Java Technology: The Future of Digital Television

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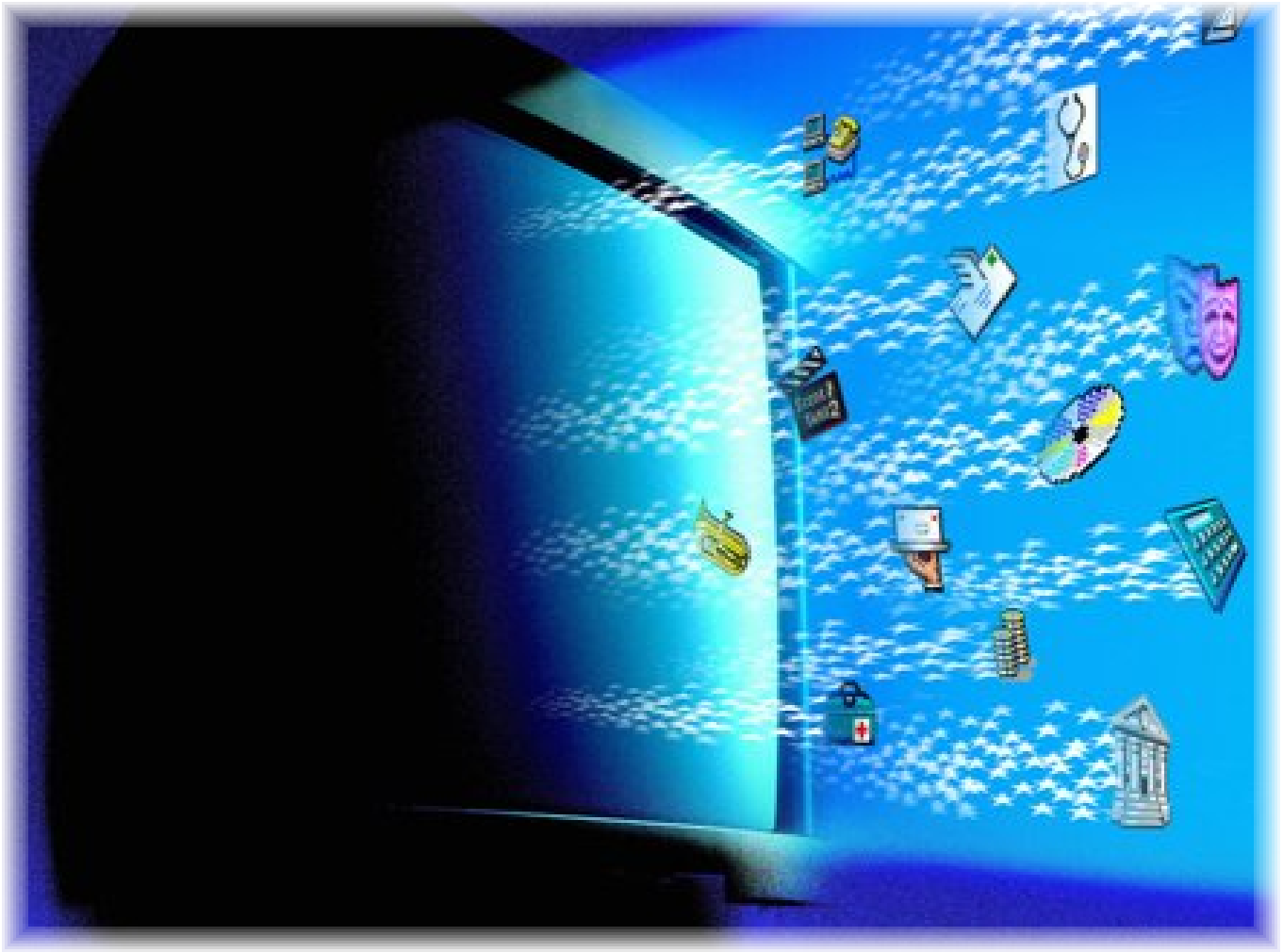
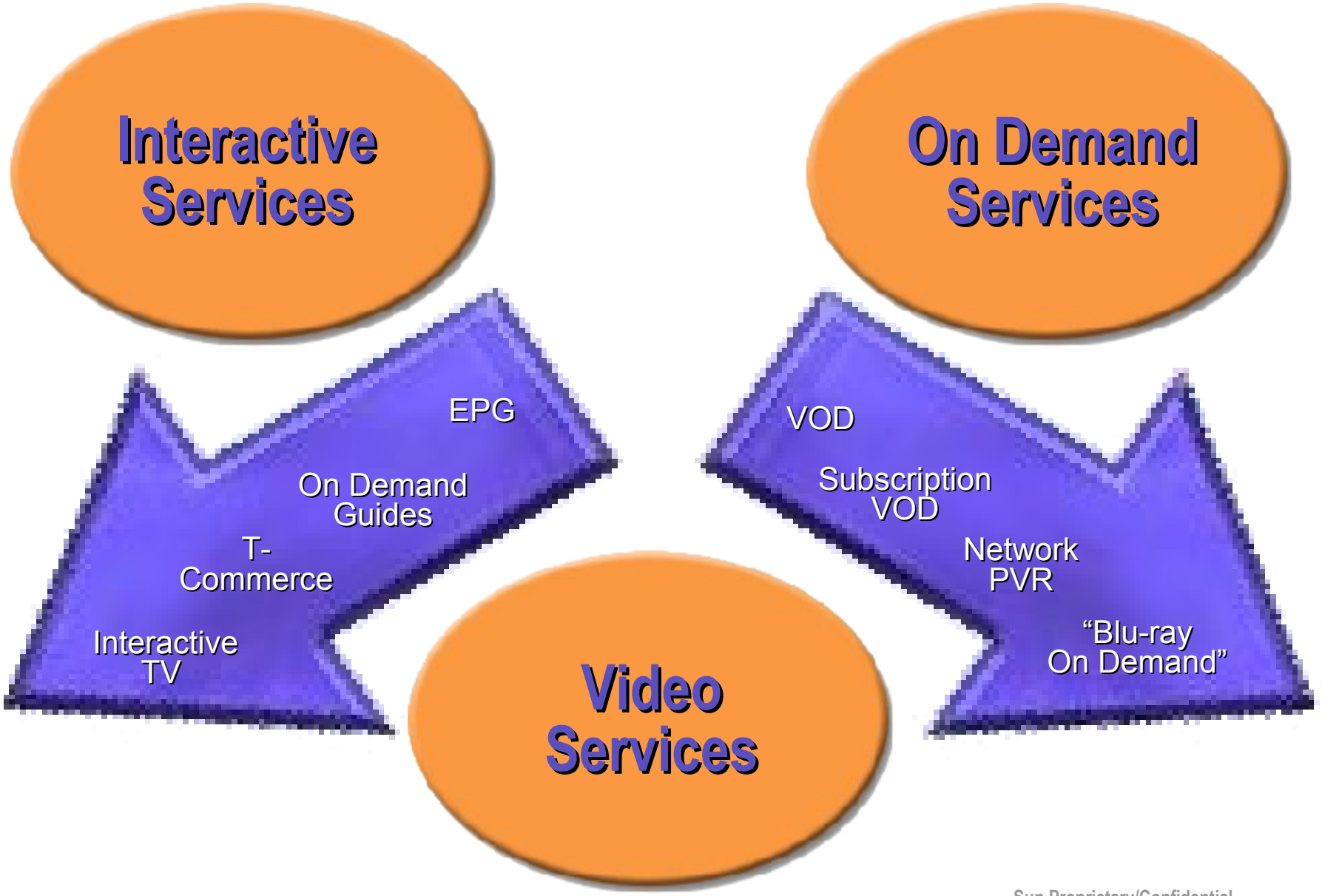
Java in Digital Television



What are TV Services?



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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

Java™
Sun Microsystems

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

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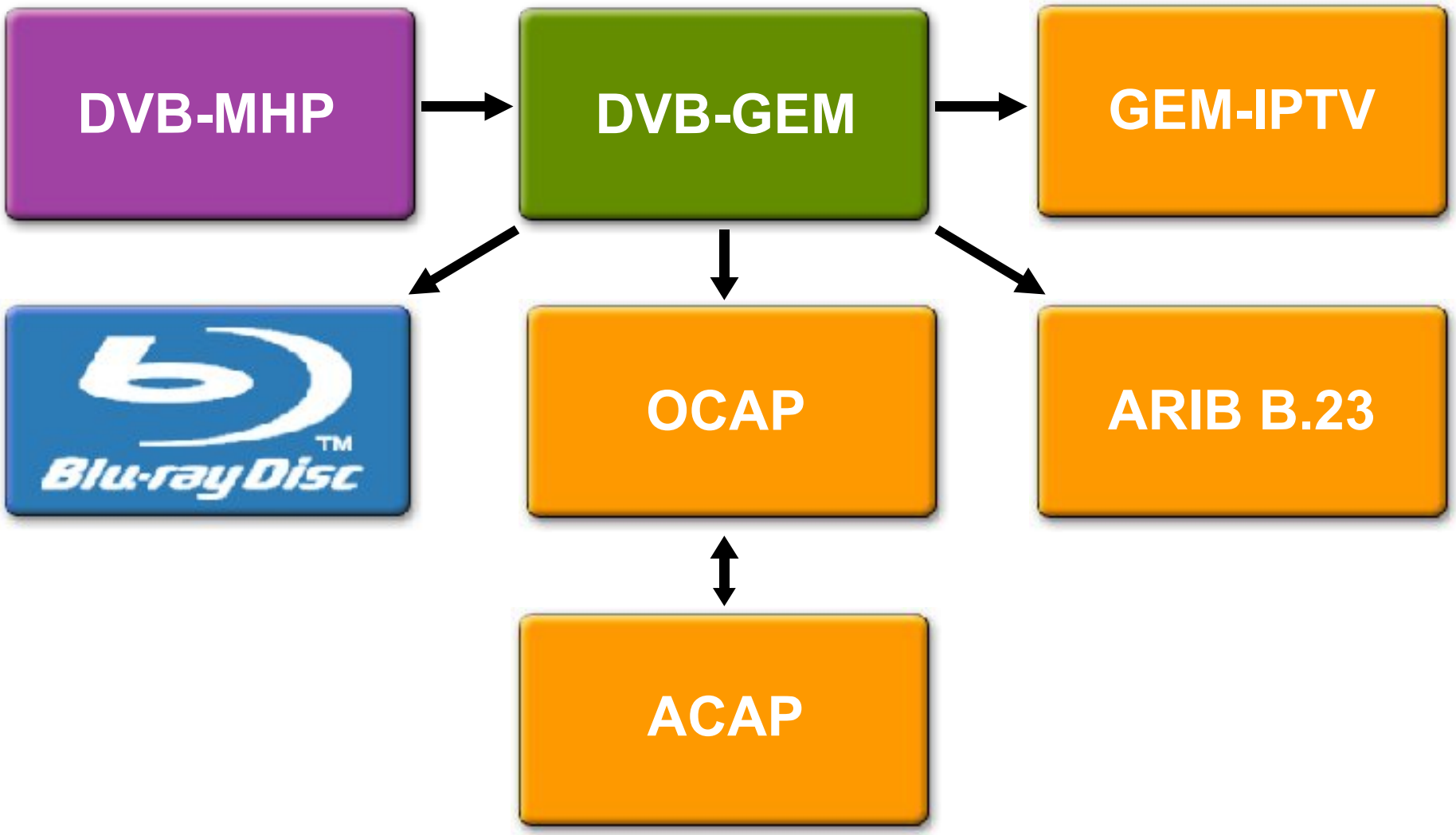
GEM: A Family of DTV Standards

- 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



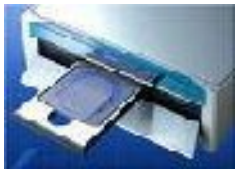
The Global GEM Ecosystem

GEM applications

<tru2way>

mhp

Blu-ray Disc



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Sample GEM screenshots

Olympics Applications in Germany

Sample GEM screenshots

DigiMessage™ by DigiSoft

GEM Stack Overview

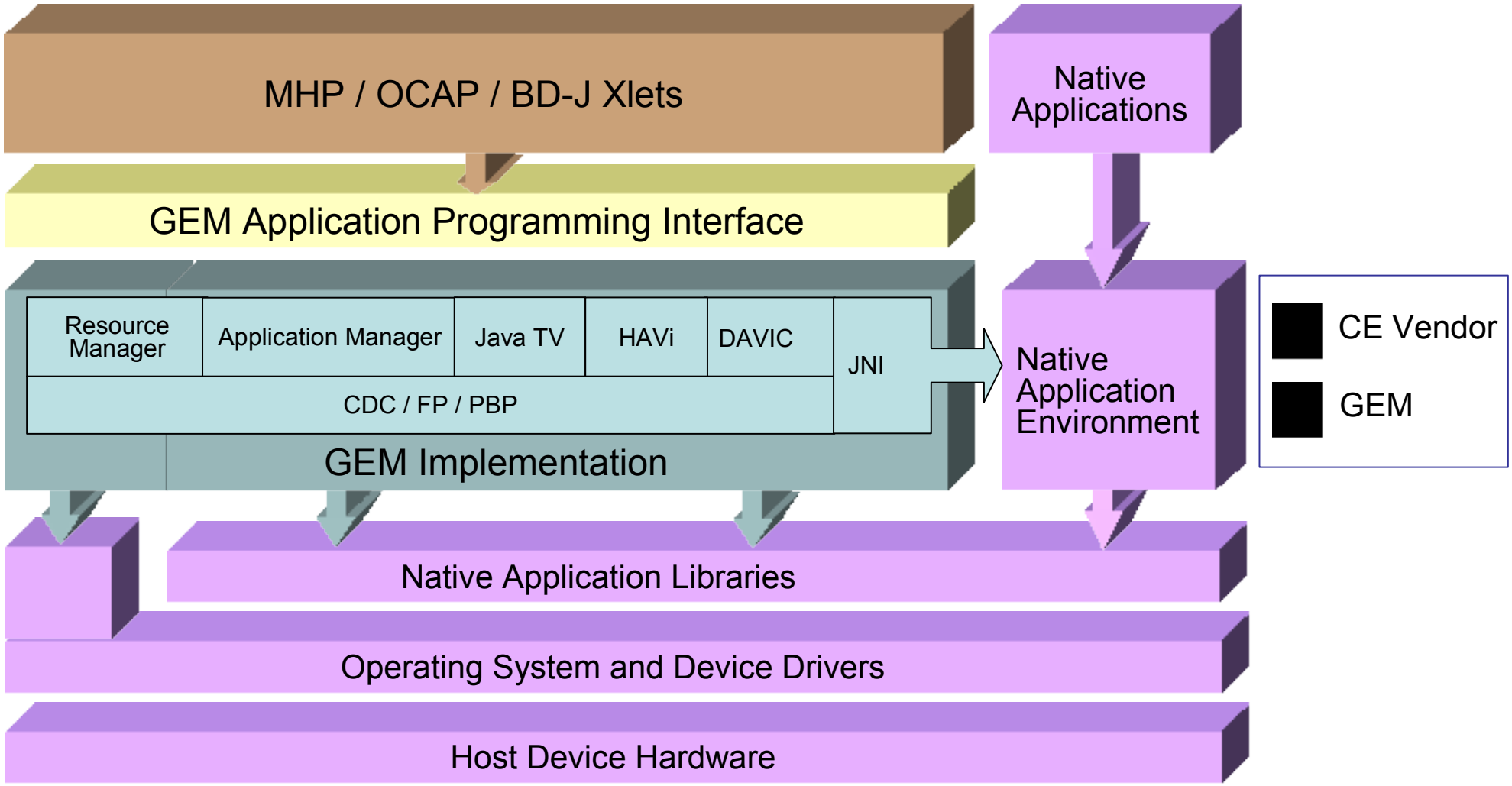
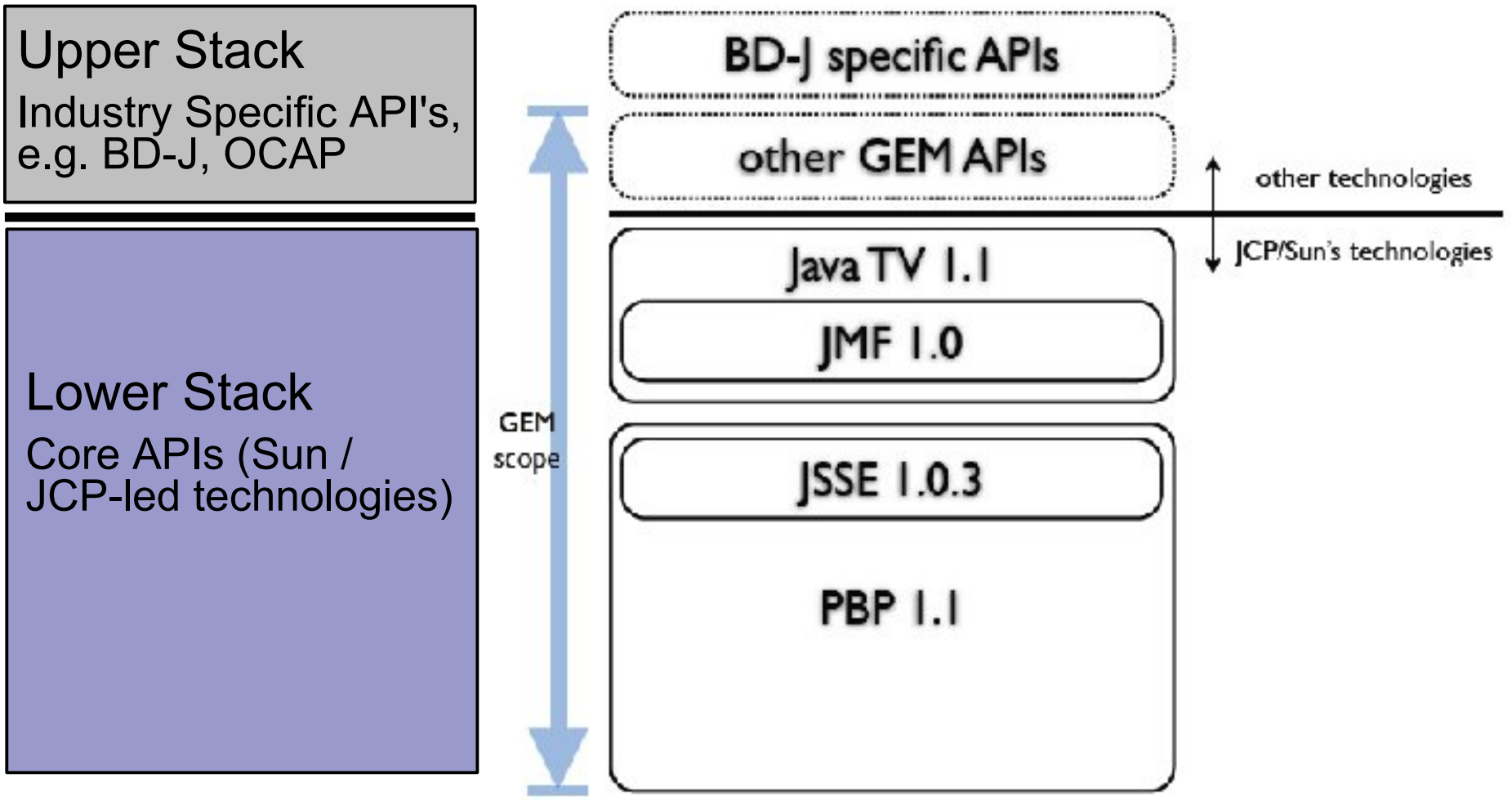


Diagram Courtesy Vidiom Systems

GEM Stack Overview



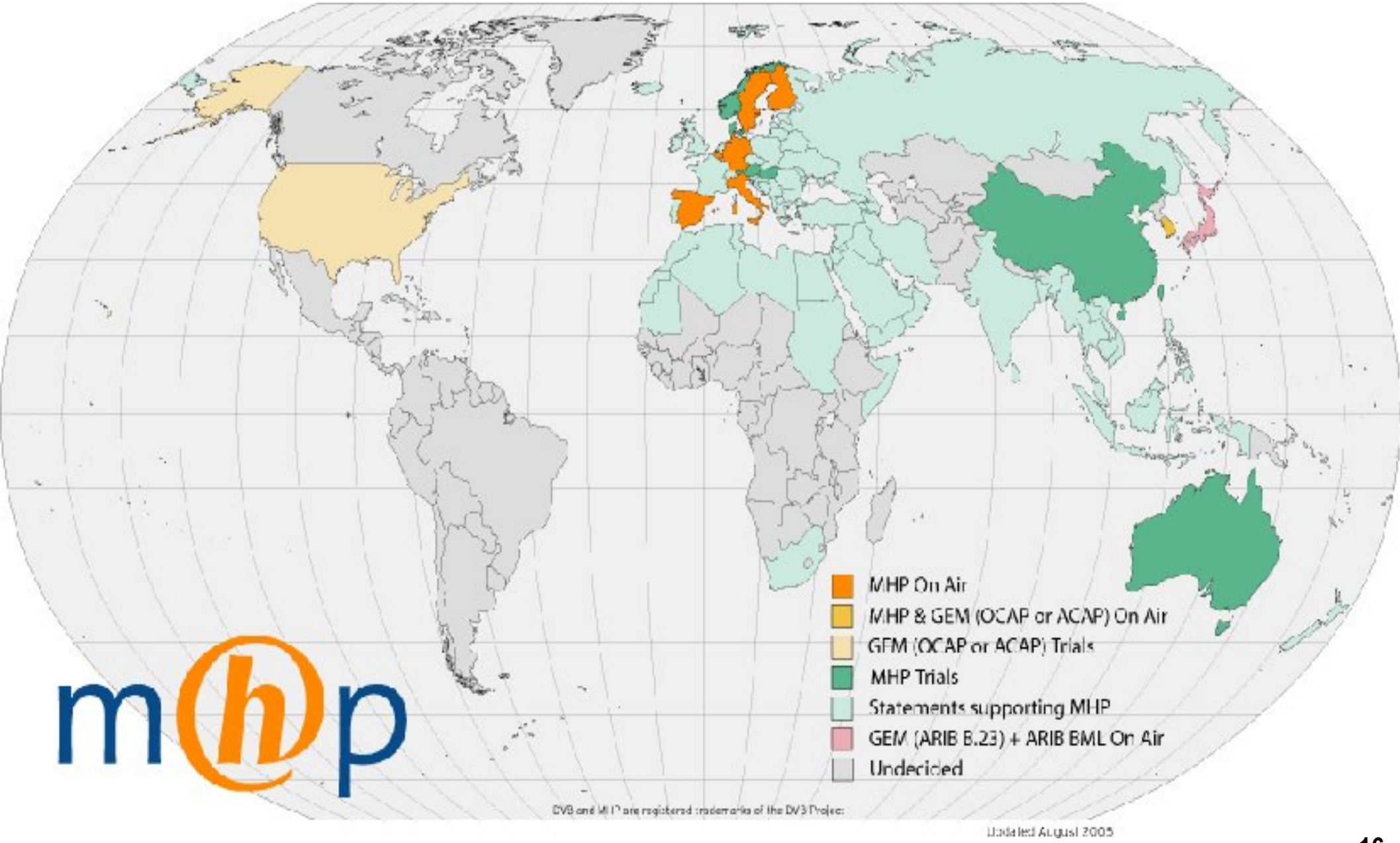
MHP: Multimedia Home Platform

- 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

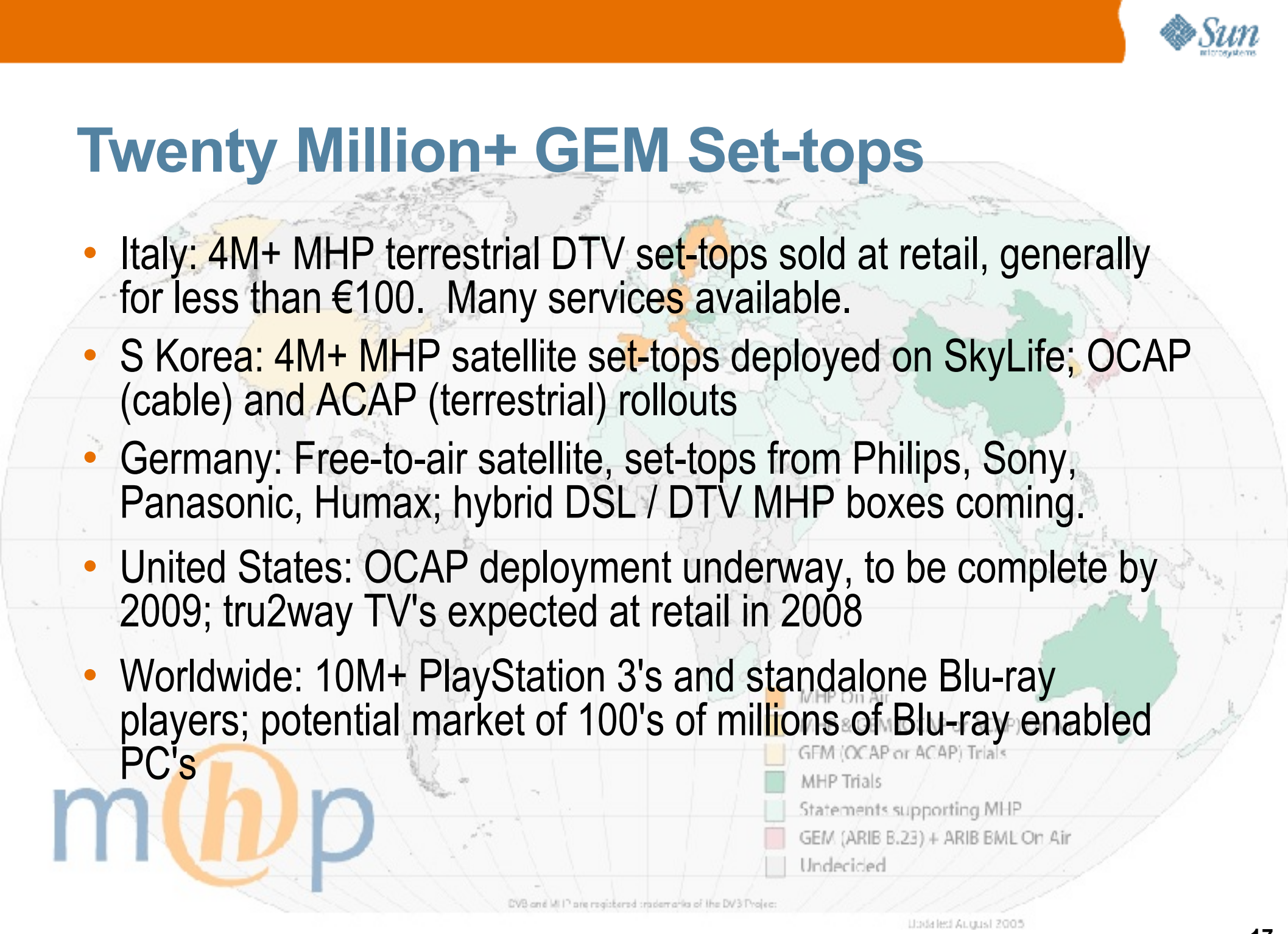
- Defined by CableLabs as part of the overall OpenCable effort to promote cable equipment interoperability
  - Initially based on MHP
- Recently re-branded “tru2way” for consumer-facing applications
- Supports delivery of two-way applications and services across both set-top boxes and tru2way-capable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



TM
Blu-ray Disc

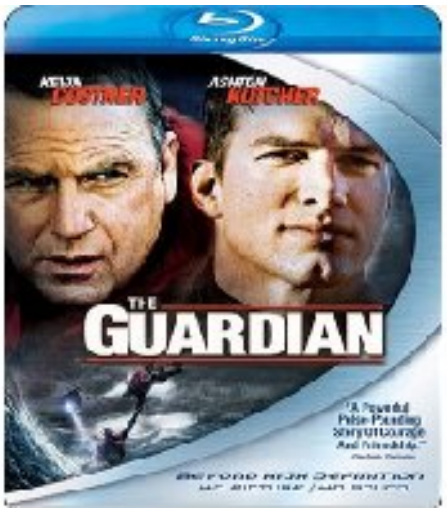
New Capabilities Enabled by BD-J

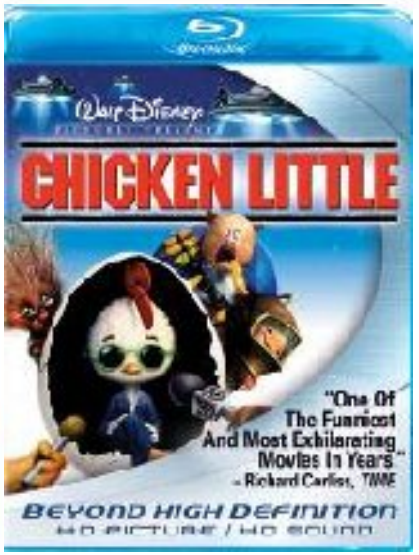
- Far richer consumer experience
  - Freedom of UI design
  - Studio-skinned A/V playback control
- Dynamic content updates via broadband
  - Download of new trailers
  - Additional subtitle options
  - Add-on bonus materials
- New forms of added content
  - Playing games from disc and on-line
  - Live events
  - On-line shopping

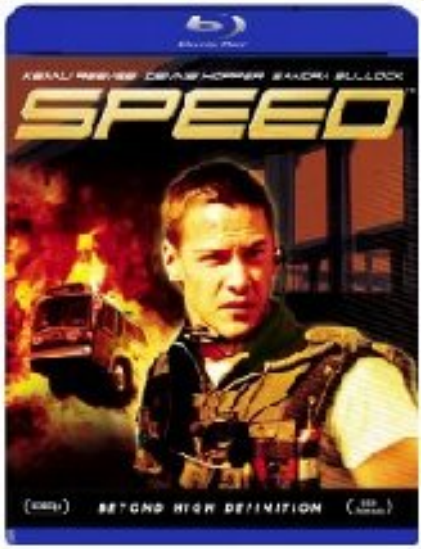
BD-J Momentum: Titles

- 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, Fantasic 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

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

ONQ CREATE

Blu-print™

Key Trend: Converged Services

- Operators will deliver services across multiple platforms
  - > Java content uniquely supported across key targets

Sprint TIME WARNER CABLE Comcast COX COMMUNICATIONS bright house

GEM Authoring Strategies

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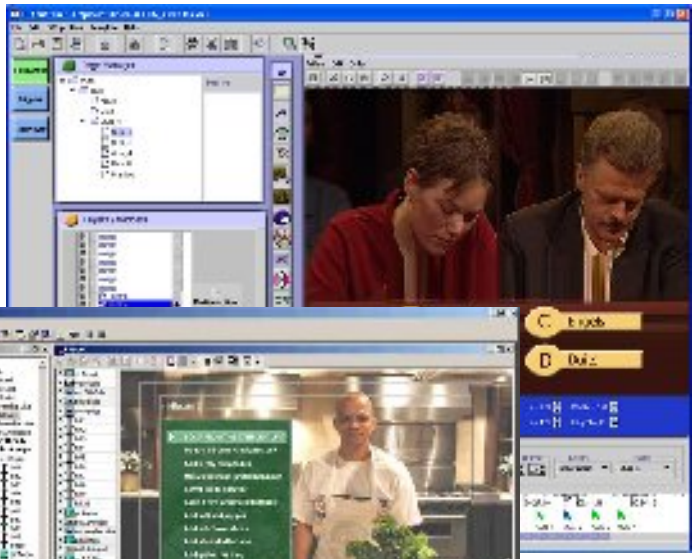
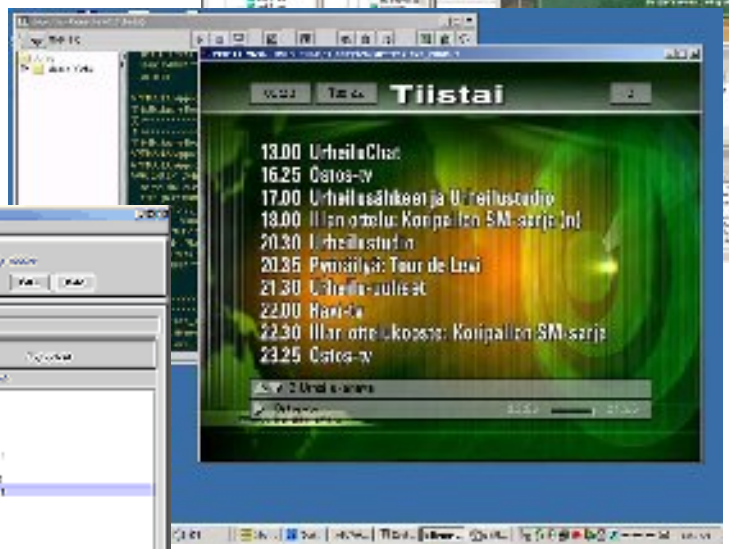
GEM Authoring Tools

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)

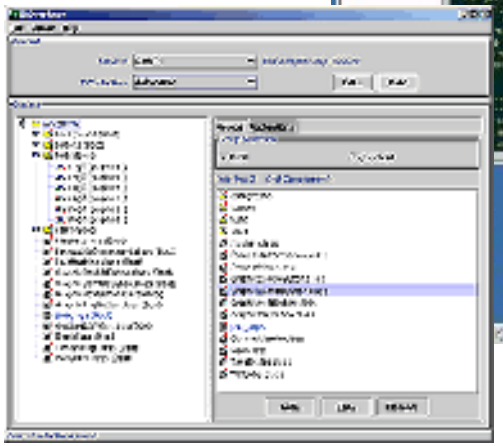


Ortikon

Ensequence



Osmosys' Evolution Console
MHP/OCAP4Windows



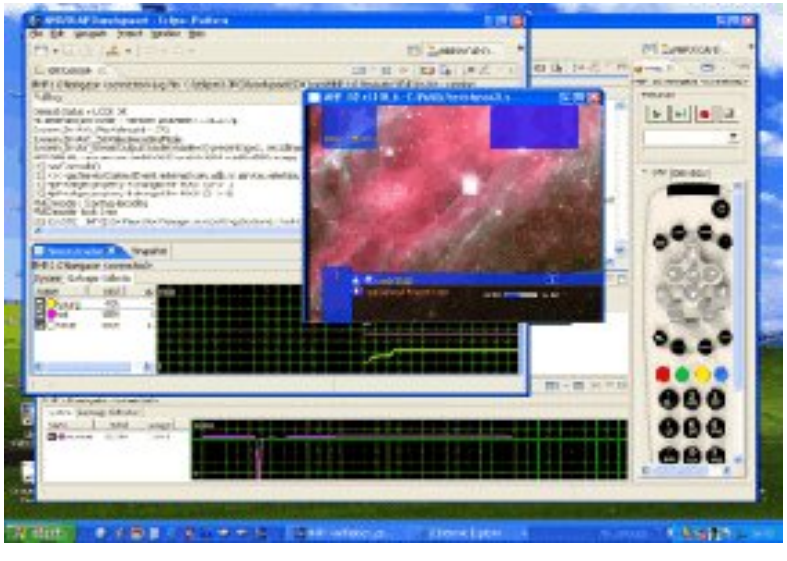
S&T TS Developer

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

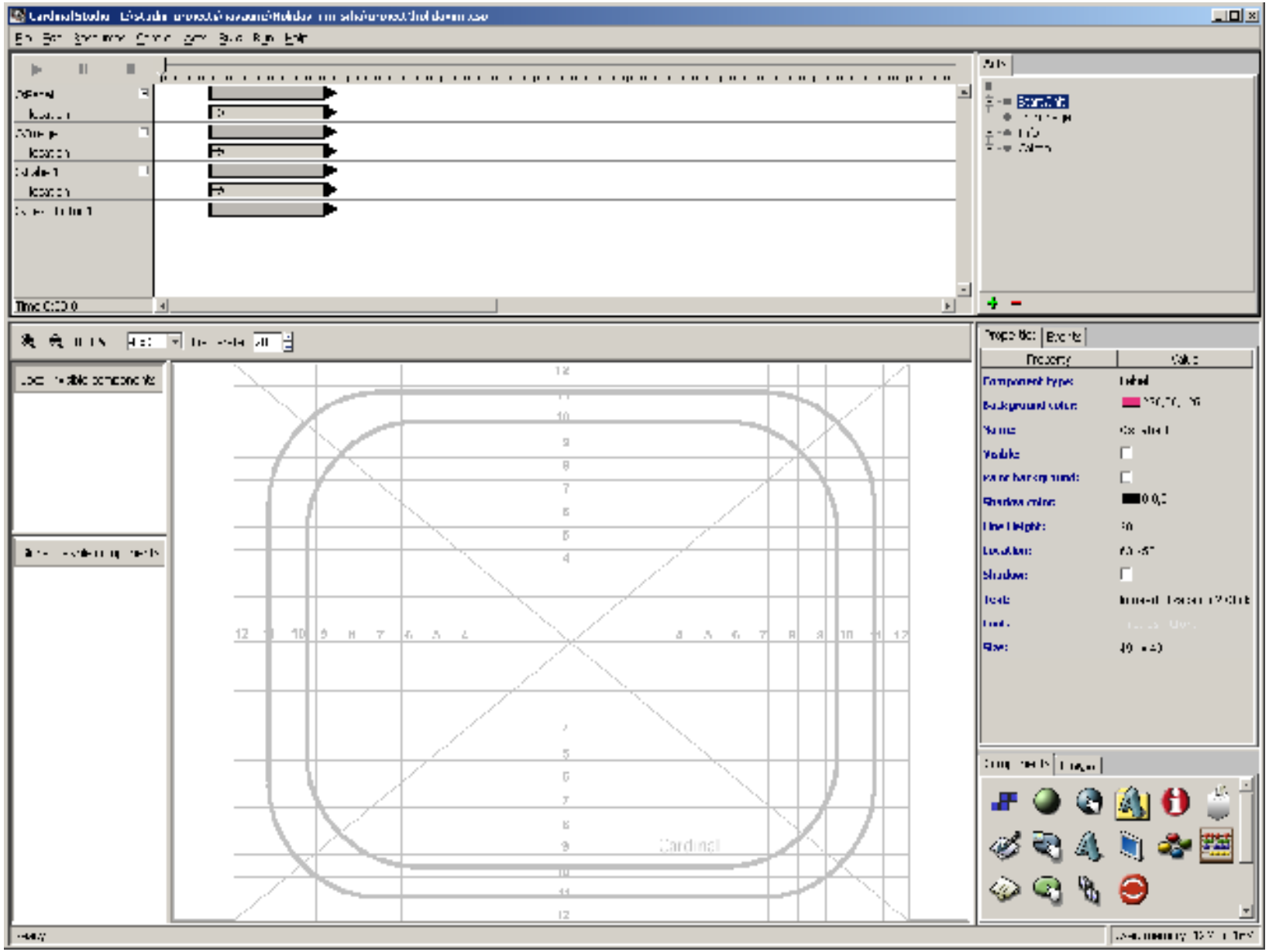
- Target: Java programmer
- Typically integrated with Eclipse or NetBeans
- Most flexibility, but requires highest skill level
- Examples:
  - > MediaHighway Development Kit (NDS)
  - > Vision Workbench (Vidiom)
  - > Osmosys SDK 2.0



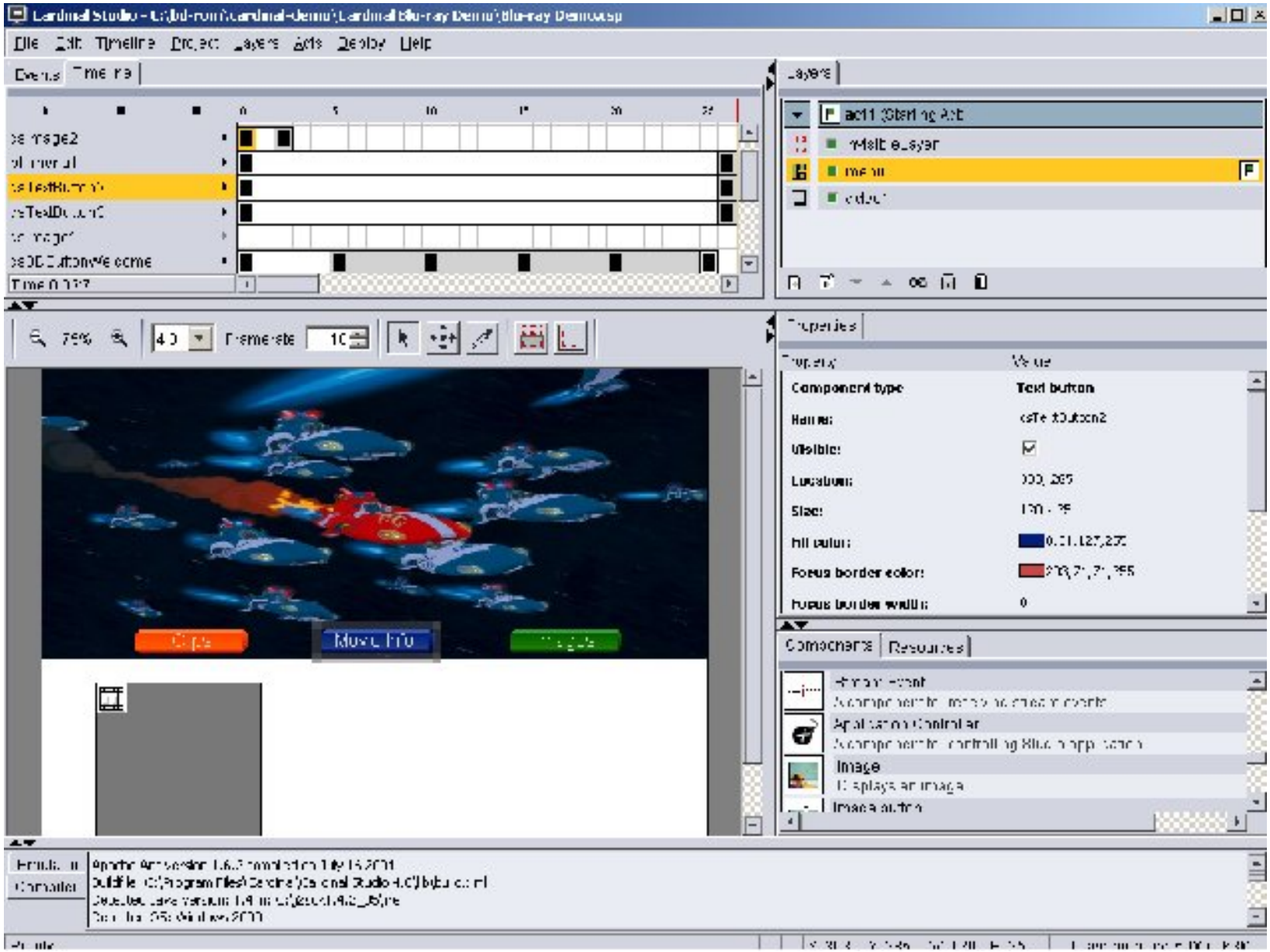
Graphically-oriented Tools

- 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



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

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

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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