



Automating Production of Cross Media Content for Multi-channel Distribution

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DE12.2.5.2

AXMEDIS-ELTEO Demonstration Report

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Abstract: This report is a deliverable of workpackage WP12.2.5 AXMEDIS-ELTEO: Validation and Demonstrator. The document describes the TEO IPTV AXMEDIS demonstrator and ELION AXMEDIS demonstrator, overview of their architecture and solution, demonstrators show cases.

Keyword List: TEO IPTV demonstrator, Elion PC demonstrator, IPTV, AXTB Player, end user, VOD Manager, IPTV administrator

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1 Executive Summary and Report Scope

As part of AXMEDIS project, a group of partners from Baltic States has undertaken to deploy an integrated AXMEDIS Framework for video-on-demand distribution. The real life demonstration prototype involves a video content producer from Lithuania (VRS Grupe), and two broadband operators – Elion (Estonia), operating an internet-based media distribution portal, and TEO (Lithuania) – IPTV service provider. Although the purpose of the demonstrator is to show how AXMEDIS tools can be used in an integrated automatic content production and distribution value chain, this report describes the technical aspects of the TEO platform, integrating AXMEDIS tools into IPTV video on demand (VOD) service.

The purpose of the TEO demo is to showcase AXMEDIS technology adopted for IPTV platform. It demonstrates broadband operator's distribution of video on demand (VOD) content to trial IPTV service subscribers. IPTV service subscribers can view digital video material on their TV through an AXMEDIS compliant Set Top Box (STB).

The purpose of the Elion demo is to showcase AXMEDIS technology adopted for streaming/downloading protected AXMEDIS content to PC over Internet. It demonstrates broadband operator's distribution of value added video on demand (VOD) content to Elion trial internet service subscribers using the media rental. Internet service subscribers can view digital video material on their PC through an AXMEDIS PC Player. The Elion demonstrator for the exploitation of AXMEDIS Framework intends to show business to consumer (B2C) digital content distribution on IP network by downloading video content into PC using http server. The content can consist of AXMEDIS objects with any kind of content: video, images, document, audio, animations, etc. The content is protected at content producer level using special AXMEDIS DRM technology. Usage licenses are produced on the fly when an AXMEDIS object is bought by the consumer.

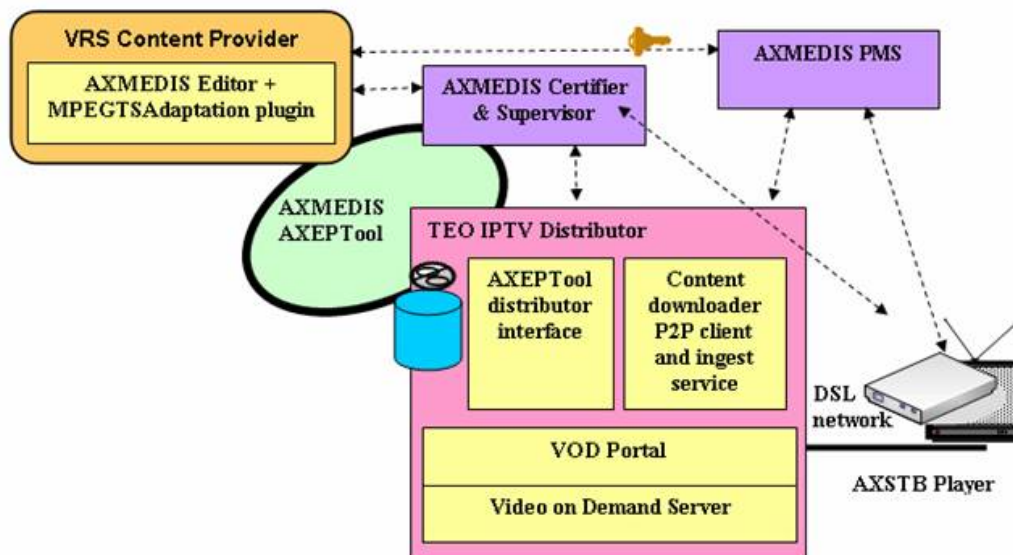
2 Introduction

As part of AXMEDIS project a group of partners from Lithuania and Estonia has undertaken to deploy an integrated AXMEDIS Framework for Video on demand distribution towards TV (TEO) and PC (Elion). Entire ELTEO demonstrator consists of TEO, Elion and VRS factories – sets of integrated AXMEDIS Tools to serve specific purposes of either content production/adaptation (VRS), or content distribution (TEO and Elion). TEO Demonstrator uses adopted AXMEDIS tools with newly developed components for STB platform. Elion demonstrator uses AXMEDIS Tools for PC platform.

3 TEO IPTV AXMEDIS system architecture

3.1 High level description

The scheme below depicts the general components of an integrated TEO demonstrator. Components depicted in yellow background are software components developed by consortium partners specifically for IPTV STB solution.

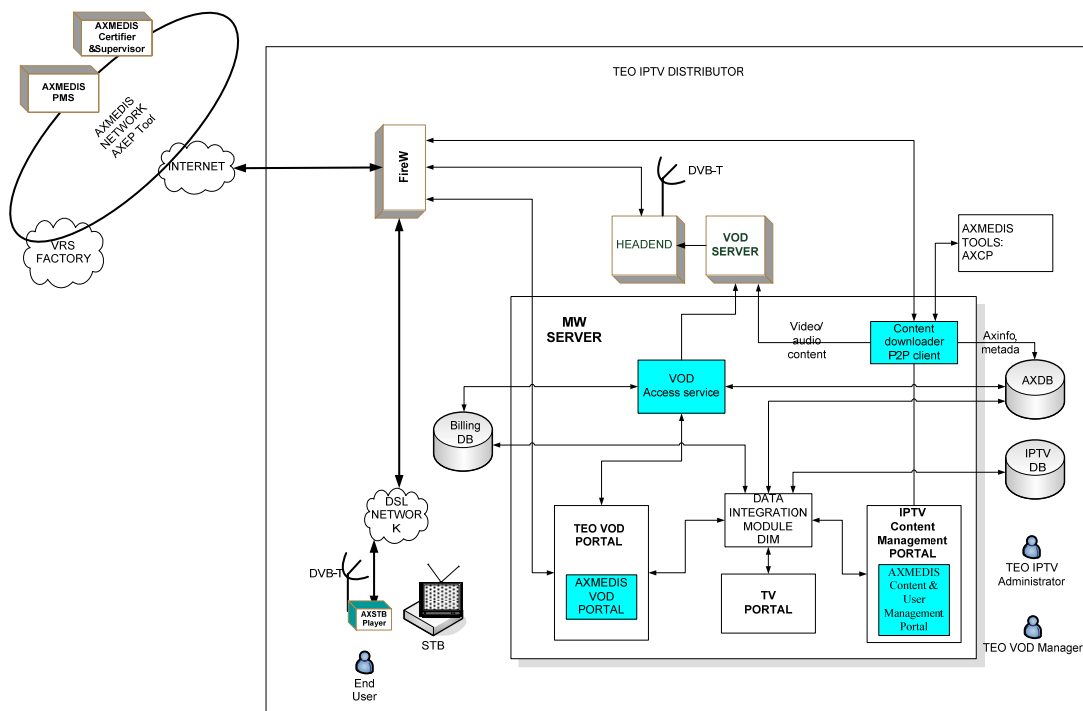


For this solution of B2B automatic content production and distribution for IPTV, the content producer VRS uses AXCP http://www.axmedis.org/documenti/view_documenti.php?doc_id=3624 and MPEG TS Adaptation Plugin to produce and make available some trial video content for TEO IPTV service. The videos are formatted as AxObjects for TEO, with pre-set usage rights and conditions and defined metadata. VRS places these AXMEDIS objects into P2P network by using the AXEPTool http://www.axmedis.org/documenti/view_documenti.php?doc_id=3612

TEO IPTV distribution facility downloads the AXMEDIS objects from the P2P by using Content downloader P2P AXEPTool client and ingest service and places them into VOD portal and server which include also Customer relationship manager and content management system. The VOD server it is capable to stream the content on demand to the user' STB.

3.2 Detailed system description

TEO IPTV AXMEDIS demonstrator setup is based on existing TEO Gala IPTV infrastructure. It started using existing IPTV architecture components in addition with some newly developed components (depicted in light blue) integrating AXMEDIS DRM elements and AXMEDIS content production and player tools.



TEO IPTV AXMEDIS demonstrator is comprised of:

- **MW Server** and related components, as follows:
 - Existing TEO Gala IPTV database IPTV DB. In this DB information about clients, services and accounting information is stored. Communication with IPTV DB is performed using DIM-ADO.NET.
 - Existing Billing DB database, where TEO users billing information is stored. Communication with this DB is performed using webservices.
 - In AXDB the AXMEDIS object metadata and stream information (AxStreamResource) is stored. The MPEG-2 TS resources are excluded due to storage efficiency. This DB is based on AXMEDIS database.
 - Data integration module (DIM) is existing TEO solution for integration different data formats in databases.
 - TV Portal – existing portal for Gala TV. This portal is used in TEO Gala TV for IPTV services:
 - On-line TV channels;
 - Electronic program guide;
 - Gaming, etc.;
 - AXMEDIS VOD PORTAL, based on TEO Middleware platform. This portal is used for TEO demonstrator to present AXMEDIS content for End User. AXSTB Player uses this portal to retrieve information about content and usage information.
 - AXMEDIS Content & User Management Portal, which has been developed on IPTV Content Management Portal platform and used for TEO AXMEDIS content and user management. This module has been implemented in IPTV Content Management Portal and used by TEO VOD Manager and TEO IPTV Administrator.

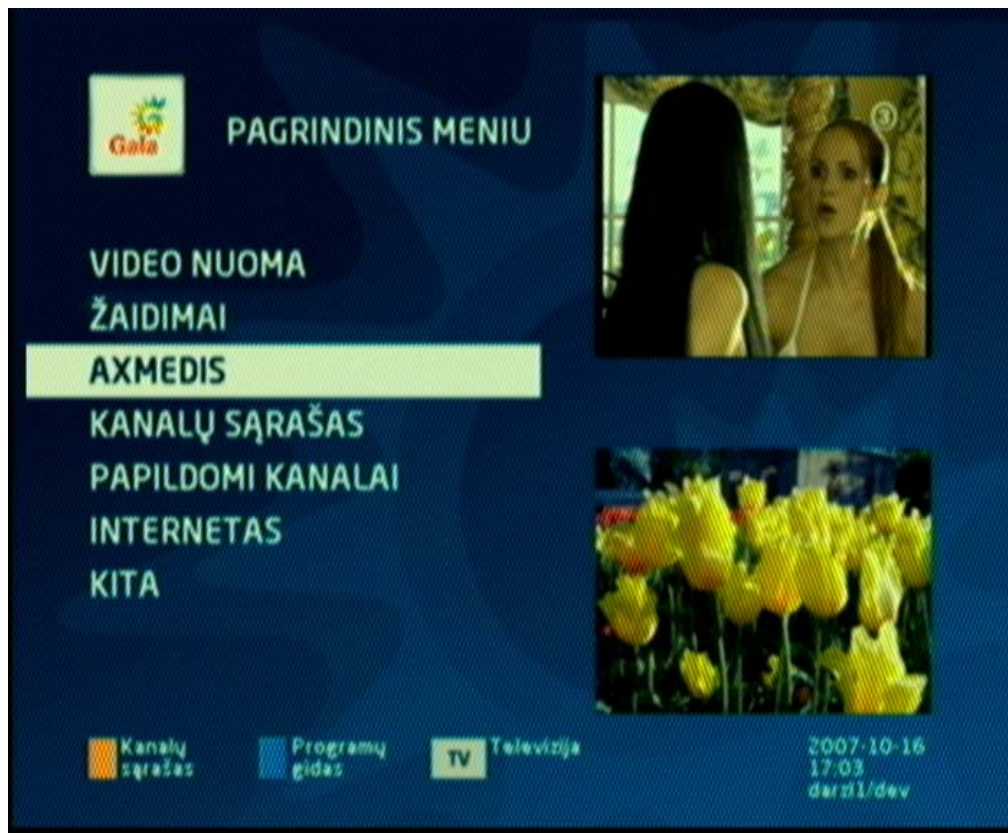
- **VOD Access Service** – a component newly developed for TEO IPTV demonstrator setup. This component is responsible for proper End User AXSTB Player connection with used DB's and services. VOD Access Service communicates with VOD server, Billing DB, IPTV DB, AXDB and AXMEDIS PMS to present required information to End User and react to End User actions.
 - **AXEPTool B2B tool** is used for connecting Middleware server with AXMEDIS network and downloading AXMEDIS data from it.
http://www.axmedis.org/documenti/view_documenti.php?doc_id=3624
 - **Content downloader P2P client** is a newly developed component for placing downloaded AXMEDIS object to VOD server, updating AXMEDIS object metadata and placing metadata and stream information into AXDB. Content downloader P2P client uses AXCP for automatically downloading new objects designed for TEO demonstrator. This component is a part of AXMEDIS Content & User Management Portal and is used by TEO VOD Manager for content management purposes.
- **VOD Server** – VOD content storage server. VOD Server is compatible with existing GALA TV network resources (Kreatel Application platform). The VOD server is capable of streaming DVB-CSA encrypted streams.
- **Headend Server** – IPTV content distribution and broadcasting server, used for transferring MPEG-2 designated content via TCP/IP network.
- **AXSTB Player** – based on AXMEDIS module called AXOM, which was integrated into Kreatel STB. AXSTB Player communicates with VOD Server, content and user databases, AXMEDIS PMS Server through VOD Access Service. The AXSTB player is certified and associated to the End User by using AXMEDIS tools and services



3.3 How does the TEO prototype work?

An IPTV service subscriber knows about AXMEDIS content category and decides to view a video from this service. The videos, in AXMEDIS file format, have been manually or automatically downloaded from AXEPTool (P2P file sharing system), on a video on demand, VOD, server by the VOD Content manager operator. The AXMEDIS objects are based on MPEG-21 standard and are specific files with embedded video resources and metadata. They can only be viewed through a specially developed AXSTB Player, and/or on any AXMEDIS Player. The AXSTB contains a low-footprint client specifically designed to support MPEG-2 video transport stream

The AXMEDIS objects with videos are made available for viewer's purchasing and viewing on AXMEDIS VOD portal accessible to the user on television. An IPTV service subscriber access to the VOD portal from the STB and thus to the AXMEDIS content category and may decide to view a video from this service.



When the user wants to view AXMEDIS digital objects, he chooses “AXMEDIS” button and connects to TEO VOD Portal. Using the remote control, the user is connected through an STB to IPTV network to browse through local AXMEDIS Database and select objects for viewing, to get them on demand.

In order to view the content, the End User must obtain a license from the AXMEDIS DRM (AXMEDIS PMS and AXCS tools http://www.axmedis.org/documenti/view_documenti.php?doc_id=3616) In the first step, the AXSTB Player verifies the user ID while the AXMEDISDRM solution ensures Digital rights management and content protection. To this end, the developed VOD Portal service displays on the User's TV screen the billing information and simple license conditions for the selected AXMEDIS object (e.g., paid or free, and pricing). If the viewer decides to view protected content, the user is prompted to enter a PIN, which has been received by the user when signed the contract for the IPTV service. Upon the user entering the PIN, AXSTB Player initializes the license generation process, by sending a request to a VOD Access Service. The VOD Access Service interacts with the

AXMEDIS PMS server to generate the specific user license. The production of the license allows the AXOM to Grant the Authorization to unprotect the content via the AXOM module of the AXSTB Player.

AXMEDIS STB Player starts to play the selected Video content. All user actions with regards to this content are registered in AXMEDIS Content Supervisor and Certifier Database.

The user can “Play”, „Stop”, “Pause”, “Fast forward”, “Rewind” and perform other remote control actions with this content within the capabilities of VOD server functionality.

The system allows the user to access information about the user’s statistics from the provider’s VOD Portal, where he can view all information about the number and type of AXMEDIS objects viewed as well as billing information.

After viewing the video clip, the viewer can go back to AXMEDIS browser or can go to IPTV provider’s portal home page by pressing remote control button or by selecting “Home” button on TV screen.

3.4 Description of TEO demonstrator show case

TEO IPTV AXMEDIS Demonstrator can be tested using STB remote control hardware (SlingBox) and software (SlingPlayer). Before downloading user must register in TEO public demonstrator page (<http://ifko.ktu.lt/TEODemonstrator>).

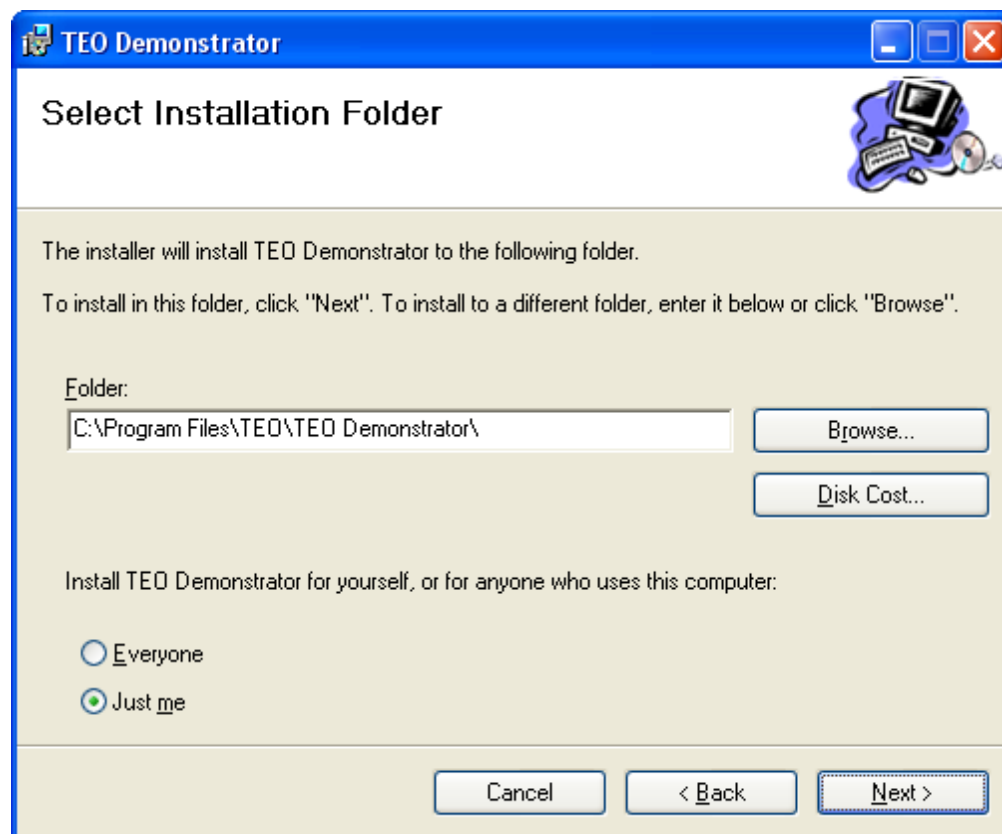
Due to remote control hardware and software restrictions only one user at a time can be connected to Sling Box, therefore after using SlingPlayer always turn off the program. Users can view Sling Box status in initial page or Status tab if it is available at that time. Every connection will be broken after 30min in order to enable other users to use Sling Box.

After downloading launch Setup file and installShield Wizard welcome screen will appear as displayed in picture below. Press “Next” button to continue.

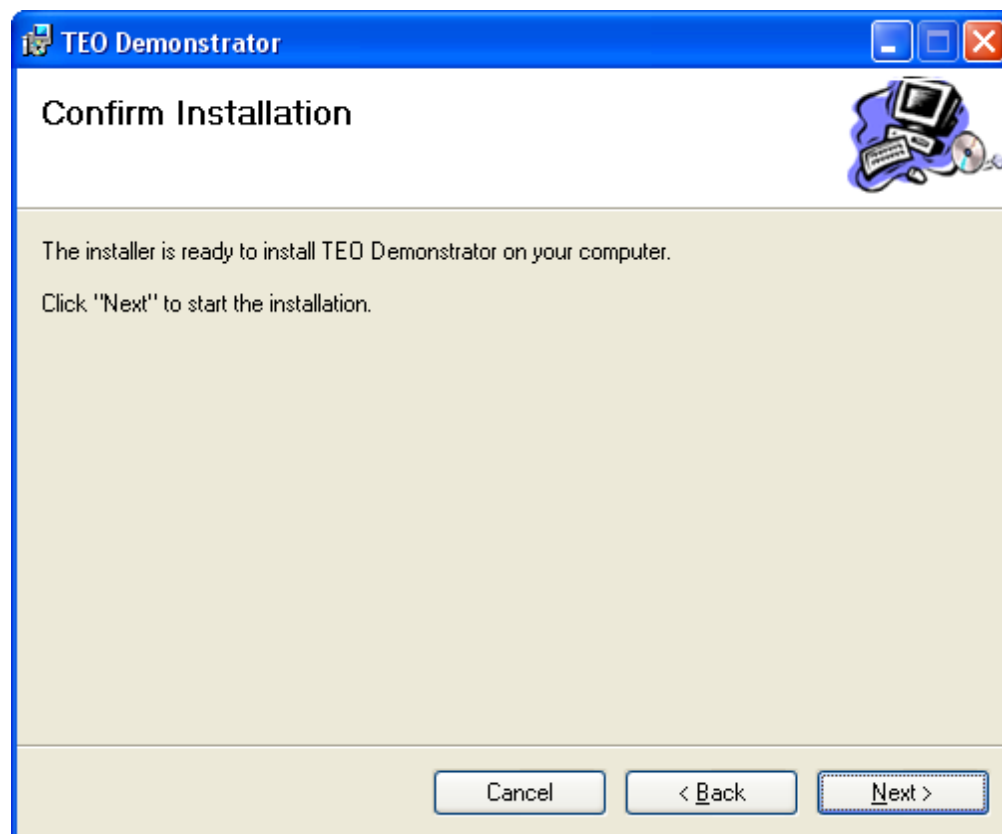


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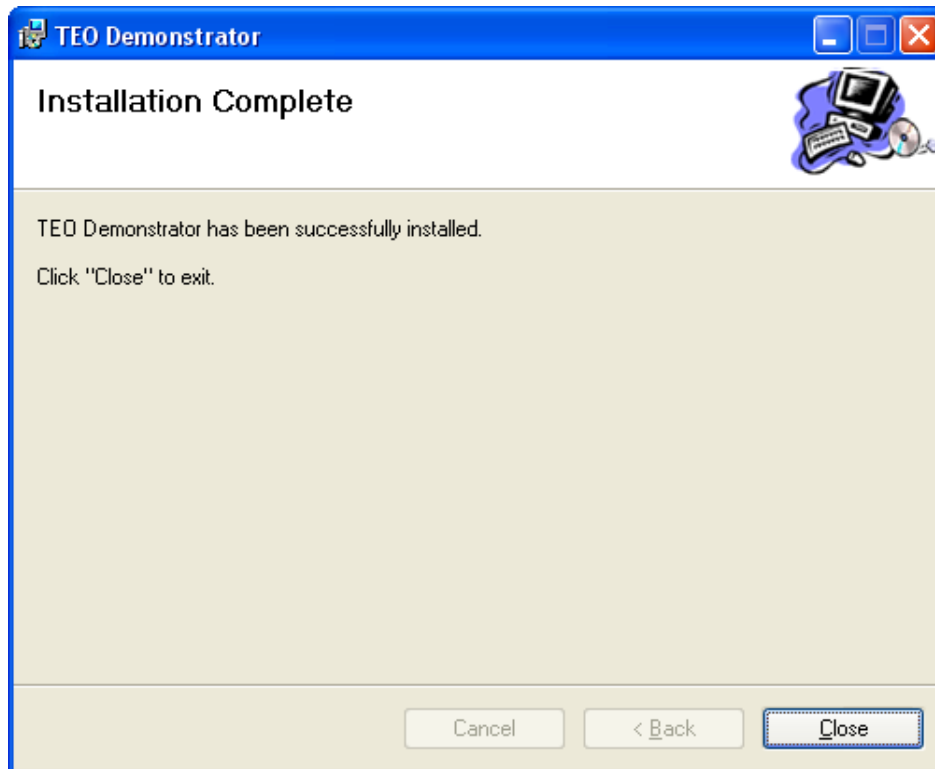
In the select installation folder screen choose your installation path and press “Next” button as displayed in following picture.



In the next page press button “Next” to start installation progress as in the picture below.



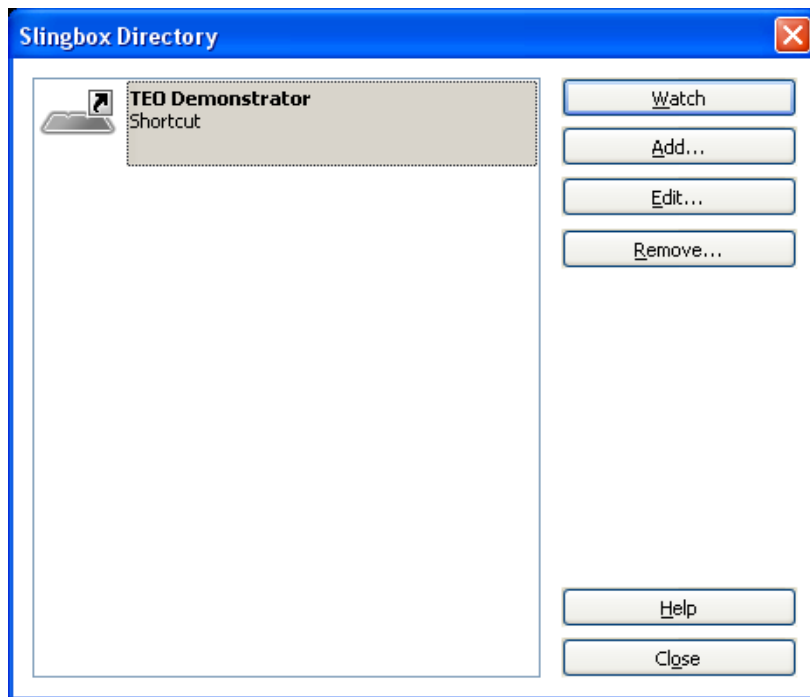
After installation is complete press “Close” button as displayed in picture below.



Launch Sling Player from shortcut created on desktop "TEO Demonstrator.exe". Shortcut also can be found in "Start" menu, "Programs" submenu.



After launching the program TEO Demonstrator Sling Box will become available in Sling Box Directory list as displayed in picture below.



Connecting to TEO Demonstrator the first time message will appear as displayed in picture below. Select check box "Do not show again" and press "No" button.



If connection to Sling Box is available (please check initial page or "Status" tab) user can connect to STB through Sling Box by pressing "Watch" button. In following picture is SlingPlayer sample. With remote control user can press buttons and watch changing information on the SlingPlayer screen on the right. If user want to see chargeable content PIN is 1111.



Video clip of TEO trial can be downloaded from:

http://www.axmedis.org/documenti/view_documenti.php?doc_id=3604

or simply from the main page of AXMEDIS:

http://www.axmedis.org/com/index.php?option=com_frontpage&Itemid=1

3.5 Description of use cases and scenarios

There are three actors in TEO IPTV AXMEDIS system:

- End User
- IPTV provider's System Administrator and
- IPTV provider's VOD Manager

On the content producer's (VRS) side, there is one actor – VRS Content Editor.

The End User uses STB with AXSTB Player and can connect to IPTV network for watching AXMEDIS video content. End User interface allows browsing through local AXDB and playing selected objects. If selected object is chargeable, End User is prompted to enter his PIN and choose the payment method. End User interface also allows browsing through global AXMEDIS network and viewing object descriptions. End User can select objects in global AXMEDIS network and subscribe them, but this feature will not be implemented in TEO demonstrator. End User can view his usage and billing information by using his AXSTB Player.

TEO VOD Manager is responsible for content management in TEO AXMEDIS IPTV network. This actor downloads AXMEDIS objects from global AXMEDIS network and prepares them for streaming in VOD server. TEO VOD Manager downloads objects according to End Users requests or to the business plan.

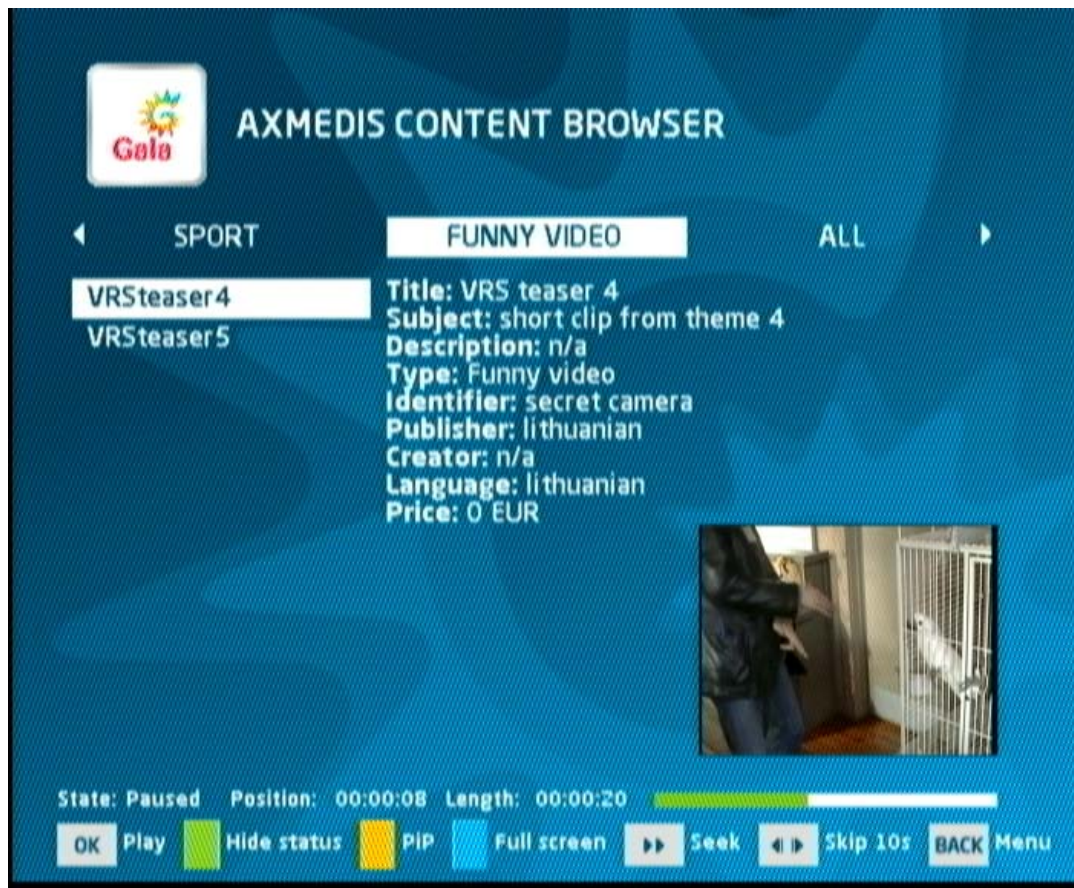
TEO IPTV Administrator is responsible for user management. He can add, delete, modify user.

VRS Producer is responsible for content production for TEO and Elion demonstrators. For TEO demonstrator VRS Producer creates streaming video AXMEDIS objects, for Elion demonstrator – AXMEDIS objects for PC platform.

3.6 End user actions

End User can:

- connect to TEO IPTV network;
- browse and see metadata of AXMEDIS video content (if video object has a trailer, user can watch it for free);
- buy and play AXMEDIS video content (before object playing license must be generated (EU6.)):
 - o enter PIN;
 - o choose payment method;
 - o stop playing video;
 - o pause video;
 - o continue playing;
 - o seek to desired point of video;
- view user information:
 - o view usage information;
 - o view billing information.



3.7 VOD manager actions

TEO VOD Manager actions are described. TEO VOD Manager can:

- Connect to TEO Content & User Management Portal;
- Manage TEO AXMEDIS content:
 - o Download AXMEDIS content from global AXMEDIS DB, using AXEPTTool and place into VOD Server and AXDB;
 - o Delete content from local TEO AXDB;
 - o Make and view reports about usage of AXMEDIS content in TEO IPTV network.

TEO Management Portal - Content Downloading - Windows Internet Explorer

http://10.0.6.62/teo/ContentDownloading.aspx

TEO Management Portal - Content Downloading

Content Management User Management TEO Content & User Management Portal Log Off

Downloading Uploading Deleting Reporting

Object list from tracker:

Title AXOID

VRS-4-0c mpeg4 avi.....urn:axmedis:00000:obj:73095685-e533-4397-9f4a-ff808299a294

VRS 010 Billboard avi.....urn:axmedis:00000:obj:7d62b096-0faa-4284-9d89-25725a24b083

VRS-the colonel-mpeg4.....urn:axmedis:00000:obj:8d6d915c-f7ad-407d-afce-d3e381b1cb98

VRS 006 Bench avi.....urn:axmedis:00000:obj:ac07afbd-68f8-4beb-a739-27dc4ecc3076

VRS 011 Pump avi.....urn:axmedis:00000:obj:ad7e6046-2ddb-4232-aa56-3333a6baaa92

VRS 020 Doggy avi.....urn:axmedis:00000:obj:b17babaf-da39-4157-8dc9-7f1606f26310

VRS 003 Car wheel avi.....urn:axmedis:00000:obj:b92a19bf-bbc4-480a-b41a-2c2c372c485a

VRS 004 Thread avi.....urn:axmedis:00000:obj:cfce519c-2601-40cd-922e-0bd1fbbdd9e41

VRS 009 Painted avi.....urn:axmedis:00000:obj:d413f89a-e4c2-465e-8e61-dcc9cf1a99f3

VRS 007 Phone avi.....urn:axmedis:00000:obj:d79fe054-3d44-4df6-99b6-8fb36a164cc0

VRS demo 0c mpeg4.....urn:axmedis:00000:obj:e4497340-ff6c-4c4d-b6f9-2c86f3826823

VRS-025-Umbrella avi.....URN:AXMEDIS:00002:OBJ:01285BC9-D2A1-3B6D-A40C-D70645B8E14C

c:\ts\VRS-5-0c.....URN:AXMEDIS:00002:OBJ:1A9C8F81-4C7E-3F07-A807-36F82E414155

VRS-1-0c mpeg4 avi.....URN:AXMEDIS:00002:OBJ:1CBDC0EB-DC53-3370-B024-599C546D832F

☒ Creator VRS ☐ MPEG2TS

Query Download

Downloading objects:

File	AXOID	Status	Progress	Downloaded
VRS-038-Theft.axm	URN:AXMEDIS:00002:OBJ:B17E41FC-0C4D-389D-9C93-9739DDF7C700	Seeding	100	71 MB
ELTEO_STB.axm	URN:AXMEDIS:00002:OBJ:B4136726-5378-3654-8C73-32C3E6238F85	Downloading	0	0 KB
VRS-teaser-6.axm	URN:AXMEDIS:00002:OBJ:C6794571-0190-399E-848B-57C783E567F0	Downloading	0	0 KB
VRS-5-0c.axm	URN:AXMEDIS:00002:OBJ:1A9C8F81-4C7E-3F07-A807-36F82E414155	Seeding	100	359 MB

Update

3.8 IPTV administrator actions

TEO IPTV Administrator can:

- Connect to TEO Content & User Management Portal;
- Manage TEO AXMEDIS users:
 - o Add user to TEO AXMEDIS DB;
 - o Delete user from TEO AXMEDIS DB;
 - o Set user rights to use AXMEDIS content in TEO IPTV network;
 - o Make and view reports about user actions in TEO AXMEDIS DB.

Existing users:

	DSL ID	Client ID
Select	555555	25
Select	37300392	27
Select	37300996	39
Select	37300997	40
Select	37300998	41

User information:

DSL ID	DSL Password	First name	Last name	Address	City	PIN	Start date	End date	AXMEDIS
37300392	1234	Vyginas	Kazanavicius	Studentu 50-214c	Kaunas	1111	2007.10.01 00:00:00	2007.10.29 00:00:00	<input checked="" type="checkbox"/>

Usage Information:

AXOID	Price	Played
urn:axmedis:00000:obj:d4953003-dbf9-47fb-a2bc-3ff89b87c7dd	0,00	2007.11.16 10:16:55
urn:axmedis:00000:obj:a9c1ce32-0104-45a0-bcf5-f5cc4f34dde4	4,00	2007.11.19 07:57:18
URN:AXMEDIS:00002:OBJ:50985319-3798-321D-A644-F059CF13CECF	0,00	2007.10.19 09:41:23
urn:axmedis:00000:obj:a9c1ce32-0104-45a0-bcf5-f5cc4f34dde4	4,00	2007.11.19 07:58:08
urn:axmedis:00000:obj:d4953003-dbf9-47fb-a2bc-3ff89b87c7dd	0,00	2007.11.19 08:17:48
urn:axmedis:00000:obj:d4953003-dbf9-47fb-a2bc-3ff89b87c7dd	0,00	2007.11.19 08:52:04
URN:AXMEDIS:00002:OBJ:9A7CEDBE-B408-3984-8948-C87F8B67875E	10,00	2007.10.19 10:44:35
URN:AXMEDIS:00002:OBJ:8EAC941D-CAD4-305C-BF71-9046D3286EFE	4,00	2007.10.19 08:49:21
urn:axmedis:00000:obj:d4953003-dbf9-47fb-a2bc-3ff89b87c7dd	0,00	2007.11.19 08:02:09
urn:axmedis:00000:obj:d4953003-dbf9-47fb-a2bc-3ff89b87c7dd	0,00	2007.11.19 07:52:05

Billing Information:

Last month	This month
20,00	60,00

3.9 Key features of the TEO IPTV AXMEDIS system

The key features of TEO IPTV AXMEDIS solution:

- B2C distribution of video on demand (VOD) via IP network by means of MPEG-2 Transport Stream (TS) feeding an AXMEDIS compliant Set Top Box (STB) for viewing video on TV;
- AXMEDIS objects with MPEG 2 video content, specially processed for MPEG TS video with accompanying information;
- Protection at signal protection level:
 - The transmitted video signal resource is encapsulated into MPEG-2 TS resource and scrambled using DVB-CSA algorithm. AXOM is used for de-protecting video signal.
- Protection at content license level:
 - At production (VRS Factory) level, using AXMEDIS Editor or AXC, with newly developed AXCP MPEGTS Adaptation Plugin for scrambling MPEG-2 TS resource.
 - At Distributor (TEO) and end user level, upon trying to access protected AXMEDIS object, AXOM protection processor is executed to de-protect the object according to the issued license.
- License:
 - Content provider provides mother licenses for distribution using its DRM editor or AXCP tools or directly the PMS Web Services. The PMS client will be employed to upload the license to PMS server which will be deployed at TEO site.

- Final licenses are produced by TEO VOD access service using AXCP rule editor/scheduler +executor after receiving confirmation of payment. The issued license is sent to PMS server.
 - License allows:
 - Free of charge view of trailers and pay-per-view for AXMEDIS objects.
 - Play, stop, pause and skip video stream from VOD server.
 - Other rights according to content type and business model
 - The AXMEDIS Objects are streamed from VOD server to the User's STB and played on AXSTB Player,
 - Registration of users and tools (AXSTB Player) as follows:
 - The end user is registered to TEO database upon subscription of IPTV service. TEO IPTV administrator checks AXMEDIS option in registration form and the user is registered to AXCS deployed at TEO site.
 - When user buys STB hardware it is registered to AXCS automatically upon first usage.

3.10 Unique AXMEDIS benefits to IPTV service providers

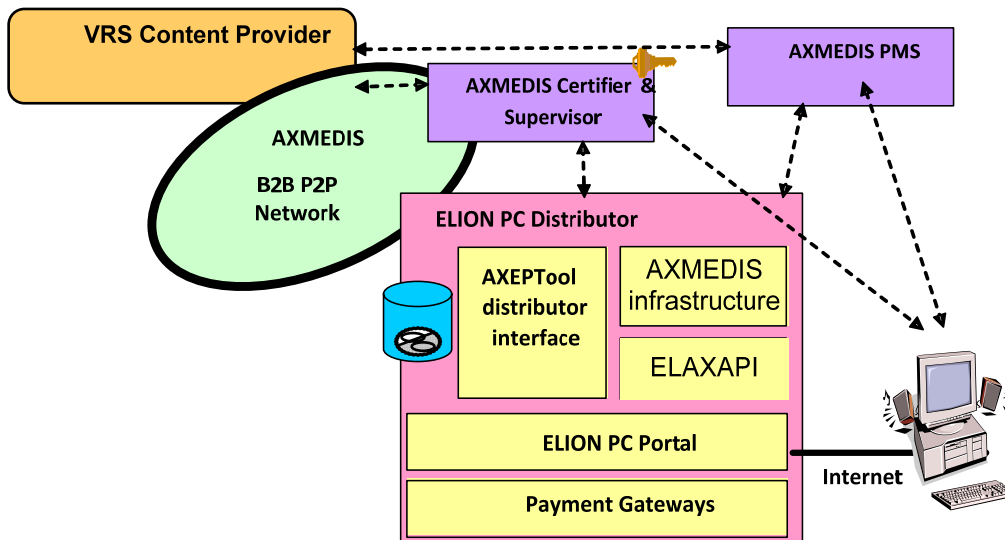
Although technologies for IPTV video on demand content delivery and protection are advanced and available today, the focus of AXMEDIS solution is on showing the automatic nature of value chain relationship between video on demand content producer/wholesale distributor to IPTV service provider for end users. The key benefits are:

- The automatic or semi-automatic nature of workflow at production and distribution levels, thanks to AXMEDIS AXCP tools
http://www.axmedis.org/documenti/view_documenti.php?doc_id=3624
- Transparent accounting and reporting of digital content consumed by value chain actors, thanks to AXMEDIS DRM tools
http://www.axmedis.org/documenti/view_documenti.php?doc_id=3616
- The usage of a standard interoperable DRM with many other distribution channels and players see other technical notes and show cases, AXMEDIS is an extension of MPEG-21 standard DRM and format;
- The simple integration of distribution and production tools with the efficient P2P content distribution of AXMEDIS for B2B and B2C (in this case only the B2B part has been used)
http://www.axmedis.org/documenti/view_documenti.php?doc_id=3612
- The connection with the AXMEDIS P2P network for accessing to the content to be distributed to IPTV
- The cross media content, when this type of content can be played according to the player capabilities. http://www.axmedis.org/documenti/view_documenti.php?doc_id=3634

4 Elion AXMEDIS system architecture

4.1 High level description

The scheme below depicts the general components of the Elion trial. Components depicted in yellow background are software components developed by partners specifically for PC distributor solution.

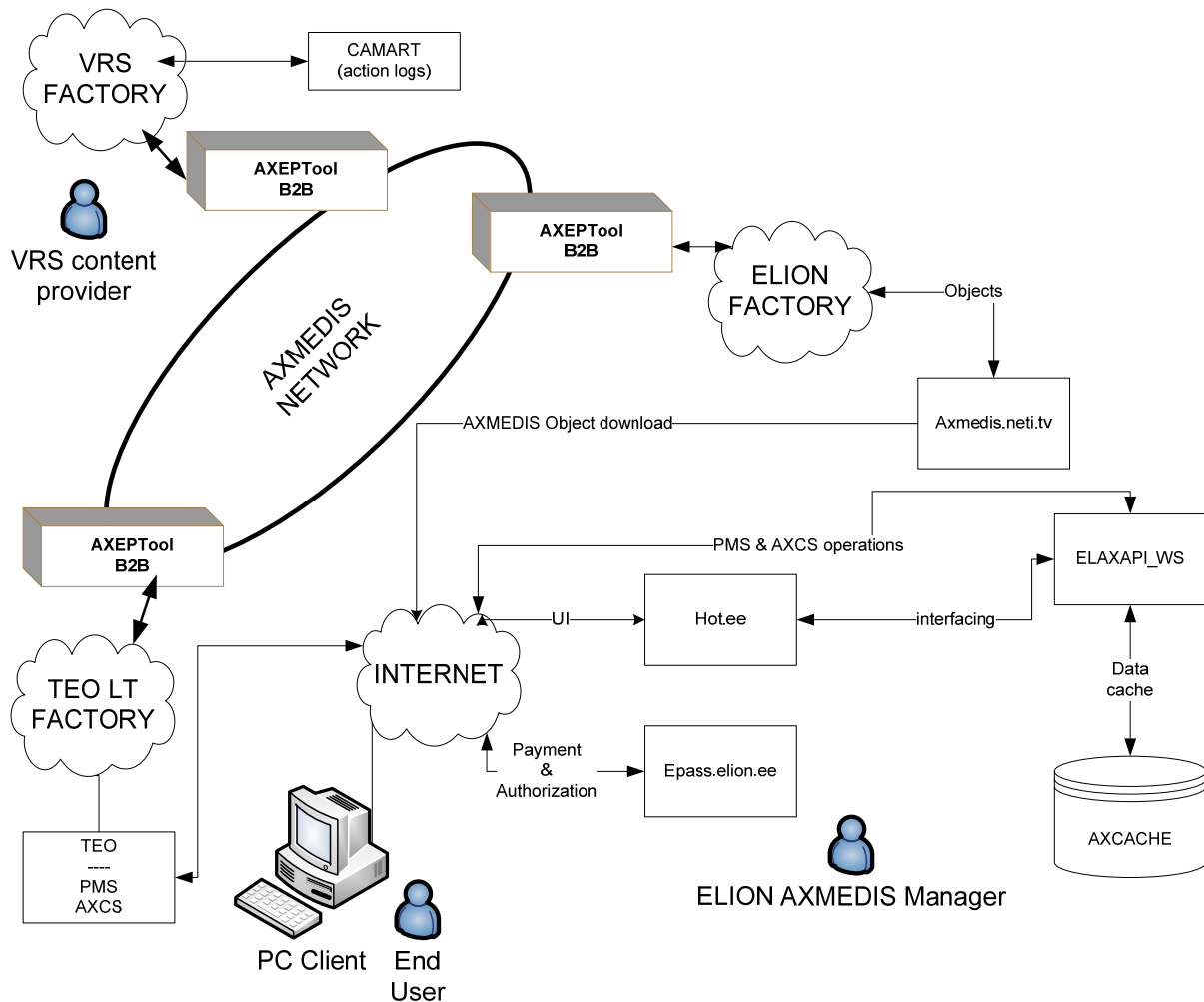


In this solution the content is produced at B2B level automatically and delivered to Elion via P2P. Content producer is VRS which produces and makes available some trial video content for Elion internet service. The videos are formatted as AXMEDIS Objects, with pre-set usage rights and conditions and defined metadata. VRS places these AXMEDIS objects into P2P network (AXEPTOOL) http://www.axmedis.org/documenti/view_documenti.php?doc_id=3612 . The content producer, VRS, use thwe content production automation provided by AXCP tools; VRS uses AXCP http://www.axmedis.org/documenti/view_documenti.php?doc_id=3624

In Elion distribution system the AXMEDIS content ready for distribution is stored in delivery server. The content is downloaded from AXMEDIS P2P network by using content downloader P2P client. Then the content is prepared, if needed, with AXMEDIS Editor for distribution. After content is prepared it will be made available for download over web server using public networks.

4.2 Detailed system description

Elion AXMEDIS Video on demand distributor for PC is based on existing Elion's Hot.ee (<http://live.hot.ee/axmedis>) community portal to enable content listing and usage. It uses existing broadband network architecture components in addition with some newly developed components for AXMEDIS integration.



Elion solution based on AXMEDIS is comprised of:

- **Axmedis.neti.tv virtual sever** node including:
 - AXEPTool B2B node for content download and sharing on AXMEDIS B2B Network: http://www.axmedis.org/documenti/view_documenti.php?doc_id=3624
 - ELAXAPI_WS interfacing web service for end user UI representation on hot.ee
 - IIS web folder share for AXMEDIS object downloads to end user
 - IIS web folder share to distribute AXMEDIS PC Player: http://www.axmedis.org/documenti/view_documenti.php?doc_id=3634
 - AXCACHE database for ELAXAPI_WS web service data store
 - SQL Server manager express for AXCACHE.

www.hot.ee portal – hot.ee portal is Elion's

- existing proprietary community and communication portal that will be featuring additional menu option to enable AXMEDIS object distribution and marketing <http://live.hot.ee/axmedis>.
- **Epass.elion.ee** – it is ELION's proprietary account services and billing system serving as single shared resource between several solutions.



Elion shared with TEO AXMEDIS DRM facilities and servers (http://www.axmedis.org/documenti/view_documenti.php?doc_id=3616) . ELION Manager uses axmedis.neti.tv node to manage AXMEDIS objects distribution and to gather statistics data about rights exploitation and content consumption.

4.3 How does the Elion demonstrator prototype work?

The videos content (or eventual any kind of cross media content provided), in AXMEDIS format, have been manually or automatically downloaded from AXEPTool, AXMEDIS P2P file sharing system based on BitTorrent, to be put on the video/content on demand server of ELION by the ELION AXMEDIS manager.

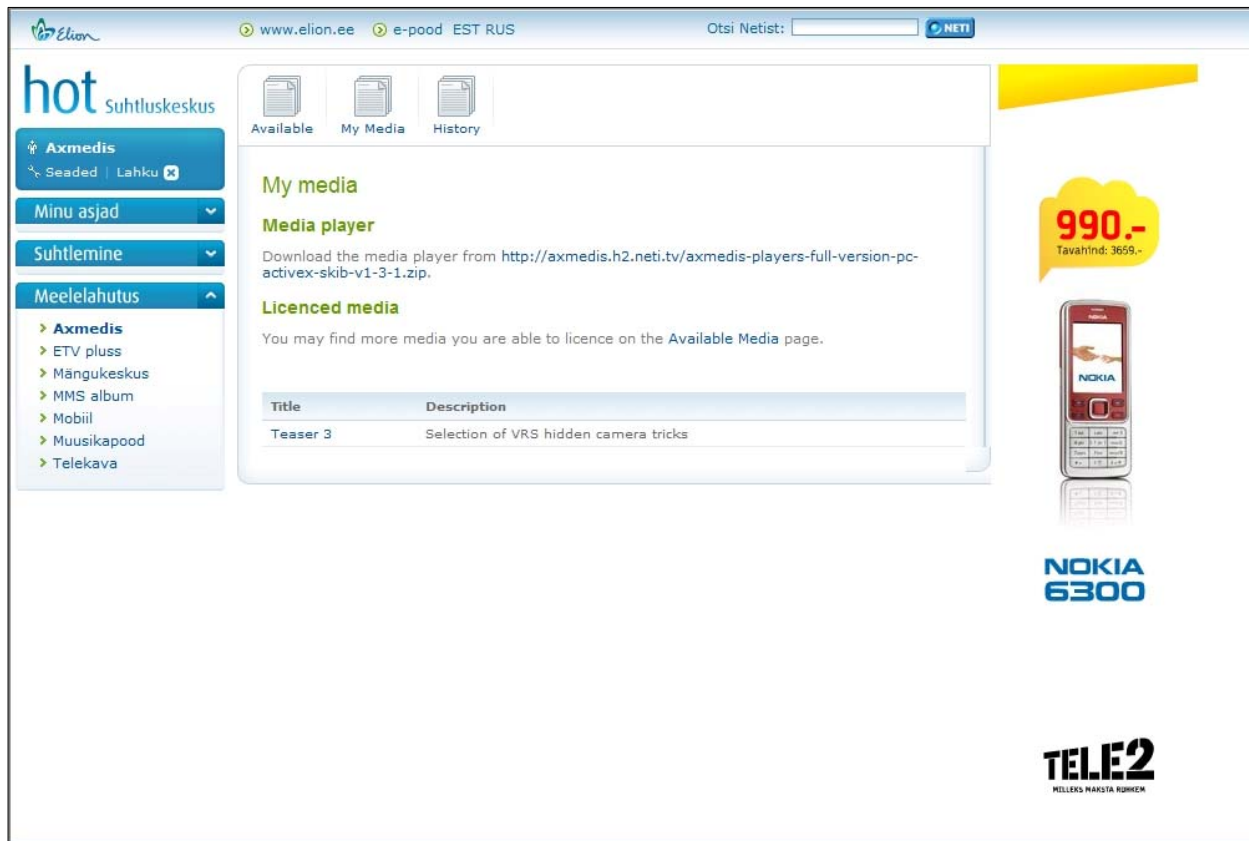
Elion's internet service subscriber knows about AXMEDIS content service and decides to view a video from this service. When the user wants to view AXMEDIS digital objects, he/she may connect to www.hot.ee via internet, register as a hot.ee user and goes to the AXMEDIS area by choosing "AXMEDIS" button.

For the first time the user has to download the AXMEDIS player from a link provided. The user can browse the content available and select desirable content for viewing. If prompted for licence user acquires the licence by secure on-line credit card or bank transfer payment, by SMS, or using provider's pre-pay service E-Pass.

Only if the user has acquired the licence the AXMEDIS Player permits to play the selected media content on PC.

All user actions with regards to this content are registered in AXMEDIS AXCS / PMS. The user can "Play", "Stop", "Pause", "Skip Forward" and exploit the content unlimited counts within the licensed 24 hour period.

After viewing the video clip, the viewer can go back to AXMEDIS browser or can go to hot.ee portal home page to get another one, etc..



To test the Content on Demand of ELION you can go on the WEB page and follow the instructions:

http://www.axmedis.org/com/index.php?option=com_content&task=view&id=75&Itemid=46

To obtain the AXMEDIS ELION PC player you can download from:

http://www.axmedis.org/documenti/view_documenti.php?doc_id=3731

or simply go on the AXMEDIS main web page:

http://www.axmedis.org/com/index.php?option=com_frontpage&Itemid=1

4.4 Description of Elion demonstrator show case

Elion explored business to consumer (B2C) digital content distribution on IP network by downloading video content into PC using http server. The content can be AXMEDIS Objects with any kind of content: video, images, document, audio, animations, etc. The content is protected at content producer level with AXMEDIS DRM technology. Usage licenses are produced on the fly when an AXMEDIS Object is bought by the consumer.

Technical note 6501: "[ELION content on demand distribution for PC](#) "

The showcase consists of two different aspects:

- business client side (administration) of professional users (link to business client side)
- distribution to consumer via a consumer portal

4.4.1 Service prerequisites for consumers

- **AXMEDIS Player** - To play content you must have the AXMEDIS Player installed on your PC. Download the AXMEDIS Player [here](#).
- **Register to AXMEDIS** - To play protected content with the AXMEDIS Player you must be registered to AXMEDIS and you must have certified the AXMEDIS Player. Register to AXMEDIS [here](#).
- **Create an E-PASS account**. Get an E-PASS account [here](#).

For payments the consumer has the following options:

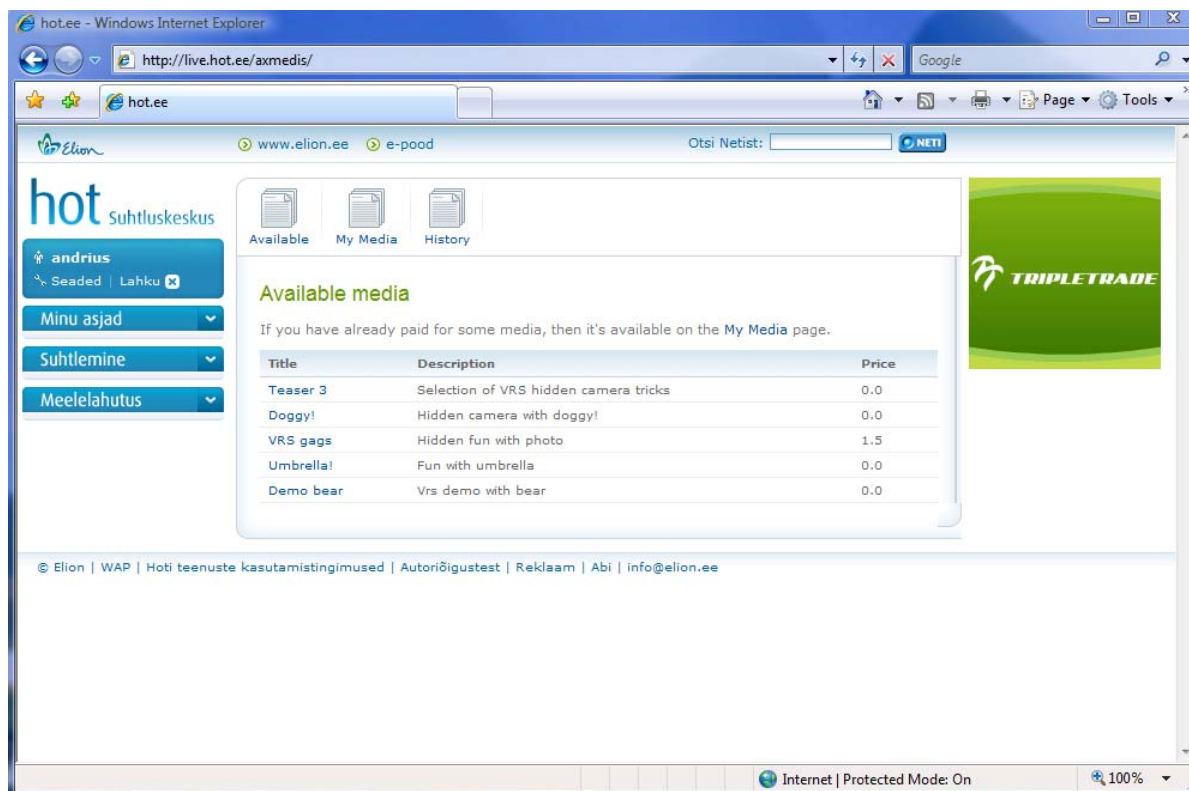
- Online Banking (Hansa Bank, SEB Ühispank, Sampo Bank)
- Mobile payment from following service providers (EMT, TELE 2, ELISA)
- Credit card (Master Card, Visa)

4.4.2 Consumer portal

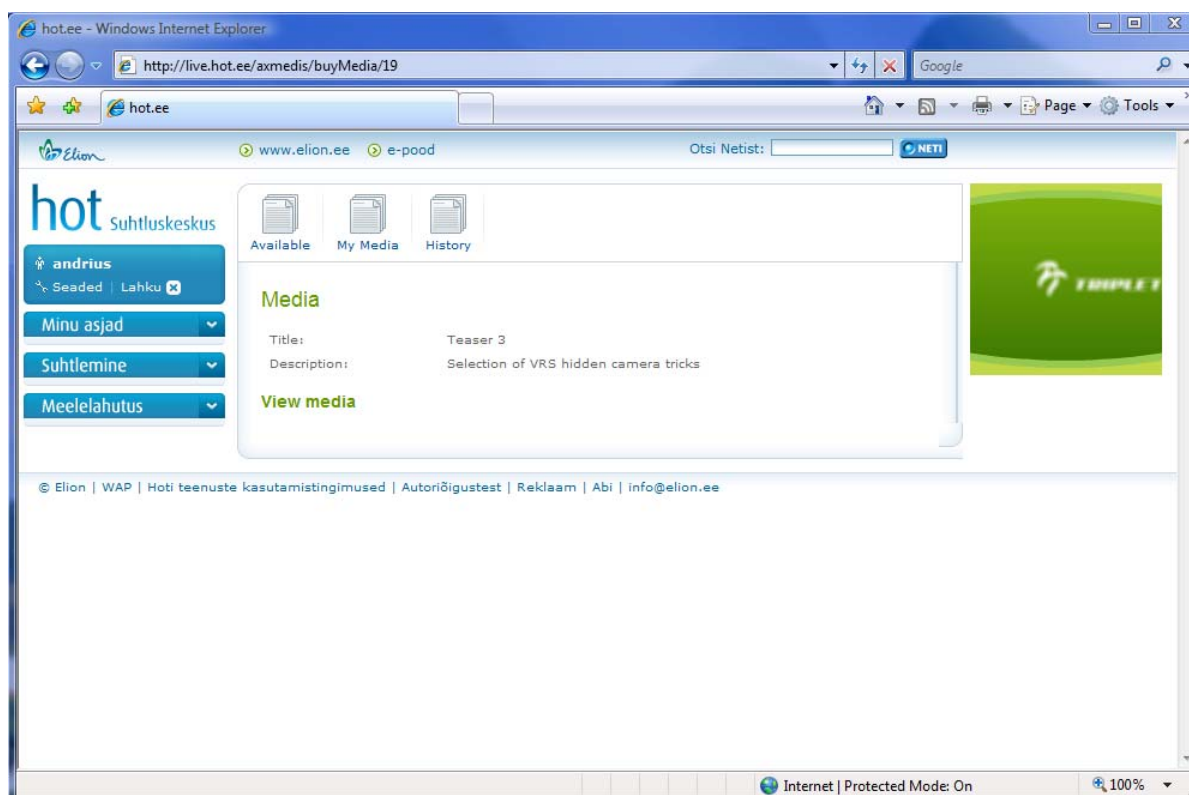
The consumer portal can be reached [here](#). Being a demonstrator, the portal is limited to private testing and is not supported by our customer support.

When you have been authenticated and the E-PASS account has been tied with your AXMEDIS user id you will be presented with a list of available content as shown below.

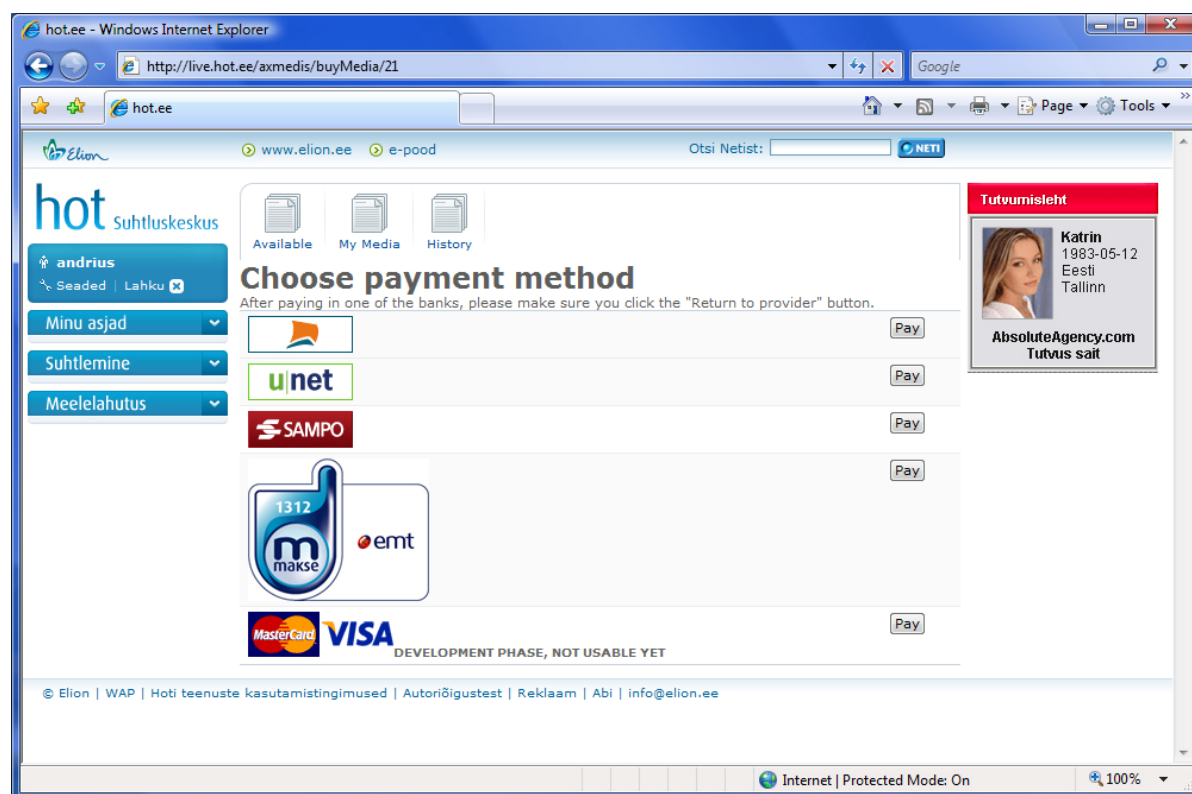
DE12.2.5.2 AXMEDIS-ELTEO Demonstration Report



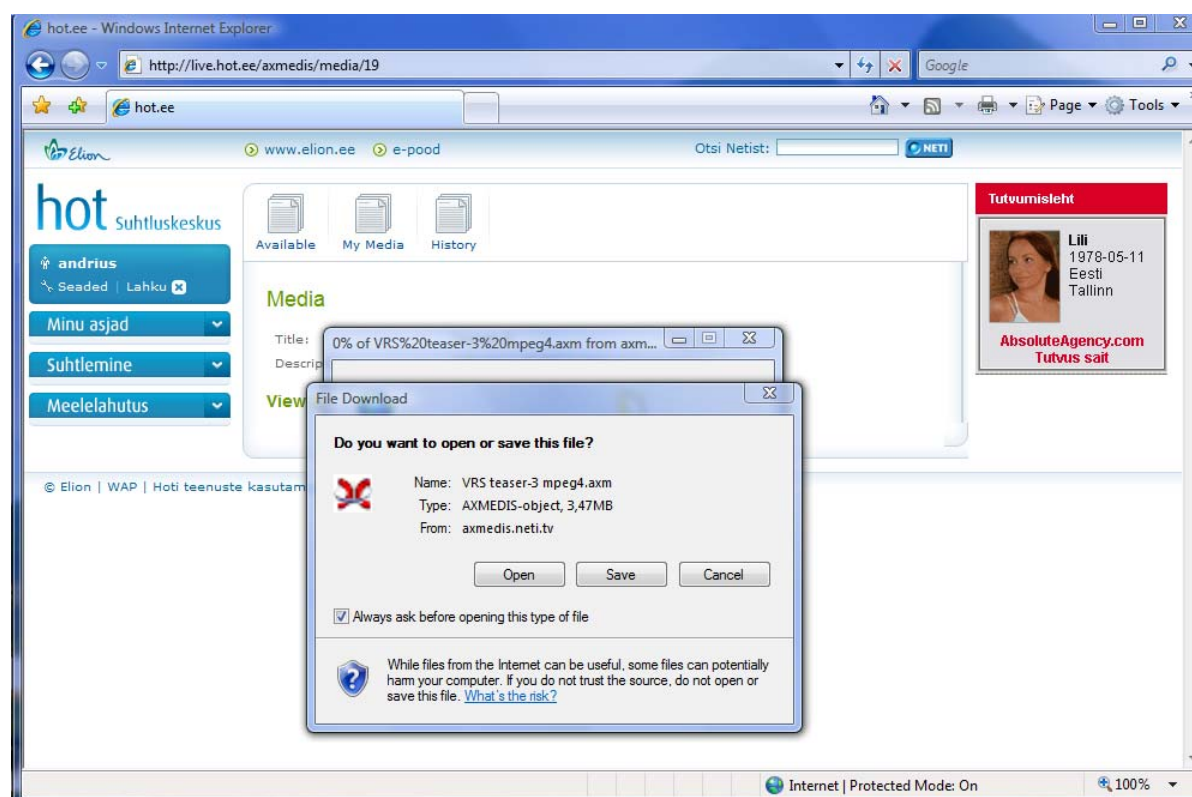
Media details are shown when you click on the media item in the list. If a media item has no price you can get the license and the object by simply clicking "view media".



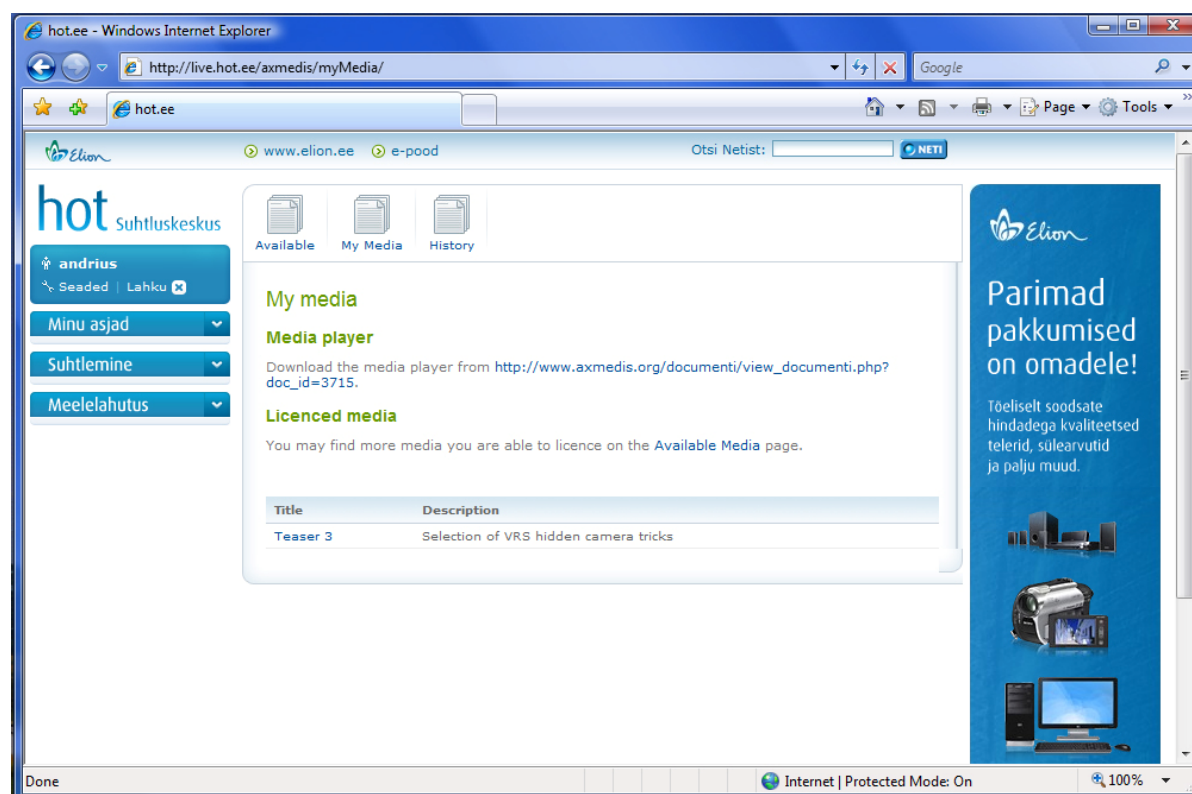
If the media object is protected then you will be asked to transfer the shown amount of money any of the available payment channels.



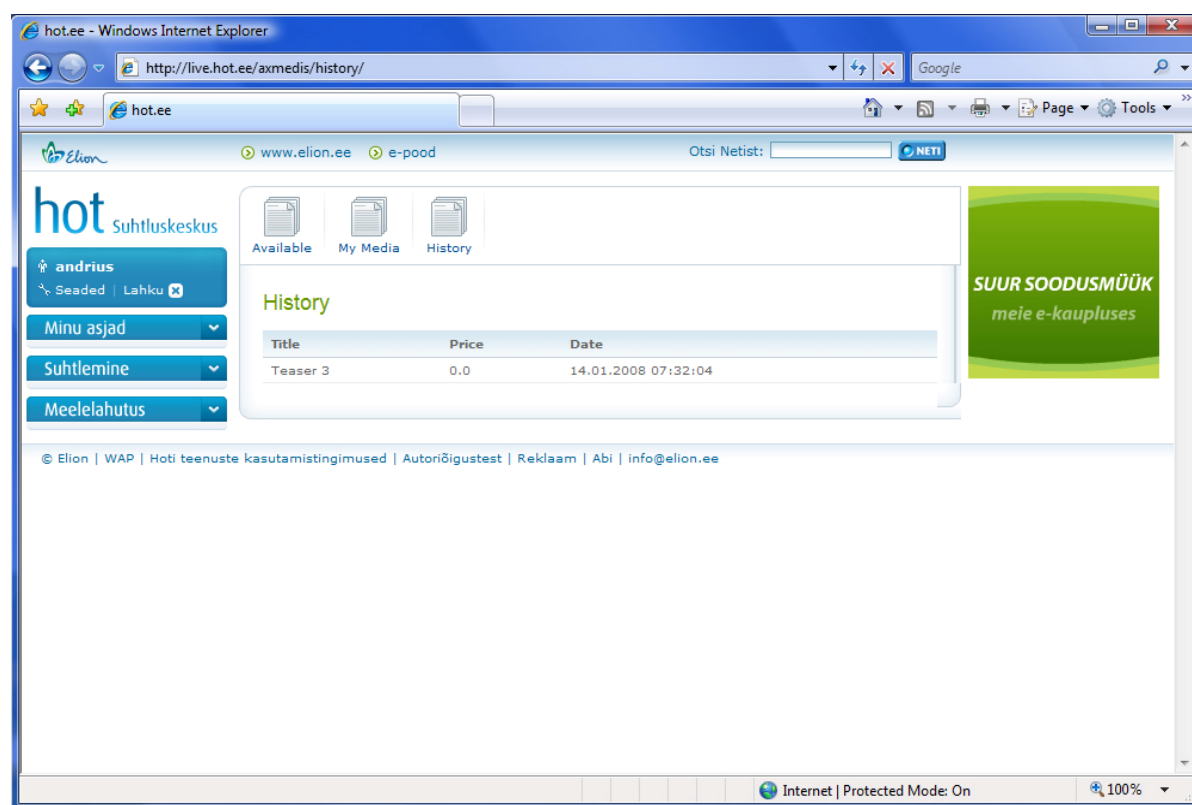
If you have an appropriate license the object becomes downloadable and you can choose to download it by clicking "save" or open the download in the player by clicking "open".



All purchased items are available for unlimited play count within 24 hours. You can click "my media" for a list of items that have been licensed for usage.



You can also view activities by checking the licensing history.



4.4.3 Professional user experience of the business client side (administration)

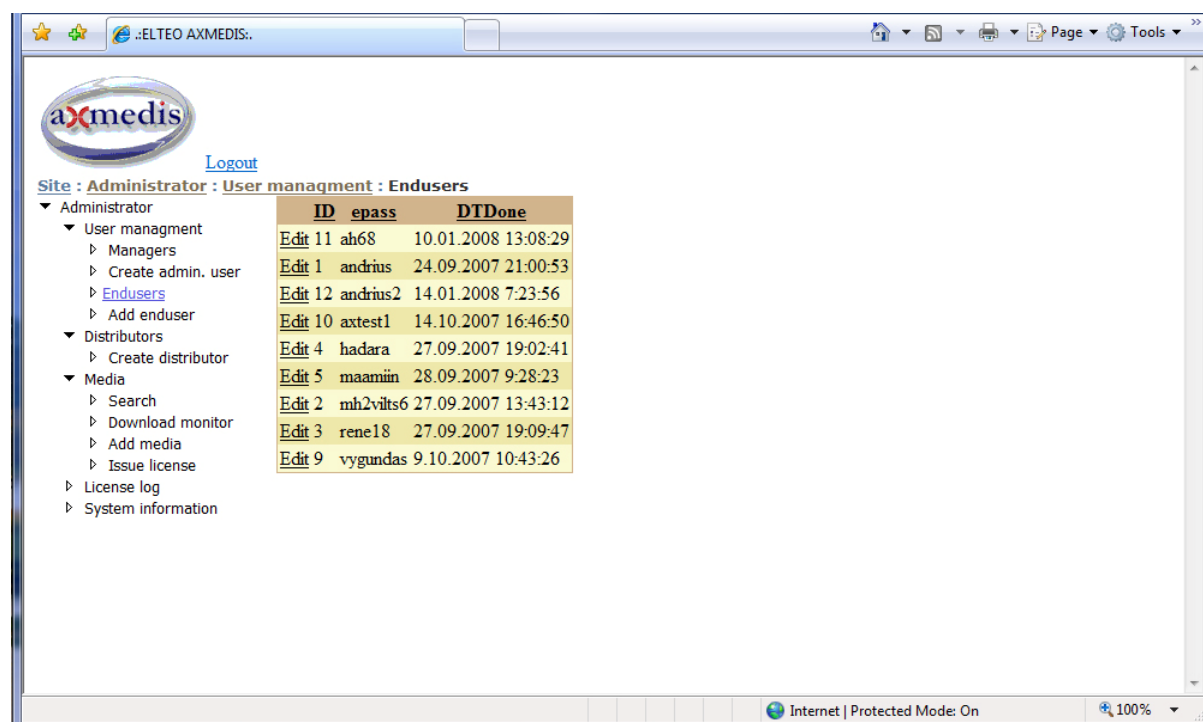
The business client side is a closed test environment. Screenshots of the business client side will illustrate the professional user experience.

DE12.2.5.2 AXMEDIS-ELTEO Demonstration Report

Since Elion is creating a distribution service our goals were to create a flexible solution for business partners. As such the administrative side is created by using standard web services and is intended to be integrated into a business client web management system to provide unified experience. The following screenshots are only examples of a few possible options available for business clients.

End user management. Since all end user functions have been embedded into the EPASS accounting system the available options for this administrative service are limited to the list of subscribers that activated the on demand service and the interface for performing manual activation, both interfaces are shown below.

Consumer list

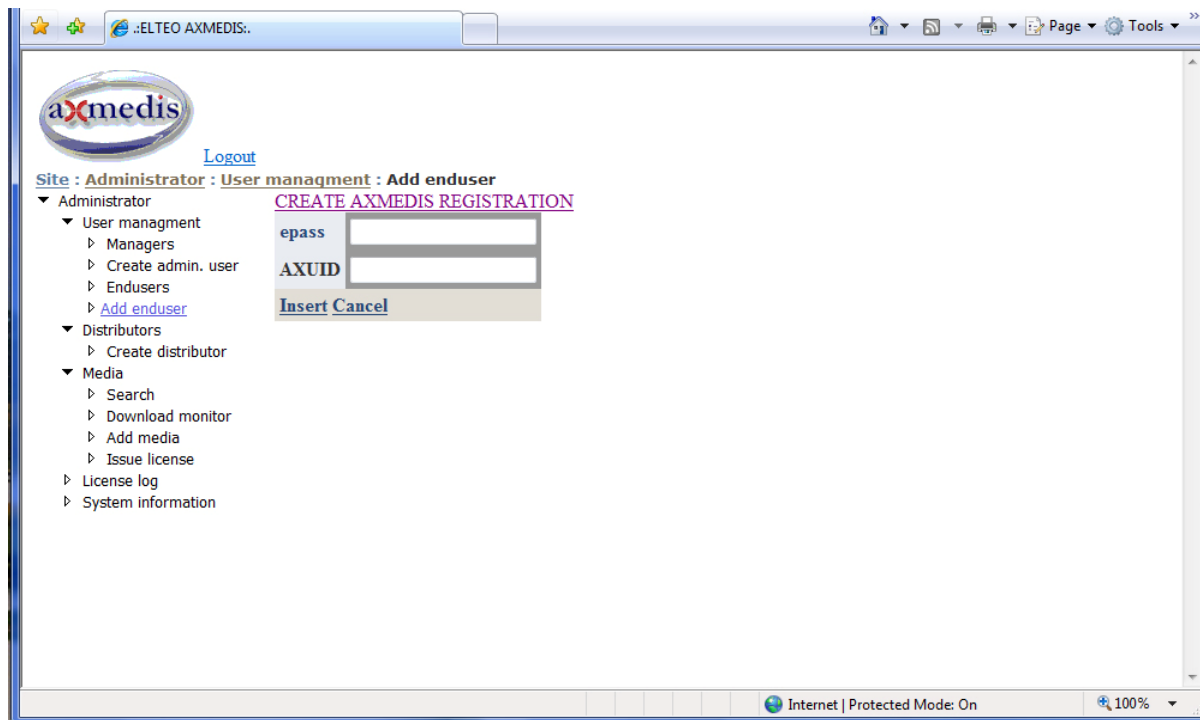


	ID	epass	DTDone
Edit	11	ah68	10.01.2008 13:08:29
Edit	1	andrius	24.09.2007 21:00:53
Edit	12	andrius2	14.01.2008 7:23:56
Edit	10	axtest1	14.10.2007 16:46:50
Edit	4	hadara	27.09.2007 19:02:41
Edit	5	maamiin	28.09.2007 9:28:23
Edit	2	mh2vilt6	27.09.2007 13:43:12
Edit	3	rene18	27.09.2007 19:09:47
Edit	9	vygundas	9.10.2007 10:43:26

For manual activation a valid AXUID and E-PASS account name must be typed into form.

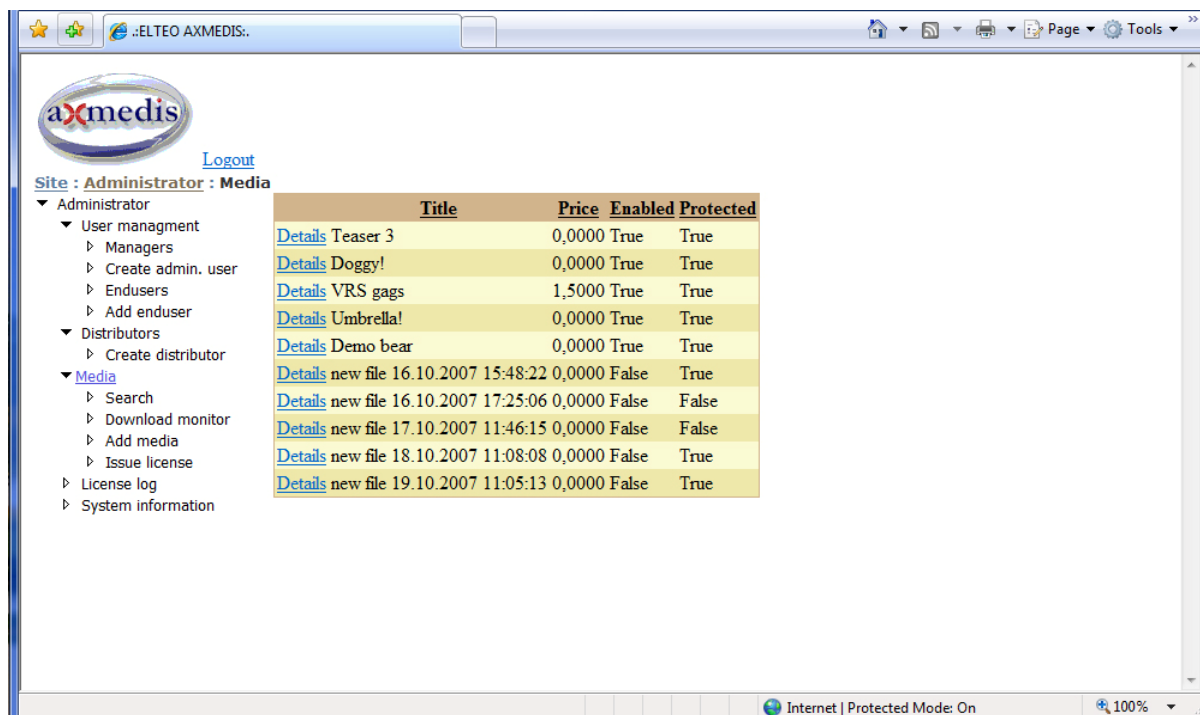
Manual account activation

DE12.2.5.2 AXMEDIS-ELTEO Demonstration Report



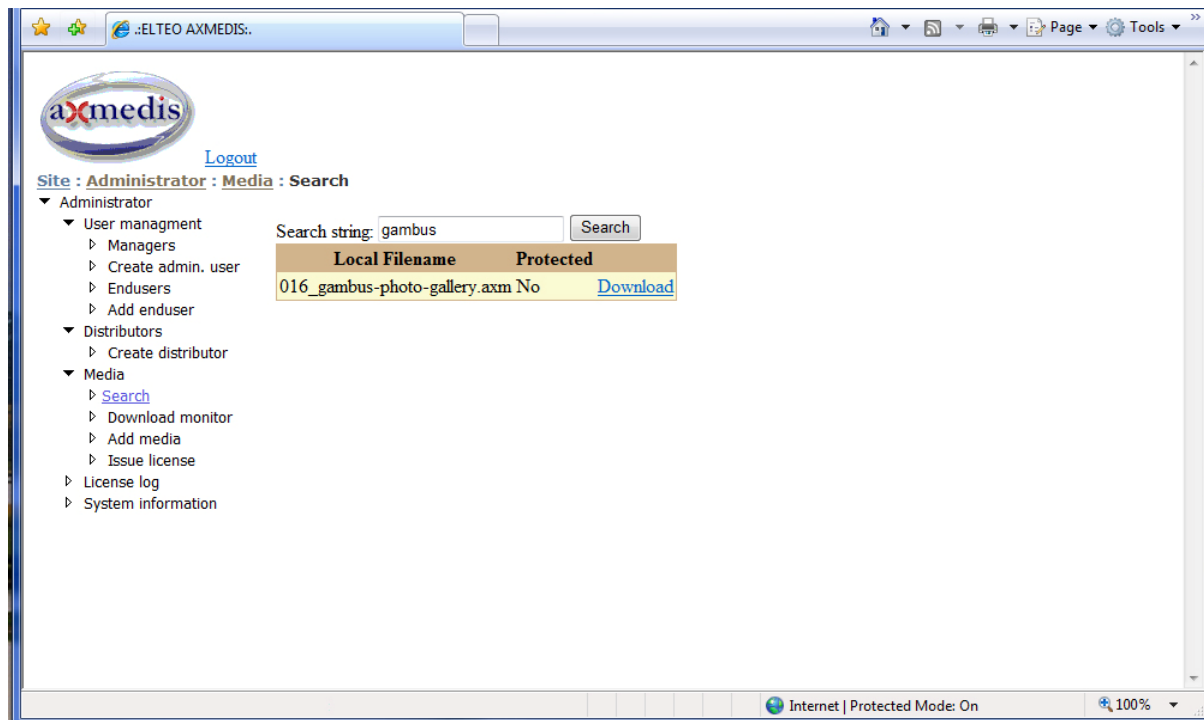
Media management. This section contains all basics of any content management system.

The following screen shows all objects on the current distributor.

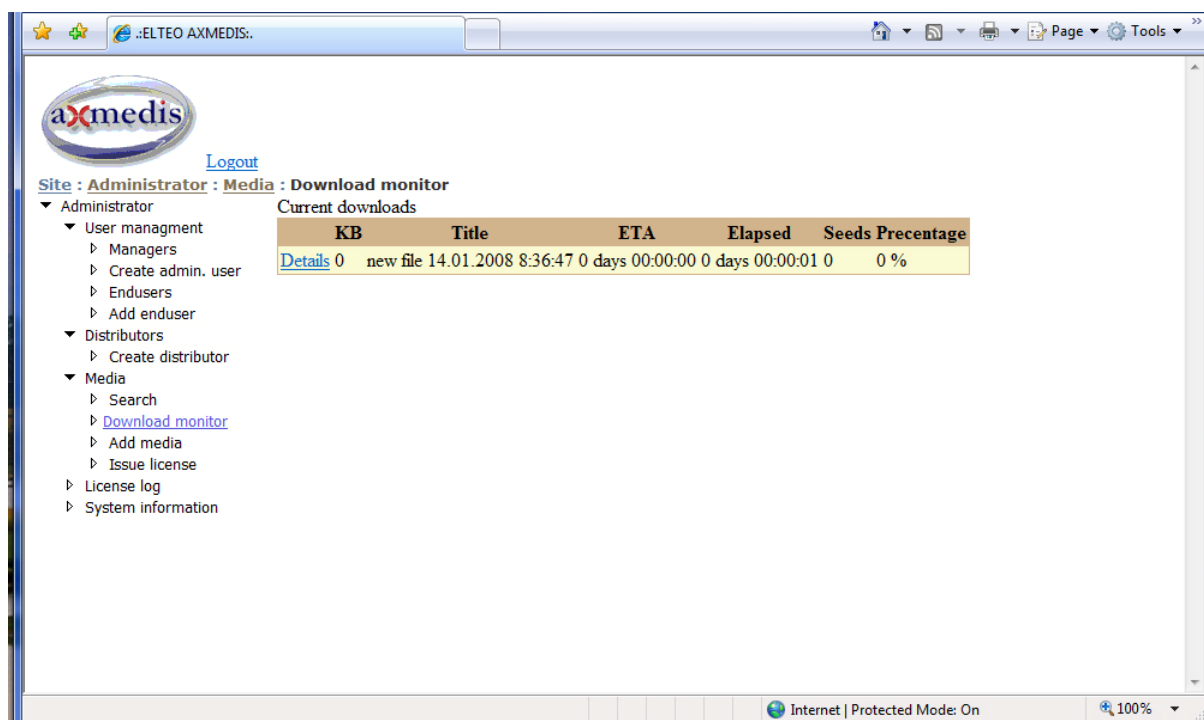


Managers can submit searches on the AXMEDIS B2B P2P networks.

DE12.2.5.2 AXMEDIS-ELTEO Demonstration Report



The download status from P2P client is available over the interface.



The system allows object delivery using non P2P networks. For example, an object can be uploaded using FTP and then this interface can be used to index the object for distribution. The filename drop down box is automatically populated by listing the objects in distribution storage.

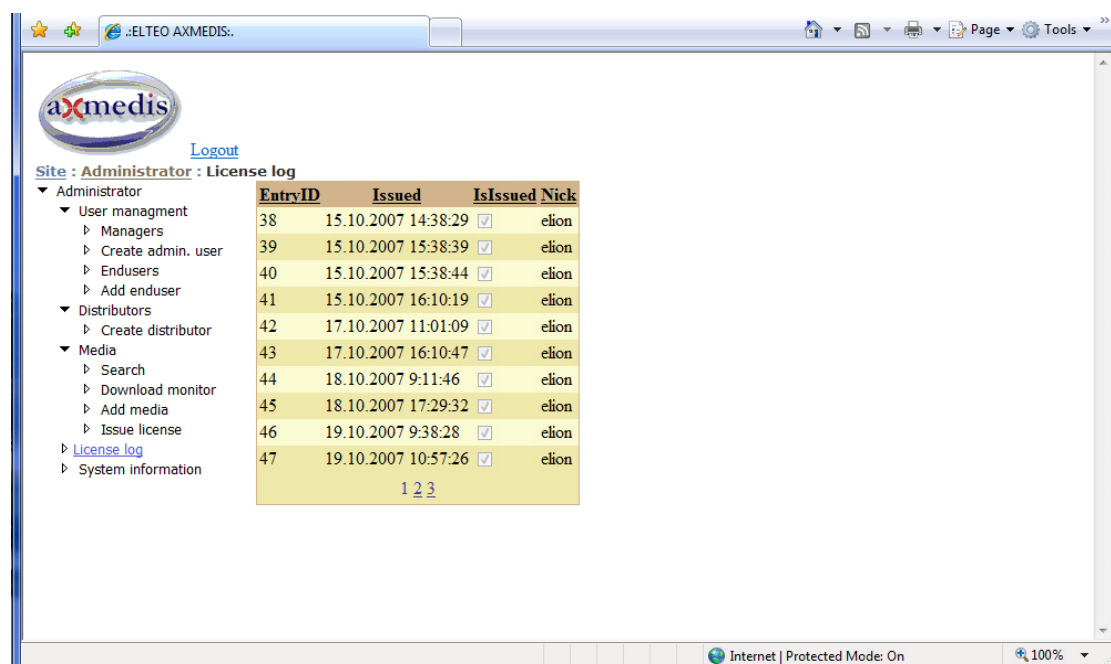
DE12.2.5.2 AXMEDIS-ELTEO Demonstration Report

The screenshot shows the AXMEDIS-ELTEO web application interface. The browser address bar displays ".ELTEO AXMEDIS:". The page features the AXMEDIS logo and a "Logout" link. The navigation menu on the left includes "Administrator" (with sub-items: User management, Managers, Create admin. user, Endusers, Add enduser) and "Media" (with sub-items: Search, Download monitor, Add media, Issue license, License log, System information). The "Add media" form is active, showing fields for "AXOID:" (with a "Get AXOID" button), "Filename:" (set to "VRS teaser-3 mpeg4.axm"), "Title:" (empty), "Description:" (empty), and "Price:" (empty). There are checkboxes for "Enabled:" and "Protected:", both currently unchecked. "Insert" and "Cancel" buttons are at the bottom of the form. The status bar at the bottom indicates "Internet | Protected Mode: On" and a zoom level of "100%".

Manual license issuing is available for object testing.

The screenshot shows the AXMEDIS-ELTEO web application interface with the "Issue license" form active. The navigation menu on the left is the same as in the previous screenshot, but the "Issue license" option under the "Media" section is selected. The "Manual license issuer" form contains fields for "AXUID:" (set to "ah68"), "Object:" (set to "Demo bear"), and "Distributor:" (set to "elion"). An "Issue license" button is located below these fields. The status bar at the bottom indicates "Internet | Protected Mode: On" and a zoom level of "100%".

Finally, the sample license issuing log is provided for a current distributor, more detailed action logs are available over AXMEDIS Camart providing flexibility and customisation dependent on business partner needs.



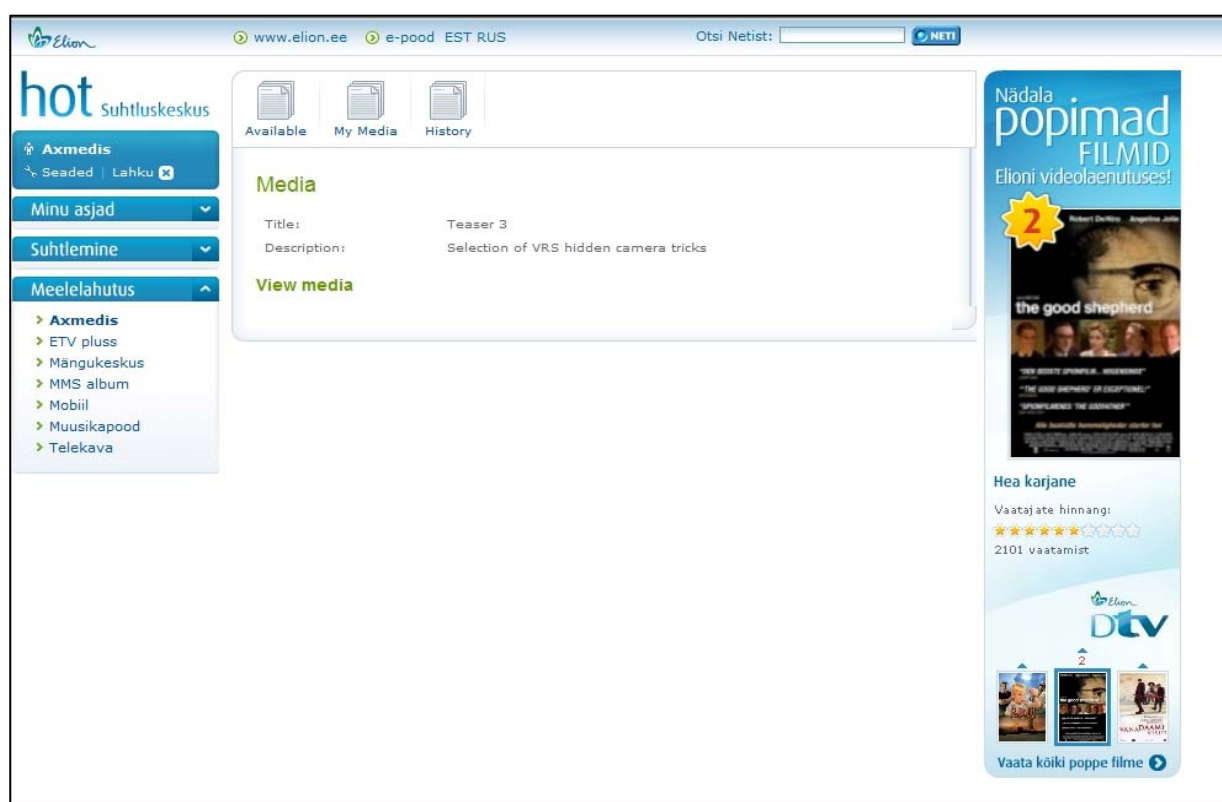
4.5 Description of use cases and scenarios

There are two actors in Elion AXMEDIS system:

- End User
- Manager

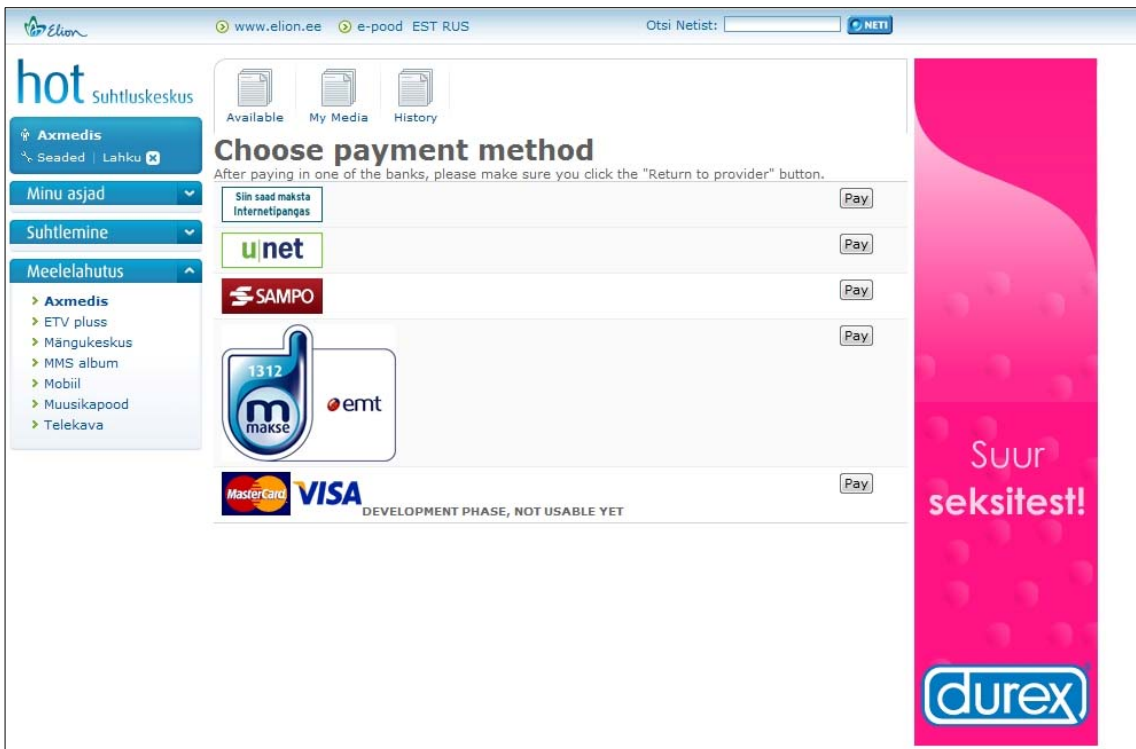
On the content producer's (VRS) side, there is one actor – VRS Content Editor.

End User has internet connection, windows-based operating system, supported browser, downloaded AXMEDIS player and is authenticated by the E-Pass account and signed up on AXMEDIS. In addition, user must own an internet bank account with supported banks or own a mobile phone subscription with supported local mobile service providers.



End user enters the community and communication portal www.hot.ee, logs in using e-pass, becomes AXMEDIS user by clicking AXMEDIS menu and downloads AXMEDIS Player. End user is presented with available content listing to choose from. When user has chosen an interesting object for purchasing he/she is directed to payment gateway and is presented with payment options. End user performs payment according to selected option and downloads the selected media object on PC. Having downloaded the object the end user uses AXMEDIS player to exploit the object according to license limitations.

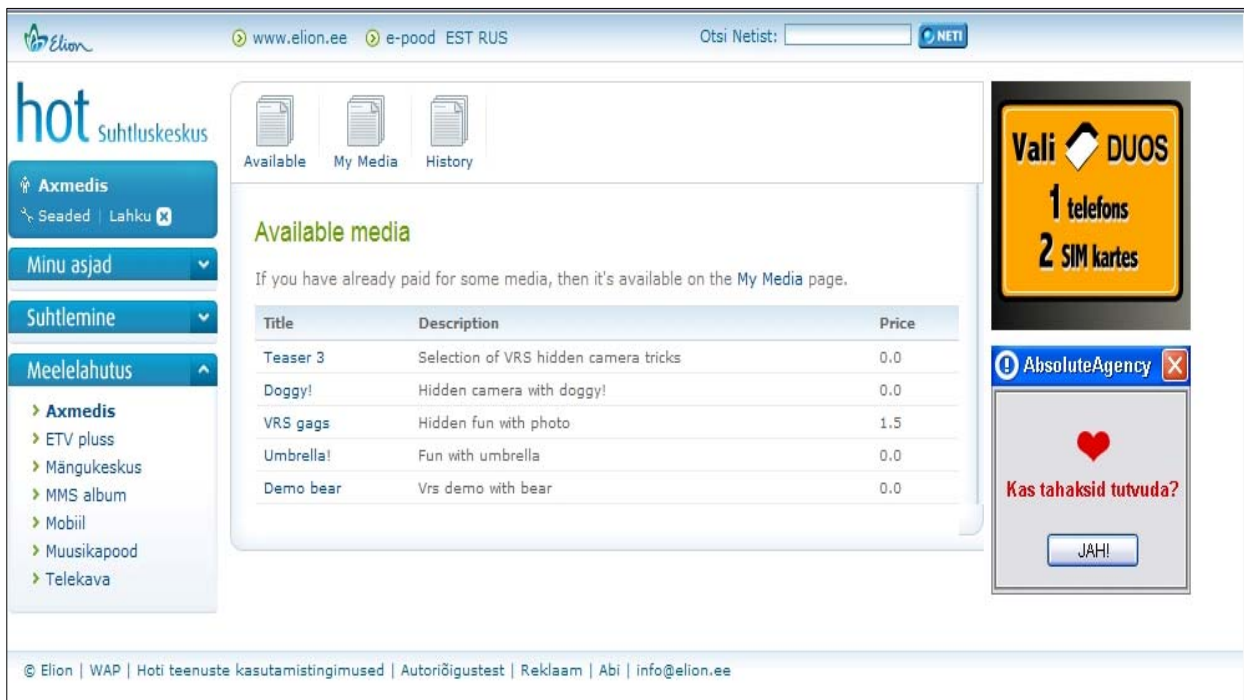
Elion Manager performs actions to manage content on distribution point. All operations are being done over terminal services session by connecting to axmedis.neti.tv node responsible for handling all AXMEDIS operations in Elion distributor.



4.6 End user actions

End User can:

- Enter to www.hot.ee portal
- Login using e-pass
- Becomes AXMEDIS user
- Browse content
- Purchase content
- Downloads content on PC from one or more AXMEDIS compliant channels;
- Consumes AXMEDIS object via one of the several AXMEDIS free players
http://www.axmedis.org/documenti/view_documenti.php?doc_id=3634



4.7 Main Manager Actions

The Elion Manager can:

- downloads new AXMEDIS object for distribution from the P2P or other means
- removes objects for the distribution
- publishes objects for the distribution
- reviews licensing logs
- manages user database;
- accessing to AXMEDIS DRM server to download reporting and statistics data. See the following link for other details
http://www.axmedis.org/com/index.php?option=com_content&task=view&id=75&Itemid=46

4.8 Key features of the Elion AXMEDIS solution for content on demand

The key features of Elion solution are:

- o B2C video (and potentially any kind of content) on demand distribution on an IP network by downloading media content onto PC using an http server and streaming video content to end user PC from a streaming server for viewing video on AXMEDIS PC Player
- o Obtaining content for the distribution directly from the producers and/or from the AXMEDIS P2P B2B network via AXEPTool http://www.axmedis.org/documenti/view_documenti.php?doc_id=3612
- o Usage of AXMEDIS objects with
 - o Any kind of content, all types: Video, images, document, audio, animation, etc.
http://www.axmedis.org/documenti/view_documenti.php?doc_id=3634
- o Protection information not in the object
 - o Produced with the AXCP with an automatic massive processing of objects
 - o With the protection tool, automatically posted in the AXCP by the Protection Tool
http://www.axmedis.org/documenti/view_documenti.php?doc_id=3624

- License for end users
 - Produced on the fly, on demand, when an AXMEDIS object is bought by
 - Using internet bank transfer payment
 - Calling the mobile phone number provided for toll payment
- License allows
 - Free of charge view of trailers and pay per view for AXMEDIS objects
 - Play, stop, pause and skim video stream from VOD server (ads inserted into clips cannot be skipped using seek operation: end user can skip forward only)
 - Other rights according to content type and business model
- The AXMEDIS Objects may be
 - Displayed/played on AXMEDIS PC player, free downloaded from http://www.axmedis.org/documenti/view_documenti.php?doc_id=3731
- The users operate a PC. The user has to perform the registration of
 - Themselves as users (on an AXMEDIS portal)
 - Any AXMEDIS player tool they would use.

4.9 Unique AXMEDIS benefits to internet service providers

By integrating AXMEDIS standards into service environments ELION is ensuring its market readiness for new pan-European standards and enabling content producers to exploit a fully transparent delivery & marketing system thus freeing content owners of having expensive solutions for private distribution and need to have dedicated infrastructure.

AXMEDIS enables ELION to address several interoperable channels as well as multitude of possible content

formats thus enriching the service capability and in turn unlocking content creator creativity. With rich AXMEDIS objects the final package delivered to end user can include a revolutionary experience due to ability to host any kind of digital elements including interactivity: audio, video, digital imaging, animation, games, text/documents, programs, SMIL, HTML, MPEG-4 with interactive parts, etc.

http://www.axmedis.org/documenti/view_documenti.php?doc_id=3634

Other benefits are:

- The automatic or semi-automatic nature of workflow at production and distribution levels, thanks to AXMEDIS AXCP tools http://www.axmedis.org/documenti/view_documenti.php?doc_id=3624
- Transparent accounting and reporting of digital content consumed by value chain actors, thanks to AXMEDIS DRM tools http://www.axmedis.org/documenti/view_documenti.php?doc_id=3616 ; and the usage of a standard interoperable DRM with many other distribution channels and players see other technical notes and show cases, AXMEDIS is an extension of MPEG-21 standard DRM and format;
- The simple integration of distribution and production tools with the efficient P2P content distribution of AXMEDIS for B2B and B2C (in this case only the B2B part has been used) http://www.axmedis.org/documenti/view_documenti.php?doc_id=3612
- The cross media content, when this type of content can be played according to the player capabilities.
- http://www.axmedis.org/documenti/view_documenti.php?doc_id=3634

- The connection with the AXMEDIS P2P network for accessing to the content to be distributed towards several distribution channels;

5 Bibliography

- [1] DE12.2.2.1 AXMEDIS-ELTEO requirements
- [2] DE12.2.3.1 AXMEDIS-ELTEO specification
- [3] DE12.2.4.1 AXMEDIS-ELTEO Component Integration Prototypes and Documentation
- [4] DE12.2.4.2 AXMEDIS-ELTEO Content Modeling and Production
- [5] Technical Note No. 6001 Video on Demand Distribution for IPTV Digital Set-Top-Box
- [6] Technical Note No. 6501 Elion Content on Demand Distribution for PC
- [7] AXMEDIS project website – www.axmedis.org
- [8] Demonstrator web pages: general – www.axmedis.org/com
- [9] Demonstrator web pages. TEO demonstrator:
http://www.axmedis.org/com/index.php?option=com_content&task=view&id=72&Itemid=51
- [10] Demonstrator web pages. Elion demonstrator:
http://www.axmedis.org/com/index.php?option=com_content&task=view&id=75&Itemid=46

6 Glossary

AXCS, AXmedis Certifier and Supervisor

AXCS is the authority put in charge of supervising the certification process over all its phases

AXCP, AXmedis Content Processing

Tools set for automatic content production, adaptation and protection of AXMEDIS object and their publication on a P2P environment.

AXDB, AXmedis DataBase

Database for storing Axmedis objects

B

B2B, Business to Business

Refers to one business communicating with or selling to another.

I

IPTV, Internet Protocol Television

A system where a digital television service is delivered by using Internet Protocol over a network infrastructure

M

MPEG TS, Moving Picture Experts Group Transport Stream

Communications protocol for audio, video, and data which is specified in MPEG-2 Part 1, Systems (ISO/IEC standard 13818-1).

P

P2P, Peer-to-Peer

Computer network which uses diverse connectivity between participants in a network and the cumulative bandwidth of network participants rather than conventional centralized resources where a relatively low number of servers provide the core value to a service or application

PMS, Protection Manager Support

DE12.2.5.2 AXMEDIS-ELTEO Demonstration Report

A tool set for protecting/unprotecting Axmedis objects.

STB, Set Top Box

A device that connects to a television and an external source of signal, turning the signal into content which is then displayed on the television screen

V

VOD, Video On Demand

Systems which allow users to select and watch video and clip content over a network as part of an interactive television system

W

WS, Web Service

A software system designed to support interoperable Machine to Machine interaction over a network.