Integrating Java Media Framework With Distributed Multimedia Database for Data Streaming.

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Abstract - As multimedia capable computers become cheaper and more pervasive in the consumer and corporate markets, and as the availability of digital information increases, the need for low-cost, cross-platform multimedia applications will steadily rise. However multimedia data is nearly useless if there is no computer aided manipulating, searching, and retrieving mechanism to obtain the desired media contents. This paper describes a research project of a Java-based multimedia data query, streaming and presentation for distributed multimedia database. This work addresses the problem of integrating multimedia content into network and internet based database applications. The application was designed using JAVA technology for developing client application/GUI and server application. Java provides a set of class libraries, called the Java Media Framework (JMF), which provides the cross-platform multimedia data support required by the application as well as by using Java, it can utilize all its functionality across platforms within any Java-enabled web browsers. This allows greater use of audio video data, because the users will no longer need to pre-install any software to present or play the data, beyond Java compatibility. The Object Relational Database Management (IBM DB2) is used for the development of multimedia database as it allows queries to be performed on complex data, e.g. video, audio. In addition the IBM DB2 Database supports the storage of data as Binary Large Object Blocks (BLOBs).

Keywords: Multimedia, Java, Java Media Framework, streaming audio/video, Distributed Database

1 Introduction

Multimedia information systems are expected to dominate our daily lives. Our houses will be wired for bandwidth to handle interactive multimedia applications. Our high-definition TV/Computer workstations will have access to a large number TV/Computer workstations will have access to a large number of databases, including digital libraries that will distribute vast amounts of outsource multimedia content.

Multimedia data may be stored, delivered, and utilized in many different ways. Application may be categorized based on their data management characteristics as follows:

- Repository applications
  A large amount of multimedia data as well as metadata is stored for retrieval purposes. A central repository containing multimedia data may be maintained by a DBMS and may be organized into a hierarchy of storage levels: local disk, tertiary disk and tapes, optical disk, and so on. Examples include repositories of satellite images, engineering drawings and designs, space photographs and radiology-scanned pictures.

- Presentation applications
  A large number of applications involve delivery of multimedia data subject to temporal constraints. Audio and video data are delivered this way; in these applications optimal viewing or listening conditions require the DBMS to deliver data at certain rates offering "quality of service" above a certain threshold. Data is consumed, as it is delivered, unlike in repository applications, where it may be processed later. For example, multimedia electronic mail. Simple multimedia viewing of video data, for example requires a system to simulate VCR-like functionality.

- Collaborative work using multimedia information
  This is a new category of application in which engineers may execute a complex design task by merging drawings, fitting subjects to design constraints, and generating new documentation, change notification and so forth. Intelligent healthcare networks as well as telemedicine will involve doctors collaborating among themselves, analyzing multimedia patient data and information in real time as it is generated.

With the growth of Internet there has been a radical change in the method of software design and deployment. Software applications are becoming more and more distributed. Java has emerged as an ideal programming