 17

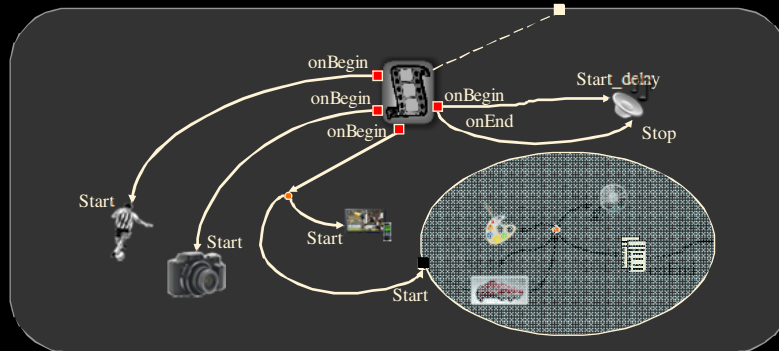




## Exemplo 18



## Exemplo 19, 20



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## TV digital se faz com Ginga



- <http://www.ncl.org.br>
- <http://www.ginga.org.br>
- <http://www.softwarepublico.gov.br>
- <http://www.telemidia.puc-rio.br>



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