Making TV Personal

August, 2006

CONFIDENTIAL

Mission

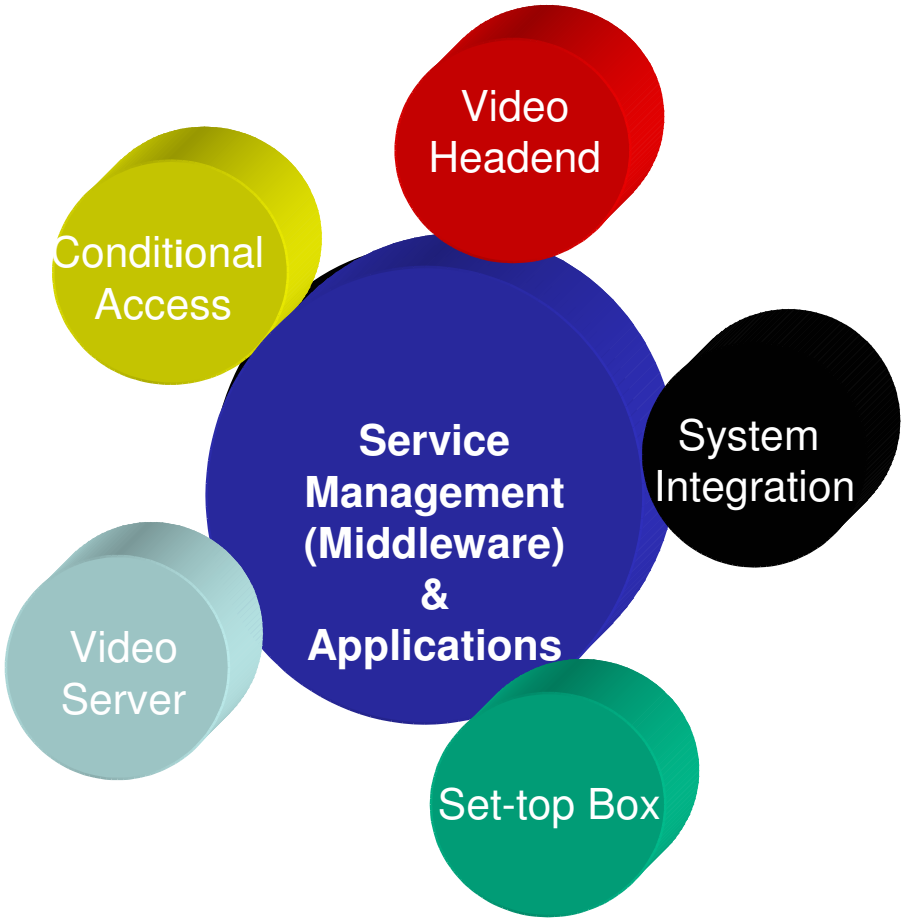
To be the leading supplier of
"open system" applications and service management platforms
for IP Television

Minerva Networks:
Long History of Technology Leadership

- **Minerva *Compressionist*** **1995**
  - First "human-assisted" MPEG-2 Encoder platform
- **Minerva *Impression*** **1998**
  - First desktop DVD Authoring software (250,000 copies sold in first year)
- **Minerva *Video Network Platform (VNP)*** **1999**
  - First MPEG-2 IP video streaming appliance
- **Minerva *Video Concentrator (VC8000)*** **2002**
  - Highest density IP video encoding/gateway platform
- **Minerva *iTVManager (Apps & Service Management Platform)*** **2003**
  - Selected to power largest IPTV deployment in the United States
- ***Minerva iTVManager*** **2004**
  - Over 40 IPTV deployments worldwide
- ***Minerva iTVManager*** **2005**
  - First IP-based PVR and HDTV deployment

Minerva's IPTV Solution

- **IPTV Middleware & Applications**
  - *Minerva iTVManager*
- **Conditional Access**
  - Integrated with Irdeto and Widevine
  - OEM Agreement with Latens
- **Video Server**
  - Integrated with C-Cor, SeaChange, Entone Kasenna and Bitband
- **Video Headend**
  - Deployed with Tandberg, Harmonic, TUT, Skystream and Optibase
- **Set-top Box**
  - Integrated with Thomson, Amino, i3Micro, Entone and Others
- **System Integration**
  - Partnerships with Nortel, IBM, Italtel, ECI, TUT, Eagle Broadband and Others



Largest Installed Base of IPTV Deployments Worldwide!

Minerva iTVManager Overview

- **Proven**
  - Over 90 installations worldwide
  - Powers largest IPTV deployment in the US (Surewest)
- **Complete**
  - Broad set of basic and advanced services
  - Supports leading Video Servers, CA/DRMs and STBs
- **Customizable**
  - Full control over User Interface
- **Extensible**
  - Open platform with robust APIs
- **Carrier Grade**
  - High availability & scalability
  - Ease of integration with leading BSS/OSS systems

Proven

Select Customers (Out of 90+ Deployments)

Midwest Telnet (7 IOCs)	Wisconsin	ADSL
Ringgold Telephone (IOC)	Georgia	ADSL
Twin Valley Telephone (IOC)	Kansas	ADSL
Hargray Communication (IOC)	South Carolina	ADSL
Pembroke Telephone (IOC)	Georgia	ADSL
Matanuska Telephone (IOC)	Alaska	ADSL
Provo (Utility)	Utah	FTTH
Livingston Telephone (IOC)	Texas	ADSL
Surewest Communications (IOC)	California	ADSL/FTTH
Grant County (Utility)	Washington	FTTH
NTS (CLEC)	Texas	FTTH
Project Mutual Telephone (IOC)	Idaho	ADSL
MMPolska	Poland	ADSL/FTTH
Smart Telecom	Ireland	FTTH

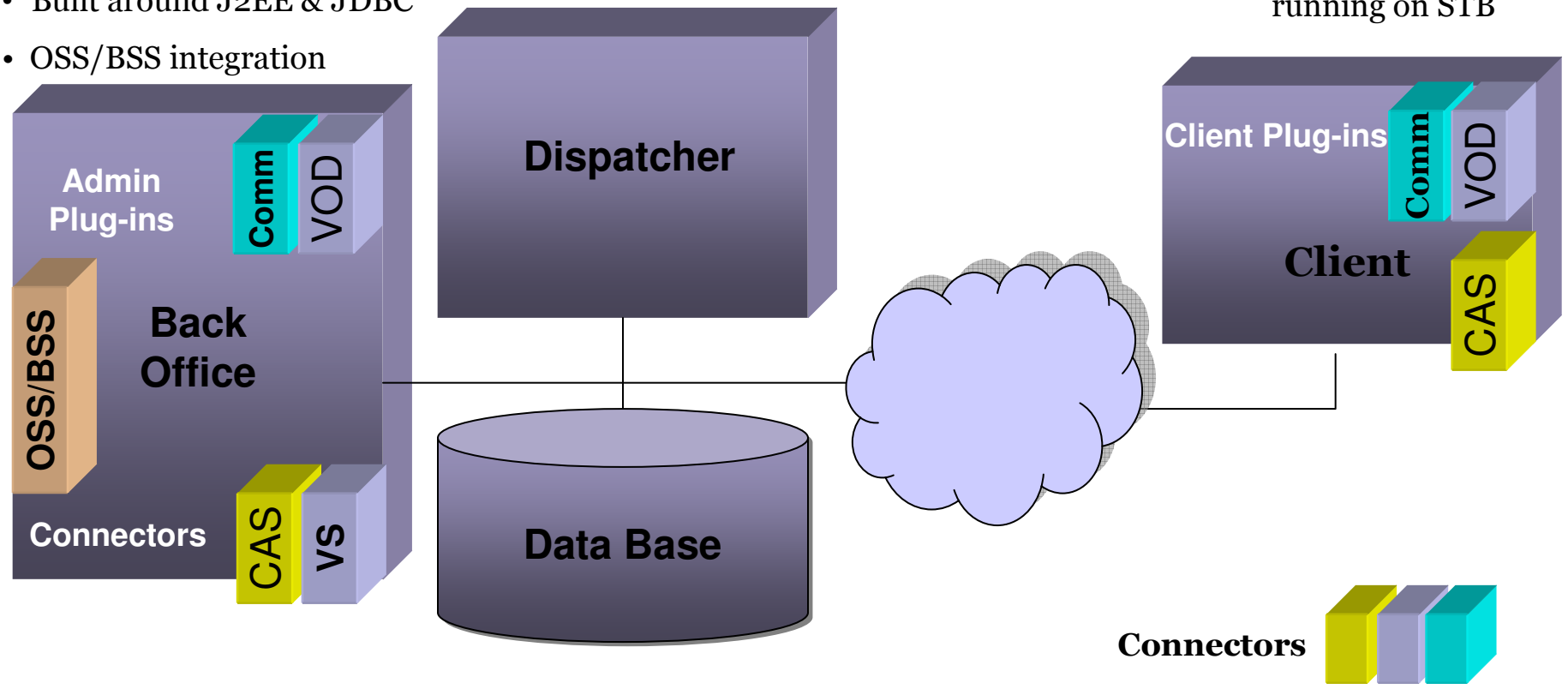
Complete

Architecture Overview

- Business logic execution and distribution of applications, content and meta-data from Back-office to Client

- Unified user interface environment for native and third-party applications running on STB

- Built around J2EE & JDBC
- OSS/BSS integration

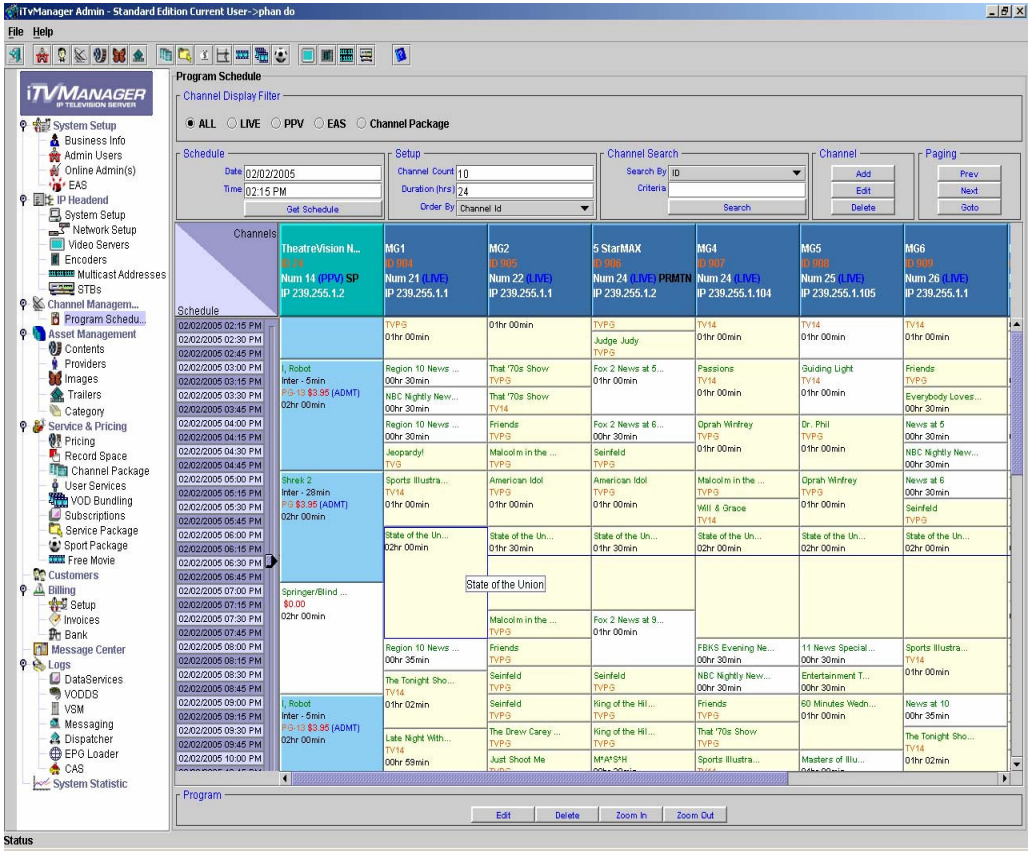


Key Components

- **Client**
  - Executes service specific applications based on provisioning and entitlement information received from the Back-office via the Dispatcher
- **Back-office**
  - Responsible for services provisioning and administration
  - Integrates with other components of the services delivery platform via a set of Connectors
- **Dispatcher**
  - Responsible for the business logic execution and the communication between Back-office and Client
- **Data Base**
  - Stores data needed to configure, maintain and operate services

Back-Office Module

- **Management Tools:**
  - STB & subscriber management
  - Content acquisition
  - Asset management
  - EPG creation and maintenance
  - Pay-per-View management
  - PPV scheduling
  - SVOD bundling
  - VOD server management
  - T-commerce packages creation
  - Service pricing
  - Usage analysis and reporting
  - Client messaging
  - Caller ID management
  - Emergency Alert System (EAS)
  - More …



EPG Creation Module

Minerva Client Applications

- **Key Features**
  - Electronic Program Guide
  - Live Pay-Per-View
  - VOD and SVOD
  - HDTV
  - PVR (DVR)
  - Caller ID
  - On Screen Messaging
  - Web Portal Access
  - Web E-mail Access
  - Bill Preview
  - Channel blocking
  - Parental Control
  - EAS
  - On screen keyboard
  - Multiple user accounts
  - Search
  - More…

Customizable

Customization & Personalization

- Base set of UI templates
- User selectable themes
- Mosaic (thumbnail view of channels)

POWERING IP TELEVISION™

Minerva Networks

POWERING IP TELEVISION™

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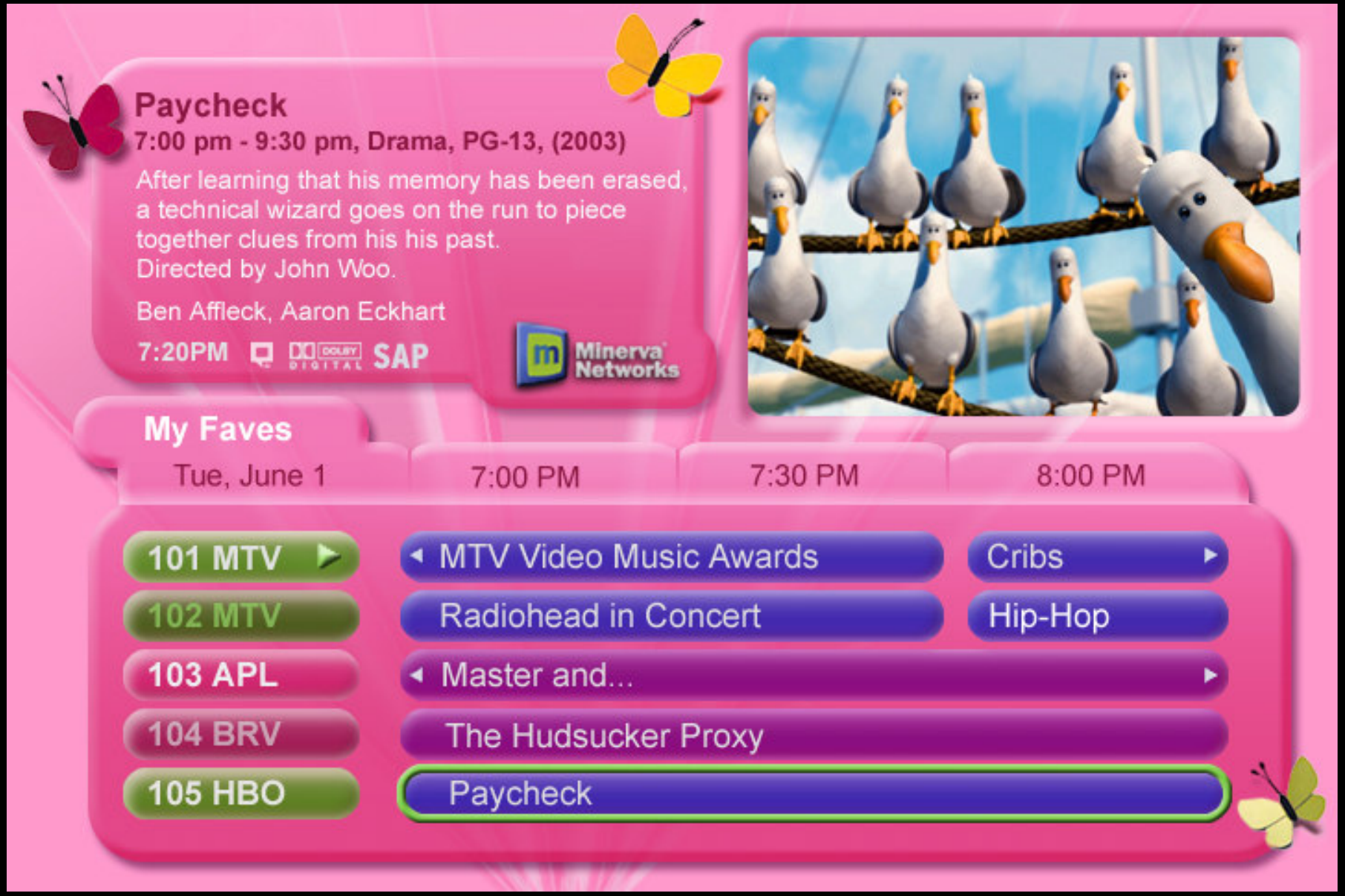

POWERING IP TELEVISION™

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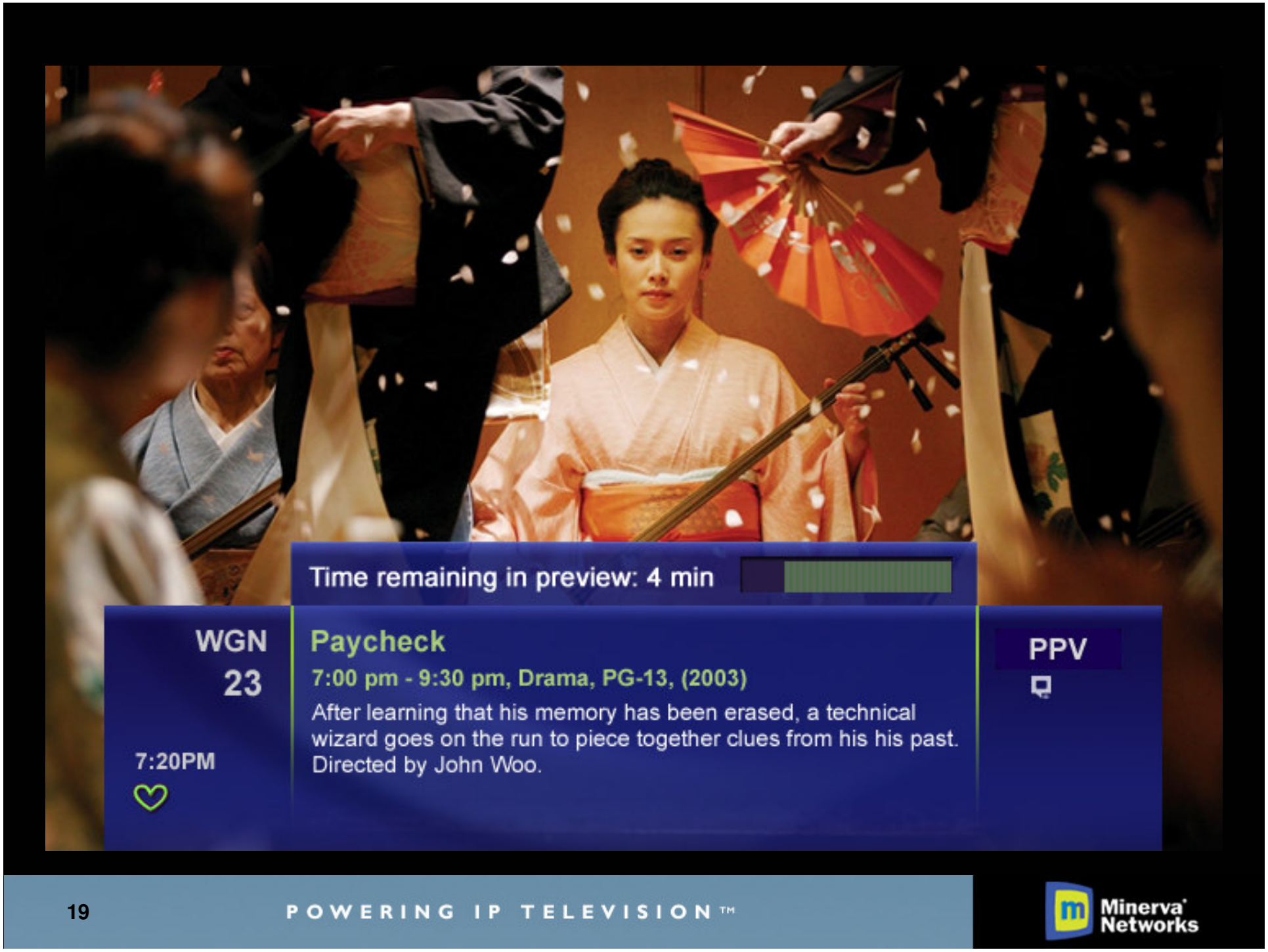

POWERING IP TELEVISION™

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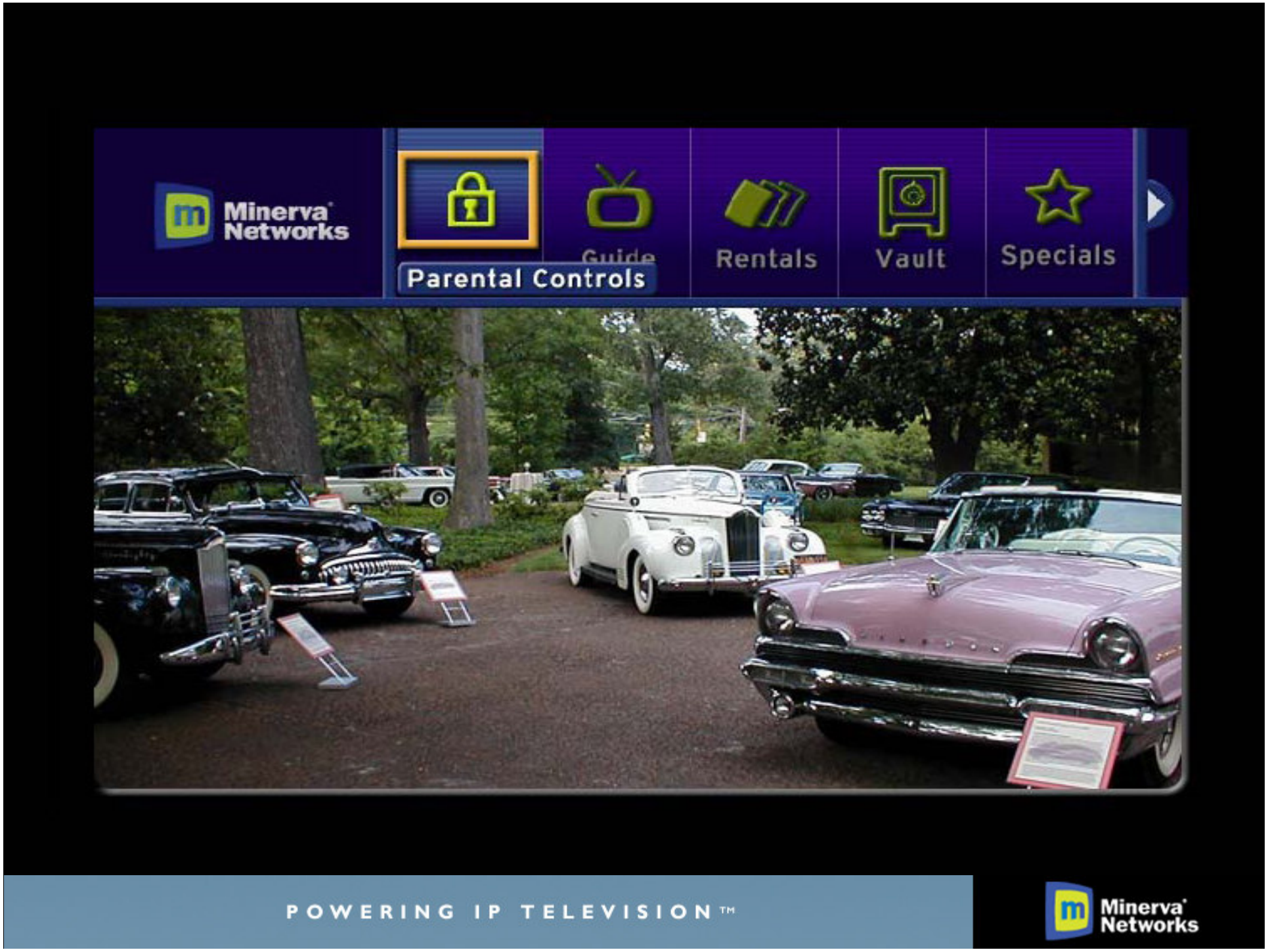
Time remaining in preview: 4 min
Paycheck
7:00 pm - 9:30 pm, Drama, PG-13, (2003)
After learning that his memory has been erased, a technical wizard goes on the run to piece together clues from his his past...
7:20PM
DOLBY DIGITAL
SAP
Price: $6.95
Subscribed
WGN
23
PPV


Minerva Networks
Guide
Parental Controls
Rentals
Vault
Specials
POWERING IP TELEVISION™
Minerva Networks

Minerva Networks
12/23/2005
12:05PM
User Name
Guide
PVR
Rentals
Vault
Video Packages
Parental Controls
Specials
Settings
Favorites

Minerva Networks
12/23/2005 | 12:05PM
User Name
Guide
PVR
Rentals
Vault
Video Packages
Parental Controls
Specials
Settings
Favorites
text & Talk

Sponsored Co-Branding

Minerva Networks
GUIDE
PVR
RENTALS
VAULT
VIDEO PACKAGES
PARENTAL CONTROLS OFF
SPECIALS
SETTINGS
FAVORITES
12/23/05 | 12:05 PM | User Name

4x
11:00 am
11:30 am
12:00 pm
11:41 am

Mosaic View

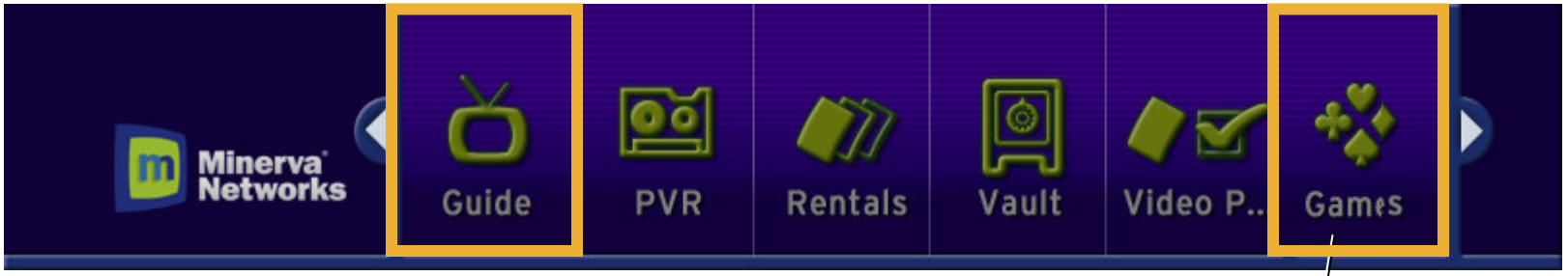
- Single stream of blended channels
- Live video in each thumbnail
- Highlighting thumbnail tunes to audio on that channel
- Selecting thumbnail tunes to channel

Picture In Picture (H2 2006)

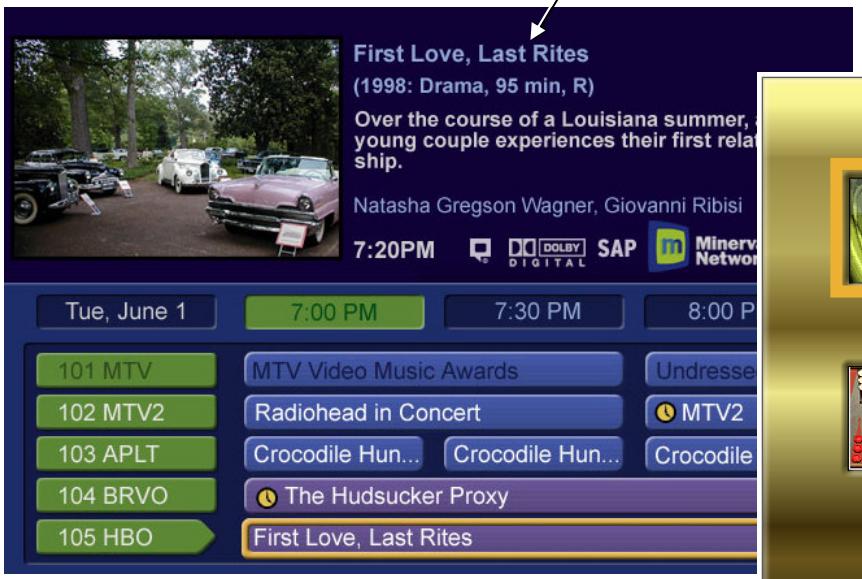
- Available with multi-stream capabile STBs (next generation system-on-a-chip design)
- Surf and preview channels while watching another channel
- EPG or info bar surfing
- Supports video from VOD library

Extensible

Third-Party Web Applications



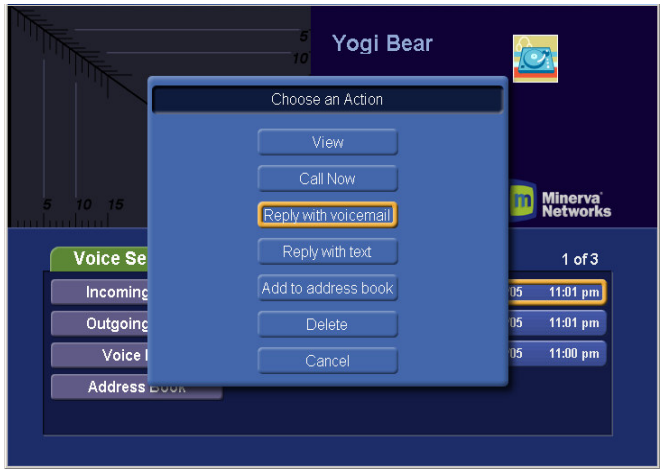
New Button in Menu bar to switch to application



Game images from arkadium

Voice And Text Communications

- Voice services (Call back, call to voice mail)
- Messaging services (Text messaging, IM)
- Personal address book



Advertising/Marketing Module

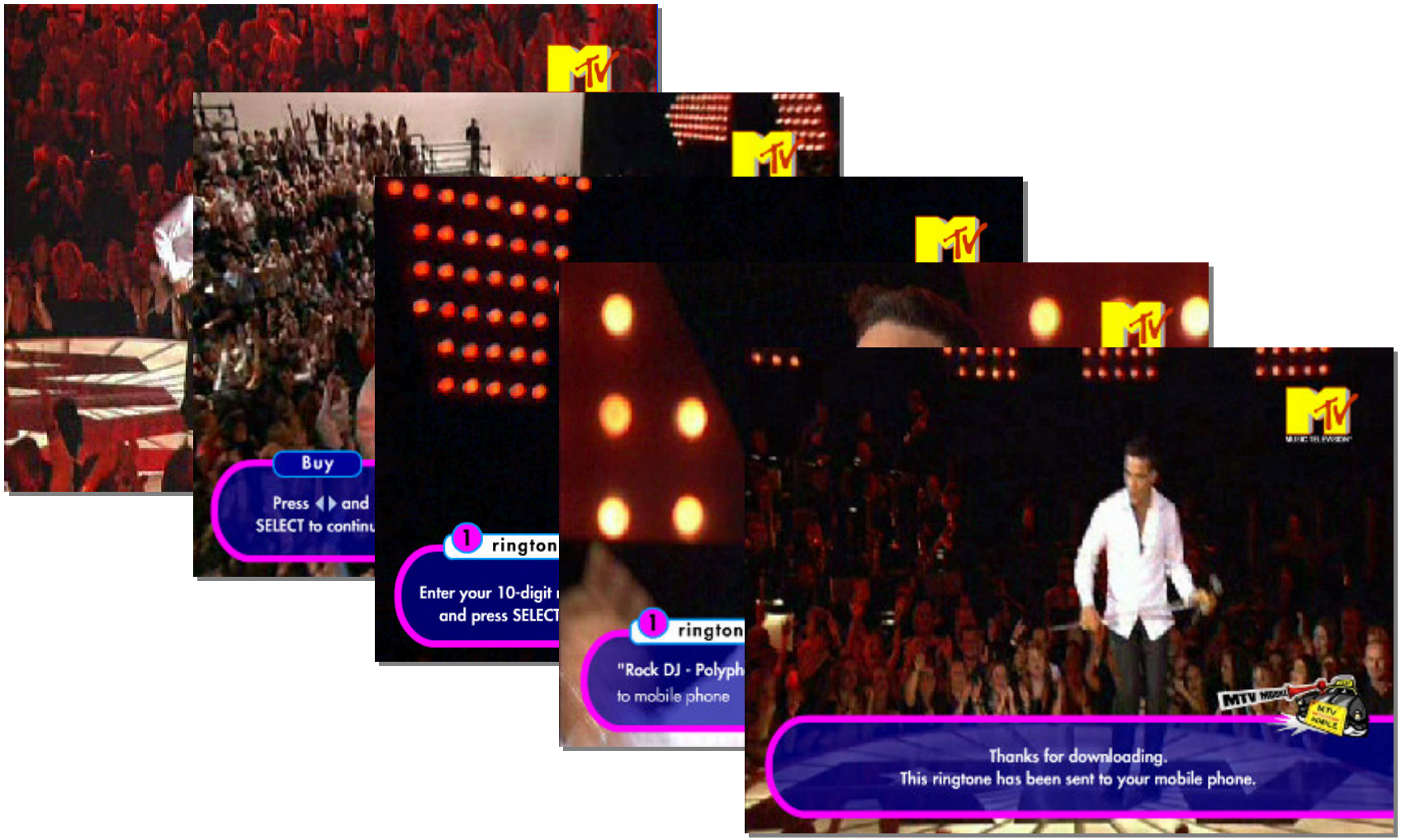
- On demand advertising (e.g. Yellow pages)
- T-commerce (e.g. Branded storefront)
- Transaction profiling (e.g. View/click tracking)

Interactive Applications

- **Application Examples**
  - Telescopic advertising
  - Remote learning
  - Polls
  - Guided viewing
  - T-commerce
  - Recommendations

- **Process Flow**
  - STB calls Server after trigger event
  - Server controls STB UI
  - STB takes action (e.g., Play VOD) and reports selection to Server

Interactive Applications: Itaas



Open: Interactive Viewing API's

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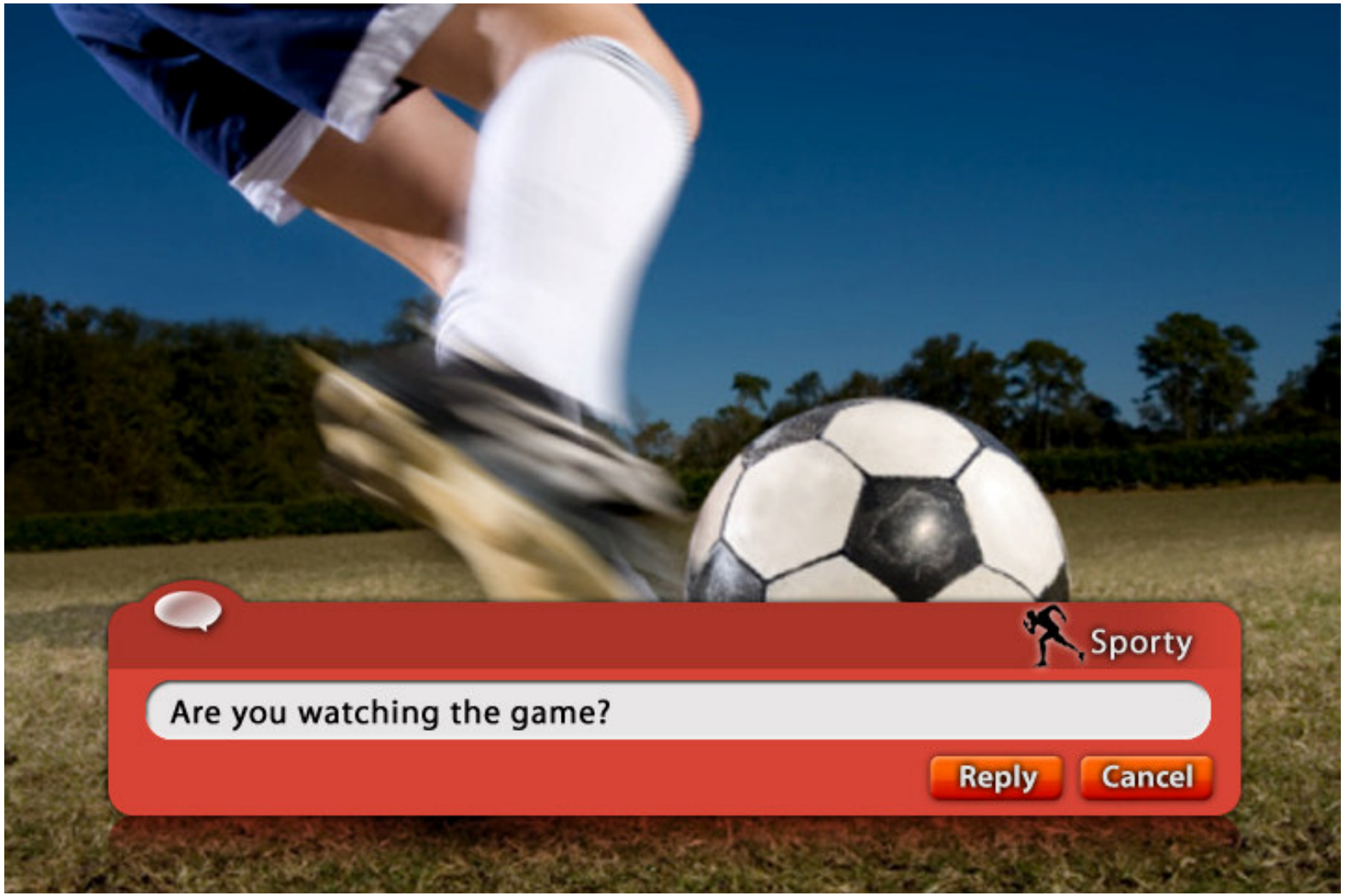
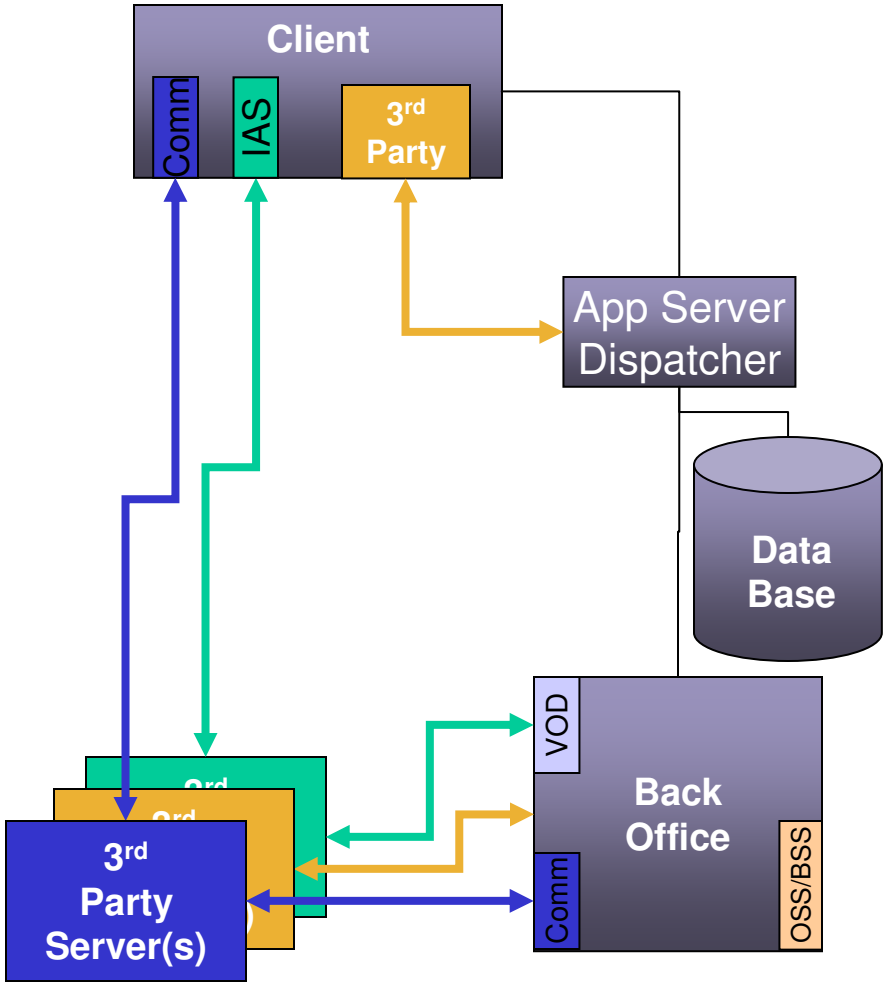


Open: Advertisement Insertion API's

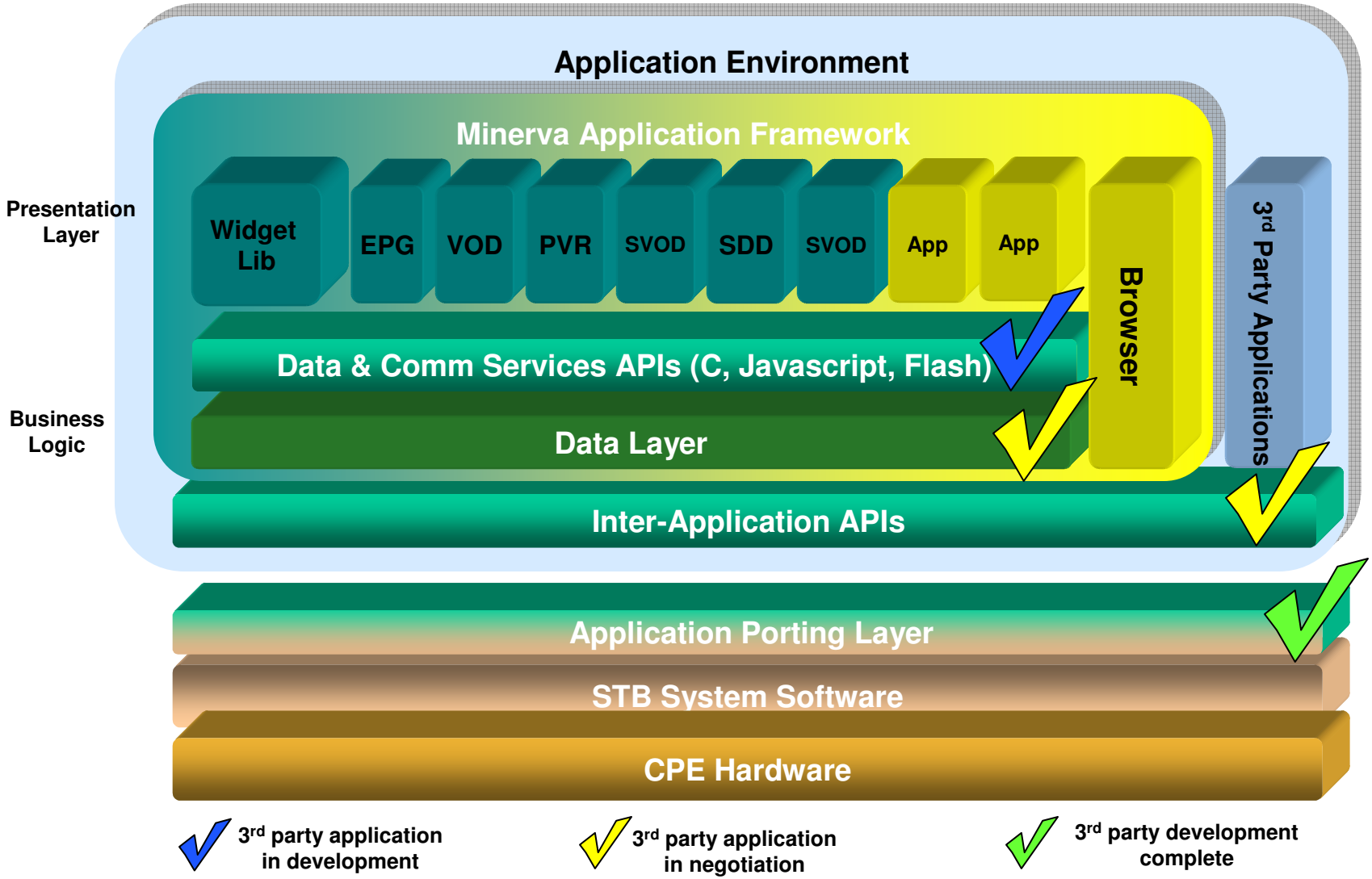
IPTV Services Platform APIs

- **Published APIs**
  - OSS/BSS+
  - VOD+
  - CA+
  - STB Application porting layer+
  - QoS API+
- **Draft APIs**
  - App Server Query*
  - Communications Services*
  - Interactive Application Services*
  - Client Data Services**
    (integrated client applications)
  - Application Context Switching
    (standalone client applications)
- **Future**
  - Javascript

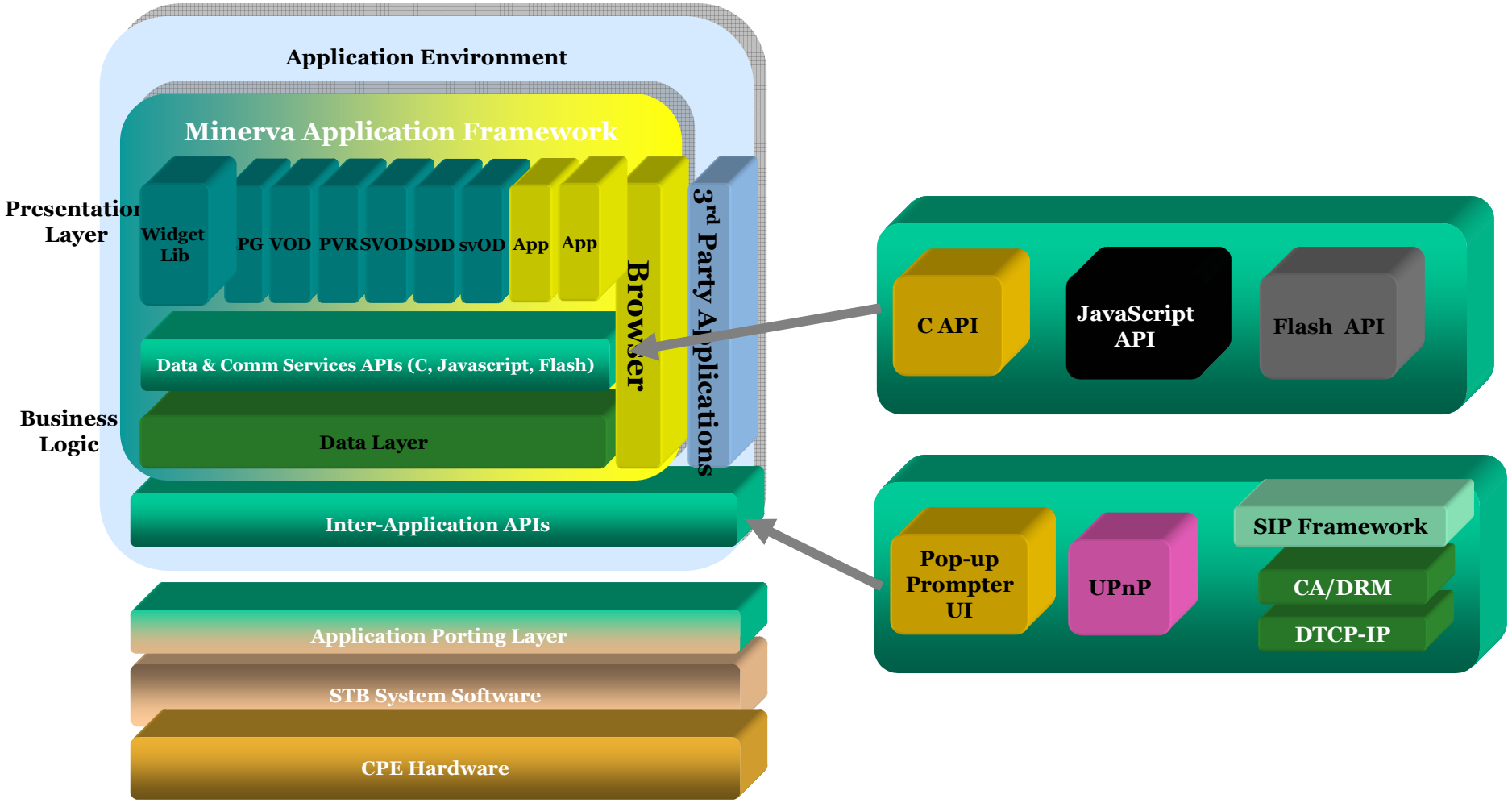


+ Third party development complete & in production
* Third party application under development
** Third party negotiations in progress

Client Software Architecture



Client Software Architecture (Cont)



Carrier Grade

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Administration and Management Platform

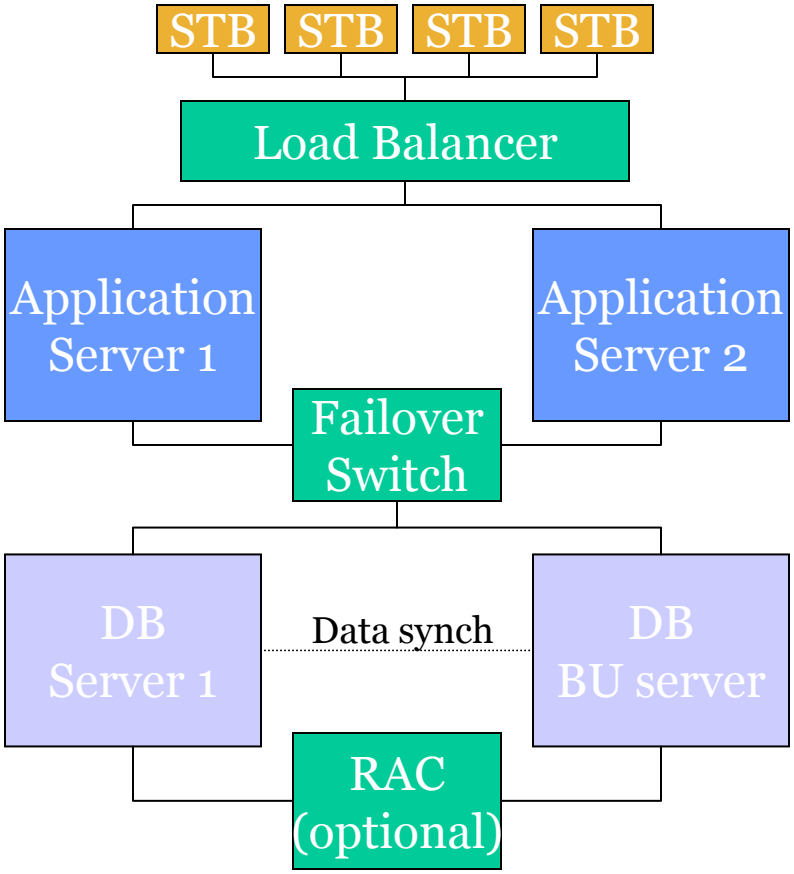
- **Complete set of APIs for integration with OSS/BSS**
- **STB management tools**
  - OS and application upgrade monitoring
  - STB status reports (offline/online)
  - HD and multi-stream control
- **Messaging tools**
  - Single or broadcast messaging
  - System alerts
  - Billing reminders
- **Streamlined Local EPG and VOD metadata input**
- **Multi-channel, multi-region support**
- **Database maintenance suite**

Auto Provisioning

- **Simple STB Deployment Process**
  - Set up customer account
  - Define maximum number of STBs for the account
    - Install STB at user location
    - Upon boot-up, STB prompts user for account code
    - STB is activated and assigned to the account
  - No need to pre-assign STB prior to actual installation
- **High Security**
  - Max limit prevents unauthorized STBs from being assigned to an account
  - Max limit prevents authorized STB from being assigned to the wrong account
- **Device Database Maintenance**
  - STBs taken out of service must be removed from DB before a new or replacement unit is activated

High Availability

- **Load balancing**
- **Data backup & recovery**
- **System failover (RAC)**
- **Disaster recovery**

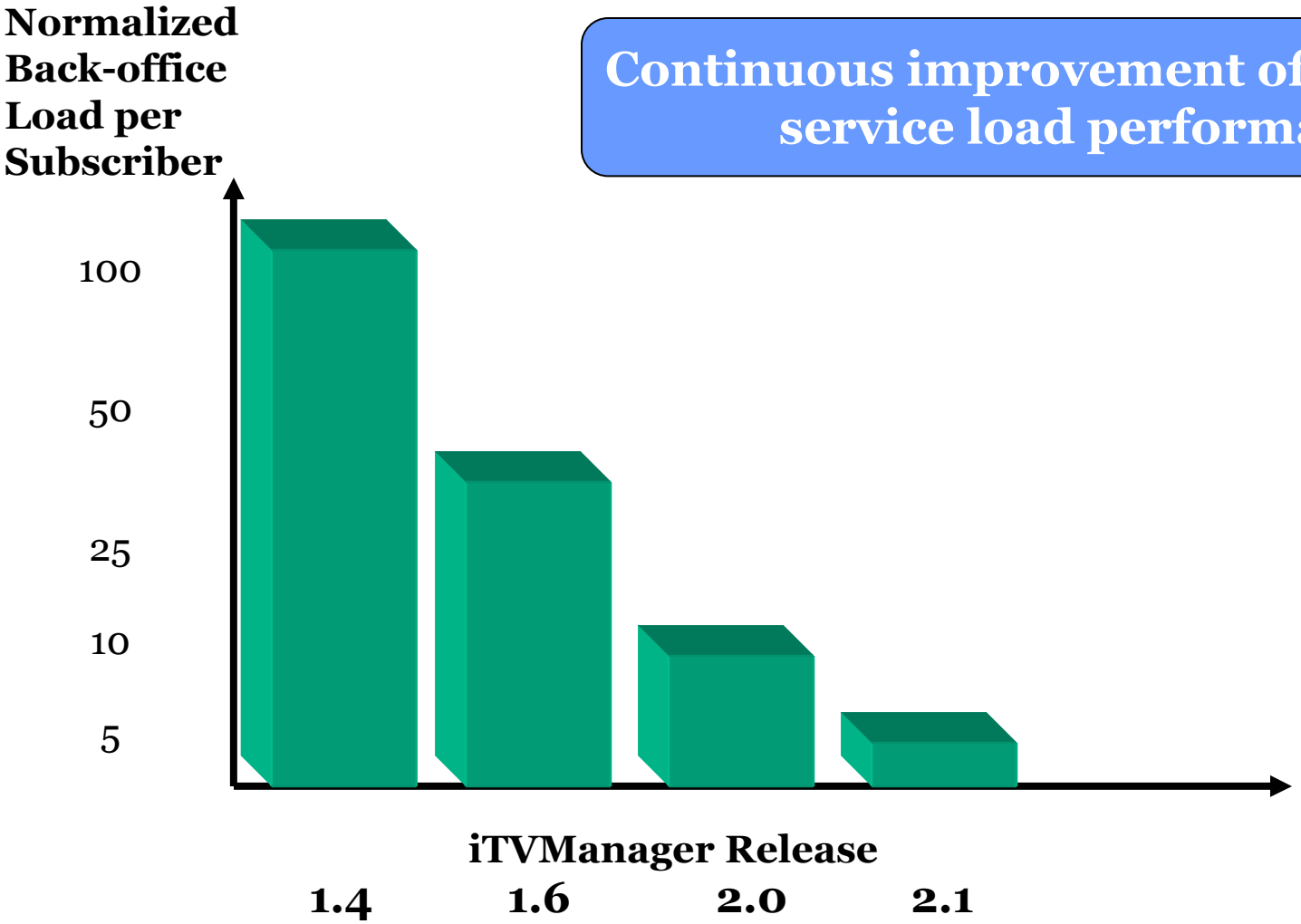


High Scalability

- **Services**
  - Modular Architecture
  - Optimized (CPU & Memory) graphics primitives
  - Optimized “Widgets” suited to TV experience
  - Rich set of Inter-application APIs
  - “Data Windowing” functionality for dynamic and flexible data caching

- **Subscribers**
  - Error resilient STB client module
  - Robust Back-office driven multicast messaging
  - Data compression
  - Caching in STB of vital service and entitlement information
  - Service specific data caching for high responsiveness

Scalability Test Results



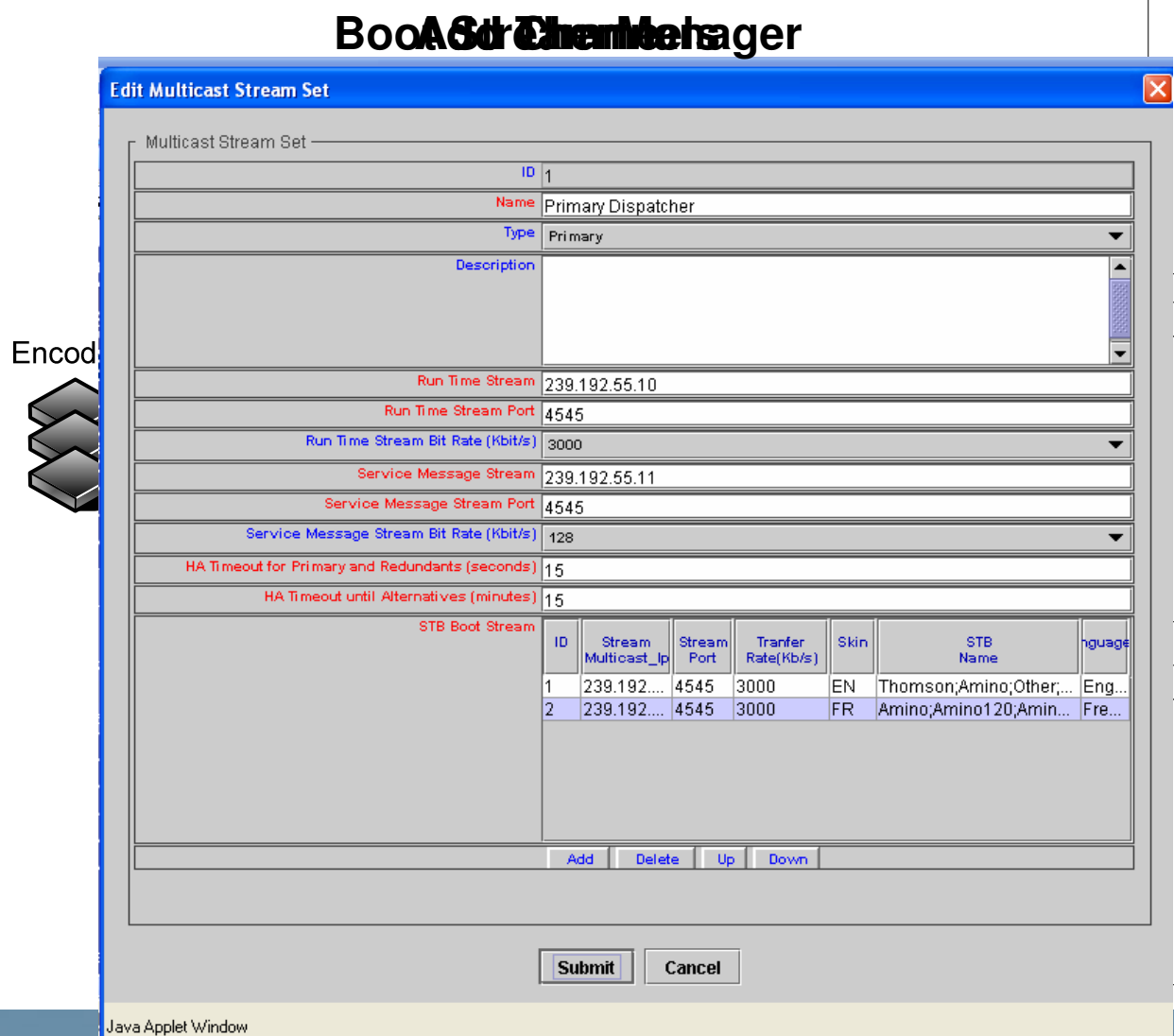
Continuous improvement of subscriber service load performance

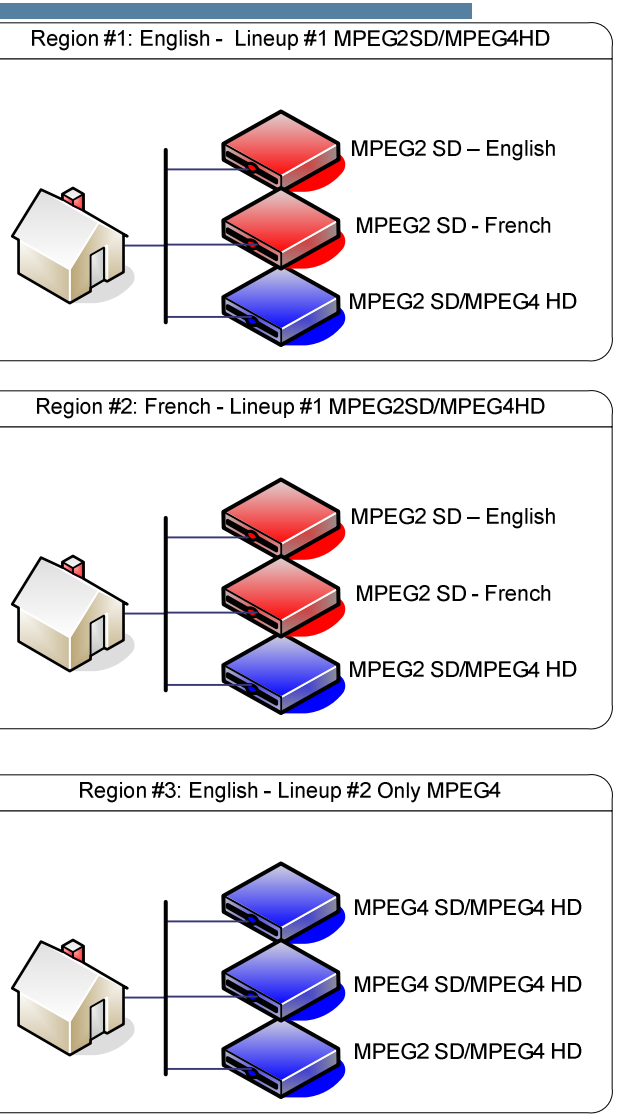
iTVManager 3.x Overview

iTVmanager 3.x Key Features

- Region and channel mgmt
  - Multi-region support
  - Multi-channel lineup
  - A la carte channel structure
  - URL channels
- Client software enhancements
  - User selectable UI
  - Video in browser
  - Improved customizability
  - Viewer statistics
  - UI customization kit
- Administration
  - HD and PVR management
  - Consolidated boot stream for all STBs
  - Expanded APIs
- High availability ready
- Platform upgrade (Red Hat, Oracle, Java)

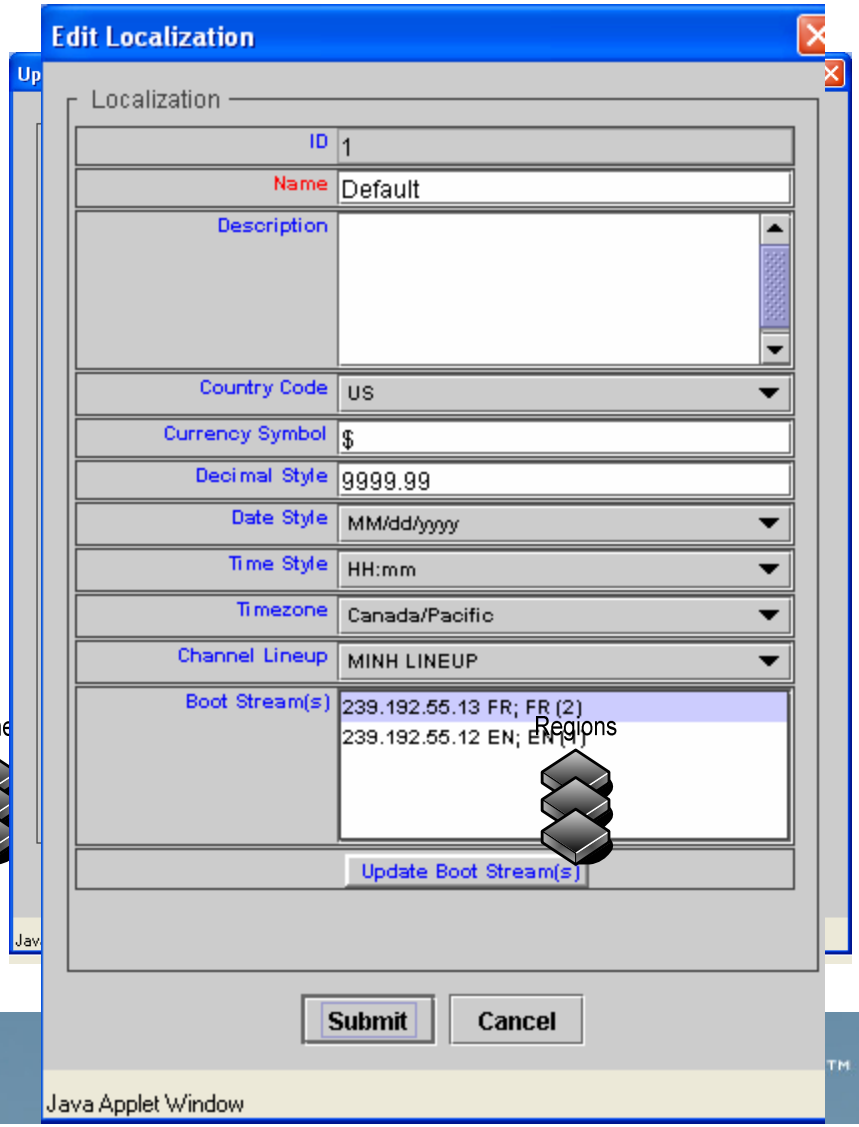
System Set-up





System Set-up cont.

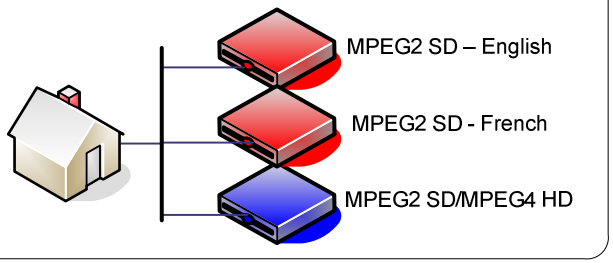
Add Regions

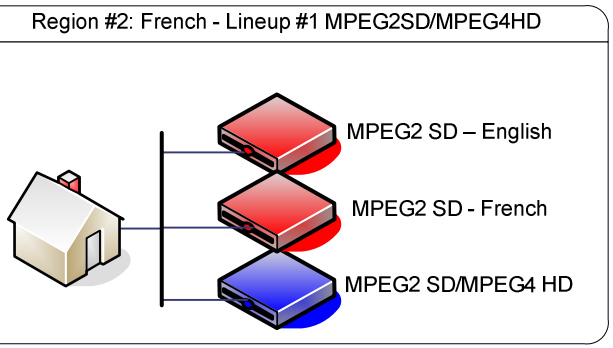


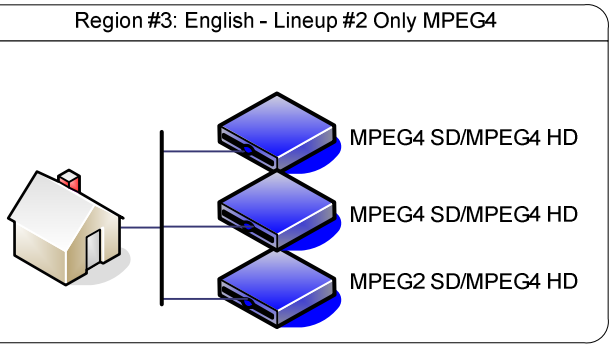
Encoders

Channe

Regions







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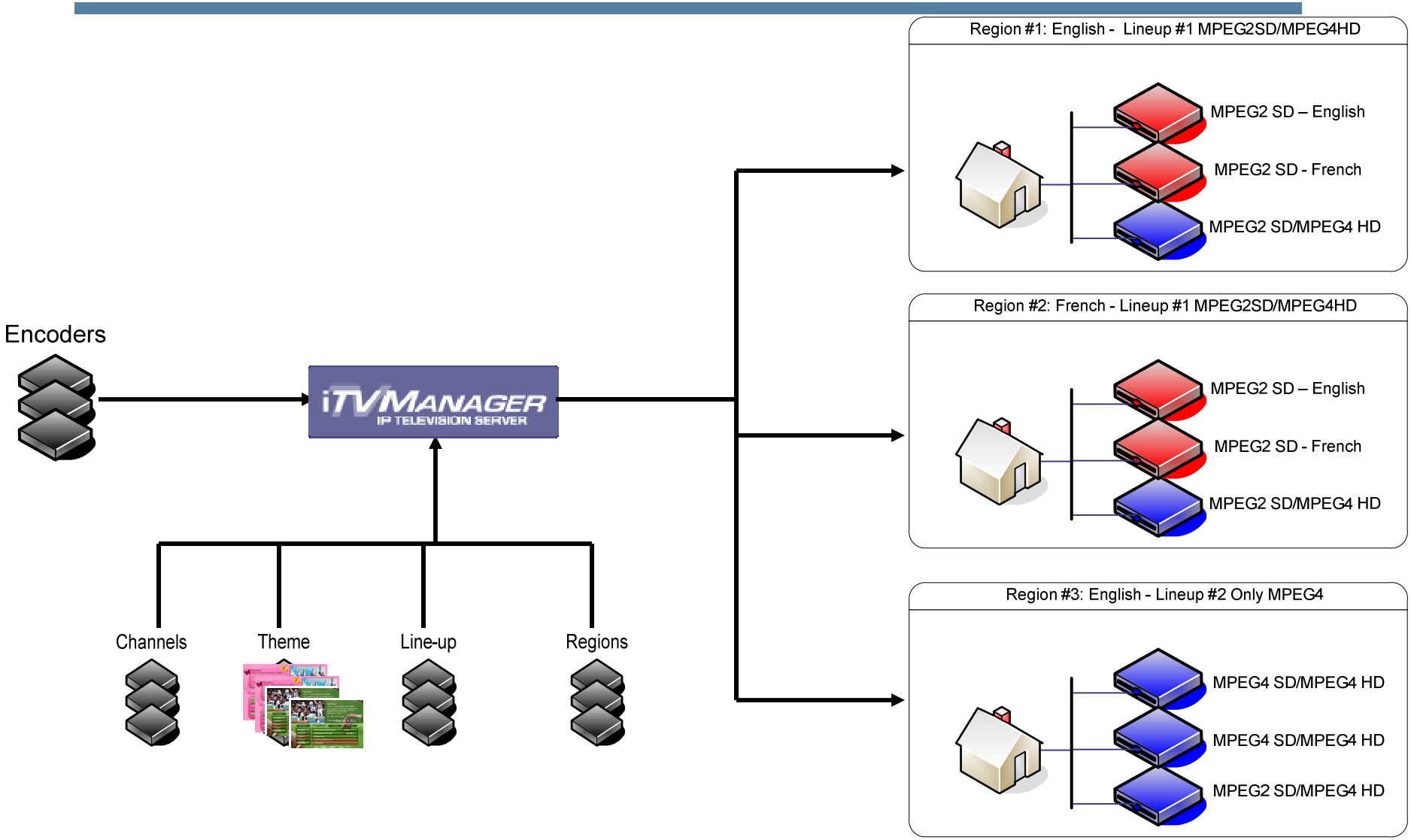
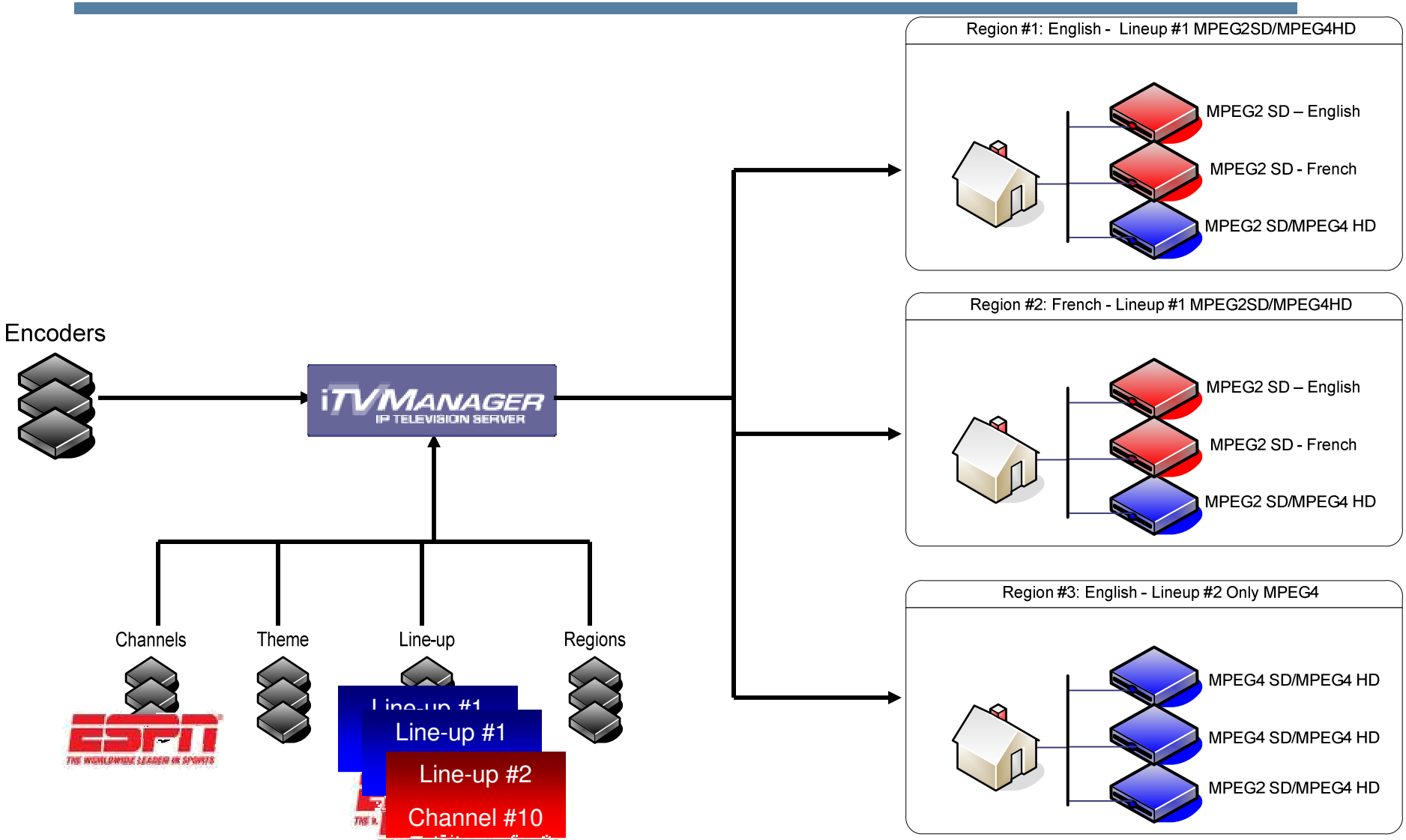
Theme Control



Channels


Region #1: English - Lineup #1 MPEG2SD/MPEG4HD
MPEG2 SD – English
MPEG2 SD - French
MPEG2 SD/MPEG4 HD
Region #2: French - Lineup #1 MPEG2SD/MPEG4HD
MPEG2 SD – English
MPEG2 SD - French
MPEG2 SD/MPEG4 HD
Region #3: English - Lineup #2 Only MPEG4
MPEG4 SD/MPEG4 HD
MPEG4 SD/MPEG4 HD
MPEG2 SD/MPEG4 HD
Encoders
iTVMANAGER
IP TELEVISION SERVER
Channels
Theme
Line-up
Regions
Line-up #1
Line-up #2
Channel #10

Roadmap: iTVmanager 3.0

	Q1	Q2	Q3
3.0	**3.0 (Limited release)** SA Widevine Seachange SDK driven **Key features:** User selectable UI Multi region Multi Line ups HD mgmt Hi-avail ready URL channels Video in browser HD PVR	**3.0.x (new systems)** Admin ADB 3800/5800 Entone VOD Widevine Latens Bug fixes	**3.1 (upgrade from 2.1)** 2.1-3.x Migration Amino 110, 120, 500 ADB PVR SA PVR Latens **Key features:** Multiple UI presets (e.g., Smoke w/o posters) Transaction profiling Static mosaic Interactive applications Series record (PVR) nPVR UI Customization kit
Platform	Dell 1950 (upgraded 1850s for 2.1 to 3.0 upgrades)		
	Red Hat 4.4		
	Oracle App Server 10g		
	Oracle DB Server 10g		

SP = service patch (bug fixes, minor features)
HP = hot patch, service critical
IR = integration release (third party updates: STB, VOD, CA)

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