Accordent Media Management System Technology
And Its Integration With The MERLINGO Portal Services

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Abstract

MERLINGO (MEdia-rich Repository of LearnING Objects) project based on the rich-media technologies application in the eLearning environment is aimed on the building of the central repository of multimedia learning objects in the distributed environment containing teachers’ presentations and accessible on-line and on-demand within the national academic computer network CESNET2. The article presents integration of its services with the Accordent Media Management System programming system and the possibilities of this new technology. Accordent product gives a unified platform for not only streaming and archiving online presentations, but also securing, organizing, customizing and managing library of multimedia content.

1. Preface

Accordent Capture Station (see [1]) and Mediasite Recorder (see [2]) are the ‘rich media’ recorders which can be used for automated audio and video recordings of lectures (or just audio recording) with synchronous presentation at the teacher’s workstation (for example, presentations in MS PowerPoint), viewer, video recorder, or other peripheral, and its on-line publication as the part of the virtual university services on the Internet in the form of the learning objects. These devices are already used by several universities in the Czech Republic (VŠB-Technical University of Ostrava, University of Ostrava, University of Hradec Králové, Masaryk University in Brno, Technical University of Liberec, etc.).

Accordent Media Management System and Mediasite EX Server ability is to stream data and to replay lecture on-line and on-demand using web services. The servers optimize data flows and resolutions according to the access speed of a concrete customer. Both of them give also an unified platform for not only streaming and archiving online presentations, but also for securing, organizing, customizing and managing the library of multimedia content. It brings order to the presentation asset library with customizable catalogs complete with content indexing and search.

MERLINGO (MEdia-rich Repository of LearnING Objects – see [5],[6],[7]) project is aimed on building of the central repository of learning objects that contains presentations accessible on-line and on-demand within the national computer network CESNET2 supporting synchronous services of virtual universities and deployment of the Accordent Capture Station and Mediasite Recorder technologies at the public universities in the Czech Republic. It is a pilot project that will enrich the learning process in a part-time form and reduce costs of operation of the recorder technologies installed at public universities in the Czech Republic.

MERLINGO project has the following participants from the public universities in the Czech Republic in the present time:

- VŠB-Technical University of Ostrava,
- University of Ostrava,
- Silesian University in Opava,
- Tomas Bata University in Zlín,
- Technical University of Liberec,
- University of South Bohemia in České Budějovice.

2. Accordent Media Management System
And Its Integration With The MERLINGO Central Repository Services

In the present time on the rich-media market it is possible to see very intensive drive of the Accordent technologies, both in the area of the recorder-side and also of the server-side products, which dispose in the comparison of the SonicFoundry products with the following indispensable advantages:

- Accordent is the owner of several significant patents collocating with the rich-media technologies.

- It is possible to use in the role of the client-side recorder potentially any standard working station or server with two special PCI cards and the Accordent client-side software installed on it, or the special device Accordent Capture Station.
• It is possible to make easy software configuration, that will change the Mediasite Recorder from SonicFoundry to the role of the Accordent Capture Station.

• AMX NetLinx Control System (see [4]) is one of the wide spread control systems, that is commonly used as an part of equipment of many audiovisual university halls. Control system is interconnected with all the audiovisual equipment in the lecture room and it allows its remote control. Control unit can communicate with remote audiovisual equipment via communication protocols (like RS232, IR, IO), user interface of the control unit is formed by wire or wireless fully programmable touch panel. Mediasite Recorder supports simple communication protocol MCIP (Mediasite Control Interface Protocol) through its RS232 interface for the purpose of the communication with the AMX NetLinx Control System. Accordent Capture Station, on the other side, supports all the standard networking technologies (eg. Ethernet) and TCP/IP protocol for the same purpose.

Fig. 1. MERLINGO Central Repository Components

• Stream media supported by the Accordent Media Management System are not restricted only to the Windows Media Format, but it is possible to integrate also another media formats, like Real Player.

• Accordent Media Management System can be installed in the distributed programming environment and it is already not bound only with the MS Windows Server software platform like the Mediasite EX Server product. Its particular parts can be used also on the central servers with the Unix operating system clones.

• Accordent Media Management System has in the comparison of the Mediasite EX Server system much more sophisticated support for the rich-media content management, eLearning support, Directory Services and LDAP integration, monitoring of end-user activities, heavy-loading control, etc.

MERLINGO central repository of the learning objects supports both major technologies in the rich-media area in the present time. Accordent Media Management System and Mediasite EX Server software systems are installed in the distributed server environment, which consists of the main components represented on fig. 1.

• Accordent Media Management System part of the MERLINGO repository is supported by:
  • Accordent Application and Web Server with the one instance of the Accordent Media Management System, Internet Information Server and FTP Server installed.
  • Accordent Media Stream Server with the Video Server and Windows Media Services software installed.
  • Accordent SQL Server with the MS SQL Server 2005 software system installed.
  • SAN2 Disk Array with 5 TB disk size based on RAID5 technology.

• Mediasite EX Server part of the MERLINGO repository is supported by:
  • Video Server Mediasite Cluster - cluster of two central servers with Video Server, Windows Media Services and Mediasite Control Service software installed.
  • Web Server Mediasite Cluster - cluster of two central servers with ten Mediasite EX Server instances, WWW server, Mediasite Directory and System Manager software installed.
• File and SQL Server Mediasite Cluster with the Internet Information Server, FTP Server and MS SQL Server 2005 software system installed.

• SAN1 Disk Array with 10 TB disk size based on RAID5 technology.

• Common part of the MERLINGO repository is supported by:
  - Backup server with Storage system for the purpose of backing up the data files from both disk arrays.
  - Uninterruptible Power Supply for all the MERLINGO components.
  - SAN Switches support common access to the disk arrays SAN1 and SAN2.
  - LAN switches support the MERLINGO connectivity with the CESNET national network.

Central disk arrays are connected through the fiber optic channels with the file servers and the database servers and their disk space is used for learning objects with teachers' presentations storage. Their multimedia content is saved directly to the file system of the disk array, all the learning object metadata are then stored to the MS SQL Servers databases tables.

3. Integration Of The MERLINGO Repository Services With The AMX Netlinx Control System

AMX NetLinx Control System (see [3]) is one of the wide spread control systems, that is commonly used as an part of equipment of many audiovisual university halls. This control system also plays the key role in the appointment of the Accordent Capture Station technologies in the educational process at the author’s faculty. Control system is interconnected with all the audiovisual equipment in the lecture room and it allows its remote control. Control unit can communicate with remote audiovisual equipment via communication protocols (like RS232, IR, IO), user interface of the control unit is formed by wire or wireless fully programmable touch panel. In the case when control unit supports TCP/IP communication protocol, the whole equipment of the lecture room can be administered from any computer in the Internet.

Accordent Capture Station supports the services of the standard communication protocol Telnet and also implements special Application Programming Interface (see [4]). It is possible to use this implemented Telnet API for automated communication and management of given Accordent Capture Station. Especially it is allowed to use the following implemented commands:

• **StartCapture** – starts recording of the presentation,
• **StopCapture** – stops the presentation recording,
• **SetTag TagName, TagValue** – command, that allows to set the metadata values associated with the given presentation recording (e.g. SetTag "<@speaker@">, Ivo Martiník),
• **GetTags** – command returns the metadata values associated with the given presentation,
• **GetLink** – command returns the URL address, which is necessary for the publication of the presentation on the web portal,
• **GetStatus** – command returns the actual recording device status.

Simple example of the communication dialog between the administrator and the Accordent Capture Station with the support of the Telnet protocol follows:

```
>telnet station1.ekf.vsb.cz
>username
>password
>startcapture
>getstatus
>stopcapture
>quit
```

This dialogue allows the administrator to capture a recording with the prepared set of metadata.
With the support of the Accordent Capture Station Telnet API, the author’s faculty practically realized a project that integrates Accordent Capture Station services, AMX NetLinx Control System equipment, and MERLINGO repository environment. One of the main results of this project is that every teacher now has full control over the recording process of their own presentation and its on-line or on-demand publication in the MERLINGO repository document management system.

4. Conclusion

The central repository of multimedia learning objects MERLINGO, using organically the properties and services of a selected document management system, is an important step in the introduction of eLearning technologies at the Czech universities. Practical integration of the MERLINGO environment and control systems functionalities is also meaningful for the fully automated recording of teacher’s presentations and their on-line publications with the rich media support. Installation of the Accordent Media Management System in the distributed environment is the pilot project in this context.

5. References