WEB STREAMING

Mac Academy, PSG Step Software Park , Coimbatore.

PROJECT REPORT

SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE AWARD OF THE DEGREE OF
MASTER OF SCIENCE IN APPLIED SCIENCE
- SOFTWARE ENGINEERING
OF BHARATHIAR UNIVERSITY,
COIMBATORE.

Submitted by

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

KUMARAGURU COLLEGE OF TECHNOLOGY
COIMBATORE- 641 006

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CERTIFICATE

This is to certify that the project work entitled

"WEB STREAMING"

has been submitted by

Mr.S.Karthick 98SE10

in partial fulfillment of the award of the degree of

Master of Science in Applied Science – Software Engineering

of Bharathiyar University , Coimbatore during the Academic year 2002-2003

S. Thangaraj 31/3/03

Head of the Department

R. Dinesh (2/3/03)

Guide

Certified that the candidate was examined by us in the Project Work Viva Voce Examination held on 5-4-2003 and the University Register Number was 9837S0050

S. Durai

Internal Examiner

External Examiner

MAC ACADEMY

To Whomsoever It May Concern

This is to certify that **Mr. S. Karthick** of Kumaraguru College of Technology doing his final year M.Sc Software Engineering has done the project entitled **"Web Streaming"** in our concern from 1st December to 1st March.

He has completed the project successfully and has made valuable contributions towards the implementation of this project.

We wish him all the success.

K. Mohanraj
Director
K. Mohanraj

S. Rajkumar
Creative Head
S. Rajkumar

18/03/2003
Coimbatore

ACKNOWLEDGEMENT

I wish to express my sincere and heartfelt gratitude to Dr.K.Padmanabhan , B.Sc (Engg) , MTech , Ph.D.., Principal of Kumaraguru College of Technology for giving me the needed encouragement in starting this project and carrying it out successfully.

I take this oppurtunity to express my sincere thanks and a deep sense of gratitude to our Prof.Dr.S.Thangasamy Ph.D.., Head of the Department of Computer Science and Engineering for his benevolent attitude to push up this project to its position of success.

I take the privilege of expressing my sincere thanks and gratitude to Mrs.S.Devaki , B.E.M.S , Co-ordinator M.Sc.Software Engineering , Assistant Professor and to my internal guide Mr.Dinesh B.Tech (Elect Power Engg) , MS (CS) , Diploma in MS Windows , CCA , DCA, Senior lecturer for their remarkable guidance and encouragement at every stage of this project work.

I take this oppurtunity to express my sincere thanks to Mr.K.Mohanraj , Director – Marketing , Mac Academy , PSG Step Software Park , Coimbatore for permitting me to undertake a software project , to fulfill my course requirement and giving me the oppurtunity to utilize all the necessary resources and extending helping hands in my long run and encouraging me in difficult situations.

I am also bound to thank other staff and my fellow students for their suggestions and heartfelt gratitude . Last but not the least , my hearty thanks to my lovely parents without whose sustained support , I could not have made my debut in Information Technology.

Company Profile

Mac Academy of PSG Step Software Park is one such organization with a clear vision of becoming the pioneers in Multimedia and applications. In view of the Industry requirements for the quality Multimedia professionals and their training necessities across the globe, Mac Academy provides focused training on significant areas of Multimedia.

Mac Academy strongly believes that the genuine assets of the organization are the people. The people at Mac Academy are not employees but they are the partners in the business right from the day they embrace to start working . The efforts has been to ensure that right kind of people have the right kind of responsibilities.

The company uses its expertise and experience to help the clients to anticipate, initiate and manage changes better than others. This commitment and supportive relationship has helped the clients to win. Mac Academy believes in recognizing and encouraging the merit of its people as individuals. The environment thus facilitates freethinking, experimentation and innovation. With an emphasis on personal responsibility, the company provides an atmosphere that support original thinking.

The most striking feature of this growing organization is the commitment of the employees , who are always trying to give the best of their knowledge and apply it in work.

Synopsis

Recent years has been a great technological boom in the multimedia market. A lot has been happening in the fields of audio and video formats , authoring and development tools , multimedia content development and delivery etc..,

A big driver behind this has been the Internet. With growing Internet penetration among the masses , content delivery over the web has grown manifold.

For the ears : MP3s became a rage the moment the technology hit the market. In recent years , we have been seeing MP3s becoming popular among music buffs around the world.

And the eyes : MPEG-4 is another big term that is making the rounds on the Internet. It's being projected as the next big thing to happen to video as MP3 happened to audio. With small file sizes and perceptibly good quality , this format might become a rage in the near future.

Online entertainment : Distribution and playback of real-time and on-demand audio-video content via Internet became a big market space with numerous portals coming up just to provide, say webcast content.

The project named "Web Streaming" done at Mac Academy , PSG Step Software Park is an implementation project of Apple's Quicktime technology. This project helps to achieve streamed content in a time saving manner. Streaming is the delivery of medias from a Server to its Clients across the network . This streaming activity is achieved with the help of a streaming server which is a server technology to transfer datas which are encoded and streamed. The users trying to access the streamed medias through the website can have a secure access and it is bandwidth specific.

CONTENTS

1.SYSTEM REQUIREMENTS

1.1 Product definition :

1.1.1 Aim of the project :

The aim of the project named "Web Streaming" is to provide streamed media from the Server to its Clients across the network.

1.1.2 Functions to be provided :

- ❖ Provision of Streamed media.
- ❖ Easy access to medias.
- ❖ Saving time.
- ❖ Bandwidth specific streaming.
- ❖ Scalability.

1.1.3 Proposed System :

The proposed system is an implementation project using Apple's Quicktime technology to deliver medias which are streamed thus avoiding the need to wait and access the medias until the downloading process is complete. The implementation part is done using the Quicktime suite of applications since

- ❖ Its free

  Software available for free from Apple's website.
- ❖ Its open

  Based on open source principles.
- ❖ Its broadband today

  No other format takes better advantage of high

delivery better than Quicktime.

- ❖ Its standard

  Supports more file formats than other streaming technology.

- ❖ Its powerful and scalable

  One server can serve upto 4000 simultaneous streams.

- ❖ Its everywhere

  Truly cross-platform and installed base of 40M.

1.2 Project Plan :

1.2.1 Life Cycle Model :

To help reduce the difficulty in constructing sites , we should adopt the "Process Model" that describes the various phases involved in website development. An ideal process model for the web would help the developer address the complexity of the site , minimize the risk of project failure , deal with the near certainity of change during the project and deliver the site quickly with adequate feedback for management during the process. The basic web project starts with the big picture and narrows down to the specific steps necessary to complete the site. The model starts first with a planning stage , then a design phase afterwhich implementation and testing and finally ends with a maintenance phase. In software engineering , this model is often called the Waterfall model or sometimes the software life cycle model because it describes the phases in the lifetime of software. Each stage in the waterfall model proceeds one after another until conclusion.

1.2.2 Development Schedule :

In order to complete the project in a given time , the development schedule is framed and based on the time slots , the product is developed.

Analysis Period :

December 1st – January 1st

During this period , analysis of the product to be developed was done.

Designing Period :

January 2nd – January 22nd

During this period , the analysed part was designed

to easily understand the final product.

Coding and Implementaion Period :

January 23rd – February 23rd

During this period , coding for the project was carried out along with implementation of streaming

concepts to the project.

Testing Period :

February 24th – March 1st

During this period , the developed product was tested.

1.2.3 Documents to be prepared :

It is suggested that the following documents must be prepared during the time of the project.

- A System Definition consisting of a product definition and a project plan.
- A Software Requirement Specification
- A Design Document
- A Test Plan

1.2.4 Manner of Demonstration :

Reviews :

Every week end , the completed modules are explained to the project leader , reviewed and outputs are verified.

Documents :

Drafts of every document is reviewed by the project leader before it is finalized. If any changes are there in the draft , they are incorporated in the document.

Product :

Demo of each module is shown to the project leader when the

module is completed. If any changes are there in the draft, they are incorporated in the document.

2. Software Requirements Specification

2.1 Project Description :

Project Title : Web Streaming

Duration : 3 Months (December 2002 – January 2003)

Name of the company : Mac Academy , PSG Step Software Park , Coimbatore.

About the Project :

The project named " Web Streaming " is an implementation project of Apple's Quick time technology. The Quick time suite of applications needed for the project are Quicktime Streaming Server and the Quicktime Player.

Modules to be done :

For usage in Server side:

- Setting up of Streaming Server.
- Managing Streaming Server.
- Preparation of pre-recorded medias for streaming.
- Creation of a virtual Internet Radio / Television Station.

For usage in Client side:

- Creation of a website wherein the clients can have access to the medias stored in the Server.

2.1.1 Hardware and Software Requirements :

Server Requirements :

Hardware :

- ❖ RAM : 512 MB of RAM
- ❖ System Processorp : 500 MHz PowerPC G3 Processor
- ❖ Harddisk : 20 GB

Software :

- ❖ Operating System : Mac OS X Server version 10.2
- ❖ Streaming Server : Quicktime Streaming Server 4.1.1
- ❖ Server Side Scripting : Active Server Pages
- ❖ Client Side Scripting : Javascript
- ❖ Language : Hyper Text Markup Language
- ❖ Database : Oracle 8.0

Client Requirements :

- ❖ QuickTime 6 and a broadband Internet connection are required to take advantage of Instant-On using QuickTime Streaming Server.
- ❖ Any ISO-compliant MPEG-4 player can view MPEG-4 files.
- ❖ Streaming MP3 playlists can be listened to using iTunes or other compatible streaming MP3 player such as WinAmp.

2.1.2 Software Features :

Active Server Pages :

Using Active Server Pages we can

- ❖ Generate dynamic web pages.
- ❖ Process HTML documents.
- ❖ Detect browser capabilities.

- Set connectivity of the website to a database.

The advantages of using ASP are :

- As a developer , we can make changes to the .asp file on the server and save the changes to the file. The next time the page is loaded , the script will be automatically compiled. The reason being ASP technology is built into all Microsoft Web Servers.
- We can create a webpage with dynamic content . The web server processes the code and generates HTML depending on the request made by the user. For example , we can create an Active Server Page that displays a greeting based on the time of day.
- By default , an ASP sends only ASCII text to a client browser. Typically,

  any browser running on any operating system can access the applications embedded in the ASP script.
- The user will be able to view the results of the script but cannot see the source code. That is because the script commands that generate the page are retained on the web server and not sent to the browser. The user cannot make any changes to the script and thereby tamper with data or content of the web page.

Javascript :

Java Script can validate the entire form to check if the user has filled in every data before the form is sent back to the server. This reduces

the workload on the server.

Oracle 8.0 :

behind the choice of Oracle as the backend in this project are as follows:

- For the optimum design of the database.
- To have a better response time .
- To have Data Integrity.
- To avoid Data Redundancy.
- To maintain the security of the database.

2.1.3 Streaming Concepts :

Streaming Media :

To understand the role of streaming media, we need to understand the functioning of the World Wide Web. Streaming delivers media from a server over a network to a client in real time. No file is ever downloaded to a viewer's harddisk. Media is played by the client software as it is delivered.

The server breaks the medias into packets that can be sent over the network. At the receiving end, the packets are reassembled by the client and the movie is played as it comes in. A series of related packets is called a stream .Streaming is different from simple file transfer, in that the client plays the movie as it comes in over the network, rather than waiting for the entire movie to download before it can be played.

QuickTime movies can be streamed using a variety of protocols, including

❖ HTTP (Hyper Text Transfer Protocol)

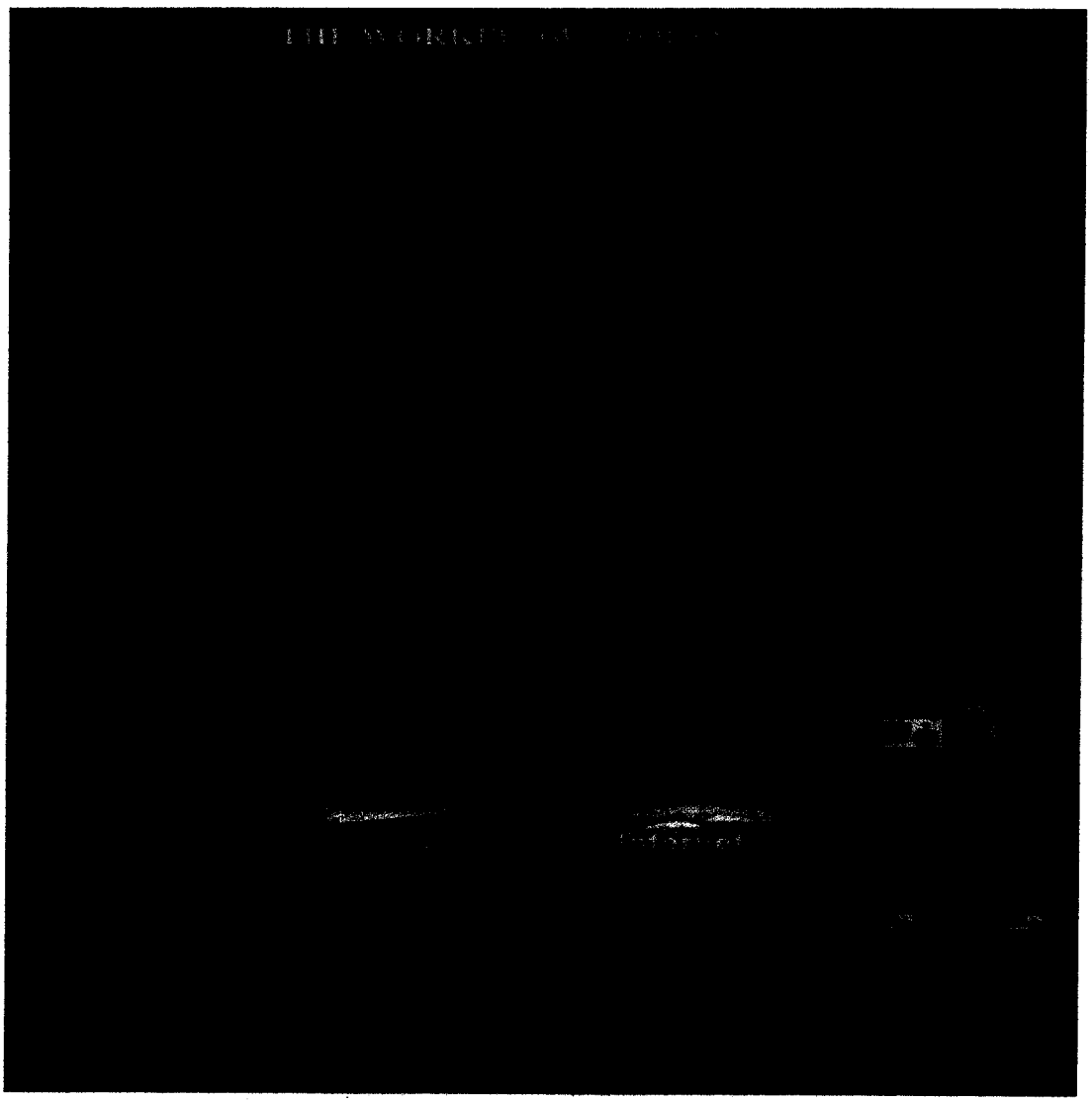
❖ RTP (Realtime Transport Protocol) – Only for Live Streaming

The project deals only with the recorded medias and not with the live content. So we don't make use of RTP protocol. Only HTTP is used.

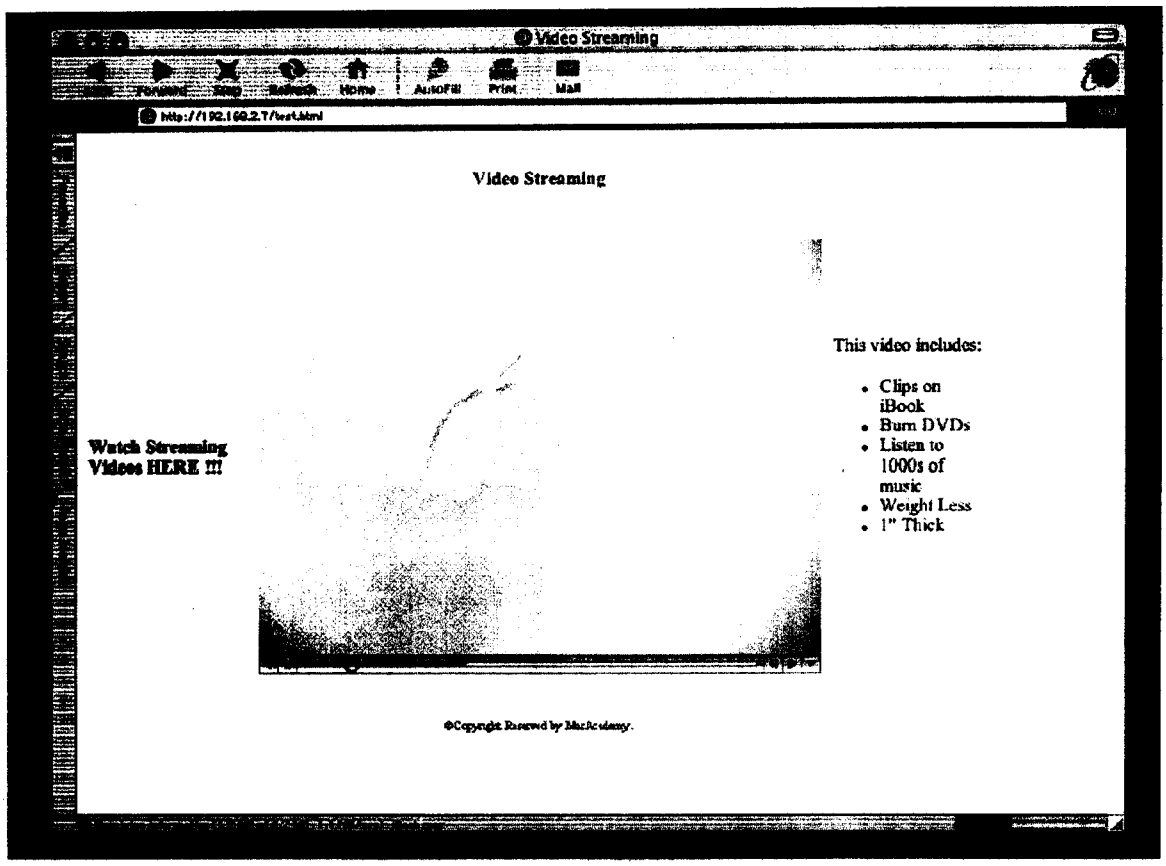
HTTP uses TCP/IP protocol to ensure that all packets are delivered and provides retransmission if necessary.To achieve the streaming activity , the streaming server should be present.

Screen showing the definition of Streaming

Screen showing the Workflow process of Streaming



Screen showing the Streaming Process



Quicktime Streaming Server 4.1.1 :

In the Web Streaming project , the streaming server used is Quicktime Streaming Server 4.1.1. If we want to send streams to people over the Internet or a local network, we need a streaming server. Just as we need a web server for web pages, and a mail server for email messages, we need a streaming server to send real-time streams.

QuickTime Streaming Server lets us deliver media over the Internet in real time. Users can tune in to broadcasts of live or prerecorded media, or they can view prerecorded media on demand. Users see streamed media as soon as it reaches the computer; they don't have to wait to download files.

Features of Quicktime Streaming Server 4.1.1 :

Quality of Service:

- Instant-on
- Supports both unicast and multicast

Support for Industry Standards:

- MPEG 4 Support
- MP3 Support

Industrial Strength Performance:

- High Volume Support

Open and Economical:

- Darwin Streaming Server
- No Server Tax

Easy Administration:

- Web based interface

Content Management:

- Playlists

Quicktime Streaming Server supports both unicast and multicast network transport to deliver streaming media.

Multicast :

- ❖ **Single stream shared by many clients.**
- ❖ **Each client tunes into the stream and receive that part of media being played at that point of time.**
- ❖ **It requires a network that has access to the multicast backbone / Mbone for content generally distributed over the Internet.**
- ❖ **It reduces network congestion.**

Unicast :

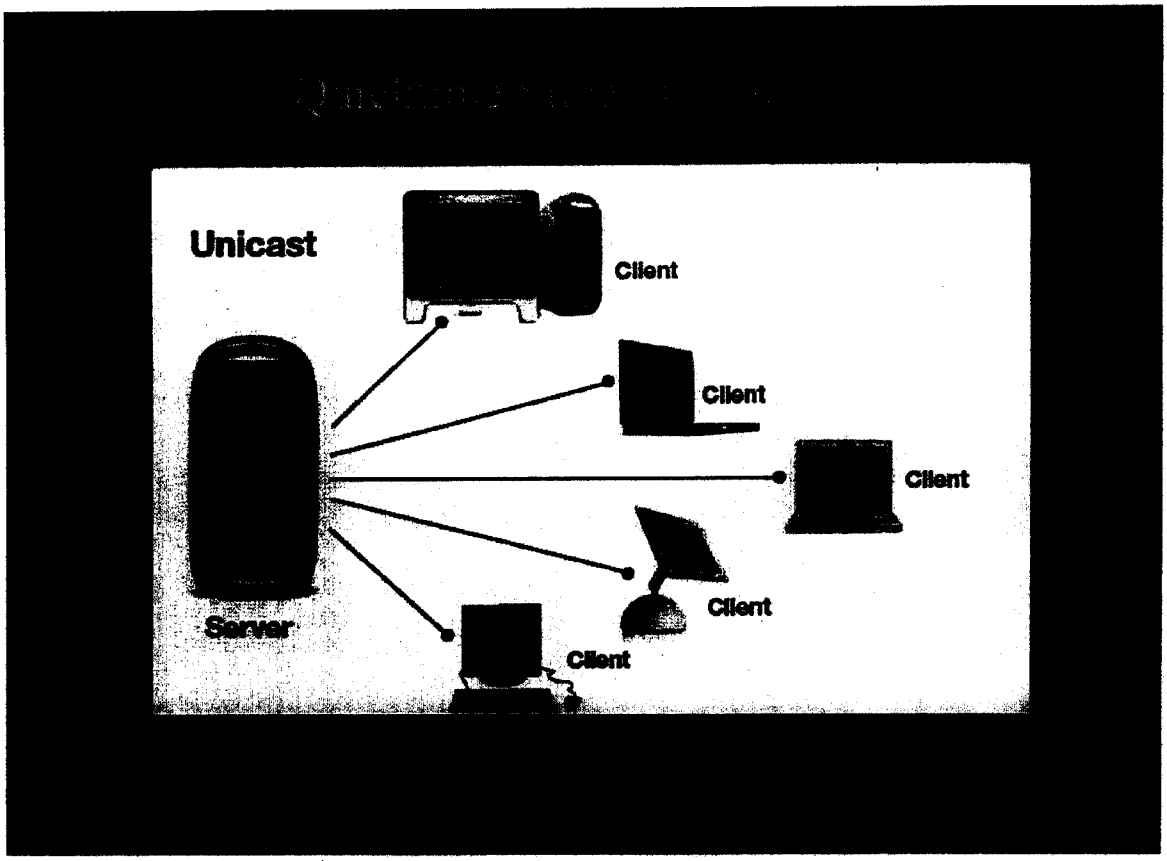
- ❖ **In a unicast , each client initiates its own stream resulting in the generation of many One-to-One connections between the Client and theServer.**

Quicktime Player :

The free QuickTime Player is an easy-to-use application for playing,interacting with, or viewing any video, audio, virtual reality (VR), or graphics file that is compatible with QuickTime.

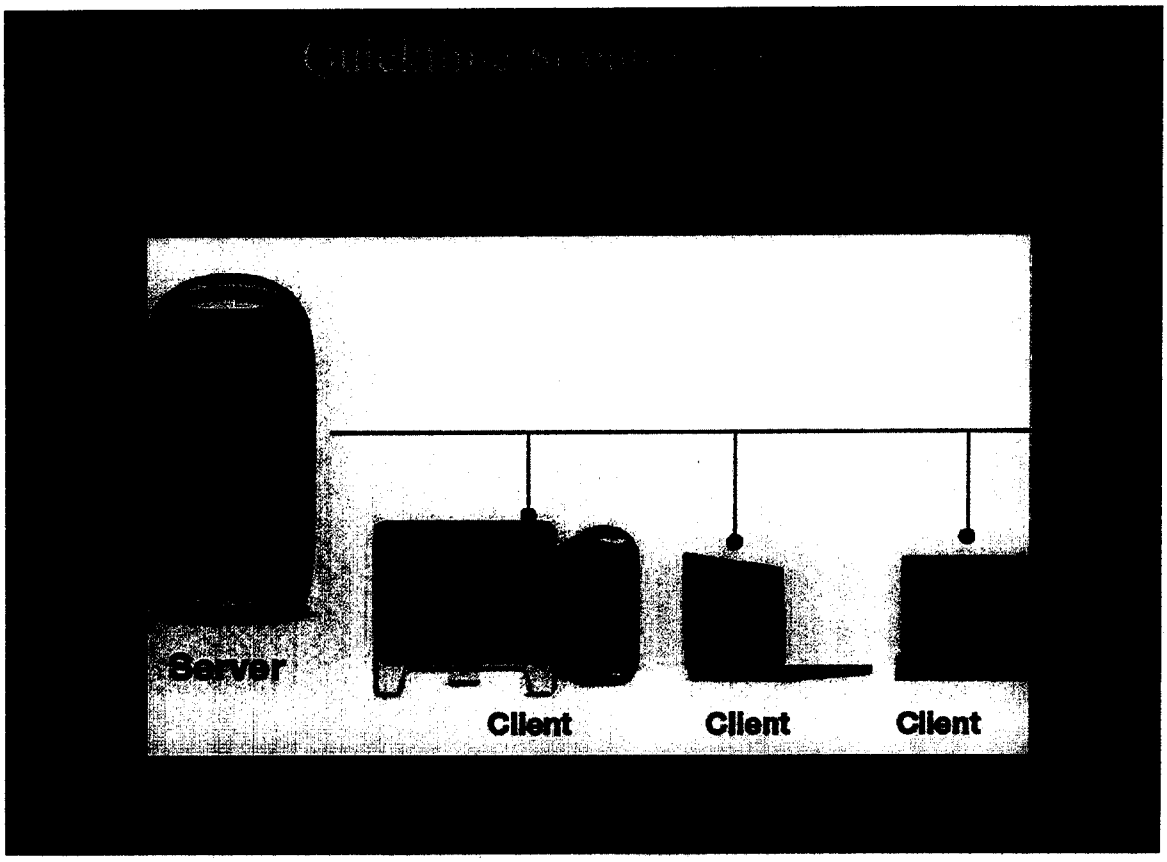
UNICAST

- In a unicast , each client initiates their own stream resulting in the generation of many one-to-one connections between the Client and the Server.

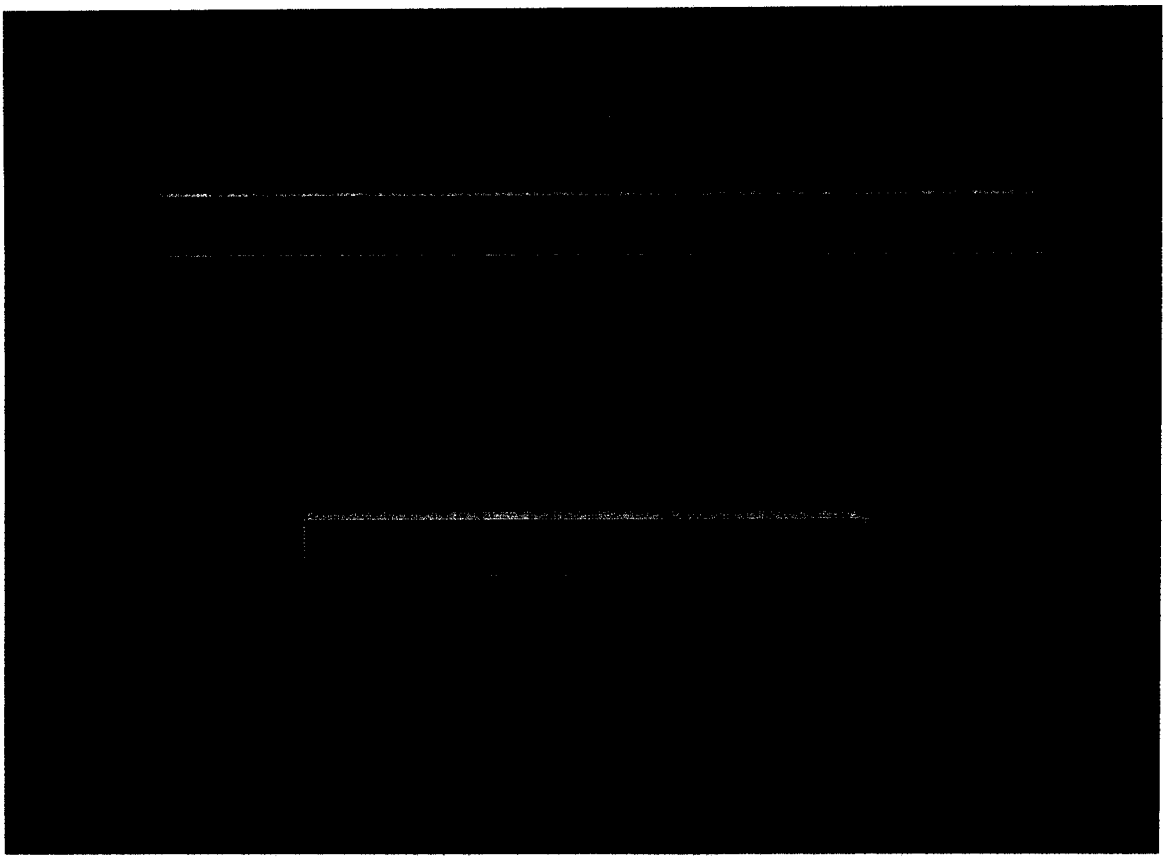


MULTICAST :

- Single stream shared by many medias.
- Each client tunes into the stream.

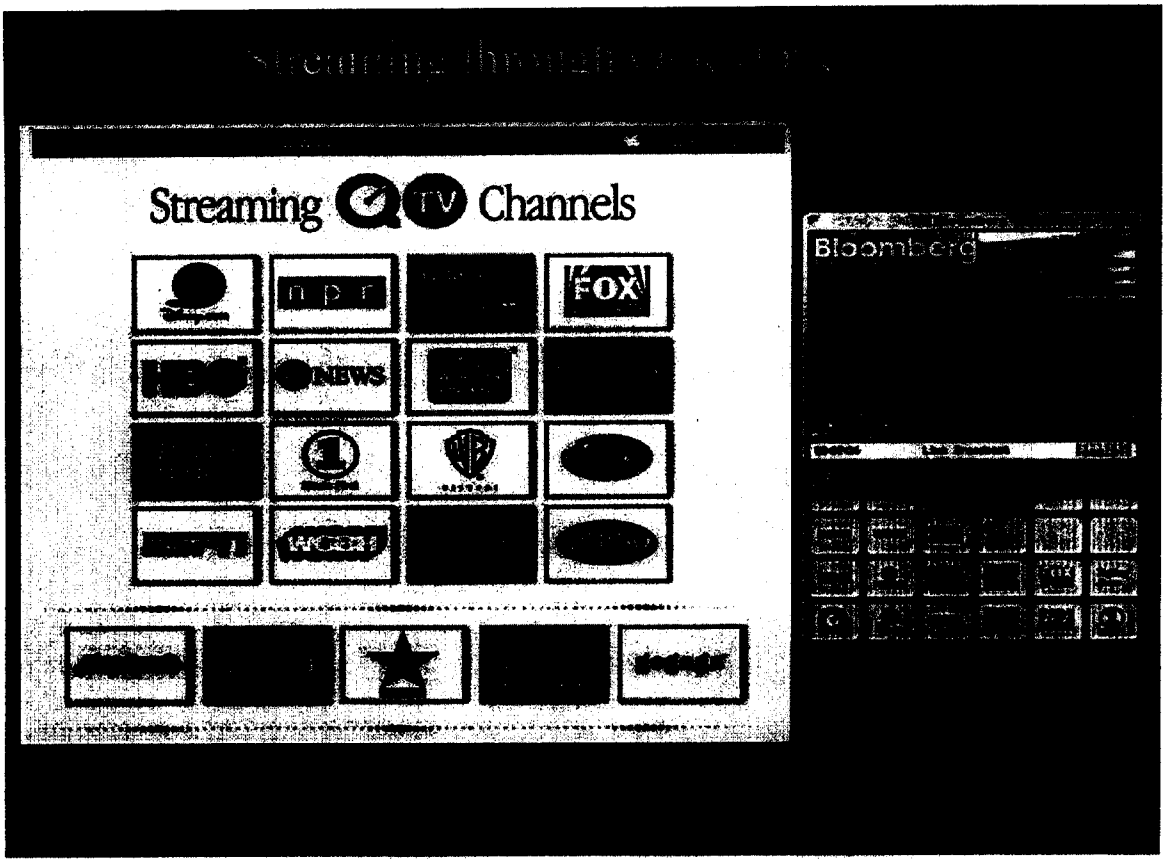


Screen showing Unicast and Multicast network transport



Screen showing various organisations using

Quicktime Streaming worldwide



2.1.4 Implementation of Streaming Concepts in Web Streaming :

The implementation part for the project is done for usage at both the server side as well as in the client side .

Server side :

- ❖ Setting up of Quicktime Streaming Server 4.1.1 in the Mac OS X Server version 10.2.
- ❖ Managing the Streaming Server.
- ❖ Preparing pre-recorded media for Streaming.
- ❖ Creating a virtual Internet Radio / Television station.

Client side :

- ❖ Developing a website through which clients can have easy access to the medias.

2.1.4.1 Setting up of Quicktime Streaming Server 4.1.1:

1. From Mac OS X Server version 10.2 , the Streaming Server Admin icon in the Dock is clicked and the web browser is opened.
2. Next , the URL for the Streaming Server Admin computer is entered.

   For example: http://hostname:1220 where hostname is the hostname or

   IP address of the streaming server computer and 1220 is the port number.

   The first time we run Streaming Server Admin, the Setup Assistant prompts for a user name and password.
3. After entering and reentering a new user name and password in the

We will use this user name and password to administer the streaming server.

4. Click Next.

The Media Folder page appears. The default path is noted . This is where we place all the medias we want to stream.

5. Click Next.

The Streaming on Port 80 page appears. Enable port 80 if we intend to allow content to be viewed from outside the local area network (that is, from the Internet).

6. Click Finish.

The Streaming Server Admin main screen appears.

"Server is Running" should appear at the top of the screen.

7. If instead "Server is Idle" appears, click the Start Server button to start the server.

The streaming server is now active and ready to stream media.

8. Click General Settings. If we want the server to start up each time we power on the server, choose Start Server at System Startup and click Save Changes.

2.1.4.2 Managing the Streaming Server :

To set up and manage QuickTime Streaming Server (QTSS) , we use the web-based Streaming Server Admin application. This tool provides a

standard graphical user interface for all supported platforms and allows us to administer the streaming server locally or remotely.

Working With Streaming Server Admin :

Streaming Server Admin is a web-based user interface (UI) in which we can change general settings, create and serve playlists, monitor connected users, view log files and manage bandwidth usage. Because the interface is web-based, we can administer the server from anywhere by connecting from any computer with compatible software and with Internet access.

Viewing Streaming Status :

We can view a snapshot of current streaming server activity or see information about connected users in the Main and Connected Users panes of Streaming Server Admin.

To view streaming server activity :

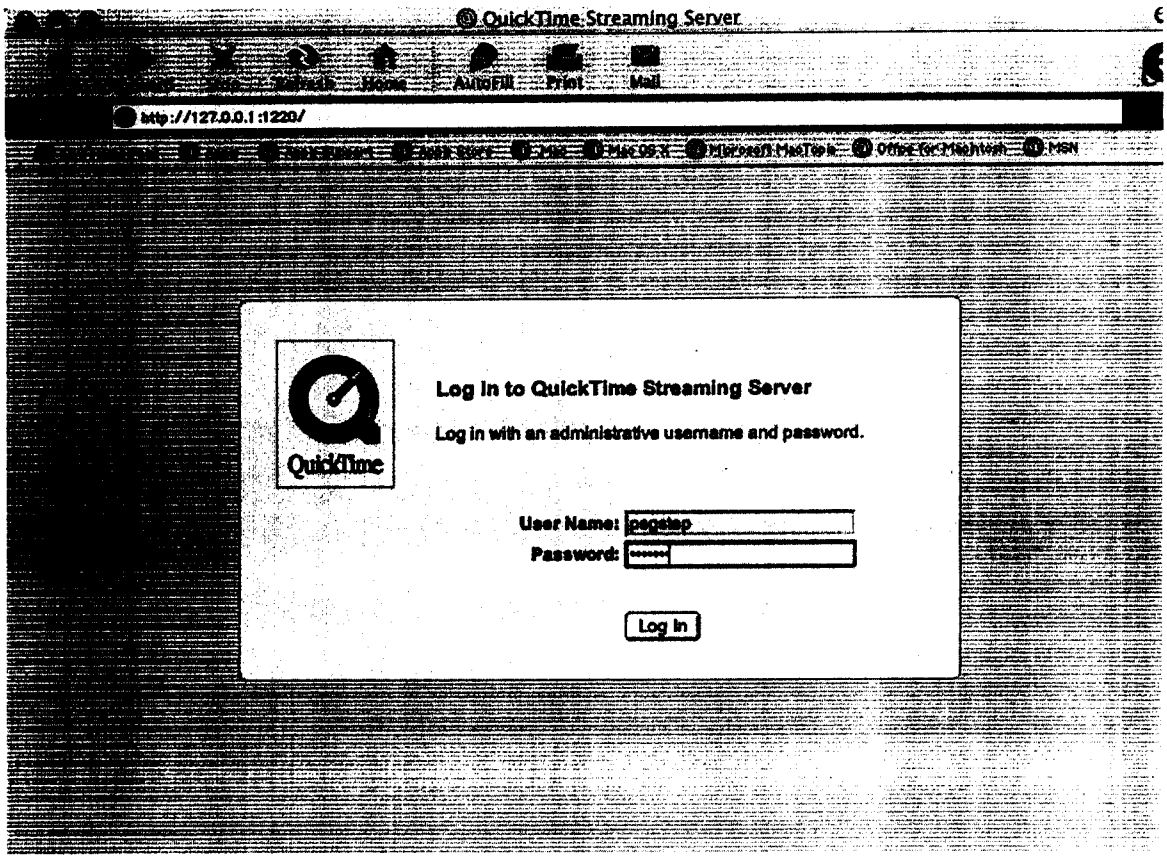
1. Click Main in Streaming Server Admin.
2. To see information about connected users, click Connected Users in Streaming Server Admin.

Starting or Stopping Streaming Service :

We can start or stop streaming service at any time by clicking the button at the top of the Streaming Server Admin window.

To start streaming service, click Start Server.

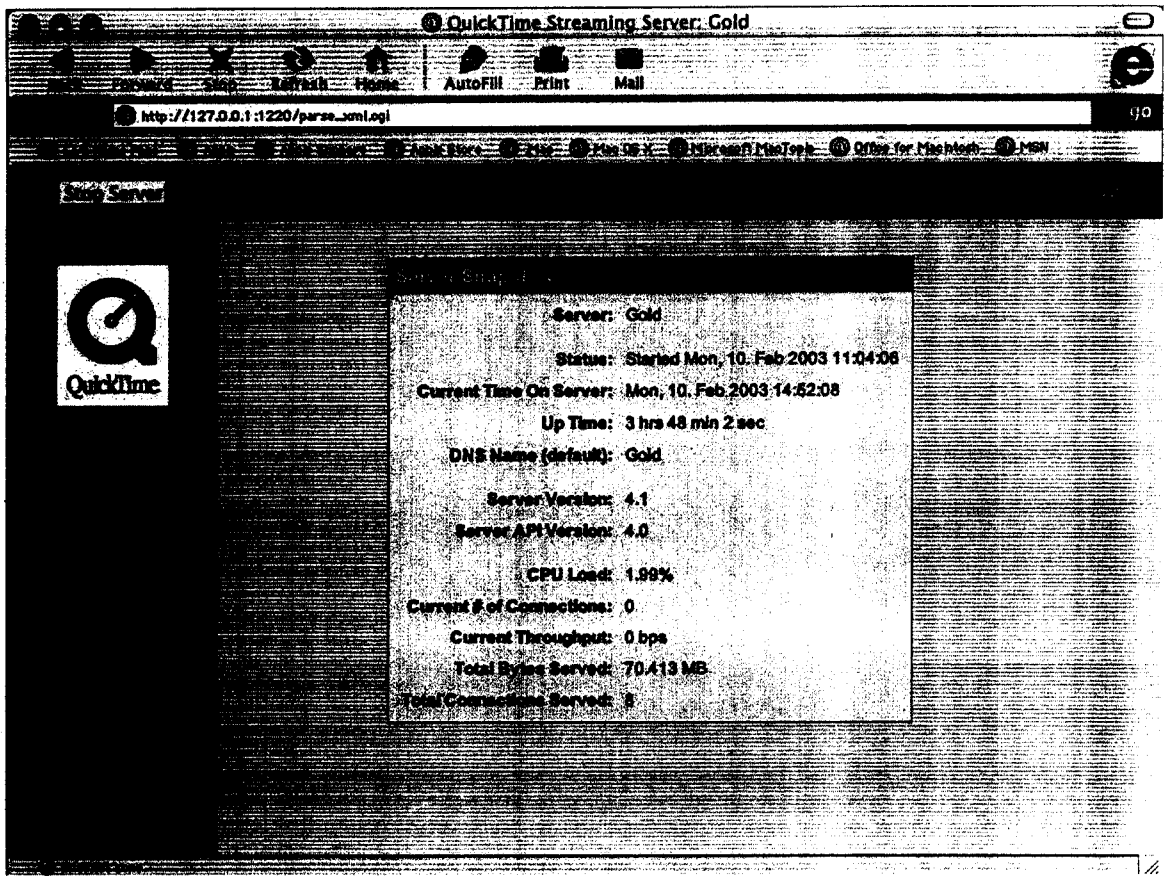
Screen showing the Login interface for Quicktime Streaming Server



MANAGING STREAMING SERVER

Screen showing the main screen of

Quicktime Streaming Server



Working With Connected Users :

To see the Connected Users pane, click Connected Users in Streaming Server Admin. In this pane, we can view information about the client users currently connected to the streaming server. We can display the information in a number of ways using the onscreen controls.

To change the number of entries displayed, choose a number from the "Display __ entries" pop-up menu.

To change how often the list is updated, choose a number from the "Page Refresh Interval" pop-up menu.

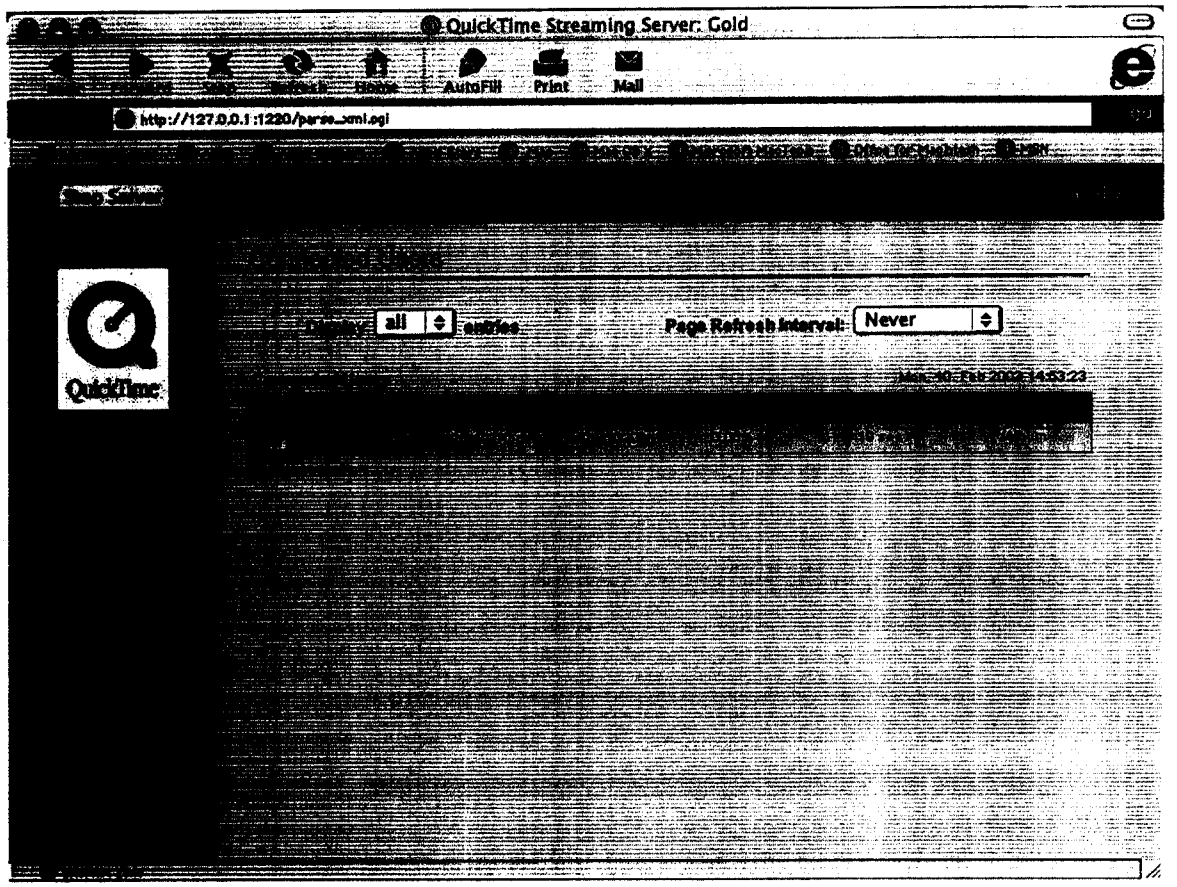
To select the sort column, click the column label by which we want to sort the user information.

To select the sort order, click the arrow next to the selected column label.

MANAGING STREAMING SERVER

Screen showing the List of Connected Users to

Quicktime Streaming Server



Changing Server Settings :

We can click the labels along the left side of the Streaming Server Admin screen to display various settings panes.

To change the settings for streaming service :

1. Click General Settings, Port Settings, Relay Settings, Log Settings, or Playlists.
2. Make the changes wanted and click Save Changes.

Working With General Settings :

Use General Settings in Streaming Server Admin to access the streaming server functions listed.

To see the general settings, click General Settings.

"Media Directory" contains the media files available to streaming server clients. The files must be properly formatted streaming media files. The media files must be located in the media directory.

"Max. Number of Connections" lets us set the maximum number of connections.

"Max. Throughput" lets us set the maximum throughput of the server. If the maximum throughput is reached, no one else can connect.

"Change Admin Username/Password" lets us change the server administrator's user name and password.

Working With Port Settings :

We can view and change port settings in Streaming Server Admin.

To see the port settings, click Port Settings.

"Streaming on Port 80" lets us serve QuickTime streams over HTTP port 80.

Working With Log Settings :

We can view logs and change log settings in Streaming Server Admin.

To see the log settings, click Log Settings.

"Error Log" shows error and informational messages. Use this log to troubleshoot problems with the server.

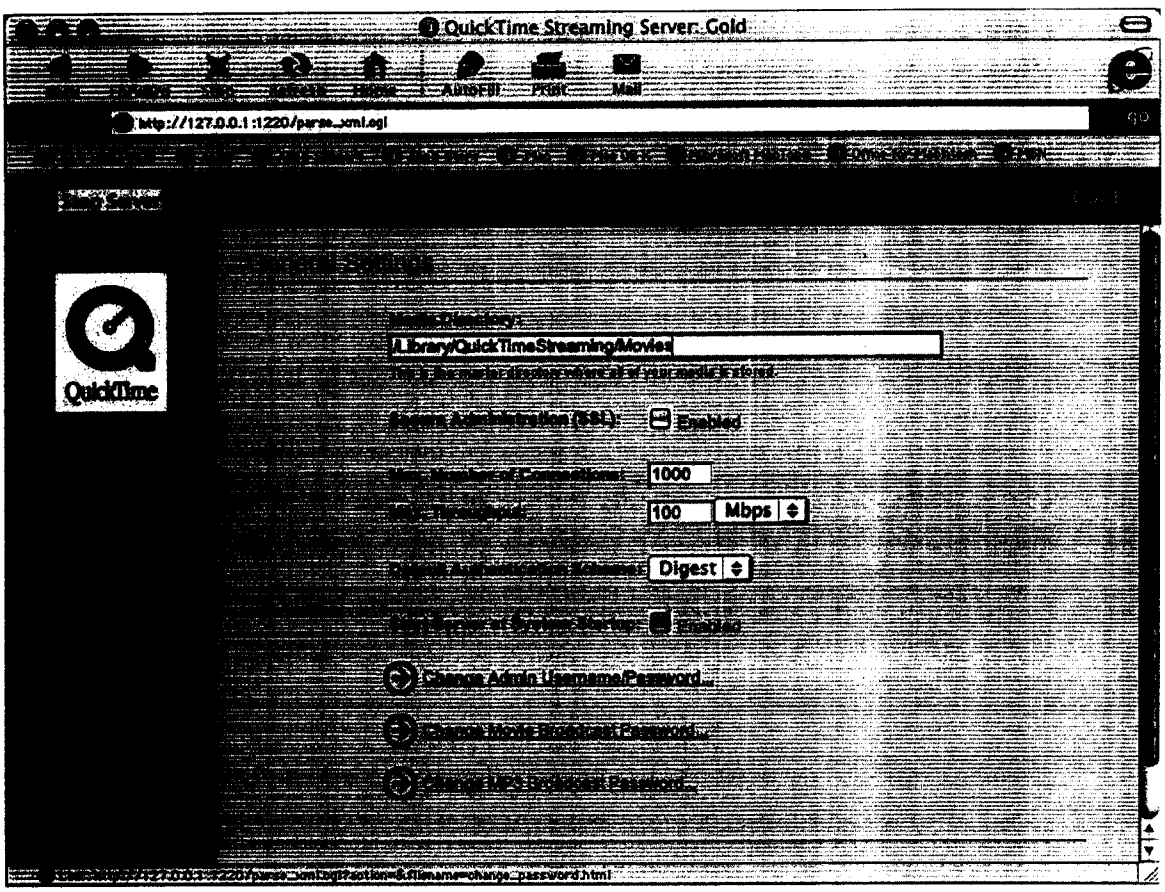
"Access Log" shows the number of times each media file has been accessed, when it was accessed, and who has accessed it since the log was reset.

Access errors are also reported in the log.

MANAGING STREAMING SERVER

Screen showing the General Settings of

Quicktime Streaming Server



2.1.4.3 Preparing Pre-recorded Media :

Prerecorded media can be played back as a simulated live stream in a playlist when prepared properly.To prepare prerecorded media for broadcast in a playlist , we must compress the audio and video files using different codecs. There are many codecs available in Quicktime Pro for both audio and video. An example codec used for audio compression is QDesign Music 2 Codec and the for video compression it may be Cinepak / Sorenson etc..,

The necessary steps to be taken while preparing medias are :

1. All audio tracks should use the same encoding, sampling rate, compression, and bit rate. All video tracks should also use the same encoding, compression, and bit rate.

2. Use the same frame size for each video track.

3. For movie playlists, be sure each media file is a hinted QuickTime movie
   or a hinted MPEG-4 file.
   For an MP3 playlist, each file must be an MP3 audio file with the same sample rate.

4. Copy all media files to the streaming server.

Movies that are intended for streaming via QuickTime Streaming Server must be hinted. Since Quicktime was chosen by ISO as the file

technique called Hinting. Hinting creates a track for each video and audio source in the file that tells the Quicktime streaming server how and when to deliver each frame of media. These hint tracks are created during the encoding process during which media is divided into small pieces / packets that are delivered in a stream one after the other.

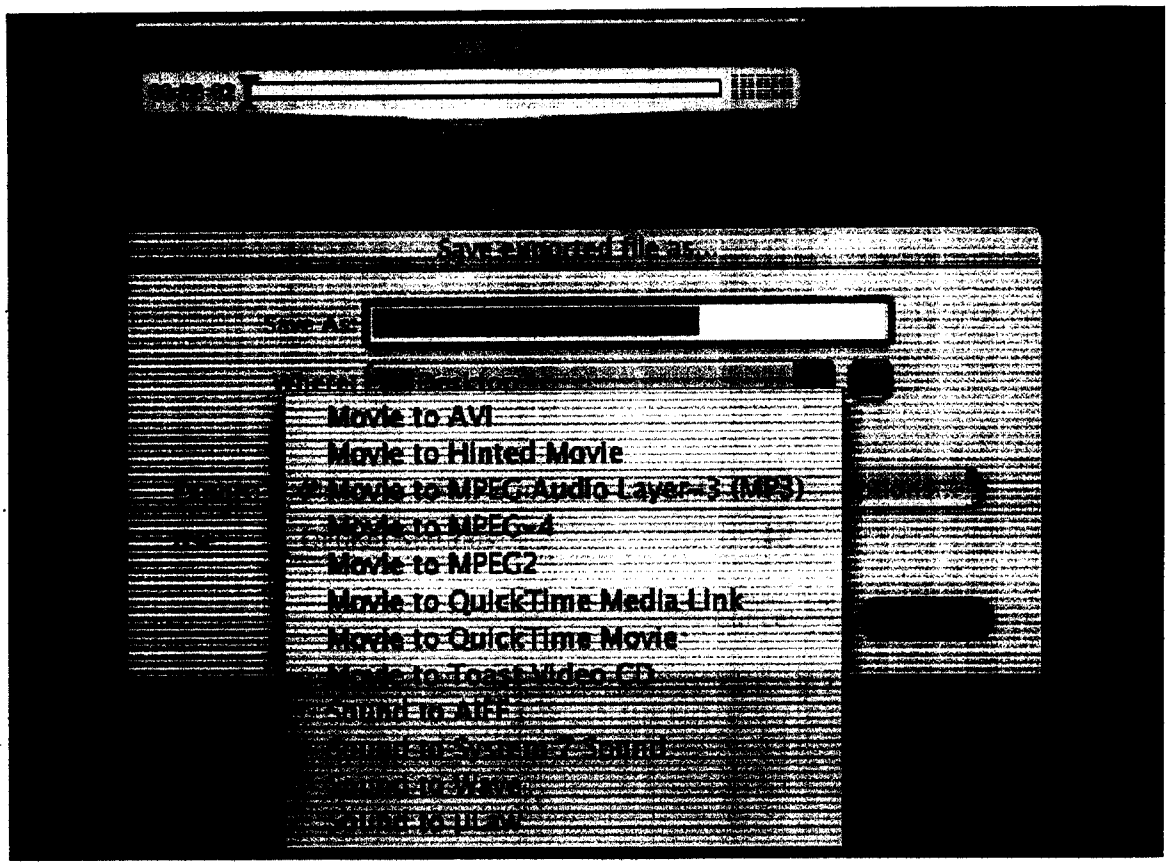
Simplest hinting method :

If the movie is already compressed and the data rate is set, choose Movie to Hinted Movie from the Export pop-up menu. Choose Default Settings from the Use popup ; these usually work fine. Hit OK and we're done. If the movie contains video, click Options . . . to see the Movie Settings dialog. Choose the video size and compressor settings in the Video section and the audio compressor settings in the Sound section. Check the Prepare for Internet Streaming box and choose Hinted Streaming from the pop-up menu. Once the medias are compressed , they are prepared for different bandwidths so that users choosing their respective modem rates receive the medias accordingly.

PREPARING PRE-RECORDED MEDIA FOR

STREAMING

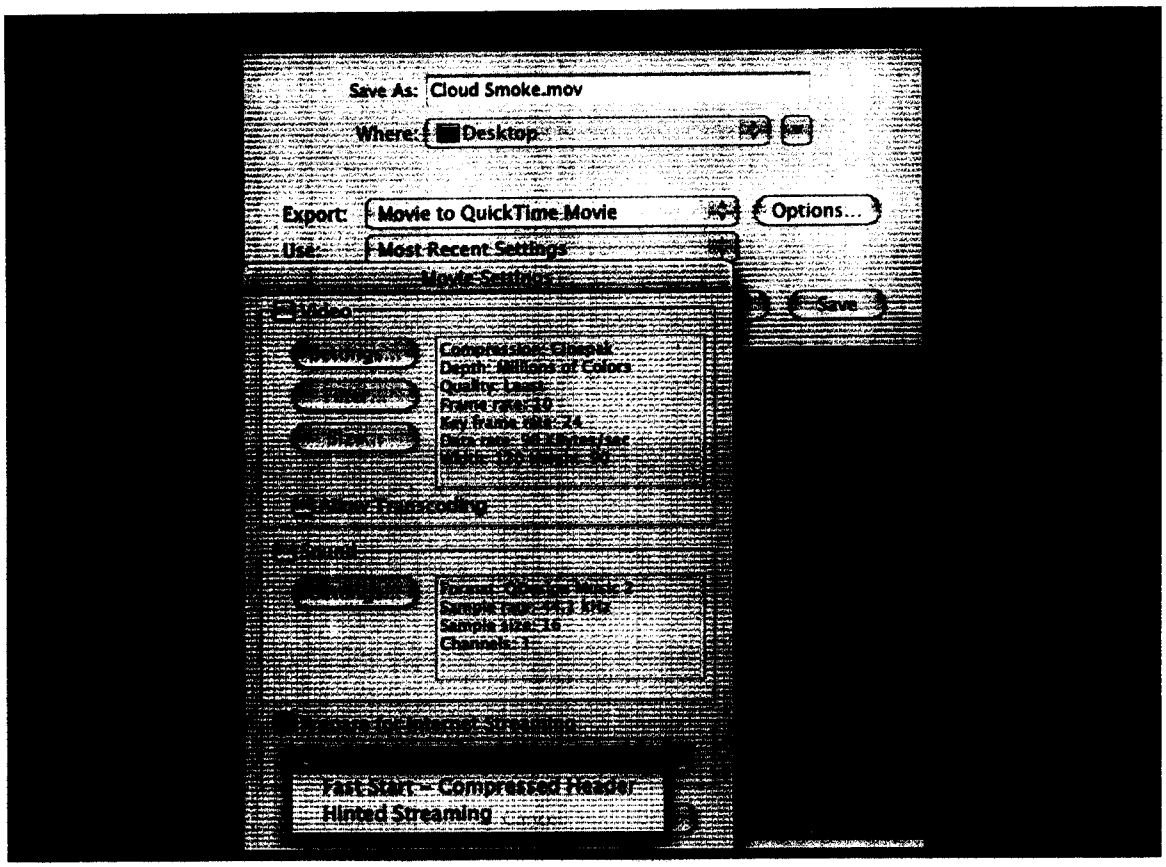
Screen showing the MP3 Media



PREPARING PRE-RECORDED MEDIA FOR

STREAMING

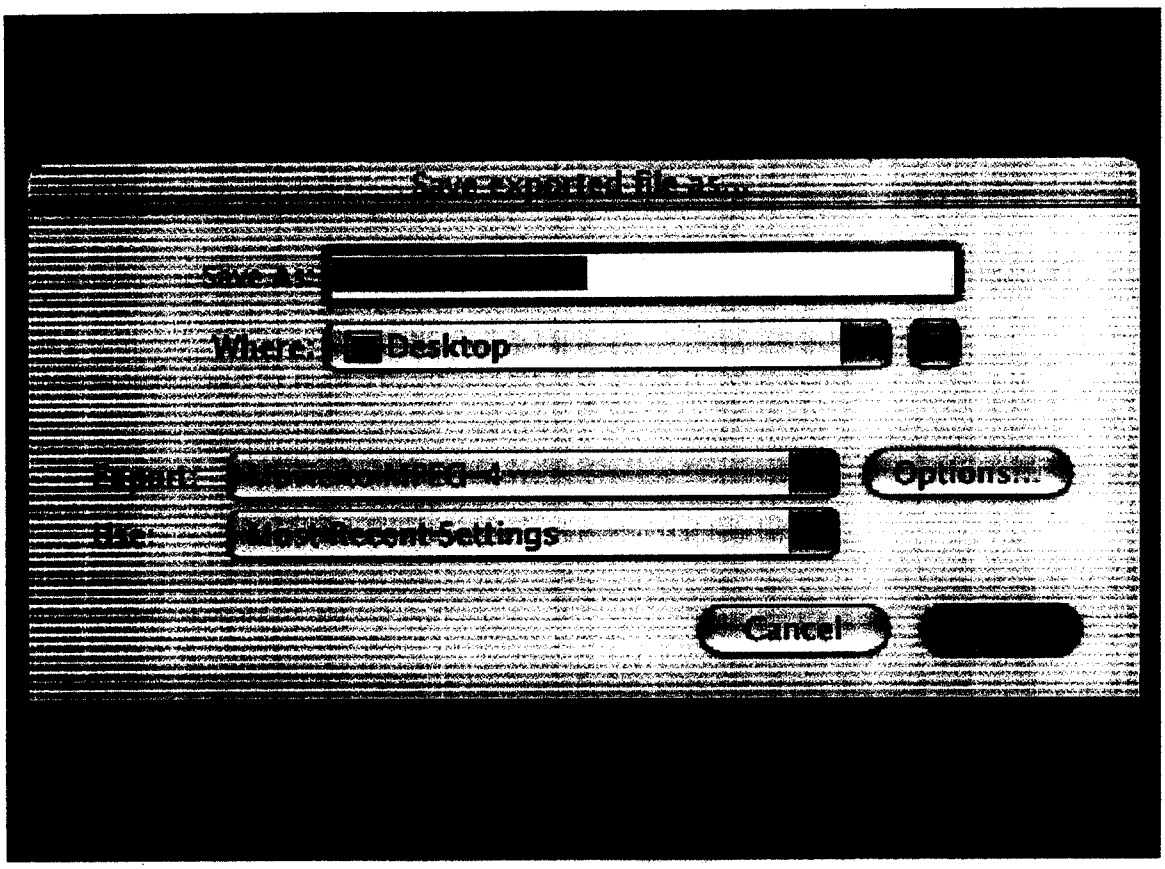
Screen showing the Mov File



PREPARING PRE-RECORDED MEDIA FOR

STREAMING

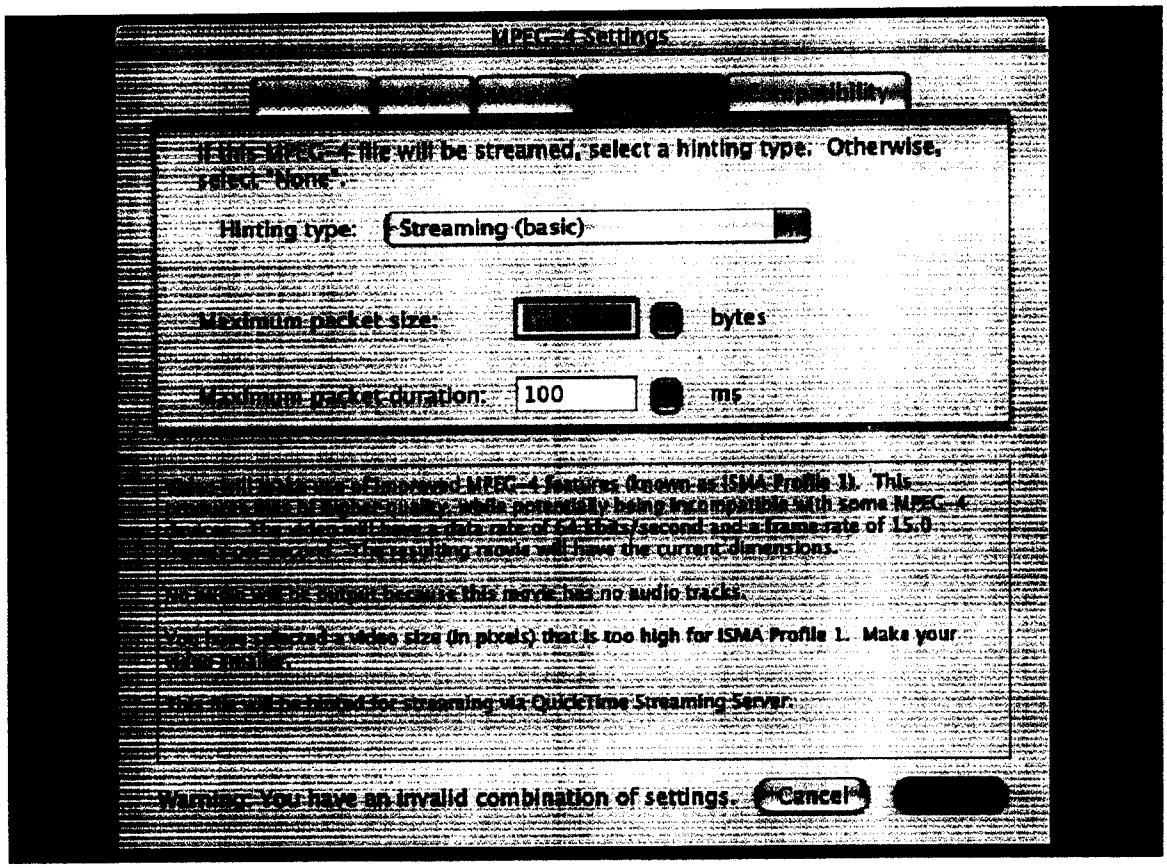
Screen showing the MPEG-4 File



PREPARING PRE-RECORDED MEDIA FOR

STREAMING

Screen showing the MPEG-4 File Settings



2.1.4.4 Creation of a virtual internet radio / television station :

Playlists are sets of media files in the QuickTime Streaming Server media folder specified to play one after the other or in random sequence. The medias can either be accessed and played as per the user's wish or the users can tune into the particular media just like a FM broadcast and receive media from the point where it is played at that part of time. We can create a virtual "radio station" or video broadcast by setting prerecorded QuickTime media, MPEG-4, or MP3 files to play in a specified order. Setting up a series of playlists broadcasts the media to the streaming server, which sends the media to viewers in the sequence we set up (random or ordered). Although the media is prerecorded, it appears to viewers as a live broadcast. All viewers see the same media when they tune in to the broadcast.

To broadcast media in a playlist :

1. Prepare QuickTime, MPEG-4, or MP3 media.
2. Create a playlist.
3. Start broadcast service by clicking the Play button for each playlist.

Working With Playlist Settings :

We can change playlist settings in the Playlists pane of Streaming Server Admin. To see a playlist's settings, click Playlists, then click the name of the playlist we want to see in the Available Playlists pane, and click Edit Playlist. "Name" is the name we give our playlist. "Play Mode" can be one of three types:

"Sequential" broadcasts the media in the order in which it appears in the playlist file. When the last media file has ended, the broadcast stops.

"Sequential Looped" broadcasts the media in the order in which it appears in the playlist file. When the last media file has ended, the playlist repeats in the same order.

"Weighted Random" broadcasts the media in random order using the specified weights to determine how often an item plays. The higher the weight, the more often the item is played. The media plays until we stop the broadcast.

"Repetition" lets us set the number of items that must play before an item can repeat. "Genre," available only for MP3 playlists, lets us choose a category to display in MP3 players that tune in to our broadcast. Click the Remove Item button to remove selected items from the playlist. Enable logging for each playlist by clicking the "Log this playlist's activity" checkbox.

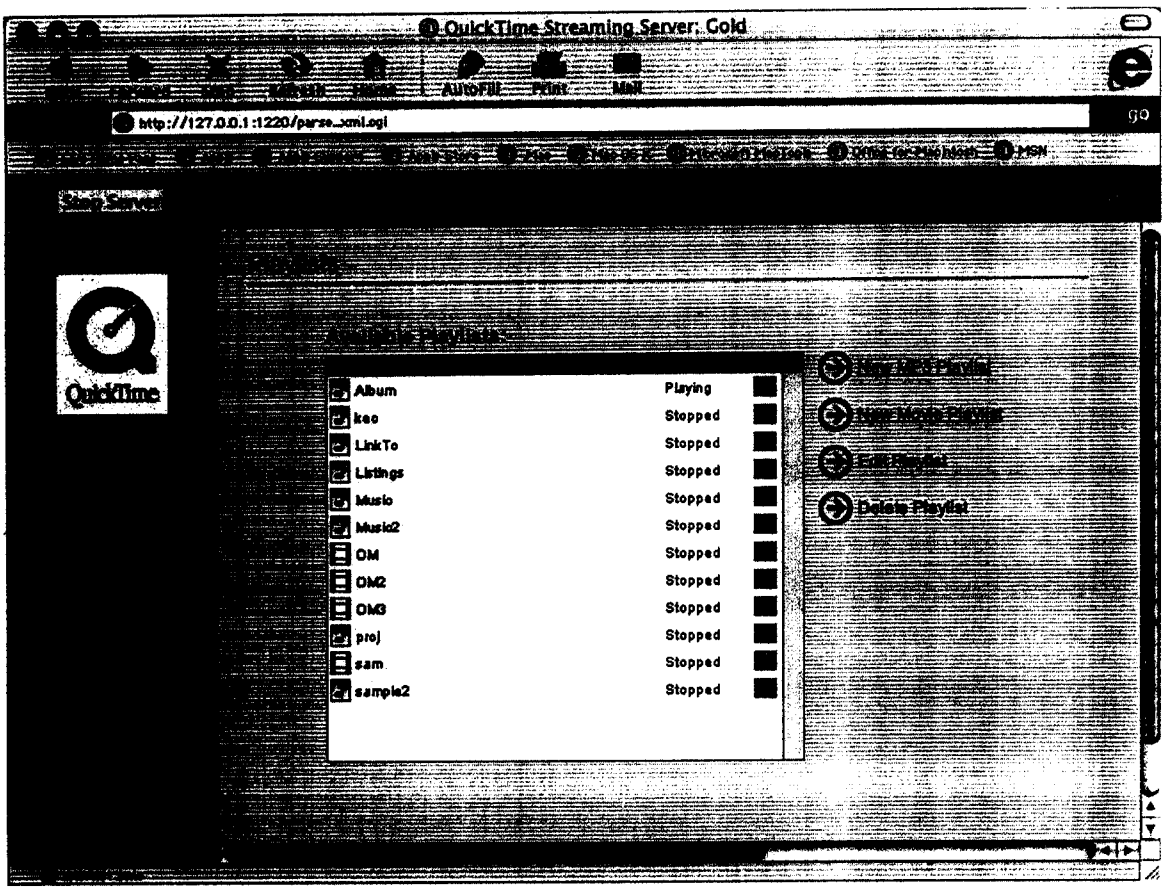
Starting and Stopping Playlists :

We can start and stop broadcasting playlists in the Playlists pane of Streaming Server Admin.To start broadcasting a playlist, click the Play button next to the name of the playlist.To stop broadcasting a playlist, click the Stop button.

MANAGING STREAMING SERVER

Screen showing the Playlists in

Quicktime Streaming Server



Creating a Playlist :

We can create a playlist of movies, MPEG-4 files, or MP3 audio tracks.

1. Click Playlists in Streaming Server Admin.
2. Click New MP3 Playlist or New Movie Playlist.
3. Enter a name for the playlist.
4. Choose a play mode from the pop-up menu.
5. Enter a number in the Repetition field to set how often an item can repeat.
6. If this is an MP3 playlist, choose a category from the Genre pop-up menu.
7. To add an item to the playlist, drag it from the Available Media column into the Items in This Playlist column.
8. To remove an item from the playlist, click it in the Items in This Playlist column, then click Remove Item.
9. Drag items up or down in the list to change the order in which they're played.
10. Use the Weight column to establish the weight for items (if we're broadcasting randomly).
11. Click "Log this playlist's activity" if we want a log of the playlist's activity.
12. Click Save Changes to save the new playlist.

Changing a Playlist :

We can change a saved playlist of movies or MP3 audio tracks.

To edit a playlist :

1. Click Playlists in Streaming Server Admin.
2. Click a playlist name.
3. Click Edit Playlist.
4. Choose a play mode from the pop-up menu.
5. Enter a number in the Repetition field to set how often an item can repeat.
6. If this is an MP3 playlist, choose a category from the Genre pop-up menu.
7. To add an item to the playlist, drag it from the Available Media column into the Items in This Playlist column.
8. To remove an item from the playlist, click it in the Items in This Playlist column, then click Remove Item.
9. Drag items up or down in the list to change the order in which they're played.
10. Use the Weight column to establish the weight for items (if we're broadcasting randomly).
11. Click "Log this playlist's activity" if we want a log of the playlist's activity.
12. Click Save Changes to save the changes to the playlist.

If we make changes to a playlist that is currently running, you need to stop and restart the playlist.

Deleting a playlist :

We can delete a saved playlist of movies or MP3 audio tracks by following these steps.

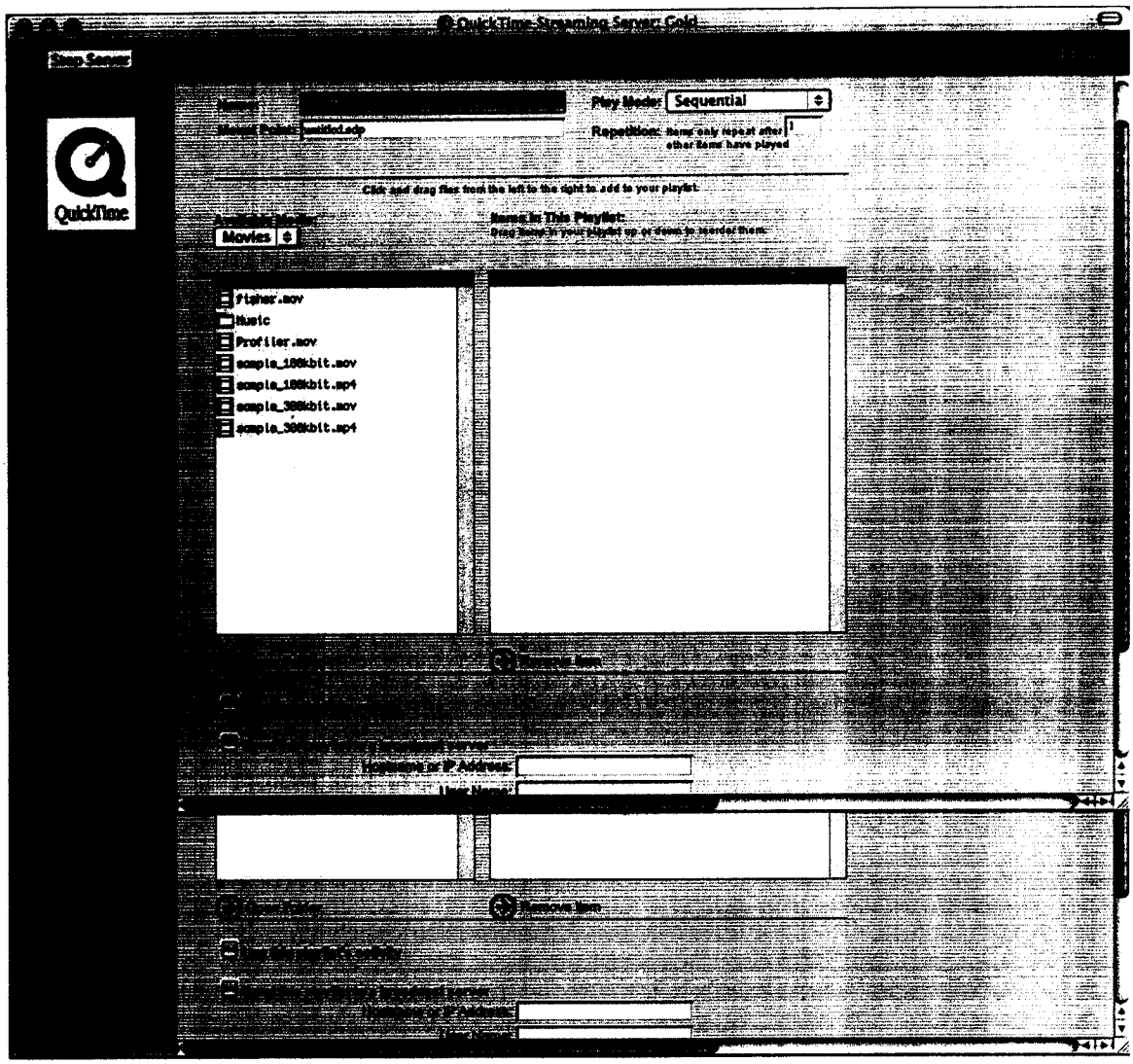
1. Click Playlists in Streaming Server Admin.

3. If the playlist is running, click the Stop button.
4. Click Delete Playlist.

MANAGING STREAMING SERVER

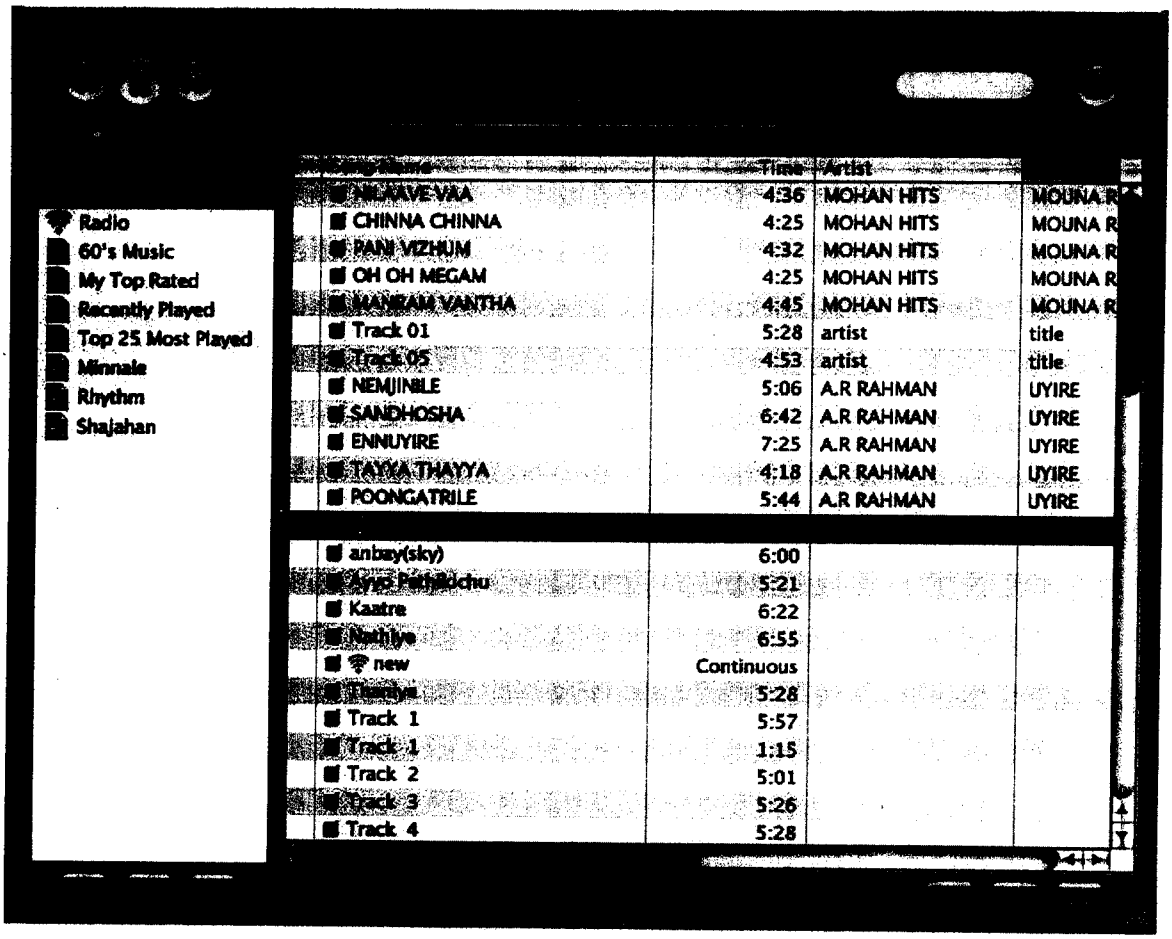
Screen showing the Playlist Editing of

Quicktime Streaming Server



MANAGING STREAMING SERVER

Screen showing the Client's Playlist



2.1.4.5 Creation of a Website :

If we want users to view streamed media through a web browser, we must set up a web page to show the media. Then give users the URL of the web page.

The web site consists of

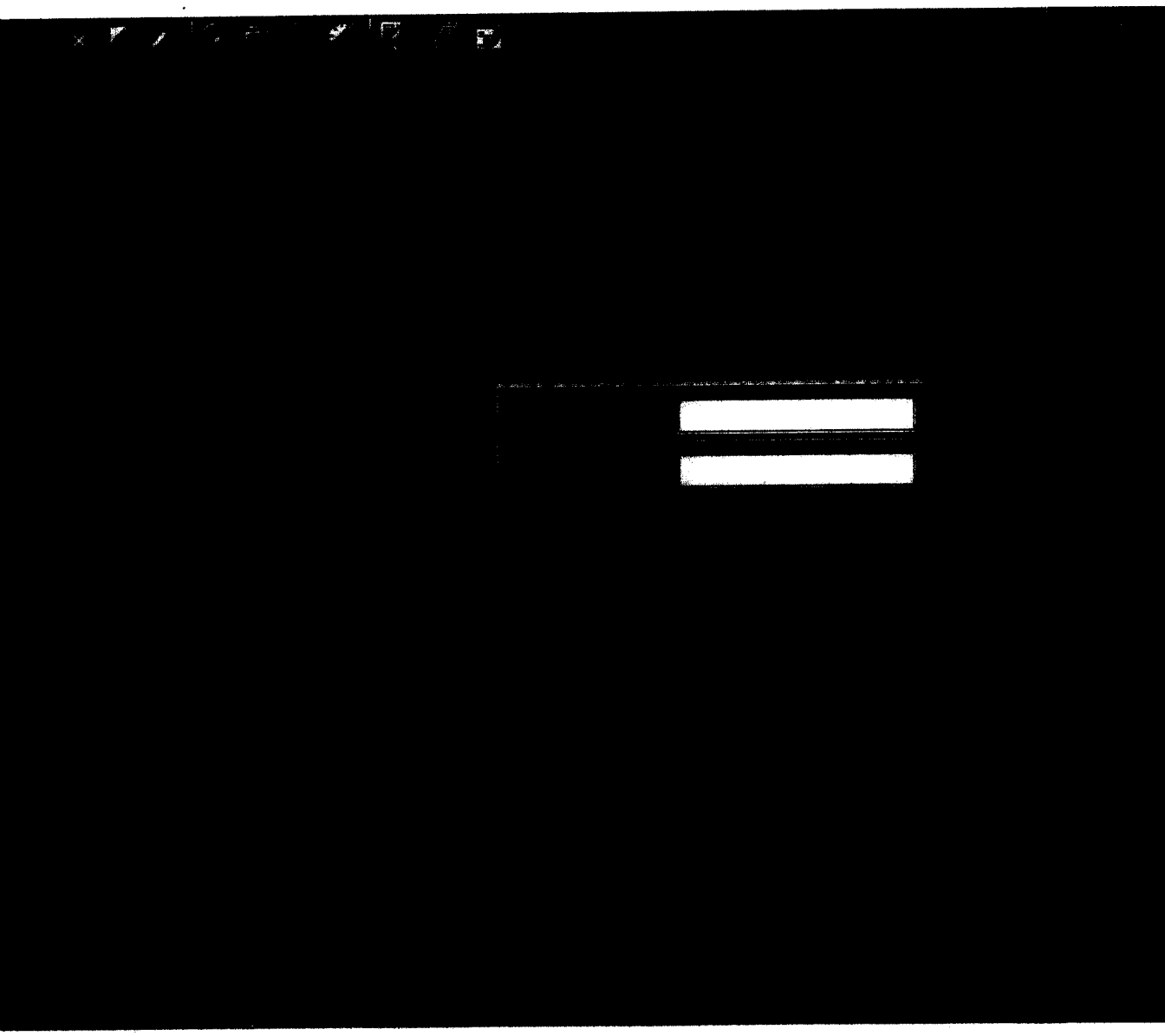
- A login page
- A registration page
- Bandwidth selection process page
- Audio files choosing page
- Video files choosing page

The users can register themselves in the website and then log in afterwhich they will be allowed to access the medias. Before the medias are accessed , the users must choose their bandwidths depending upon their modem rates. Based upon the bandwidth chosen , the users will receive the medias which are prepared for different bandwidths. Next , the users will be provided with audio files and video files dealt with either company lectures / meetings / study materials / movies which they can listen to or watch after being streamed to their computer.

When a user starts to play streamed media through a web page, the QuickTime plug-in sends a request to the streaming server. The server responds by sending the multimedia content to the client computer. The type of multimedia that is sent to the client computer depends on what content we specified on the web page. If we linked to a playlist created on the streaming server, that's sent. If we linked to a QuickTime movie in the specified media directory, that movie is sent.

WEB SITE FOR CLIENT SIDE USAGE

SCREEN SHOWING THE LOGIN AND REGISTRATION PAGE

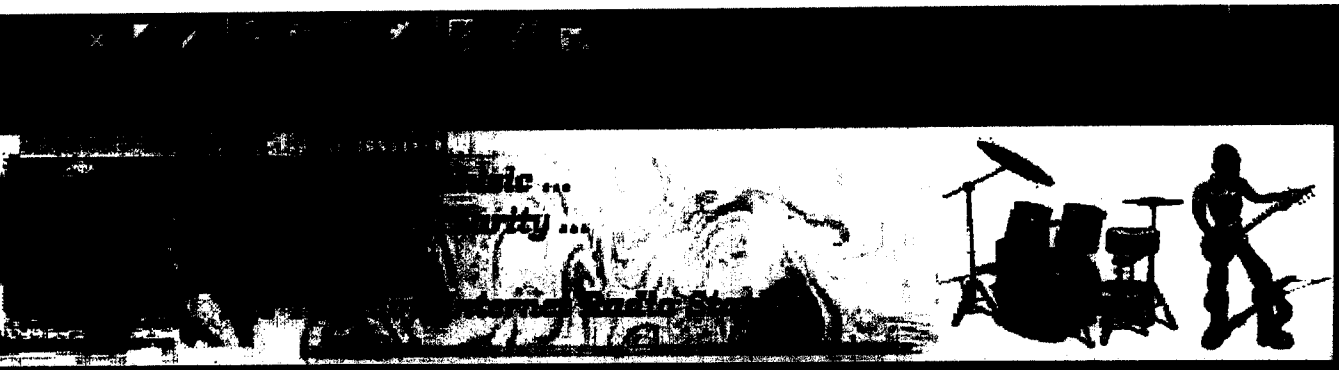


WEB SITE FOR CLIENT SIDE USAGE

SCREEN SHOWING THE BANDWIDTH SELECTION PAGE

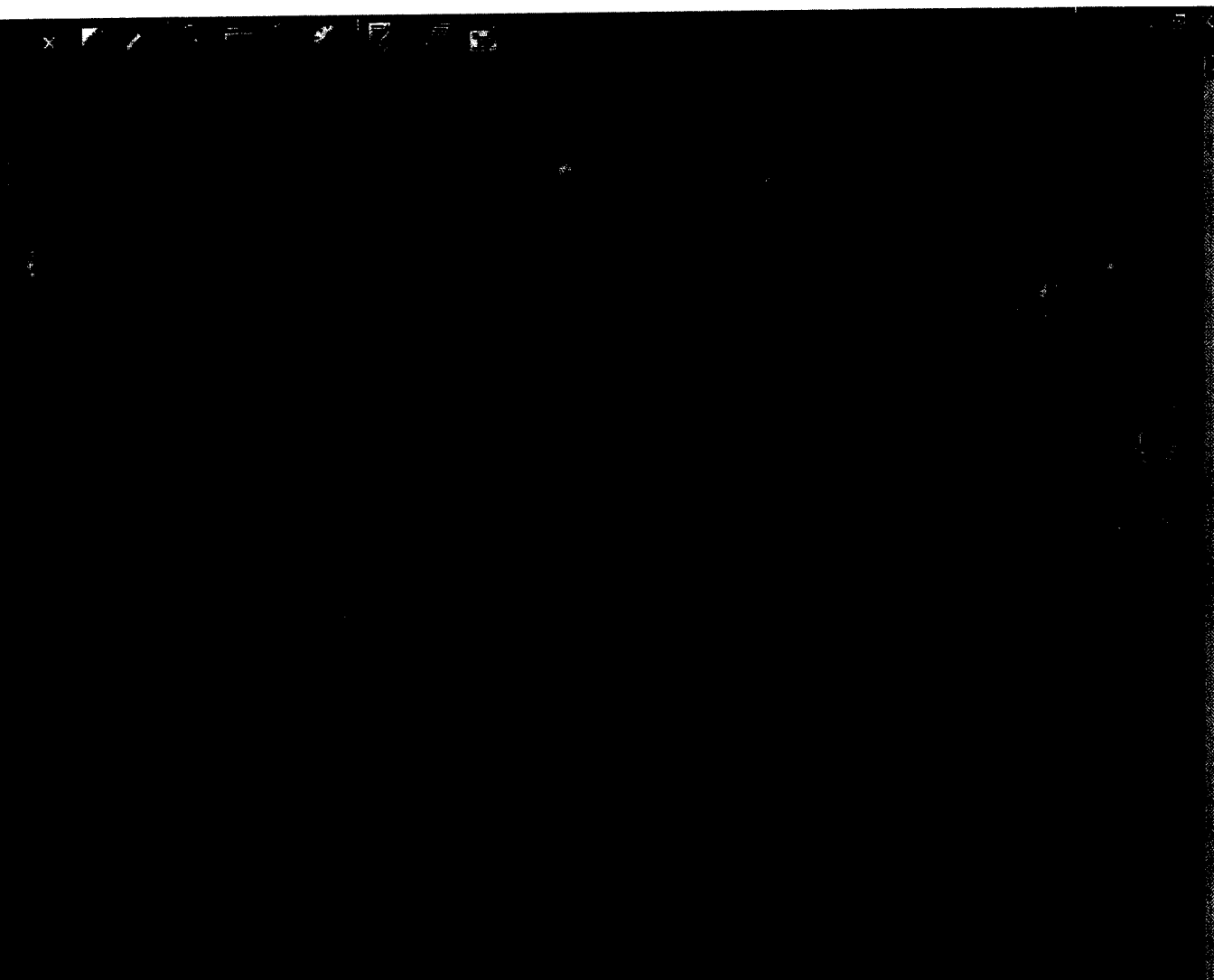
WEB SITE FOR CLIENT SIDE USAGE

SCREEN SHOWING THE AUDIO GALLERY PAGE



WEB SITE FOR CLIENT SIDE USAGE

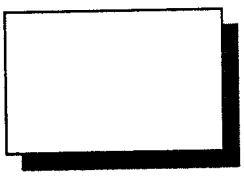
SCREEN SHOWING THE VIDEO GALLERY PAGE

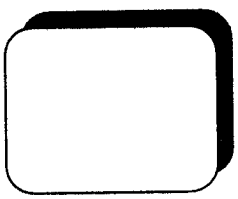


3.1 Dataflow Diagram

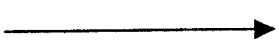
Dataflow diagrams are one of the various methods to show the flow of data within the module and is an useful and intuitive way of describing a system. It describes about end-to-end processing , that is, the flow of processing from when data enters the system to where it leaves the system can be traced.

The various symbols used in the Data flow diagrams are as follows :

SOURCE OF DATA 

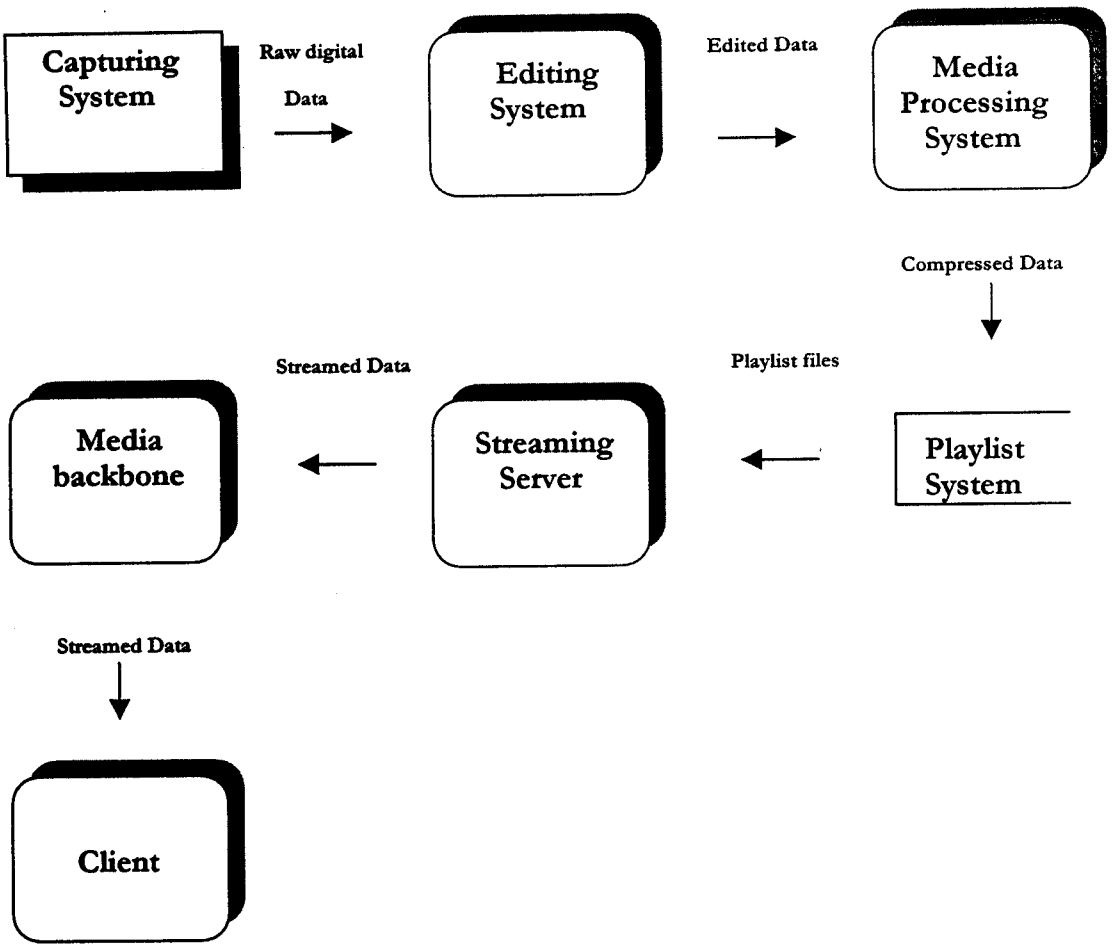
PROCESS 

DATASTORE / DATABASE 

DATAFLOW 

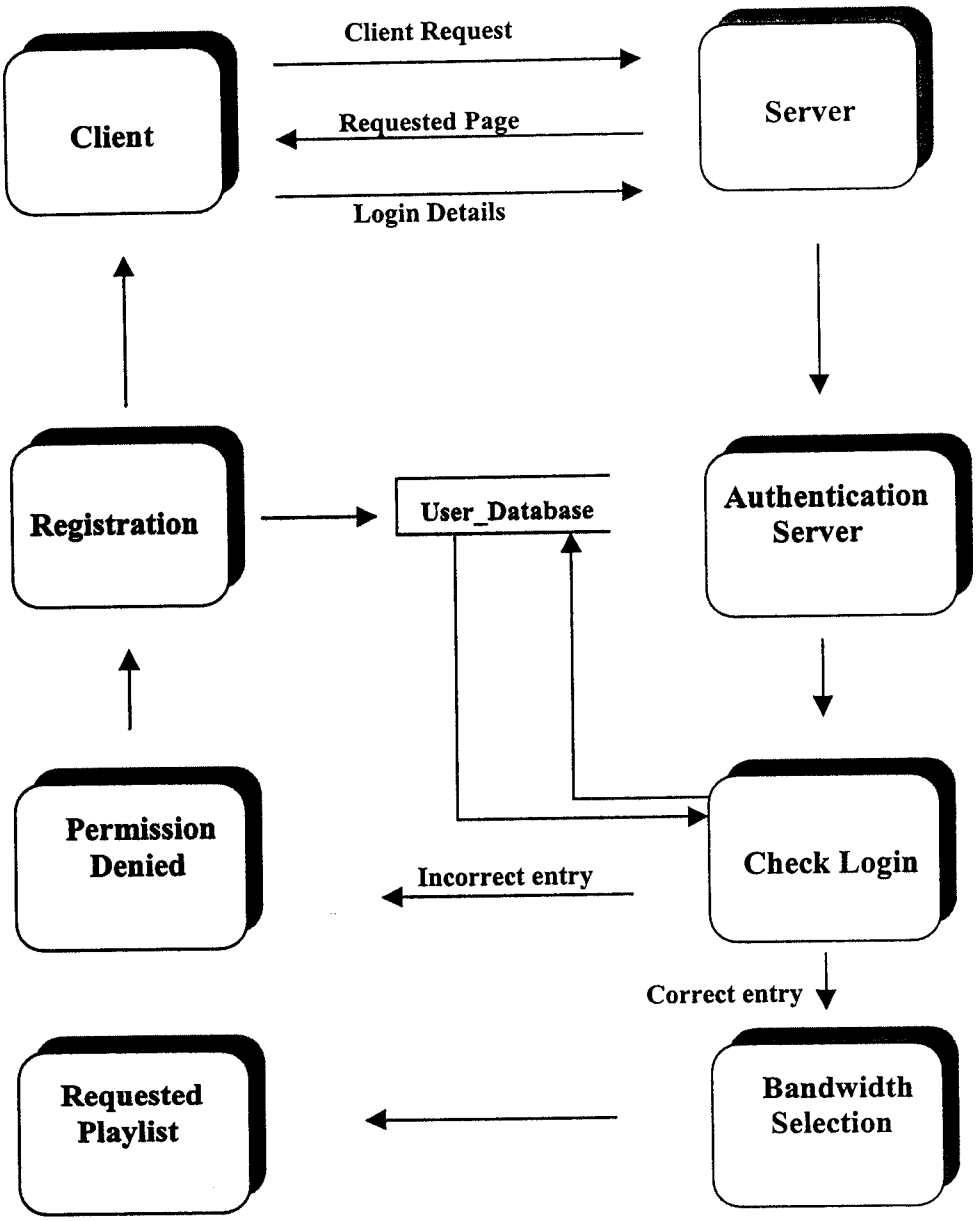
DATAFLOW DIAGRAM

WORKFLOW PROCESS OF WEB STREAMING



DATAFLOW DIAGRAM

ACCESSING MEDIAS THROUGH WEB SITE



DATABASE DESIGN

3.2 Creation of a database

The database creation is one of the crucial part of work related to the system development. In most cases , the database is the source for all activities to be performed on the system. In this project , the user's details are stored in the database. Whenever a new user tries to enter the system , they must first register and then are allowed to enter the website . In case an unregistered user tries to log in , he/she will be asked to register first and then log in . This part of the database creation ensures security while logging in to the system.

Authentication table :

Field name	Type	Size	Constraint
User ID	Varchar	10	Primary key
Password	Varchar	10	Not Null

Registration table :

Field name	Type	Size	Constraint
User ID	Varchar	10	Foreign Key
Father's name	Varchar	10	Not null
Address 1	Varchar	20	Not null
Address 2	Varchar	20	-
Pincode	Number	6	Not null
Country	Varchar	10	Not null
Phone	Number	8	Not null
Email ID	Varchar	30	Not null

4. TEST PLAN

Objectives of Testing:

The Objectives of testing are as follows :

1. Testing is a process of executing a program with the intention of finding an error.
2. A good test is one that has a high probability of finding an undiscovered error.

For most developers , testing is probably the least favourite aspect of the Web development process. After all the hard work of specification , design and implementation , most people are ready to just launch the site. But testing is key to a positive user. We must not force our users to test our site after its release. If they encounter bugs with what is considered a production site ,they wont be forgiving. Unfortunately , most developers considers that if the site looks right , it is right. Yet web design doesn't include visual design alone.We must test all other aspects of site design as well . The basic aspects of web testing are

❖ **Visual Acceptance Testing :**

Visual acceptance testing ensures that the site looks the way it was intended. We must view each of the pages in the site and make sure that they are consistent in layout , colour and style. We must test the site under different browsers and resolutions.

❖ **Functionality Testing :**

Functionality testing and visual testing overlaps in the sense that the most basic function of a page is to simply render onscreen. However , most sites contain atleast basic functions such as

rectify any broken links. Broken links should be considered catastrophic functional errors.

❖ **Content Proofing :**

The content details of a site are very important. We must make sure that contents are in place and that grammar and word usage is consistent and correct. Details such as Copyright dates and trademarks must be checked along with the spellings. Clients and users often will regard an entire site as being poor just on the basis of one small typo.

❖ **System and Browser Compatibility Testing :**

We must make sure to browse the site with the same types of systems and browsers the site's users will have.

❖ **User Acceptance Testing :**

User acceptance testing should be performed after the site appears to work correctly.We must let the users try the working site and comment on it one last time. We must not perform this type of testing until the more obvious bugs have been rectified. It is an important form of testing because it most closely simulates real use.

5. IMPLEMENTATION AND MAINTENANCE

Once a web server is installed and successfully delivering content to its users, there are a great number of maintenance tasks that should take place. Servers must be continually monitored for availability , performance and security. Site content must also be checked for accuracy and freshness as content probably will be continually added and deleted. As visitors use the site , their usage patterns should be analyzed to determine which sections are being used as well as which are not. Usage analysis can lead to further modification of the site.

6. FUTURE SCOPE

In future , the present form of streaming medias which are pre-recorded can be further enhanced to support live streaming with the help of a DV Camera and a Broadcasting software such as Quicktime broadcaster using the RTP / RTSP protocols. This enables the users to experience live content of lectures , concerts and speeches.The broadcasting software encodes a live source such as video from the camera in real time and delivers the resulting stream to the server. The server then serves or reflects the live streams to the clients.

7. CONCLUSION

The implementation of Apple's Quicktime technology to serve streamed medias has been implemented in such a way that the Quicktime streaming server functionalities are utilized well and the medias are prepared well for streaming .With the creation of a website , the clients are able to access the medias by means of a web based interface wherein allotment of medias are according to the client's selection of bandwidth. The users can listen to / watch medias as if they are watching a live content which is made possible by means of creating a virtual internet radio/television station. Through this project , distant learning classes , corporate communications to employees , customers , suppliers or shareholders and recorded concerts / presentations are made possible.

8. REFERENCES

1. www.apple.com
2. "ASP 3 Programming Bible" - Eric A.Smith
3. "The Complete Reference HTML" – Thomas A.Powell