

# MAR4 Suite PRO



**Automation System for Radio Broadcasting  
The Third Generation**

## **Functional Description for Engineers**

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**APLICACIONES ELECTRONICAS QUASAR S.A.**

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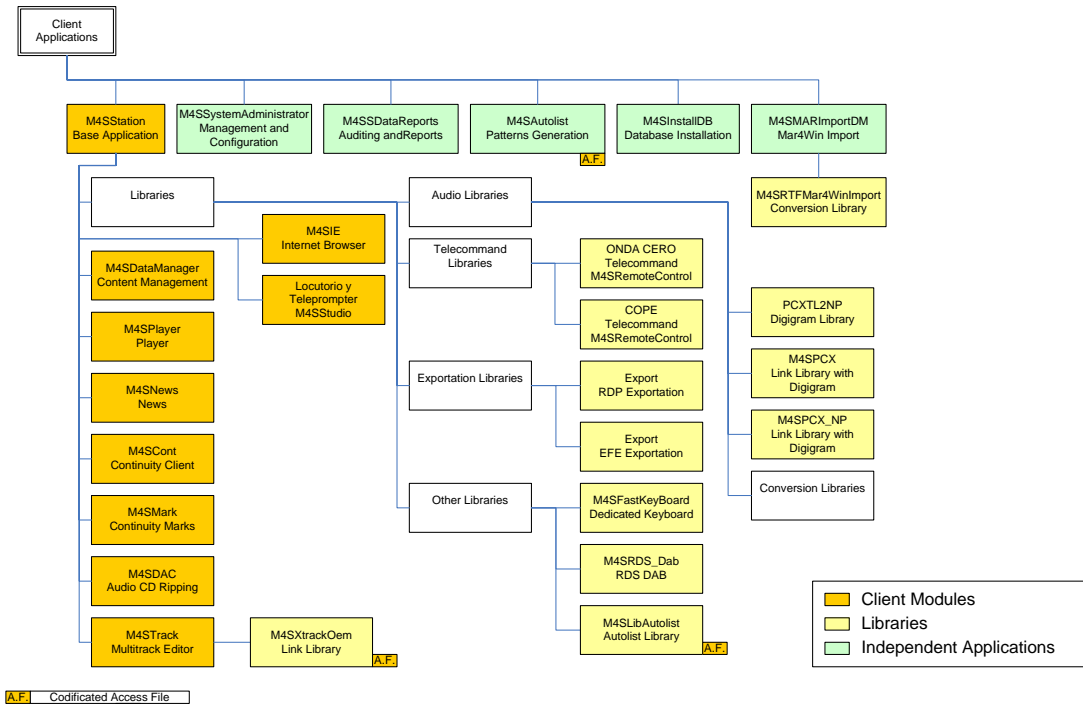
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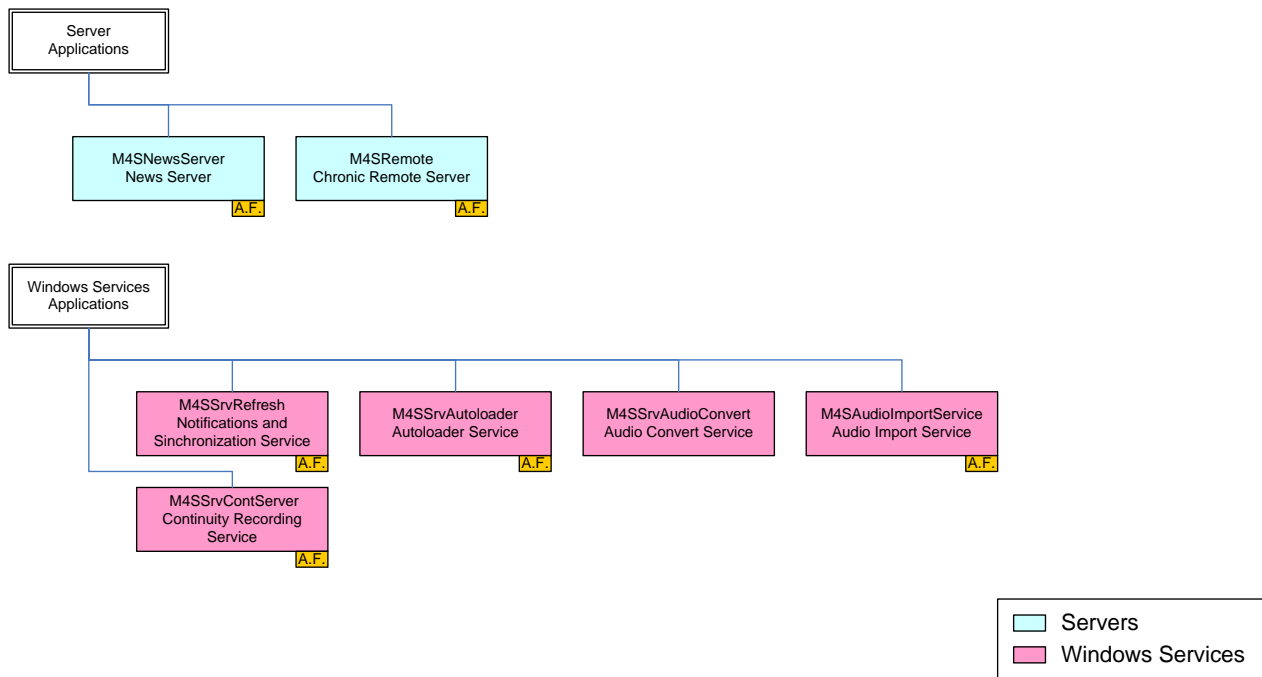
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# 1. - Modules, Applications and Components that comprise it

## 1.1. - Mar4Suite Pro Modules and Applications



### Mar4Suite Pro Client Applications



### Mar4Suite Pro Services and Servers

### 1.1.1. - M4SStation Base Application

The M4SStation base application plays a major role in a Mar4Suite Pro system. It is installed in the clients and provides a work space for the system client modules (Content Management, Broadcasting, News, Continuity, etc.) to which it furnishes the information contained in the local system database.

It further enables the local configuration of each workstation to be managed, thus permitting the adjustment of the various parameters of each of the modules that are executed on the base station.

It is also responsible for interacting with the local system database, where a copy of the configuration of the main system database is stored. This interaction occurs automatically and is transparent to the user. It enables the local copy of the system configuration to be kept synchronized with the main server configuration whenever the system configuration is modified. This process is executed in the background without interfering with the user's work.

Functionalities:

- Automatic background synchronization of the local system
- Detection of connection / disconnection of the main system, automatically shifting to and from isolated mode
- Configuration of the station data.

### 1.1.2. - Content Management

The Content Management module is the central core on which the entire digital production process is handled. On this module all the input, output, addition, modification, deletion, audio editing, preparation, organization and management operations are performed on all the digital content that is handled in a digital production system.

In Mar4Suite Pro, contents are organized through "*Information Managers*". An information manager is an organizing unit that groups certain contents (objects) together on certain devices (network resources, FTP, extractable devices, etc).

*The various types of Information Managers that can be used in Mar4Suite Pro are:*

- Structured manager
- Reference manager
- Autoloader manager
- Remote manager
- Own Manager
- On-the-fly manager

- Bookmark manager
- Search manager
- Mar4Win manager.

Each one of them has a specific functionality, which ensures a great deal of flexibility when organizing and distributing the system contents.

All of the information is accessed through a simple but complete interface, with mechanisms for handling easily accessed information (element drag and drop, one-click arranging, contextual menus) and equipped with the tools necessary for digital radio production: data edition, text and audio editors, audio recording, audio cut extraction, searches, content importation and exportation "from" and "to" other audio formats and qualities.

All these features are controlled through the assignment of permissions that determine the types of tasks and privileges that will be available to each system user.

Among the main functionalities of the Content Management module, the following stand out:

- Real-time data updating
- Support and maintenance (create, modify and delete) of types of audio, text, list and reference list objects
- Unlimited number of managers
- Unlimited number of folders per manager
- Progressive search for objects directly over the data view
- Object view configuration The position and display of data columns can be established
- List for fast access to managers
- List for fast access to the folders in a manager
- Copy and Move elements using Drag and Drop operations
- Access to the mixing editor for configuring Fade-In, Fade-Out and Cross Fade when editing objects of the list type with a Fade modifier
- Object data sheet printing
- Object cueing
- Capability enabling users to define their own (local) managers
- Capability for defining managers on the fly
- Controlled object deletion
- Arrangement of data views by any column
- Automatic activation / deactivation of managers, either by loss of connection or administrative disconnection
- Capability for simultaneously extracting multiple fragments from an audio object
- Configuration of managers with multiple templates
- Option of blocking the transmission of an object

- Exportation to other audio formats
- Direct importation from other audio formats
- Searches in all the managers in the system
- Advanced audio editing. Non-destructive editing. Capability for recovering original audio after it has undergone editing several times
- Rich text format (RTF) text editor for objects of the text type  
Capability for configuring an external text editor.

### **1.1.3. - Broadcasting**

The Broadcasting module is responsible for playing back the contents that are supplied to it from the Content Management module.

The main element of this module is the broadcast player. It is on the player that objects (audio, texts, and lists) to be played are organized and with which the operator can interact, inserting controls and modifiers and controlling the playback by using control buttons, if the player is in normal mode (list), or by acting directly on the objects if it is in cartridge mode.

As many as four broadcast players can be configured. These players, in turn, can be directed toward a single audio play board, or each player can be configured to an audio board. This configuration enables users to have available up to four different audios added together on one board, or to have each broadcast list played by a different board (four programs).

Element loading is easily accomplished through Drag and Drop operations from the Content Management module to the broadcast player or players.

Apart from the playback functions, the broadcast player has two recording functions: normal and immediate.

- Normal recording: in the normal recording mode, the user must previously fill out the data sheet that is displayed when the REC button is pressed by keying in the data concerning the audio that he or she is about to record. Once the minimum data have been entered, the user must press the "Record only" button to return to the player that is going to perform the recording, and press the Play button to start the recording.
- Immediate recording: in this mode, the user need only press the Fast Record button followed by the PLAY button to start recording the signal being received in the board associated with the player. When the recording is finished, a temporary file will be generated which can be discarded after use or incorporated into the Content Management module by using the options menu.

The broadcast player offers the option of being remotely monitored through the Studio and Teleprompter module, which is described below.

It also has a mechanism used to operate the player in case the network connection is lost, called "Secure Mode". When this mode is activated, it makes local copies of the audio loaded in the player in a way that is transparent to the user, and without interrupting the operations that it may be executing. Thus, if the connection with the server where the audio is stored fails, the broadcast will be able to continue, albeit by playing the audio material located in the local player.

Functionalities:

- Up to four simultaneous broadcast players per workstation
- Secure mode to guarantee the playback of the contents
- Option of storing the player content in list form
- Real-time updating of the player elements; for example, if the title or the interpreter of the object is modified
- Player operation auditing. Apart from the auditing of the broadcast itself, the pressing of the player buttons can be audited.
- Continuous editing of controls and modifiers
- Assignment of modifiers to selection of objects on the list
- Improved Fade editor
- Editing by visual depiction of the waves of each audio object
- Capability for visually adjusting the values of Fade-IN, Fade-OUT, Cross-Fade, Intro time and positioning
- Capacity for as many as two Talk-Over's
- Direct recording of Talk-Over's in the editor, with generation of temporary files
- Mix cueing
- Continuous editing on all the objects loaded in the player that are associated with the Fade modifier
- Automatic elimination of blanks (on left and right) in Talk-Over recording
- Adjustment of the decrement of the levels of the audios over which the Talk-Over object is to be played
- Operation in Autoloader mode The player is associated with an Autoloader manager in such a way that all the objects deposited in that manager are automatically loaded in the player
- Playback of the objects in the player from the control console by means of Fader-Start

#### 1.1.4. - News

The News module enables its users to receive and read teletypes coming from news agencies, and to classify them automatically according to diverse user-defined criteria.

It also enables the contents of teletypes to be included in text objects in the Content Manager module.

This module is composed of two elements: the news server and the client. The server connects itself to the news supply equipment provided by the news agencies (teletype receivers via serial port, Internet downloads, etc.) and includes them in an SQL Server database, where they are processed and organized so that they can subsequently be consulted from the news client module. This module has an interface on which the news is shown as it comes in. Further, it enables its users to search for news based on diverse criteria, and to use the “*selections*” defined from the server.

##### Server Functionalities:

- Configuration of multiple news agencies for teletype reception
- Processing of the texts received according to the configuration of each agency, to be able to decode them and extract information included in the texts (headlines, key words, etc.) These files will be created by the communications system configured in each agency
- Storage of the teletype received in the MS SQL Server database, including whatever additional information may have been extracted
- Maintenance of the agencies and selections A selection consists of the automatic classification of a teletype based on criteria defined by the administrator
- Database maintenance, with deletion of old teletypes based on user-defined retention criteria
- Real-time notification of the news received.

##### Client Functionalities:

- Display of a list of existing news stories
- Preview of the text of the selected news item
- Automatic creation of news on the Content Management module, with generation of a new text object for each news item
- Printing of the news received
- Conduct of news searches indicating the text, date, agencies, priorities, categories and / or selections they belong to
- Monitoring of the status of the agencies configured in the server
- Configuration of the interface, modifying the source of the news list according to the type of priority of the news item. Here, an audible alarm

can be configured as well as the size of the columns and the source of the listing of search results.

### **1.1.5. - Audio Editing: Fragmenter, Intermediate Editor and Advanced Editor**

For audio editing, AEQ offers four possibilities. On one hand, we have an editor that is fully integrated into the application: the *Mar4Suite PROTrack* module for advanced audio creation and editing.

Audio objects can be exported to and imported from the Content Manager module; Fade values in audio data sheets can be modified. The latter function lets the user assign a progressive level increase at the beginning of an audio track and a decrease at the end to facilitate mixing consecutive audio objects in a program.

An outstanding characteristic of the editor is the ability to perform continuous, non-destructive editing on an audio object; even if it is edited repeatedly, the audio is neither degraded nor altered, and the original audio can be recovered.

Functionalities:

- From two to 32 inputs / outputs, depending on the boards installed
- Up to 16 tracks directed to an output (depending on the sound board installed)
- Mixing, stretching, tone change, noise gates, normalization, level adjustment and other functions
- Support for DirectX treatment plug-ins
- Visual configuration of Fade-In, Fade-Out intro time values
- Importation from and exportation to the Content Manager module

Because this application is included in the Corporate License that AEQ offers for all audio workstations, there is no need to acquire it after the system is supplied. The application is simply activated in the workstation where its use is required.

All our audio editors—from the simple to the intermediate to the advanced version—are based on the multitrack editor. In the simple version, the editing functionalities have been largely minimized, leaving the basic (but extremely complete) functions to be used by less skilled editors who need to work with uncomplicated editing functions.

The intermediate editor employs the same editing base, but with expanded functionality compared with the basic version and limitations with respect to the advanced multitrack version.

In addition to this integrated multitrack editing application, AEQ has signed integration agreements with other audio editor manufacturers.

### 1.1.6. - Continuity and Markers

The continuity module gives Mar4Suite Pro a series of key functions that are indispensable today in any digital radio production environment.

On one hand, it provides a tool for obtaining the "legal copy" that all radio stations must maintain of their broadcasts, and a capability for making recordings over other broadcasts, whether transmitted by the station itself or from other broadcasting sources.

On the other hand, it enables all recorded material to be handled in such a way that it can be extracted and included in the Content Management module of the digital production system.

To provide the functions described above, this module is structured as follows:

- A continuity recording server that simultaneously enables audio to be sent through the network to be played in the client module.
- A continuity client that enables the service to be configured, the audio streaming that is sent through the network by the server to be played and time "markers" to be placed in the audio for quick retrieval of content of interest to the user.
- A continuity audio extractor that identifies the audio to be extracted by means of time "markers" placed previously with the aid of the continuity client or placed "in situ".

Functionalities:

- Continuity server
  - Application designed as a Windows service
  - Recording in any audio quality configured in the system
  - Transmission through the network of the audio signals being recorded
  - Maximum recording time, starting from which the occupied disk space will be reused by the recordings that exceed this time
  - Scheduling of recording for special or unattended recordings
  - Detection of empty audio to optimize the recording space
  - Recording stops automatically when no audio level is detected (configurable), and is resumed when it is detected.
- Continuity client
  - Monitoring of audio transmitted through the network
  - Continuity server configuration
  - Scheduling in the recording agenda
  - Ability to start and stop the recording in each channel

- Maintenance (add, modify, delete) of time markers in continuous recording
- Continuity marker extractor
  - Maintenance (add, modify, delete) of time markers in continuous recording, to include those markers generated with the Continuity Client module
  - Manual creation (with specification of marker start and end date and time)
  - Visual creation of time markers
  - Cueing of the audio referenced by time markers
  - Display of the audio wave Visual adjustment of the length of the audio to be extracted
  - Exportation of markers to Content Management
  - Exportation of markers to disk.

### **1.1.7. - Audio CD Extraction (Ripper)**

The Audio CD extraction or Ripper module, allows its users to incorporate audio in Audio CD format and from music CD-ROMs in the most frequently used audio formats into the Mar4Suite Pro Content Management module.

The features of this module make it possible to store the Mar4Suite Pro system music collection, making it available to all its users.

Functionalities:

- Extraction of audio to system formats (MPEG-I, MPEG-II, PCM)
- Retrieval of Audio CD data from the Internet Consultation of CDDB data
- Level normalization when extraction is done
- Selection of the tracks to be extracted
- Cueing of the tracks to be extracted
- Cueing of the extracted tracks
- Exportation to the Content Management module
- Selection of files to be exported to the Content Management module
- Support for all the CD reading units installed in the equipment
- Editing / modification of the data regarding the tracks (title, artist, etc.)
- Configuration of the format to which the Audio CD extraction is to be converted.

### **1.1.8. - Internet Browser**

The Internet Browser module allows its users to integrate Internet surfing into the Mar4Suite Pro client application without using additional programs.

In this way, when Mar4Suite Pro is installed in closed environments governed by security policies that do not allow the use of other software than the Digital Production System, we can offer users the possibility of consulting data on the Internet.

The browser as such does not include security mechanisms to prevent files from being downloaded, access to websites offering doubtful content, etc. It is the system administrator's responsibility to properly configure and protect the network to avoid the entry of undesirable elements.

Since the Internet Browser module is supported by the Microsoft Internet Explorer engine, it is in that engine that the system administrator must configure the Web security and access to elements.

Functionalities:

- Browsing by means of the Internet Explorer engine installed in the equipment
- Multiple simultaneous websites by using tabs
- Direct creation of news in the Content Management module based on text selected on a website
- Access to and management of Internet Explorer bookmarks
- Website printing
- Search for text on the website
- Copying text to the Clipboard

### **1.1.9. - Studio and Teleprompter**

The Studio and Teleprompter module offers broadcast monitoring and control functions for the broadcasting announcers, providing them with a function for the assisted reading of any text objects loaded into the broadcast player, as well as a view of all the loaded elements that will let them know beforehand what objects are going to be transmitted.

It also enables announcers to incorporate other text objects into the teleprompter that are not loaded in the broadcast player, to call up preliminary displays of the text to be played and, in general, to control the reading of the texts.

Another characteristic of this module is the choice of manual or automatic operation when playing audio objects embedded in the text. In automatic mode, the audio objects embedded in the text being played on the teleprompter will be executed automatically in the broadcast player that is being monitored when the text playback cursor is placed on the embedded audio object.

Functionalities:

- Multiple studio workstations can be connected to the same broadcast workstation
- Real-time display of the contents of the broadcast player in the broadcasting workstation

- Assisted text display to ease reading
- Capability for automatic playback, from the studio, of the audio objects embedded in the text being displayed
- Possibility of loading new text objects into the teleprompter
- Preliminary display of the text object that is going to be played by the teleprompter
- Option of adjusting the teleprompter reading speed
- Capability for controlling the teleprompter display by advancing and retreating by lines and words, pausing and stopping the playing process and returning to the starting point.

#### **1.1.10. - Administration and Configuration**

The administration tool centralizes all the functions for configuring and supervising Mar4Suite Pro systems.

This tool is used to define the system managers, groups and users, system operating parameters, and even to configure other Mar4Suite Pro servers and services, such as: Autoloader Broadcasters, Conversion Services, importation services, FTP servers for remote managers, remote news report servers, etc.

There is no limit on the number of users and groups that can be created in the system.

Functionalities:

- Capability for administering multiple Mar4Suite Pro systems
- Record of all the servers in the system
- Maintenance of structured, reference, remote and autoloader managers
- Maintenance of content templates
- Maintenance of broadcast players
- Maintenance of broadcast templates
- Maintenance of groups and users, including the configuration of permissions and actions
- Configuration of additional services and servers
- Configuration of types of audio, system qualities, available controls, etc.

#### **1.1.11. - Auditing and Reports**

The Auditing and Reports module is used to consult, print and export data relative to the broadcasting system. This tool provides access to the information generated in the various audits (operation, broadcast and actions on broadcast players), as well as the information contained in the system managers.

Mar4Suite Pro enables three types of audits to be performed: operation audits, broadcast audits and audits of actions on players.

- Operation audit: allows the actions that are taken on the Content Manager module to be audited. These actions include: create, modify and delete objects; create, modify and delete folders; entry into and exit from the system, etc.
- Broadcast audit: enables the objects that have been broadcast, and those that have not, to be audited. Additionally, the controls and modifiers that have been executed in the player can be audited.
- Audit of actions taken on players: enables the pressing of player control buttons to be audited: loop, link, delete, fader-start, cartridge player, ignore, etc.

Functionalities:

- Interactive consultation of data by means of filters, auto filters and arrangement of the columns shown
- Customization of the query / report fields. The customized view is recovered when the application is executed again.
- Query exportation to Word, Excel, HTML, etc.
- On-line updating of audit data.

#### **1.1.12. - Schedule Generation**

Automatic Schedule Generation is an application designed for use by musical formula radio stations that need music programming to be generated for long periods of time according to a series of parameters, which can include: type of music, speed, nationality, etc.

Based on a music collection obtained from the Content Management module and from the classification parameters assigned to each audio object in this application, broadcast lists for specific time periods can be generated according to the parameters.

Once the lists have been generated, they can be dumped into the Content Management module so that they can be broadcast.

Functionalities:

- Selection of audio objects from available Content Management so that they will be usable in the automatic generation of rules
- Automatic updating of writers and artists when importing
- Possibility of using up to seven classification criteria: Nationality, Type, Rhythm, Speed, BPM, Priority and Version
- Scheduling up to seven days in advance
- Exportation to the Content Management module

## **1.2. - Complementary Modules and Services**

### **1.2.1. - Importation of Mar4Win Systems**

In order to provide, inasmuch as possible, a trauma-free transition from Mar4Win automation systems, AEQ has developed a tool that enables the complete, fast and simple migration of Mar4Win systems to Mar4Suite Pro systems.

The importation utility takes care of loading all the system data (templates, groups, users, permissions, etc.), as well as the data in the Mar4Win managers, including all the files, into the new Mar4Suite Pro system. This process can be repeated as many times as possible.

Functionalities:

- Importation of Mar4Win systems
- Importation of network managers
- Importation of reference managers
- Importation of autoloader managers
- Importation of Autolist managers.

### **1.2.2. - Remote News Report Server**

The remote news report server is designed for the reception of news reports or calls from clients. These will be recorded as system audio objects and incorporated into the system in the manager and folder configured for this purpose.

To be able to accept diverse types of communications lines with different audio qualities, the system pilots dual AEQ Phoenix Studio audio codecs that are provided, as required, of modules for:

Conventional telephone lines (giving support to conventional telephone calls, calls with hybrids and AEQ codecs with frequency extension, and large bandwidth POTS calls, through the AEQ data modems that are a part of the Phoenix equipment.

ISDN lines, giving support to the most frequently used encoding modes and compatible with most ISDN codecs on the market.

IP lines, with compatibility with the codecs produced by any manufacturer compliant with the EBU N/ACIP working group recommendations, with calls from IP networks as well as data connections through cellular telephony and 3G.

For voice calls, the server has a voice menu which calling users employ to identify themselves and record the news report. Once the recording is finished, the server processes the recorded audio and places it in the managers and folders that the calling user had assigned.

Functionalities:

- In a Mar4Suite Pro system as many remote news report servers can be installed as necessary
- Capability for independently configuring the parameters of each server: number of connection attempts, maximum recording time, number of tones before going off hook, etc.
- This server accepts up to 9,999 different users
- It accepts multiple users per mailbox.

### **1.2.3. - Notification and Synchronization Service**

One of the most important characteristics of Mar4SuitePro is the mechanism for updating the data in client workstations. Thanks to this mechanism, the client data can be kept up to date when objects are created, modified or deleted from the system.

The operation of the updating and notification mechanism has, on one hand, a notification database where the activity of the other Mar4Suite Pro databases is recorded. On the other hand, it has a Windows service that monitors the notification database and forwards the messages to the network, where they will be received and processed by the Mar4Suite Pro client modules.

It is also responsible for generating the replica of the data in the manager servers in the main system, thus enabling searches to be carried out in all of the managers in the system, regardless of the server in which they are resident.

### **1.2.4. - Audio Conversion Service**

Due to the proliferation of media for acquiring and distributing audio objects, such as the MP3 and WMA audio compression formats, or the distribution of audio via the Internet (podcasts, etc.), it has become necessary to have available a tool that enables audio file formats to be transcoded in a way that is transparent to the user.

For this purpose an application has been designed that transcodes whatever audio files are required of it. This transcoding can be “from” and “to” any audio format supported by the conversion server.

This server application works transparently for its users, since its use is integrated into the modules in the Suite that require support for automatic transcoding.

Among the modules that make use of this service are:

- Content management:
  - From the on-the-fly managers, users can drag and drop files in non-standard Mar4Suite Pro formats (MP3, WMA) into structured managers. They are automatically transcoded to the predetermined system format.
  - Each audio object has an option that enables it to be exported to the formats supported by the conversion service.
  
- Audio importation service:
  - The audio importation service enables the automatic incorporation of audio objects deposited in different network directories. The audio objects may come in non-standard formats, and therefore must be converted before they are incorporated into the system.

It is thus possible to incorporate the use of this service into other modules, if this is required.

Functionalities:

- Support for PCM, MPEG-I, MPEG-II, MP3, Windows Media Audio, Broadcast Wave File and other formats
- TCP/IP connections
- Notification of the progress of the copying process by means of UDP messages
- Operation as a Windows service; it is not necessary to start a session in the player where the conversion service is installed
- The conversion service is available to those groups of users who have permission to use it.

### **1.2.5. - Audio Importation Service**

The audio importation service is an application designed to enable the automatic ingestion of audio objects by a Mar4Suite Pro system.

The ingestion process is executed when the importation service detects that files have been added to one of the folders that it is monitoring. Each folder that is monitored can have a mailbox associated with it which indicates in which managers and folders the audio must be deposited. If no mailbox is assigned, the importation service will search for a text file attached to the audio that is to be imported, which will indicate in which manager and folder the audio object must be deposited. If there is no attached text file, the file is discarded without being imported. Once the importation process has been completed, the original file is deleted.

Functionalities:

- Operates as a Windows service
- Monitoring of multiple directories

- Capability for incorporating audio into different Mar4Suite Pro managers and folders
- Option of processing text files associated with the audio
- Automatic transcoding of the audio objects to the predetermined format of the system into which they are being incorporated, using the Mar4Suite Pro conversion system.
- Supports all the audio formats that the conversion service is able to handle
- Capability for normalizing / changing the level of the audio objects incorporated into the system
- Possibility of scheduling the importation.

## **2. - Auxiliary Hardware Devices**

### ***Programmable keyboards***

The use of programmable keyboards in broadcasting workstations enables fast access to them, providing the user with a more dynamic handling of the broadcast player.

The keyboard is configured in a predetermined manner to control the operating buttons of the player: play, stop, pause, start recording, skip, record and immediate recording. The maximum number of players that can be handled with this keyboard is two.

Additionally, buttons are configured for handling: movement through the elements loaded into the player, launching of elements when the player is shown in cartridge mode, up to a maximum of 20.

The model that is customarily recommended is the 55-key POSIFLEX KB-2100 keyboard, although, if necessary, a model with more keys, such as the 84-key KB-6600, could be used.

### ***Jog/Shuttle***

This device consists of a wheel and a set of programmable keys, which can be configured to execute diverse tasks, depending on the module in which it is to be used.

Currently, Mar4Suite Pro allows the use of devices of this type in the broadcast module for the handling of all the recorders in the template, including play, stop, pause, record and scrolling through the broadcast list; in the editor, for the operations of marker selection, play, stop, pause, forward and rewind, recording, etc.; and in the mixing editor, for the Fade-In, Fade-Out, Cross-Fade, positioning, and intro time adjustments; as well as the mix cueing, play, stop, pause and record functions for Talk-Over.

The system offers support for any device compliant with the MIDI standard, in addition to other with proprietary interfaces such as the CONTOUR SHUTTLEPRO V2.

### ***Control surfaces***

The type of control surfaces supported are those equipped with faders and encoders, and are focused on audio editing use, since they enable the control and adjustment of the levels of each one of the audio tracks that is being edited.

The editor may use any device of the types that comply with the MIDI standard, such as the Behringer BCF2000 control surface with motorized faders. This surface, together with the audio editor provided with the suite, enables up to 32 audio tracks to be handled. This includes the gain level adjustment of each of the tracks independently or in groups; balance, bass, treble and mid-range controls, as well as mute and solo buttons.