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Java™ Platform Micro Edition MIDP 2.0 Client Design for Digital Video Broadcast

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Goal

Explore key technologies behind mobile video and identify opportunities for the Java ME Platform

Agenda

What Is DVB-H?

Video and Audio Encoding

Client Hardware/Software Requirements

Client UI Design

Interactive Video Applications

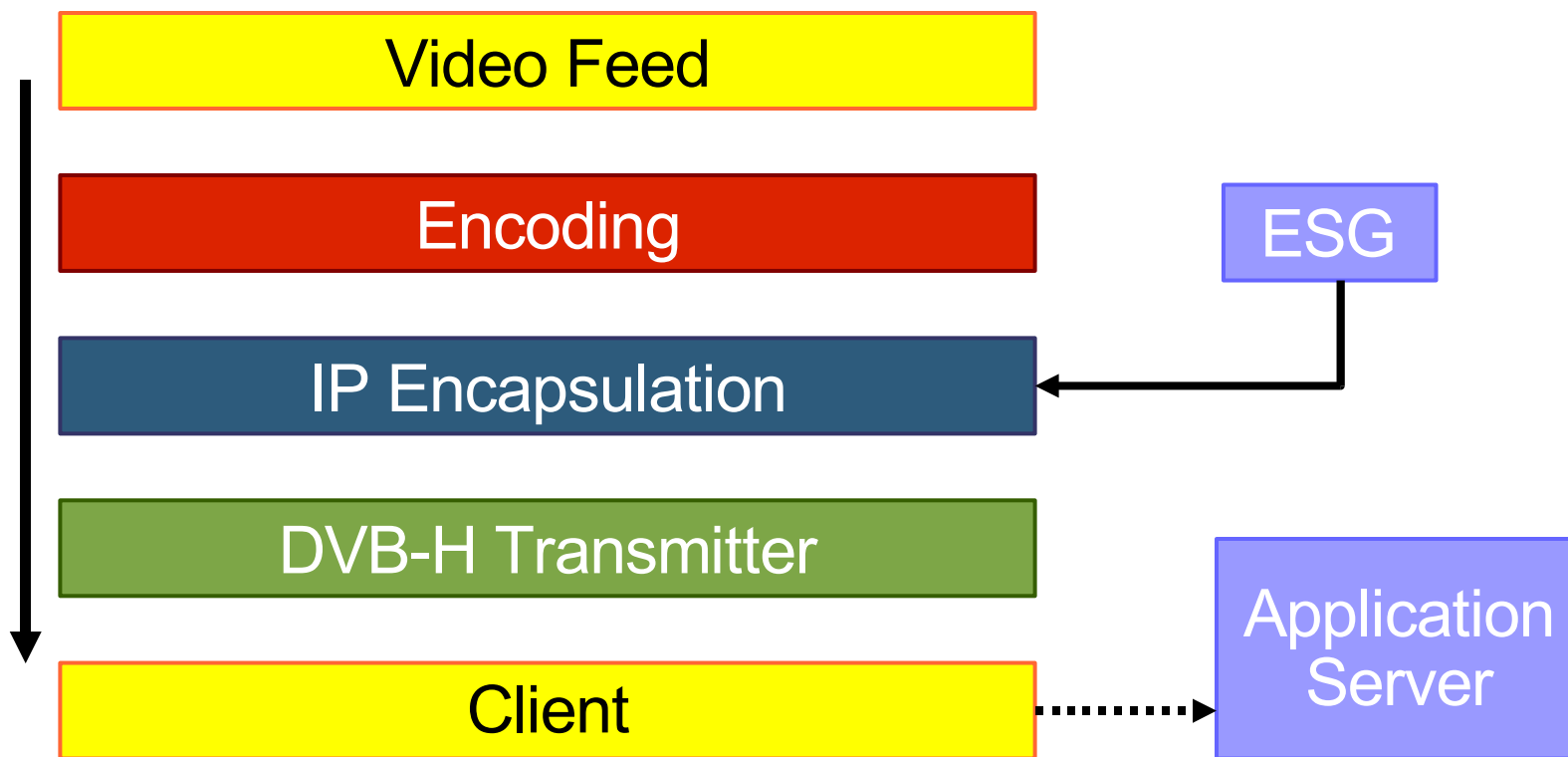
Future Directions

What Is DVB-H?

- **Who?** www.dvb-h-online.org
- **What?** Digital video broadcast-handheld
- **Where?** Worldwide
- **Why?** Ultimately ARPU
- **How?** That's what we are here for...

What Is DVB-H?

High-Level Architecture



What Is DVB-H?

More Details

- What was left out
 - DRM
 - Keys
 - Encryption
 - Client files
 - SDP or NSC for tuning in
 - Service management
 - Carrier integration
 - A series of talks on its own

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Video and Audio Encoding

Factors

- Video codec
 - Resolution
 - Frame rate
 - Advanced settings
- Audio codec
 - Sampling rate
 - Resolution

Best Perceived Quality for the Lowest Data Rate

Video and Audio Encoding

Choices

- Codec testing
 - Quantitative
 - Qualitative
- Tradeoffs
 - Audio environment
 - Resolution
 - **Number of channels vs. channel quality**

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Client Hardware/ Software Requirements

- Hardware
 - Minimum 15 FPS (20 preferred)
 - QVGA, 24-bit color
 - Stereo audio, 16-bit, 44.1 KHz
- Software
 - MIDP 2.0, CLDC 1.1
 - JSR 135, 234 with DVB-H support
 - JSR 272 (forthcoming) or a subset
 - Desired audio and video support

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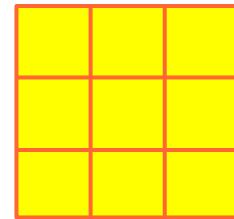
Video Client Feedback

- Feedback was collected from several sources
 - Focus groups
 - Analysts' reports on available products
 - Internal analysis of available products
- Guiding principles were established
 - **Ease of use**
 - **Aid in finding new programs**
 - **Quality viewing experience**

Client UI Design

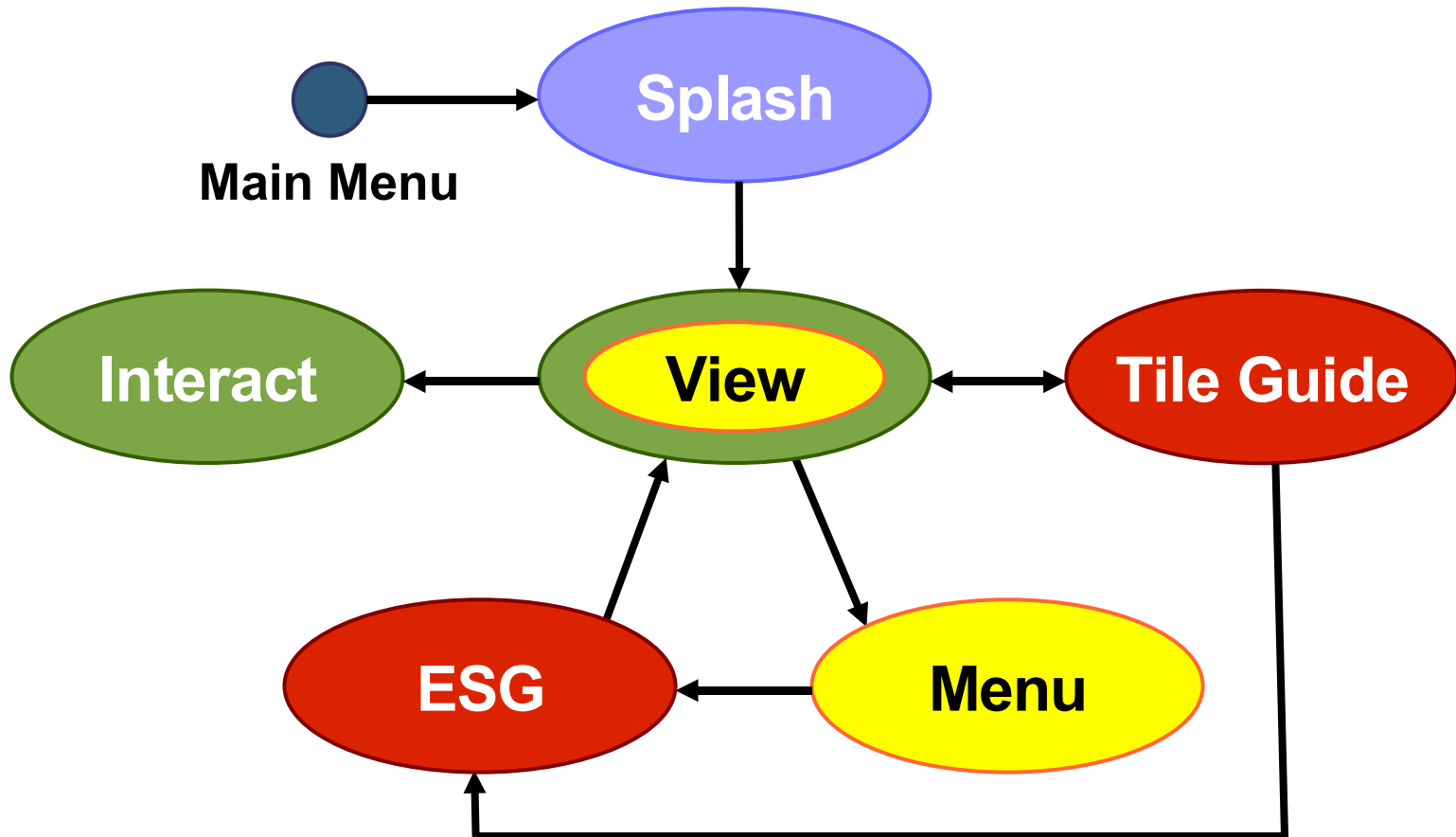
Key Points

- Users want to view programs right away
 - Start up on last channel
- Small number of favorite channels
 - Use simple channel “tiles” with icons →
 - Channel “grid guide” (ESG) is secondary
- Add support for interaction
- Broadcast in QVGA



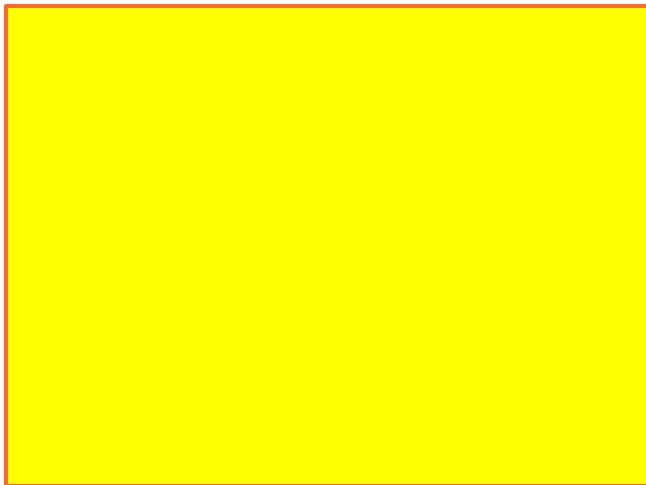
Client UI Design

Client Navigation

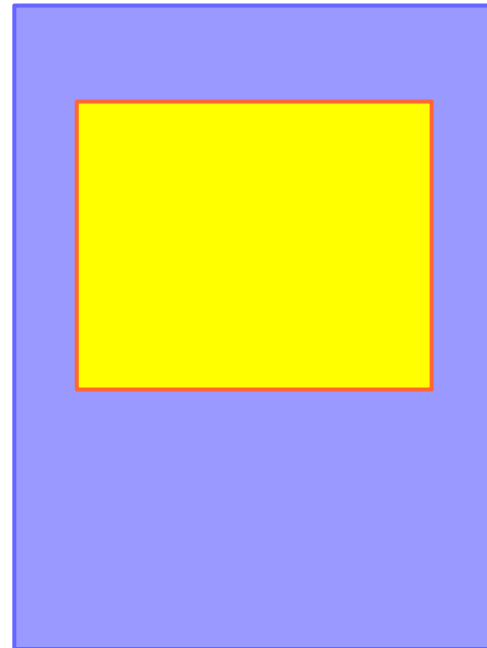


Client UI Design

Form Factor



QVGA—320 x 240
Full Screen Mode



QCIF—176 x 144
Small Screen Mode

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Interactive Video Applications

Today

- Most common interactive application
 - The electronic service guide
- Using a phone or web browser to vote
 - Simple calls or text messaging
- Least standardized area of mobile video

Great Opportunity Exists!

Interactive Video Applications

The Sky's the Limit!

- Messaging
 - Send program link (viral model)
 - Voting, text chat
- Data feeds
 - Overlay RSS feed, weather, etc., onto video
- Hyperlinks
 - Shopping
 - Launch browser to learn more
- Content discovery
 - Video search

Interactive Video Applications

Dynamic Content Generation

- Create video from still images, audio, and text
- Text can be news, trivia, etc.
- Choose media based on popularity (sales)

How?

- Prototyped using the QuickTime SDK for Java™ Platform

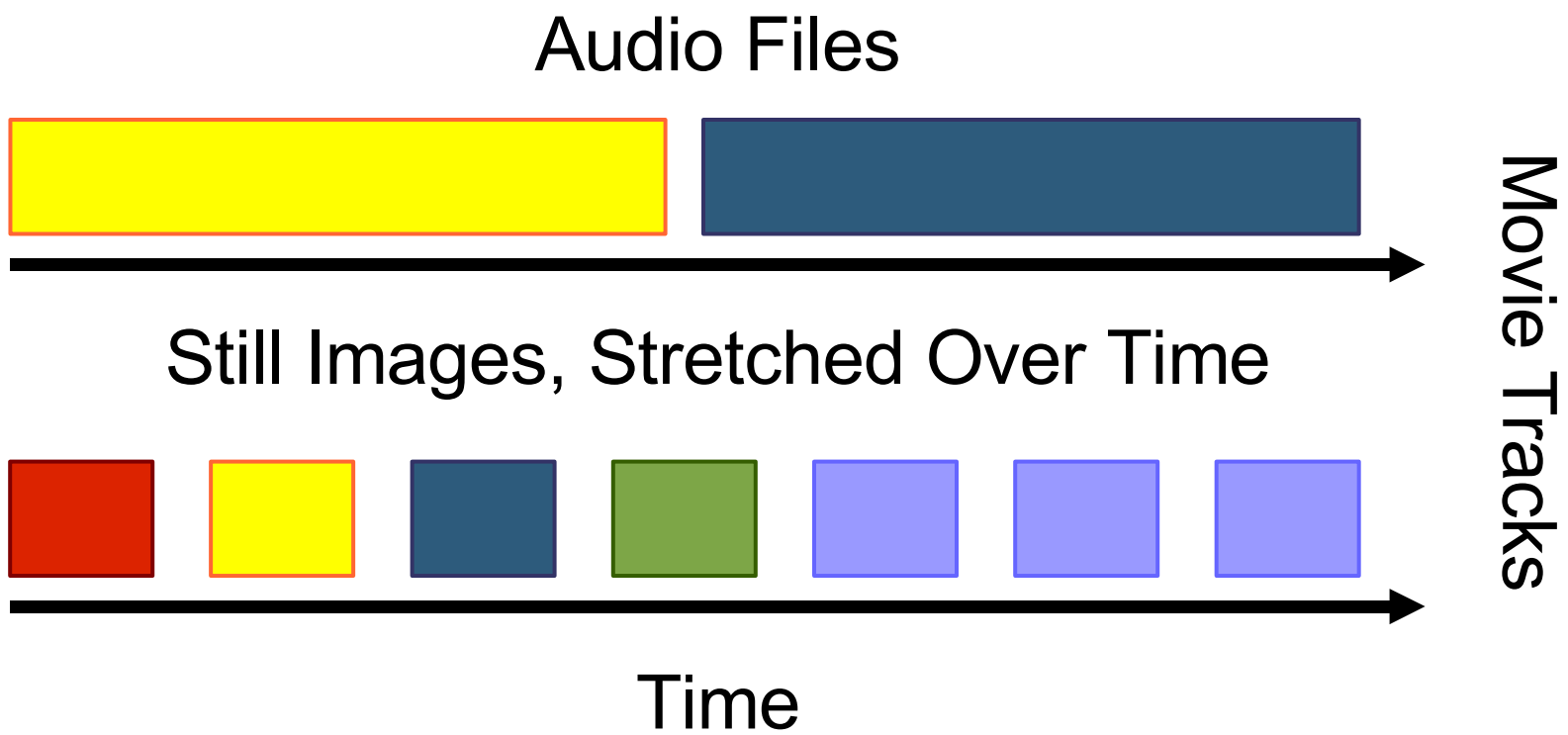
Interactive Video Applications

Dynamic Content Generation

- Needs
 - Media store (database or a file system)
 - Additional meta data (recent news)
 - QuickTime Java SDK
- Basic Steps
 - Add audio files, still images with text to movie
 - Render the movie and export for broadcast
 - Create movie meta data (what is playing when)

Interactive Video Applications

Dynamic Content Generation



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Future Directions

- New interaction models
 - Gaming
 - Advertising
 - Location awareness
- Service management systems
 - **Better integration with telecom systems**
- Hardware improvements
 - Video decoding
 - DRM functions

Summary

- Mobile video is here
- Many ways to be part of the ecosystem
- Java technology has client and back-end opportunities

For More Information

Specifications, etc.

- JSR 272—Mobile Broadcast Service API for Handheld Terminals
- Digital Video Broadcasting Project: www.dvb-h-online.org
- FLUTE—File Delivery over Unidirectional Transport (RFC 3926)
- Digital Video Broadcasting Transmission System for Handheld Terminals (ETSI EN 302 304)
- Digital Video Broadcasting Specification for Data Broadcasting (ETSI EN 301 192)
- Service Guide for Mobile Broadcast Services, OMA-TS-BCAST_ServiceGuide-V1_0_0-20050512-D

Helpful Tools

Video Clients, Servers, Editors, Encoders

- VLC www.videolan.org
- Apple QuickTime for Java
- Microsoft Windows Media Encoder
- VirtualDub www.virtualdub.com

Q&A





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