Context: Multimedia Convergent Technologies

- Audio/Video convergent codecs
  - MPEG-4 AAC
  - MPEG-4 AVC

- Convergent graphics
  - SVG / HTML

- View graphically and media rich content (including TV programs) on many types of devices
  - STB / TV
  - PC
  - Mobile phones / tablets
Context: TV Evolution

- **TV is becoming digital**
  - Many channels, many programs
  - E.g. 2010/2011 Analog TV switch off in France
  - Opportunity for more interactivity (e.g. HBBTV)

- **Devices and networks are evolving**
  - TV connected to the Internet
  - Mobile phones capable of receiving TV programs (3G)
  - Mobile broadcast networks are being deployed
    - Deployment costs
    - Deep indoor penetration
The PINGO Project

- Indoor redistribution of adapted TV signal
  - DVB-T/-H/-SH reception
  - Transcoding of A/V
  - Transformation of EPG data
  - Targets: PC, phones, tablets

- Principles
  - Transformation of available EPG data into SVG
  - Delivery over Wi-Fi using a Streaming or AJAX approach
  - Adapted to different terminals iPhone, iPad, PC
Law & Order
"Kid Pro Quo"
Wed Apr 30, 10:00 pm - 11:00 pm
Several people are suspects when the head of admissions for a private school is killed.

10:23 pm

Not Recording

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<th>10:30 pm</th>
<th>11:00 pm</th>
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The EPG standard ecosystem

- **EPG in DVB-T =**
  + MPEG-2 Transport Stream
  + DVB Event Information Table

- **EPG on the Web =**
  + IP
  + XML / HTML

- **EPG in DVB-H/SH =**
  + MPEG-2 Transport Stream
  + DVB IP Data Casting (IPDC)
  + FLUTE Protocol (File Delivery)
  + XML (TV-Anytime …)
Why use SVG?

- SVG has interesting properties
  - Layout, gradients, animations, interactivity
  - Audio/Video support (in Tiny 1.2)
- SVG is becoming ubiquitous in Browsers
- Mobile industry interest (3GPP, OMA, ATSC-M/H)
- SVG extended with 3GPP DIMS can be streamed
Dynamic Interactive Multimedia Scenes

- 3GPP Standard: TS 26.142
  - Based on MPEG-4 LASeR

Concepts

- SVG extensions
- Timed SVG updates: DOM insertion, removal, replacements
  - Sent by a server or read from timed files
  - Transported of SVG Updates for streaming, in MP4 files or over RTP streams
Architecture of the system

- Demodulator
- A/V Transcoding
- SVG Generation
- DIMS Packaging
- Streaming
- RTP
- AJAX/HTTP
- Web Server
AJAX Approach

- **Traditional Pull method**
  - Programs are retrieved from the sources
  - XML data files are stored on a Web server with an SVG harness
  - The client periodically retrieves the XML and updates its display using Javascript

- **Pros/Cons**
  - Light server (XML generation + Web Server)
  - Adaptation on the client
  - Reduced dynamicity (layout and programs)
Streaming / Broadcasting Approach

■ **Principles**
  • Programs are retrieved from one broadcast source
  • Transformed into SVG content
  • Packaged into 3GPP DIMS unit
  • Streamed to the client over RTP

■ **Pros/Cons**
  • Reproduce the behavior of TV broadcast channels
    - Programs are displayed incrementally as soon as they arrive
  • Lighter client (JavaScript only for navigation)
  • Heavier server
  • Increased bandwidth
  • More difficult to adapt to device features
Implementation details

■ Server
  • Embedded platform
  • ARC Processor @ 400 MHz
  • Video transcoding chip

■ Clients
  • Streaming: GPAC on PC and Mobile phone (ARM 200MHz)
  • AJAX: Firefox, Opera, Chrome, Safari (PC & iPhone/iPad)
PINGO Results (PC)

GUIDE DES PROGRAMMES

15:00

TFI
Le bateau de l'espoir
Toute une histoire

2
Questions au gouvernement
Comment ça va bien!

3
Desperate Housewives - Nurse Jackie - Machine infernale

CANA
Allô, Amour: un peu, beaucoup, à la folie - Superscience - Les rocheuses

arte
La porte dans le noir
Les yeux noirs

Direct8
Maigret - Maigret et Maigret - Maigret et les plaisirs de la nuit

W9
Sue Thomas, l'œil du FBI - Ce t'est qu'un au W9 hits

TMC
Hercule Poirot - La maison du péril

15:30

Magazine, Politique
L'émission débute par une interview politique puis propose les questions des différents groupes parlementaires et les réponses du gouvernement. En direct de l'Assemblée nationale
PINGO Results
Demo

- Online Web Site (to be announced)

- Video on iPad
Problems and limitations

- **Interoperability**
  - SVG Tiny 1.2 not widely supported
    - `textarea` (replaced by `foreignObject + HTML div+CSS`)
    - Trait Access API (used fallback DOM access)
    - SVG video element (replaced by HTML5 element)
  - Events on mobile devices vs. PC (e.g. `touchEvent`)
  - Lack of SVG support on the Android platforms
  - Lack of DIMS support

- **Missing SVG features**
  - Screen orientation detection
  - Pixel density detection
  - Text ellipsis (‘…’)
  - Z-order

- **SVG Features not useful: nav-***
Merci de votre attention

Questions ?