Java Technology: The Future of Digital Television

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Java in Digital Television
What are TV Services?

Interactive Services
- EPG
- On Demand Guides
- T-Commerce
- Interactive TV

Video Services

On Demand Services
- VOD
- Subscription VOD
- Network PVR
- “Blu-ray On Demand”
Platform Standards are Critical

Delivery of compelling TV services requires:

• Critical consumer mass
• Common content support across varied devices
• Support for a rich palette of capabilities
• A broad vendor ecosystem
• Clearly-defined specifications
Java™ Technology Is the Right Platform for DTV Applications

- Secure, flexible execution environment
- Cross-platform application compatibility
- Supports multiple content types (HTML, applets, streaming media, etc.)
- Standards body endorsement
- Great tool and developer support
Java Deployment Success Worldwide

- 5B: Java devices worldwide
- 2.1B: Java powered phones*
- 180: Carrier deployments
- 800M: Java powered PCs
- 2.5B: Java Cards deployed
- 6M: Java developers

*Source: Ovum
GEM: A Family of DTV Standards

• Originated with DVB's Multimedia Home Platform
• Supports application interoperability between GEM-based standards which may have differing transport streams, etc.
  > CableLabs OCAP Profile
  > ATSC ACAP Profile
  > Blu-ray BD-J Profile
  > GEM-IPTV

• Defines a set of APIs, semantic guarantees, and content formats commonly accessible to all GEM applications.

• GEM has emerged as the only viable standards-based platform for advanced interactive TV-related content
Relationship of Digital TV Standards

- DVB-MHP
- DVB-GEM
- GEM-IPTV
- OCAP
- ARIB B.23
- ACAP
The Global GEM Ecosystem

GEM applications
Sample GEM screenshots

Olympics Applications in Germany
Sample GEM screenshots

DigiMessage™ by DigiSoft
GEM Stack Overview

Diagram Courtesy Vidiom Systems
GEM Stack Overview

Upper Stack
Industry Specific API's, e.g. BD-J, OCAP

Lower Stack
Core APIs (Sun / JCP-led technologies)
MHP: Multimedia Home Platform

- The Multimedia Home Platform specification was developed by DVB, a consortium of around 300 organizations focused on standardizing worldwide digital broadcasting.
- Has emerged as the clear target for advanced interactive TV-related content.
- Based on Java™ ME Personal Basis Profile and Java TV API.
- Deployed widely in Europe, S Korea.
OpenCable Application Platform

- Defined by CableLabs as part of the overall OpenCable effort to promote cable equipment interoperability
  > Initially based on MHP
- Recently re-branded “tru2way” for consumer-facing applications
- Supports delivery of two-way applications and services across both set-top boxes and tru2way-capable televisions
Twenty Million+ GEM Set-tops
Twenty Million+ GEM Set-tops

- Italy: 4M+ MHP terrestrial DTV set-tops sold at retail, generally for less than €100. Many services available.
- S Korea: 4M+ MHP satellite set-tops deployed on SkyLife; OCAP (cable) and ACAP (terrestrial) rollouts
- Germany: Free-to-air satellite, set-tops from Philips, Sony, Panasonic, Humax; hybrid DSL / DTV MHP boxes coming.
- United States: OCAP deployment underway, to be complete by 2009; tru2way TV's expected at retail in 2008
- Worldwide: 10M+ PlayStation 3's and standalone Blu-ray players; potential market of 100's of millions of Blu-ray enabled PC's
New Capabilities Enabled by BD-J

- Far richer consumer experience
  - Freedom of UI design
  - Studio-skinned A/V playback control

- Dynamic content updates via broadband
  - Download of new trailers
  - Additional subtitle options
  - Add-on bonus materials

- New forms of added content
  - Playing games from disc and on-line
  - Live events
  - On-line shopping
BD-J Momentum: Titles

• The first BD-J titles were released over five months after format launch
• One year ago there were three titles (League of Extraordinary Gentlemen, Speed, Behind Enemy Lines)
• As of today there are at least 50 released BD-J titles
  > Including most recent major releases (PotC: At World's End, Spiderman 3, Cars, Ratatouille, Fantastic Four: RotSS, etc.)
  > BD-J titles continue to increase as a percentage of all titles
  > BD-J games are beginning to appear
BD-J Titles: Movies
BD-J Titles: Games

- **SPACE ACE**
- **DRAGON'S LAIR**
- **SUDOKIA**
BD-J Momentum: Features

• BD-J content is getting more sophisticated
  > Cars: “Car Finder” in-movie game
  > Pirates of the Caribbean Dead Man's Chest: “Liar's Dice” feature
  > Weeds 2: Automatic bookmarking
  > Multiple Fox titles: Scene / actor database

• Upcoming titles continue to break new ground
  > Terminator 3: In-Movie Experience
  > War: Networked game, Picture-in-picture, Blu-line Slider
BD-J Momentum: GUI Tools
Key Trend: Converged Services

- Operators will deliver services across multiple platforms
  - Java content uniquely supported across key targets
GEM Authoring Strategies
GEM Authoring Tools

1. Cardinal Studio  Cardinal Systems (Finland)
2. Media Gateway  Sony
3. MHP-ADK  Panasonic (Germany)
4. OCAP Studio  NDS
5. Sofia Tools  Sofia Digital (Finland)
6. Evolution Console  Osmosys (Switzerland)
7. MHP Author  Teleidea (Spain)
8. ModelStream  Emuse (Ireland/USA)
9. Q-Studio  Ensequence (UK/USA)
10. AltiComposer  Alticast (Korea)
11. Bando  NPTV (France)
12. ezTV MHP Suite  Zappware (Belgium)
13. ACE Publisher  Ortikon (Finland)
14. RegieLine  IDP (NDS)
15. iTVSuite  Icareus (Finland)
16. Application Suite  Aircode (Korea)
17. JAME  Fraunhofer
18. Vision Workbench  Vidiom (ADB)
Four Primary Authoring Models

• Traditional IDE-based package
• Graphically-oriented environment for non-programmers
• Standard HTML with packaged xlet-based browser
• Customized markup language with fit-to-purpose renderer
Traditional IDE-based Package

- Target: Java programmer
- Typically integrated with Eclipse or NetBeans
- Most flexibility, but requires highest skill level
- Examples:
  - MediaHighway Development Kit (NDS)
  - Vision Workbench (Vidiom)
  - Osmosys SDK 2.0
Graphically-oriented Tools

- Target: Creative Professional
- Generally timeline-based paradigm (like Macromedia Director)
- Good mix of flexibility and rapid development
- Examples:
  - Ensequence On-Q Studio
  - Cardinal Studio
Cardinal Studio Screenshots
Java Web Browsers

• A GEM application can package a suitable Java Web browser for delivery to the set-top box
  > Browser then renders HTML

• Content author has full control over the content displayed by the browser
  > Use desired HTML/CSS/script capabilities

• Many embedded browser vendors
  > Espial, Pontegra, HotJava, IceSoft, Javio WebWindow, GrandRapid, NetClue…

• Typical footprint 125K - 1.5MB
Who Wants to be a Millionaire

Ai mondiali del 1986 contro quale squadra Maradona segnò un famoso gol di mano?

1: BELGIO  2: GERMANIA  3: INGHILterra  4: MESSICO

BACK I per uscire dal gioco
Customized markup language with fit-to-purpose renderer

- Target: Creative Professional, web author
- Once markup environment is defined, very rapid deployment of new applications
- Markup environment can be enhanced as desired
- Examples:
  - Sofia Digital Browser Platform
  - Icareus iTV Integrator
Sofia Digital Browser Platform

- Xlet-based XHTML microbrowser
  - Supports XHTML, CSS, XML, SOAP, HTTP(S), etc.
  - Typically 130-180KB
- CSS extensions to support video, remote control buttons, etc.
- Full suite of tools for managing content, assets, etc.
Sofia Digital Screenshot

Daily

Main

News
Weather
Sports
Finance
Travelling

Exit

Iraqi opposition unites

Iraqi opposition leaders drew up plans for life after Saddam Hussein...

Japan prepares to weaken the Yen

Central Bank of Japan announced its plans to weaken the Japanese currency over 10%...

New Format For Champions League

UEFA Champions League will be a knock-out competition starting from 2005 season...

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Conclusion

• Standards-based DTV platforms are finally and truly here
  > OCAP / ACAP / MHP / ARIB / BD-J
  > Retail tru2way devices this year

• Support for converged applications is a clear market advantage
  > Java architecture eases deployment of services across multiple devices

• The thriving Java mobile ecosystem indicates similar compelling benefits will be achieved in television
Thank you!

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