

**Automating Production of Cross Media Content  
for Multi-channel Distribution**

[www.axmedis.org](http://www.axmedis.org)

IST-2-511299

## AXMEDIS 2007

# AXMEDIS Overview and Content Distribution

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<http://www.axmedis.org/>  
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- **Preface** 
- **What is AXMEDIS**
- **Short Market Analysis and Opportunities**
- **State of the Art, Limitations, Needs**
- **AXMEDIS Content Packaging**
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- **AXMEDIS Content Production and Processing**
- **AXMEDIS Application Scenarios**
- **Conclusions and references**






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## This AXMEDIS tutorial and the others for the 2006


- **This tutorial belongs to a series:**
  - ◆ **Content Production:** manual production of content, AXMEDIS model, MPEG-21 Model, object authoring, the packages, the metadata editor, the license editor, the protection editor, the players (PC, PDA, Mobile, STB/PVR), etc., Any kind of digital format content into the AXMEDIS format.
  - ◆ **Content Processing,** automated content production and processing tools, automating the backoffice, AXMEDIS GRID tools, estimation of descriptors, estimation of fingerprint, content protection, crawling of legacy databases and content management systems, content formatting, usage of Scripts, etc.
  - ◆ **Workflow tool usage with AXMEDIS tools,** integration of workflow systems with AXMEDIS, control of AXMEDIS tools, monitoring, etc.
  - ◆ **Content Distribution,** multichannel content distribution, example of for internet distribution with TISCALI, example of mobile distribution with ILABS, example of Kiosk distribution towards PDAs with ILABS, example of satellite distribution with EUTELSAT, content sharing, etc.
- **In some occasions they are proposed in compressed and/or aggregated forms**

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## Purpose of this Tutorial

- **This tutorial aims to provide you an overview of the AXMEDIS technologies, solutions and architecture.**
- **It gives you answers to the following questions**
  - ◆ What is AXMEDIS ?
  - ◆ Which is the State of the Art of the sector ?
  - ◆ Which are the innovations/advantages of AXMEDIS ?
  - ◆ What can I do with AXMEDIS ?
  - ◆ Why I should use AXMEDIS ?
  - ◆ Which are the major tools of AXMEDIS ?
  - ◆ How can I use AXMEDIS for my business ?
  - ◆ Which implications I have in using AXMEDIS ?
  - ◆ Who can help me in knowing more ?
  - ◆ Any other which ?
  - ◆ ...
- **Please do not hesitate to make questions !!**


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## Schema of the Tutorial and Purpose

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- **Duration: 3.5-4 hours**
- **Which could be the Attendees of this Tutorial:**
  - ◆ **who** is interested to get a general overview of AXMEDIS aims, technologies, solutions and tools
  - ◆ **Business Managers and decision makers** interested in understanding if AXMEDIS is suitable for their business or not, if it is an advantage or not, etc.
  - ◆ **Technical Managers** interested to have a first overview
    - ➔ How to exploit AXMEDIS technology in their solutions
    - ➔ technical innovation of AXMEDIS with respect to the state of the art
  - ◆ **Research Managers** interested to get an overview of the whole architecture and assessing the advantages for Using AXMEDIS framework for:
    - ➔ testing and developing new solutions, new algorithms, etc., reducing costs of infrastructure creation
    - ➔ Promoting and disseminating their new solutions on a large audience
    - ➔ Making business with AXMEDIS, exploiting the framework


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- AXMEDIS Application Scenarios
- Conclusions and references


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## What is AXMEDIS ?

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- **AXMEDIS is a consortium/project of the European Commission proposed by companies and institutions to solve a set of problems in the area of e-commerce of digital content**
  - ◆ approved by the EC for reaching specific objectives, among them the creation of an Open Platform for the digital content production, protection and distribution.
  - ◆ partially funded by the EC and partially from the Companies and Institutions involved
- **Start: 1st September 2004**
- **Cost: about 14 Meuro, >8 Meuro of Funding**
- **About 200 people are working on AXMEDIS every day**
- **More than 35 partners (contractors and affiliated)**

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## Partners

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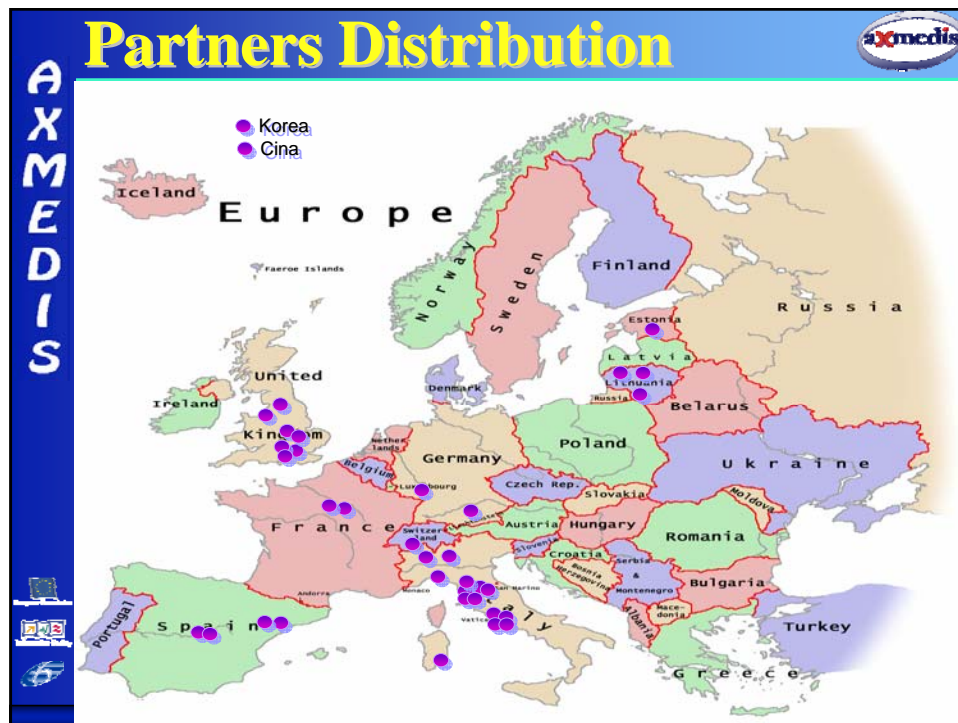
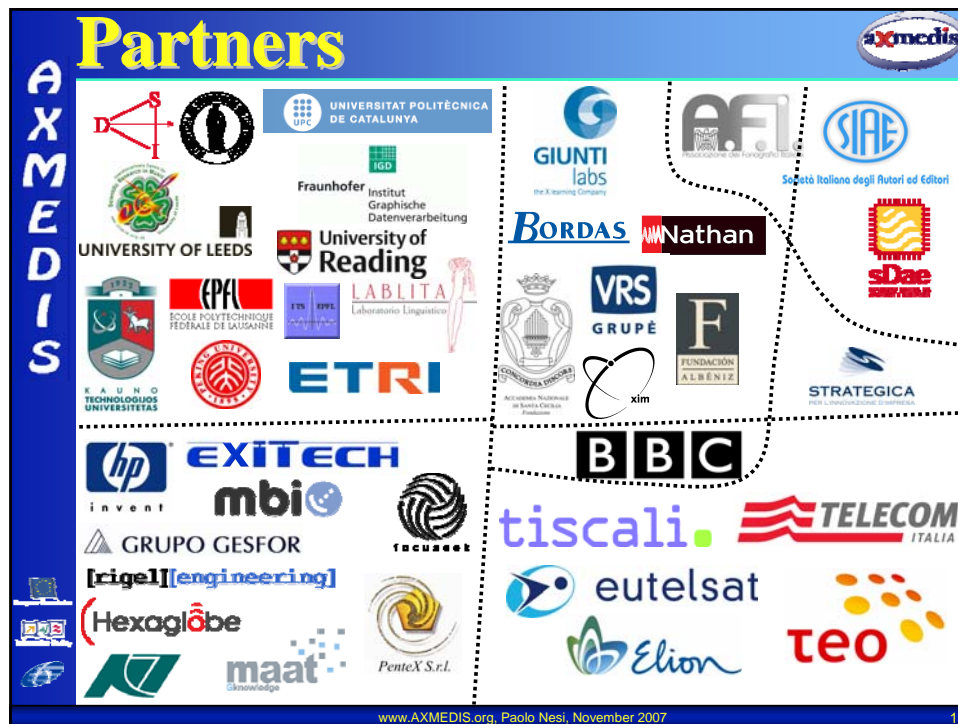




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## Growing and numbers



- **AXMEDIS started in Sept 2004 with fewer partners**
  - ◆ GIUNTI, TISCALI, EUTELSAT, HP, AFI, SEJER, etc.
  - ◆ Univ. Florence, Univ. Leeds, FHG, Univ. Politecnica Catalogna, 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
- **Now**
  - ◆ >700 AXMEDIS technical documents/tools have been downloaded
  - ◆ >1.2 Millions of accesses





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## Objectives


- **reduction of costs for content production, management and distribution considering activities of B2B and B2C**
- **exploiting new models, methods and tools for content production, protection and distribution**
  - ◆ Content more
    - interactive: .....cross media, multimedia
    - interoperable: ....device, DRM, formats
- **Supporting massive processing for content production and distribution (on demand)**
- **Harmonize B2B and B2C**
  - ◆ Enforcing flexibility in business and transaction models
  - ◆ Integration of B2B and B2C areas
  - ◆ Modeling secure/legal P2P content sharing for both B2B and B2C
- **Create the AXMEDIS Framework for all**



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## Applications and Customers


- **Applicative areas of AXMEDIS automation**
  - ◆ Entertainment, edutainment, infotainment, educational, etc.
    - ➔ Real-time and non-real-time content production, distribution and sharing
    - ➔ Internet, P2P, broadcast, IPTV, mobiles, DVB-T, DVB-S, DVB-H, etc.
  - ◆ And also:
    - ➔ banking, governmental, military and healthcare
- **AXMEDIS Customers**
  - ◆ content management, production, protection and distribution
    - ➔ Broadcasters, satellite, terrestrial, etc.
    - ➔ Telecom operators, multichannel operators
    - ➔ Content producers, editors, publishers
    - ➔ Collecting societies
    - ➔ Multimedia and cross media archives and WEB Portals
    - ➔ Etc.

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## Technical Applications

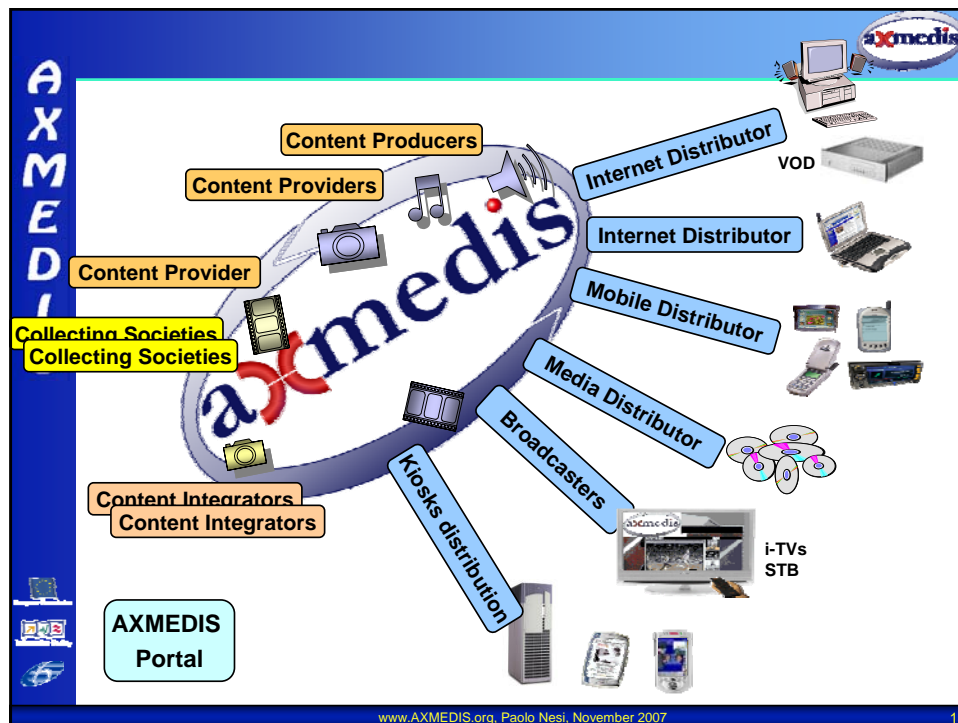
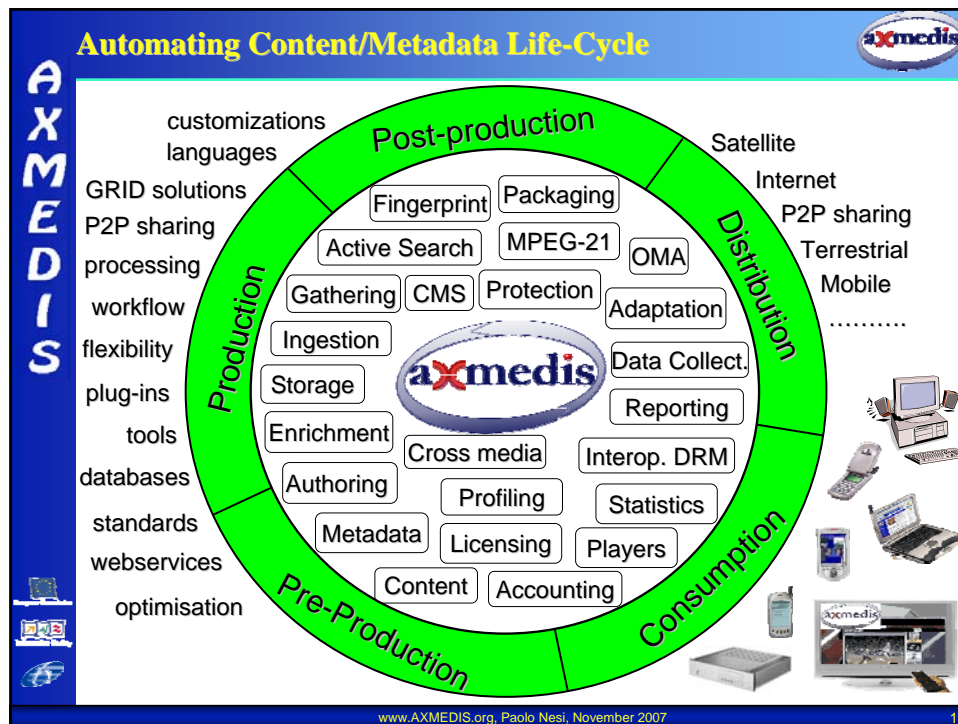
- General content management and processing
- Multi-channel production and distribution: broadcasting, IP/Internet, WEB sites, P2P, mobile, PDA, IPTV, interactive TV and channels, etc.
- Multi-channel experience for customers
- Video on Demand (VOD), and production on demand solutions
- Control of P2P content sharing and distribution, involving your customers in distribution (super-distribution)
- Involve customers and final users in content production and social networking
- interoperable DRM (MPEG-21, OMA, etc.)
- different business models and/or transactions on the same distribution channels: pay per play, monthly rate, preview, renting, advertising, etc.

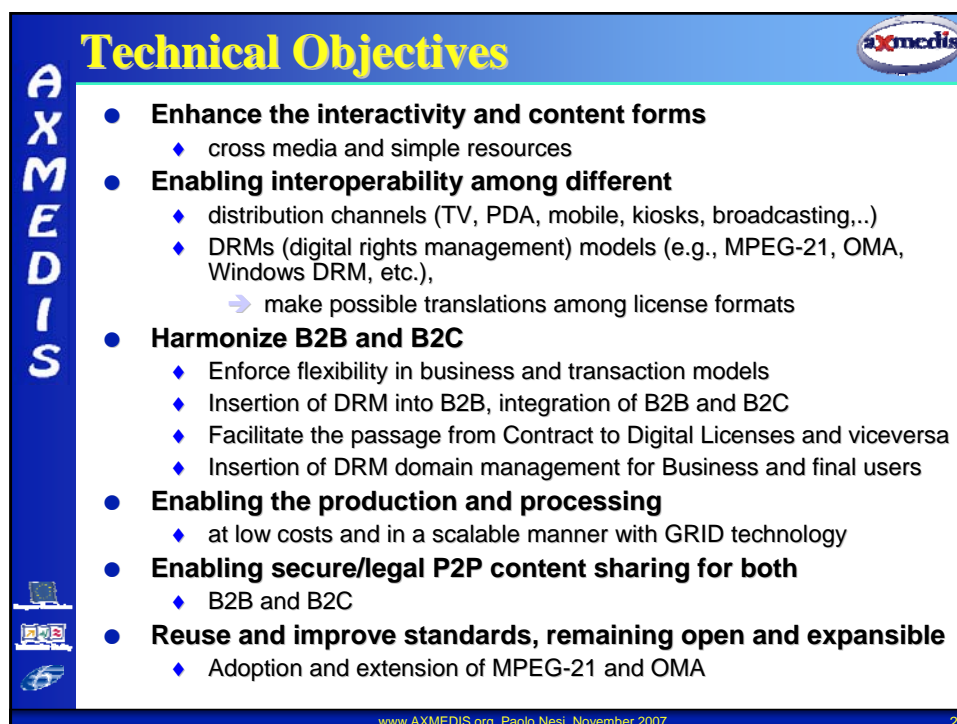
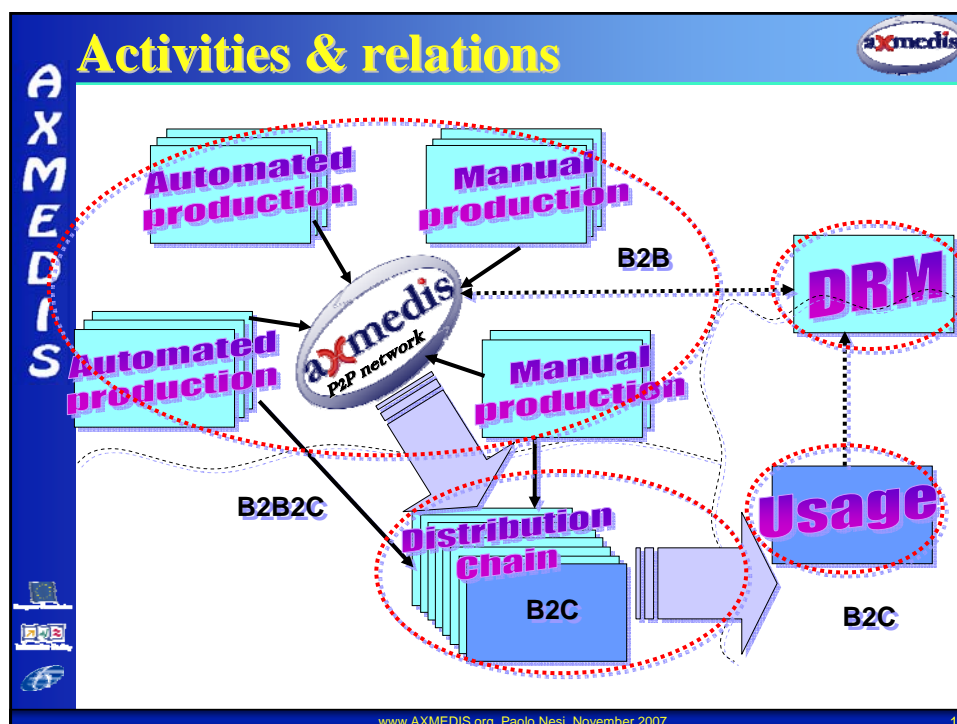




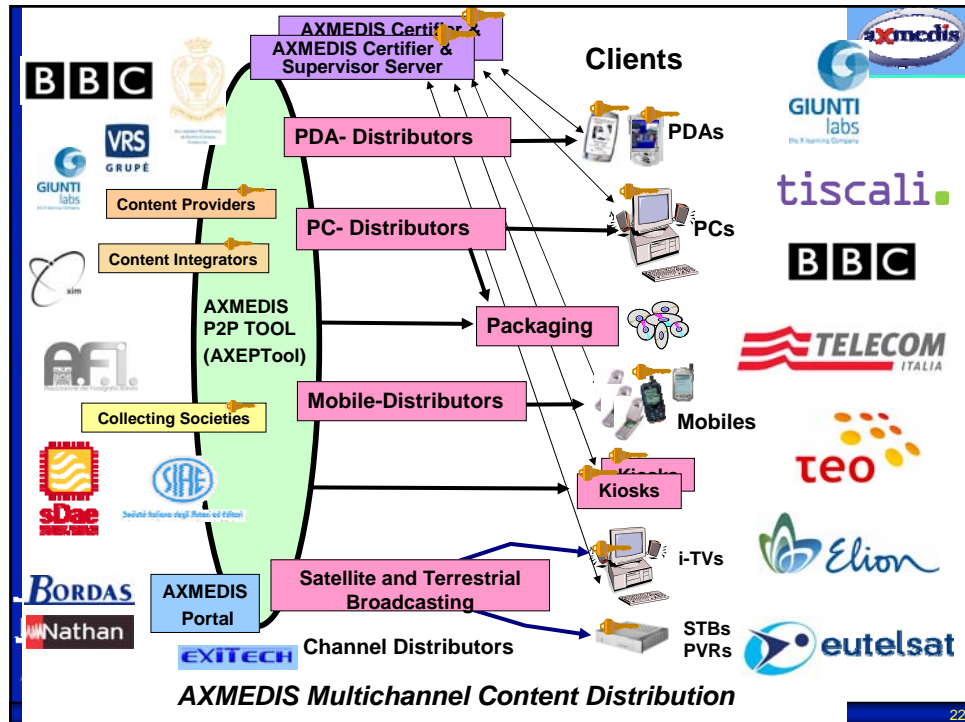
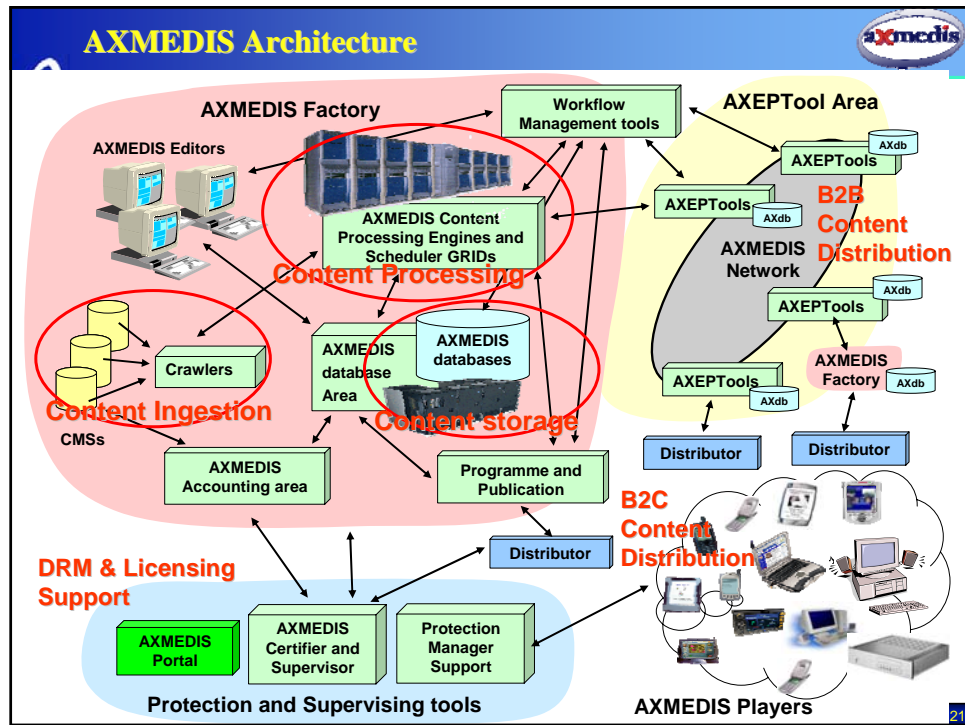
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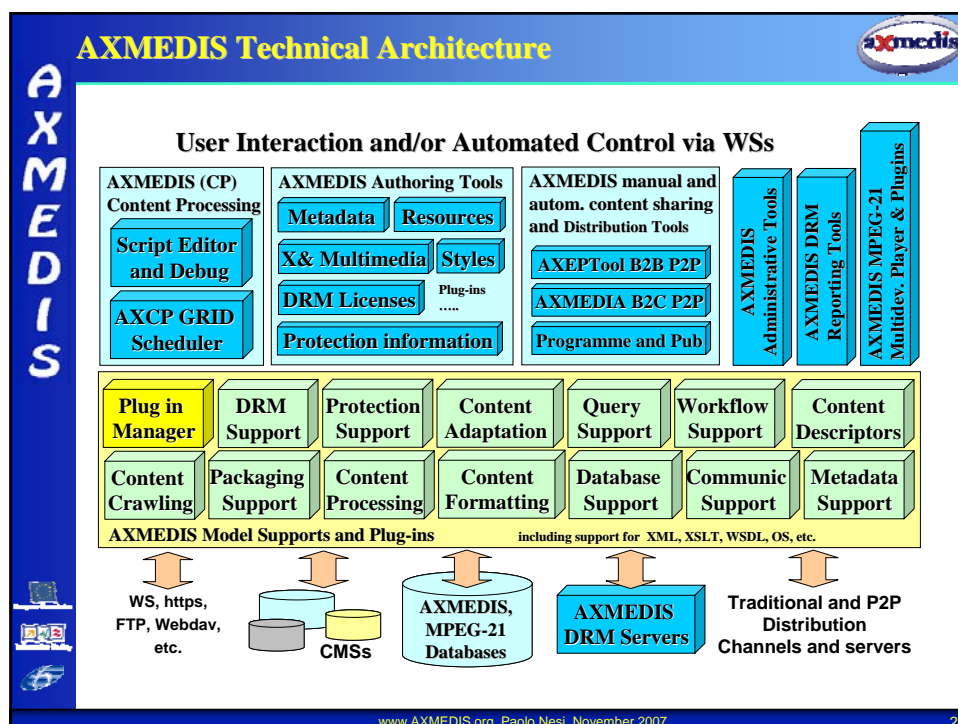
## AXMEDIS Framework

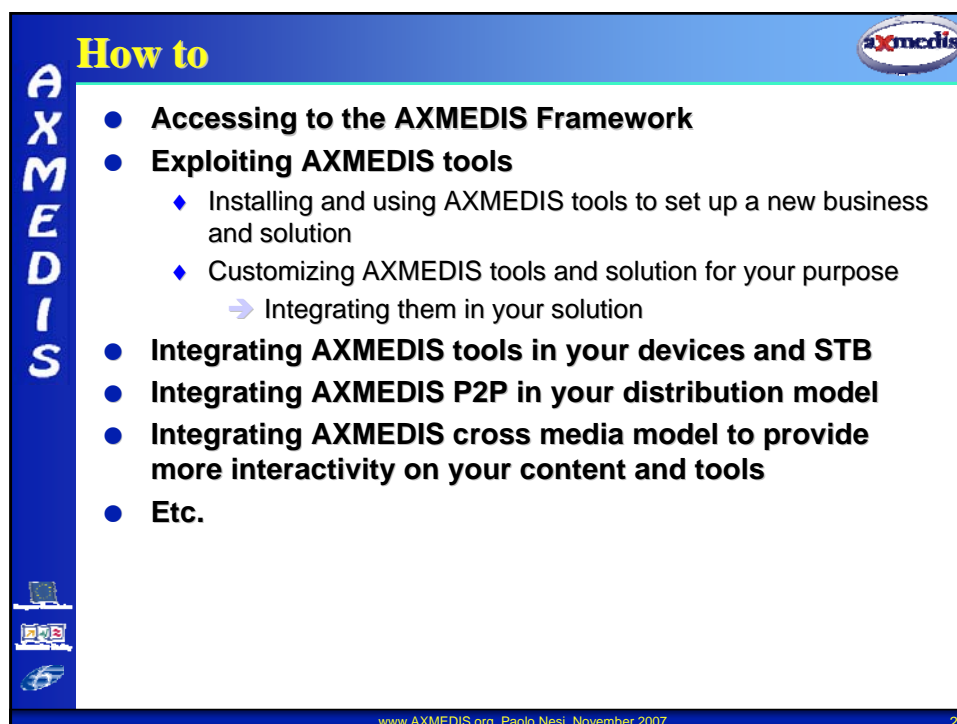
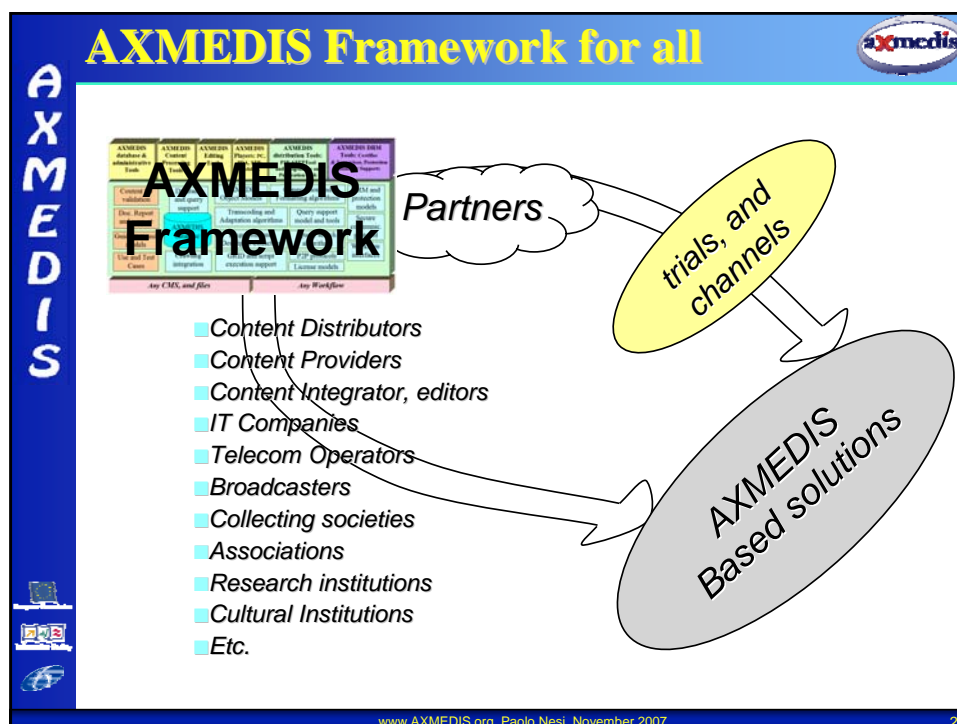
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- **A unified European platform for content production and distribution, AXFW**
  - ◆ Improve standards
  - ◆ Development of the AXFW
  - ◆ Make the AXFW open, expansible and accessible to all
  - ◆ Open the Affiliation Programm to access at the AXFW
  - ◆ Set up of trials and demonstrators

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## Affiliation to the AXMEDIS

- **You can become affiliated with AXMEDIS.** The affiliation provides access to
  - ♦ **a large amount of information and knowledge**
  - ♦ **full source code of the AXMEDIS Framework**
- The benefits of the affiliation include the possibility of using the AXMEDIS technology and tools (customize them from source code), for your business without limitations
- The affiliation can be formalized via the affiliation agreement, you can find information on the flyers and on the DVD and on the portal.
- The affiliation has a convenient annual fee that can be covered in money or value by offering in change contributions to the AXMEDIS Framework itself for the community.
- For additional information please contact Paolo Nesi  
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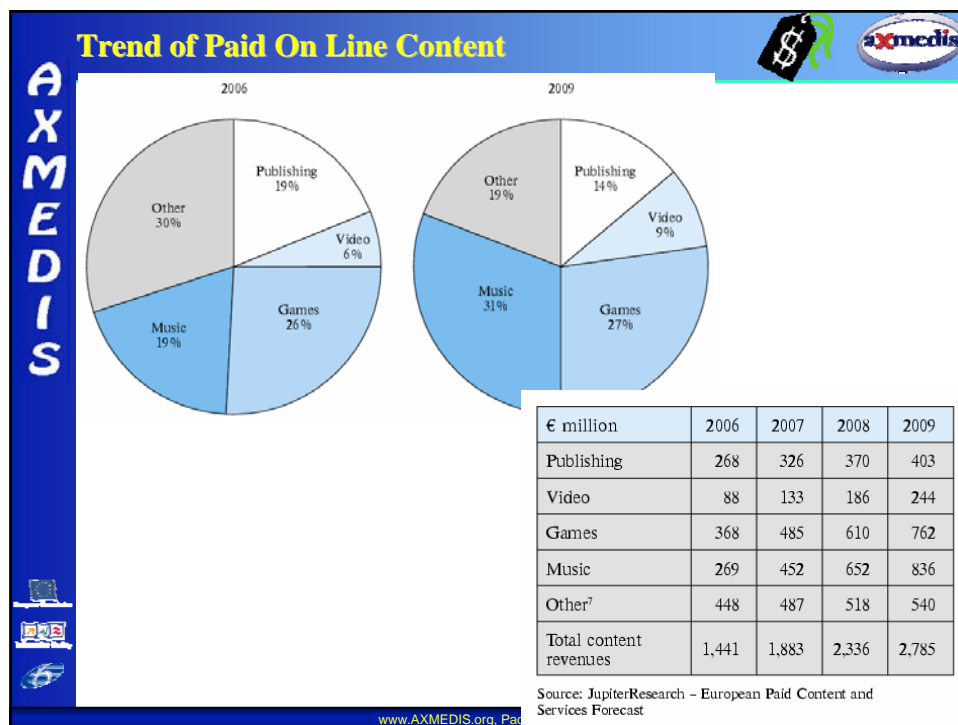
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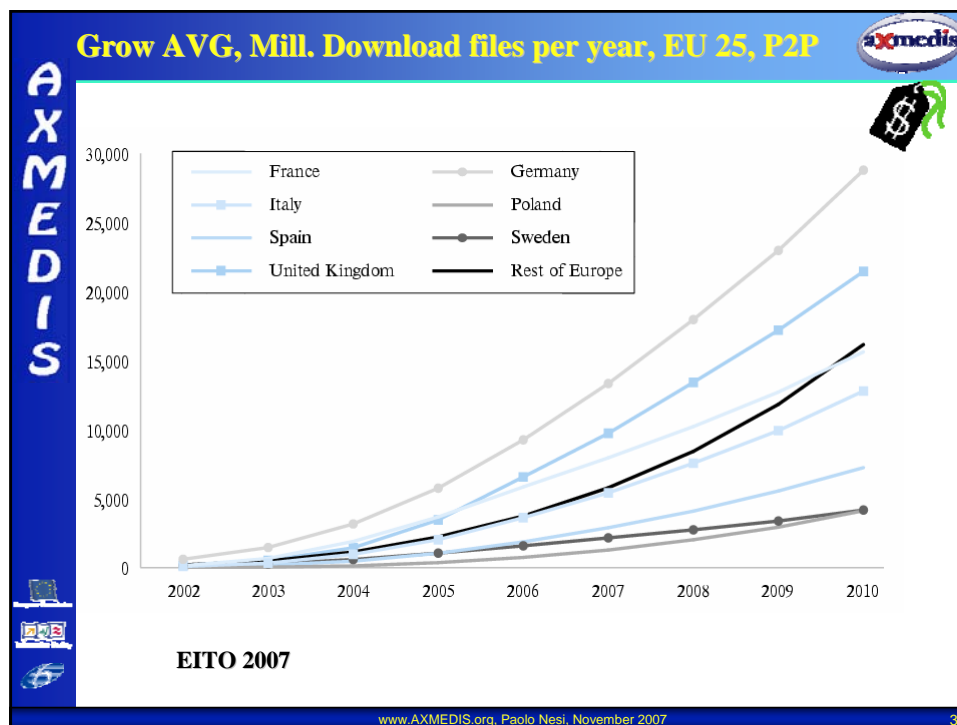
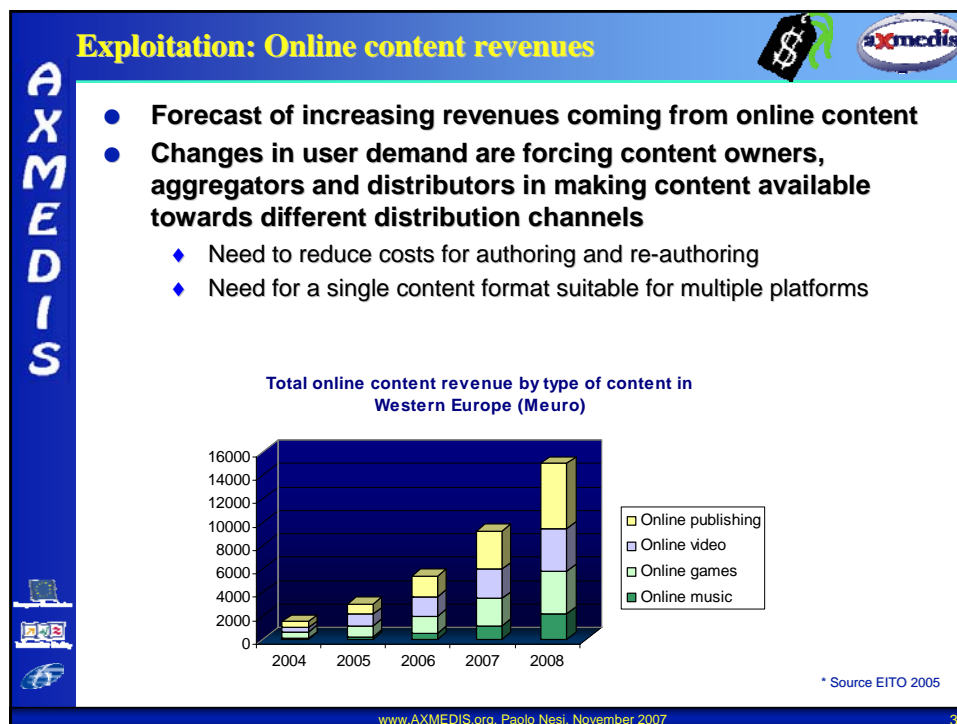


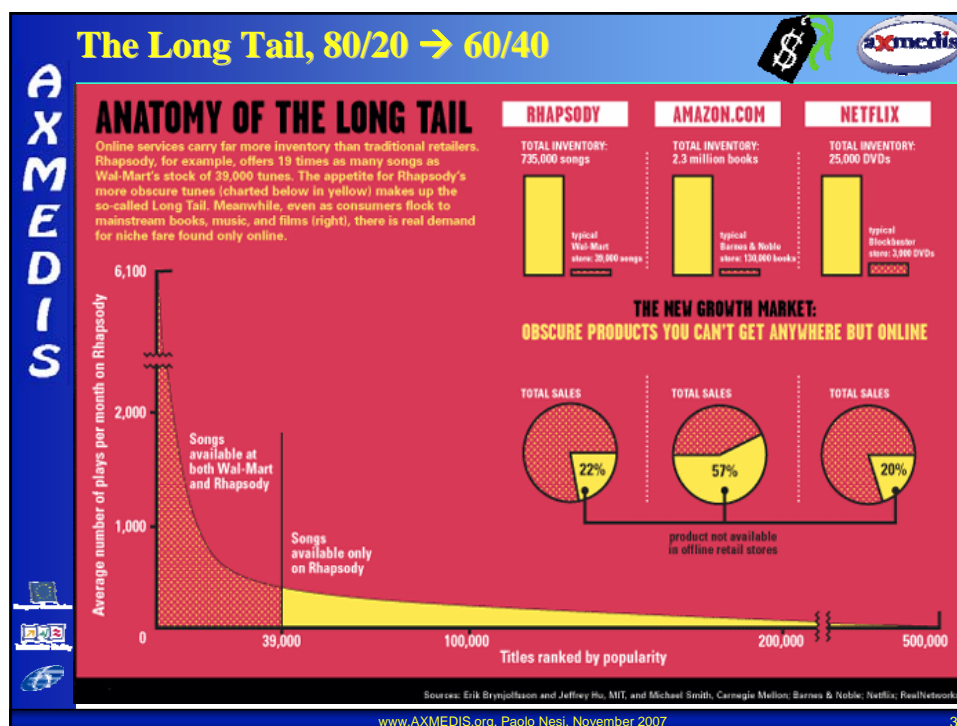


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## Needs and the cure

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- **Lower costs for**
  - ◆ production (packaging, protection, management, advertising, etc.), distribution and advertising
  - ◆ contract management, licensing, accounting, reporting, etc.
  - ◆ P2P distribution
- **Automation is THE cure/solution to**
  - ◆ reduce the costs
  - ◆ make the long tail access possible and convenient for all


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# Contingency



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- **Trend of the market for digital content:**
  - ◆ Audio and Video distribution growing
  - ◆ Issues regarding the market loss for piracy (60-80%)
  - ◆ Issues regarding the P2P as primary source of piracy
  - ◆ High costs of content production and distribution
  - ◆ long tail of content (the low of 80/20, 60/40)
  - ◆ High business risks
- **High demands on**
  - ◆ content interactivity
  - ◆ interoperability of content and devices
  - ◆ tools for cultural valorization of content
- **Issues on DRM**
  - ◆ Legal and technical capabilities
  - ◆ Lack of interoperability, openness
  - ◆ Flexibility in the business and transaction models
- **Massive processing in content production and distribution, and in license processing and event tracking**
- ***These are a real challenge for many industries that are discovering the complexity of managing large digital content factories and distribution chains.***





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## User's Trends

- **Users are gradually abandoning the traditional TV**
- **We can see that they**
  - ◆ Spend more time on PC/games console
  - ◆ Spend more money and time on i-TV
    - Cultural programme
    - Thematic information
  - ◆ Are more attracted by new content models and usages
  - ◆ Are more attracted by new devices,
  - ◆ Are interested in personal content publishing and sharing
    - YouTube, Video Google, etc.,
  - ◆ Are interested in Personal TV, personal realities,
  - ◆ Are more interested in individuality and personal needs,
  - ◆ Are interested in interactive and interoperable content
  - ◆ Are interested in home media centers and content management,
  - ◆ Etc,

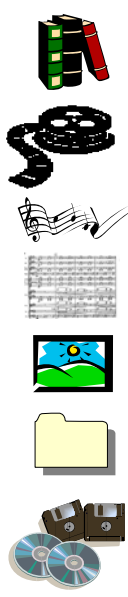
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## Convergence, the Interoperable Content



Internet Distributor

Internet Distributor

Mobile Distributor


Broadcasters, DVB-H

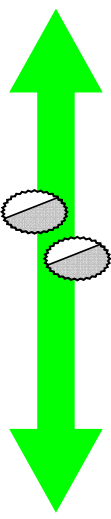
Media Distributor

Broadcasters, DVB-T

Broadcasters, DVB-S

Kiosks distribution






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## Present Needs for Accessing New Markets

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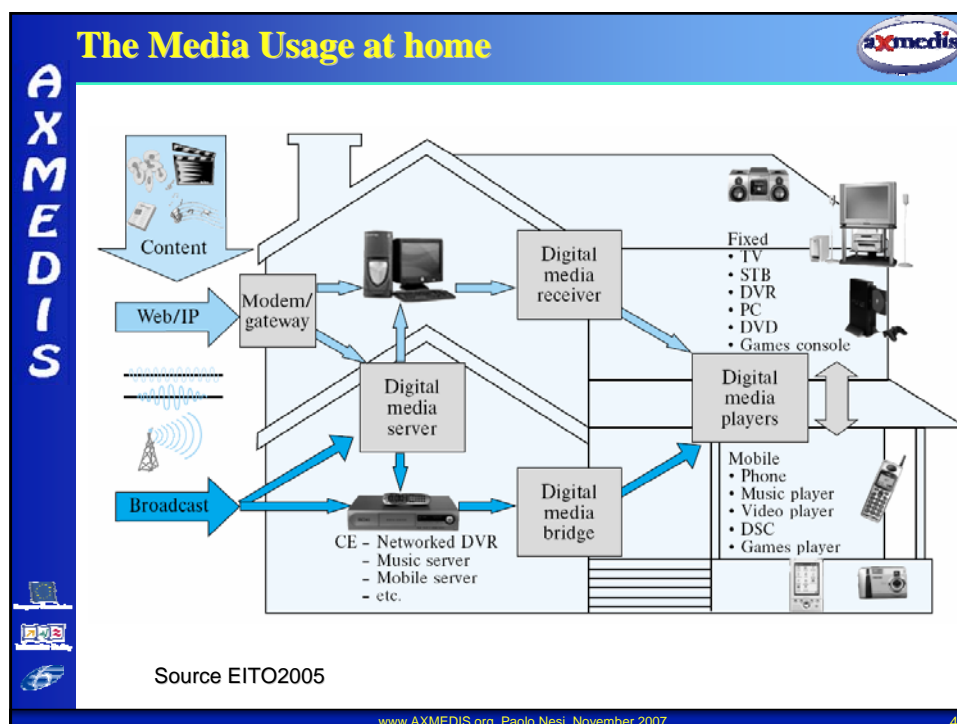
- **Reduction of costs to access at the Fatter "Tail"**
- **Needs of Interoperable Content that may Migrate from**
  - ◆ one terminal/device to another
  - ◆ one user to another
  - ◆ one channel to another
  - ◆ Licenses assigned to users, devices or domains
  - ◆ etc.
- **Transcoding/Adaptation problems**
  - ◆ Content is packaged
  - ◆ Content is protected, adaptation of protected content is needed
  - ◆ Content contains several types of information: digital resources, metadata, glue, etc.
  - ◆ On the servers and/or on the client terminals
- **DRM Architecture has to support Migration and Adaptation**
  - ◆ see in the following

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Not enough interactivity and interoperability





- **Cross Media Content examples are:**
  - ◆ Interactive training material
  - ◆ documents with hyperlinks
  - ◆ interactive content in which the user may navigate
- **DVDs, WEB pages, eBooks, etc.**
  - ◆ mainly audio visual or textual
  - ◆ allow the inclusions of Simple Games (only DVD)
  - ◆ mainly for physical distribution (e.g., DVD)
  - ◆ eBooks and WEB pages are only digital distribution
  - ◆ low or absent interoperability among devices and distribution channels
- **AXMEDIS Innovations**
  - ◆ more interactivity and interoperability among devices/players
    - Content moving among devices and player
    - The same content on difference devices
    - different media inside
  - ◆ flexibility in creating content packages
  - ◆ ...






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## Traditional value chain Issues, state of the art

- **The protection is performed just before distribution**
  - ◆ By the distributor or
  - ◆ By a specialized third party company as a service
- **The B2B areas are (production, integration, etc.):**
  - ◆ Considered trusted
  - ◆ Based on paper contracts
  - ◆ Contracts are produced on the basis of a limited and not standard terminology, so that they are not easy interpreted and transported on other media, or channels, etc.
- **Producers and integrators have no control about what is done on the content in the last phase of distribution:**
  - ◆ authors and producers cannot verify, they may ask
  - ◆ integrators cannot verify, they may ask at the business partners
  - ◆ Etc.
- **The distributors:**
  - ◆ control the selling of content, mainly with conditional access systems
  - ◆ do not control/verify the exploitation of each single rights






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## Aim of ..... Digital Rights Management

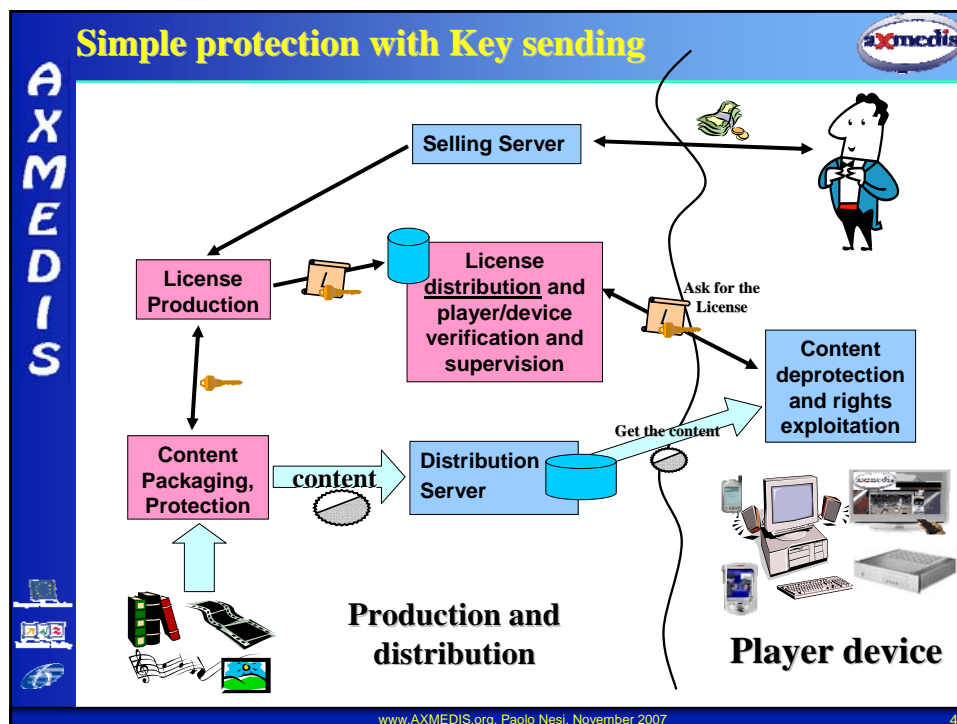


- **To prevent the non-authorized rights exploitation by who has not acquired the rights**
- **To allow accessing at the digital content functionalities in a controlled manner**
  - ◆ To who has been **authenticated/certified**
  - ◆ To do what (are the rights) is defined in a **License**
  - ◆ **Verifying/Control/Supervise** if the above conditions and others are respected
  - ◆ By using technologies to **protect content** (e.g., encryption, fingerprint, watermark, etc.)
- **To *Verifying/Control* if the allowed rights are respected**
- **There are some Cons, since the user is constrained:**
  - ◆ Registration of users
  - ◆ Authentication of users and/or tools/terminal/devices
  - ◆ Control of users
- ***It has to be supported by a set of additional technical solutions***

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### Technologies and standards

- **Technologies for content protection**
  - ◆ Microsoft Windows Media, DRM
  - ◆ Apple I-Tune
  - ◆ Media Commerce Suite of Real Network
  - ◆ Intertrust
  - ◆ Liquid Audio
  - ◆ DMD secure
  - ◆ Adobe
  - ◆ And also the Conditional Access Systems:
    - ➔ Nagravision, Irdeto, etc...
- **Standards on DRM**
  - ◆ OMA, Open Mobile Association
  - ◆ MPEG-21, DI, DID, IPMP, REL, etc.
  - ◆ XrML, Content Guard, related to MPEG-21

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| Market solutions viz AXMEDIS                         |   |
|--|---|
| Business Models                                      | Larger number of Business Models  |
| B2B DRM  | B2B, B2C, B2B2C DRM solution  |
| Proprietary / Standard DRM and model                 | Standard DRM: MPEG-21, OMA, etc.  |
| Non interoperable DRM                                | Allowed Interoperable DRM: MPEG-21, OMA, etc.   |
| Fixed/Flexible Protection Model                      | Any Protection Model, key, algorithms, etc.   |
| Separation among Content and license                 | Separation among Content and license  |
| Signed Content Header                                | Signed Content AXINFO, any Metadata   |
| Channel distribution                                 | Multichannel with the same license  |
| Players and Devices                                  | Players and Devices: PC MS-Windows, PDA Windows Mobile, STB, Linux OS, Apple MAC, Mobiles |
| License Proprietary: number of rights                | Licenses MPEG-21 REL: Expandable dictionary, Any type of rights, Licenses OMA             |
| Authentication of Player                             | Authentication of device, user, domain, etc.  |
| Revocation per Player                                | Revocation per device, user, etc.,  |
| Revocation per license                               | Revocation per license  |
| digital resources that can be included and protected | Any digital format, of any type   |
| Media content  | Single audio, video, image, doc, and Cross media: SMIL, HTML, SVG, MPEG-4,...             |
| Customizable Tools                                   | Customizable Tools: servers and player clients  |

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| Limitations of Present DRM solutions |  |
|--------------------------------------|--|
| AXMEDIS                              | <ul style="list-style-type: none"> <li>DRM is typically added only in the Integration or distribution phases           <ul style="list-style-type: none"> <li>DRM is seen mainly for B2C               <ul style="list-style-type: none"> <li>Added by distributors</li> <li>Owners demand to producers</li> <li>Producers demand to integrators or distributors</li> <li>Some Distributors demand to carriers</li> </ul> </li> <li>DRM is tuned for a specific distribution channel and media               <ul style="list-style-type: none"> <li>Windows Media DRM for PC/internet, etc.</li> <li>OMA DRM for Mobile</li> <li>Etc.</li> </ul> </li> <li>No convergence               <ul style="list-style-type: none"> <li>no interoperability of content</li> <li>No possibility of assigning a License to a Domain</li> <li>Partially solved producing content in several formats for several channels and terminals, very complex and expensive</li> </ul> </li> <li>Large Limitations for the final users</li> <li>Limitations for the business and markets</li> </ul> </li> </ul> |

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## Business Rules, a way to formalize allowed rights

- **Exploitation Models (contracts from the consumers to the provider are aligned to the exploitation model):**
  - ◆ Subscription to a collection or service
  - ◆ All you can eat
  - ◆ Pay per renting
  - ◆ Pay per use, pay per play, pay per print, etc.
  - ◆ Pay per stream, per download, etc...
  - ◆ Pay per minute all you can eat
  - ◆ Pay per burning the CD
  - ◆ Pay per copy the object
  - ◆ Pay per moving the object
  - ◆ Pay per passing the object to a different device
  - ◆ Pay per building a collection
  - ◆ Preview without paying
  - ◆ Try and buy
- **Etc.**

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## B2B Rights Management


- **Advantages of B2B DRM**
  - ◆ Automation of contract-based deals
  - ◆ Assessing the Usage in the B2B
  - ◆ Reducing costs of B2B promotion
  - ◆ Allowing integration and composition of protected content
  - ◆ Allowing content production on demand, no contracts signatures, immediate DRM processing
  - ◆ Try and buy, try and use for business
  - ◆ Free try for Business users
  - ◆ Increasing the control, decreasing the risk
- **P2P distribution**
  - ◆ sharing of content
  - ◆ lower costs to access content
  - ◆ Lower costs to promote/distribute content
  - ◆ Increment of accessible content


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## Summary of Major Needs



- **Convergence of content distribution and usage**
  - ◆ Multichannel solution
  - ◆ create/buy one to use on many devices
  - ◆ Interoperable Content and Devices
  - ◆ Interoperable DRM, Licenses
- 

- **Content management in the home**
  - ◆ the domain management
  - ◆ Interoperability of content in the home, interoperability of the devices, the Home Media Server
  - ◆ Multimedia Middleware among devices
  - ◆ Integration with domotic applications and tools




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## Summary of Major Challenges



- **Reduction of production, protection and distribution costs**
- **Content production/protection on demand**
- **Automating the B2B area, DRM and distribution**
  - ◆ Production, protection and distribution phases
  - ◆ Expanding DRM to B2B
  - ◆ Reducing costs of B2B distribution
- **Real Time content Processing**
  - ◆ Reducing production and distribution costs
  - ◆ Flexible Content Distribution
  - ◆ Content production, protection, distribution on demand
  - ◆ Adaptation and transcoding
  - ◆ Accelerating B2B processing
- **Increasing security: rights usage and control on**
  - ◆ Harmonization of B2B and B2C
  - ◆ Increasing security and interoperability
  - ◆ Increasing control of rights exploitation
  - ◆ Allowing the set up of a large number of business models
- **Any other question/issue ??**






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# Table of Content

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- **AXMEDIS Content Packaging**
  - ◆ Content Elements and model
  - ◆ Content Models vs DRM models
  - ◆ Content Model and hierarchy
- AXMEDIS Content Protection and Tracking
- AXMEDIS Content Production and Processing
- AXMEDIS Application Scenarios
- Conclusions and references





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# AXMEDIS Content Elements

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- **Content Packaging for protection and distribution**
  - ◆ Streaming (so called real-time) and/or downloading
  - ◆ Sharing on P2P, etc..
  - ◆ portable on physical supports, etc. (scalable)
  - ◆ binary and/or XML, etc.
- **Real Cross Media**
  - ◆ Multimedia hierarchies of digital resources such as models based on:
    - HTML, SMIL, SCORM/IMS, WEDELMUSIC, MPEG-4, etc.
    - With internal and external links and relationships: *for example one HTML page may be build by using several images and audio files.*
  - ◆ **Integration of docs, audio, video, images, via spatial rendering and synchronization, providing interactivity**
- **The Content Package in the hands of the final user to be used may need of the following information**
  - ◆ Metadata.....
  - ◆ Digital Resources.....
  - ◆ Protection Information.....
  - ◆ License.....

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## AXMEDIS Metadata

- **Metadata:**
  - ◆ Identification of information,
    - unique ID (AXOID), UUID,
    - distributor ID, UUID,
    - other codes such as: ISRC, ISBN, etc.
    - Producer ID and Information, etc.
    - Author Information, etc.
  - ◆ Classification information also for indexing:
    - Dublin core, etc.
  - ◆ PAR: Potentially Available Rights
  - ◆ Descriptors: for indexing, MPEG-7, technical and conceptual, etc.
  - ◆ References to Owner, to Distributor, etc.
  - ◆ Fingerprint
  - ◆ Historical and versioning aspects
  - ◆ Etc.
- **Some of them are grouped in AXMEDIS format in the so called AXMEDIS Information, AXINFO**
- **One Metadata set for each resource or group, ITEM**

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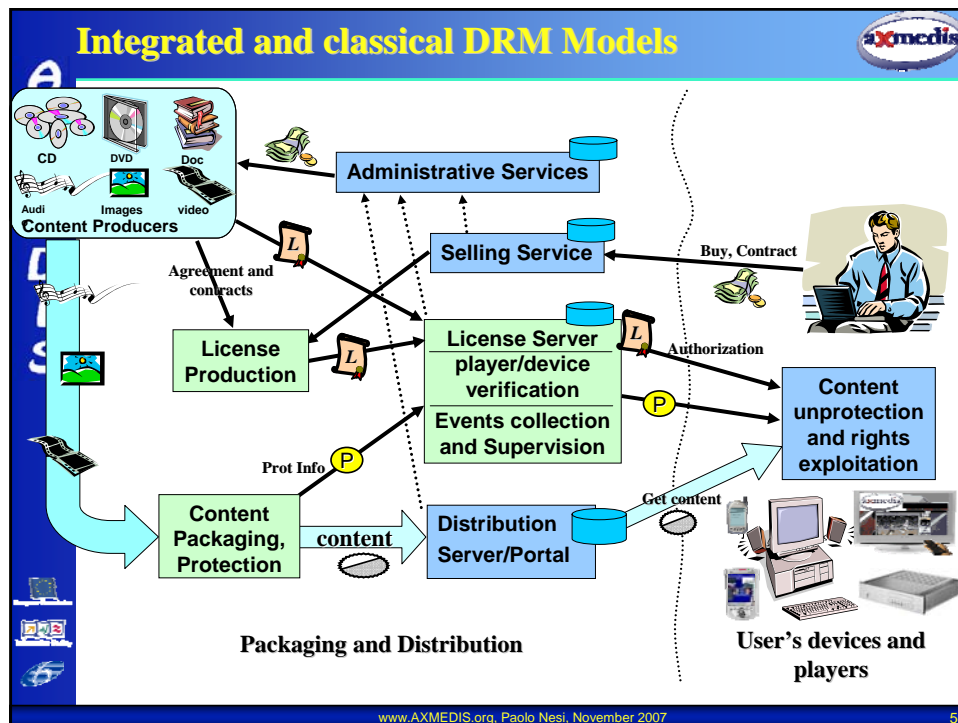
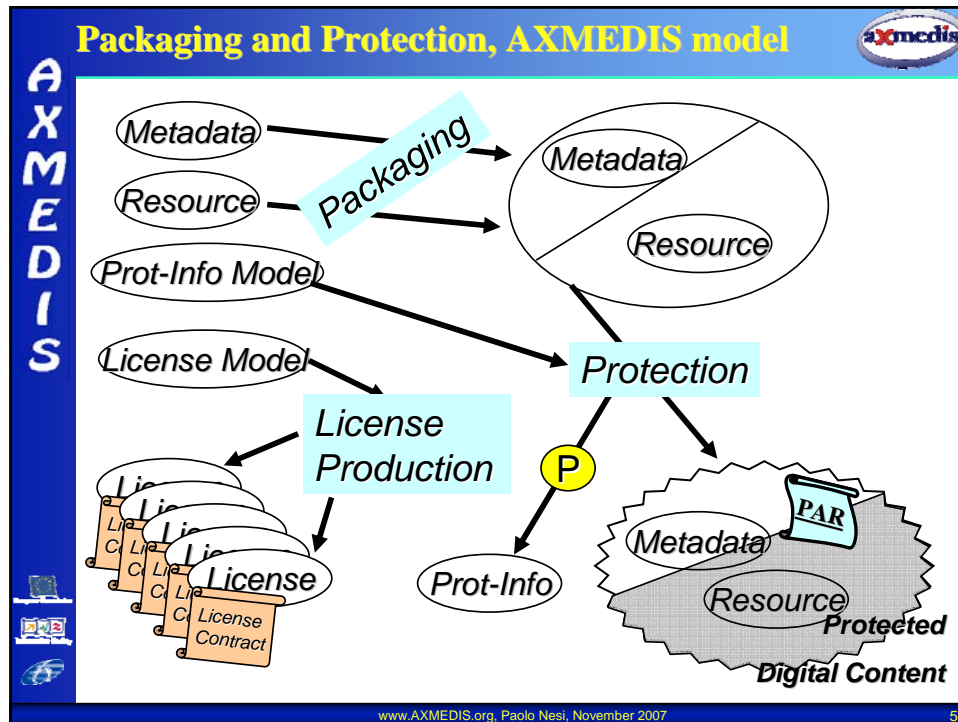
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## AXMEDIS Content Elements

- **Digital Resources:** Resource
  - ◆ Any digital information: images, docs, txt, video, game, application, xml files, audio, animation, etc.
  - ◆ Hierarchy of digital resources, nesting levels
  - ◆ Internal and external links: e.g., HTML navigation, SMIL references, MPEG-4 paths..
- **Protection Information:** Prot-Info Model → P
  - ◆ What has to be done to access (unprotect) a given information/resource
  - ◆ Protection Tools used, their parameters, etc.
- **License:** License Model → License Contract
  - ◆ Which rights are provided, who is the recipient, what are the conditions, etc.


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## The Cross Media Content Model

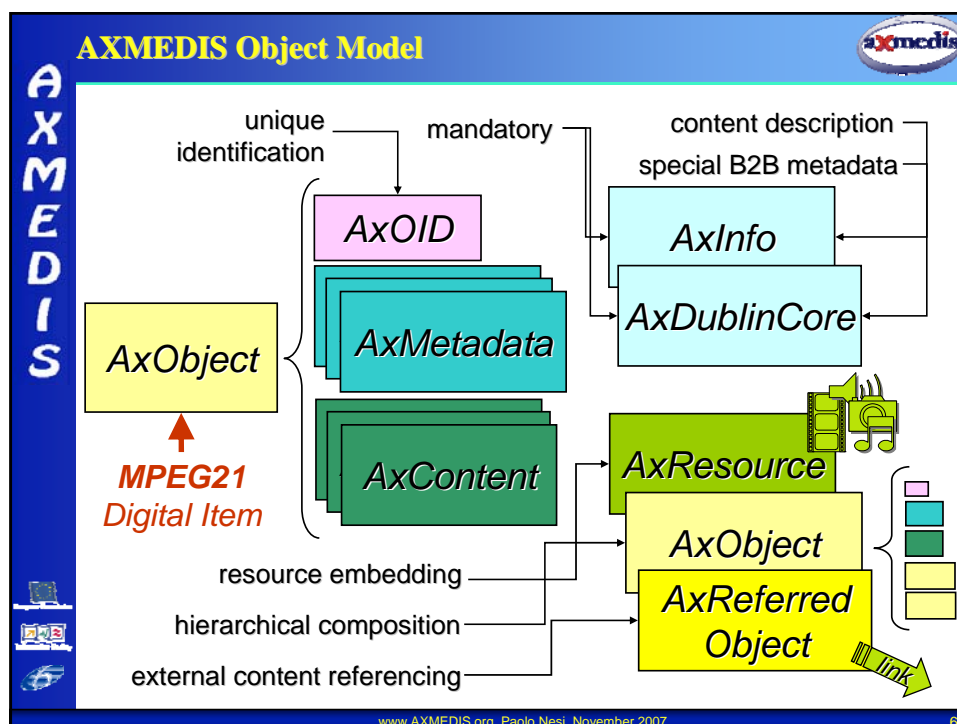
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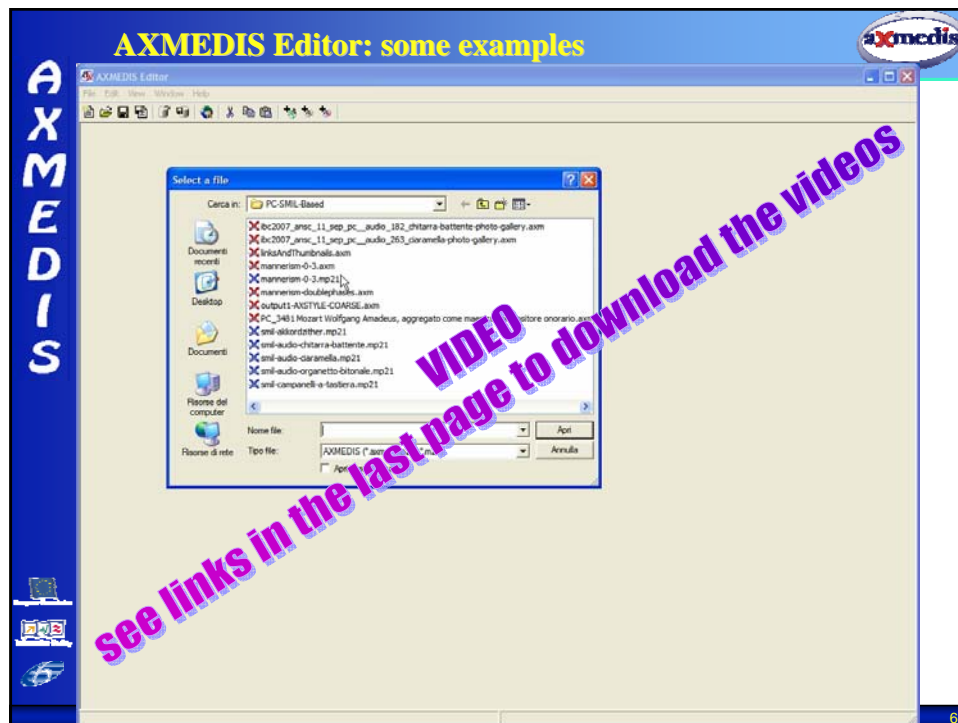
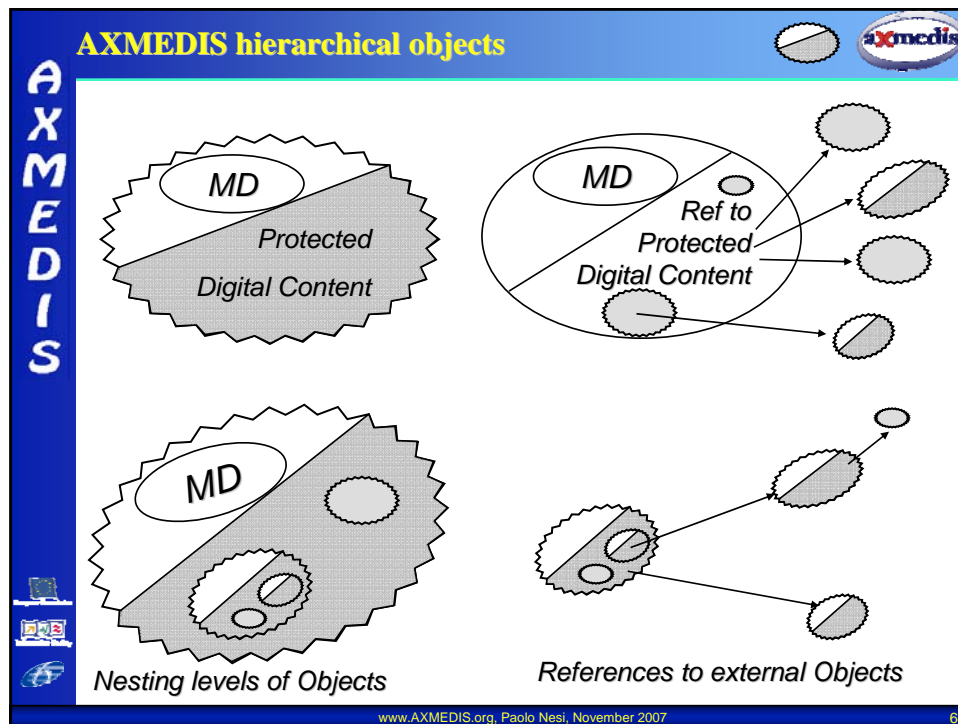


- **Based on MPEG21 Digital Items, but not limited to**
- **Overcoming limitations in content modeling and DRM:**
  - ◆ Cross media:
    - ➔ any kind of metadata and any kind IDs
    - ➔ presentation and glue (e.g., HTML, SMIL,), plus
    - ➔ digital resource images, documents, video, audio, games, MPEG-4, etc.;
  - ◆ Content components: composition and reuse;
  - ◆ DRM interoperability: MPEG-21 and OMA
  - ◆ DRM Chain of licenses: B2B and B2C integration;
  - ◆ Integration of semantics and behavior into the content.
- **DRM, Digital Rights Management**
  - ◆ Modeling licenses for the B2B-B2C areas
  - ◆ Algorithms and tools for processing licenses, chains and relationships
- **Supporting legal/secure P2P for B2B and B2C/C2C**
- **Supporting B2B-B2C content production and transactions,**
  - ◆ for protected and non protected objects


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## Table of Content



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  - ◆ License Models and Processing
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## AXMEDIS Digital Rights Management

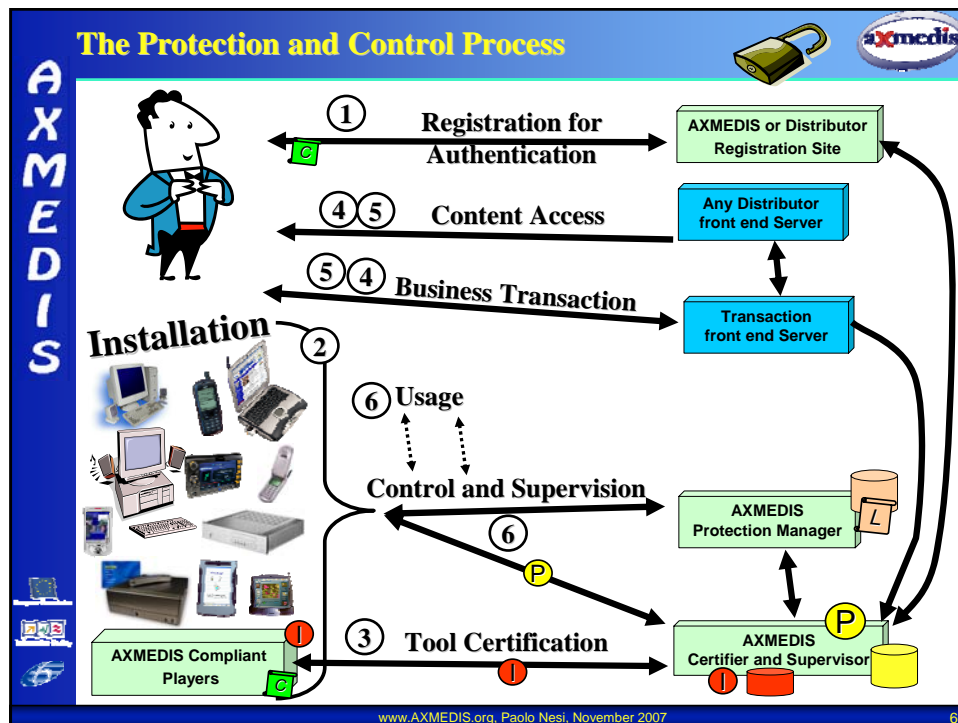
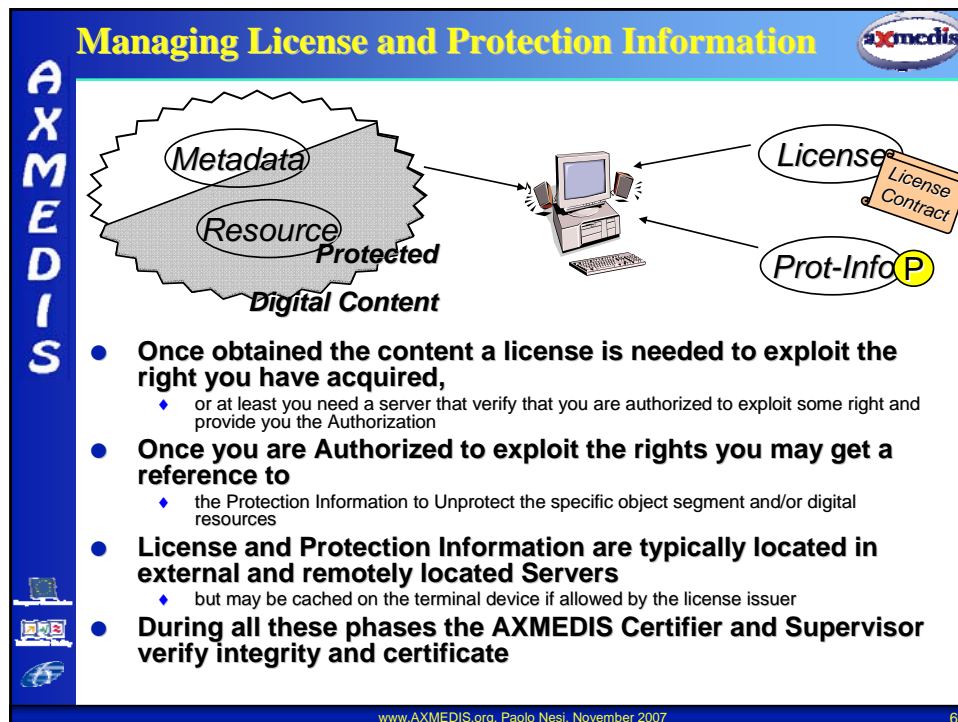
- To allow accessing at the digital content functionalities in a controlled manner
  - ◆ To who has been registered the first time and continuously: **authenticated and certified**
  - ◆ To do what is defined in a **license** (to allow exploiting the rights)
  - ◆ By using technologies to **protect content** (e.g., encryption, fingerprint, watermark, etc.)
  - ◆ **Verifying/Control/Supervise** if the above conditions and others are respected




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## License Definition and Processing



- **License:**
  - ◆ digital version of the contract
  - ◆ contains the list of acquired rights
  - ◆ may be signed by clicking
  - ◆ supported by a way to demonstrate its authenticity
  - ◆ can be stored in the digital object or not
    - ➔ If not, may in the terminal or remotely located
  - ◆ may refer to other licenses, creating a chain of licenses for the evaluation of each given grant associated to a right
  - ◆ formalized in some language
    - ➔ Refer to some dictionary for terms that define the semantics of the expressions of the language
  - ◆ may be revoked
  - ◆ Etc.







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## AXMEDIS License formal language



- **AXMEDIS License**
  - ◆ Derived from MPEG-21REL
  - ◆ Support for RDD: Rights Data Dictionary
- **MPEG-21 RELRights Expression Language**
  - ◆ Derived from XrML
- **XrML 2.0: eXtensible rights Markup Language**
  - ◆ At the basis of the MPEG-21 REL
  - ◆ ContentGuard, Nov. 2001, Microsoft
  - ◆ At the basis of the Windows Media
  - ◆ Derived from DPRL
- **OMA ODRL: Open Digital Rights Management**
  - ◆ Expression language for mobiles
  - ◆ Simpler than MPEG REL
  - ◆ Under certain restriction is compatible with AXMEDIS license
  - ◆ ..





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## AXMEDIS DRM Aspects

- **Formal definition of Licenses as MPEG-21 REL**
  - ◆ Facilitate the passage from Contract to Digital Licenses and viceversa
- **Support and make easier the B2B market of digital content, and cross media content**
  - ◆ Content composition and DRM management
  - ◆ Tracking and monitoring the exploitation of rights
  - ◆ Reduction of costs for B2B trading of content
  - ◆ Enforce flexibility in business and transaction models
  - ◆ Harmonize and automating B2B and B2C
  - ◆ Management of domains
- **Enable interoperability among different**
  - ◆ distribution channels and devices with their DRM
    - ➔ TV, PDA, mobile, kiosks, broadcasting,...
  - ◆ DRMs models: MPEG-21 and OMA, other can be added
- **Enabling**
  - ◆ Content production on the consumer side
  - ◆ secure/legal P2P content sharing for both B2B and B2C

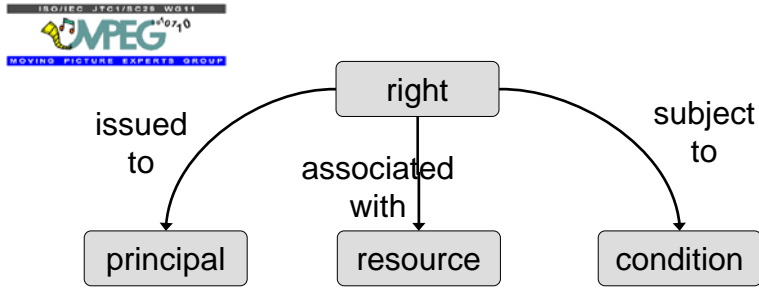
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## MPEG-21 REL data model



```


graph TD
    right[right] -- issued to --> principal[principal]
    right -- associated with --> resource[resource]
    right -- subject to --> condition[condition]
    
```

- **REL grant consists of**
  - ◆ principal to whom grant is issued
  - ◆ rights the grant specifies
  - ◆ resource to which right in grant applies
  - ◆ condition to be met before grant can be exercised


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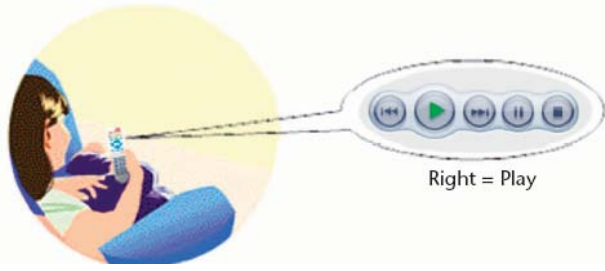
## An example of REL statement



Condition = November 2003



Resource = Ocean Wilds



Right = Play

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

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## Possible values for terms

- **Principal**
  - ◆ AllPrincipals and KeyHolder
- **Rights**
  - ◆ Issue, Obtain, PossesProperty and Revoke
- **Resources**
  - ◆ DigitalResource, Revocable and ServiceReference
- **Conditions**
  - ◆ AllConditions, ExerciseMechanism, ExistsRight, Fullfiler, PrerequisiteRight, RevocationFreshness, ValidityInterval
  - ◆ CallForCondition     ◆ Territory
  - ◆ ExerciseLimit        ◆ TrackQuery
  - ◆ FeeFlat                ◆ TrackReport
  - ◆ FeeMetered            ◆ TransferControl
  - ◆ FeePerInterval        ◆ ValidityIntervalFloating
  - ◆ FeePerUse             ◆ ValidityIntervalStartsNow
  - ◆ FeePerUsePrePay     ◆ ValidityTimeMetered
  - ◆ SeekApproval        ◆ ValidityTimePeriodic

- **Examples of Rights**
  - ◆ Adapt
  - ◆ Delete
  - ◆ Diminish
  - ◆ Embed
  - ◆ Enhance
  - ◆ Enlarge
  - ◆ Execute
  - ◆ Install
  - ◆ Modify
  - ◆ Move/Migrate
  - ◆ Play
  - ◆ Print
  - ◆ Reduce
  - ◆ Uninstall
  - ◆ Burn
  - ◆ .....

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## Managing License Chain, B2B and B2C

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- **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

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## Cross media content and composition

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

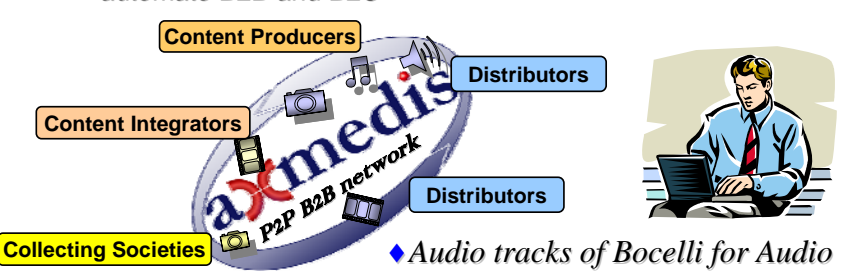
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## Make easier the B2B market of digital content

**REL and Composition enforce flexibility and openness in business transactions**

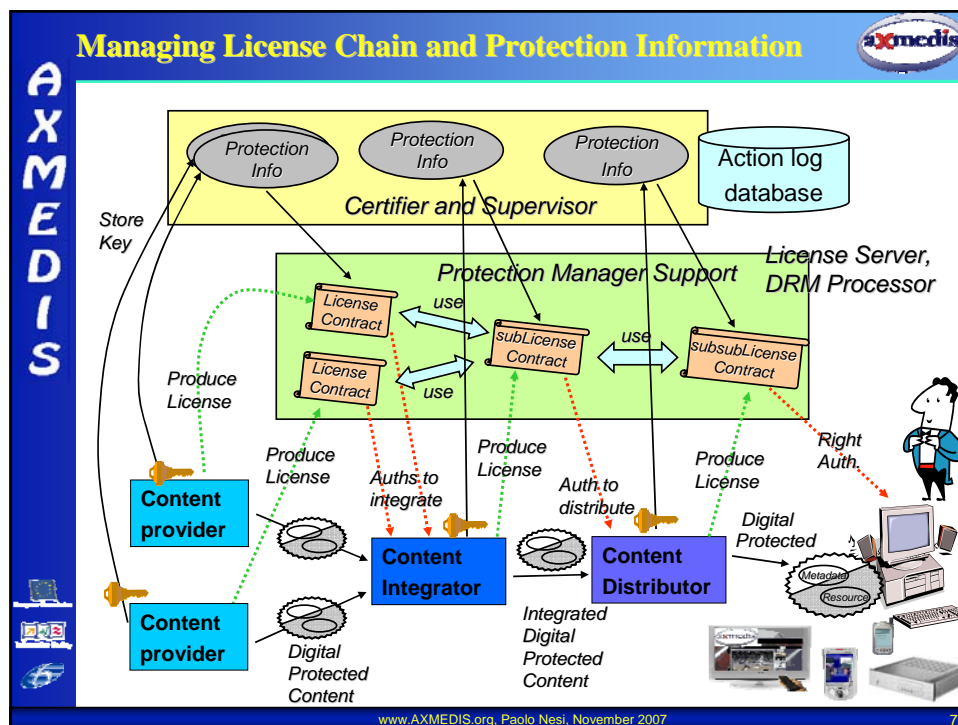
**PAR: Potentially Available Rights into AXMEDIS objects**

- ◆ PARs based content trading
  - Customers may know directly which rights they could buy and by who
  - Querying can be performed on DBs and P2P
- ◆ PARs may be used to harmonize and automate B2B and B2C

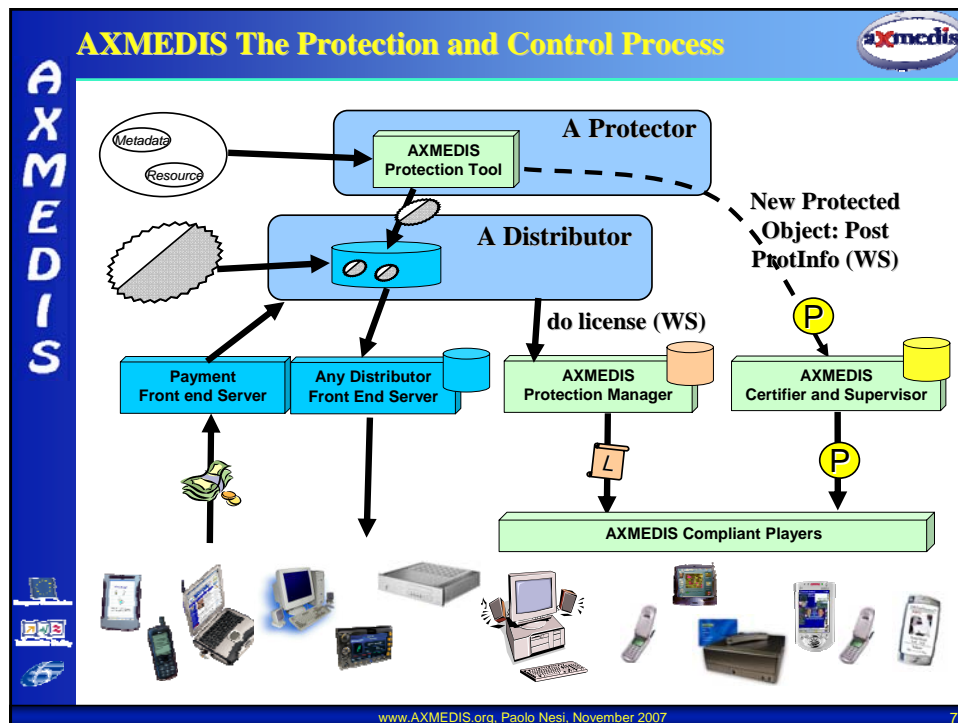
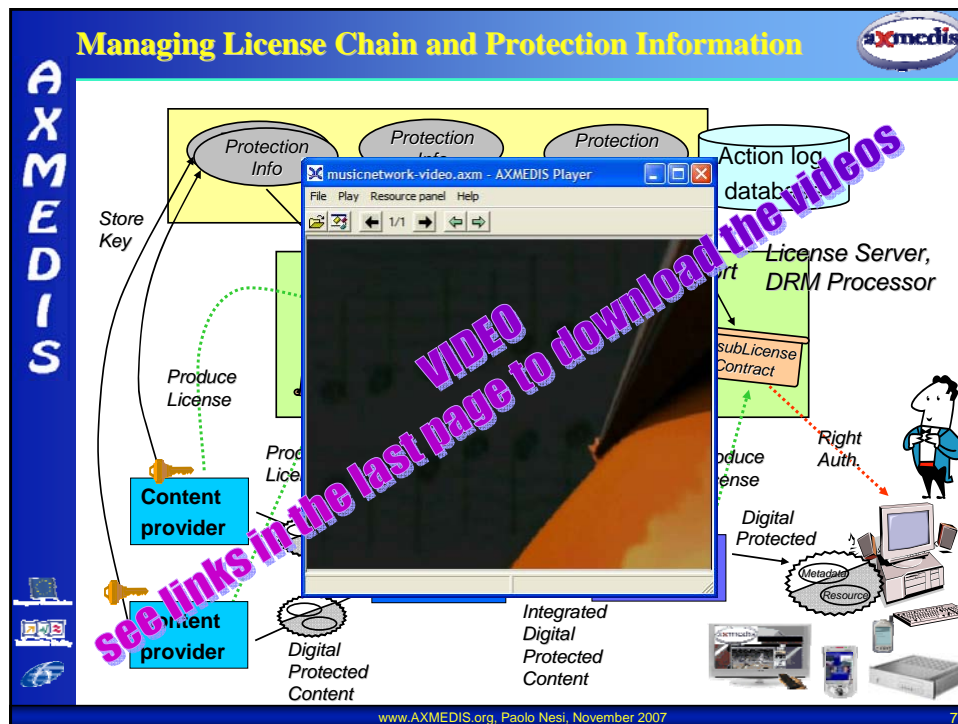


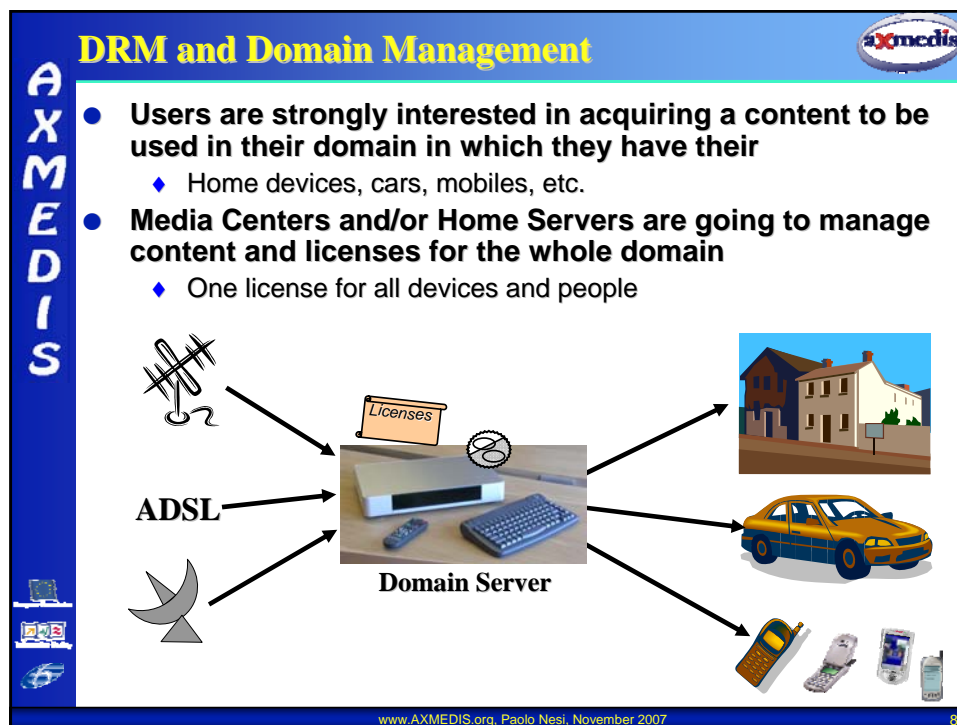
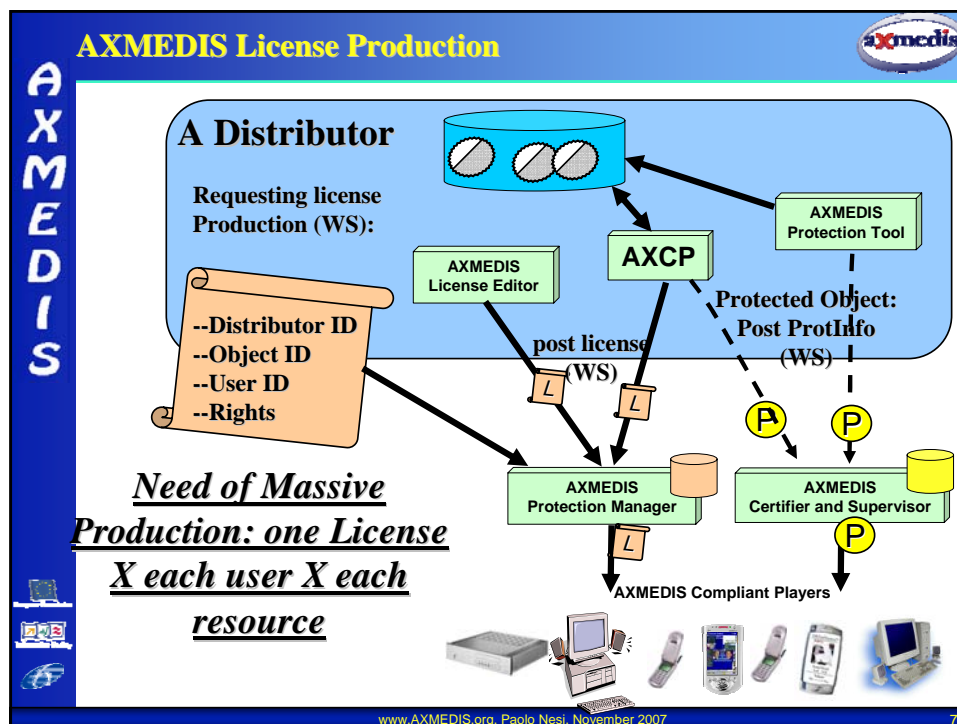
◆ Audio tracks of Bocelli for Audio broadcasting for June 2008 in Gemany?

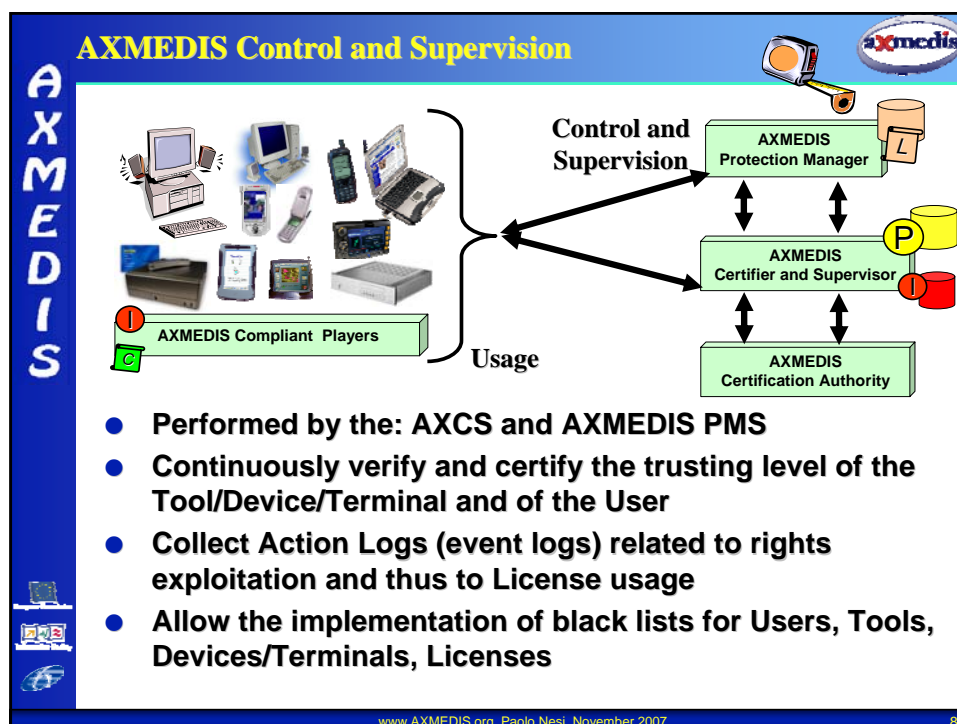
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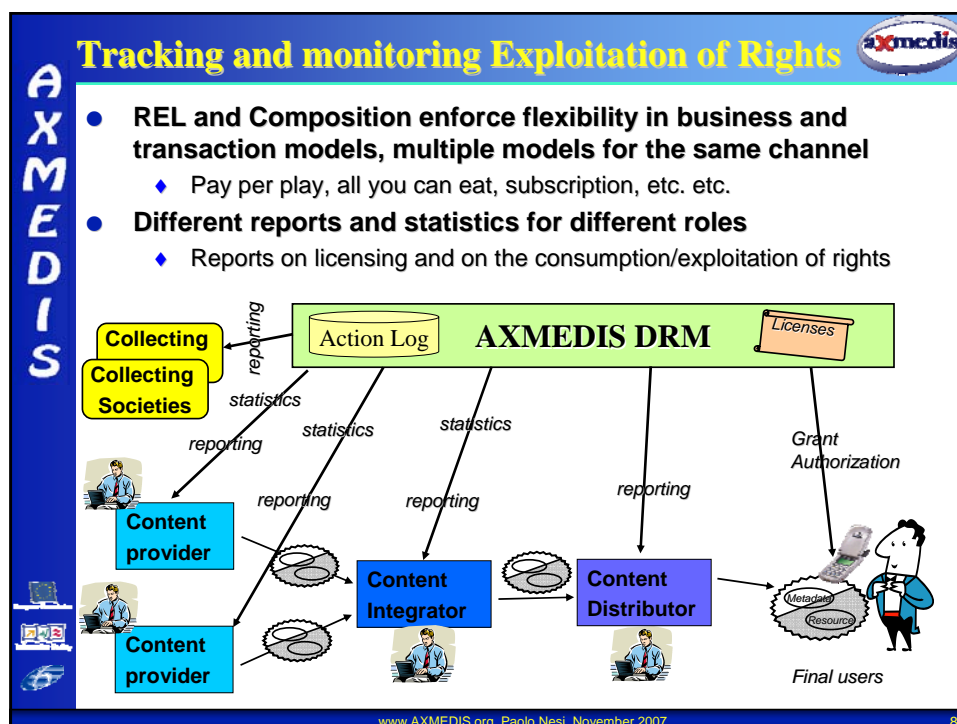




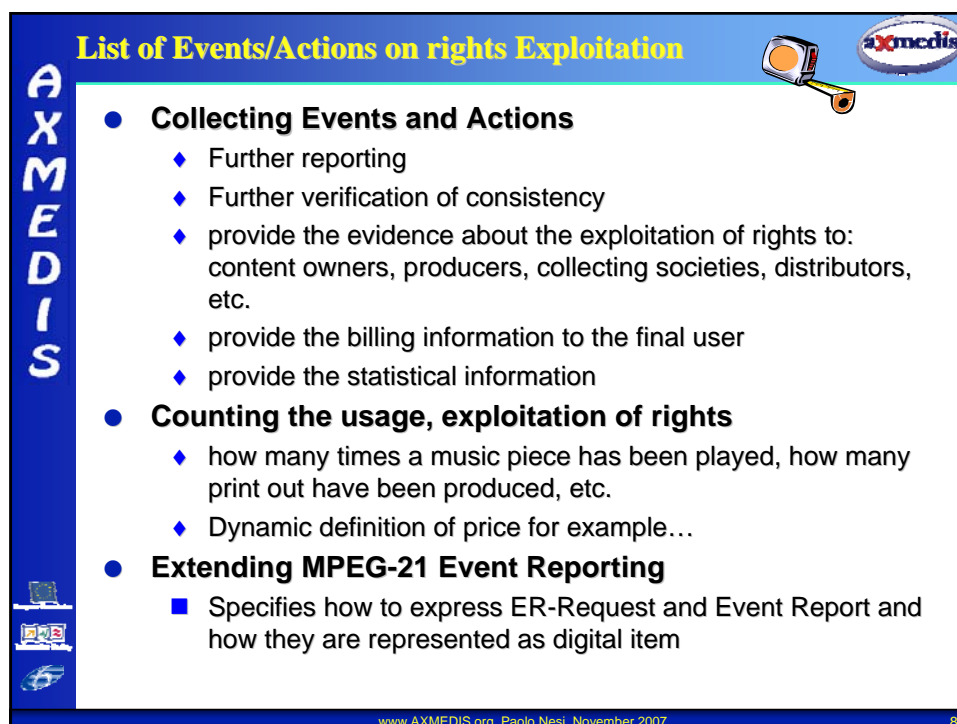
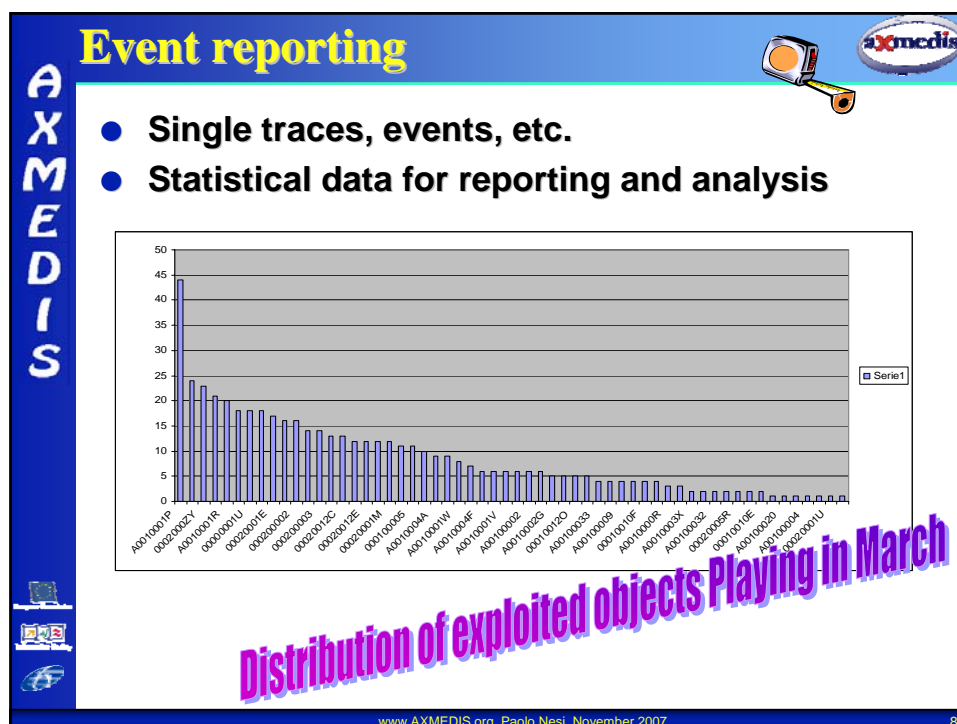




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## DRM Interoperable .....

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- **DRM, Digital Rights Management**
  - ◆ Digital management of rights
- **Proprietary DRM solutions are**
  - ◆ based on *proprietary* formats for content and licenses, protection information, control messages, and reporting, etc.
- **DRM Interoperable (e.g., DMP, OMA)**
  - ◆ based on a **UNIQUE** *Standard* format for content and licenses, protection information, control messages, and reporting, etc.
    - ➔ Extensions are not accepted if not decided by the standard body
    - ➔ Standards are becoming obsolete in short time, patent pending is blocking the market
- **DRM Interoperable “a la AXMEDIS”**
  - ◆ based on **SEVERAL** *standard formats* (now MPEG-21 e OMA) e/o *proprietary* for content and licenses, protection information, control messages, and reporting, etc.
  - ◆ Interoperable on the B2B and B2C areas
  - ◆ It can be extended to accept other *solutions* for example MS Windows DRM, i-Tune, or more, etc.


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## Considerations



- **AXMEDIS DRM integrated solution:**
  - ◆ Allows usage of DRM on new object types such as Cross Media content: SMIL, HTML, etc.
  - ◆ Allows the control on multichannel distribution
  - ◆ Support multiple business models in the same and on different channels
  - ◆ Support with a unified DRM both B2B and B2C areas
  - ◆ Continuously Controls user terminals
  - ◆ Collects Actions Logs of any kind of event
    - ➔ Allows to bring back easily the Action Log on your Administration
    - ➔ Provides the evidence of the exploited rights
    - ➔ Provides statistical data on the rights exploitation
  - ◆ Manages black lists of several Entities
    - ➔ Allows the definition of policies for putting user, device, license, objects, etc. into the black lists
  - ◆ Etc.
- **Any other question/issue ??**




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- **AXMEDIS Content Production and Processing**
  - ◆ AXMEDIS Editors, Authoring
  - ◆ AXMEDIS players
  - ◆ Automated AXMEDIS Content Processing and Production
  - ◆ Multichannel Back-Office Management
  - ◆ Production of Content on Demand
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# Major Tools

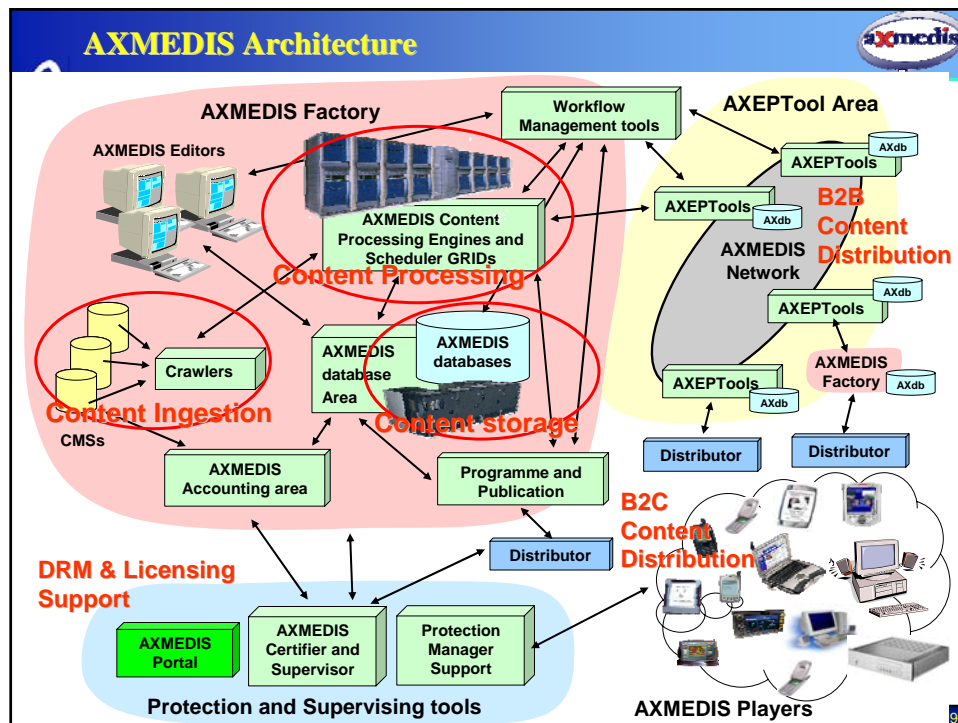
AXMEDIS

- **Players for cross media content:**
  - ◆ PC, PDA, STB, mobiles, etc.
- **DRM and protection support**
- **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



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## AXMEDIS Cross Media Content


AXMEDIS

**Any content inside a package:**

- ♦ Video, Audio, Documents, Images, games, animations, WEB pages, tools, etc.
- ♦ compliant and extend MPEG-21

**Packing content that can**

- ♦ create content for other devices, etc.
- ♦ satisfy social activity, user annotations, user content production, etc.
- ♦ be digitally streamed on TV (DVB-T/DVB-S/DVB-H with the same level of interactivity
- ♦ be protected with the needed flexibility
- ♦ be distributed on different terminals/devices and via different channels.
- ♦ be customized for culture and language



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## AXMEDIS Interoperability among devices

AXMEDIS

**The user likes 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, using there, and passing and playing it at home on the TV set
- ♦ Etc.....

**AXMEDIS interoperability satisfies these demands among a large set of devices:**

- ♦ PC, STB/PVR/HDR, PDA, Mobiles, etc.
- ♦ You can buy once to use on all




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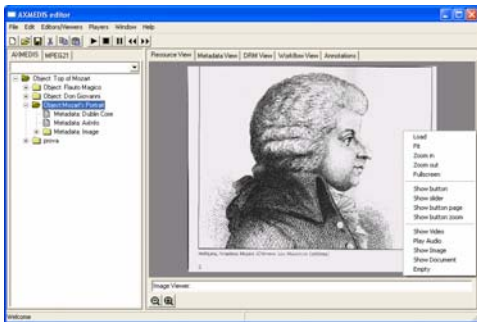
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## AXMEDIS Authoring Editor

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- **The AXMEDIS Editor is an application allowing**
  - ◆ manual production of AXMEDIS objects
  - ◆ inspection of automatically produced objects
  - ◆ finishing AXMEDIS objects pre-produced automatically
- **It integrates many Editors & Viewers to handle all the aspects of the AXMEDIS Objects production**
  - ◆ Resource
  - ◆ OBJ Composition
  - ◆ Metadata
  - ◆ DRM/Licenses
  - ◆ Protection
  - ◆ Presentation
  - ◆ Behavior
  - ◆ Etc....






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## AXMEDIS Client Tools

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- **AXMEDIS/MPEG-21 Model plus a set of players**
  - ◆ Audio and video players: almost any format
  - ◆ Document viewers: PDF, HTML, etc.
  - ◆ Image viewers: any format
  - ◆ Cross media: MPEG-4, SMIL player, HTML, etc...
  - ◆ Etc.
- **AXMEDIS Metadata support**
  - ◆ AXInfo, Dublin Core, etc.
  - ◆ Any descriptors, etc.
- **Possible integration AXMEDIS AXOM core module in any player**
  - ◆ The access to the AXMEDIS Framework allows you to create in short time your customized AXMEDIS compatible player in many platforms based on AXOM:
    - ➔ Windows
    - ➔ Linux
    - ➔ PDA, Windows Mobile 5
    - ➔ Etc.





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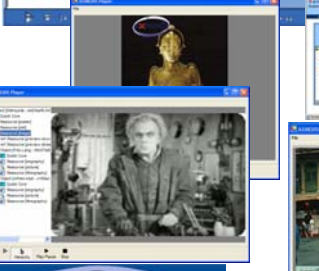

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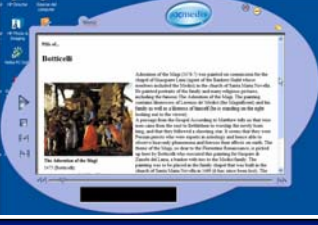

## Interoperable Players

AXMEDIS

- **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 October 2007
  - ◆ SMIL support with Audio Visual, MMAPI of Java

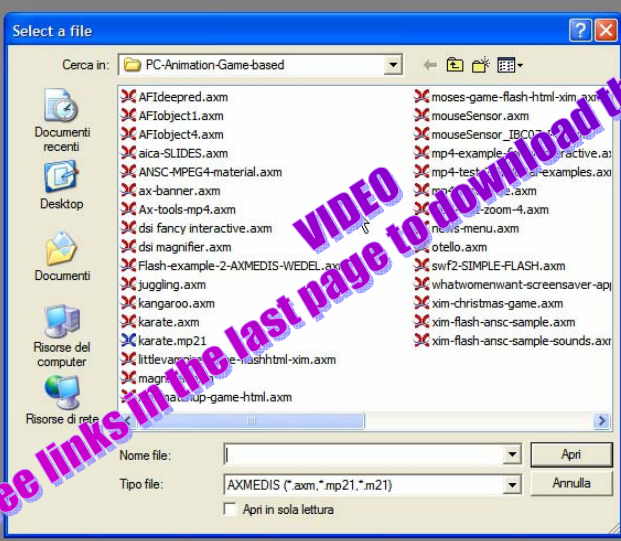



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## AXMEDIS Players, interaction, SMIL, HTML, MP4...

AXMEDIS



VIDEO  
see links in the last page to download the videos

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**Cross media Player as Active X, for MS IE and .NET applications**

The image displays two side-by-side windows of the AmbulantPlayer ActiveX control. The left window shows a football match between Club Italia and another team, with a score of 2-0. The right window shows a Spider-Man movie scene with the text 'SPIDER-MAN' and 'VISIT THE SPIDER-MAN 3 BLOG'. The player interface includes standard media controls like play, stop, and volume.

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**AXMEDIS Players: videos, SMIL, HTML, ....**

The image shows a video player interface with a 'Wait' dialog box overlaid. The dialog box contains a progress bar and a 'Wait' button. A large diagonal text overlay reads 'see links in the last page to download the videos'. The background of the player is black, and the text 'AXMEDIS' is visible on the left side.

see links in the last page to download the videos

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## AXMEDIS Player for PDA with SMIL/MPEG-4

AxmedisPlayer 16.09

AXPDAPlayer 15.59

AxmedisPlayer 16.13

MPEG-21

HTML, SMIL and/or MPEG-4 PDA-player

www.AXMEDIS.org, Fabioresi, november 2007

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## PDA player

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VIDEO

see links in the last page to download the videos

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**AXMEDIS Player for STB, PVR, Decoders, etc.**





**MPEG-21**

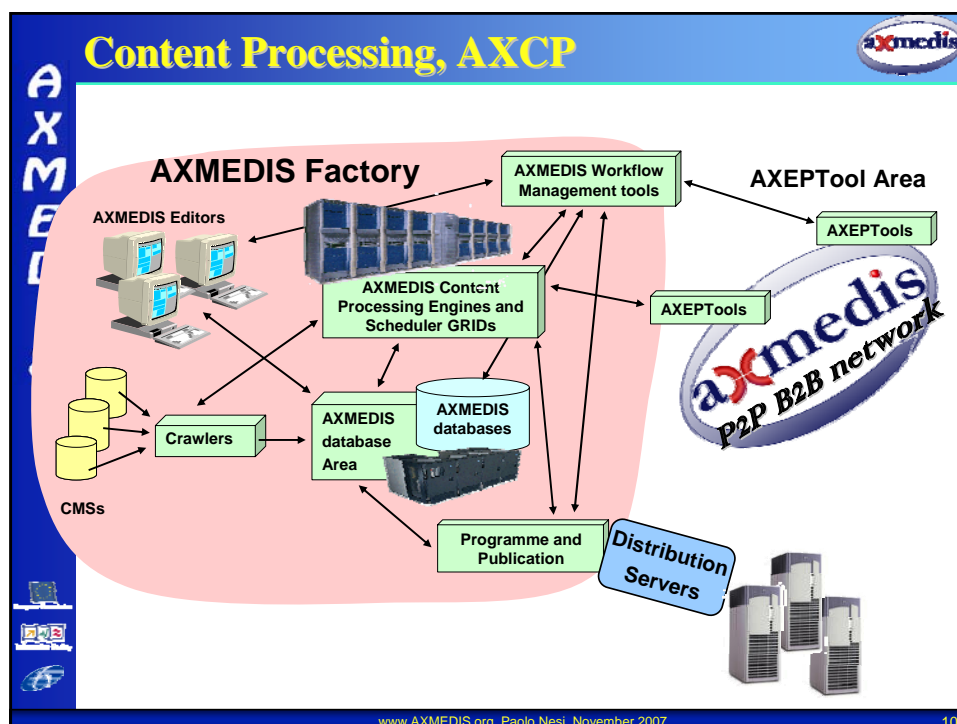
**STB with AXMEDIS tech**

www.AXMEDIS.org 101

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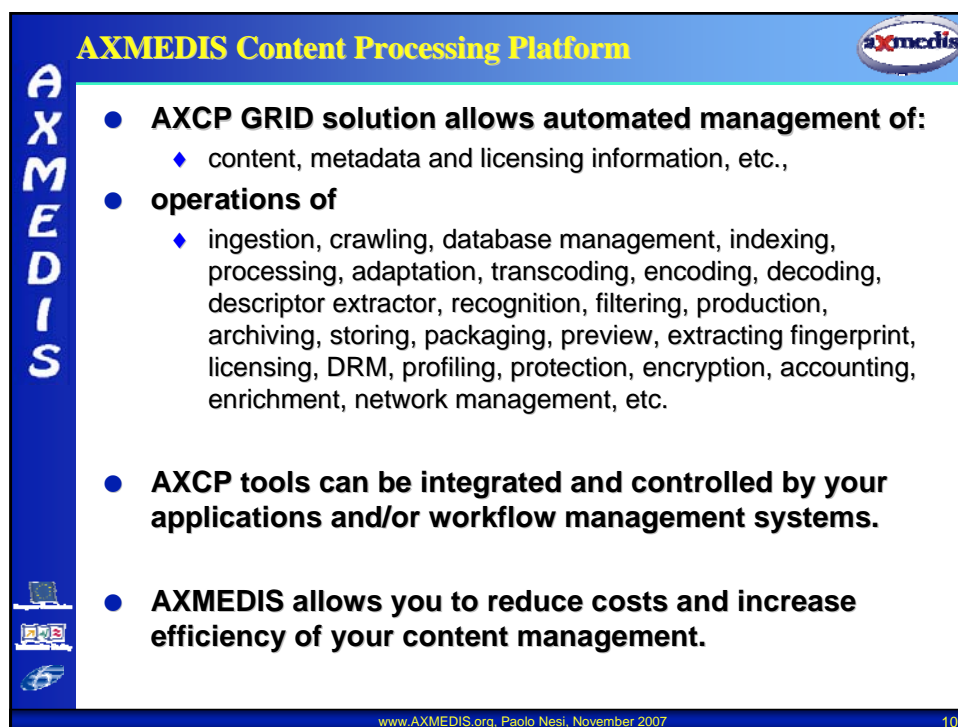
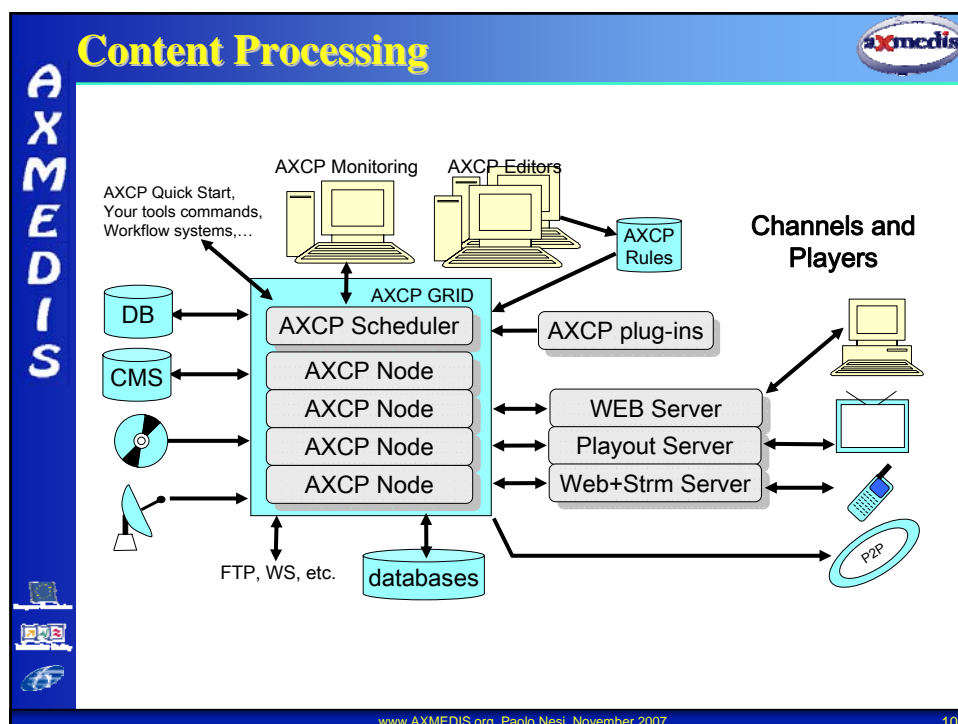
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## Content Processing Applications


- 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.
    - ➔ Algorithms for automated formatting of content: SMIL, style, Genetic Algorithms
- Automating massive processing applications**
  - ◆ For solving the on-demand problem:
    - ➔ Production
    - ➔ Adaptation, transcoding, processing, ....
    - ➔ Advertisement insertion
    - ➔ Managing profiling (user device, network, etc.), etc.
  - ◆ Multi-channel distribution:
    - ➔ multiple interoperable DRMs, license chain processing/reasoning
  - ◆ Content recognition for monitoring
    - ➔ broadcast and networks,
    - ➔ P2P, Web sites, etc.

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## AXMEDIS Content Processing Platform

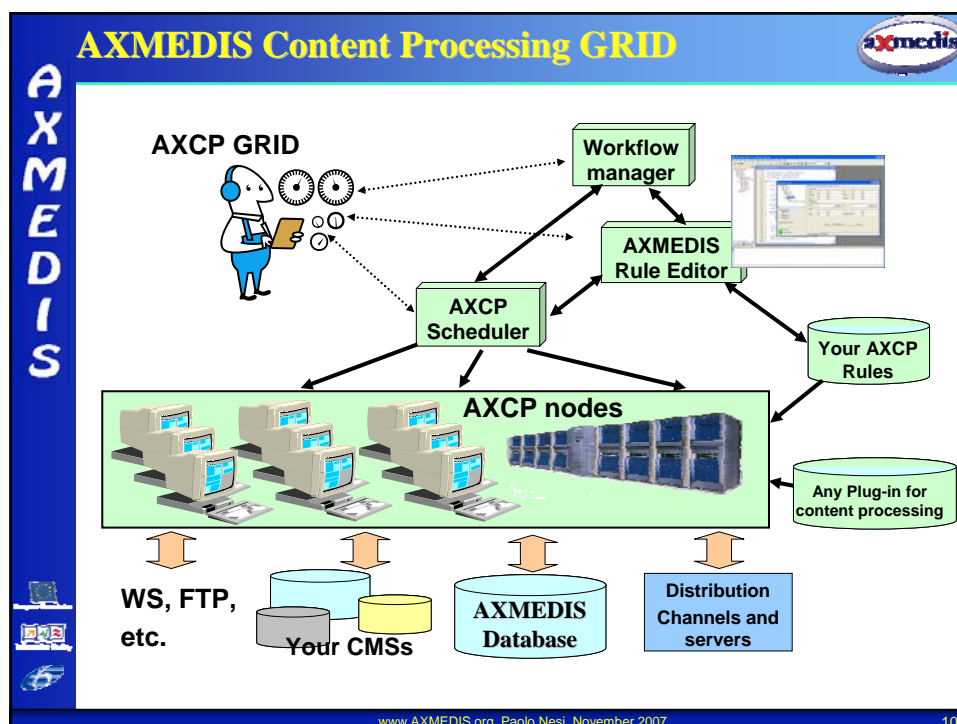
AXMEDIS




- **AXMEDIS supports the whole value chain and makes real and simple the convergence of media,**
  - ◆ media transcoding,
  - ◆ interoperability of content enabling multi-channel distribution (e.g., mobile, satellite, kiosk, iTV, web, P2P, interactivity, etc),
  - ◆ provides a flexible and interoperable DRM, for both B2B and B2C across traditional and P2P distribution platforms.
- **AXCP solution is based**
  - ◆ AXCP Rules formalized in JavaScript and XML to define jobs, processes and their features (deadlines, needs, etc.).
- **The AXCP tools are based on a Service Oriented Architecture (SOA);**
  - ◆ fully documented APIs for all the JavaScript functionalities, and WEB Services for accessing and controlling tools, and for distributing produced content towards your front-end distribution servers.

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## 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 including P2P Network
  - ◆ Automated Content Distribution
  - ◆ Automated Profiles management and processing
  - ◆ Automated Production of Content on Demand



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## 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.



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## AXMEDIS CP GRID tools


- **AXCP Rules can be:**
  - ◆ activated for content processing on any AXCP Node as well as on a single computer
  - ◆ used/parameterized to produce content on demand or to be integrated in your content factory
  - ◆ activated from your Workflow Management System or from any other application
  - ◆ activated by changes in remote objects and queries in the local database and on the P2P network.
- **AXCP Nodes allow to be controlled by an AXCP Scheduler. The stand alone version of the AXCP Node can be used for executing AXCP Rules for ad-hoc processing and activation without demanding their allocation and scheduling to the AXCP Scheduler.**
- **AXCP Scheduler to allocate and manage AXCP Rules on Nodes:**
  - ◆ scheduling and balancing jobs/processes on AXCP Nodes
  - ◆ activating jobs as sporadic and periodic tasks
  - ◆ monitoring progress of production processes and their status, etc.
- **AXCP Rule Editor allows you to produce, debug, test and validate AXCP Rules to execute them on AXCP Nodes**
- **AXCP Quick Start allows you to activate Rules in simple manner by passing them parameters;**

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## AXMEDIS Considerations

- **AXMEDIS Content Processing allows you to automate any kind of content processing:**
  - ◆ Massive or small scale processing
  - ◆ Locally performed or Workflow controlled
  - ◆ On any kind of Digital Resource not only AXMEDIS objects
- **AXCP Applications for massive processing as**
  - ◆ Production/packaging platform for producers and integrators
    - ➔ Digital files, metadata, etc.
  - ◆ Protection of objects, and protection information processing
  - ◆ Transcoding/adaptation platform for distributors
  - ◆ License Production, or as License Server/processor
  - ◆ etc.
- **Any other question/issue ??**




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- AXMEDIS Content Production and Processing
- **AXMEDIS Application Scenarios**
  - ◆ Application Scenarios
  - ◆ Content Sharing and/or Distribution
  - ◆ AXMEDIS Trials and Demonstrators
- Conclusions and references





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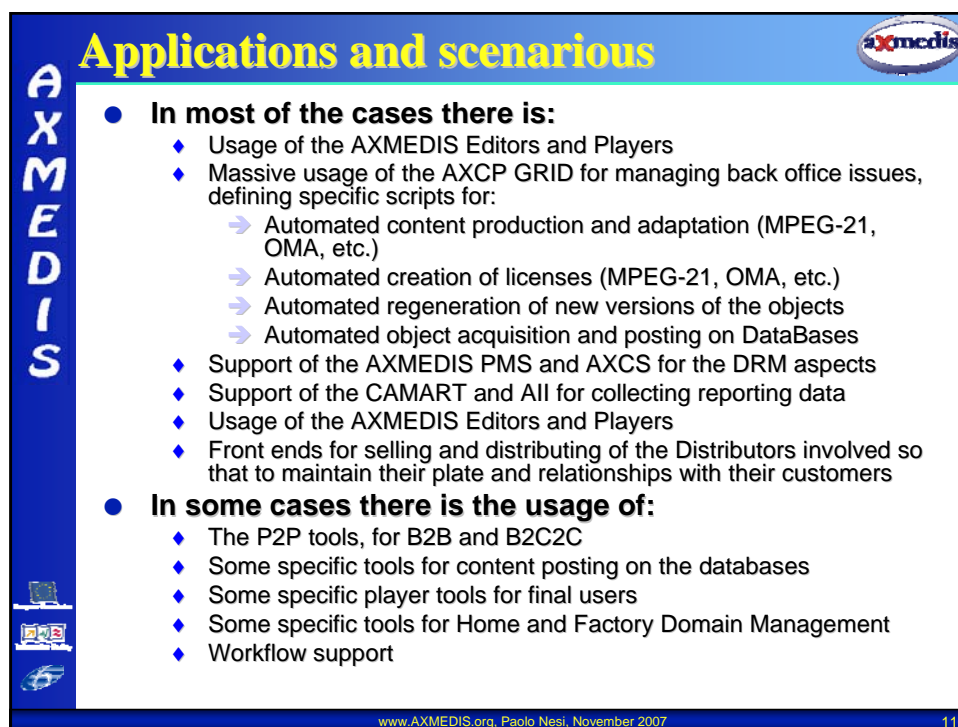
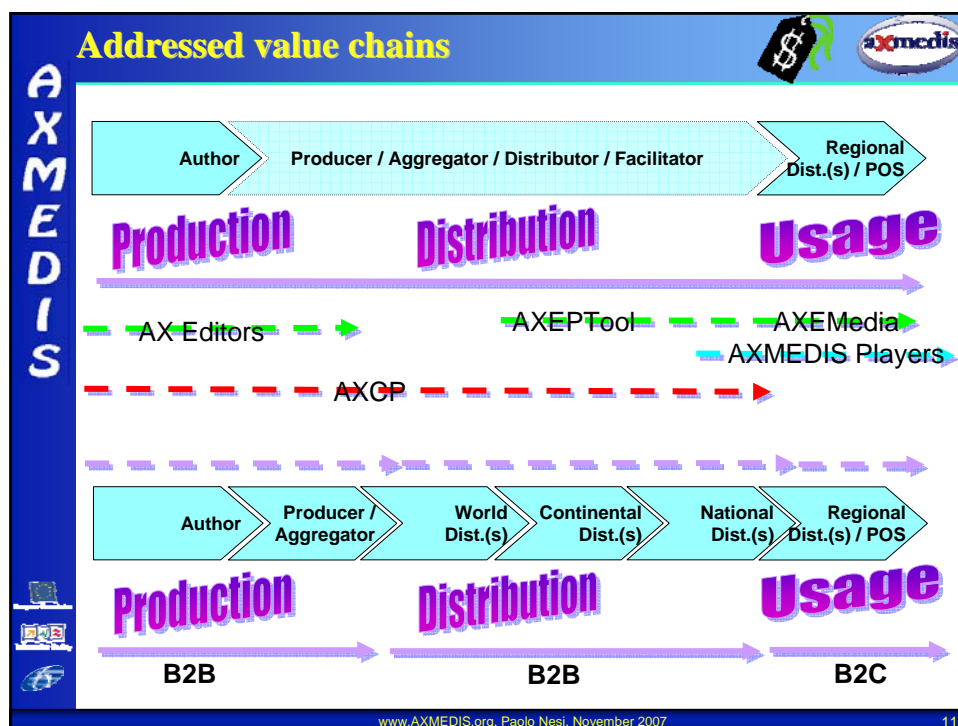
## Applicative Areas

- Multi-channel production and distribution: broadcasting, IP/Internet, WEB sites, P2P, mobile, PDA, IPTV, interactive TV and channels, etc.
- Multi-channel experience for customers
- Video on Demand (VOD), and production on demand solutions
- Control of P2P content sharing and distribution, involving your customers in distribution (super-distribution)
- Involve customers and final users in content production and social networking
- interoperable DRM (MPEG-21, OMA, etc.)
- different business models and/or transactions on the same distribution channels: pay per play, monthly rate, preview, renting, advertising, etc.
- interactivity with cross media models
- advertising (customized and/or real time personalized advertising)
- Production and distribution of content with unprotected preview and the rest protected
- Etc.

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AXMEDIS

## Enabling secure/legal P2P

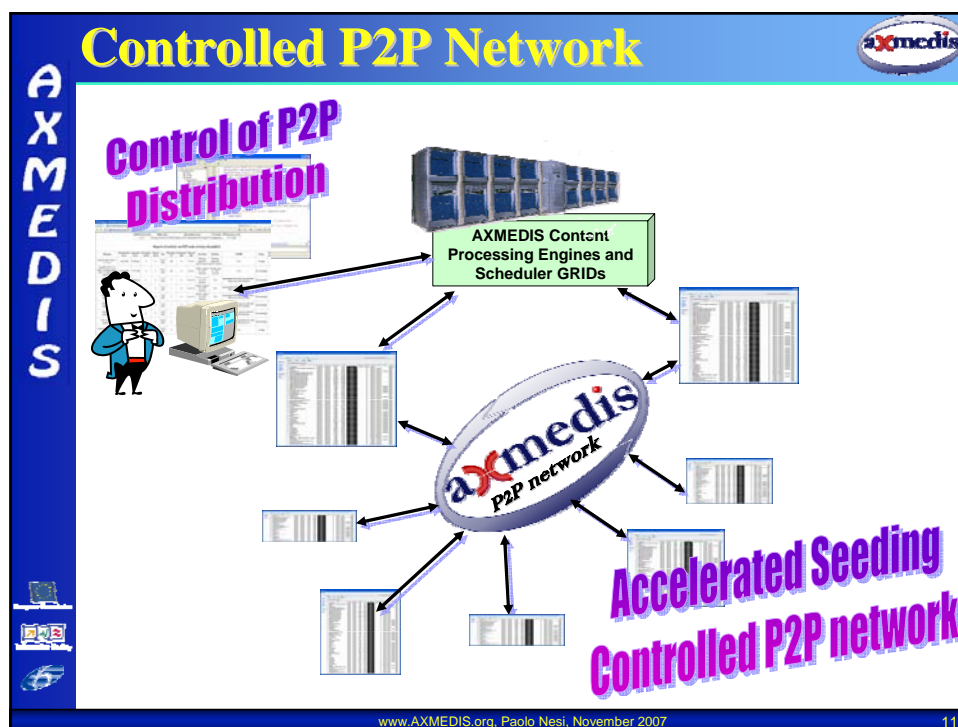
- **P2P network set up for content distribution**
  - ◆ BitTorrent Technology with Query and Catalogue
  - ◆ Protected content, legal P2P set up
  - ◆ P2P Client Tools
  - ◆ Automated B2B content distribution/publication via P2P, fast seeding,
  - ◆ Automated and efficient control of P2P networks
  - ◆ CONSUMER content distribution and sharing
- **Content Sharing among, producers, integrators, archives and libraries, etc.**




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## AXMEDIS P2P Tools

AXMEDIS



- **AXMEDIS P2P tools for content sharing respecting IPR**
  - ◆ Content Distribution and P2P file sharing based on BitTorrent
  - ◆ DRM support, supervision and control
  - ◆ Certified metadata, etc.
- **AXEPTTool**
  - ◆ Only for B2B
  - ◆ Technical queries and information:
    - ➔ Features, descriptors, duration, formats, license information, distribution model, etc.
  - ◆ Automated loading and publication via the AXCP tools
  - ◆ Control and certification of metadata
- **AXMEDIA tool:**
  - ◆ Only for C2C and B2C
  - ◆ Simple queries on simple user focussed metadata
  - ◆ Simple management of files on the file system
  - ◆ Control and certification of metadata

AXMEDIS




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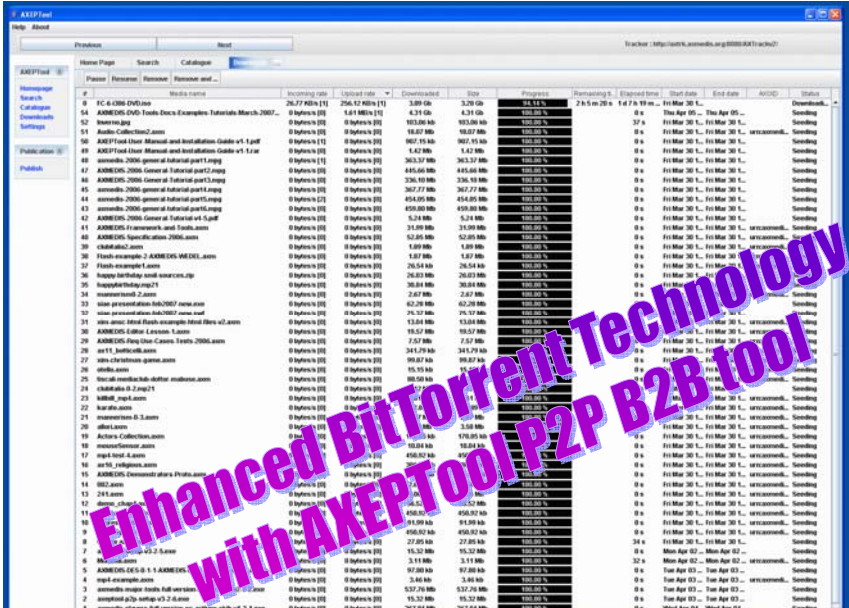
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## AXMEDIS P2P for B2B: AXEPTTool

AXMEDIS

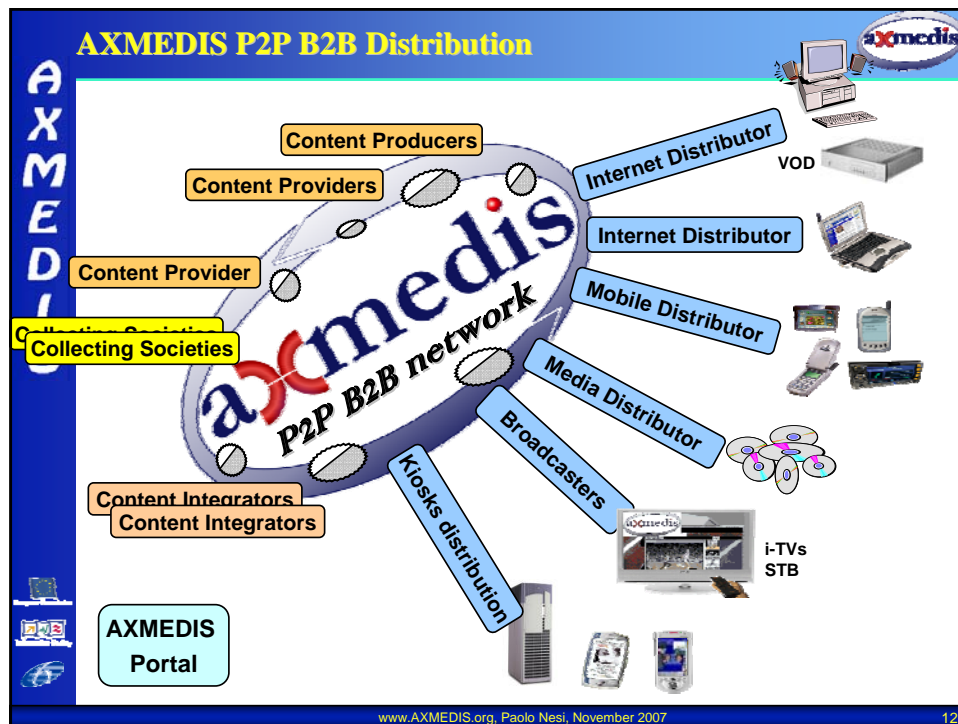


Enhanced BitTorrent Technology  
 with AXEPTTool P2P B2B tool

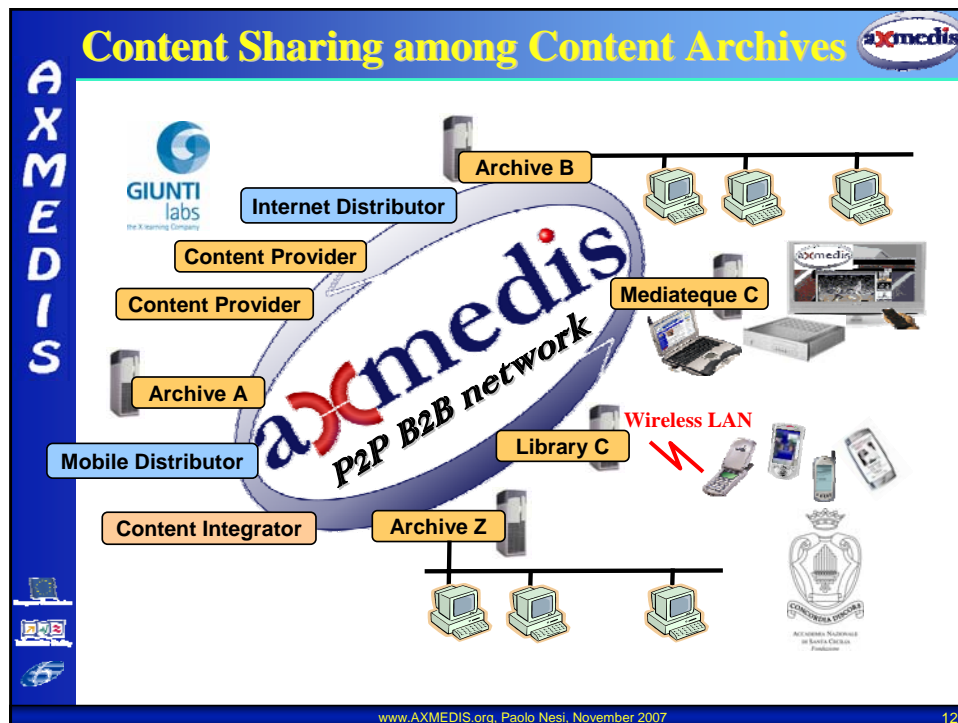


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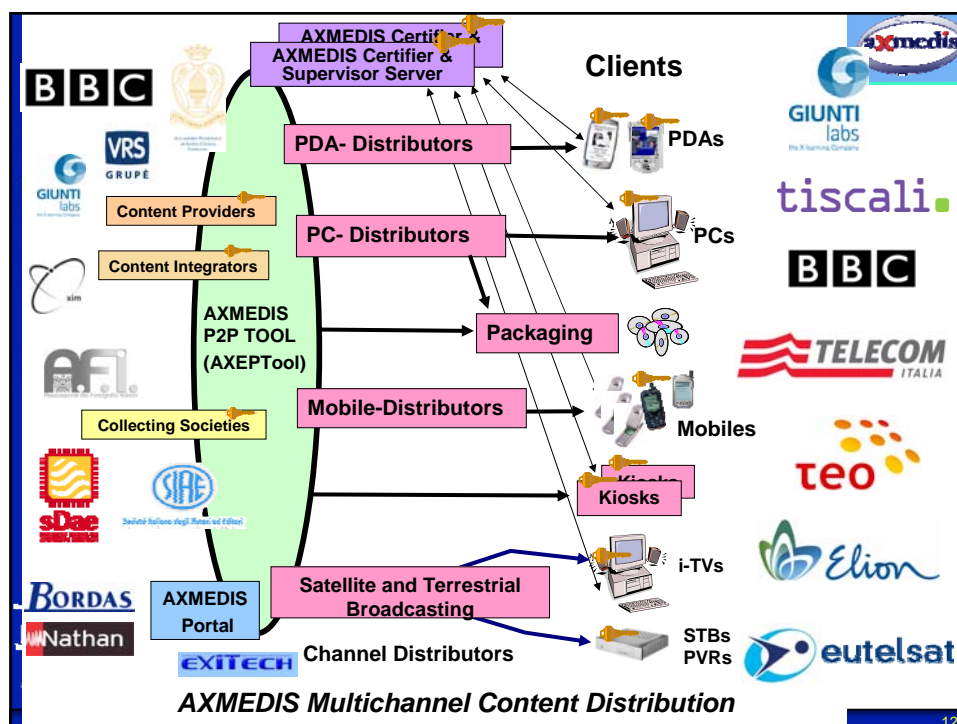


## AXMEDIS Multichannel Distribution

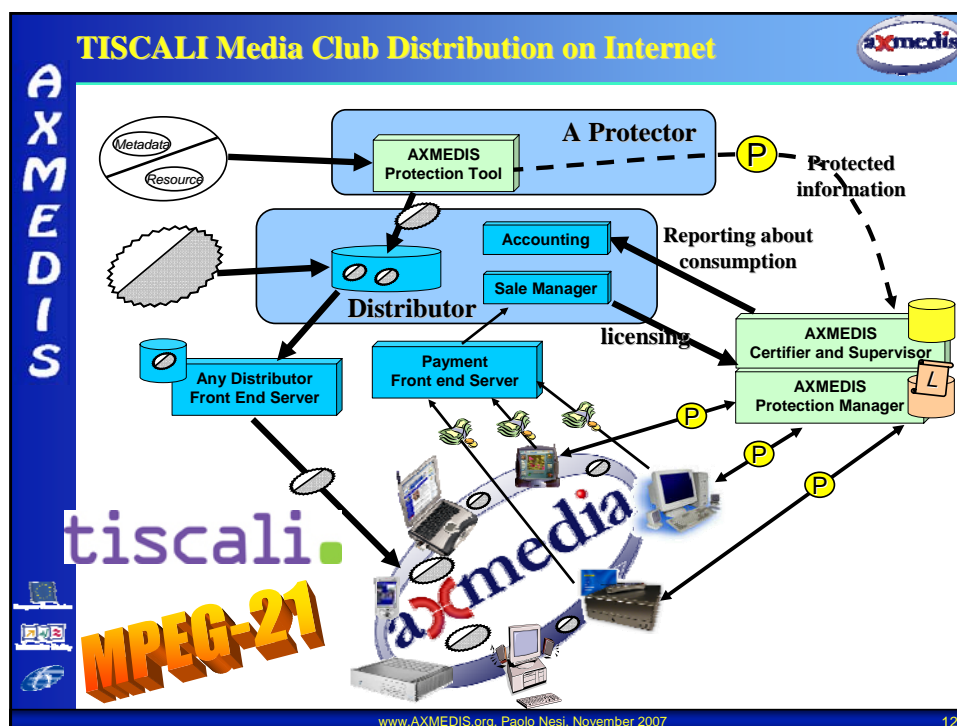
AXMEDIS

- 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 

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## TISCALI Distribution with AXMEDIS Technology

- **B2C distribution**
- **AXMEDIS objects with**
  - ◆ Video and Audio Files, with MD, images and also MPEG-4
- **The AXMEDIS Objects may be**
  - ◆ Downloaded from the TISCALI media club or P2P AXMEDIA
  - ◆ shared among consumers with AXMEDIA Tool a P2P tool
  - ◆ Visualized and played on AXMEDIS players free accessible
- **The users**
  - ◆ have to perform the registration on TISCALI
  - ◆ by a license to use the content
  - ◆ may use any AXMEDIS player
  - ◆ Mainly on PCs and Media Centers. PVRs
- **License allows**
  - ◆ Content sharing on AXMEDIA
  - ◆ Content play
  - ◆ Content Adaptation...
  - ◆ Content Migration on other P2P channels...
  - ◆ Content Migration on any other AXMEDIS terminal

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## TISCALI Media Club, Distribution Portal

### mediacubmanager

---

Search Axmedis media

Media catalog

Statistics

Search Axmedis media

Search for:  CONTAINS  brief

☒ right EQUAL ☐ play ☐

☐ territory EQUAL

☐ exercise limit EQUAL

☐ validity interval LESS EQUAL

2 records found Page 1

| title  | type | creator | date       | import status |
|--------|------|---------|------------|---------------|
| Ariete | NULL | NULL    | 12/09/2007 |               |

Statistics

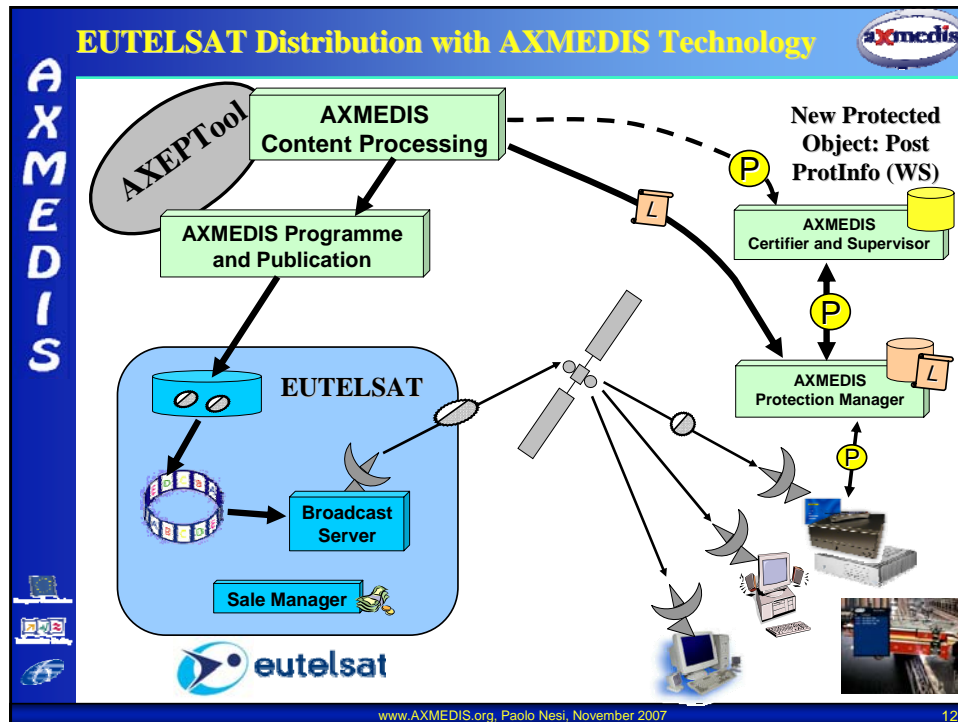
Search: from: 2007-06-16  media id:

creator:  domain:  work identification:

1844 records found Page 1

| media id   | creator  | operation | execution           | regi       |
|--|--|-----------|---------------------|------------|
| URN:AXMEDIS:00002:OBJ:00909E67-1D09-3708-9467-115183071319 | URN:AXMEDIS:00002:BUS:0090006-6E93-3EC0-AB04-8B2122A0654C  | mxplay    | 2007-10-16 10:50:02 | 2007-10-49 |
| URN:AXMEDIS:00002:OBJ:7362A059-9461-31A1-0B51-0B073ED1E3F3 | URN:AXMEDIS:00002:BUS:7C38E82E-6040-3EB0-8476-9C2000DDE43D | mxplay    | 2007-10-16 09:24:19 | 2007-09:24 |
| URN:AXMEDIS:00002:OBJ:8A795BCC-34DB-3D29-B26A-44EF6CFD9B51 | URN:AXMEDIS:00002:BUS:0090009-6E03-3EC0-AB04-8B2122A0654C  | mxplay    | 2007-10-16 08:43:19 | 2007-08:43 |
| URN:AXMEDIS:00002:OBJ:0905BACD-8687-375D-BC58-678F157AFA67 | URN:AXMEDIS:00002:BUS:D6D45C62-807E-3AC2-99AE-EF8D97C784A4 | mxplay    | 2007-10-15 17:36:14 | 2007-17:37 |

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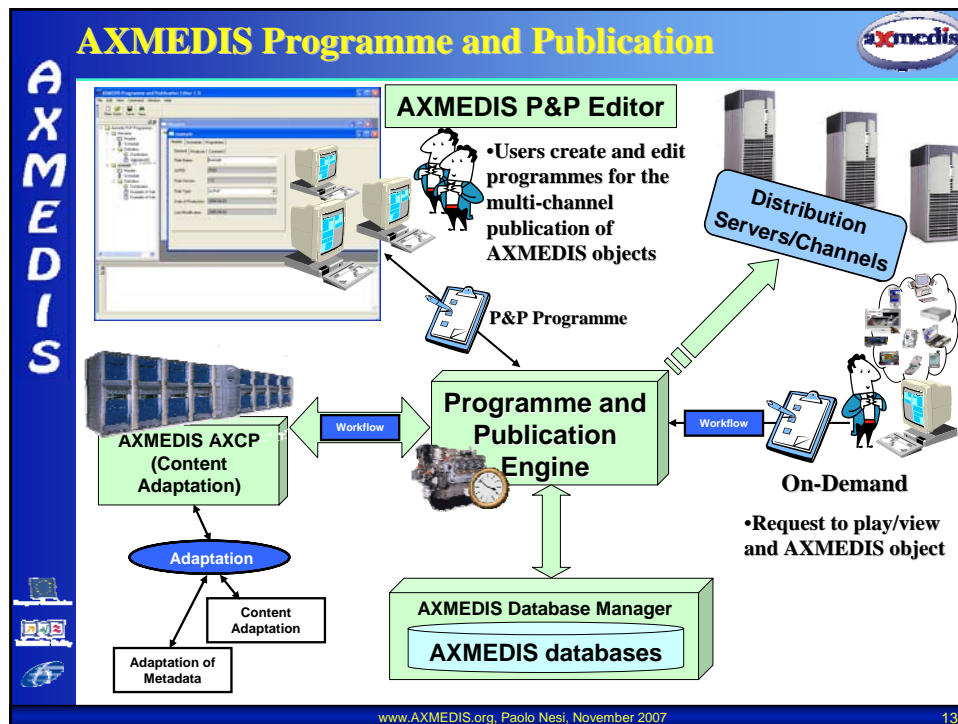


### EUTELSAT Distribution with AXMEDIS Technology

- 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>

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## VIDEO on EUTELSAT distribution

**see links in the last page to download the videos VIDEO**


| Name                    | Start Time | Duration | Size    | Speed   | Target |
|-------------------------|------------|----------|---------|---------|--------|
| Tina Turner             | 16:12      | 3s       | 205 KB  | 64 KB/s | 100%   |
| Le... ..                | 16:12      | 2s       | 159 KB  | 64 KB/s | 100%   |
| ... ..                  | 16:13      | 8s       | 543 KB  | 64 KB/s | 100%   |
| Mandolino               | 16:13      | 1m 6s    | 4.16 MB | 64 KB/s | 100%   |
| Miracle Maker           | 16:15      | < 1s     | 58.2 KB | 64 KB/s | 100%   |
| theCrossing             | 16:15      | 1m 32s   | 5.76 MB | 64 KB/s | 100%   |
| Little Vampire Inter... | 16:17      | 42s      | 2.68 MB | 64 KB/s | 100%   |
| sport1                  | 16:18      | 2m 40s   | 10 MB   | 64 KB/s | 100%   |
| sport2                  | 16:22      | 2m 40s   | 10 MB   | 64 KB/s | 100%   |


Search Show all Add to jobs

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AXMEDIS

## EUTELSAT Distribution with AXMEDIS technology





- **B2B and B2C distribution**
- **AXMEDIS objects with**
  - ◆ Any kind of content,...
  - ◆ Video, images, document, audio, animations, etc.
- **The AXMEDIS Objects may be**
  - ◆ Visualized and played on AXMEDIS players free downloaded
- **The users have to perform the registration of**
  - ◆ themselves on an AXMEDIS portal or via the STB ID/PIN
  - ◆ any AXMEDIS player tool they would use
  - ◆ Mainly on PC for TV and/or STB and/or Kiosks
- **License allows**
  - ◆ Content play
  - ◆ Content Adaptation...
  - ◆ Content Migration on any other AXMEDIS terminal, in some cases





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AXMEDIS

## ILABS Distribution with AXMEDIS technology





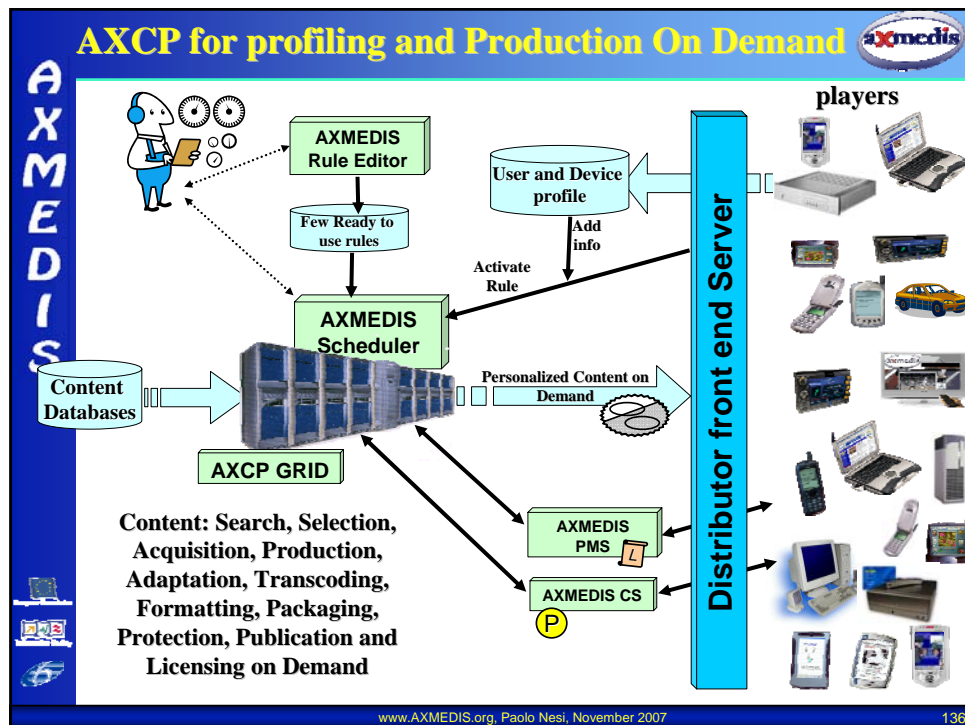
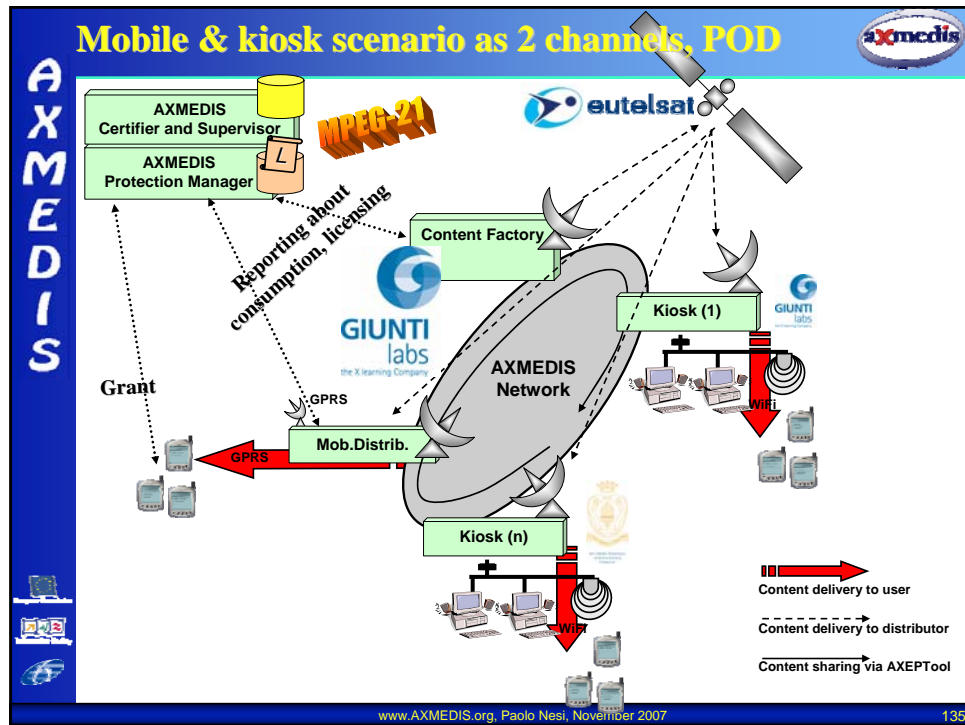
- **B2B and B2C distribution**
- **AXMEDIS objects with**
  - ◆ Educational and cultural content,...
  - ◆ Video, images, document, audio, animations, etc.
- **The AXMEDIS Objects may be**
  - ◆ Produced on demand on the basis of phone profile, POD
  - ◆ Visualized and played on AXMEDIS players free downloaded
- **The users have to perform the registration of**
  - ◆ themselves on ILABS portal and/or an AXMEDIS portal
  - ◆ any AXMEDIS player tool they would use
  - ◆ Mainly on PC-Kiosks, PDA and/or mobiles
- **License allows**
  - ◆ Content play
  - ◆ Content Adaptation...
  - ◆ Content Migration on any other AXMEDIS terminal, in some cases



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## ILABS Content Distribution to Kiosks and PDA

AXMEDIS

**KIOSKFACTORY**

Catalogue Creation   Workflow management   Cart   Home   Back

**Catalogue Creation**

Fields marked by \* are mandatory.

\*Filename: cat.xml  
 \*Identifier: cat  
 Description:  
 Template:  
 \*Validity start: 2007-03-09  
 \*Validity:

**User Management**

Welcome admin   Home   Catalogue   Admin   Back   Logout

| Username | Last Name | First Name | (i) | Roles | Modify | Remove |
|----------|-----------|------------|-----|-------|--------|--------|
| a1       | a1        | a1         |     |       |        |        |
| a22      | a22       | a22        |     |       |        |        |
| admin    | cognome   | nome       |     |       |        |        |
| my       | cognome   | nome       |     |       |        |        |
| joker    | Smith     | John       |     |       |        |        |

Username   Last Name   First Name   (i)   Roles   Modify   Remove

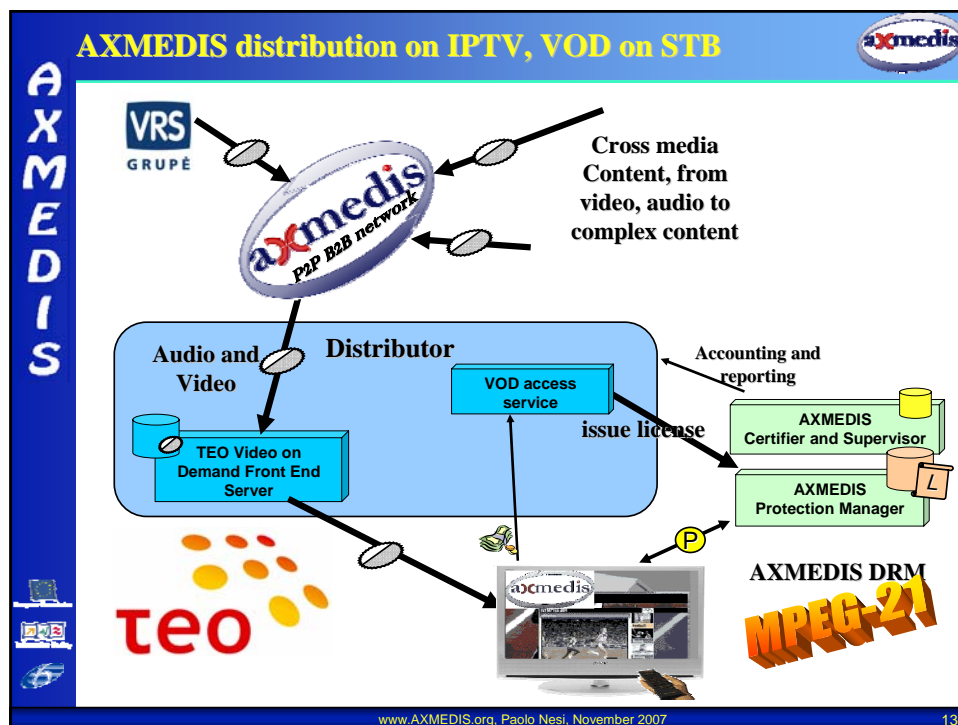
Change language

MPEG-21

**GIUNTI**  
labs  
the X learning Company

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**VIDEO on TEO VOD channel**

**AXMEDIS**

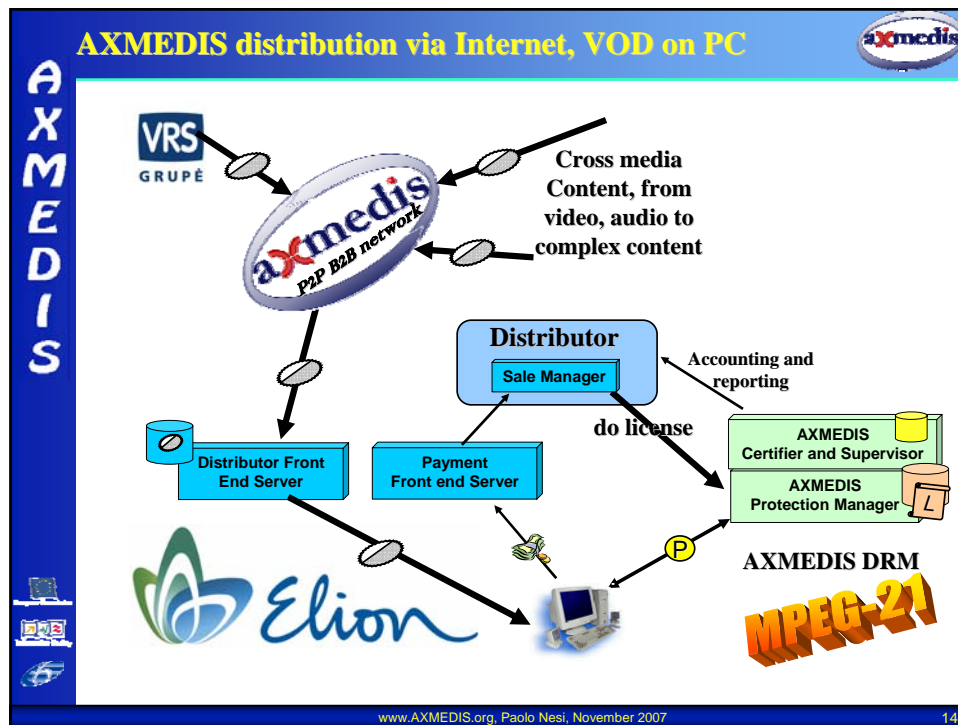
**see links in the last page to download the videos**

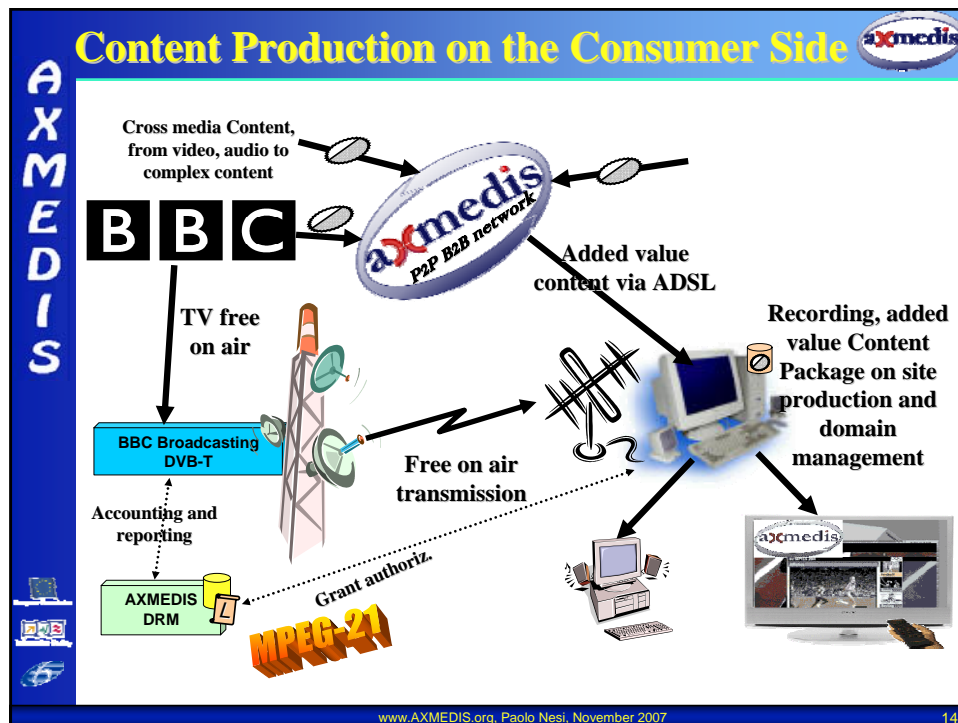
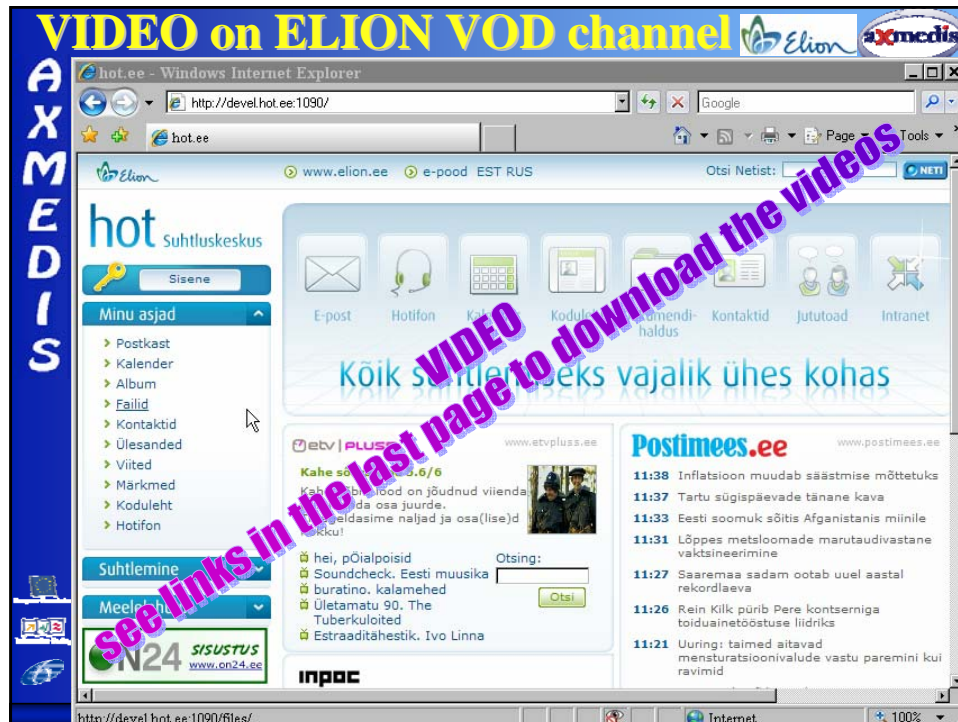
**VIDEO**

**TEO**

**axmedis**

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AXMEDIS

## VIDEO on BBC content production






see links in the last page to download the videos











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AXMEDIS

## 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

DVB-T

P2P

Internet

UMTS

GPRS



DVB-S

Downloading

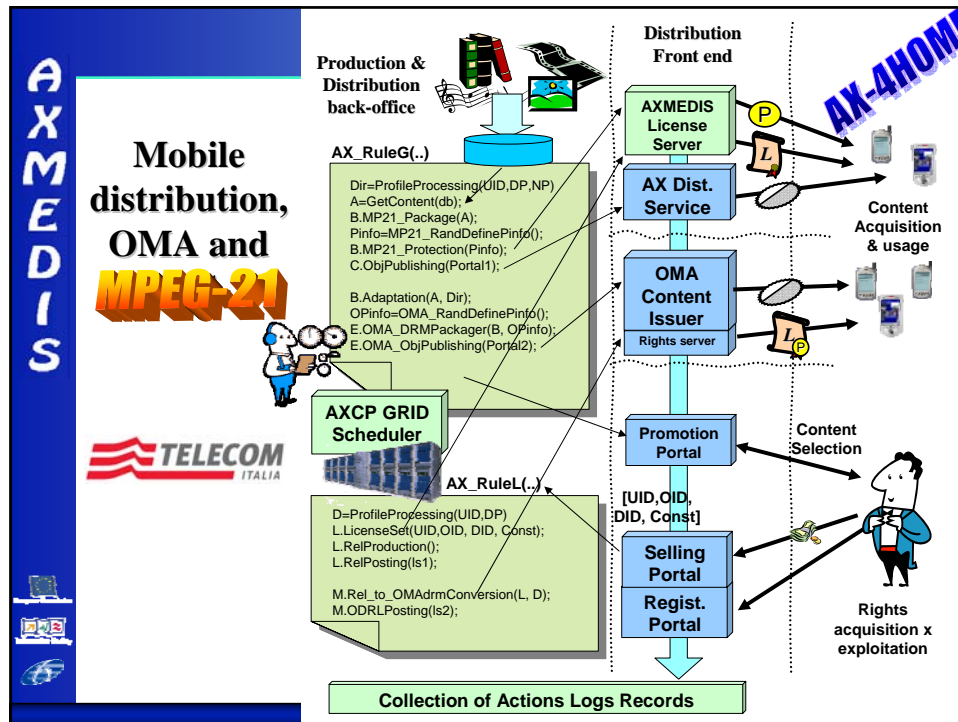
Streaming

VOD

P2P

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### Telecom Italia, OMA & MPEG-21 distribution

```

function adaptAudio(audio, mimeType)
{
    print("Content: adaptAudio");
    var resource = audio.getContent();
    var i = 0;
    for (i in resource)
    {
        var res = resource[i];
        var p;
        if (res instanceof AudioResource)
        {
            val = resource[i].mimeType.search("audio");
            if (val == -1)
            {
                // ...
            }
        }
    }
}
            
```

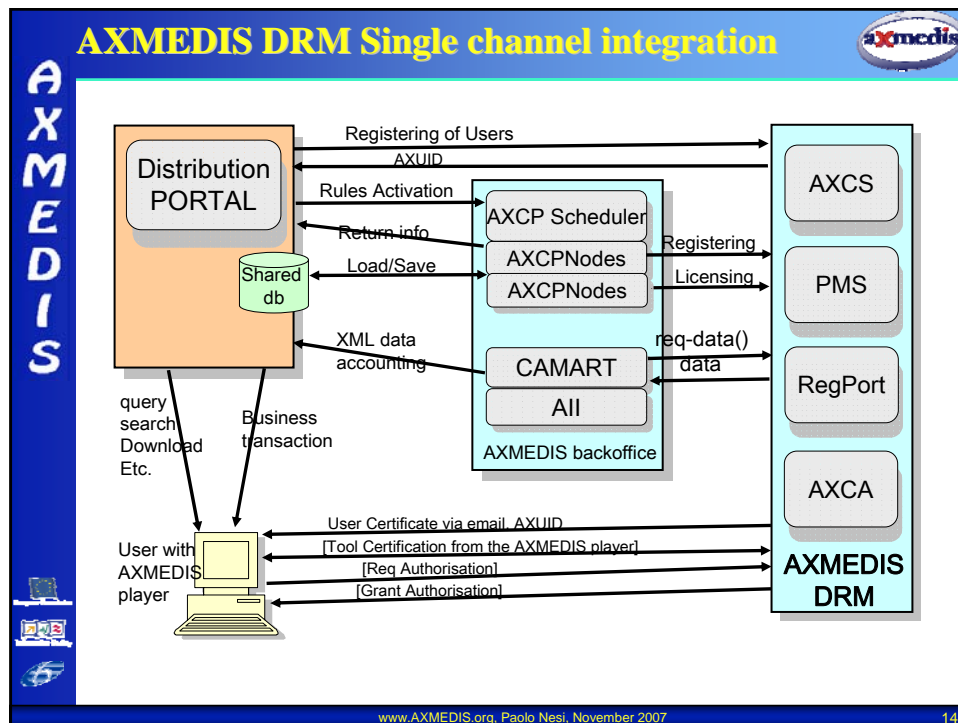
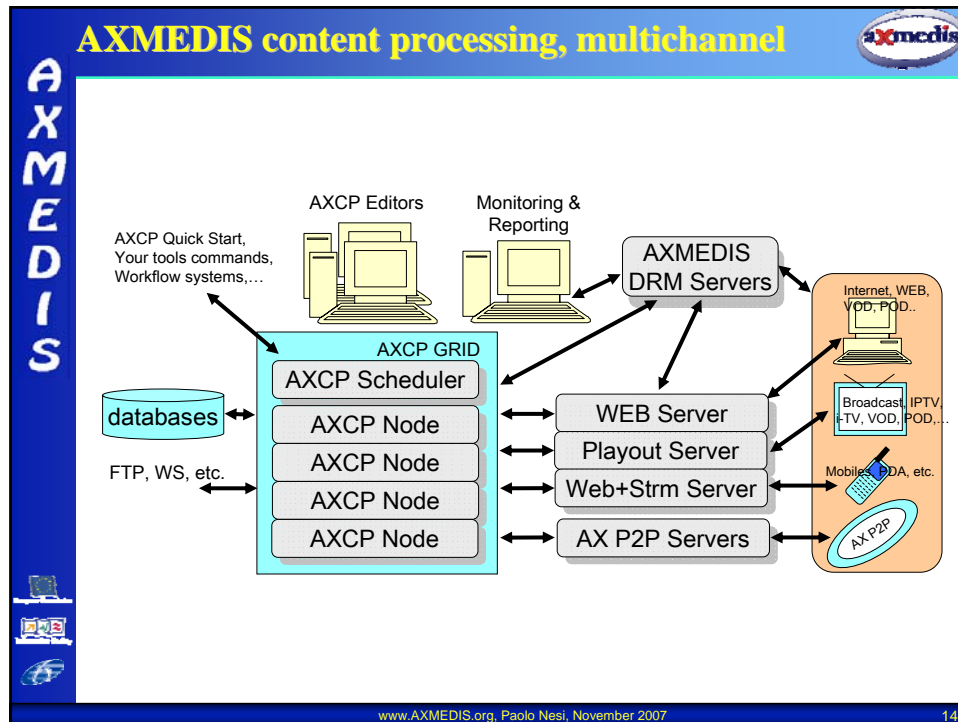
**AXMEDIS Home Page - Mozilla Firefox**

Choose an option:

- View list of Axmedis contents
- Load a new content
- Load a new license


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AXMEDIS






## USERS production and distribution

- **Content production tools for final users, SIAE trial**
- **Set up a service for final users', producers**
  - ◆ content acquisition and collection from the final user would,
    - ➔ Definition of the DRM rules from the final users
  - ◆ automated content production, protection and adaptation
  - ◆ automated license creation
  - ◆ License production on demand, different models
  - ◆ Content distribution via distribution portal with/without DRM




Società Italiana degli Autori ed Editori

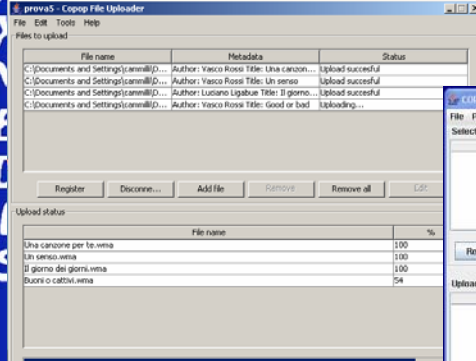
www.AXMEDIS.org, Paolo Nesi, November 2007

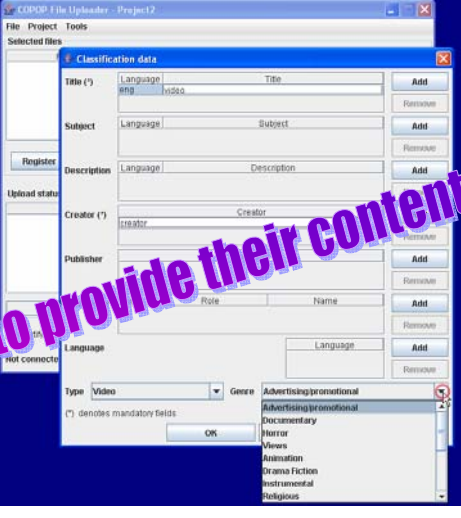
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AXMEDIS






## AXMEDIS Content Posting Portal, SIAE



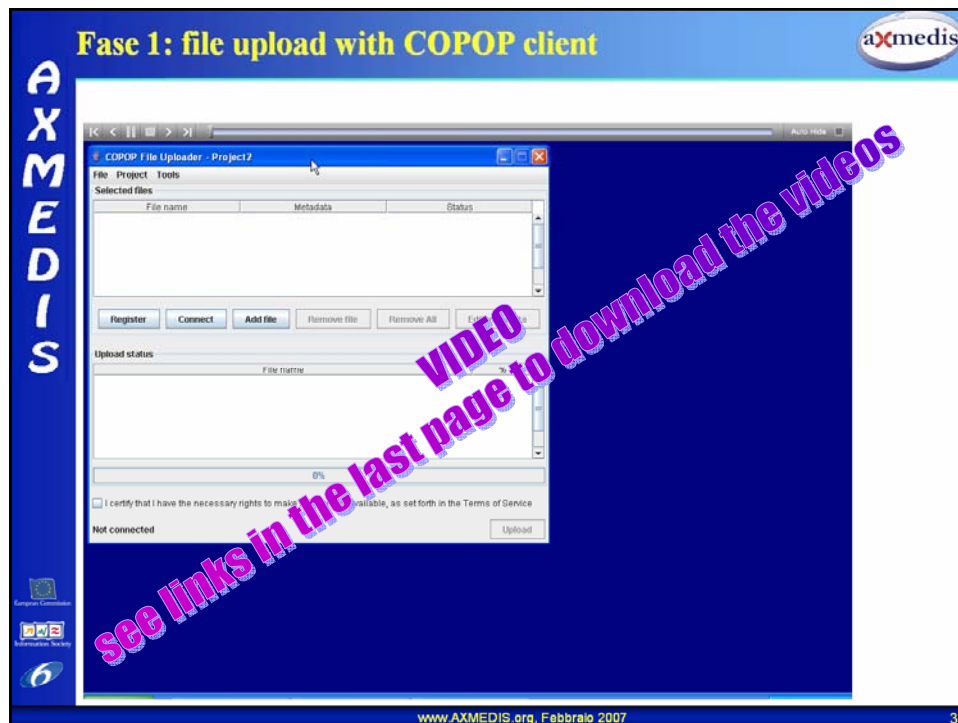
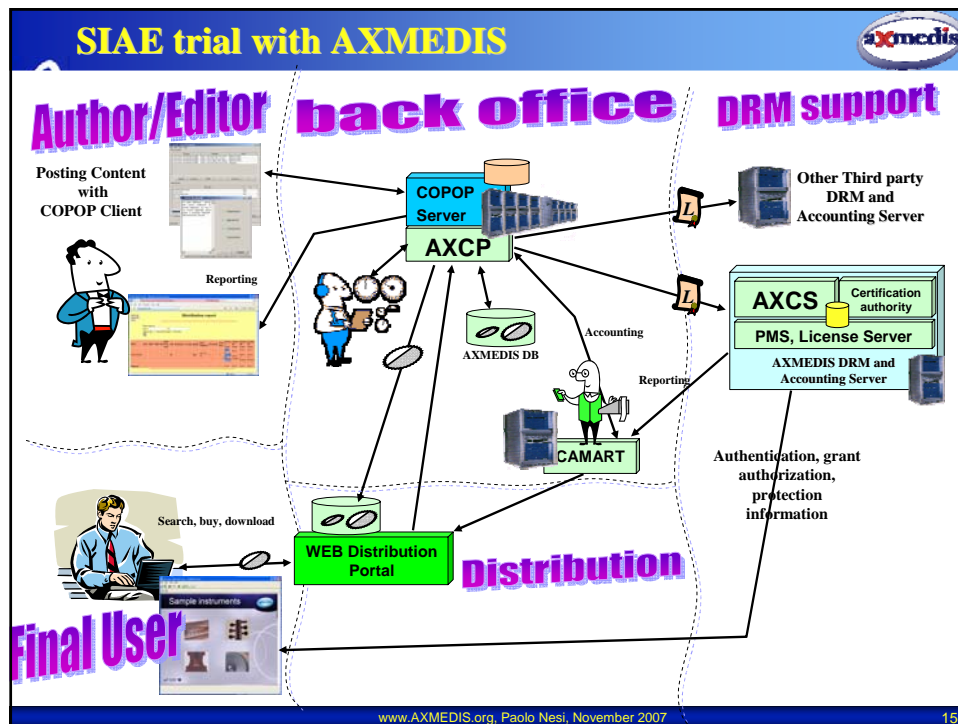


Engage FINAL USERS to provide their content


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## Content Enrichment with final users

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- **Content Enrichment with AXMEDIS**
- **VARIAZIONI e-ContentPlus**
- [www.variazioni.org](http://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

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## Content Enrichment and social network

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VARIAZIONI

- **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









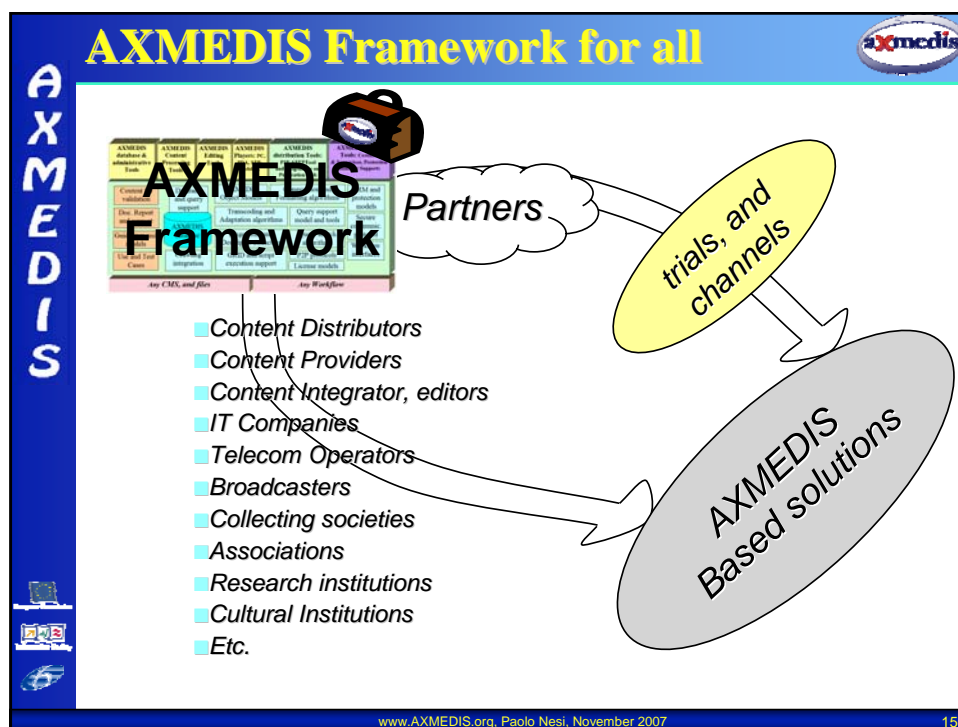

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| Table of Content |  |
|------------------|--|
| ●                | Preface                                  |
| ●                | What is AXMEDIS                          |
| ●                | Market Analysis and Opportunities        |
| ●                | State of the Art, Limitations, Needs     |
| ●                | AXMEDIS Content Protection and Tracking  |
| ●                | AXMEDIS Content Production and Packaging |
| ●                | Examples of AXMEDIS Applications         |
| ●                | <b>Conclusions and references</b>        |

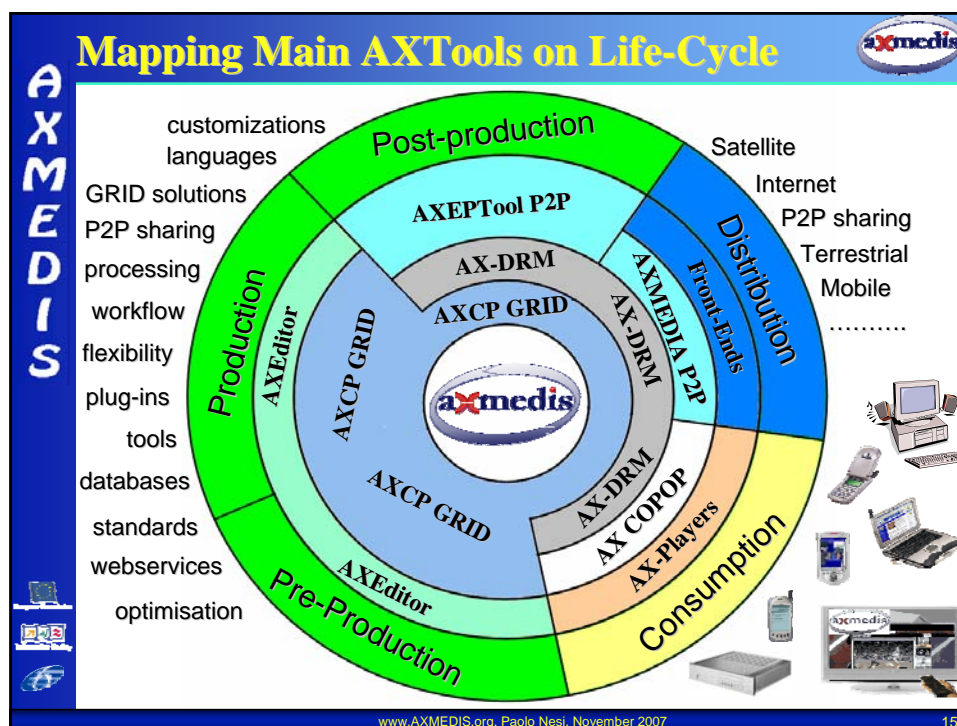
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## Can be a very important solution to



- **support the distribution of Cross media content**
  - ◆ More interactivity and capabilities for the consumers
  - ◆ Interoperability among devices/content for the consumers
  - ◆ Interoperability among DRM for the consumers and along the value chain
- **make easier the B2B market of digital content, and of cross media content**
  - ◆ Composition and DRM management
  - ◆ Tracking and monitoring the exploitation of rights
  - ◆ Simpler B2B Content Trading, costs reduction
  - ◆ High flexibility in business and transaction models
- **make easier for SMEs to access/survive in the digital content market**
  - ◆ Proposed and getting content
  - ◆ Set up distribution and other business solutions for content

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## AUTOMATING the BACKOFFICE



- **Lower costs of and enabling**
  - ◆ content gathering, transcoding/monitoring platform, production of content on demand with AXCP
  - ◆ integrate cross media content and automatically managing rights for complex multimedia products
  - ◆ production, B2B distribution, promotion via P2P B2B
- **New forms of content and unexploited content:**
  - ◆ Making business with cross media content, integrating HTML, SMIL, document, video, etc., no possible up to now
  - ◆ Exploiting the content "long tail"
- **Interoperability, convergence of media**
  - ◆ interoperability of content and DRM, Multi-channel distribution
  - ◆ access to the same content on several platforms, devices and locations
  - ◆ greater level of security, control of content usage in all channels B2B2C
- **DRM, creation new business models**
  - ◆ different business models on the same channel may be used
  - ◆ adapting the distribution channel to the users needs and would
  - ◆ Access to detailed reporting on the exploited rights
- **Distribute content with**
  - ◆ Any B2C: Internet, STB, broadcasting, Mobile, kiosks, pda, etc.
  - ◆ P2P to Consumers with the support of DRM




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- **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!**




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## Affiliation to the AXMEDIS


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- The benefits of the affiliation include the possibility of using the AXMEDIS technology and tools (customize them from source code), for your business without limitations
- You can become affiliated with AXMEDIS.  
The affiliation provides access to
  - ◆ a large amount of information and knowledge
  - ◆ full source code AXMEDIS Framework TOOLS
  - ◆ AXMEDIS tools ready to be used
  - ◆ Technical reports and documentation
  - ◆ Mailing and discussion lists, wiki portal
  - ◆ Training reports and tutorials, videos, slides and docs
  - ◆ Access to the AXMEDIS workshops and training
- The affiliation can be performed via the affiliation agreement
  - ◆ information can be recovered from the DVD and on the portal
- The affiliation has a small annual fee that
  - ◆ can be covered in money or by value, offering contributions to the AXMEDIS Framework for the community.
  - ◆ Is free of charge for no profit institutions




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- **slide 62: editor-new5b.wmv**
  - ◆ [http://www.axmedis.org/documenti/view\\_documenti.php?doc\\_id=3643](http://www.axmedis.org/documenti/view_documenti.php?doc_id=3643)
- **slide 77: mn1.wmv**
  - ◆ [http://www.axmedis.org/documenti/view\\_documenti.php?doc\\_id=3644](http://www.axmedis.org/documenti/view_documenti.php?doc_id=3644)
- **slide 96: play5-N.wmv**
  - ◆ [http://www.axmedis.org/documenti/view\\_documenti.php?doc\\_id=3645](http://www.axmedis.org/documenti/view_documenti.php?doc_id=3645)
- **slide 98: play5-VIDEO-NESI.wmv**
  - ◆ [http://www.axmedis.org/documenti/view\\_documenti.php?doc\\_id=3646](http://www.axmedis.org/documenti/view_documenti.php?doc_id=3646)
- **slide 100: pda-short.mpg**
  - ◆ [http://www.axmedis.org/documenti/view\\_documenti.php?doc\\_id=3647](http://www.axmedis.org/documenti/view_documenti.php?doc_id=3647)
- **slide 132: part2-sat-client-NESI.wmv**
  - ◆ [http://www.axmedis.org/documenti/view\\_documenti.php?doc\\_id=3648](http://www.axmedis.org/documenti/view_documenti.php?doc_id=3648)
- **slide 139: AXELTEO-TEO-STB-demo.mpg**
  - ◆ [http://www.axmedis.org/documenti/view\\_documenti.php?doc\\_id=3604](http://www.axmedis.org/documenti/view_documenti.php?doc_id=3604)
- **slide 141: ELION-enduser-nesi.wmv**
  - ◆ [http://www.axmedis.org/documenti/view\\_documenti.php?doc\\_id=3649](http://www.axmedis.org/documenti/view_documenti.php?doc_id=3649)
- **slide 143: bbc-user3.mpg**
  - ◆ [http://www.axmedis.org/documenti/view\\_documenti.php?doc\\_id=3650](http://www.axmedis.org/documenti/view_documenti.php?doc_id=3650)
- **slide 152: siae-presentation-short-July2007-new-nov07.wmv**
  - ◆ [http://www.axmedis.org/documenti/view\\_documenti.php?doc\\_id=3651](http://www.axmedis.org/documenti/view_documenti.php?doc_id=3651)



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