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### Rec. ITU-T H.761 (2011) NCL and Ginga-NCL

### IPTV Multimedia Application Framework



# H.761 (2011) - Introduction

### ✓ H.761 - Nested Context Language (NCL) and Ginga-NCL

- ✓ Ginga-NCL is the Presentation Environment of Ginga
  - Subsystem for running NCL applications
- ✓ NCL is a declarative, XML-based language.

### ✓ Main NCL features:

- Glue language (strict separation between the application's content and structure)
- Intrinsic ability for easily defining spatiotemporal synchronization among media assets
- Multi-device support
- Presentation and content adaptability
- Language homogeneity and flexibility
- Reuse facility
- API for building/modifying applications at runtime



# **Ginga Position**

- ✓ Ginga is an ABNT standard for terrestrial DTV since 2007 (ABNT NBR 15606-2)
- ✓ In 2009, Ginga-NCL and NCL became ITU-T Recommendation for IPTV (ITU-T H.761)
- ✓ Ginga-NCL is also part of the ITU-T J.201 and ITU-T BT 1699 Recommendations
- ✓ At least 7 brands of commercial Ginga-NCL implementations embedded in most TV sets of main manufacturers in Latin America
- ✓ 13 countries have adopted Ginga as the middleware of their terrestrial DTV standards



### **Authoring Tools**

 Several textual and graphical authoring tools were developed to help application designers to create new NCL applications.

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### NCL Eclipse

### NCL Composer

http://www.ncl.org.br/en/autoria



### H.761 Reference Implementation

# ✓ Open-source reference implementation

 $\checkmark$  Also available as a tool for:

- > Developers to test their applications
- End-users to watch interactive content
- Ported to main Operating Systems:
   Linux, Windows, Mac OS X, Android

http://www.ncl.org.br/en/ferramentas

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### H.761 - Examples



Humerus The humerus from Latin humerus, umerus upper arm, shoulder; cf. Gothic ams shoulder, Greek õmos. Plural: humeri) is a long bone in the arm or forelimb that runs from the shoulder to the elbow.





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### H.761 - Examples





#### sports (mobile)





#### talk show

game (multi-device)



# Nested Context Language

- ✓ NCL imposes a strict separation between application content and its structure
- ✓ NCL does not define itself any media content
- Defines the glue that holds media objects together in multimedia presentations
  - An NCL application just defines how media objects are structured and related, in time and space.
  - User interactivity is homogeneously handled as a temporal synchronization



### Supported Media Types

- Supported media types just depend on which media players are coupled up to the NCL Presentation Environment
  - Video, Audio, HTML, Image, Text...
  - Lua Scripts (NCLua API)
- Independently of their types, media objects are homogenously handled by the same group of events and actions: Presentation, Selection and Attribution
- Media objects may be sourced from local file system, carrousels, Internet



### H.761 - Example

 Code sample: temporal synchronization, including user interactivity

```
<link id="lBegingShoes" xconnector="conEx#onKeySelectionStopSet_varStart">
        <bind role="onSelection" component="icon">
            <bindParam name="keyCode" value="RED"/>
        </bind>
        <bind role="start" component="shoes"/>
        <bind role="start" component="ptForm"/>
        <bind role="start" component="reusedAnimation" interface="bounds">
        <bind role="start" component="reusedAnimation" interface="bounds">
        <bind role="start" component="reusedAnimation" interface="bounds">
        <bind role="start" component="reusedAnimation" interface="bounds">
        <bindParam name="var" value="5%,6.67%,45%,45%"/>
        <bindParam name="var" value="5%,6.67%,45%,45%"/>
        <bind role="stop" component="icon"/>
        </link>
```



# Multi-device Support

 NCL provides declarative support for presenting distributed DTV applications on multiple devices

Presentation of media objects in NCL applications can be associated to devices using an abstraction called device classes

Secondary devices (child devices) are registered to classes controlled by a parent device



### **Multi-device Support**





### **Multiple Device Examples**





### **Multiple Device Examples**







# Multi-device Support

- ✓NCL has two main types of device classes:
  - Passive classes: in a passive class, the same content is shown on all paired devices, under the rendering of their parent device
  - Active classes: in an active class, the content is decoded and rendered by each individual child device, thus allowing independent navigation and interaction



### H.761 - Example

### ✓ Code sample: multi-device presentation

```
<regionBase device="systemScreen(2)">
<region id="NCLAdvertReg" width="100%" height="100%" zIndex="1"/>
</regionBase>
```



### **Final Remarks**

✓ NCL is a simple, easy to learn multimedia language

- Ginga-NCL is a lightweight multimedia presentation environment
- ✓ Official Websites:
  - <u>http://www.gingancl.org.br</u>
  - <u>http://www.ncl.org.br</u>
- ✓ NCL Reference Guide:

<u>http://www.ncl.org.br/en/handbooks</u>

- ✓ More application examples:
  - <u>http://clube.ncl.org.br</u>