AXMEDIS Overview

June 2008

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http://www.axmedis.org/
version 1.4

Partners
Growing and numbers

- **AXMEDIS started in Sept 2004 with fewer partners**
  - GIUNTI, TISCALI, EUTELSAT, HP, AFI, SEJER, etc.
  - Univ. Florence, Univ. Leeds, FHG, Univ. Politecnica Catalaniga, Univ. Reading, etc.

- **Added 10 more partners in the December 2006:**
  - BBC, TEO, ELION, TI, SDAE
  - MBI, VRS, KTU, ETRI, PKU

- **Added Affiliated partners:**
  - SIAE, PENTEX, GESFOR, MAAT-G, FIA, RIGEL, HEXAGLOBE, Focuseek, Ai2, TELSEY, RAI, EUREKA, APT...TelcomBretagne

- **Now from the web portal**
  - Several trials and show cases
  - Technical documents and tools
  - Millions of accesses and downloads
Summary

- Coverage
- AXMEDIS Model
- AXMEDIS DRM
- AXMEDIS Editor and Players
- AXCP: Automating Content Management
- AXMEDIS P2P
- Multichannel Support
- AXMEDIS Framework

Context

- Users are requesting content from multiple channels
  - DVB-T,S,H,SH, ..; IPTV, webTV, P2P, mobile, etc.
- TelCO are proposing Multiple-Play
  - Mobile: OMA, i-Tune,
  - STB: Irdeto, Nagravision
  - PC: Windows, Adobe, …
  - PDA: ..??
- Problems
  - Content & devices are not interoperable
  - Business models are not interoperable
    - CAS and DRM are not interoperable
    - Content acquired for a device cannot be moved on others
  - Advertising business implies high costs for user profiling and dynamic content production, automation is needed
  - Backoffice is too expensive to be managed, automation is needed
  - Returns for accounting are too expensive, automation is needed
- AXMEDIS can solve all these issues!
New integrated technologies are needed

- More attractive formats

Needs:
- Evolved Formats with a certain intelligent
  - Proactive content
  - Interoperable Players
- Systems for automated production
  - Prod. on demand, VOD, personal advertising,
  - managing UGC,
  - managing rights and CAS, etc.
- Efficient automated distributions systems
  - Multichannel
  - Controlled P2P
- multi DRM, interoperable DRM and CAS

Innovations

- New models, methods and tools for:
  - *interactive*: from multimedia → to cross media
  - *intelligent*: active and proactive with users
  - *interoperable*: devices, DRMs, and formats

- Cost reduction, via
  - Automated Content Management:
    - production, processing, protection and multichannel distribution
  - Workflow+processing+DRM
  - Integration of B2B/B2C rights management activities
  - Secure/Legal P2P for content distribution
    - B2B and B2C

- AXMEDIS Framework open to all
Factory and integration

- AXMEDIS Automated and Manual Factory
- Monitoring & Reporting
- AXMEDIS DRM
- Control and supervision
- AXMEDIS Automated and Manual Factory Tools
- AXMEDIS Automated and Manual Factory Tools
- FTP, WS, etc.
- DB, CMS

Convergence, the Interoperable Content

- Internet Distributor
- Mobile Distributor
- Broadcasters, DVB-H
- Media Distributor
- Broadcasters, DVB-T
- Broadcasters, DVB-S
- IPTV distribution
- Kiosks distribution
- Internet, WEB, VOD, ....
- DVB, IPTV, i-TV, VOD, ...
- Mobiles, PDA, etc.
**Major Tools**

- **Players for cross media content:**
  - PC, PDA, STB, mobiles, etc.
- **Tools for DRM and protection**
- **Content Production tools**
  - Authoring tools for cross media content: AXMEDIS Editor
  - for content, protection and licenses
  - Automated production tools for content, protection packages and licenses: AXCP, Workflow
  - CMS: search and retrieval, automated connection with your own and/or third parties CMSs
- **Content Distribution**
  - P2P tools for B2B and C2C in a controlled and safe/legal manner: AXEPTool, AXMEDIA
  - User and tool Registration portals
  - Certification authority, AXCA
  - License Server and Certifier and Verificator, PMS/AXCS
  - Scheduling: Program and publication, Workflow, etc.
  - Distribution Portal
  - Content acquisition portal for end user production

**AXMEDIS B2B Distribution and Sharing**

- **Content Producers**
- **Internet Distributor**
- **Mobile Distributor**
- **Media Distributor**
- **i-TVs**
- **STB**
- **Kiosks distribution**
- **AXMEDIS Portal**
- **AXMEDIS P2P monitoring**
- **AXMEDIS DRM**

**Collecting Societies**

**Content Integrators**
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Interactive and intelligent

- integrated media info
- proactive with the users
- attractive experience
- personalized
- multichannel interoperable
- device interoperable

Final users

Browse, search
User generated
proactive
Multichannel
User generated
Saving experience
An example to wrap it all up

Music Album

- Rights Owner
- Producer
- Distributor
- Genre
- Authors
- Other Descriptions (e.g. MPEG7)

Backstage Video

- Rights Owner
- Producer
- Distributor
- Subtitles Languages
- Playing time
- Resolution

Resource MPEG2 Video

- Metadata will be always accessible for indexing and querying

NewsML

- NewsML
- NewsItem
- NewsItem
- NewsComponent
- NewsComponent
- ContentItem
- ContentItem

News Markup Language
Conversione MXF → AxObject

Elementi di MXF viene convertito in un elemento dell’AxObject, quindi non c’è perdita di informazioni.

Conversione AxObject → MXF

Il file MXF si limita a contenere le essenze senza prevedere alcun tipo di sincronizzazione, inoltre ci sarà perdita dei DRM nel caso siano presenti.
AXMEDIS Cross Media Content

- Any content inside a package:
  - Mix of: HTML, SMIL, MPEG-4, video, audio, text, Documents, images, actions, games, animations, etc.
  - Additional content and interactivity for the end users
  - compliant and extending MPEG-21

- AXMEDIS Intelligent content allow user/producers to
  - create content for other devices: ringtones, mobiles, …
  - support social activity
    - annotations
    - user generated content
    - personal collections
  - internal query
  - customized for culture and language

Intelligent Content

- From buttons and events to actions
  - HTML, SMIL, Flash may activate AXmethods
- HTML forms to collect user inputs
- AXMethods intelligence in Extended javascript
  - AXCP functionalities: ingestion, content processing, transcoding, database access, licensing, mailing, save/load, profiling, etc.
  - communication, monitoring, reporting events, etc.
  - content production, migration (from PC to PDA) and protection
  - coding presentations, sliding, sequences
  - educational intelligent content
  - non linear story telling
  - collecting user content
  - Internal search
  - Annotations (future)
  - autorun
- Future:
  - collaborative communications
  - cameras connections
  - etc.
Interoperability among devices

- interoperability among devices, e.g., getting
  - a video for the TV and reproducing it on mobiles, PC, etc.
  - an MP3 audio track and using as ringtone in the phone, reproducing it on the car stereo, or in the living room, passing to a friend.
  - a guide in a museum for his mobile/PDA, using there, and passing and playing it at home on the TV set and/or on the PC
  - Making annotations on a video and pass to a friend, …
  - …
- Buy once to use on all
  - According to the business model
  - Via different DRM models and tools

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An example of REL statement

- Rosy can Play 3 times the Ocean Wilds in November 2003.

Managing License Chain, B2B and B2C

- Alice states: “Bob has the right to issue a license to anyone to print the book in Italy”
- Bob states: “Carl has the right to print the book in Italy”
- To solve the SubSubLicense for Carl all the connected Licenses are needed
- Licenses have to be accessible on Processing Engine
- Alice can revoke the license to Bob
The Licence Maker Wizard, an AXMEDIS object

Cross media content and composition

- AXMEDIS objects can be used as components for creating other added values AXMEDIS objects
  - Allowing the production added value object for composition or integration of protected content
    - Who is composing can add its own protection and licensing
  - Allowing the Rights Management Of Composition, in the digital world similarly at what is performed in the physical world
  - The shares along the value chain are de facto formalized

metadata resources
Make easier the B2B market of digital content

PAR: Potentially Available Rights into AXMEDIS objects

The PAR can be used to make queries

♦ PARs based content trading, Customers may know directly which rights they could buy and by who
♦ PARs may be used to harmonize and automate B2B and B2C

Managing License Chain and Protection Information
DRM and Domain Management

- Users are strongly interested in acquiring a content to be used in their domain in which they have their
  - Home devices, cars, mobiles, etc.
- Media Centers and/or Home Servers are going to manage content and licenses for the whole domain
  - One license for all devices and people

Tracking and monitoring Exploitation of Rights

- Different reports and statistics for different roles
  - Reports on licensing and on the consumption/exploitation of rights
- REL and Composition enforce flexibility in business and transaction models, multiple models for the same channel
  - Pay per play, all you can eat, subscription, etc. etc.
### User Generate Content

- **WEB Server**
- **Broadcast Server**
- **Social Networks**
- **Portal**
- **AXMEDIS Automated and Manual Factory Tools**
- **Protection**
  - (see sec. 1.6)
- **Registration on AXCS**
  - (see sec. 1.7)

### Market solutions

<table>
<thead>
<tr>
<th>Business Models</th>
<th>Larger number of Business Models</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proprietary / Standard DRM and model</td>
<td>Standard DRM: MPEG-21, OMA, etc.</td>
</tr>
<tr>
<td>Non interoperable DRM</td>
<td>Allowed Interoperable DRM: MPEG-21, OMA, etc.</td>
</tr>
<tr>
<td>Fixed/Flexible Protection Model</td>
<td>Any Protection Model, key, algorithms, etc.</td>
</tr>
<tr>
<td>Separation among Content and license</td>
<td>Separation among Content and license</td>
</tr>
<tr>
<td>Signed Content Header</td>
<td>Signed Content AXINFO, any Metadata</td>
</tr>
<tr>
<td>Channel distribution</td>
<td>Multichannel with the same license</td>
</tr>
<tr>
<td>Players and Devices</td>
<td>Players and Devices: PC MS-Windows, PDA Windows Mobile, STB, Linux OS, Apple MAC (in progress), Java Mobiles</td>
</tr>
<tr>
<td>License Proprietary: number of rights</td>
<td>Licenses MPEG-21 REL: Expandable dictionary, any type of rights, licenses OMA, domains</td>
</tr>
<tr>
<td>Authentication of Player</td>
<td>Authentication of device, user, domain, etc.</td>
</tr>
<tr>
<td>Revocation per Player</td>
<td>Revocation per device, user, etc.</td>
</tr>
<tr>
<td>Revocation per license</td>
<td>Revocation per license</td>
</tr>
<tr>
<td>Source code non accessible</td>
<td>Source Code Accessible</td>
</tr>
<tr>
<td>Limited Metadata</td>
<td>Any metadata, custom metadata, any ID, any Descriptor</td>
</tr>
<tr>
<td>Media content, simple content, not intelligent</td>
<td>Any digital format, of any type: audio, video, image, games, doc, and Cross media: SMIL, HTML, MPEG-4, INTELLIGENT content</td>
</tr>
<tr>
<td>Customizable Tools</td>
<td>Customizable Tools: servers and player clients</td>
</tr>
</tbody>
</table>
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AXMEDIS Editor

- Metadata editor, Metadata mapper:
  - AXINFO, DC ++
- Resource player/viewer:
  - Images, video, audio, doc, HTML, SMIL, MPEG-4
- Visual editor:
  - SMIL, synchronization, presentation
- Behavior editor:
  - AXmethods: Business logic, extended JavaScript, ..., a huge range of functionalities
- DRM Editor:
  - License editor, production of licenses
- Protection editor:
  - How to protect the object, DES, AES, etc.
- Workflow:
  - Content production status, flags, etc.
- In the short future:
  - Scenarios Editor to design links of SMILs, etc.

AXMEDIS Workflow Management System

Collection of AXMEDIS plug ins

AXMEDIS Database

AXMEDIS P2P

AXMEDIS DRM

Prod/grant

control
Some Snapshots from the examples shown

Interoperable Players

- PC players with full functionalities
  - Stand Alone Player for Windows
  - Version with Replaceable skins
  - Active X Player for Windows, for: Integrating player in HTML pages
    - Microsoft Internet Explorer Browser
    - Macromedia tools Authorware
    - Realising customised AXMEDIS Players based on .NET
  - Plug in for Mozilla Internet Browser Integrating player in HTML pages
    - Two different skins

- PDA player:
  - MPEG-4, SMIL, HTML

- STB player:
  - for IPTV
  - for DVB-S
  - MPEG-2, MPEG-4

- Mobile player:
  - A pure Java player will be ready for Feb 2008
  - SMIL support with Audio Visual, MMAP of Java
AXMEDIS Players, interaction, SMIL, HTML, MP4...

AXMEDIS Player: video, SMIL, HTML, MP4...
AXMEDIS: videos, SMIL

Custom MM Players

- Multimedia Players
- Customizable for
  - Skin, multiple
  - Functionalities
  - Formats
  - Interface
AXMEDIS mobile player, java based

- Progressive Download from HTTP
- AXMEDIS DRM with registration
- Browsing on Memory
- Java based
- Content: SMIL, images, video, audio, and text
- SMIL interactivity and presentation layer
- Menus and collections
- Chained AXMEDIS objects

Interoperable Players
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AXMEDIS Architecture

- AXMEDIS Factory
- AXMEDIS Editors
- AXMEDIS Content Processing Engines and Scheduler GRIDs
- CMSs
- Crawlers
- AXMEDIS Accounting area
- AXMEDIS databases
- Programme and Publication
- Workflow Management tools
- Protection Manager and Support
- Protection and Supervising tools
- AXMEDIS Portal
- AXMEDIS Certifier and Supervisor
- B2B, P2P Content Distribution
- AXMEDIS Players
- AXMEDIS P2P Network
- AXEPTool Area
- B2C Content Distribution
- Distributor
Enabling massive content production and processing

- AXMEDIS GRID language and tools for
  - Automated Content Ingestion and Gathering
  - Automated Content Query and Retrieval
  - Automated Content Load and Storage: databases and files
  - Automated Content and Metadata Processing, enrichment
  - Automated Content and Data processing
  - Automated Content Filtering and Repurposing
  - Automated Content Composition, Formatting
  - Automated Content Protection and Licensing
  - Automated Content Publication/Download on/from any channel
  - Automated Content Distribution via Multichannel
  - Automated Profiles management and processing
  - Automated Production of Content on Demand
  - ...

Content Processing Applications

- AXMEDIS allows you to reduce costs and increase efficiency of your content management.
- Automating back office content production/protection and distribution
  - Open and secure architecture for content production, processing, protection and enrichment, based on a scalable GRID model
  - Maximum flexibility with
    - AXMEDIS content processing GRID Language
    - Uses plugins for content adaptation/transcoding for multi-channel production, fingerprinting, processing profiles, etc.
- AXCP GRID solution allows automated management of:
  - content, metadata and licensing information, etc.,
- AXCP tools can be integrated and controlled by your applications and/or workflow management systems.
AXMEDIS Content Processing GRID

Front end servers, VOD, prod on demand

Workflow manager

AXMEDIS Rule Editor

Your AXCP Scheduler

AXCP nodes

AXMEDIS Database

Distribution Channels and servers

WS, FTP, etc.

Your CMSs

AXCP GRID

Any Plug-in for content processing

AXMEDIS Content Processing capabilities

- In AXCP Scripts you can manipulate, produce, adapt, extract, manage and process:
  - Any type of resource in any format
  - AXMEDIS/MPEG-21 Objects, IMS, SCORM, OMA objects, and features
  - Digital resources in any format
  - Production of new objects: composition, etc.
  - Formatting, automatically producing/selecting: SMIL, XSLT, etc.
  - Digital resource adaptation, transcoding, …
  - Extraction of descriptors and fingerprints
  - Synchronization of media, etc.
  - Metadata processing, adaptation, and mapping
  - Production and posting of licenses/PAR in OMA and MPEG-21
  - Verification of Licenses against them and PAR
  - Protection Information, OMA and MPEG-21 IPMP
  - Profiling for devices and network capabilities,
  - Reasoning on device capabilities and user preferences
  - User Profile and preferences
  - Etc.

- Open to any other module with plug-in technology:
  - Burning
  - Etc.
Some Snapshots from the examples shown

Rule Scheduler

Rule: Scheduler

Run: 

Port: 

Run/Stop:

Stop/Start:

Suspend/Resume:

Resume:

Temperature:

Rule: 

Port Touch Time:

Run/Stop Touch Time:

Suspend/Resume Touch Time:

Resume Touch Time:

Reboot:

Port Touch Time:

Run/Stop Touch Time:

Suspend/Resume Touch Time:

Resume Touch Time:

Reboot:

Port Touch Time:

Run/Stop Touch Time:

Suspend/Resume Touch Time:

Resume Touch Time:

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Port Touch Time:

Run/Stop Touch Time:

Suspend/Resume Touch Time:

Resume Touch Time:

Reboot:

Port Touch Time:

Run/Stop Touch Time:

Suspend/Resume Touch Time:

Resume Touch Time:

Reboot:
Snapshots of the GRID at work

AXCP visual editor

- Fast and simple Visual Programming of AXCP GRID processes
- Composing Blocks as JS modules to create AXCP rules
- Composing AXCP Rules to create sequences of actions to be scheduled according to their dependencies
Interfactory content production and sharing

- AXCP based Factories
  - content management and publication
  - content gathering
  - automated production, transcoding
  - automated metadata enrichment, labeling, completion
  - content protection and DRM, B2B content sharing with DRM rules

- WFM
  - Workflow harmonization and control
  - Control points and check points

- HL-AXCP + AXP2P
  - content sharing among Factories according to DRM

- AXDRM
  - Control of content access and usage

- Fully Scalable, fully integrated

Planning and Exploiting Node capabilities

- GRID node has a profile describing its capabilities: time profile, memory, HD, communication, tools and plug ins, etc.
**Metadata Mapper, XSLT visual production**

- XML to AXM
- AXM to XML
- AXM to AXM
- AXM to XML

**Production On Demand**

- Content: Search, Selection, Acquisition, Production, Adaptation, Transcoding, Formatting, Packaging, Protection, Publication and Licensing on Demand
- AXCP GRID
- User and Device profile
- Personalized Content on Demand

- Collection
- Distributor Server
- AXMEDIS DRM
- Social Networks

Request or user generated content
The device/terminal capabilities include codec capabilities (specific parameters for each codec), display capabilities, including players features, interactivity features, power consumption, memory, CPU power in terms of MIPS or MFLOPS, storage, etc.

The network capabilities (such as: maximum capacity, minimum bandwidth, quality indicators, etc.) and conditions (such as: delay and errors related to capabilities, etc.).

The user characteristics such as: user information in MPEG-7; user preferences; user history including (e.g., the actions performed on DIs), presentation preferences such as preferred rendering of audiovisual and textual information, accessibility features (for example, audio left/right balance and color arrangement), location characteristics (such as: mobility characteristics and destination, for example for describing the user movements).

The natural environment characteristics are related to the physical environment such as light conditions, time, location, environmental noise, etc.
Examples of Cross media Adapation

Process results
Genetic Algorithm for formatting

\[ OF(\text{areaparameters}) = \sum_{i=1}^{N} K_i \text{VisualLayoutTerm}(\text{areaparameters}) \]

\[ \text{Score} = \frac{\sum_{i=1}^{N} K_i}{\sum_{i=1}^{N} K_i} \]
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Secure and legal P2P

- P2P network set up for content distribution
  - CONSUMER content distribution and sharing
  - Allowing setting up large P2P networks at low costs, about 160,000 peers per server.
  - Automated B2B content distribution/publication via P2P, ready to download content on publication
    - Accelerated seeding
  - Protected content, legal P2P set up
  - Efficient control of P2P networks
  - BitTorrent Technology with Query and Catalogue
  - P2P Client Tools
- Content Sharing for B2B and/or B2C
P2P Network of AXMEDIS

- AXTracker is a modified BitTorrent Tracker that manages the AXMEDIS P2P network and community
- AXEPTool is a special P2P BitTorrent Client Node, suitable to play the role of a P2P Node for B2B activities such as producers, distributors, integrators, etc., for B2B content distribution.
- AXMEDIA is a specific P2P BitTorrent Client Node for final users content sharing and B2C (Business to Consumer) content distribution.
- AXCP GRID is an instance of the AXCP GRID tool to control the activities of some AXEPTools
- AXQuery Support is a server on which the user and the AXCP may perform queries

AXMEDIS P2P for B2B: AXEPTool
Example of AXEPTool monitoring

Summary of AXMEDIS P2P Node Status

<table>
<thead>
<tr>
<th>Node Profile</th>
<th>AXMEDIS Version</th>
<th>Node ID</th>
<th>Operating System</th>
<th>AXMEDIS Status</th>
<th>AXMEDIS Name</th>
<th>AXMEDIS Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example</td>
<td>1.0</td>
<td>16</td>
<td>Windows 7</td>
<td>Online</td>
<td>Example</td>
<td>Example</td>
</tr>
</tbody>
</table>

Network results

AXTrack's traffic

- Maximum Inbound
- Average Inbound
- Maximum Outbound
- Average Outbound
Content Sharing among Content Archives

- Internet Distributor
- Archive B
- Content Provider
- Mediateque C
- Archive A
- Mobile Distributor
- Library C
- Content Integrator
- Archive Z
- Wireless LAN
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AXMEDIS Multichannel Distribution

- PCs via Internet+P2P, AXMEDIS P2P and PC player: TISCALI Media Club, DSI
- PCs via Internet, AXMEDIS PC player:
  - ELION, VRS
- PCs via Satellite data broadcast, AXMEDIS PC player:
  - EUTELSAT, UNIVLEEDS
- PDA via Kiosks, AXMEDIS PDA player:
  - ILABS + ANSC Kiosks, TISCALI, DSI
- STBs and PVRs:
  - AXMEDIS STB: IPTV, Internet VOD: TEO, VRS
  - AXMEDIS STB/PVRs via Satellite data broadcast:
    - EUTELSAT, MBI
- Mobiles:
  - AXMEDIS mobile player: ILABS, TISCALI, DSI
  - OMA player: Telecom Italia (TI), DSI
- PCs via Internet+P2P, AXMEDIS P2P and PC player:
  - free air DVB-T + home domains/media center
  - BBC, SDAE, ETRI, UPC
AXMEDIS Multichannel Distribution

- **VOD, Video or Content on Demand:**
  - Internet direct download, PC (AXMEDIS DRM)
  - Internet P2P, PC, mobile
  - IPTV streaming: STB of Motorola
  - Streaming of AXMEDIS MPEG-21, audio/video
  - Progressive download of AXMEDIS MPEG-21, audio/video

- **Satellite data broadcast**
  - Distribution in Push
  - STB/PVR in download

- **DVB-T + P2P ++**
  - EPG + recording + intelligent content

- **Kiosks and PDA**
  - Push on Kiosks, Download on PDA

- **Mobiles**
  - Interoperable MPEG-21 and OMA DRM production
  - AXMEDIS/MPLG-21 player and/or OMA for mobiles
  - Download and progressive download on mobiles, java

- **UGC, user generated or posted content**
  - SIAE trial
  - Automated production, transcoding, licensing, etc.

- **P2P as support for the above**
  - B2B and/or B2C networks

---

AXMEDIS Multichannel Content Distribution

**Players**
- PDAs
- PCs
- Mobiles
- i-TVs
- STBs

**Content Providers**
- AXMEDIS Portal
- AXMEDIS Certifier & Supervisor Server

**Content Integrators**
- PDA-Distributors
- PC-Distributors
- Mobile-Distributors
- Physical Distributors

**Local distributors and Kiosks**

**Collecting Societies**
- AXMEDIS P2P TOOL (AXEPTool)

**Channel Distributors**
- Satellite and Terrestrial Broadcasting

**B2B and/or B2C networks**
- P2P as support for the above
and VOD on PC with P2P

Cross media Content, from video, audio to complex content

Controlled P2P network

Media Club Portal

Sale and CRM service

AXMEDIS DRM

Accounting and reporting

issue license

TISCALI Media Club, Distribution Portal

Video, audio to complex content

Cross media Content, from video, audio to complex content

Controlled P2P network
TISCALI Media Club, Distribution Portal

Push Distribution and AXMEDIS Technology

AXMEDIS Technology

AXMEDIS Content Processing

MPEG-21

EUTELSAT

Sale Manager

Broadcast Server

AXMEDIS DRM

AXMEDIS Tool
EUTELSAT Distribution with AXMEDIS Technology

AXMEDIS Service on ATLANTIC BIRD™ 1:

- 12.5° West, covering Europe and Americas
- Frequency: 11.428GHz
- Symbol rate: 30000KSym/s
- Polarization: Horizontal

http://www.eutelsat.com/satellites/125e.html

VIDEO on EUTELSAT distribution

http://www.axmedis.org, Paolo Nesi, July 2008
Mobile & kiosk scenario as 2 channels, POD

Content delivery to user
Content delivery to distributor
Content sharing via AXEPTool

ILABS Content Distribution to Kiosks and PDA

The link to download this video is in the last page of these slides.
AXMEDIS and IPTV, VOD on STB/PC

- Cross media content, from video, audio to complex content
- Audio and Video
- Video on Demand
  Front End Server
- Sale and CRM service
- Issue license
- AXMEDIS DRM

VIDEO on TEO VOD channel

The link to download this video is on the last page of these slides.
Content Production on the Consumer Side

Cross media Content, from video, audio to complex content

TV free on air

BBC Broadcasting, DVB-T

Accounting and reporting

AXMEDIS DRM

Added value content via ADSL

Recording, added value Content Package on site production and domain management

Free on air transmission

Grant authorization

www.axmedis.org, Paolo Nes, July 2008

BBC Broadcasting, DVB-T

Cross media Content, from video, audio to complex content
VIDEO on BBC content production

AXMEDIS BBC AX4HOME recorder/player
**Interoperability among channels**

- Channels are the distribution methods for content:
  - Streaming, e.g., DVB-T, S, H
  - Downloading, WEB

- Channels are grounded on different communication standards,
  - MPEG, HTTP, RTSP, DVB, etc.
- Content and devices are strongly related to the supported input channel

- AXMEDIS content is independent on the communication channel
  - Content can be automatically produced for multiple channels at the same time
  - Content received from one channel can be passed to a different one

**Factory and integration**

AXMEDIS Automated and Manual Factory Tools

- AXCP Quick Start, Your tools commands, Workflow systems,...
- Monitoring & Reporting
- AXMEDIS DRM

- WEB Server
- Playout Server
- Web+Strm Server
- P2P distrib & monitor

- AXMEDIS Automated and Manual Factory Tools
- FTP, WS, etc.
- DB
- CMS

- Internet, WEB, VOD, POG...
- Broadcast, IPTV, VOD, POG...
- Social Networks
- Mobiles, PDA, etc.
AXMEDIS slides, http://www.axmedis.org

**Mobile distribution, OMA and MPEG-21**

- AXMEDIS License Server
- AX Dist. Service
- OMA Content Issuer
  - Rights server
- AXCP GRID Scheduler
- Promotion Portal
- Selling Portal

**Collection of Actions Logs Records**

**Content**

- Acquisition & usage

- Dir=ProfileProcessing(UID,DP,NP)
- AXเรียนรู้(Content(db));
- B.MP21_Package(A);
- Pinfo=MP21_RandDefinePinfo();
- B.MP21_Protection(Pinfo);
- C.ObjPublishing(Portal1);
- B.Adaptation(A, Dir);
- OPinfo=OMA_RandDefinePinfo();
- E.OMA_DRMPackager(B, OPinfo);
- E.OMA_ObjPublishing(Portal2);

**Rights server**

- D=ProfileProcessing(UID,DP)
- L.LicenseSet(UID,OID, DID, Const);
- L.RelProduction();
- L.RelPosting(ls1);
- M.Rel_to_OMAdrmConversion(L, D);
- M.ODRLPosting(ls2);

**D=ProfileProcessing(UID,DP,NP)**

- A=GetContent(db);
- B.MP21_Package(A);
- Pinfo=MP21_RandDefinePinfo();
- B.MP21_Protection(Pinfo);
- C.ObjPublishing(Portal1);
- B.Adaptation(A, Dir);
- OPinfo=OMA_RandDefinePinfo();
- E.OMA_DRMPackager(B, OPinfo);
- E.OMA_ObjPublishing(Portal2);
Distribution of cultural content, AV guides

- At MUSA: instrument museum at Accademia Nazionale di Santa Cecilia, Roma
- Usable for AV guides, even with RFID
- Production of content for continuous formation, in medical area or for other interactive guides
- Monitoring of the user activities

AXMEDIS slides, http://www.axmedis.org
Content Enrichment with final users

- Content Enrichment with AXMEDIS
- **VARIAZIONI** e-ContentPlus
- www.variazioni.org
- Content
  - enrichment, several forms
  - produced and reproduced on demand at each enrichment
  - production with DRM
  - distribution from VARIAZIONI portal and from AXMEDIS P2P
- > than 10 partners + communities
  - Partners from Spain, Lithuania, Belgium, Portugal, Italy, Finland, Portugal

Content Enrichment and social network

- **audiovisual**
  - Master classes of famous magisters (Harmos)
  - Concerts
  - Conferences
  - Special Events…
- **audio**
  - Concerts
  - Lessons
  - Rehearsals of concerts
  - Popular Songs…
- **historic documents**
  - Programs of concerts
  - Letters
  - Scores
  - Images
  - Articles
  - Pedagogical Material
Summary

- Coverage
- AXMEDIS Model
- AXMEDIS DRM
- AXMEDIS Editor and Players
- AXCP: Automating Content Management
- AXMEDIS P2P
- Multichannel Support
- AXMEDIS Framework

Mapping Main AXTools on Life-Cycle

- Production
  - AXEditor
  - AXEPTool P2P
  - AXCP GRID
  - AX-DRM
  - AX-EDI
  - AX-P2P
  - AX-Players

- Pre-production
  - AXEditor
  - AXCP GRID
  - AX-DRM
  - AX-P2P
  - AX-Players

- Post-production
  - AXEditor
  - AXEPTool P2P
  - AXCP GRID
  - AX-DRM
  - AX-EDI
  - AX-P2P
  - AX-Players

- Distribution
  - Satellite
  - Internet
  - P2P sharing
  - Terrestrial
  - Mobile

- Consumption
  - languages
  - GRID solutions
  - P2P sharing
  - processing
  - workflow
  - flexibility
  - plug-ins
  - tools
  - databases
  - standards
  - webservices
  - optimisation

---

AXMEDIS slides,  http://www.axmedis.org

www.axmedis.org, Paolo Nesi, July 2008
**Applications and scenarios**

- **In most of the cases there is:**
  - Usage of the AXMEDIS Editors and Players
  - Massive usage of the AXCP GRID for managing back office issues, defining specific scripts for:
    - Automated content production and adaptation (MPEG-21, OMA, etc.)
    - Automated creation of licenses (MPEG-21, OMA, etc.)
    - Automated regeneration of new versions of the objects
    - Automated object acquisition and posting on DataBases
  - Support of the AXMEDIS PMS and AXCS for the DRM aspects
  - Support of the CAMART and All for collecting reporting data
  - Usage of the AXMEDIS Editors and Players
  - Front ends for selling and distributing of the Distributors involved so that to maintain their plate and relationships with their customers

- **In some cases there is the usage of:**
  - The P2P tools, for B2B and B2C
  - Some specific tools for content posting on the databases
  - Some specific player tools for final users
  - Some specific tools for Home and Factory Domain Management
  - Workflow support

---

**AXMEDIS Framework for all**

- Content Distributors
- Content Providers
- Content Integrator, editors
- IT Companies
- Telecom Operators
- Broadcasters
- Collecting societies
- Associations
- Research institutions
- Cultural Institutions
- Etc.

AXMEDIS Partners

AXMEDIS Based solutions

trials, and channels
**AXMEDIS Technical Architecture**

User Interaction and/or Automated Control via WSs

<table>
<thead>
<tr>
<th>AXMEDIS (CP) Content Processing</th>
<th>AXMEDIS Authoring Tools Metadata Resources</th>
<th>AXMEDIS manual and autom. content sharing and Distribution Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>AXMEDIS Authoring Tools Metadata Resources</td>
<td>AXMEDIS manual and autom. content sharing and Distribution Tools</td>
<td></td>
</tr>
<tr>
<td>AXMEDIS DRM Servers</td>
<td>AXMEDIS Authoring Tools Metadata Resources</td>
<td>AXMEDIS manual and autom. content sharing and Distribution Tools</td>
</tr>
</tbody>
</table>

Content Crawling Packaging Support Content Processing |

<table>
<thead>
<tr>
<th>AXMEDIS Model Supports and Plug-ins</th>
<th>AXMEDIS, MPEG-21 Databases</th>
<th>AXMEDIS DRM Servers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional and P2P Distribution Channels and servers</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Coverage**

<table>
<thead>
<tr>
<th>Device for player</th>
<th>Models</th>
<th>CAS</th>
<th>DRM</th>
<th>Accounting, rep.</th>
<th>Player</th>
<th>Down., Stream., PD</th>
<th>Automated back office</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC</td>
<td>VOD, PPV, Counting, Periodic, subscription, ....</td>
<td>--</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>D, S, PD</td>
<td>Yes</td>
</tr>
<tr>
<td>STB/PVR</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>AXOM</td>
<td>D, S, PD</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>PDA</td>
<td>--</td>
<td>Yes</td>
<td>Yes</td>
<td>D</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mobile</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>D, PD</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IPTV/STB</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>AXOM</td>
<td>any</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>webTV</td>
<td>--</td>
<td>Yes</td>
<td>Yes</td>
<td>D, PD</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social network</td>
<td>--</td>
<td>Yes</td>
<td>Yes</td>
<td>D, PD</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UGC</td>
<td>--</td>
<td>Yes</td>
<td>Yes</td>
<td>--</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P2P</td>
<td>--</td>
<td>Yes</td>
<td>Yes</td>
<td>D, PD</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
- A unique framework for all
  - Cross Media Content and tools
  - Backoffice Automation
  - Standards
  - Open platforms
  - Interoperability on content
  - Interoperability on devices/players
  - Interoperability on DRM

- The added value to your business!

Click on these links to download the videos

- editor-new5b.wmv
- play5-N.wmv
- play5-VIDEO-NESI.wmv
- new-xim-ansc-objects-with-audio.wmv
- pda-player-medium.wmv
- sat-dist-with-audio.wmv
- kiosk.wmv
- AXELTEO-TEO-STB-demo.wmv
- ELION-enduser-nesi.wmv
- bbc-user4.wmv
- siae-presentation-short-July2007-new-nov07.wmv
Technical Notes

- AXMEDIS for all
- AXMEDIS Object model
- AXMEDIS Automated Content processing
- AXMEDIS P2P
- AXMEDIS DRM
- AXDRM how to use on a portal
- Video on demand and STB, TEO show case
- Content on demand on Internet, ELION show case
- Content distribution via Satellite Data broadcast EUTELSAT Case

Please download AXMEDIS Tools

- AXMEDIS PC player:
- AXMEDIS PC player with SKIN
- AXMEDIS PC player, Active X and .Net
- AXMEDIS PC player for EUTELSAT OPENSKY:
- AXMEDIS Editor:
- AXMEDIS content production tools (includes the above AXMEDIS Editor):
- PDA player:
- PDA content:
- P2P Client tool AXEPTool:
If you like to know more about the AXMEDIS framework and other AXMEDIS technologies and functionalities please do not hesitate to contact the project coordinator.

Prof. Paolo Nesi, Ph.D.

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