AXMEDIS

Automated Production of Cross Media Content for Multichannel Distribution

www.axmedis.org

AXMEDIS DRM FOR DUMMIES

Table of Content

AXMEDIS DRM FOR DUMMIES 5

INTRODUCTION 5

AXMEDIS DRM at a glance 5

AXMEDIS Content and players 6

1 AXMEDIS DRM USAGE 7

1.1 WHAT YOU NEED 8

1.2 USER REGISTRATION 9

1.3 TOOL CERTIFICATION 10

1.4 CREATE A NEW OBJECT 13

1.4.1 Define and/or change metadata 16

1.4.2 Save AXMEDIS object/File on disk 18

1.5 REQUEST FINAL AXOID (UNIQUE AXMEDIS OBJECT ID) 19

1.6 AXMEDIS OBJECT PROTECTION 20

1.6.1 DEFINE the License URL [optional] 22

1.7 REGISTER ON AXCS 24

1.8 DISTRIBUTION OF THE AMEDIS OBJECT 25

1.9 LICENSING THE OBJECT 27

1.9.1 Identify the User to be licensed 27

1.9.2 Decide the license you prefer to produce 27

1.9.3 Issue the license for a final user 31

1.10 OPEN A PROTECTED OBJECT 33

1.11 HOW TO GET INFORMATION ABOUT USER'S CONSUPTION 34

1.12 CONTACTS 34

1.13 ACRONYMS 34

List of AXMEDIS Acronyms for Identifications 34

List of AXMEDIS Acronyms for Tools 35

List of MPEG21 Acronyms and Terminology 35

1.14 REFERENCES AND LINKS 35

AXMEDIS Tutorials 35

AXMEDIS tools for free download 36

AXMEDIS Technical Notes 36

AXMEDIS Solutions 37

AXMEDIS showcases 37

AXMEDIS Framework Specification 37

AXMEDIS reports on basic enabling technologies 38

Basic knowledge reports 38

Content Modeling and Test Cases 38

AXMEDIS Framework Demonstrators, Cases, Trials, for distribution etc. 38

Brochures and press cutting (a part) 39

An AXMEDIS object is like a container where you can put any kind of resource inside.

AXMEDIS DRM FOR DUMMIES

INTRODUCTION

This manual shows the minimal steps regarding the production, protection, publication and fruition of an AXMEDIS object with DRM. It does not pretend to be an exhaustive user manual of the AXMEDIS Editor, neither an exhaustive user manual of the AXMEDIS DRM. It is only devoted to user that would like to make a first tour in the usage of the AXMEDIS DRM and are starting using the AXMEDIS tools for the first time with DRM.

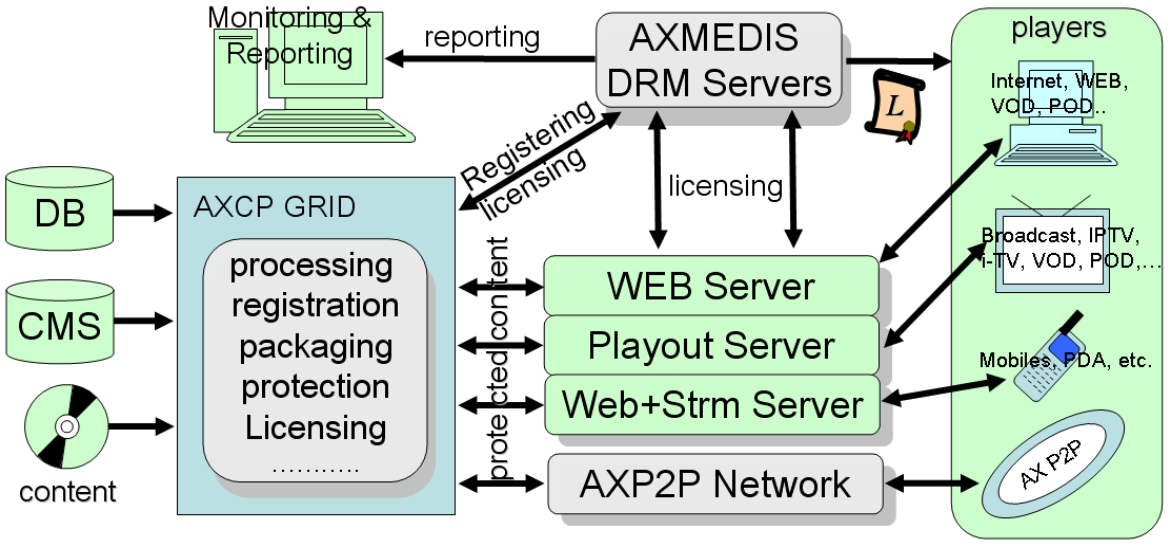
AXMEDIS DRM AT A GLANCE

AXMEDIS solutions can reduce costs and increase efficiency of content management. AXMEDIS supports the whole value chain and provides tools to simplify the convergence of media, the media transcoding, and the interoperability of content enabling multi-channel distribution. AXMEDIS provides a flexible and interoperable DRM, for both B2B and B2C across traditional and P2P distribution platforms.

AXMEDIS Multichannel DRM is an open interoperable solution for protecting and managing rights for a wide range of content, from single files to complex cross media and multimedia, distributed on different channels towards different type of players and devices. AXMEDIS can be used to setup and manage DRM solutions for:

- Internet, client server and P2P distribution;
- broadcasting, satellite and terrestrial distribution;
- production and video on demand distribution, VOD and IPTV;
- mobile and PDA distribution;
- interactive TV and educational content distribution;
- PC, STB/PVR, HDR, PDA, Mobiles, etc.;
- physical media: CD, DVD, USB, etc.;
- business to business (B2B) distribution;
- integrated business to business to consumers (B2B2C) distribution models.

AXMEDIS DRM can be easily integrated into any distribution channel, allowing you to maintain your front end distribution solution and customer relationship management tools. In the following figure, the green parts are your servers and tools and your customers/markets; grey and light blue part are those that can be provided by AXMEDIS or in which AXMEDIS parts can make the difference with tools.



AXMEDIS DRM exploits and extends the MPEG-21 standard allowing you to:

- **protect any content formats and types:**
  - video, audio, images, documents, games, etc.;
  - cross media and multimedia content: HTML, SMIL, MPEG-4, etc.;
  - collections and combinations of the above mentioned content formats;
- **control the exploitation of rights** of the above content formats:
  - formalization of rights and conditions with formal licenses. The license for content is a digital version of a contract that contains the list of rights (with related conditions) that can be exploited on that content by a given user. In AXMEDIS, licenses are formalized in MPEG-21 REL Standard;
- **collect and report information about consumption** of rights for
  - accounting, billing and/or statistical analysis;

AXMEDIS DRM solution provides you:

- **tools for content packaging and protection** (they may range from simple manual tools to automated tools based on GRID technology, AXMEDIS Content Processing, AXCP solution), see a summary in the following technical note http://www.axmedis.org/documenti/view_documenti.php?doc_id=3624
- **DRM servers** for (i) controlling the exploitation of rights of protected content, (ii) collecting information about the exploitation of rights; for example counting the number of times a given content object has been played, by a given user, on given device, etc. (iii) optionally interacting with an intellectual property ontology to facilitate the production and verification of licenses.
- **players for protected content** on PC (MS Windows), PDA (Windows Mobile 5 and 6), STB/PVR (Linux and Kreatel based), and AXMEDIS Java based Mobile. AXMEDIS players can be customized in several different manners and can be hosted in WEB pages (AXMEDIS player in the form of Active X).
  http://www.axmedis.org/documenti/view_documenti.php?doc_id=3634
- **tools** for manual and automated production of licenses, and for accelerating the transformation of contracts to licenses directly from the contract text, and vice versa for legal validation of licenses.

Front end content distribution servers, e-commerce servers, customer relationship servers can produce licenses for customers/users. These licenses are required to be posted onto the AXMEDIS DRM Servers via a Web Service call. In alternative, the same servers can delegate the AXCP GRID to perform the same activity, particularly when there are a high number of licenses to be produced. For example, in the case of a business models based on subscription; each new subscription produces a set of licenses to enable the new user to access all the content distributed.

As illustrated in the above figure, it is possible to exploit the P2P technology for content distribution by using AXMEDIS P2P Network solution which is fully integrated with the AXCP GRID and AXMEDIS DRM. See technical note on P2P http://www.axmedis.org/documenti/view_documenti.php?doc_id=3612

AXMEDIS CONTENT AND PLAYERS

AXMEDIS content may range from simple files with single resources such as video, audio, images, documents, animations, games, etc., to cross media and multimedia content: HTML, SMIL, MPEG-4, etc. Combinations of the above mentioned content formats can be used, protected and managed in terms of detailed rights. AXMEDIS content model extends the MPEG-21 standard and allows creating different solutions for your distribution channels. The model enables you to distribute, for download or streaming, AXMEDIS content packages (also called AXMEDIS Objects) containing:

- simple single files: audio, video, images, documents, animations, games, etc.;
- reference to external files and/or other AXMEDIS objects as URIs and links;
- content with a large variety of
  - metadata, descriptors, classification information, and identification information associated to single resources and content collections. In addition, any metadata file can be integrated into an AXMEDIS package;
- collections as lists or hierarchically organized files, collections/packages, AXMEDIS objects (nesting levels)
  - on which users may navigate, make queries on the basis of metadata of single components or files;

  - with HTML and/or SMIL as presentation layers to provide interactivity to users and presentation of other files. These allow to set up: menus, lists, text, list of icons, audio play and image presentation, dynamic advertising integration, etc.;
  - with files and internal nested packages protected in different manners with different algorithms, or selectively non-protected. This allows to create previews and to offer non protected content elements to show users the product and stimulate them to acquire licenses;
- dynamic scripts to add narrative capabilities, business logics, semantics, and in general to make more intelligent and interactive the content package behavior. This enables final users to perform activities of content enrichment (addition of comments and data to content), content transformations (for example the migration to another platform), content queries inside the content collection, etc. All these features are operated on the basis of user rights.

For the production of AXMEDIS content it is possible to use AXMEDIS Editor tools for MPEG-21 and AXMEDIS authoring (SMIL, HTML, MPEG-4, or any other kinds of digital resources), DRM, licensing, protection, packaging, workflow, playing, etc. AXMEDIS authoring is available on MS Windows. AXMEDIS players run on MS Windows, Mac OS X, Linux, Windows Mobile 5, Java mobiles, and are available for PC, STB/PVR/HDR, Media Centers, PDA, and mobiles. Their GUI and functionalities can be customized (examples of customizations are available). The production of AXMEDIS content can be also automated by using AXCP tools, see the technical notes.

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

1 AXMEDIS DRM USAGE

In the following, it will be shown how to create a new AXMEDIS object, protect it defining a simple license, publish the protected object in the P2P. After the publication the object will be opened by an unauthorized player to show how the protection works. After the authentication, the object can be opened and played by a certified player.

The steps to make a full tour into the AXMEDIS DRM are based on the following phases:

- 1.1: User registration, to be done for all the users, object creators and final users.
- 1.2: Tool certification, to be done for AXMEDIS editor and all your AXMEDIS players.
- 1.3: Creation of an AXMEDIS object (see the collection of examples to see what you can do with them).
  - Define and/or change metadata
  - Save AXMEDIS object/file on disk, optional.
- 1.4: Request of the final AXOID
- 1.5: AXMEDIS Object protection
- 1.6: Registering your content on the AXMEDIS DRM
  - Save AXMEDIS object/file on disk
- 1.7: Distribution
  - The AXMEDIS object is ready to be distributed in several different manners
  - You can test and verify if a your user can open or not the AXMEDIS object
- 1.8: Licensing an user
  - Identify the User to be licensed
    - For your test please use at least two users to see the differences
  - Different types of Licenses
    - Parent license, the license to produce other licenses
    - User license, the license for the final user
  - Decide the License model and grant you prefer to produce
  - Licensing activity for one of your users
- 1.9: Final user enjoy and play of AXMEDIS content
- 1.10: how to get information about consumption of the AXMEDIS objects and thus about the exploitation of the rights enforced into the licenses you created for your users

All the above activities and many other can be automated by using the AXMEDIS AXCP tools.

Before to create a protected AXMEDIS object, the AXMEDIS Editor tool has to be certified and the user registered in the AXMEDIS registration portal. Please, follow the following steps to complete the certification procedure. If you are not interested in creating protected AXMEDIS objects you can skip this part and go directly to the creation section. On the other hand, this AXMEDIS tutorial has been created especially for those that would like to test the protection capabilities of AXMEDIS DRM.

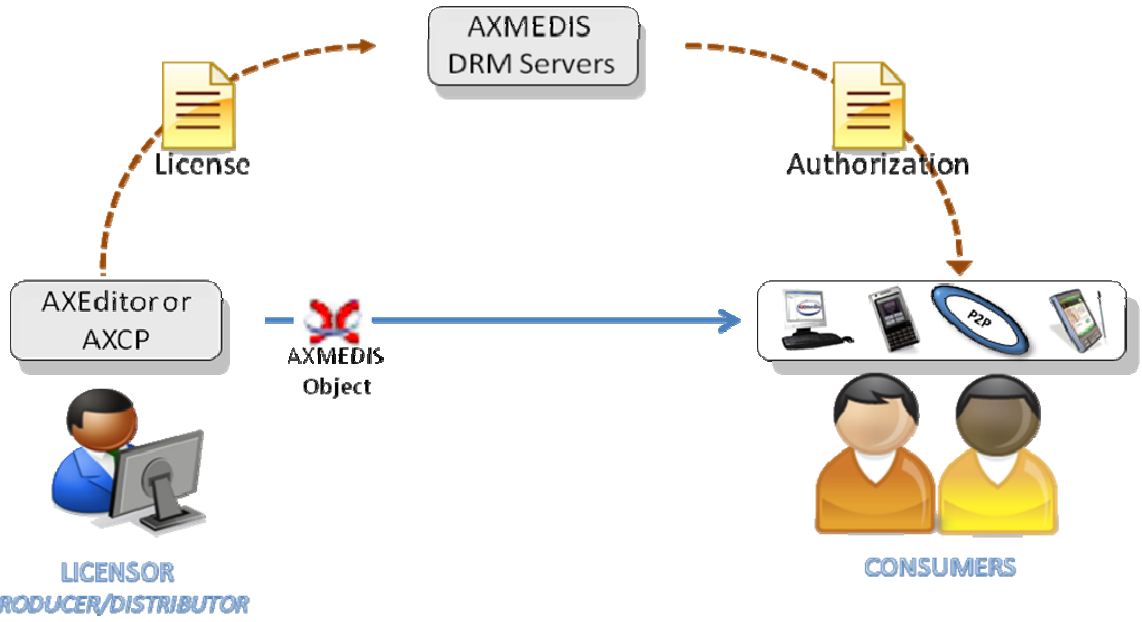
1.1 WHAT YOU NEED

To perform the following experience you need to have at the minimum:

- LICENSOR: One computer **connected to internet** with Windows XP, on which you have to install:
    a. AXMEDIS Editor: http://www.axmedis.org/documenti/view_documenti.php?doc_id=3720 you can freely download it and install;
    b. An AXMEDIS Player, for example: http://www.axmedis.org/documenti/view_documenti.php?doc_id=3715 you can freely download it and install.
- CONSUMER(S): One or more computers with installed AXMEDIS players, for example: http://www.axmedis.org/documenti/view_documenti.php?doc_id=3715 you can freely download them and install.

Both the computer have to be connected in Internet.

The first computer will play the role of content producers or distributors LICENSOR. That will package the content, will protect the content and will produce the licenses to permit at the CONSUMER(s) to use the content object(s) licensed. In the minimal case exposed in this document, the Producer and Distributor are a unique computer, device, and thus person, the LICENSOR. AXMEDIS also allows to manage the licensing of the producers toward the distributor, in order to authorize the latter in producing the licenses. This part is out of the scope of this AXMEDIS DRM for dummies document. The AXMEDIS DRM reported in the figure is provided by the AXMEDIS organization. If you have the intention of creating your distribution channel(s), you can install your own AXMEDIS DRM Server for managing one or more channels.

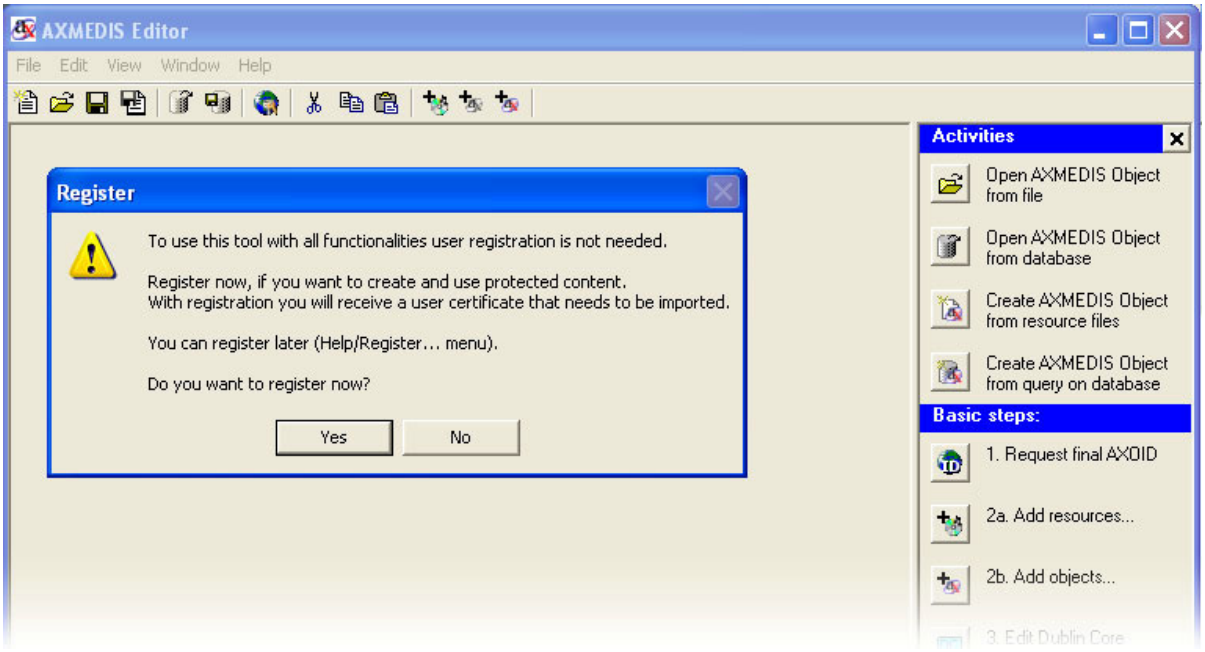


The CONSUMERs are going to use the content produced and licensed by the LICENSOR.

As a limit case, you can reduce the needs to a single computer in which both LICENSOR and CONSUMER may be hosted but the evidence and the powerful of the solution will be less clear.

1.2 USER REGISTRATION

When the AXMEDIS Editor is opened for the first time, a window asking to register the new user is shown (see the figure below).



By clicking the “Yes” button, the certification procedure starts. This is performed by using your internet browser that will open a web page asking you mandatory information to be filled in for the correct user registration as below. Please fill all data.

Please note that all fields marked with * have to be filled-in or the registration procedure will not be completed correctly.

The registration procedure may fail due to:

- Lack of connection;
- You do not have filled all mandatory fields;
- You have used a nickname already in use (error 12227);
- Some data are missing;
- Etc.

By clicking the "OK" button this information is sent and collected by the AXMEDIS DRM. Thus the AXMEDIS registration portal sends to you three emails as described below:

- the first email contains an URL to be clicked for the confirmation of the procedure: this is necessary to control the correctness of the specified email address;
- the second email: after the confirmation of the first email, another email is sent to you at the same email address stated above, containing your AXMEDIS User ID and the a password. The password is necessary to import the certificate you will receive in the third email into the AXMEDIS players and other AXMEDIS tools;
- a third email is sent automatically containing in attach the user certificate (a .p12 file). See section 1.3 for the certification procedure.

The User Certificate received has to be saved on your hard disk in a secure place before starting the import procedure into your AXMEDIS tools.

Please note that the emails are generated automatically so that:

- You have to provide a valid email address;
- They may be identified as spam since are automatically generated and this can be easily detected by antispam tools.

They usually are sent immediately, so that if you do not receive them in few minutes you have to repeat the registration procedure.

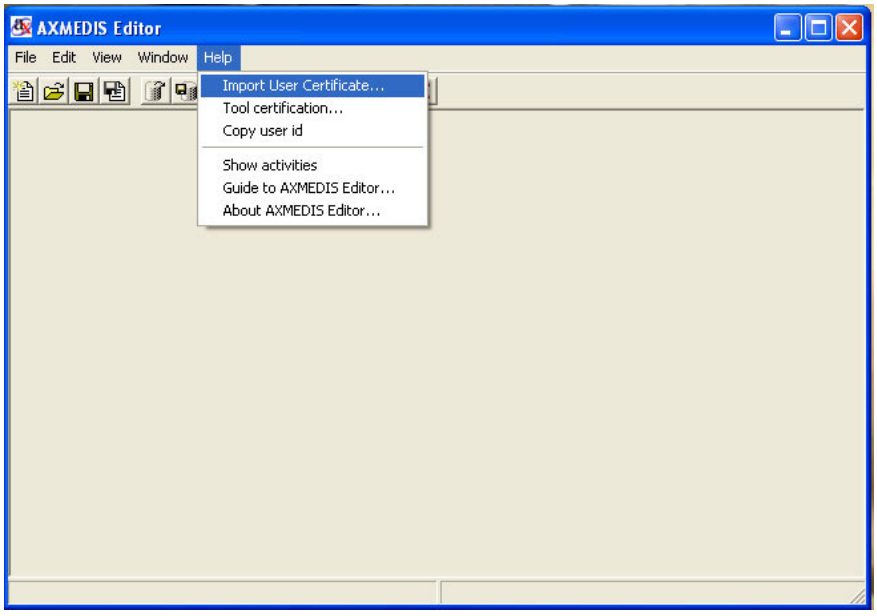
Please note that the tool certification procedure may fail due to:

- Lack of connection;
- The firewall blocks the connection.

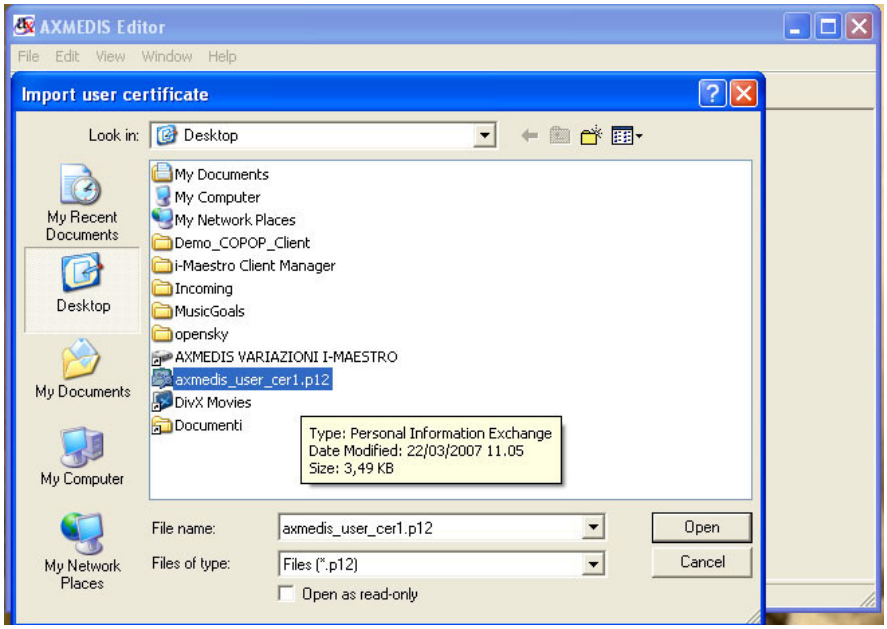
1.3 TOOL CERTIFICATION

All the AXMEDIS tools have to be certified before using and/or generating protected AXMEDIS content. The Tool Certification has to be performed by a Registered user (see previous section) by using the certificate he/she received via email during the registration.

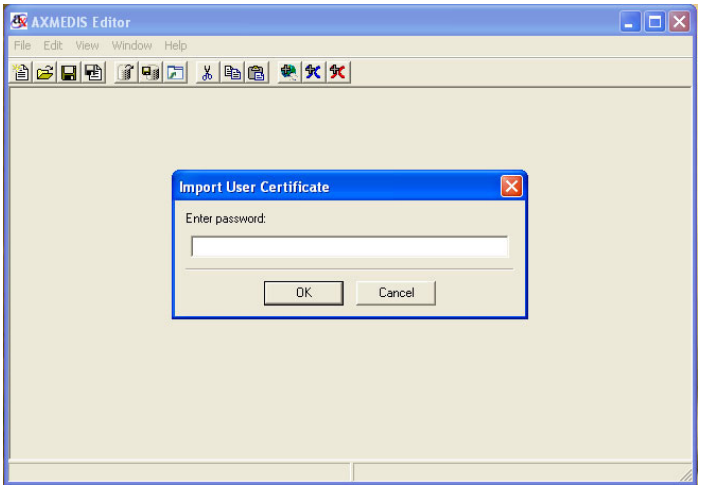
To perform the Tools Certification, you have to import the User certificate in the AXMEDIS Editor/Tool (this procedure is valid also for all the AXMEDIS players, including the AXMEDIS PDA player, but excluding the AXMEDIS Mobile player for which a simplified procedure is provided). In the AXMEDIS Editor and Players, the import has to be performed by selecting the menu **Help/Import User Certificate…** as depicted in the following.



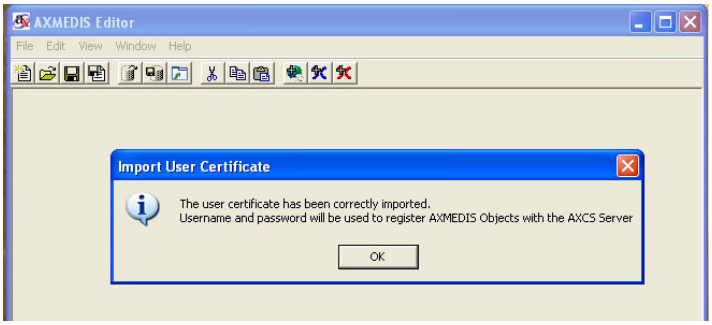
Please, select the .p12 file received via email and press the **Open** button.



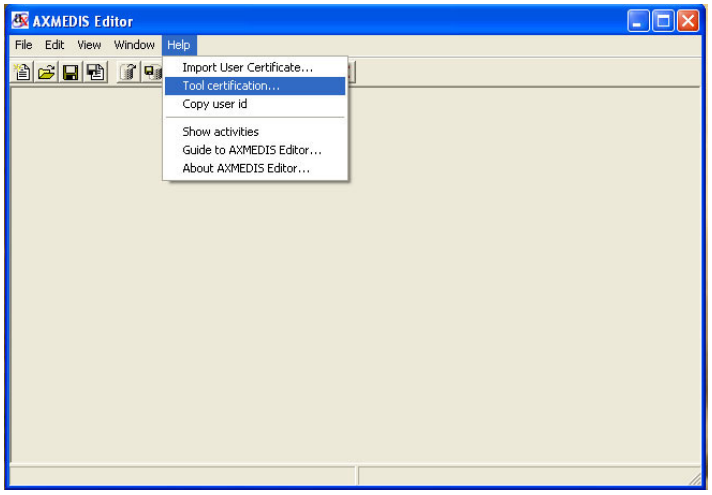
Then, insert the password received by email as stated above to continue the user certificate import procedure and press the **OK** button.



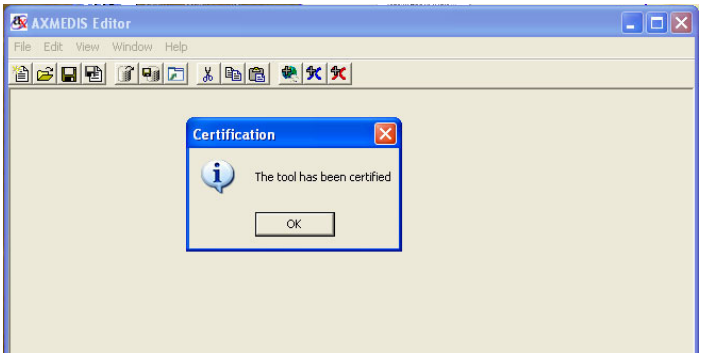
In the case of success, a message confirming the correctness of the user certificate import procedure is showed. Press the **OK** button to continue.



After the Import of the User Certificate, it is necessary to Certificate the tool. In the AXMEDIS Editor and Players, please open the menuitem **Tool certification…**in the Help menu



This action is commanding your tool to connecting with the AXMEDIS DRM to make the certification. This is possible only if you are connected with internet. Thus if the operation will be successfully, immediately a message will be shown confirming the tool certification.



Now, you have certified you tool. You can certify all tools that you have with the same procedure by using your user certificate. After this you are capable to create protected AXMEDIS objects using the AXMEDIS Editor as described in the following.

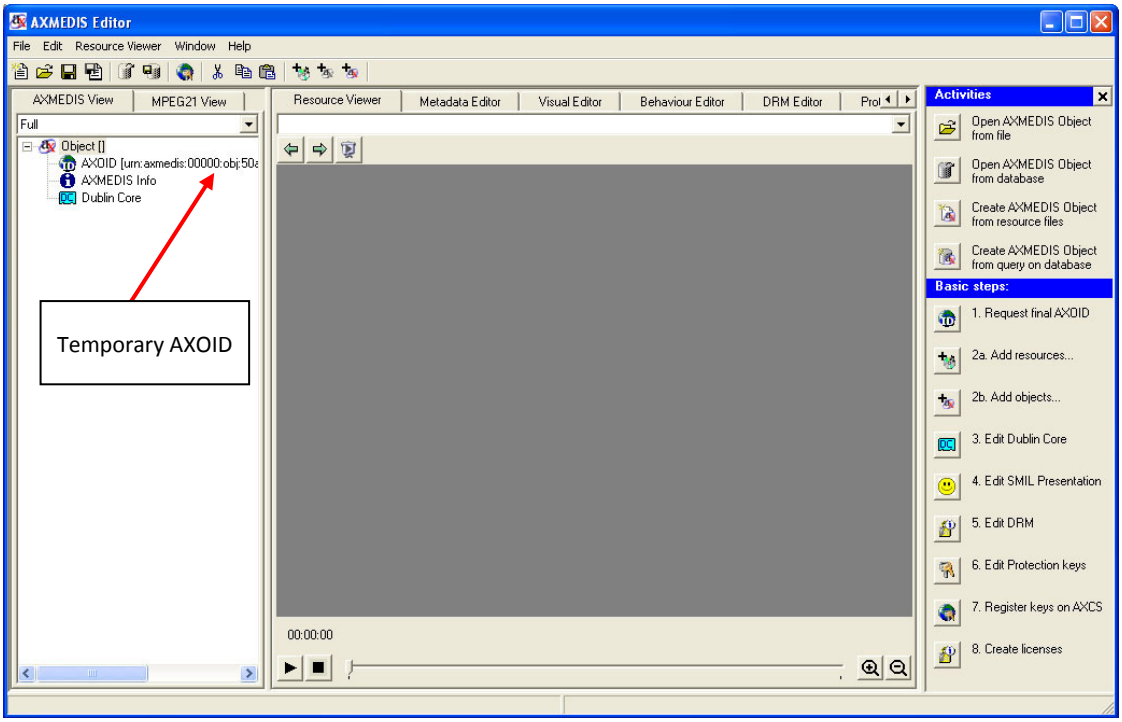
Please note that the procedure of user registration has to be performed only once to enter in the AXMEDIS users lists. At each user correspond on ID that is called AXUID. AXMEDIS unique User ID. Each user receives one certificate and that certificate can be used to register a number of AXMEDIS tools. From the AXMEDIS editor to the players. Also AXMEDIS PDA players can be certified with the user certificate.

The AXMEDIS players have to be certified to play protected AXMEDIS content.

1.4 CREATE A NEW OBJECT

To create an AXMEDIS object from scratch select **File/New** from the Menu or use the button on the toolbar. Also in the **Activities** vertical toolbar a specific button is available.

When a new object is created, a temporary AXOID is produced and associated to it. A temporary **AXOID** (AXMEDIS Object ID) can be recognised by observing five zero at the beginning of the ID number as depicted in the following figure.



The AXMEDIS Editor appears divided in three main parts:

- the Tree view window on the left, that provides a view of the AXMEDIS object structure; selecting the MPEG-21 panel it is possible to see the hierarchical view of the MPEG-21 structure of the object;
- the Panels View window in the middle, which shows the selected panel; below these panels a combo box is present showing all the resources available in the object and facilitating the applications of all the different features to them;
- the Activities windows on the right, that helps to easily find the main features of the Editor and to guide the user in the basic steps to create a AXMEDIS objects. If necessary this windows can be closed by clicking on the button in the high-right corner to enlarge the Resource View window. And it can be reactivated by suing the subitem into **Help** menu item.

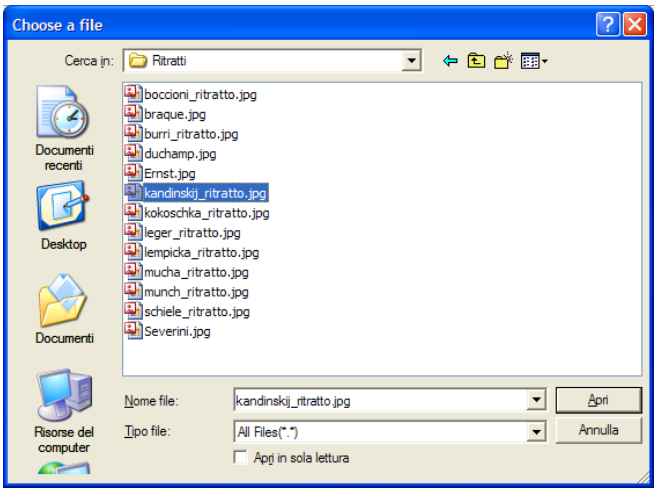
In the Tree window, initially only three items are present:

- the AXOID, that is the unique AXMEDIS Object Identification number, the is provided in temporary format;
- the AXMEDIS Info item, double clicking on it shows information about the object creator;
- the Dublin Core item, preparing the space for the metadata information in Dublin Core standard format, that you may have interest to insert.

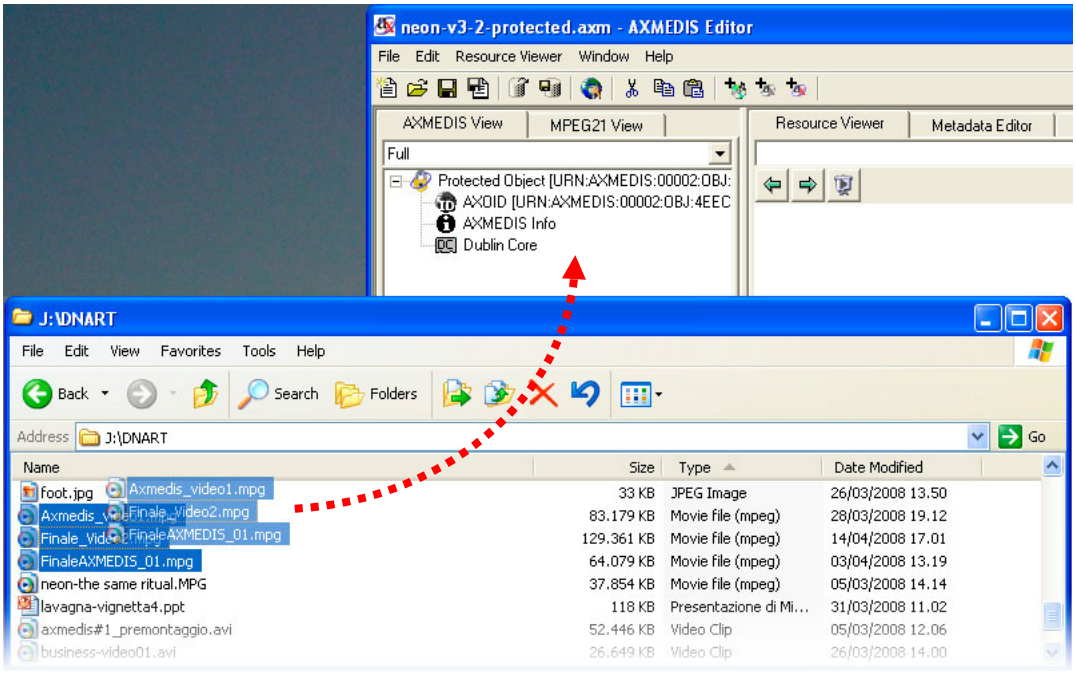
In order to create a new object, the first step is to add a number of digital resource into the AXMEDIS object. This can be initially stored in your hard disk as single file or as group of files. The digital resources that for instance you would like to protect with AXMEDIS DRM and thus that your would like to include into an AXMEDIS objects have to be identified and ported into the objects. Once the AXMEDIS objects is created and protected it will be ready to be distributed.

In order to add a digital resource/essence from a file on the local hard disk into the AXMEDIS object you may perform different possible activities as described in the following:

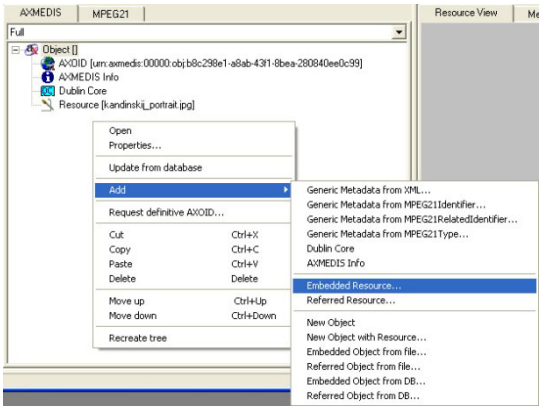
- select button from the toolbar and select the file(s) to be added;



- drag&drop the resource from a folder directly into the AXMEDIS Editor, dragging one or more resources and dropping them into the hierarchical view on the left part of the AXMEDIS Editor;



- add a resource using the contextual menu with a right click on the tree window and selecting **Add/Embedded Resource…**

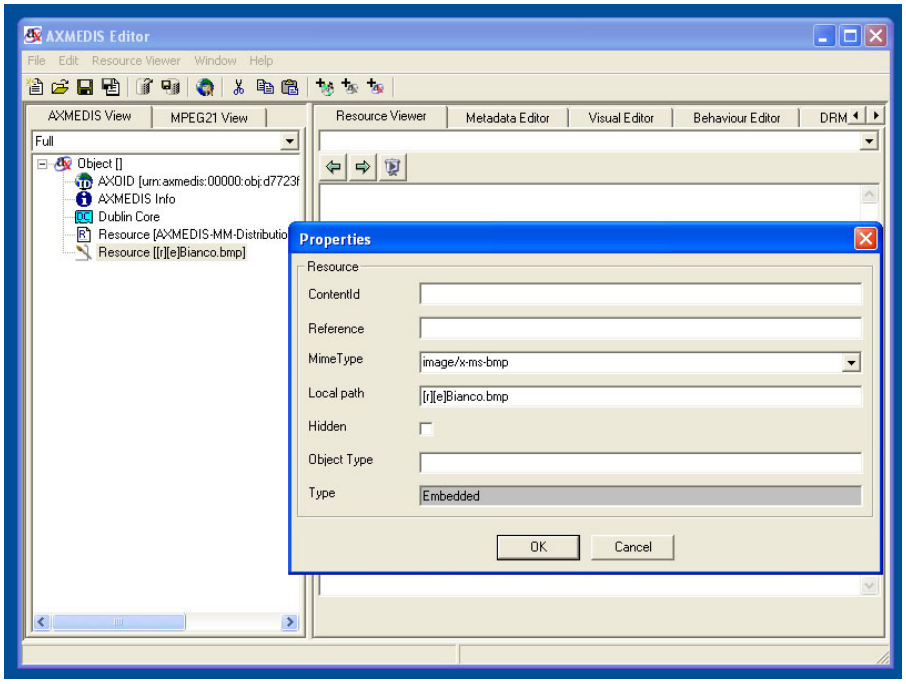


The AXMEDIS Editor is capable to automatically recognize all the most important file formats for documents (txt, doc, pdf, rtf, etc.), images (gif, tiff, png, jpg, etc.), audio (wma, mp3, wav, etc.), video (mpeg, mpg, etc.) and to play them using the internal player according to the MIME-type defined on your computer. Please note that you can insert also AXMEDIS objects/files into an AXMEDIS object. so that creating nesting levels. The nested objects can be protected and licensed as well.

When a resource is correctly embedded, it appears in the tree window with an icon identifying the type of the resource followed by the prefix *Resource* and the resource name closed by square brackets.

A Double clicking on the resource opens the Resource Viewer.

If a resource cannot be executed by the resource viewer means that: it has not been recognised in terms of mimetype so that in your computer you cannot execute/play it with a double clink on the Explorer of the file system. In this case, you can impose the mimetype by changing the value in the properties of the resource. They can be accessed with right click on the digital file that cannot visualized, see the example of the following figure.



In order to impose the right mimetype your have to consult the standard about the mimetype of your file. At each extension a unique mimetype is asseigned. The AXMEDIS Editor and player are capable to play/rendering more than 400 different resource types. In some cases, for example in the case of audio and video, the rendering of the mime type may depend on the codec that you have or not installed on your computer. Please consult our AXMEDIS technicians to satisfy specific requests.

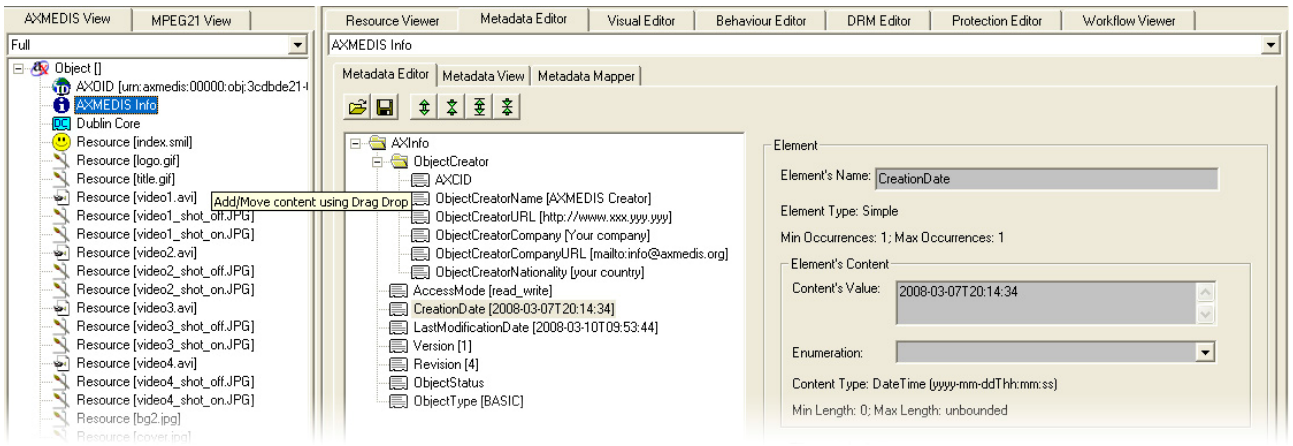
Please note that all the above mentioned operations can be performed automatically by using the AXMEDIS Content Processing solution, AXCP mentioned before.

1.4.1 DEFINE AND/OR CHANGE METADATA

In this section how to add the mandatory metadata will be shown. Please, refer to the AXMEDIS Tools User Manual for detailed information about the Metadata Editor functionalities.

The AXMEDIS Metadata Editor allows the user to add, edit, delete and view metadata elements including Dublin Core and AXMEDIS Info (AxInfo) using a simple interface with pop up menus and editing boxes. The Metadata Editor can be opened by selecting “Metadata Editor” tab or by double clicking on a metadata (e.g., AXMEDIS Info or Dublin Core) in the Hierarchical View on the left side of the main AXMEDIS Editor.

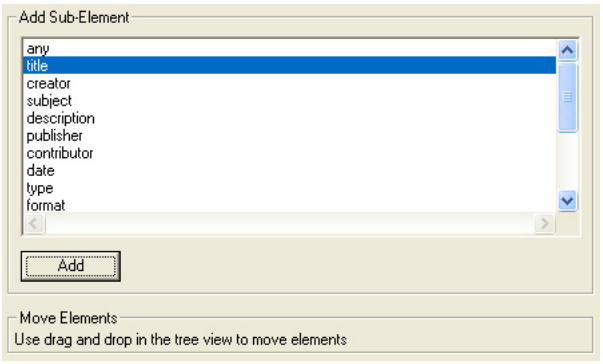
Most of the AXMEDIS Info Metadata are automatically updated by the tool and generally you don’t need to change them. If you want to access and modify these metadata, double click on the AXMEDIS Info icon on the hierarchical view.



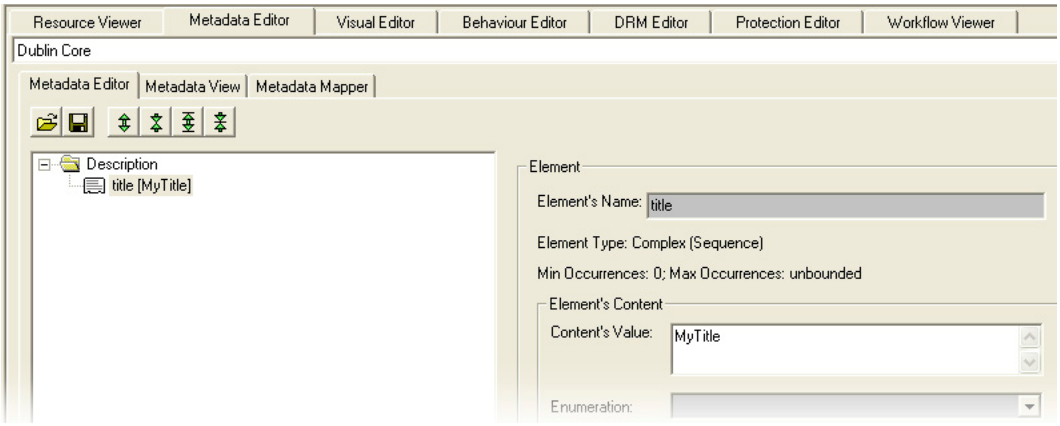
We strongly suggest to insert at least the title as mandatory Dublin Core metadata. This is necessary since if no metadata will be defined, will be impossible to search the object in the database when it will be distributed. Please note that for the purpose of this AXMEDIS DRM tour you can avoid to insert any metadata, the default values are ok. So that if you do not intent to manage AXMEDIS object into a database please skip the rest of this section.

In order to add the title in your AXMEDIS object metadata please follow the following steps:

- double click on the Dublin Core icon in the hierarchical view of the AXMEDIS Editor to open the Metadata Editor;
- select with the mouse the *title* element in the **Add Sub-Element** box and press the **Add** button;



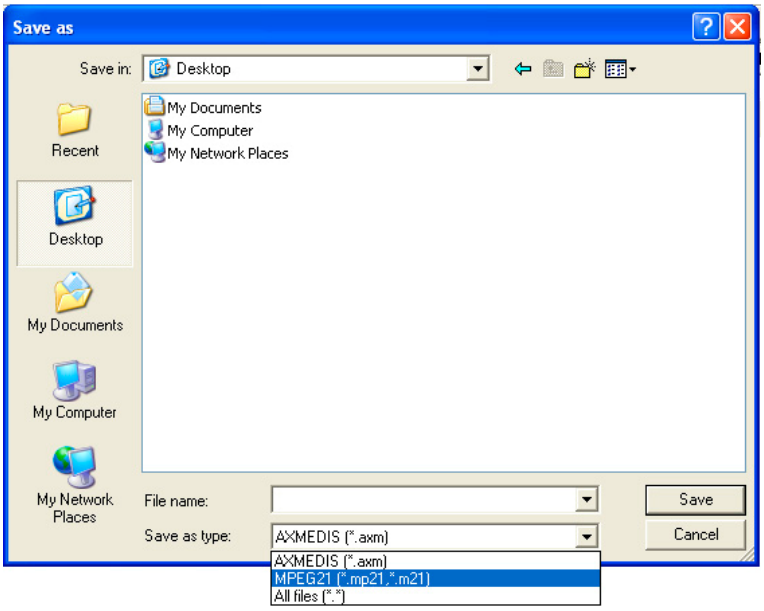
- The title will be show immediately below the *Description* folder in the metadata hierarchical view. Select the title element and write the title in the **Element's Name** box.



1.4.2 SAVE AXMEDIS OBJECT/FILE ON DISK

When an object has been created it can be overwritten on the local hard disk using **File/Save** (or using the button on the toolbar) or saved as new file using **File/Save As…** from the menu.

The save procedure can be performed in two AXMEDIS based formats: AXMEDIS format (identified by the *.axm* file extension. Please note that the icon of this file is identified by a red X) and MPEG-21 format (identified by one of the following possible file extension, *mp21* or *m21.* Please note that the icon of this kind of file is identified by a blue X).



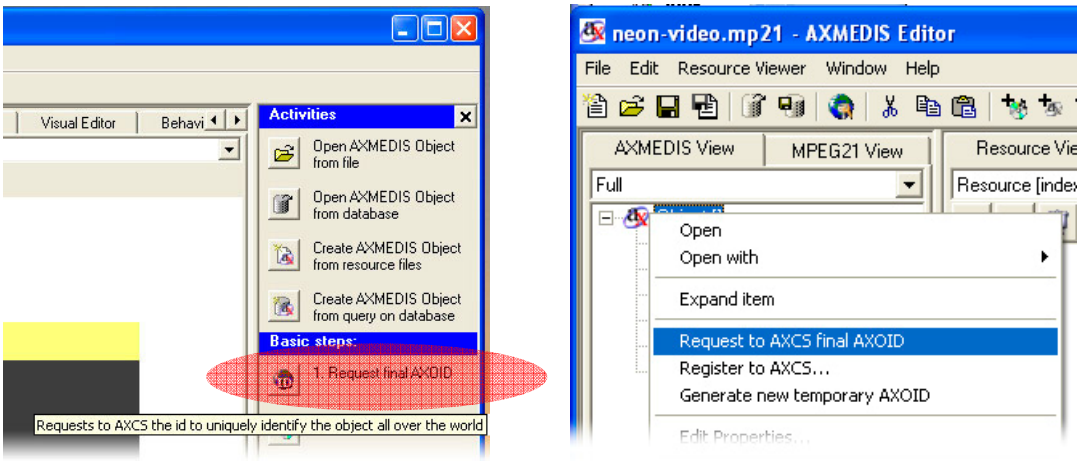
We strongly recommend to save the file in MPEG-21 format. The mp21 files format is much more faster and compressed with respect to the AXM format that is an XML based format.

Please note that all the above operations can be performed automatically by using the AXMEDIS Content Processing solution, AXCP mentioned before.

1.5 REQUEST FINAL AXOID (UNIQUE AXMEDIS OBJECT ID)

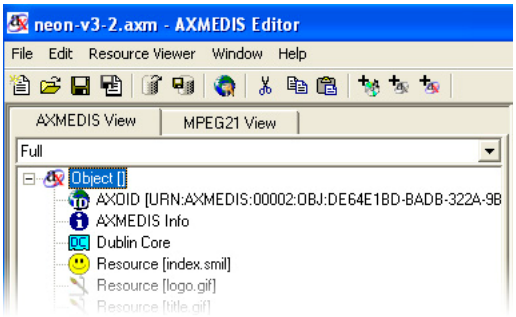
Before licensing of an AXMEDIS object, it is necessary to request the final unique AXMEDIS Object ID number (Final AXOID) that will identify the object uniquely in the AXMEDIS DRM license server.

Once opened the AXMEDIS objects, to request the final AXOID for that AXMEDIS object, it is necessary to press the relative button in the activities window, as shown in the following figure. Alternatively it is possible to right click with the mouse in the first line in the tree view, identified by the *object* text, and select **Request to AXCS final AXOID**.



To get the final AXOID the AXMEDIS Editor contact the AXMEDIS DRM server so that even in this case you have to be connected to Internet.

When successfully performed, the AXMEDIS object will be get a new AXOID, this time definitive, not temporary as described above.



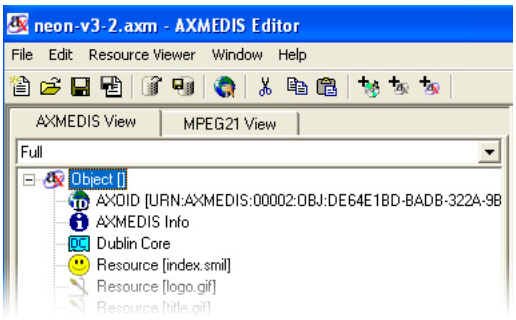
Please note that all the above operations can be performed automatically by using the AXMEDIS Content Processing solution, AXCP mentioned before.

This activity is performed by establishing a connection with the AXMEDIS DRM servers and in particular with the PMS and AXCS. To this end, failures of this procedure may be due mainly to:

- Lack of connection;
- Your active firewall;
- Problems on the network;
- Your do not have certified the tools.

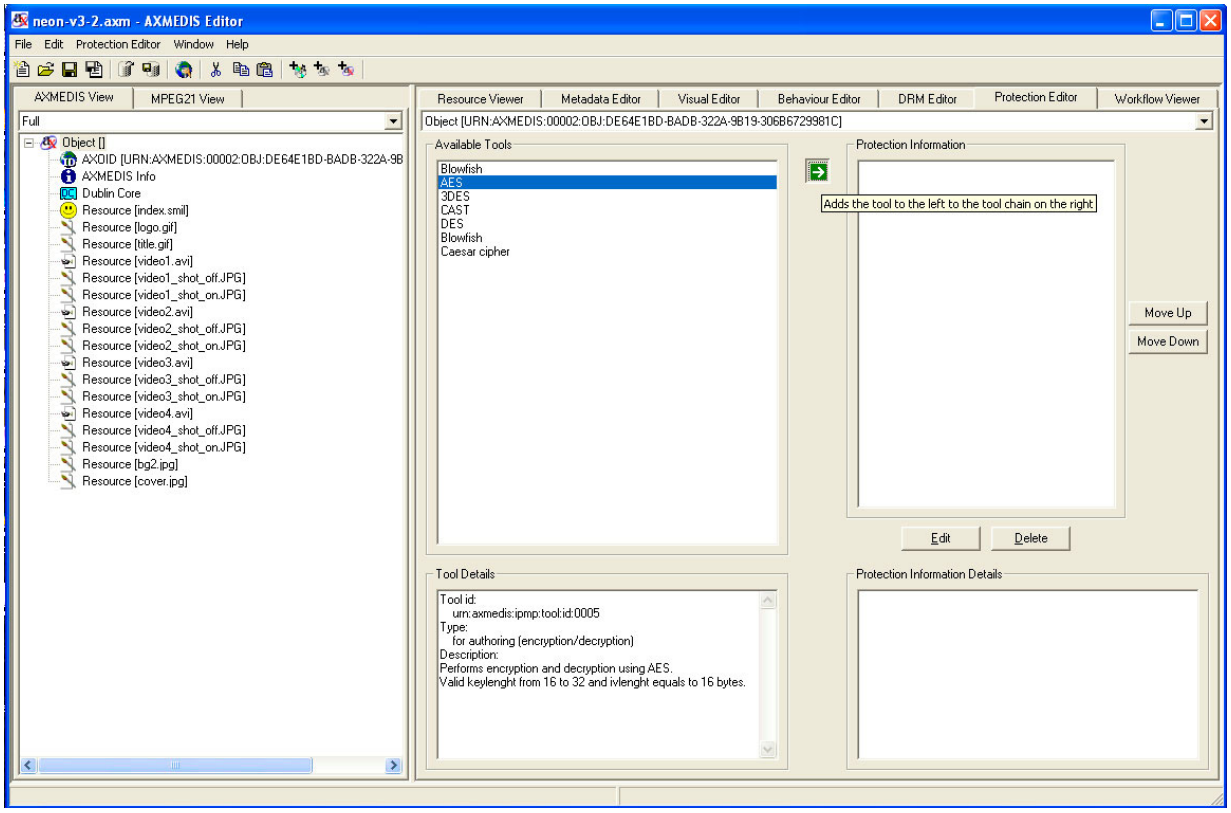
1.6 AXMEDIS OBJECT PROTECTION

Typically you may be interested to protect a non protected AXMEDIS object. You can recognize a non protected but registered AXMEDIS object quite easily. In the next figure, the AXOID presenting the first 5 charts different from 00000 means that the AXOID has been finalized, while the Blue and Red AXMEDIS logo for the Object root indicates that the object is not protected.



In order to protect the AXMEDIS object that you have loaded into the AXMEDIS Editor, it is necessary to define the algorithm to be used for the protection and some protection parameters. This activity can be performed in the integrated **Protection Editor** tab of the AXMEDIS Editor. The AXMEDIS protection tools are loaded from the AXMEDIS plug-ins. So that additional AXMEDIDS protection tools can be produced by using the AXMEDIS plug in development kit and added posting them in the directory of the plug ins.

As showed in the following figure, as a first step it is necessary to select in the **Available Tools** window, the encryption algorithm to be used and then press the green arrow in the middle of the right panel to confirm the selection. The name of the tool will be shown in the right window (**Protection Information**).



To make a first experiment we suggest using the AES algorithm. Immediately a new window will be shown containing the Protection Information parameters to be provided.

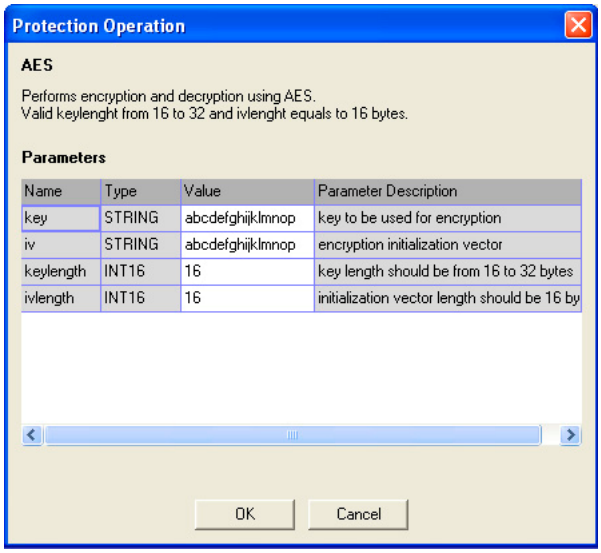
As showed in the following figure, the fields in the **Protection Operation** window have to be filled-in with the following parameters:

key: a string of 16 characters (in this case *abcdefghijklmnop*); You can change the values if you like!

iv: a string of 16 characters (in this case *abcdefghijklmnop*); You can change the values if you like!

keylength: an integer number representing the total characters to be inserted in the ***key*** field (16 in this case);

ivlength: an integer number representing the total characters to be inserted in the ***iv*** fields (16 in this case).

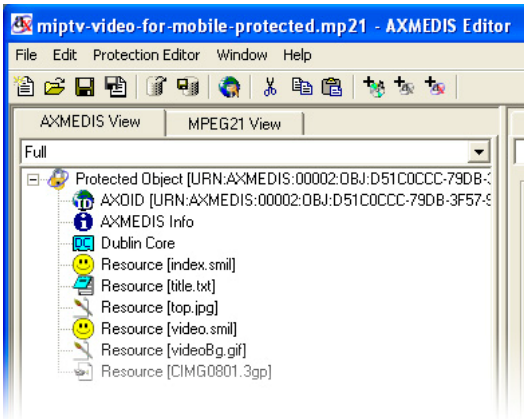


Please note that, if the fields **keylength** and **ivlength** have a different number, the characters to be inserted in the **key** and **iv** fields have to be changed accordingly or you will receive an error message.

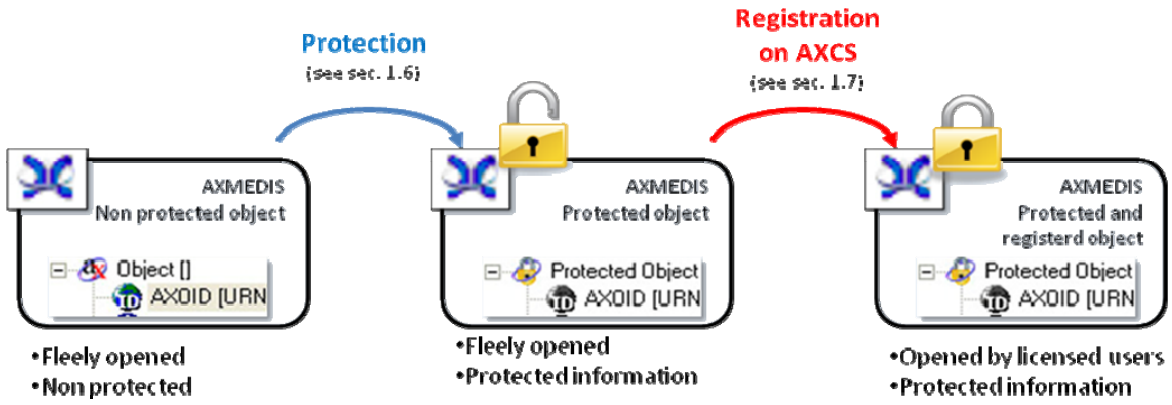
When all the fields have been completed, it is possible to press the OK button. The defined protection information will be displayed in the **Protection Information Details** window. And thus the AXMEDIS object will be protected.

The AXMEDIS object has been produced and can be saved on the disk in AXM or MP21 formats, see section 1.4.2.

Please note that a protected and not registered objects contains the protection information directly inside. So that it is encrypted but it can be opened since it contains the sensible data in the object body. Please do not distribute those objects: they are only temporary objects for the producer. You can recognize the AXMEDIS object that are protected and not registered by loading them into the AXMEDIS Editor. They present the protection icon of the object and at the same time the resources are visible without accessing to licenses, as shown in the following figure.

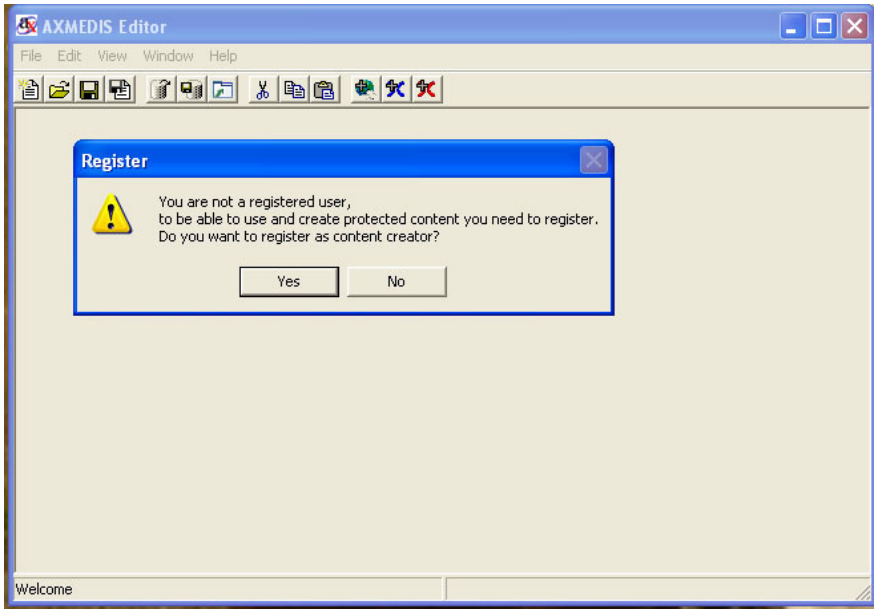


In the following figure is depicted the whole process to related to the protection and the registration of the AXMEDIS object to better explain the steps needed to produce the AXMEDIS protected object.



Please note that all the following operations can be performed automatically by using the AXMEDIS Content Processing solution, AXCP mentioned before.

If you are a not registered user and you try to create protected objects, you will receive the following error.

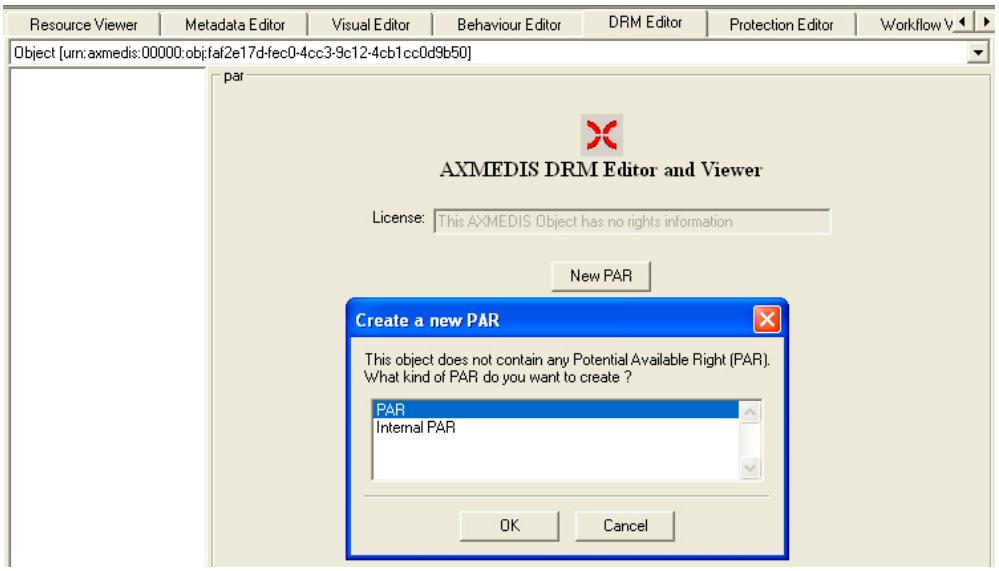


To avoid this error you have to be registered as described in Section 1.1.

1.6.1 DEFINE THE LICENSE URL [OPTIONAL]

If a non authorised user tries to open a protected object, he will receive an error message showing that he is not authorised to do the operation. In some cases it is possible to define also a Licensing URL so that, when a non authorised user will try to open the protected object, a web pages will be automatically showed. This web page could be used to allow non authorised users to buy a license for the protected object. In this section how to add the Licensing URL to a protected object will be described.

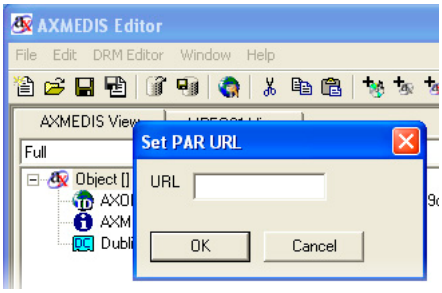
- To add the License URL select the DRM Editor tab in the AXMEDIS Editor tool. A new dialog will be shown asking for if you want to create a **PAR** or an **Internal PAR** (see next figure);



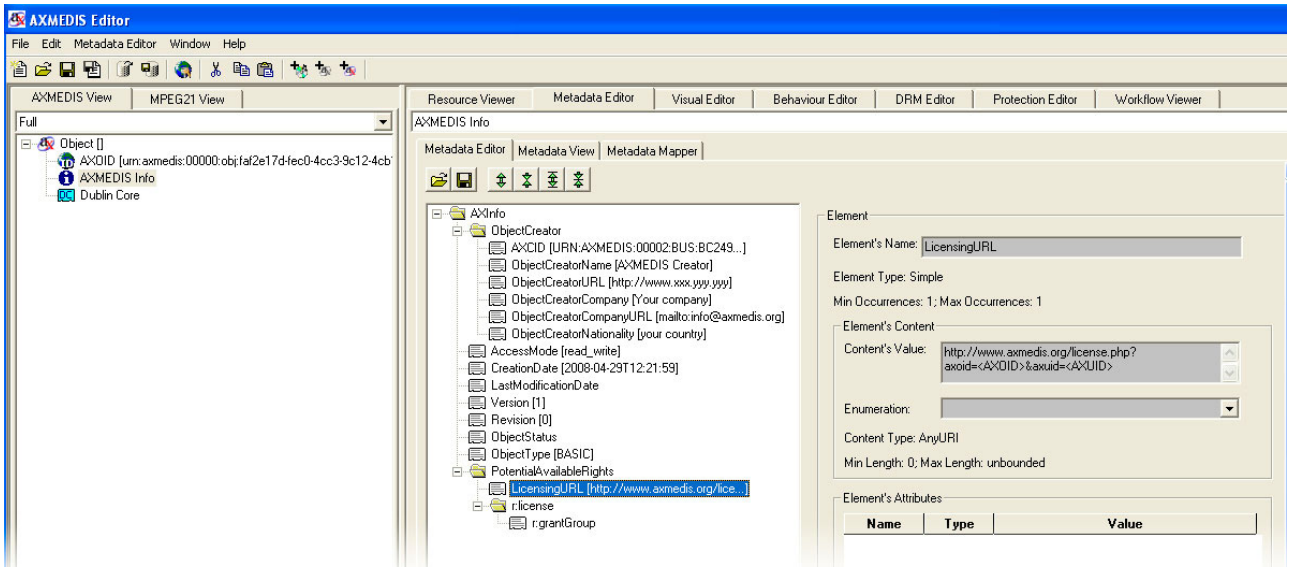
- Select PAR and press OK;

- In the DRM Editor menu in the AXMEDIS Editor select the Set PAR URL item;

- a new dialog will be showed where the URL of the web page to be opened has to be specified;



- write your URL in the dialog and press OK. For example, fill-in the dialog URL with the following text, by making a cut and paste of it into the dialog, `http://www.yourportal.com/license.php?axoid=<AXOID>&axuid=<AXUID>`. You will see that in the AXInfo metadata a new item has been added (see next figure);



- when a non authorized user will try to open a protected object, he will be automatically redirected to your portal `http://www.yourportal.com`, passing to the http protocol the parameters of current AXOID and AXUID related to the license for that object (see for details standard http protocol).

1.7 REGISTER ON AXCS

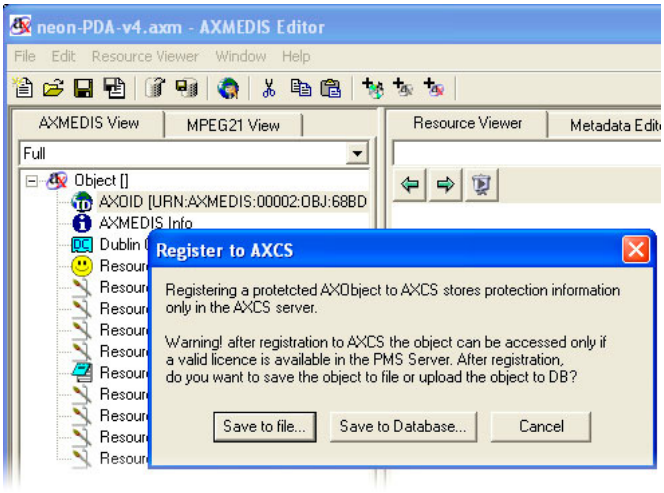
When the protection phase has been completed, it is necessary to register the protection information for the protected AXOID in the AXMEDIS DRM server (precisely AXCS server). This operation is executed by pressing the Register keys on AXCS button in the Activity tool bar on the right. Each time a user will try to open the protected object, he/she will have to get the grant authorization from the AXMEDIS DRM on the basis of a licenses and if granted the protection information will be recovered automatically by AXMEDIS tool from the AXMEDIS DRM server.

Thus, before to send the object on distribution the final step to complete the object creation is to perform the registration on AXCS.

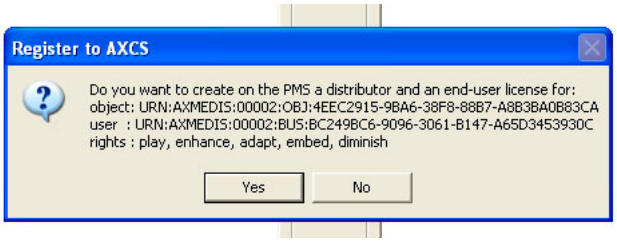
Before making the registration you will have the possibility of saving the final version of the registered and protected object into your hard disk and thus in a file.

The entire process of registration and save is started by suing in the Activity toolbar, the button**.7.Register keys on AXCS,** or from the general menu.

The pressing of the button **7.Register keys on AXCS** will open a small dialog as depicted in the following figure, asking if you would like to save the AXMEDIS protected and registered object to a file or into an AXMEDIS database. In this case, **the tour does not include the usage of the data base so that please select the save on disk.**



After your choice (Save on File), you will see a new window asking if you want that a new license is automatically created for the object for yourself. In this manner you will be able to access to the protected object you create in the future, please select Yes. This will be clarified later in this document.



By selecting YES, a confirmation message will be shown and a license for you will be stored in the PMS.

Please note that all the above operations can be performed automatically by using the AXMEDIS Content Processing solution, AXCP mentioned before.

This activity is performed by establishing a connection with the AXMEDIS DRM servers. To this end, failures of this procedure may be due mainly to:

- Lack of connection;
- Your active firewall;
- Problems on the network;
- Your do not have certified the tools.

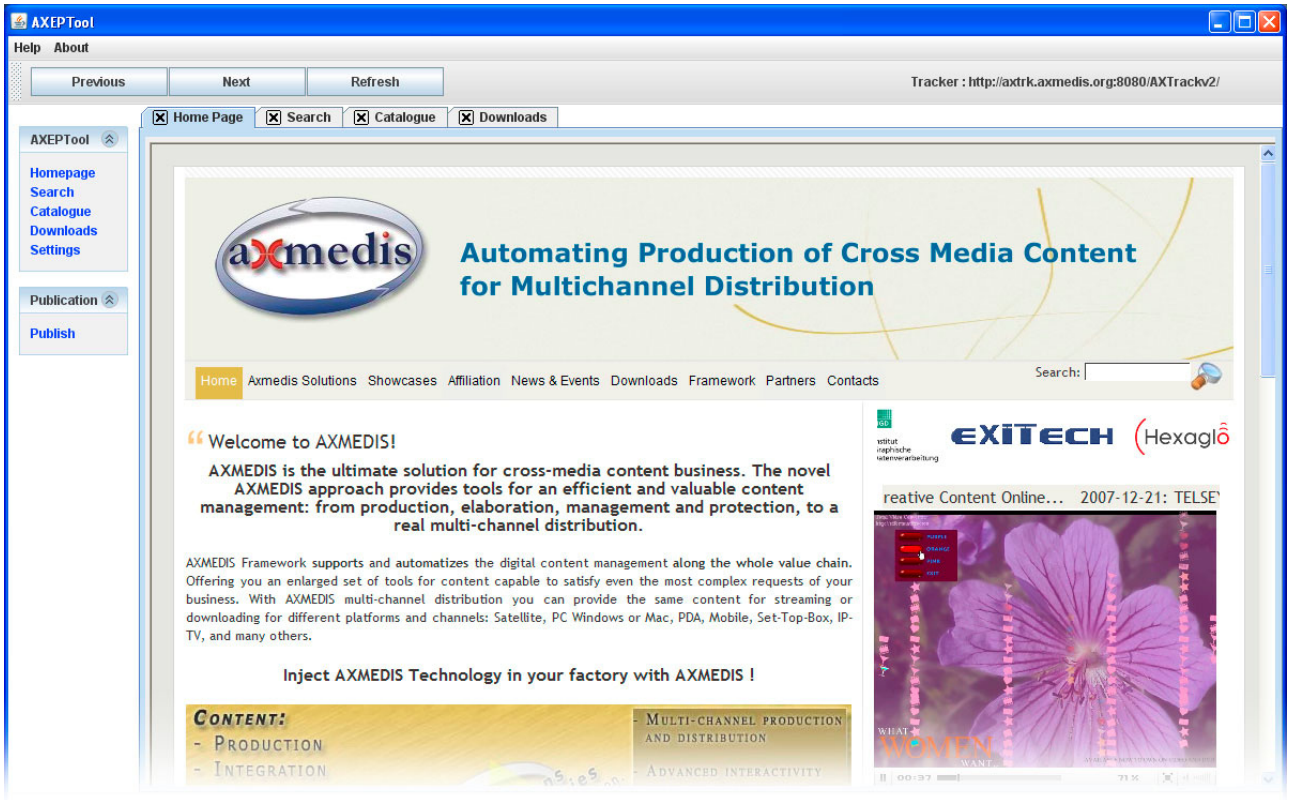
1.8 DISTRIBUTION OF THE AMEDIS OBJECT

When all the previously discussed operations have been performed, the object can be freely distributed in a secure manner. You can decide to distribute the AXMEDIS object in any distribution channel you prefer. For example the

object can be distributed in the AXMEDIS P2P network by using the **AXEPTool** available for free download in the following link: http://www.axmedis.org/documenti/view_documenti.php?doc_id=3840. Once downloaded you can get the AXMEDIS P2P user manual from the main start menu All Programs of windows.

You can visit the AXMEDIS showcases area in the AXMEDIS portal to see real example regarding the use of the AXMEDIS technology for different channels of distribution. In this section we will show you only how to distribute the protected object in P2P network by using the AXEPTool. Please, download and install the tool before go ahead.

When the tool has been installed and opened, you will find the following user interface.



To publish a new object you has to click on the “Publish” button on the left column.

After clicking on the « Publish » button of the publication menu, the application will open a file chooser dialog box. Just select the file you want to publish from your local hard disk and click on Open when you are done.

The application will then open a popup window while the publication is in progress. At the end of the publication:

- The file will be published on the tracker server;
- The torrent file will be created on your local hard drive in the directory specified in your configuration.

Please, refer to the AXEPTool User Manual for additional information regarding the use and the features available in the AXMEDIS P2P tool.

To this end, failures of this procedure may be due mainly to:

- Lack of connection;
- Your firewall blocks the AXEPTool, please unlock when it is executed for the first time. The same for the Java since the AXEPTool is based on Java;

- Problems on the network.

1.9 LICENSING THE OBJECT

To authorize a user to open the AXMEDIS protected object you create, you have to follow the following steps:

- identify the User ID, called AXUID, AXMEDIS user ID;
- license your protected object to him to perform some action, the called right to be granted.

These steps are described in details in this section.

Please note that all the following operations can be performed automatically by using the AXMEDIS Content Processing solution, AXCP mentioned before.

1.9.1 IDENTIFY THE USER TO BE LICENSED

As described in previous Section 1.1, each AXMEDIS user after his registration is identified by a unique AXUID. This AXUID is automatically sent to the user by email after the registration in the Registration Portal, see above for the registration.

If a user asks you to be authorised to open a protected AXMEDIS object produced by you, you have to create a license for him and decide which operations he can do and the eventual conditions associated to those operations. For example to play once, to play as many time you like at 1 Euro of cost, to play for ever, to play only in October 2008, etc.

To start the production of the license, You have to know the AXUID of the users you like to license. For the purpose of this tour you can create a number of fake users and take their AXUID from email they received with their registrations. The AXUID is a long string like the following:

AXUID URN:AXMEDIS:00005:BUS:AB123CD4-5678-9012-E345-F67G8901234H.

Please note that the previous AXUID is not a valid ID but is only an example. Please note that your user have to have certified their tools in order to use the protected and licensed content on their AXMEDIS players.

1.9.2 DECIDE THE LICENSE YOU PREFER TO PRODUCE

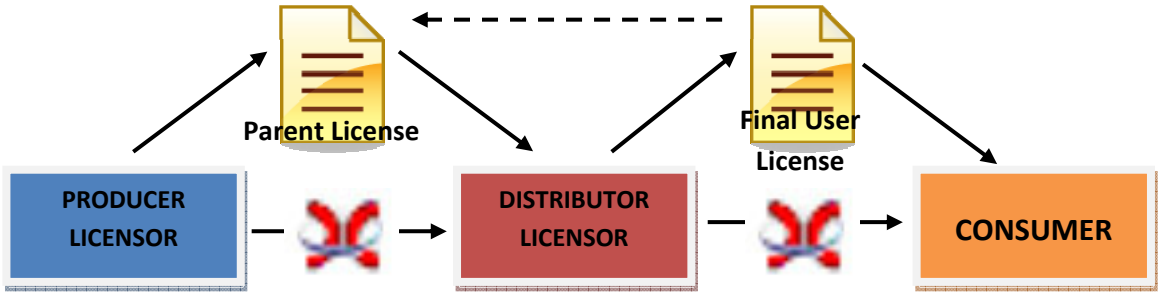
To define the rights to be licensed, it is necessary to open the AXMEDIS License Editor by pressing the **Create Licenses** button in the **Activity** toolbar on the right. The AXMEDIS License Editor is part of the AXMEDIS Editor, so that you have to open the AXMEDIS Editor.

A new window will be opened allowing to define the rights according to the MPEG-21 REL standard. For additional information regarding the use of the License Editor, please see the AXMEDIS Tools User Manual. By using the License Editor you can produce two kinds of licenses.

- the license for a final user; a license to authorize an user to perform some actions on a given AXMEDIS object;
- the license for a distributor; a license to authorize a distributor to produce licenses of the first kind to final users;

To better understand this process it is necessary to know some basics of the MPEG-21 REL syntax, that is the standard used in AXMEDIS for digital rights management.

In AXMEDIS, the Producer LICENSOR can issue a license to a Distributor LICENSOR, and thus the Distributor LICENSOR is able to issue licenses to final users. This process is depicted in the following figure.

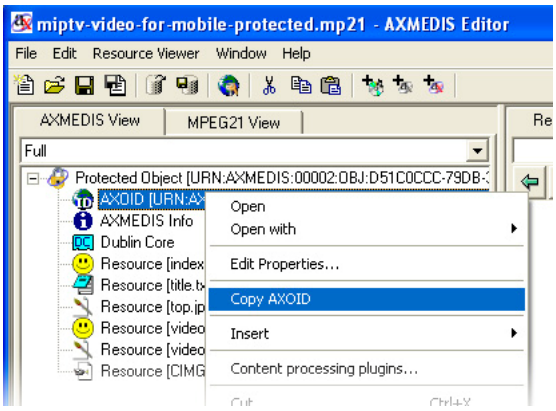


In this manner, it is created a chain of licenses where the license for the final user is issued by the Distributor LICENSOR, according to the parent license defined by the producer. The rights expressed in the final user license have to be the same defined in the Parent License. To produce the Parent License it is not necessary to know the AXUIDs of all the users, but only to know the ID of the Distributor (AXDID). It is only the Distributor LICENSOR that has to known the AXUIDs of his users to issue the final licenses to them. What is important is that the Final User license depends on the Parent License you defined and the Distributor LICENSOR is not allowed to issue licenses with different rights with respect to what you defined in the Parent License. This is the so called B2B DRM of AXMEDIS DRM.

To produce a simple license for a CONSUMER, here in the following it will be shown an example where you are going to create a license inserting as Distributor LICENSOR yourself. After this, you will be able to create a license for a CONSUMER. It a simplified model.

In order to proceed in this direction you have to follow the next steps in order to produce the Parent License for your yourself. The license that you are going to produce will enable yourself to produce licenses for the final user to play 5 times an AXMEDIS object identified by its AXOID. So that in order to perform the following steps you need to have:

- The AXOID of a registered protected AXMEDIS Object coming from section 1.7. In order to get the AXOID without rewriting it manually you can load the AXMEDIS object having that AXOID and, by right click on the AXOID item in the hierarchical view, select the **Copy AXOID** item in the contextual menu (see next figure);



- Your AXUID as received by email during registration.

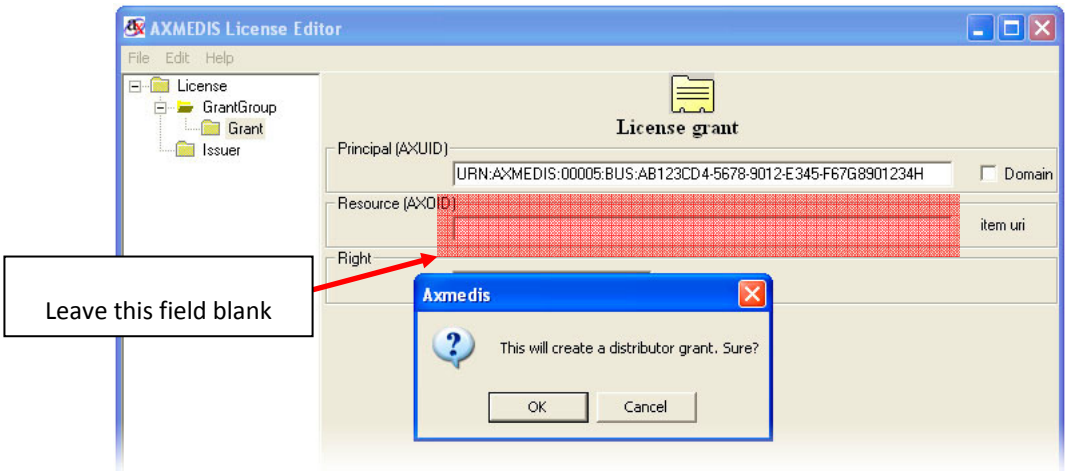
Thus you can proceed in creating the Parent License for your yourself:

- open the protected and registered object to be licensed, that one that it has been saved at section 1.7;

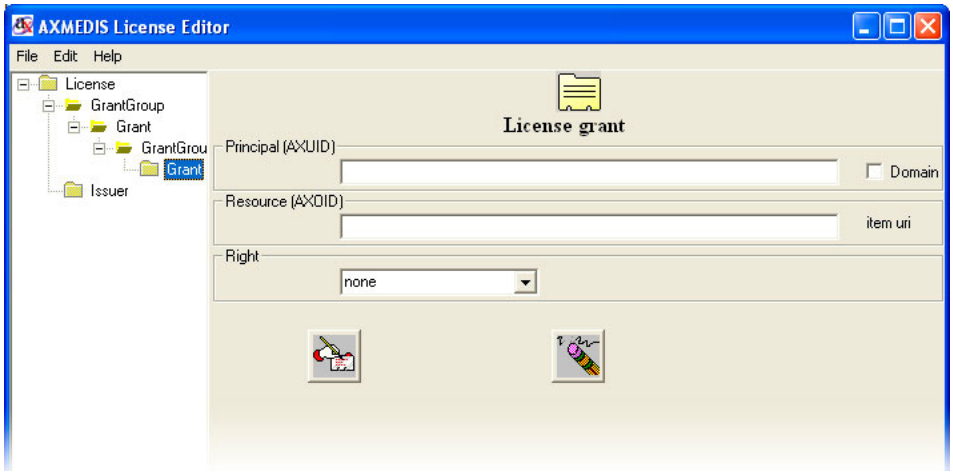
- open the AXMEDIS Editor and it internal License Editor by clicking the **Create Licenses** button in the Activity toolbar on the right;
- In the AXMEDIS Editor/License Editor select the **Menu File/New**. A new license will be created and you will see some new folder in a hierarchical view of the License Editor (see next figure);

- select the *GrantGroup* folder in the hierarchical view and press the **Creates Grant** button;

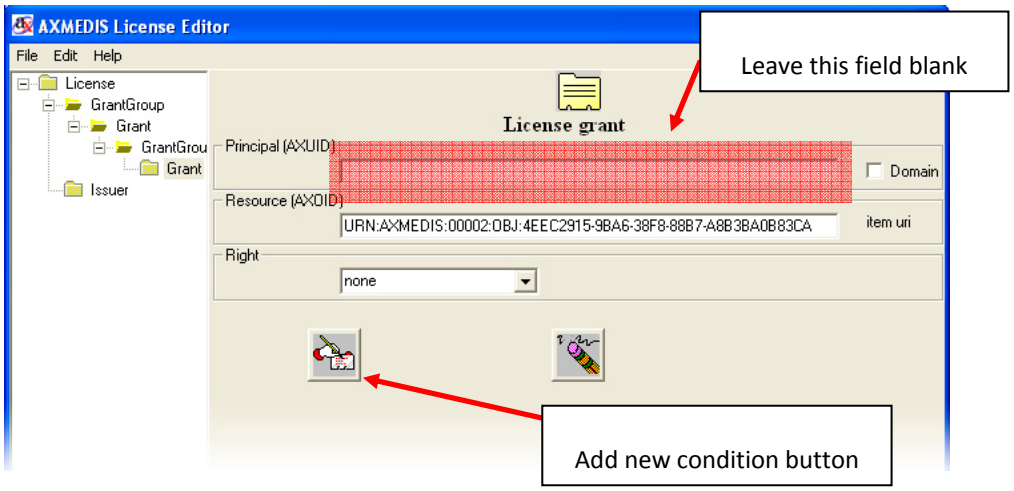
- a new folder named *Grant* will be shown in the hierarchical view below the *GrantGroup* folder. By selecting the *Grant* folder, a new *License Grant* form will be shown on the right with the fields to be filled in to define the license;
- copy in the *Principal* field the your AXMEDIS User ID (AXUID); The principal is the recipient of the grant you are providing licensing the final user or the distributor;
- leave the Resource field blank, in this case;
- select the *Right* **r:issue**. A confirmation will be shown asking if you are sure, that you want to create a License for a Distributor. Click OK to confirm;



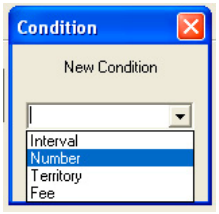
- a new folder called *GrantGroup* will appear below the *Grant* folder in the hierarchical view. Select this *GrantGroup* folder and click the **Creates Grant** button on the right part of the License Editor window. You will see that the hierarchical view is like the following figure;



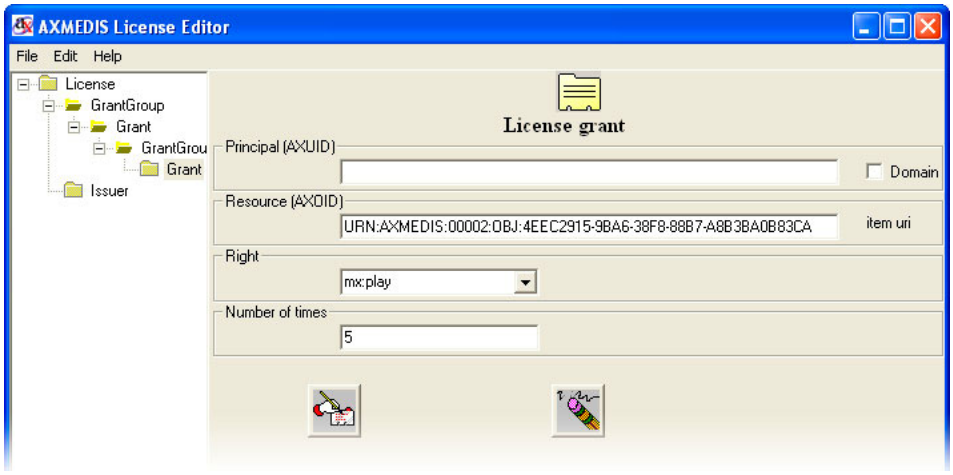
- leave the Principal field blank and copy the AXOID in the Resource field. The AXOID has to be one corresponding to a protected and registered AXMEDIS object;



- Press the button on the left to **Add new condition**. A new window will be opened to select the condition associated to the right. Please select Number in this case and press OK to confirm;



- Write a number to define the Number of times that the AXMEDIS Object identified by the AXOID can be played (5 times in this case);



- Click on the menu File and select Save to server to store the license on the AXMEDIS DRM server. On this basis, if all will go successfully, you will receive a final message confirming the storage of the license with the License ID, which is a unique number associated to the license;

To this end, failures of this procedure may be due mainly to:

- Lack of connection;
- Your firewall blocks the AXMEDIS Editor;
- Problems on the network.

1.9.3 ISSUE THE LICENSE FOR A FINAL USER

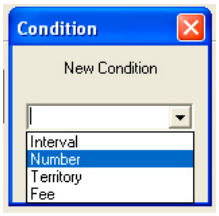
Now you are a Distributor LICENSOR and thus in the conditions to produce licenses for final users. This process is similar to what has been described before.

To produce the license for a final user you have to follow the following steps, and in addition you have to be prepared to provide the AXUID of your users:

- open the AXMEDIS Editor/License Editor by clicking the **Create Licenses** button in the Activity toolbar on the right;
- In the AXMEDIS Editor/License Editor select the **Menu File/New**. A new license will be created and you will see some new folders in a hierarchical view of the License Editor (see next figure);

- select the *GrantGroup* folder in the hierarchical view and press the **Creates Grant** button;

- a new folder named *Grant* will be shown in the hierarchical view below the *GrantGroup* folder. By selecting the *Grant* folder, a new *License Grant* form will be shown on the right with the fields to be filled in to define the license;
- copy in the Principal field the AXUID of the user you want to authorize;
- copy in the Resource field the AXOID of the AXMEDIS Object to be licensed;
- save the license on the AXMEDIS DRM server as above;
- Press the button on the left to **Add new condition**. A new window will be opened to select the condition associated to the right. Select Number in this case and press OK to confirm;



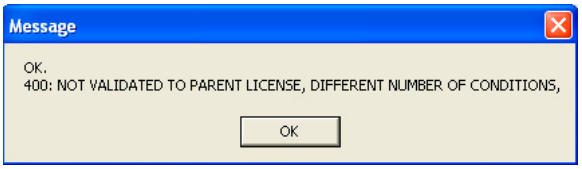
- In the **Number of times** field, write the number 5 in this case, as defined in the Parent License before.

Please note that as Distributor LICENSOR you are authorized to issue licenses that are identical in terms of rights and conditions to the Parent Licenses received from the Producer LICENSOR.

Now, each time that the registered user identified by AXUID will try to play the AXMEDIS object will be able to play it only 5 times. After the consumption of those 5 plays the AXMEDIS object will not be anymore playable by him.

Please note that you can create a license and specify your AXUID as Distributor but you cannot create a license where you specify your AXUID as Final User. This is due to the fact that in this case your new license would be in conflict with the license automatically created at the step showed in section 1.6.

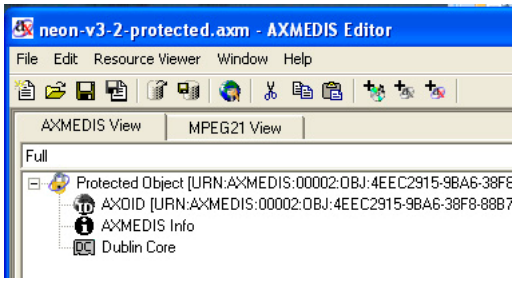
If you create a license in conflict with a parent license yet stored in the AXMEDIS DRM and associated to the same object (AXOID), you will receive an error message like one of the following.



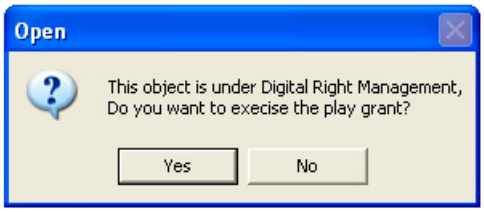
1.10 OPEN A PROTECTED OBJECT

Please take note of the following considerations regarding the use of an AXMEDIS protected object.

When you load a protected object, you will not see any resource in the hierarchical view (as showed in the next figure) since to access to all resources you has to be authorised, as illustrated in Section 1.6.



If you are authorised to access to the resources in the protected object, double click the Protected Object line in the hierarchical view. You will see the following message.



By clicking yes, after some seconds, if you are authorised you will be able to access to all the resources in the object

If you are not authorised and you try to open a protected object, you will receive the following error message.

In the previous image you can see that is showed also the message “No licensing URL defined”. Please see Section 1.6.1 for additional information regarding this.

If a not certified tool tries to open a protected object, the following message will be shown.

To avoid this error certify the tool as described in Section 1.1 and 1.2.

1.11 HOW TO GET INFORMATION ABOUT USER'S CONSUPTION

By using the AXMEDIS technology it is possible to take trace of all operations performed by users on protected objects. In this manner you will be able to collect information about consumption of rights for accounting, billing and/or for statistical analysis.

On the basis of the rights consumption specified into the licenses all the actions performed by the users (Action Log) are stored on the AXCS server. This information can be requested in an automated manner by the AXMEDIS tool CAMART, that can be installed on a remote server, or on the Portal BackOffice. All the information stored by CAMART can be exported through XML into various formats by using AXMEDIS tool AII. A conversion profile can be defined according to the needs of the administrative database. The obtained can be used in producing monthly reports (or reports with different periodicity), or maybe for statistical purposes: for instance to understand the commercial data of a certain songs in a given region or period.

For additional information regarding this part, download the following technical note:

- Technical Note on AXMEDIS DRM, MPEG-21 DRM, Interoperable DRM: http://www.axmedis.org/documenti/view_documenti.php?doc_id=3616
- Technical Note EN on How to integrate the AXMEDIS DRM into an e-commerce portal and content distribution solution for content on demand and subscription : http://www.axmedis.org/documenti/view_documenti.php?doc_id=3736

1.12 CONTACTS

If you have questions don't hesitate to contact our technical staff. We at your disposal to clarify any problem you may encounter in the use of the AXMEDIS tools.

Prof. Paolo Nesi
Office: +39-055-4796523
LAB: +39-055-4796425
FAX: +39-055-4796469 or 363
email: nesi@dsi.unifi.it

1.13 ACRONYMS

By working with the AXMEDIS tools you will encounter many different acronyms. The following tables will help you to be confident with the most used of them.

LIST OF AXMEDIS ACRONYMS FOR IDENTIFICATIONS

AXCID	Unique AXMEDIS Object Creator ID, can be creators: publishers, producers, authors, integrators, etc. All who can produce a new AXMEDIS object. A Creator is the only one entitled to ask for an Object ID
AXDID	Unique AXMEDIS Object Distributor ID
AXID	In AXCS can be an B2BUserID such as AXDID or AXCID or a AXUID, this could be called AXGUID
AXLID	Unique AXMEDIS License ID

AXOID	Unique AXMEDIS Object ID
AXRID	AXMEDIS Rule ID

LIST OF AXMEDIS ACRONYMS FOR TOOLS

AXCP	AXMEDIS Content Processing (composition, adaptation, fingerprint, formatting, protection, publication, etc.)
AXCP	AXMEDIS Content Processing (Editor, scheduler, engine etc.)
AXCS	AXMEDIS Certifier and Supervisor
AXDB	AXMEDIS database
AXEPTool	AMEDIS P2P tool for content distribution and sharing at level B2B, among companies with AXMEDIS tools for content production, processing or distribution
AXFW	AXMEDIS Framework
AXInfo	visible information into AXMEDIS objects, replicated into the protected part. In the AXInfo is included the identification, the metadata, workflow, history, fingerprint, etc.
AXMEDIA	AXMEDIS Client Peer in the P2P network of AXMEDIS Clients on PC, see TISCALI distribution, see distribution toward PC on Internet
AXMEDIS DB	AXDB
AXMEDIS Factory	a company that has the possibility of creating AXMEDIS objects. An AXMEDIS factory typically has AXMEDIS database, AXCP tools, and a connection via AXEPTool to other AXMEDIS Factories
AXOM	AXMEDIS Object Manager
AXQS	AXMEDIS Query Support
CAMART	AXMEDIS Core Accounting Manager and Reporting Tool
P&P	Programme and Publication tool, AXMEDIS P&P
PAR	Potential Available Rights, expresses in Mpeg-21
PMS	AXMEDIS Protection Manager Support, it can be Client, Home and Server

LIST OF MPEG21 ACRONYMS AND TERMINOLOGY

REL	Rights Expression Language

1.14 REFERENCES AND LINKS

AXMEDIS TUTORIALS

- General Tutorial and Overview (November 2007, Barcelona, Spain)

- PPT: http://www.axmedis.org/documenti/view_documenti.php?doc_id=3653
- Video on part 1
- Video on part 2
- Video on part 3
- Video on part 4
- Video on part 5
- Video on part 6

- Content Production Tutorial (AXMEDIS 2007 Conference) http://www.axmedis.org/documenti/view_documenti.php?doc_id=3869
- Content Distribution Tutorial (AXMEDIS 2006 Conference) http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=2666
- Content Processing Tutorial (AXMEDIS 2006 Conference) http://www.axmedis.org/documenti/view_documenti.php?doc_id=3868
- Workflow Tutorial (AXMEDIS 2006 Conference) http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=2652
- AXMEDIS general overview and content production tutorial, March 2008

AXMEDIS TOOLS FOR FREE DOWNLOAD

- General download page: http://www.axmedis.org/documenti/documenti.php
- AXMEDIS content production tools include: http://www.axmedis.org/documenti/view_documenti.php?doc_id=3722
  Free Download of AXMEDIS Content Production Tools (editor and GRID AXCP tools, PnP, DRM editor, etc.), all what you need to create AXMEDIS objects and process any kind of content automatically: SMIL, HTML, MPEG-21, content adptation,, fingerprint, crawling, indexing, cms, search, retrieval, control of P2P, etc. and much more. See documentation included
- AXMEDIS players for PC: http://www.axmedis.org/documenti/view_documenti.php?doc_id=3715
  AXMEDIS PC player version 1.2 January 2008. Free download, AXMEDIS player, MPEG-21 player, cross media player, SMIL, HTML, MPEG-4 ,etc
- AXMEDIS multiskin player for PC: http://www.axmedis.org/documenti/view_documenti.php?doc_id=3716
  AXMEDIS MultiSkin PC player version 1.2 january 2008. Free download, AXMEDIS player, MPEG-21 player, cross media player, SMIL, HTML, MPEG-4, with different skins available.
- AXMEDIS Active X Player for PC for Web Pages, AXMEDIS .Net Player, MPEG-21 player, SMIL, HTML, MPEG-4, cross media, more than 200 file formats: http://www.axmedis.org/documenti/view_documenti.php?doc_id=3717
- AXMEDIS player plus EUTELSAT OPENSKY client integrated http://www.axmedis.org/documenti/view_documenti.php?doc_id=3767
- AXEPTools: P2P client tool for establishing connection with the AXMEDIS P2P B2B network as Business User: http://www.axmedis.org/documenti/view_documenti.php?doc_id=3840
- AXMEDIA: P2P client tool for establishing connection with the AXMEDIS P2P B2B network as final users: http://www.axmedis.org/documenti/view_documenti.php?doc_id=3841
- AXMEDIS PDA player for Windows Mobiles 5 and 6: http://www.axmedis.org/documenti/view_documenti.php?doc_id=3842
  It is capable to play AXMEDIS objects based on SMIL, HTML, video, audio, MPEG-4 files, etc. AXMEDIS PDA player for AXMEDIS MPEG-21 content including resources with presentations layer based on MPEG-4, HTML and SMIL Unzip the file, copy the CAB file and execute it on the PDA
- Collection of Objects for AXMEDIS player for PDA (Jan 2008): http://www.axmedis.org/documenti/view_documenti.php?doc_id=3748

AXMEDIS TECHNICAL NOTES

- AXMEDIS Content Model and Tools, Authoring Tools, Players for MPEG-21, PC, PDA, Mobile, STB, PVR, HDR, etc. (in English)
- AXMEDIS Content Model and Tools, Authoring Tools, Players for MPEG-21, PC, PDA, Mobile, STB, PVR, HDR, etc. (in Italian)

- AXMEDIS Content Processing GRID all features listed (in English)
- AXMEDIS Content Processing GRID Tutte le caratteristiche descritte (in Italian)
- AXMEDIS P2P Controlled network all features listed with cases (in English)
- AXMEDIS P2P Controlled network tutte le caratteristiche, con alcune casistiche (in Italian)
- AXMEDIS DRM, MPEG-21 DRM, Interoperable DRM (in English)
- AXMEDIS DRM, MPEG-21 DRM, DRM interoperabile (in Italian)
- Technical note on how to integrate the AXMEDIS DRM into an e-commerce portal and content distribution solution for content on demand and subscription
- Come integrare AXMEDIS DRM in un portale per la distribuzione di contenuti digitali (in Italian)
- AXMEDIS Show Case, AXMEDIS Mpeg-21 Content distribution via datellite dta broadcast, EUTELSAT OPENSKY
- Technical note on the ELION AXMEDIS content on demand trial and solution, how to exploit AXMEDIS framework to create an cross media content distribution with DRM and automated production, and connection with P2P
- Technical note on the TEO IPTV AXMEDIS trial and solution, how to exploit AXMEDIS framework to create an IPTV with DRM and automated production, and connection with P2P.

AXMEDIS SOLUTIONS

- Content Management Automation, AXCP: http://www.axmedis.org/com/index.php?option=com_content&task=view&id=94&Itemid=33
- AXMEDIS controlled P2P: http://www.axmedis.org/com/index.php?option=com_content&task=view&id=97&Itemid=34
- AXMEDIS production tools and players: http://www.axmedis.org/com/index.php?option=com_content&task=view&id=101&Itemid=35
- AXMEDIS DRM, MPEG-21 DRM: http://www.axmedis.org/com/index.php?option=com_content&task=view&id=99&Itemid=36
- FAQs: http://www.axmedis.org/com/index.php?option=com_content&task=blogcategory&id=7&Itemid=73

AXMEDIS SHOWCASES

- Content Distribution to Licensed Domains via DVB-T and P2P (BBC)
- Protected Video on Demand Distribution via P2P toward PC (Tiscali)
- Protected Video on Demand (VOD) Distribution to PC (ELION)
- Content Distribution via Satellite Data Broadcast (DVB-S) to PC and STB (EUTELSAT)
- Content Distribution to Kiosks (ILABS)
- Video on Demand (VOD) Distribution to Set Top Box (TEO)
- Content Posting Tool, for Final User content production/publication/DRM (SIAE)
- Variazioni: Enrichment of Cultural Content
- AXMEDIS Content and Tools: Automatic Production
- AXMEDIS Controlled P2P Network

AXMEDIS FRAMEWORK SPECIFICATION

- AXMEDIS Framework General aspects, Editor and Model http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=1891
- AXMEDIS Command Manager http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=2686
- AXMEDIS Object Manager and Protection Processor: http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=1972
- AXMEDIS Editor and Viewers: http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=2213
- AXMEDIS External Editors, Viewers and Players: http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=2211
- AXMEDIS Content Processing Area: http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=1958
- AXMEDIS External Processing Algorithms: http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=2017
- AXMEDIS CMS Crawling capabilities: http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=1907
- AXMEDIS Database and query support: http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=1932

- AXMEDIS AXEPTool and AXMedia Tools: http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=2718
- AXMEDIS Programme and Publication Tools: http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=1885
- AXMEDIS Workflow Tools: http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=1883
- AXMEDIS Certifier and Supervisor and networks of AXCS http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=1952
- AXMEDIS Protection Support http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=1882
- AXMEDIS Accounting and Reporting : http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=1887
- Definitions Terms tables links http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=1388

AXMEDIS REPORTS ON BASIC ENABLING TECHNOLOGIES

- Content Model and Managing, MPEG-21, authoring, etc. http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=2324
- Content indexing and querying: http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=2436
- Content processing, Composition and Formatting http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=2374
- Content sharing and Production on P2P: http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=2454
- Content Protection and Supervision http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=2371
- Content Distribution via Internet http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=2451
- Content Distribution via Mobile http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=2442
- Content Distribution via Satellite data broadcast http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=2313
- Usability issues http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=2339
- AXMEDIS vs DMP MPEG21 Analysis http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=1063
- AXMEDIS Framework Infrastructure, guidelines and some tools http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=1391
- AXMEDIS Framework Validation and integration http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=2445

BASIC KNOWLEDGE REPORTS

- User requirements http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=1712
- Use Cases http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=1824
- Test Case http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=2023

CONTENT MODELING AND TEST CASES

- Content Aspect Specification http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=1389
- Content Aspect Specification Appendix http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=1670
- Content for Test Cases and Validation http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=1393
- Content Selection Guidelines http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=1390
- Multilingual Guidelines and Technical Solutions http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=1427
- AXMEDIS Editorial Format Guidelines and basic examples http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=1394

AXMEDIS FRAMEWORK DEMONSTRATORS, CASES, TRIALS, FOR DISTRIBUTION ETC.

- requirements and use cases of AXMEDIS ELTEO of the content distribution for DVB-T to STB of Telecom Lithuania, and content distribution of Telecom Estonia http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=2978
- requirements and use cases of the 4HOME take up, demonstrators of BBC, TI, SDAE, including domains, AXMEDIS for broadcasting, and OMA integration and distribution http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=2976
- Specification final version of Take up AXMEDIS ELTEO for Video on demand, STB, IPTV solutions based on AXMEDIS technology: http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=3096
- Integrated CMS integration aspects: http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=2853
- Integrated prototype: automated content production and formatting: http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=2939
- Integrated Distribution on demand via Internet http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=2951
- Integrated distribution via satellite data broadcast: http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=2954
- Integrated distribution towards mobiles: http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=2945
- Integrated Distribution towards PDA via Kiosks: http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=2944
- Content Posting Portal, Content Posting for Final User publication, SIAE Trial presentation:
  - http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=2922
  - http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=2923
- VARIAZIONI project portal: http://www.variazioniproject.org/

BROCHURES AND PRESS CUTTING (A PART)

- AXMEDIS Project Brochure (v. March 2008) http://www.axmedis.org/documenti/view_documenti.php?doc_id=3871
- Annual Public Report (2007): http://www.axmedis.org/documenti/view_documenti.php?doc_id=3621
- Annual Public Report (2006) http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=2471
- Annual Public Report (2005) http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=1439
- AXMEDIS Project Synopsis http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=1668
- Digital Media in Italy presentation http://www.AXMEDIS.org/documenti/view_documenti.php?doc_id=1669