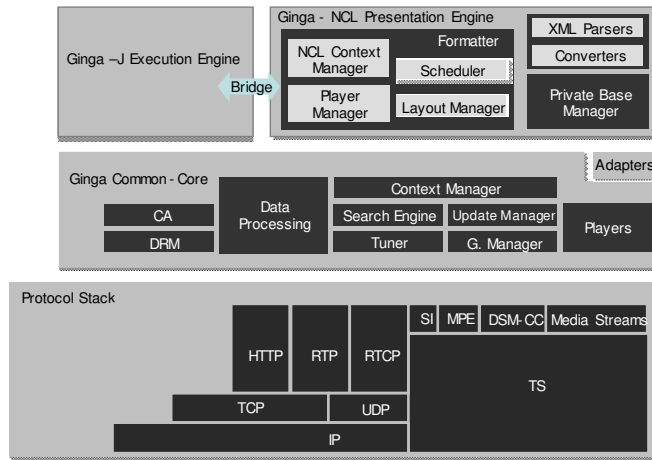


Ginga-J + Ginga-NCL



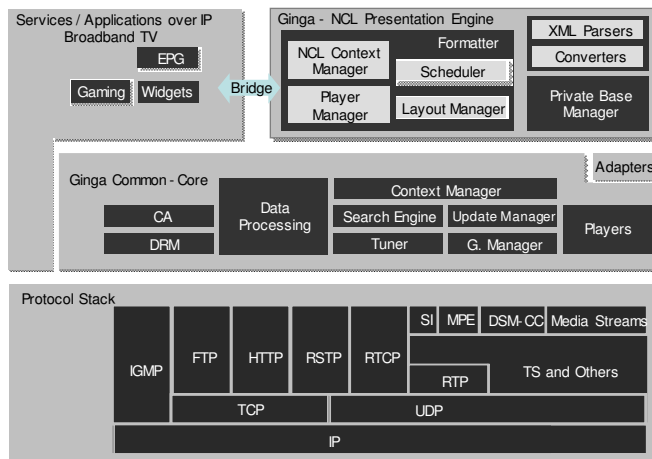
9



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Broadband TV + Ginga-NCL



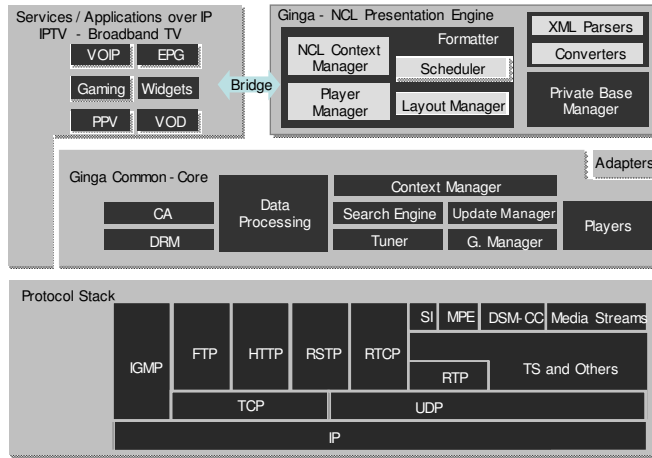
10



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IPTV + Ginga-NCL



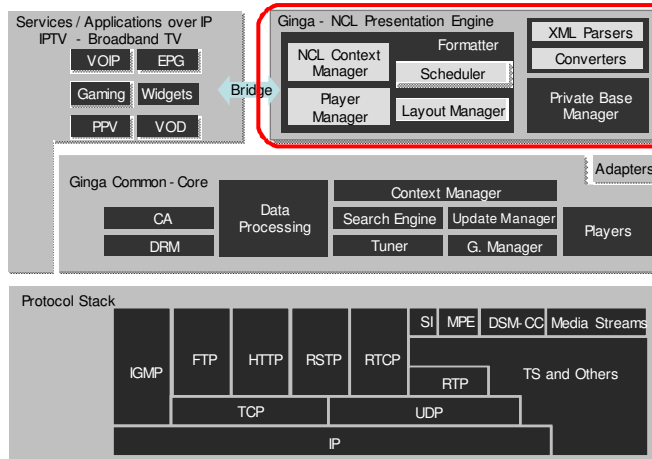
11



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Hybrid TV



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Middleware Requirements

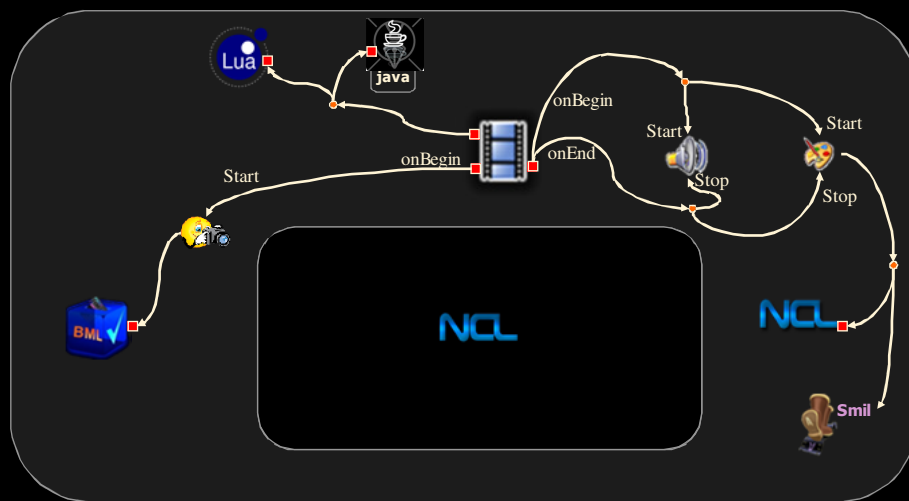


NCL

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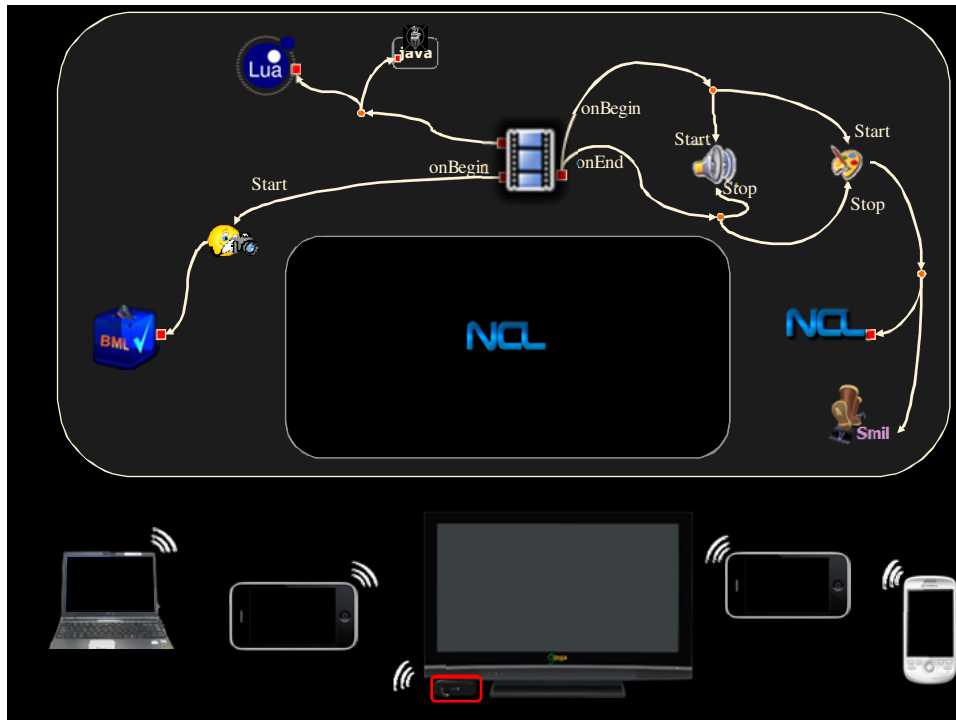
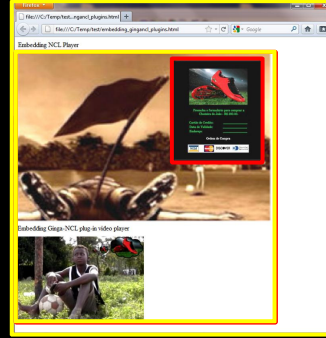
NCL

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Interoperability

- Interoperability: *Liaison* ITU-T/W3C
 - NCL as a glue language
 - NCL as a Web plug-in



	TV	TV (assinatura)	Tel. Fixo	Celular	Computador	Computador + Internet	Nunca usou computador	Nunca usou a Internet
TOTAL	98%	20%	37%	87%	45%	38%	42%	47%
Área Urbana	99%	23%	42%	91%	51%	43%	37%	42%
Área Rural	95%	4%	10%	69%	16%	10%	67%	75%
Classe A > R\$ 12.440,00	100%	85%	93%	100%	98%	96%	5%	6%
Classe B	100%	45%	69%	97%	84%	76%	15%	17%
Classe C	99%	15%	35%	91%	45%	35%	39%	46%
Classe DE < R\$ 2.480,00	94%	2%	9%	70%	8%	5%	72%	79%

17  Dados de 2011, publicado em 06/2012 pelo CGI.br  

Programming Paradigms

- Imperative (procedural)
 - algorithm specification: "how to do"
 - more expressiveness
- Declarative
 - specification: "final intention"
 - highest level specification

Specification Language

- Simple to be understood and learned
- Lightweight
- Powerful
- **Declarative DSL language**

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NCL Nested Context Language

- The Brazilian innovation in the ISDB System:
 - NCL (Nested Context Language) declarative language
 - Its script NCLua language
 - Its engine: GINGA-NCL *middleware*.
- **ITU-T H.761 Recommendation for IPTV services**
- **ITU-R BT 1691-1 Recommendation for Terrestrial DTV**

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Why NCL?

NCL

Functionalities – Declarative support to:

- Media synchronization
 - Interactivity as a particular case
- Adaptability
- Different distribution networks
- Multiple exhibition devices
- Live edition
- **NCL is free software**

Why Lua?



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Why Lua?



- ✓ Lua is Simple and Powerful
- ✓ Lua is Portable
- ✓ Lua is Embeddable
- ✓ Lua is Fast
- ✓ Lua is Robust
- ✓ Lua is Free Software

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Final Remarks



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Ginga-NCL is free software



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Ginga Communities



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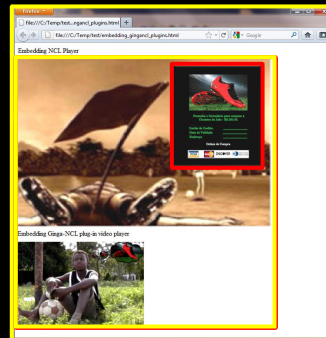


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Interoperability

- Interoperability: *Liaison* ITU-T/W3C
 - NCL as a glue language
 - NCL as a Web plug-in



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Plug-ins Ginga



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NCL Evolution



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NCL 4.0

- NCL 4.0
 - Higher level abstraction for relationship definitions
 - Better support to context aware applications
 - Support to multimodal interfaces
 - Support to 3D objects
 - Multiple devices
 - Social media

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Gracias

<http://www.ncl.org.br>
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