Java Applications for Digital TV
Java and Digital TV on ISDB-T
JCP F2F Meeting - Korea

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Why Brazil ?

Why is Brazil important for DTV?

Large

- Almost 200M people, 60M+ TV households, 11M TVs produced / year
- 8th largest economy in the world
- Potentially world's largest dual digital terrestrial/mobile deployment
- Potentially one of the largest national Java TV adoption to date (with Italy and Korea)

Innovator

- BRIC innovator, global influencer, open standards & Java tradition
- Broken ranks from traditional RAND ("Open") TV standards (DVB / ATSC)

Right Roadmap

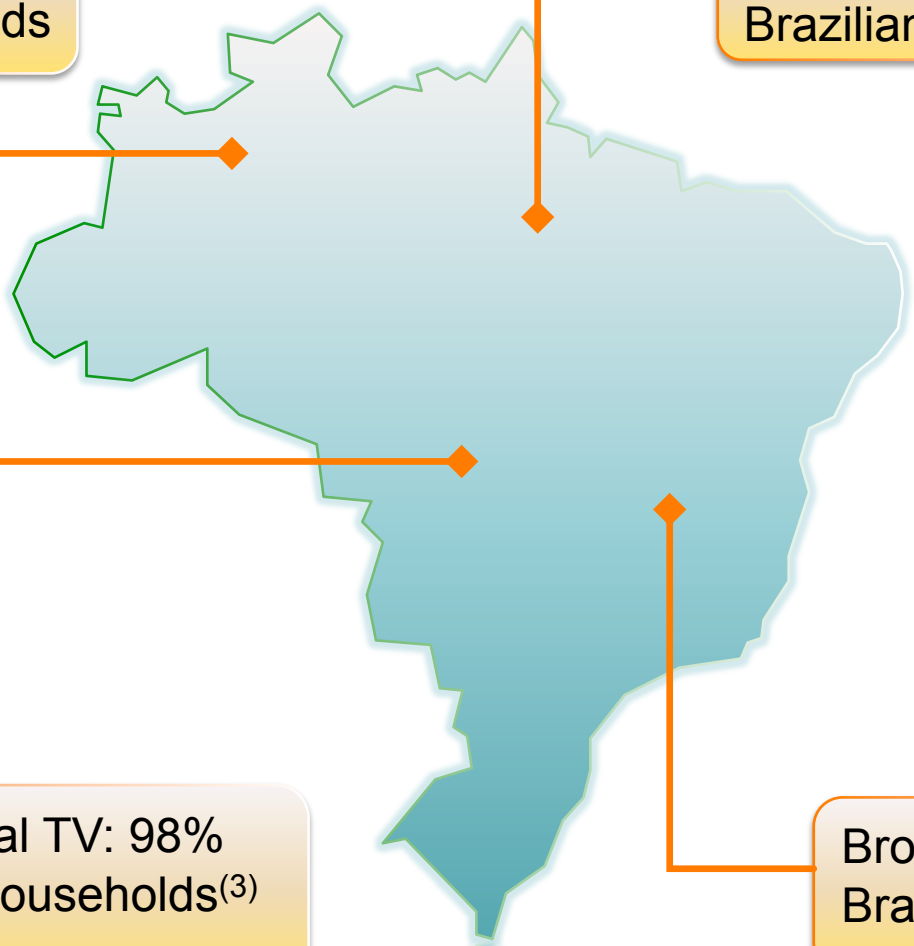
- Royalty free, dual digital terrestrial / mobile
- Aligned interests with broadcasters, CE industry, software industry

SBTVD Forum is a World Leader for Digital TV – is leading the adoption of ISDB-T system in 10 other countries in Latin America and heads the ISDB-T International Forum

TV Market in Brazil

Pay TV: 16% of Brazilian households (2)

PC penetration: 55% of Brazilian households(1)



FTA Terrestrial TV: 98% of Brazilian households(3)

Broadband: 18% of Brazilian Households (2)

(1) Computer Industry Almanac / IBGE
(2) Telecom/ IBGE
(3) WWW.eletros.gov.br

DTV adoption in Brazil

Planned Analog Switchoff: 2016

State penetration: 24 of 26 states (1)

Cities: 56 total, 24 capitals (1) , 48% of the population

Broadcasters: 100+ broadcasters, including headends and affiliates (1)

(1) http://www.dtv.org.br

ISDB-T adoption

Population: 357 Million in LATAM (2) – it is now the 2nd most used DTV system in the world

11 countries in LATAM + Philippines and Japan in Asia (1)

(1) http://www.dtv.org.br
(2) http://pt.wikipedia.org/wiki/ISDB-TB

Ginga Standard and Interactivity

The DTV **Middleware** (conceptually similar to the JEE world) is the **software layer** that enables the development of **interactive applications** in such a way as to to be independent from the hardware platforms of the digital receiver manufacturers while also coming with several powerful features that allow transparent and easy access from applications.

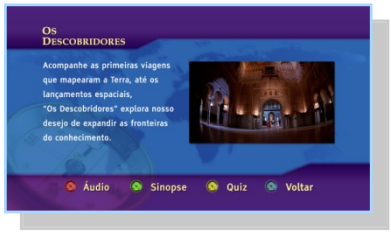
The Middleware is able to execute **native applications** (embedded by the manufacturer) or **broadcasted applications** sent by the broadcaster networks in their signal. In the **Ginga Standard** these applications can be developed in languages like **Java**, **NCL** or **LUA**.

The Ginga Standard defines 2 Engines: Ginga-J (Execution) and Ginga-NCL (Declarative).

DTV Interactivity

Interactivity is the new frontier for the TV users all over the world. A frontier still largely unexplored. The technologies offered in the Ginga Middleware Standard (NCL, Lua and Java) present a fantastic potential for exploring this new frontier.

Many scenarios have been tested and broadcasted in Brazil and after much debate involving media specialists, content producers and application developers some trends were set. New business models are now being discussed between broadcasters, advertisers, and others. Many new segments, like the banking system, are approaching this possibility expecting to bring new ideas to produce and explore interactive applications.



Ginga-J: History

Original Ginga-J Standard

The original Ginga-J standard was based on the European middleware standard that uses as its core the GEM (Globally Executable MHP) specification.

Although GEM is itself based on the royalty-free JavaTV from Sun, the european sponsored extensions (HAVi, Davic and DVB Extensions) are controlled by “Patent Pools” who charge for the specification use.

Ginga-J: History

January/2008

- GEM/MHP – STVD Forum discovers royalties for the specification use.
- MOU signed between SBTVD Forum and Sun Microsystems.

June/2008

- Contract for technical cooperation signed (TECC).
- Ginga-J Commision formed.
- Joint Project: Sun Microsystems + SBTVD Forum.
- Goal: New Java DTV specification: functionally equivalent to GEM.

Ginga-J: History

December/2008

- Java DTV Specification created in record time.
- Java DTV property: co-ownership Sun and SBTVD.
- Specification: Royalty-free for all implementors.
- International potential.
- Technology convergence with mobile world.
- Maintains the same basis (JavaTV and JMF) used in OpenCable/tru2way, GEM-MHP, GEM-IPTV and Blu-ray Disc/BDJ, while removing all patented extensions.

Ginga-J: Current Status

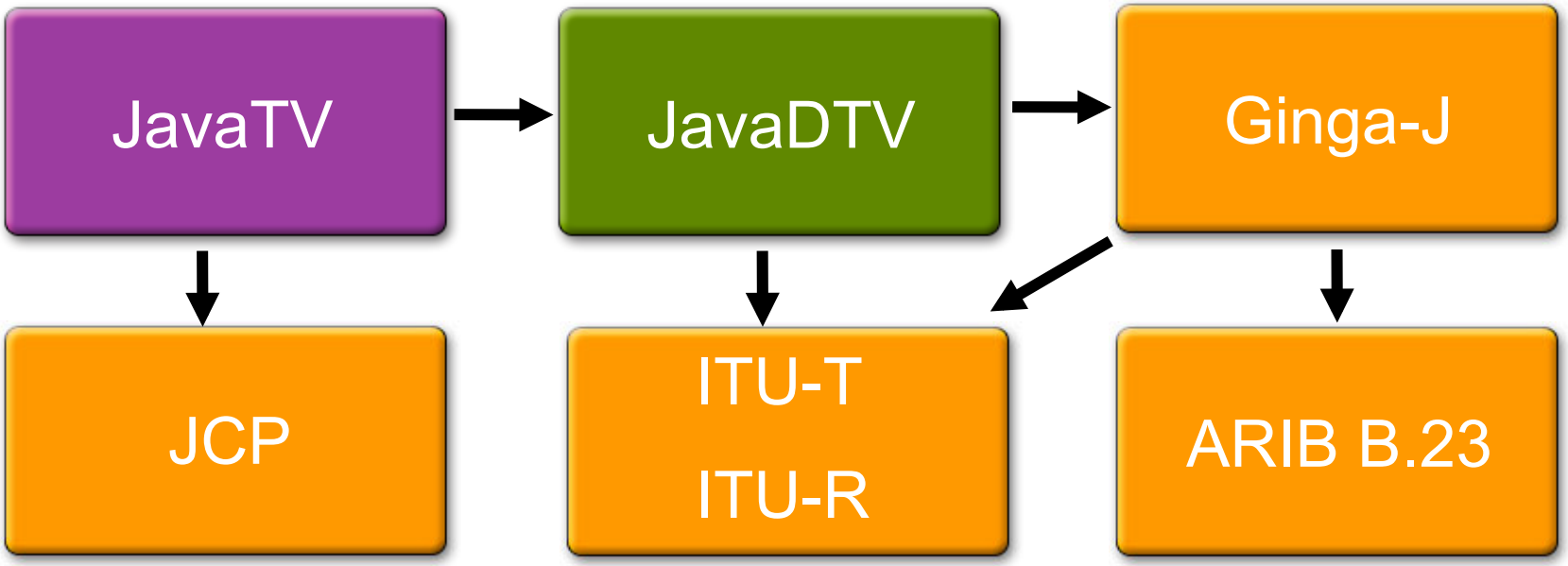
Ginga-J and Java DTV – Published Standards

Now Ginga-J uses JavaDTV as its core and builds several extensions upon this core. Ginga-J was finalized in May/2009 and has published in the beginning of 2010. In 2010 Ginga-J and JavaDTV also became part of the updated revisions to international ITU recommendations J.200 and J.202. JavaDTV was inserted as the new core for Interactive Middleware Execution Engines in J.202 and was also published as an open Brazilian Standard (Ginga Volume 6).

Ginga-J: International Potential

Future

- Adoption of Ginga-J and JavaDTV in other countries.
- JavaDTV/Ginga-J as an international standard.
- Big repercussion in the Java Community.
- Exporting of content and tools.



Ginga in ITU

- In the scope of ITU (International Telecommunication Union), Ginga has a successful track history. The Brazilian delegation has been led by Anatel (Brazilian Government Agency for Telecommunications) and the SBTVD Forum has participated during all the meetings in the last years.
- The NCL language was approved as an IPTV Standard by ITU-T SG16 and published as the new Recommendation ITU-T H.761.
- Ginga was the object of extensive studies inside ITU-T SG9 and ITU-R WP 6B in their revision work to develop new versions of Recommendations J.200, J.201 and J.202 (in ITU-T) and BT.1699 and BT.1722 (in ITU-R). All of these Recommendations were approved with the inclusion of Ginga standards in 2010.
- The convergent effort between Japan and Brazil was fundamental to this successful work inside ITU.
- The new work currently progressing inside ITU-T SG9 will be a basis for future Ginga extensions and will create new ITU Recommendations converging Interactivity in Digital TV with Home Networking and with Hybrid Broadcast-Broadband solutions.

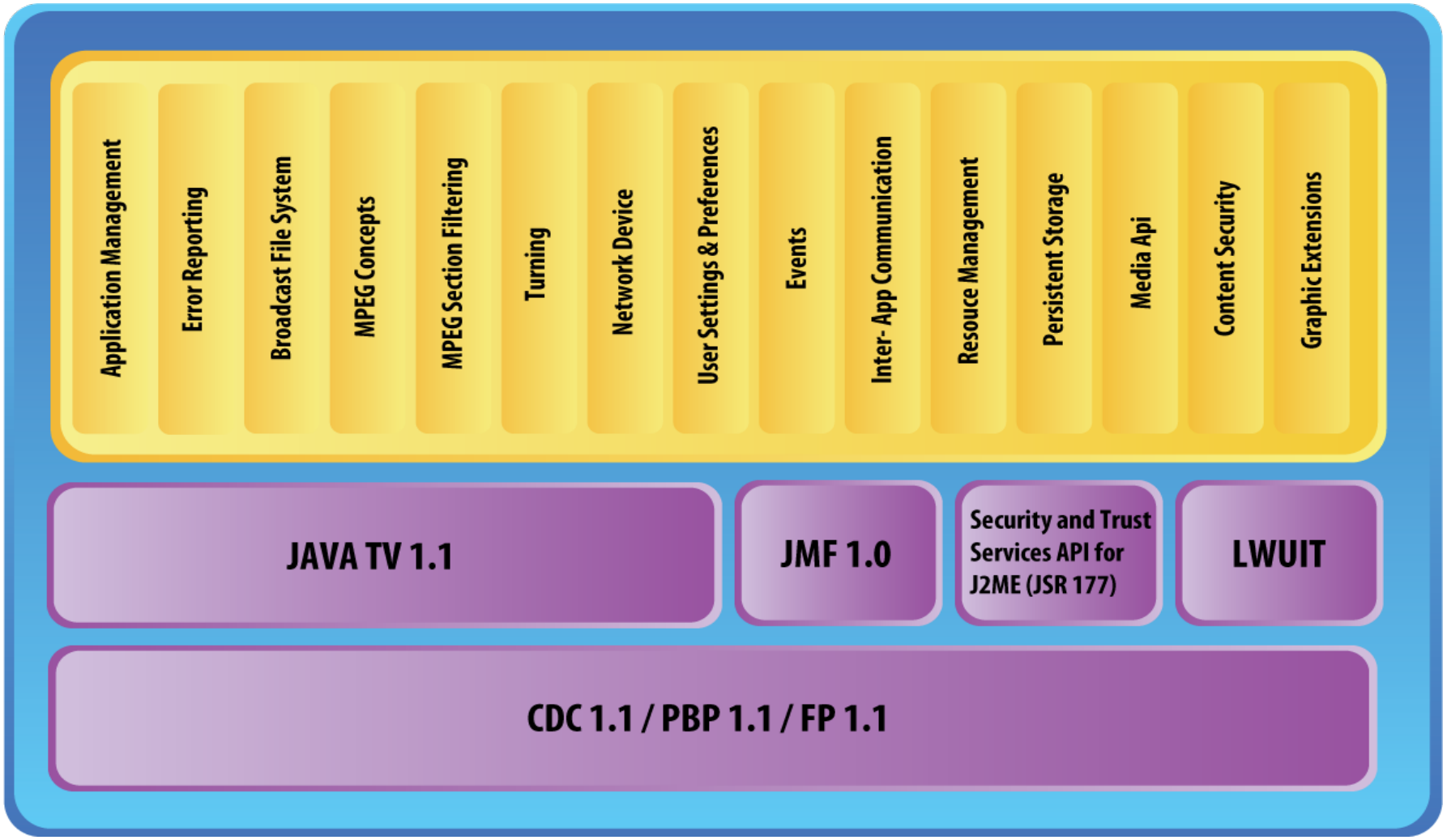
ITU International Telecommunication Union

ANATEL Agência Nacional de Telecomunicações

FÓRUM SBTVD

Java DTV Architecture

Java DTV has a simple, flexible and powerful architecture, built bottom-up upon proven Java standards. It is now published as ABNT 15606 Vol. 6 and was accepted by ITU-T as a new Core for Recommendation J.202 with equal status to the GEM standard.



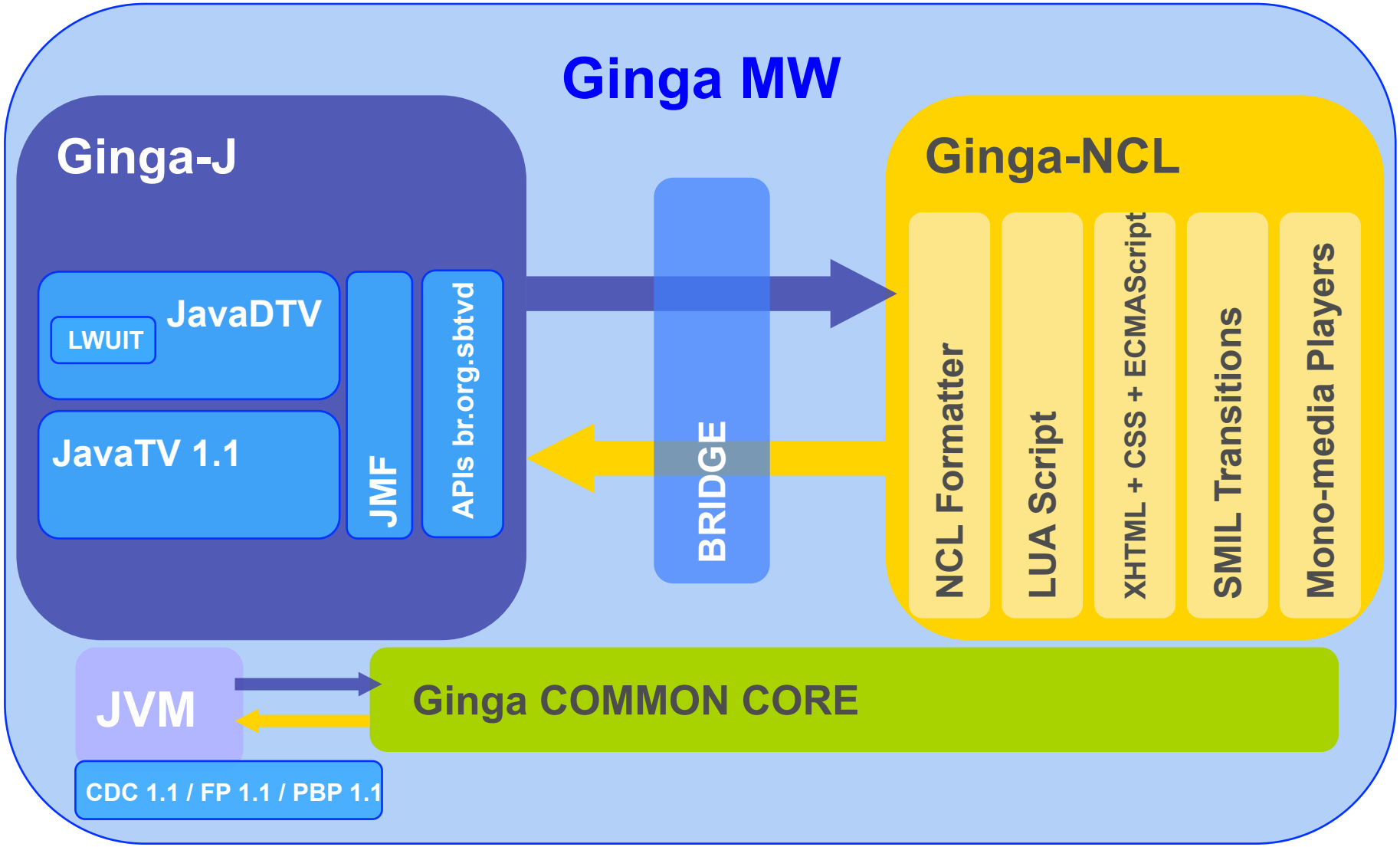
Ginga-J and Java DTV - Features

- Component based interfaces
- Access to platform resources
- Applications catalog
- Simple and effective media control
- Secure data transactions
- Animations and rich graphical transitions (LWUIT)
- Application internationalization capability
- *Smartcard support*
- Easy content adaptation to other technologies
- Simultaneous interaction with multiple users *
- Receiver integration with other devices *

* Optional features

Ginga Specification and Architecture

Ginga Specification's official published status according to ABNT15606 and ITU-T J.201 / J.202



Ginga Evolution

Ginga Standards in SBTVD will continue to evolve to address:

- **Technology advancements and breakthroughs (3D, Hybrid, HAN).**
- **Trends to harmonize with open, royalty-free international standards.**
- **ISDB-T International adoption in Latin America and elsewhere in the world.**
- **Convergence with new initiatives inside Japan and in ITU.**
- **Extensions to support hybrid DTV receivers including pay-TV services (IPTV, Cable, Satellite) alongside with FTA TV.**
- **The greatest focus is the creation of conditions and synergy necessary for the success of Interactive Digital TV.**

Ginga Deployment

Ongoing

- **Complete implementations of Ginga including all mandatory parts of Ginga standards are being deployed by several manufacturers in Brazil: LG, Sony, Panasonic, Philips.**
- **Announced for soon: Samsung, Fujitsu, Toshiba.**
- **Applications are also being broadcasted in the signal of the main Brazilian broadcasters, several of them during prime time.**
- ***Countries in Latin America that adopted ISDB-T signed a memorandum for the harmonization of standards, including Ginga to prevent market fragmentation, enable interoperability and encourage widespread use of data content. This is one of the main cooperation areas inside the newly formed ISDB-T International Forum.***

DTV Interactivity in Brazil

- **Market adoption** – Interactivity market adoption depends on Broadcasters interest, Manufacturers response and time-to-market. This cycle in Brazil (and in other LATAM countries) is heavily influenced by a third player: Government.

- **Broadcasters** - DTV adoption in Brazil is progressing fast and all major Broadcasters are adopting Interactivity scenarios linked to primetime shows or with unlinked applications (general content, news / sports / etc. portals). Timing: 2011-2012 will be key years for broadcasters in preparation for big events in 2012, 2014 and 2016.

- **Manufacturers –** All main TV manufacturers are already offering or close to offering complete Ginga solutions in Brazil. Timing: early 2012.

- **Governmental Actions** - Pushing interactivity as a digital inclusion strategy and as a mandatory feature in DTV receivers. This will be heavily tied in Brazil with the adoption of large scale public Broadband initiatives. Timing: 2012. (1)

(1) http://www.estadao.com.br/estadaodehoje/20110501/not_imp713287,0.php

Content production costs

Set of tools

- Authoring, Emulators, Playouts, Development frameworks

Team formation

- Internal team (worst scenario)
- Consulting with know-how transfer from Ginga experts (e.g.: TOTVS has its network)
- Creating a development market (best)

Potential professionals in the market

- Brazil: 110 thousand+ (Java)
- Ginga-J: high interest in the development community

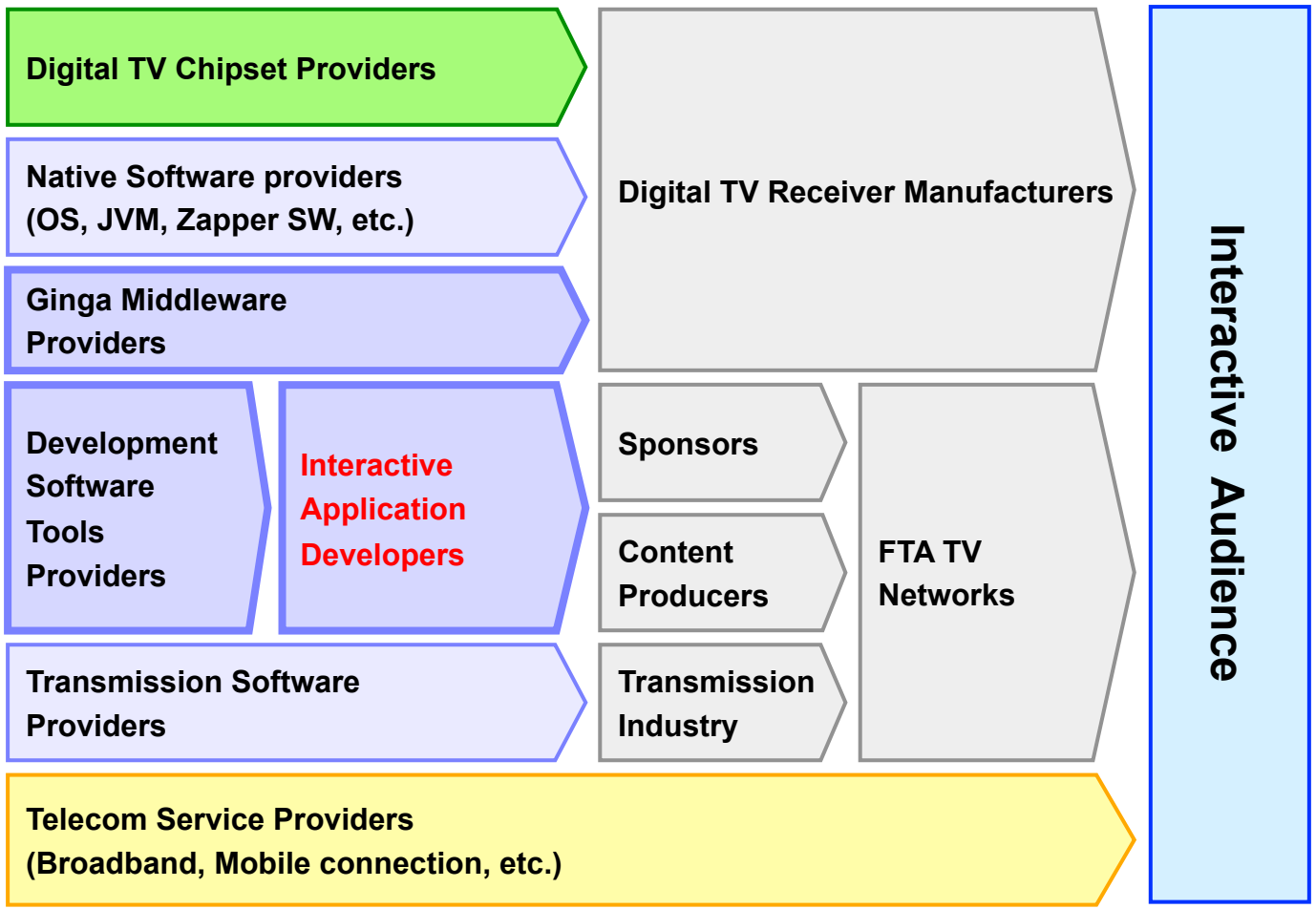
Formation courses

- Companies / Universities

Market for Interactive Apps

How the current model works for developers?

Software is the new piece in the puzzle and software providers are the new players in the value chain. Everyone else is a potential software consumer.



Scenarios and use cases

Types of Applications – already deployed or being tested in the current traditional (broadcaster-led) interactivity model

- **Informative**
- **Marketing**
- **Content enrichment**
- **Entertainment**
- **T-Government Services (Health, Education, etc.)**
- **T-Banking**
- **T-Commerce**
- **Etc.**

Next slides: some real applications are shown. Most of them are Java applications, but currently the market does not perceive differences between Java and NCL-Lua applications.

Scenarios and use cases

Information

- **Eletronic Programming Guide**

Scenarios and use cases

Information

- **News, events, etc.**

Scenarios and use cases

Marketing

- **Marketing campaings, T-commerce, etc.**

Scenarios and use cases

Government

- **Several services, T-Government, T-Banking**

Scenarios and use cases

Entertainment

- **Shows, musical events, etc.**

Scenarios and use cases

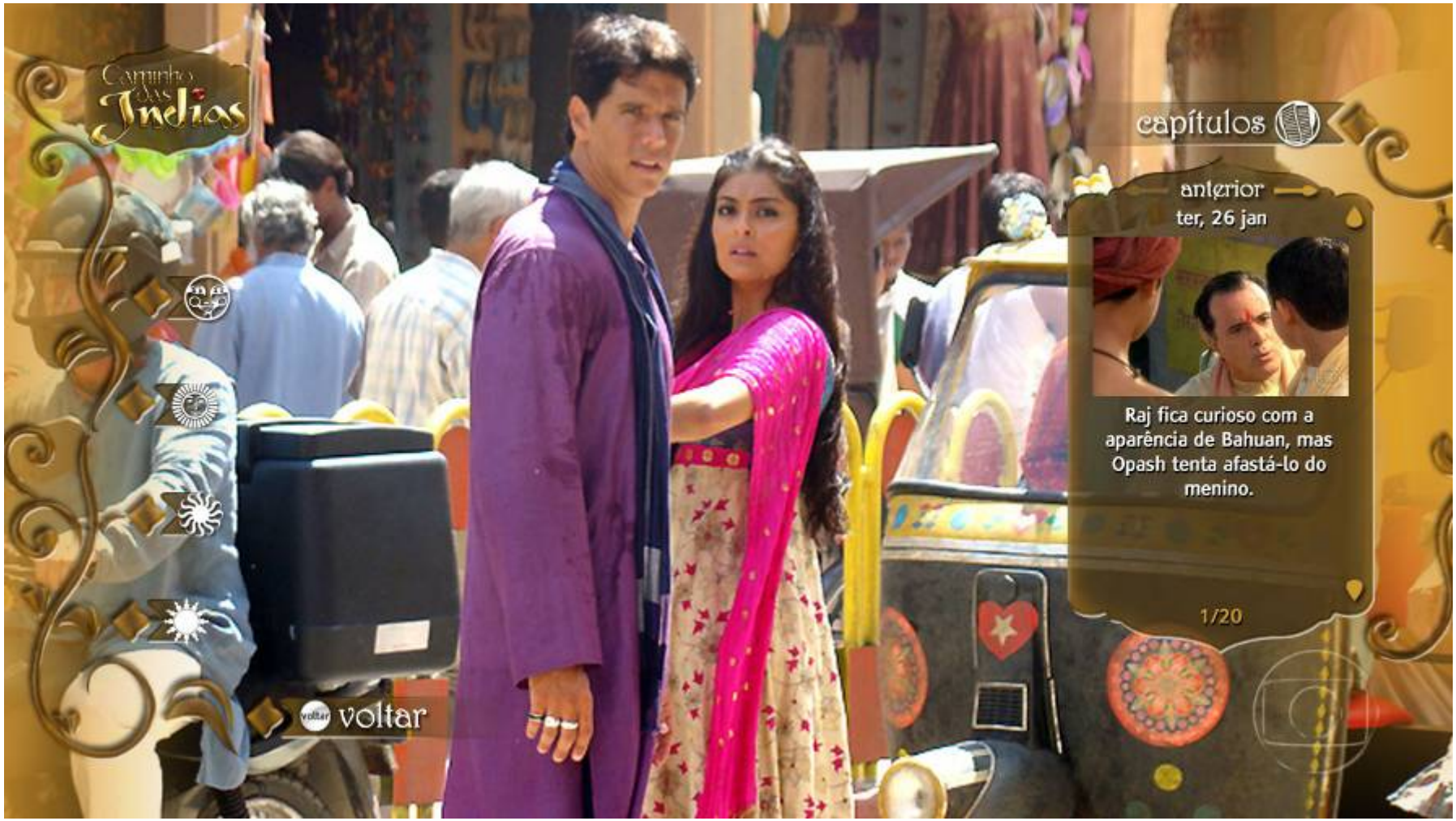
Entertainment

- **Sports, Chats, etc.**

Scenarios and use cases

Entertainment

- **Enriching the content.**



DTV Interactivity: a new scenario

Interactivity: a new scenario

- **New Interactivity governmental actions** – In Brazil, DTV is a reality in all TVs 32" and above and the *Brazilian government is signaling the need for interactivity* proposing several initiatives for bridging the digital gap. From 2012 onwards, at least 5% of mobile phones produced in Brazil will come with interactivity. Integrated DTVs and STBs manufacturers will also increase their DTVi (Ginga) lineups. (1)

- **New Technologies** – Digital TV in Brazil and other Latin America countries is entering in a new phase, where Connected TVs, new standards like HBBTV and even IPTV are coming as potential competition for traditional TV models.

- **New Products** – A new product, called Sticker Center, based on Ginga, was launched during the SET 2010 Broadcast and Cable Fair, to boost digital TV adoption by the population, bringing several other actors into the process of offering interactive applications (banks, retailers, supermarkets, etc.).

Current Ginga Interactivity

Business Model

Traditional Interactive TV Business Model

- The ISDB-T interactive TV model is under the control of the broadcaster and is based on the transmission of interactive Ginga applications via the broadcasters' signal.

- Broadcaster strategies

  - Business model is very similar to traditional broadcasting model: advertisers sponsor interactivity insertions in the channel schedule.

  - Advertisers can now produce marketing content with video + interactive content that give more data on their products to consumers.

  - Broadcasters also have the added benefit of online, real-time interactive models for shows that require viewer's feedback (like reality shows) with much better control over this feedback than current (SMS-based) solutions.

Different players, different goals