A Video Sharing Platform for mobile devices using Data Grid Technology.

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Abstract:

In wireless network there is limitation of storages space and characteristics their will extraordinary challenges to sharing the video files for mobile devices. To solve this problem, we use Mobile grid system for wireless network and P2P protocol and also propose architecture to establish video file sharing platform for mobile devices. We sharing video file from mobile devices using Index server to Node server for client mobile device.

***Keywords**: Grids, peer-to-peer systems, Replica Location Service, resource discovery service Stream Data Processing.*

1. Introduction:

Sharing creates new possibility of entire world and human life, the sharing that we are concerned with is primarily file exchange and also direct access to computers, software, data, and other resources, as is required by a range of collaborative problem solving and resource-brokering strategies emerging in industry, science, and engineering. File sharing is necessarily, highly controlled, with resource providers and consumers defining clearly and carefully just what is shared, who is allowed to share, and the conditions under which sharing occurs. Wireless grids Better use or resources improved energy, power and spectral efficiency. It is very difficult to download the file in our mobile due to the wireless network limit, unstable characteristic and restricted storage space, and so mobile users face challenges in establishing connections with other users for sharing video, files. Internet users need a place to share their video clips. YouTube saw their demand and becomes the pioneer of video sharing website. Users can establish personal theaters, movie issue stations, and news stations in YouTube to substitution tradition communication media

The remaining of this paper is organized as follows: section 2 explains the background of file sharing mobile. Section 3 Explains Different Data Transfer techniques for mobile devices .Section 4 Explain Different modules used by system. Section 5 Explain Administration System. Section 6 Explains UML Diagrams for the system .Section 7 Explains Language used by System implementation. Section 8 Explains Implementation snapshot for the System .Section 9 Explains Conclusion and Future section .10 gives the References.

2. Background:

For developing P2P collaborative application in a mobile devices ad hoc networking devices, and close mobile devices establish a cooperative while they are also connected to the cellular network. One of the most critical characteristics of the mobile grid system is the intermittent connectivity of mobile devices. We can find similar situations in Peer-to-Peer computing area. In general, P2P system consists of huge number of computing devices and they can act either as a client or a server. In P2P, each machine's CPU cycles, storages, and contents can be shared in order to broaden their resource limitations

3. Different data transfer techniques for mobile devices:

3.1 Clint to Server: Well known, powerful, reliable server is a data source. Clients request data from server. Very successful model for WWW (HTTP), FTP and Web services. But the limitation of client and server is Scalability is hard to achieve, Presents a single point of failure , Requires administration , Unused resources at the network edge

3.2 Peer-to-Peer Protocol : Peer to Peer networks is that all clients provides bandwidth, storage space and computing power .Simply it means network of peer node acting as both server and clients For mobile devices it include: a)Short connection time b)Decreased levels of user interaction

3.3 Data Grid: Data Grids are grid computing systems that deal with data. They are built on next-generation computing infrastructures, providing intensive computation and analysis of shared large-scale databases, from hundreds of terabytes to petabytes, across widely distributed scientific communities. We adopted the Globus Toolkit as our Data Grid Infrastructure. The Data Grid environment provides solutions for security, video and data management, as well as information services .

3.4 The Globus project : To building grid system and application there is use Globus toolkit is an open source software toolkit. The Globus Toolkit developed within the Globus project provides middleware services for Grid computing environments. Major components include the Grid Security, Infrastructure (GSI), which provides public-key-based authentication and authorization services; resource management services, which provide a language for specifying application requirements, mechanisms for immediate and advance reservations of Grid resources, and for remote job management; and information services.

3.5 .net: It is used in internal domain name system.

3.6 Java CoG Kit: It combines Java technology with Grid Computing to develop advanced grid services and basic Globus resource accessibility.

4. Different modules used by system:

4.1. Client Module: This module will be implemented in J2ME used to connect to the Index Server running in web server (Tomcat). The client (J2ME) will be processed by the user by his user menu whether to upload or to download a file.The user can upload or to download a Text, Image file from the server by sharing the resources directly to another client through the server, in order to reduce wireless network limit, unstable characteristic and restricted storage space, so mobile users face challenges in establishing connections with other users for sharing video, image, text files.

4.2. Index Server Module: Index Server responsibility is to calculate the Work Load of the Server nodes (where the files are stored) and it will calculate the which server node is very effective by its least working load, so that the client's request can be forwarded to that Server node. In our scheme, after users log into the index server through hard-wired or wireless networks, the index server based on the loading on each server node will assign them to grid server nodes. Users can look up the file databases to find out videos they want, and download the file from the server.

4.3. Server Nodes Module: Server node process the redirected request from indexed server and sends the response to the client directly. Using GPRS connection.

5. File sharing Administration System:

5.1 Resource Sharing:

Resource sharing it gives resource requesters login to the index server through hard wired or wireless

network. User can see resource list database to find resources they want and where to connect to the user who owns the resource, and what other users also downloaded the resource and what other users also downloaded the resource from the server.

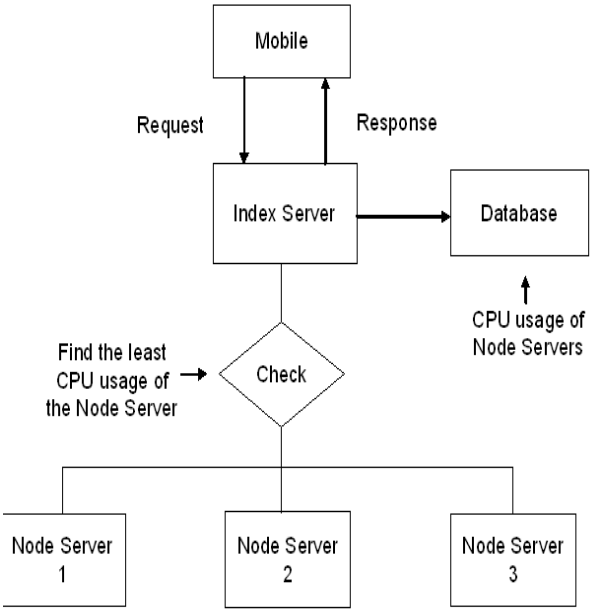

Figure 1: Administration System

5.2 Management: It consists of three part (1) Information Monitor, (2) Replica Manager, and (3) Data Transfer manager,

Information Monitor: Administrators can monitor the operational status of each machine through the System Information. Monitor being integrated into the Interface Manager. When unusual events occur, the System Information Monitor notifies the Administrator to respond appropriately, thus improving service satisfaction and productivity.

Replica Management: It can create and delete replicas at specified storage sites. A replica manager typically maintains a replica catalog containing replica site addresses and file instances. The Replica Manager periodically synchronizes data lists on all grid servers to ensure data list identical. If the access frequency of some files is high, the Replica Manager will save the files on grid servers, and delete them when access frequency is lower than a given threshold.

Data Transfer Management: It is responsible for data in data-intensive applications. it provides effective and secure transmission for users.

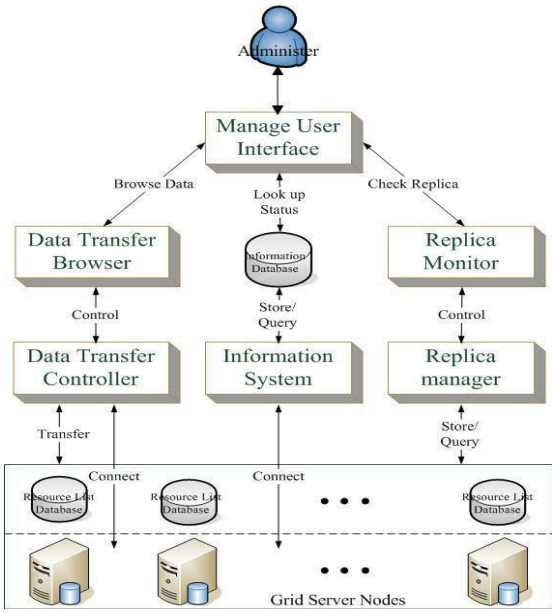

Figure 2: Administration Operation

5.3 Video Download and Upload:

In our scheme, after users log into the index server through hard-wired or wireless networks, they will be assigned to grid server nodes by the index server based on the loading on each server node. Users can look up the video databases to find out videos they want, and download the video from the server. We also provide the sharing method, if users want to share videos to other users. Users only need to upload their video to our servers; the Video Format Converter will convert them to Flash format and enroll them in the video databases. All videos are transmitted using the GridFTP protocol. The video download and upload scenario is depicted in Figure 3.

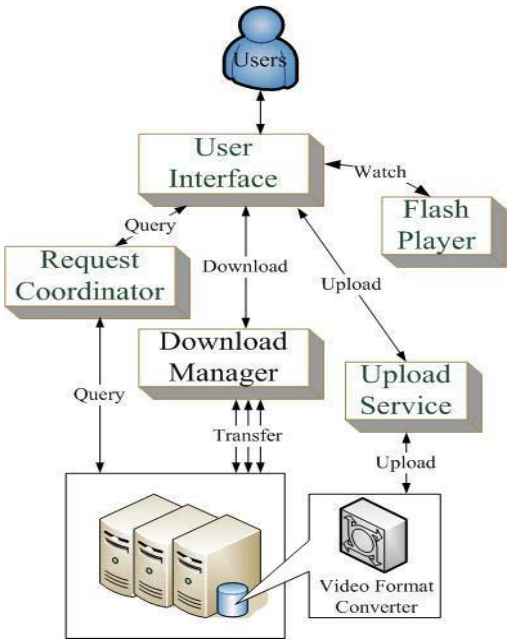

Figure 3: Operation of Client Devieces.

5.4 Download Strategy

Our system is a video sharing system as well as Gnutella, Napster, and many peer-to-peer network systems. Users can download file which they want and upload the possessive file which other users need at the same time. Our destination is fast network sharing for let anyone can fast get any files. To attain to multi-point download and resume broken download, files are divided in full chunks of 9,728,000 bytes plus a remainder chunk. Furthermore, valid downloaded chunks are available for sharing before the rest of the file is downloaded, speeding up the distribution of large files throughout the network. The system is designed for users to search the videos for users need. We also designed a management interface, with an integrated data transfer service, replica manager, and information monitor to facilitate user operation of the system. When uploads each chunks, sharer are gave a time T. If a chunk has not shared completely in the time, it will be gave to other people have this chunks to share. Avoid some sharer's network speed is too slow to cause the entire download speed to reduce (see Figure 4).

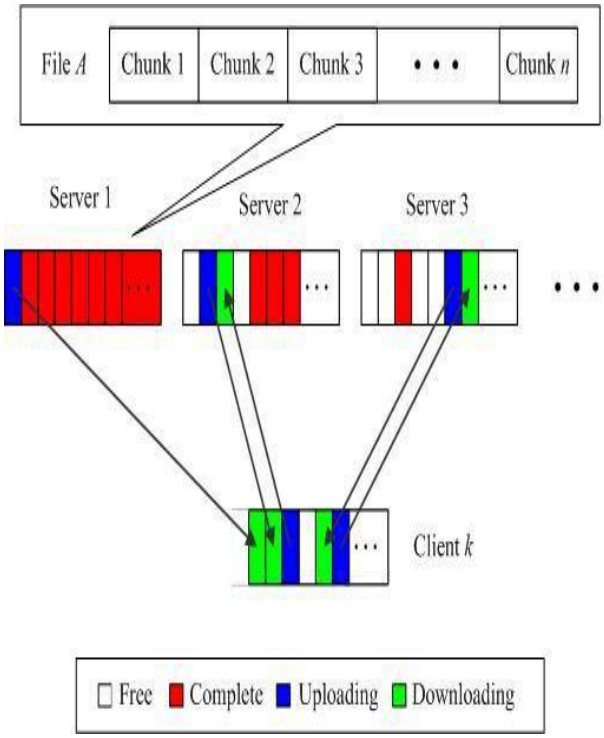

Figure 4: Video Download strategy

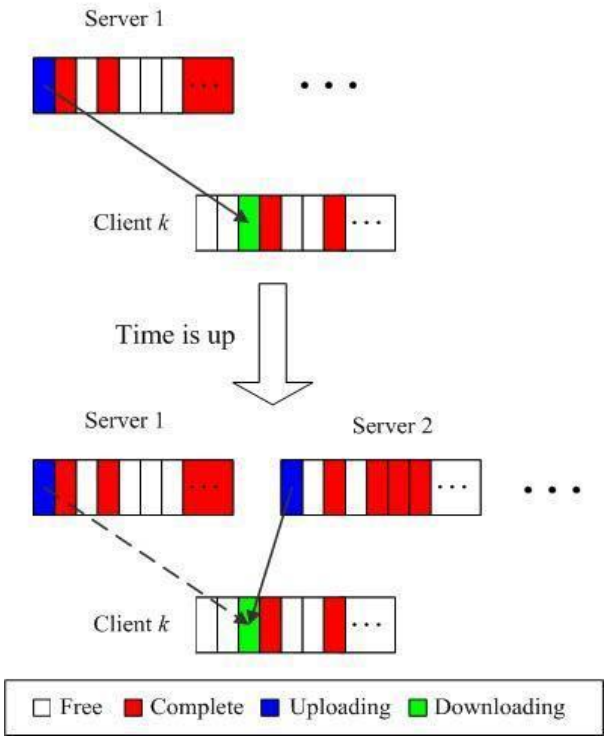

Figure 5: Time of upload chunk is up

5. UML Diagrams for the system.

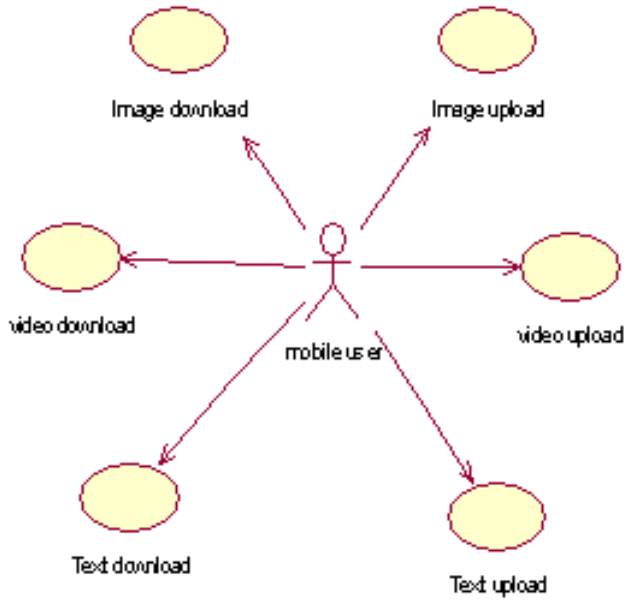

Figure 6: Use case Diagram for the mobile user system

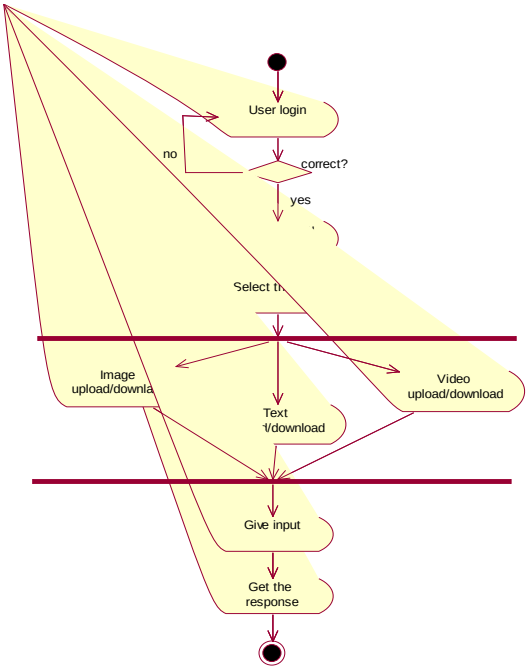

Figure 8: Activity Diagram for the system

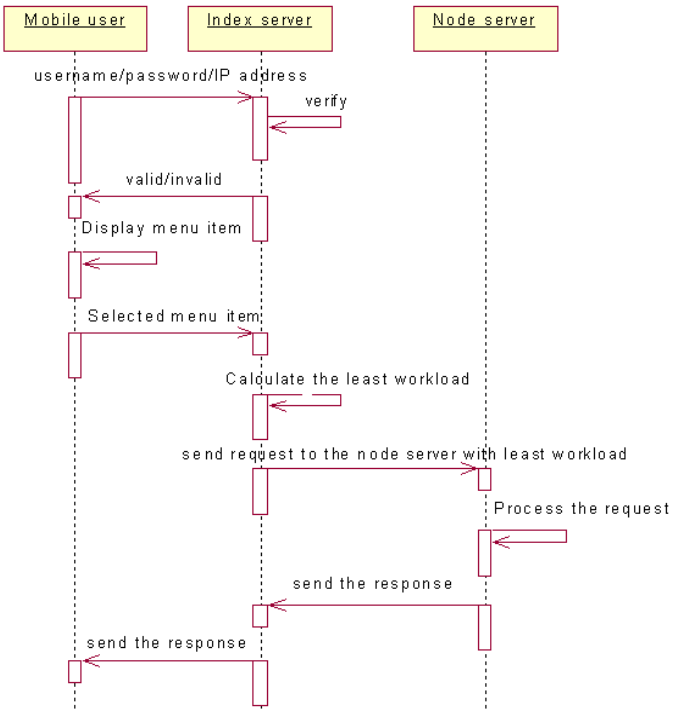

Figure 7: Sequence Diagram for the system

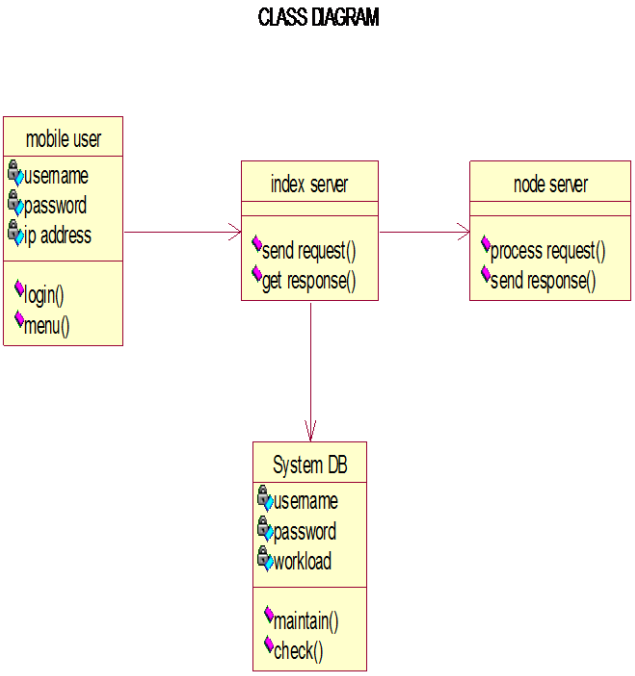

Figure 9: Class Diagram for the system

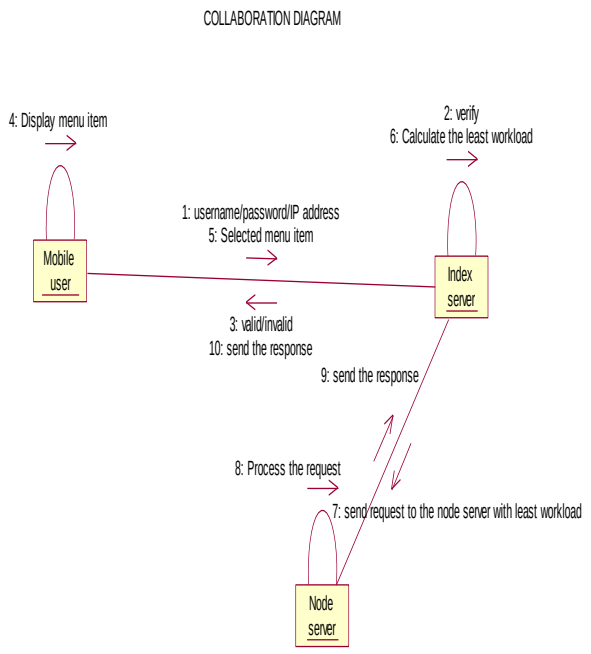

Figure 10: Collaboration Diagram for the system

7. Language used by System.

7.1 J2ME: The Java™ 2 Platform, Micro Edition (J2ME™) Wireless Toolkit is a state-of-the-art tool for developing wireless applications using the Java programming language. The toolkit is an emulation environment for developing applications targeted at J2ME Connected Limited Device Configuration (CLDC)/Mobile Information Device Profile (MIDP) technology-enabled mobile devices. Developers using the J2ME Wireless Toolkit can rest assured that their applications are compatible with CLDC/MIDP J2ME implementations. And with the toolkit's performance optimization and tuning features, they can quickly bring to market efficient and successful wireless applications.

7.2 J2EE:J2EE stands for Java 2 Enterprise Edition for applications which run on servers, for example, websites.

7.3 JMF: The Java Media Framework API (JMF) enables audio, video, and other time-based media to be added to applications and applets built on Java Technology. This optional package, which can capture, playback, stream, and transcode multiple media formats, extends the Java 2 Platform Standard Edition (J2SE) for multimedia developers by providing a powerful toolkit to develop scalable, cross – platform technology.

8. Implementation snapshot for the System.

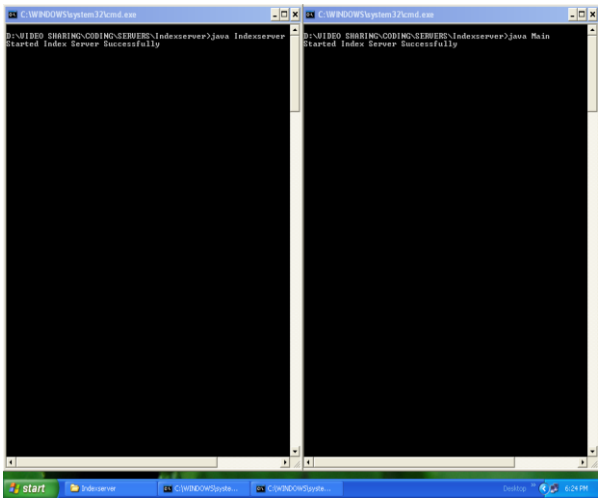

Figure 11: Initializing Index Server

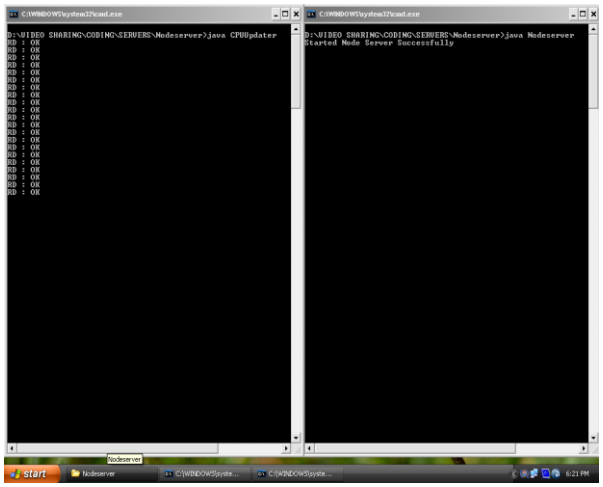

Figure 12: Initializing Node Server

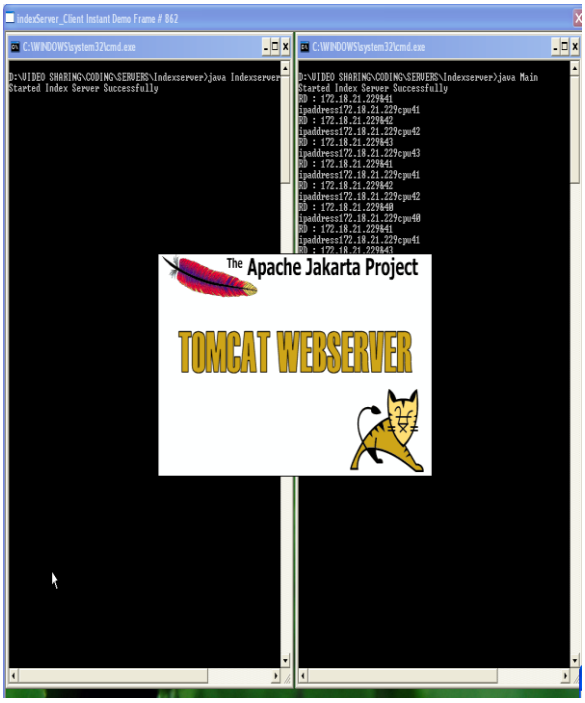

Figure 13: Starting Apache Tomcat Server

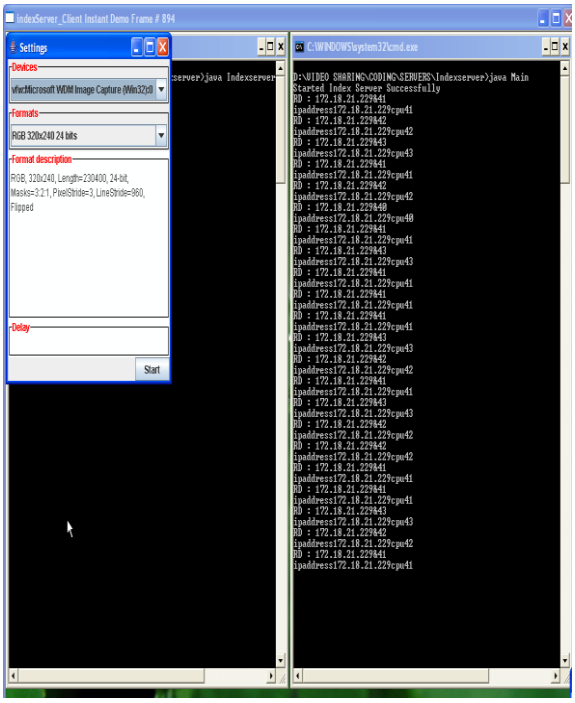

Figure 15: Starting JMF

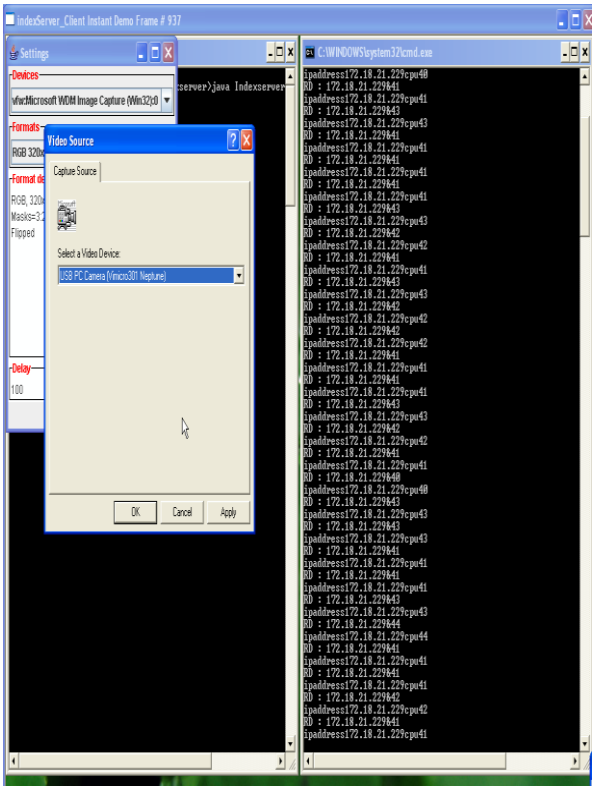

Figure 14: Web Camera Setting

Figure 16: Starting Wireless Toolkit

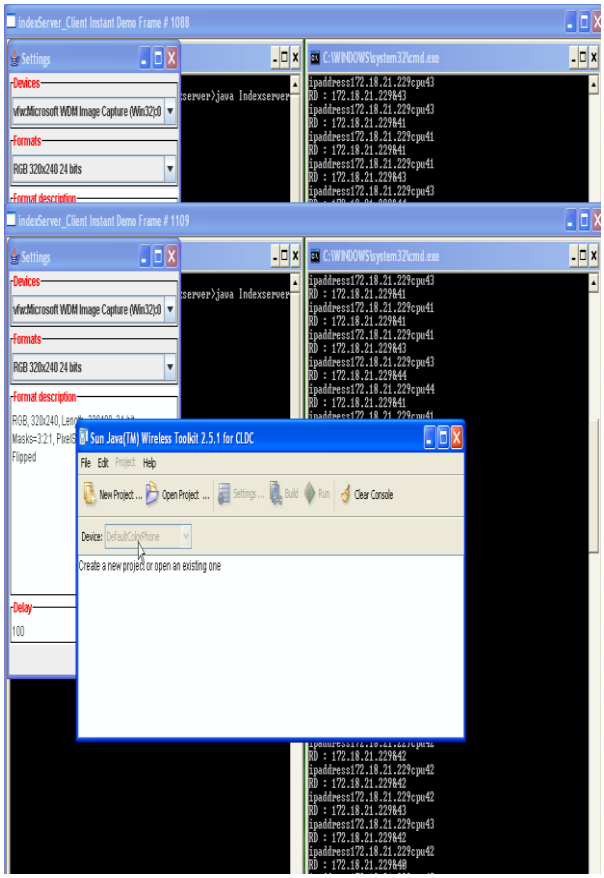

Figure 17: Open "Grid Video Project"

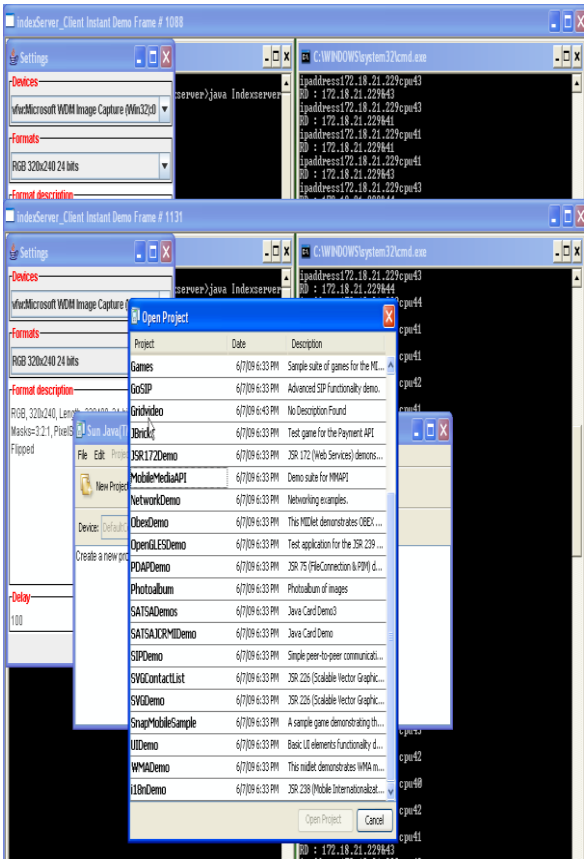

Figure 18: Build the Project

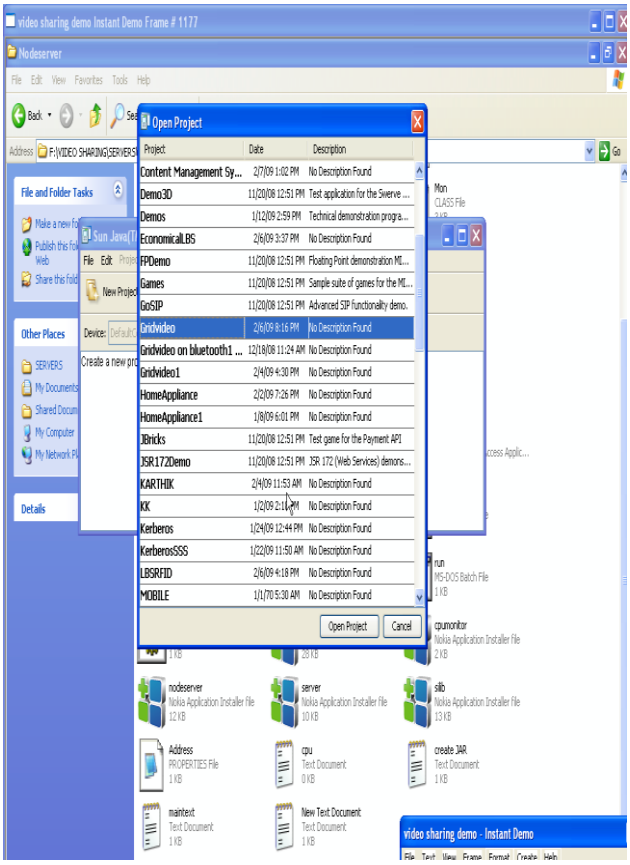

Figure 19: Build the Grid Video Project

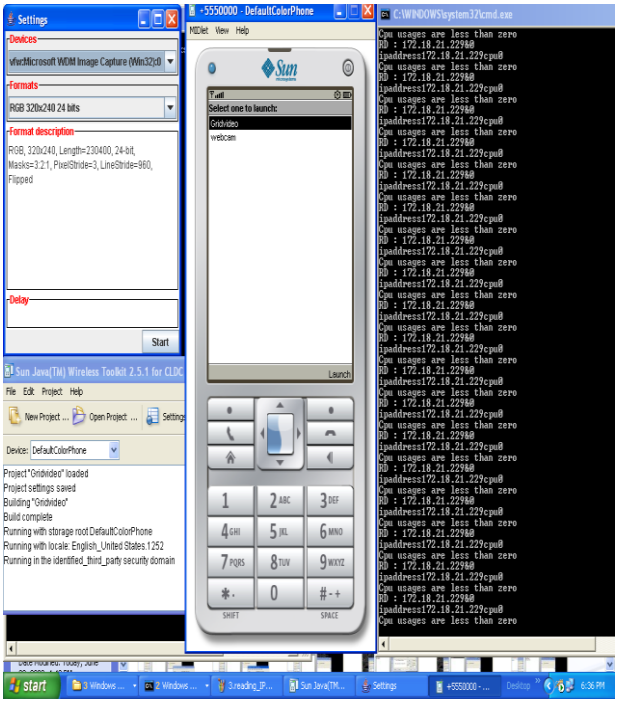

Figure 20: Using Web Camera

Figure 21: Video Mode

Figure 22: Playing Video

9. Conclusion and Future:

This paper designed video file sharing architecture and describe file sharing Administration System. In this paper we have presented Video File requester can collect the limited sharing traffic to increase download speed, and replaces immediately supplies the files origin. We use Data Grid system to handle some central problems, i.e., search file location and client certification. Data Grid is extendable, let us can easily connect with many store equipment to form a large-scale storage system. Our system also depend on its' computing power to classify, analyze, and convert various kinds of video files, to keep the files in the newest state at all times. This technology we have seen that using data grid can be used for carrying video streaming simulation.

10. Reference:

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