

**PROMOND – File Exploring and Sharing over the Network**

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## **ABSTRACT**

### **PROMOND – File Exploring and Sharing over the Network**

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Productivity of a person or an application can be increased by exploring various arenas of accomplishing a task in an efficient way. With the advancements in technology and increased use of personal agents it is now possible to access remote data locally from anywhere in the world. To achieve the intended goal in this area, it is important to implement an interface which serves a specific professional purpose. Traditional systems provide a generalized way of usage which makes it difficult to apply them on to a specific area. This brings into light an idea of developing a more personalized user-friendly tool which provides an approach to utilize a generalized application efficiently. Promond is one such client which is mainly aimed at developing a client for professors which serves the purpose of use of personal systems or travel drives with the changing location. A professor can organize his files and folders in an orderly manner. Client-server architecture is being implemented. This tool is a client-interface through which a user can access the folders and files in his account, share the files with other users, restore the work and schedule the events from anywhere, independent of location and local machine. Our goal is to develop a tool with the basic and constructive features which can be further improved to be more sophisticated.

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# **Chapter 1:**

## **Introduction:**

In this internet world, data haulage is gaining more importance among people in their way of improving the performance and productivity. Thus, the usage of personal laptops or travel drives has increased. The development of different kinds of personal agents and the increased necessity of remote access led to the development of tools which will substitute the concept of data transfer and carrying data. There are various tools and many ways of using these tools in this software community, to increase the productivity of work, provided that they are made accessible and widely applicable.

Though there are many tools which provides various good features which facilitates remote access and file transfer and sharing, these tools might be highly complex or cannot always be adaptable by all the fields or for a specific purpose. At times, work becomes easier if there is a tool which can specifically be applied to a particular area combining all necessary and easily accessible features.

### **1.1 Remote Access:**

It is not always possible to have the data along all the time. The widespread usage of technology and internet makes the idea of data transportation easier. The concept of remote access has gained much importance in this context. This concept has been made important in increasing productivity and profitability of any organization or of any person. Independent of the field, it is always advantageous for an individual to be able to use the remote access concept. In this regards, most of the organizations are on their way to use this feature to increase their productivity [1]. Through remote access facility users can be connected though they are far away. This feature provides various advantages like

saving time, avoiding the task of carrying data all through, avoiding the loss of continuation in work etc. It facilitates users with file transfer, file sharing, uploading and downloading files etc., through internet, between systems located anywhere in the world.

A client – server architecture is used to implement this feature. This architecture has a server located at a particular location and the data in the server can be accessed from anywhere using an internet connection. Client-server architecture is a model where client is a computer which requests a service and server fulfills the request.

It is an important model in the area of network computing. Different clients can be connected to the server from different locations. There can be two-tier architecture and N-tier architecture. In two-tier architecture, an application is written in such a way that one or more clients requests service from an application running on another machine, called server. In N-tier architecture, the first tier is client, the second tier is a server and the third tier is the database which contains the database management system.

## **1.2 Network Collaboration:**

Collaboration is an important concept when we think of a group of people working on the same project to achieve a goal. In this scenario, it is very important to coordinate and share the work done by different people. This sharing of information among the group will further mobilize the flow of the project until the desired result is obtained. Collaboration can be applied to various fields where people have to exchange information. Computers play a major role in such coordination of data through file transfer and sharing. Here comes in the concept of network of people or computers among which collaboration is needed to achieve the desired goals.

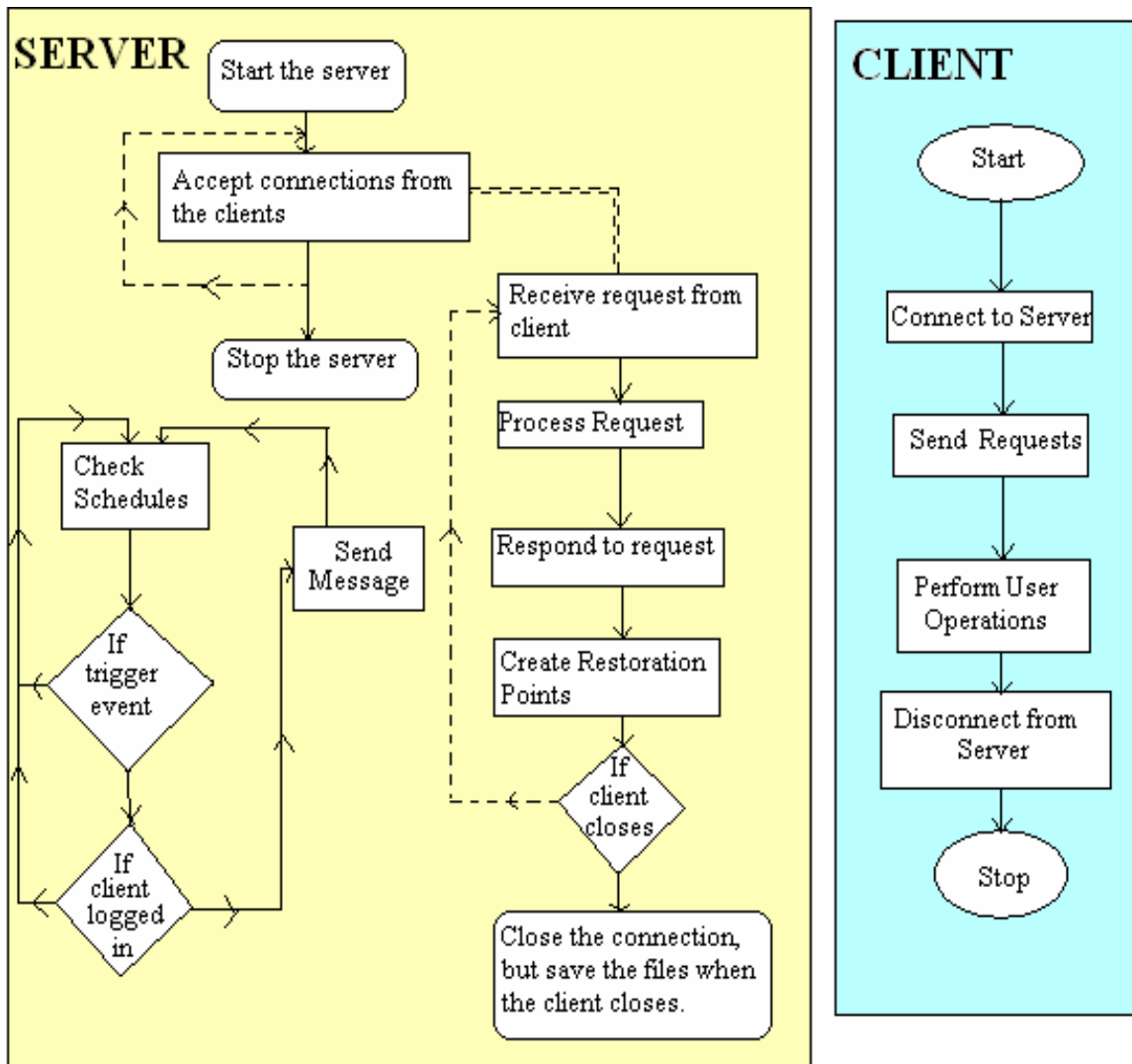
Use of network based computing, it becomes easier to share the data and coordinate the work of different people. There are many applications available that supports work collaboration by implementing different functionalities. Some of the functionalities include email, public file repositories etc. But some tools increase the complexity by incorporating all the features and seem highly sophisticated to the users [7]. Simplifying and using these tools in an appropriate way helps in applying them to specific application as required.

### **1.3 Promond:**

If a tool or an interface provides access to the remote data, one can work on it from any place and also share it with others when needed. This helps in many emergency circumstances when data is needed while one is away from his personal system. It supports work collaboration also in a way, when a group of people are working on a project.

Implementing highly complex models may not meet the requirements of a particular application and may seem more sophisticated. When considering a particular scenario like 'a professor's world', it is required that a person organize his work and material in an orderly and easily accessible manner. It will be a tedious task for a person, when working on a particular system, to save his work and email his files or carry them using a travel drive when changing the location. It would cause a problem if some files are missing. This problem will be solved with a client that can provide such remote access to retrieve the data. Putting together the roles, responsibilities, usage and other kinds of requirements, a client interface is being designed which implements all

necessary features. The flow of requests and responses between a server and a client are shown in the figure below.



*Client-Server architecture*



## **Chapter 2:**

### **Concepts being used**

#### **2.1 TCP/IP:**

Protocol can be defined as a set of rules that are used while establishing a connection between two systems. Transmission Control Protocol or Internet Protocol is the basic communication protocol over internet. When a connection is established with the internet, a TCP/IP program is provided to the system. This program can be used to send or receive data from any other system. TCP/IP has two layers, where TCP is the higher layer and IP is the lower layer. It is the connection-oriented service over internet. TCP is responsible for putting a file into packets at one end and reassembling those packets into original file at the other end. IP is responsible for handling the address to which those packets have to be transferred. TCP/IP is said to be a point-to-point communication, which employ client-server architecture, where server provides the service to the client's request. A server can handle any number of requests using TCP/IP.

The advantages of TCP service is that it provides a reliable and in-order byte stream data transfer. There is control in flow of data. It does not overwhelm the receiver by sending continuous data. This is achieved with the use of acknowledgments for the data that is being sent. There is congestion control where the sender slows down the rate of sending data when the network is congested and receiver is not as fast in receiving the data.

Many higher level application protocols like Hyper Text Transfer Protocol, Telnet (remote login), File Transfer Protocol and Simple Mail Transfer Protocol use TCP/IP to establish a connection with the internet [4].

## **2.2 Socket Programming:**

A socket is a communication mechanism. In a client-server mechanism, client and server can communicate through these sockets. There are two communication protocols that can be used for socket programming. They are datagram communication and stream communication. It is a door between application process and end-end-transport protocol (UDP or TCP). The datagram protocol is User Datagram Protocol which is connectionless protocol. In this when the datagrams are sent, it is necessary to send the socket descriptor and the receiving socket's address. This ends up in sending additional data when a communication is made.

The stream communication is known as TCP. Since it is a connection-oriented protocol, a connection must be established between the sockets. TCP is useful in implementing network services such as telnet and FTP. The server sockets listens for the connection request and the other socket called the client socket requests for connection. Server must be running and should open a socket to process the client's request for connection. Client will create a socket which is a local TCP socket specifying the IP address and port number of the server. Once the two sockets are connected, they can be used to transmit data in both directions. When server is contacted by the client, server TCP creates new socket for server process to communicate with the client. A server can

handle multiple clients by assigning different port numbers to each client that requests for a connection.

A stream is a sequence of characters that flow into and out of a process. An input stream is connected to an input source like a keyboard which gives input to the system through sockets. Any input data that has to be sent to the server or another process is put on an input stream and sent. An output stream is a connected to an output source like a monitor, which gives the output or response to the clients through the sockets. Hence, any type of data transfer between a client and the server takes place through sockets in TCP/IP.

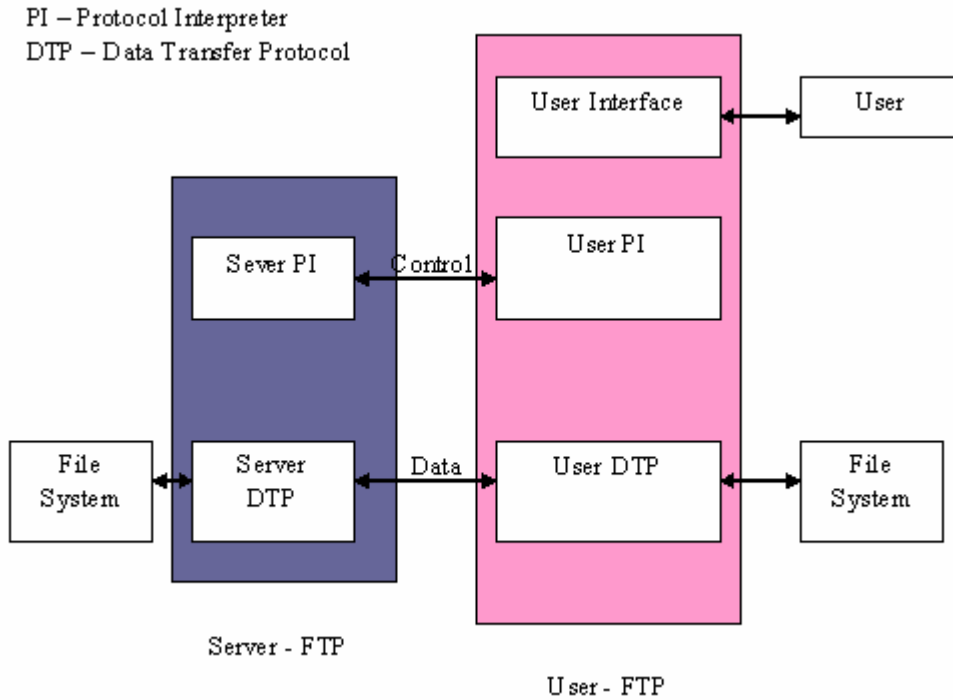
### ***2.3 File Transfer Protocol:***

File Transfer Protocol is a basic means to transfer files between two systems, a client and a server, over a TCP/IP network using an internet connection. Clients or interfaces based on FTP do not require users to be aware of the sophisticated technology. Most of the applications in today's world use FTP in many ways. It is as simple as downloading a software from internet. Hence whoever have used internet should have used FTP.

File transfer protocol needs a server and a client which interacts with each other. A user needs a username and password to access the server through internet for a secure file transfer. There are many kinds of clients available to provide secure way of transferring files over internet. As it is said that a right tool at the right place makes work easier, it is important to choose a right client to use FTP. We are designing a user interface which implements FTP.

When a client needs a file, it opens a connection and the server sends the file and then the data connection is closed. The client initiates the FTP connection. It opens a TCP connection which is used as a control connection. This connection is used to send commands and receive replies from the server. This connection is maintained between the client and the server through out the entire session of data transfer. This connection is not used to for the file transfer. The file transfer is done using a data connection. The client sends a command to retrieve the file, and the server receives the command and sends the file across the data connection and closes this connection when the transfer is complete, but still maintains the control connection. The server closes the connection depending upon the commands sent by the client. [3]

There are two types of data connections – Active and Passive. Passive mode is said to be ‘server-managed’ and active mode is said to be ‘client-managed’. In Passive mode, the client sends a PASV command to the server indicating that it is trying to connect to the client and the server waits for the connection and sends an acknowledgment with host and port address. And when required the client uses this address to establish a data connection. In the active mode, the server connects to the client. Here the client sends the address and the port number and when the data connection is required, the server initiates the connection.



Model for FTP Use

- NOTES: 1. The data connection may be used in either direction.  
2. The data connection need not exist all of the time.

In the above model, the connection is established by the user protocol-interpreter. This is a control connection between the server PI and the user PI. The control connection follows the Telnet Protocol (remote login). The user generates the FTP commands and transmits to the server over the control connection. The server also responds to those commands over the control connection. The parameters needed for a connection or any operations are sent through these FTP commands. Based on these commands the server initiates the data connection or the data transfer. [4]

There are two data types that are used – ASCII and Binary. ASCII is being used as a default data type. This is mostly used to transfer text files. Binary data type is used to send binary files. Images, videos and executable files come under binary files. Such files when sent as ASCII files will be corrupted. [3]

#### **2.4 Related Work:**

There are many clients that are already in use which provides a means for file transfer between local and remote machines. Secure File Transfer Protocol provides secure way for transferring files. In this protocol, the server is authenticated and the user needs a username and password to get connected to the server. It uses the advanced features of the FTP and is supposed to be more secure in transferring files. It is platform independent. It is termed as the slowest protocol, since it sends the data through packets and needs acknowledgment. SFTP is often used as subsystem of SSH version 2. Some of the clients that use this SFTP are WinSCP and Core FTP.

WinSCP client provides a user interface for windows. It provides a means for secure way of file transfer between the local and remote computers. Core FTP also provides secure fast and reliable way of file transfer. Most of these clients support features like drag and drop support for uploading and downloading files, FTP transfer resume, and FTP URL parsing etc.

## **2.5 Using FTP on Windows:**

Microsoft has provided Internet Information Services in windows, which supports File Transfer Protocol service. It provides reliable and secure web server capabilities over intranet or internet. This IIS supports both active and passive modes of the FTP. Most of the organizations use IIS to host and manage web pages and FTP site on the internet or intranet and manage web applications efficiently. FTP websites can be created and they can be made secure by providing authentication to access those sites. The directories that are present in the computer can be made as directories for websites and the client can access the files in these directories and use them.

Some problems are encountered while using FTP when there are proxies or firewalls over internet which is called Network Boundary Securing Device. Sometimes control connection is allowed over port 21 but data connection would create a problem while using some FTP commands. Normal FTP is not a secure way of transferring files though it requires authentication of username and password. The data is not encrypted when sent through FTP. It can be intercepted by any network.

There are some alternatives to meet this problem. One of the methods is to use HTTP as a method to transfer files rather than FTP, since most firewalls allow HTTP connections over TCP 80 and HTTPS connections over TCP 443. [8]

## **Chapter 3:**

### **3.1 Introduction:**

Promond is intended to be a personal tool for professors being location and system independent. It implements the necessary concepts and builds-up to a personal agent by providing a handy user-interface. Users can work from different locations

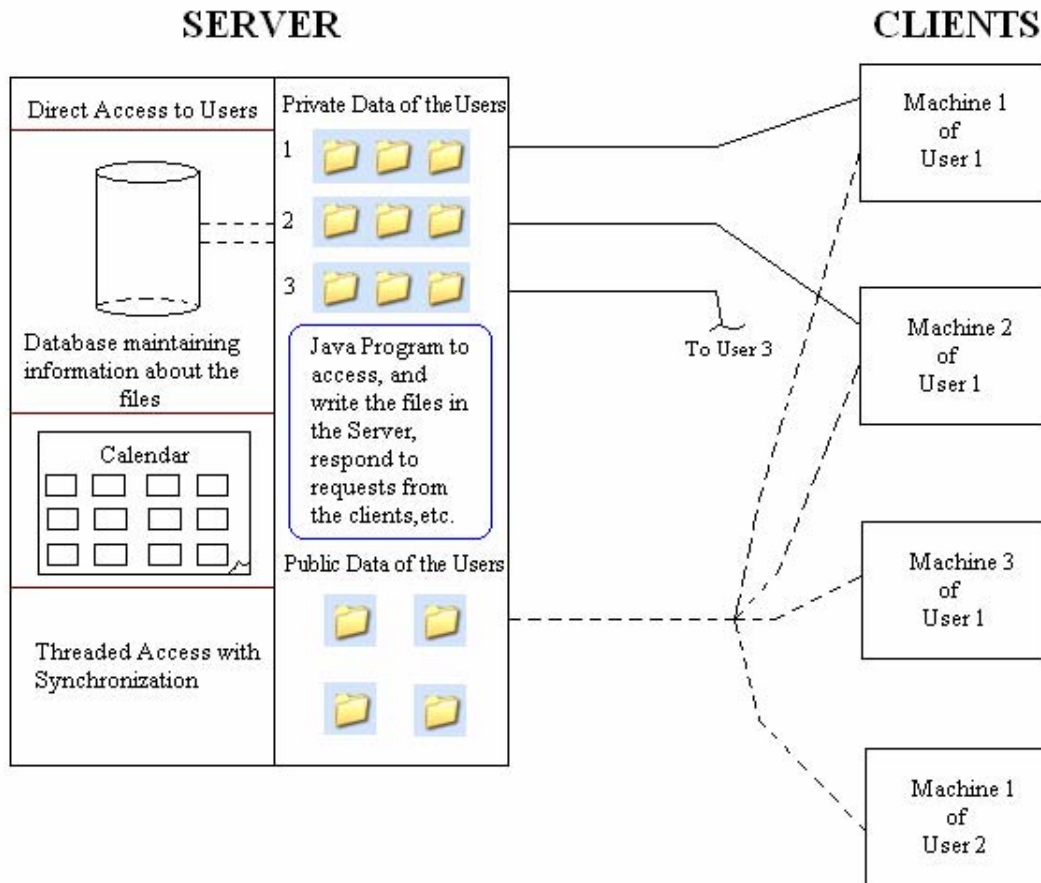
through this client. It provides access to the files from different machines, provided all are connected to a centralized server through the internet. Work collaboration is also possible through the file sharing feature.

The entire data is saved in the server. Users can upload and download files to and from the client. Being system independent there is a privilege of restoring the files while changing the location. This avoids the loss of data and ambiguity in recollecting the recently used files and navigating through the folders to retrieve those files. This tool is more useful in terms of carrying data and can replace the use of travel drives to some extent.

### **3.2 Promond:**

Promond is client that is connected to the server and is accessible by the users from any location. Any number of clients can be connected to the server in parallel, since the server can handle multiple clients through multi-threading by assigning different ports to each client. Each user is provided with a username and a password to login to the tool. The backend database contains the data related to the users like first name, last name, designation etc. The client contacts the server which in turn is in contact with the database. The server maintains a separate folder with each username, which on the GUI is displayed as the private workspace of the users. It also contains a folder for public workspace which is visible in common to all the users. Hence, promond is the interface through which the user contacts the server and the database and does his work from anywhere in the world. An overview of functions and working of the project is shown below:





### 3.3 Using FTP:

FTP is a method which can be used to get the files from the server. A computer dedicated to receive the FTP connection is referred to as an FTP server or FTP site. A client can connect to this FTP server to access the folders through a username and password. The folders that are intended to be accessed by the client are set as directories in FTP websites in the server. When a client tries to connect to the server using a username and password, the folder or site related to that login can be accessed. Once the user gets access to the files they can be used or represented in any way. This concept is being used in creating private and public workspaces in Promond.

### **3.4 Features Supported by Promond:**

#### **3.4.1 Private Workspace:**

The private workspace shows the folders and files present in the account of the user who has logged in. It is visible only to the user who has logged in. The data is shown in the form of a tree structure, where the root folder will be the name of the user. The user can navigate through the folders by expanding the tree. This avoids the need to browse through the folders and search for a file by going back and forth. The user can open and view the files through a double click. Every file that is opened will be monitored.

For all kinds of requests and responses, the client and server communicates through socket programming using TCP/IP protocol. When one opens a file, the server receives a request from client for a file transfer and the server processes the request by sending the file to the local system. The user can edit the file and once it is saved the file is sent to the server. A list is maintained to keep record of all the files that are being opened. This list is maintained in the database for future use i.e., when the user logs in for the next time. During the next login from another location the list of recently opened files is retrieved and the files are opened automatically without the need for the user to browse for his files. The file restoration feature prevents the loss of data while closing the client due to any interruption. This is the feature that serves the purpose of accessing the files from any location avoiding the need to carry the data.

There is an option to add, delete and rename the folders. The server manages all the actions that are to be performed for the commands that the client sends. It takes the input from the GUI and performs the actions. Hence, the changes takes place in the server and the client GUI represents the server.

### **3.4.2 Uploading and downloading files:**

The tool implements a drag and drop feature for uploading and downloading the files between the server and the client. When a user is working on a particular system, he can directly upload files from local machine to server just by dragging a file and dropping it onto a particular folder in the file tree. A copy of the file is shown in the file tree. When the file is dropped on to a particular folder in the client, it is directly sent to the server where the file is saved into the destination folder on which the file was dropped. The path of the destination folder is taken by the drop action being performed. The server handles the 'send' and 'receive' commands sent by the client and performs the operations.

Users can download the files from the server on to the local machine using the download button. The user selects the required file and the download button opens a dialog box where the user can browse to the destination where the file has to be saved. The server sends a copy of the selected file to the selected location on the local machine.

This feature is advantageous in the remote access scenario where people require the data and need to work on it from different locations. One can directly work on the tool and have the data saved on the server instead of carry personal systems.

### **3.4.3 File Sharing:**

This tool has a public workspace similar to the private workspace which is common to all the users. The server maintains a folder for all the public files i.e., the files which are accessible by all the users. These files are also shown in the form of a tree structure and have all the features that a private workspace has. This is used mainly to share files with other users when necessary. This feature builds up an environment for work collaboration. A group of people working on a particular project can share the files

with their colleagues, edit the files and update the public workspace with the recent files. Users can also have an update of all the other projects that are going on by having separate folders for separate projects.

Uploading files from the local machine to the public workspace is done through drag and drop, similar to the private workspace. Similarly, downloading the files is also done using the download button. This drag and drop feature is implemented between the private and public workspace also. One can share files with the other users by dragging and putting the files in to the folders in the public workspace. It also has the features of adding, deleting and renaming the files and folders. One can open the files from the public workspace, edit the files and when the files are closed they are saved and sent to the server.

Here, the feature of file restoration is not applied to the public workspace. The record of public files is not maintained in the database after closing them since it is not intended to get the files back during the next session of login. The feature implemented here is restricting the access of public files by multiple users simultaneously.

When a person is accessing a file from the public workspace and at the same time when another person from another client requests the access for the same file, the server denies the access by showing an error message. Here a separate list is maintained in the server for the public files that are being accessed by the users. When one client is accessing a particular file, it is sent to the list, locking it from being accessed further. Once the later person has finished working on the file and has closed it, the server receives a signal and the file is said to be removed from the lock so that others can access the file.

This method is important here because, when a group of people are working together, it is important that people receive the updated files. Multiple editing accesses of files make it confusing for the people to decide on the recently updated files. It is necessary that one receives a correct file to work on.

#### **3.4.4 Other Features:**

There is auto-saving of the files and also file monitoring which keeps track of recently used files so that the files will be opened automatically during next login. The user need not worry about keeping track of version of the files. Promond will take care of updating the server with latest version of the files and also maintain the exact path of different files with same names.

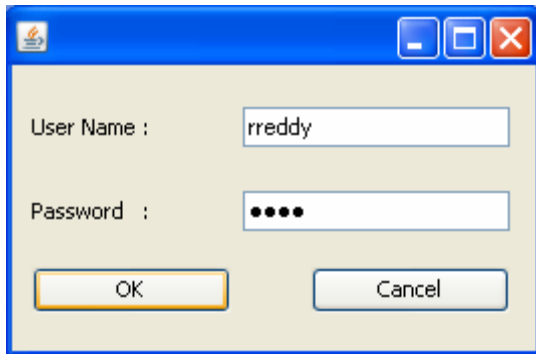
One of the other features is an event organizer in the form of a calendar. The client will provide the user with schedule maintenance, which helps in scheduling the events, appointments or reminders.

The client also has an email feature to interact with others. It will have the facility to send group mails.

#### **3.5 Client GUI:**

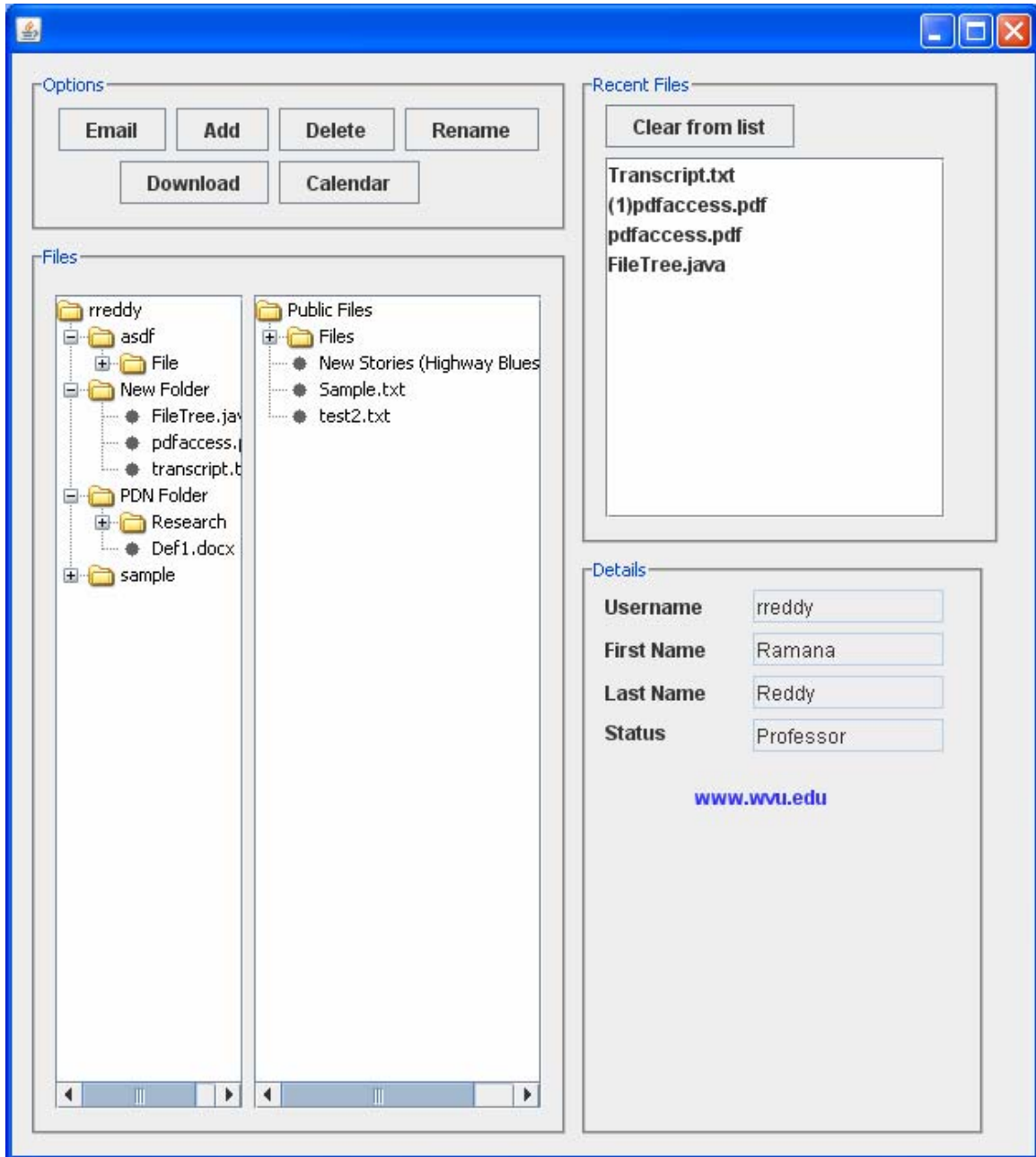
In the GUI, as it is already said that the private and public workspaces have the content in the form of JTrees, to obtain this structure virtual directories are created on the server side with their names being the usernames. Finally, when the files are accessible, they are represented in the form of a JTree. Hence, when the user logs in the root folder of the tree structure by default would be the name of the user. Here FTP is being used in getting the access to the files and representation of the folders and files in the form of JTree.

A user has to login with the given username and password. The login window is shown below.



After successful login, the user is taken to an interface which shows a private workspace with all the files in the user's account, a public workspace with a list of shared files, if any, and a list of restored files from his account. The files in private and public workspace are listed in the form of a tree structure.

The Graphical User Interface of the client is shown below:

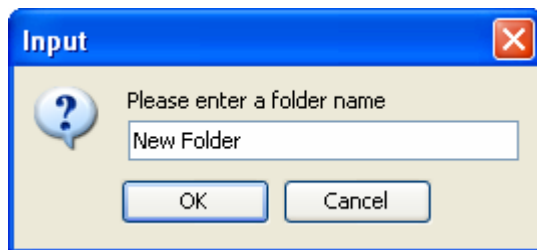


Considering a scenario where a professor is using the tool: The user can start using the tool by creating folders in the private workspace and uploading the files to the

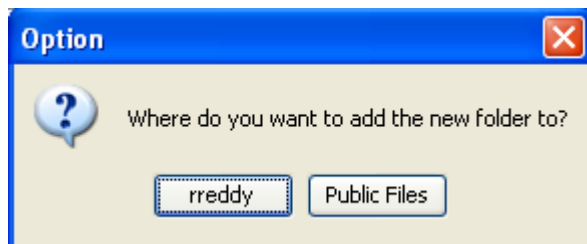
client by dragging and dropping them from the local machine to the folders in the GUI. The same can be done with the public workspace. When the user wants to share some files with others, he can create a folder for his project and put the files in to the folder.

The private and public workspaces are shown on the left in the GUI. There is a buttons panel on the top which gives options to 'Email', 'add', 'delete', 'rename' 'Download' and 'Calendar'. All these actions are handled by the server.

When a user tries to add a new folder, he has to select a folder in to which the new folder is to be added or else the new folder will be added to the root folder. The GUI for creating a folder is shown below.



If the user does not select a folder to which the new folder is to be added, a dialog box appears which asks whether the folder has to be added to the root folder of private workspace of public workspace.

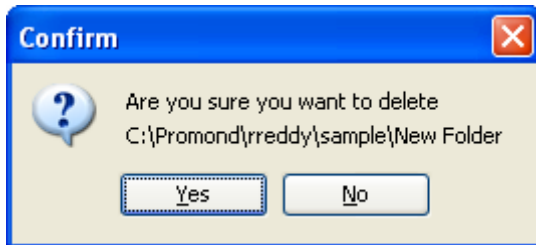


Users can delete the files and folders with all the contents. The root folders cannot be deleted. The user has to select a particular folder to delete or else a message pops up saying the root folder cannot be deleted.

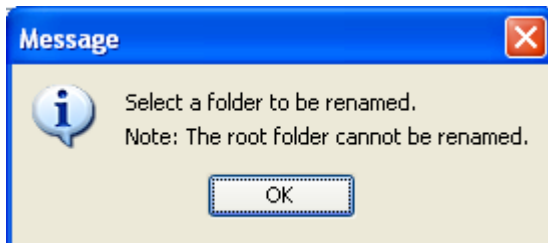




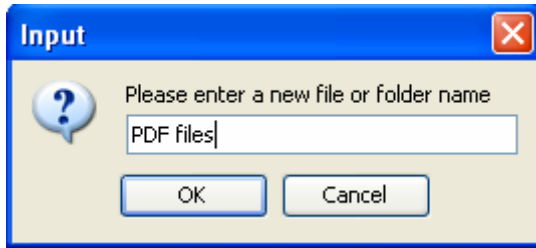
When delete button is hit a confirmation dialog box as below appears to confirm the action.



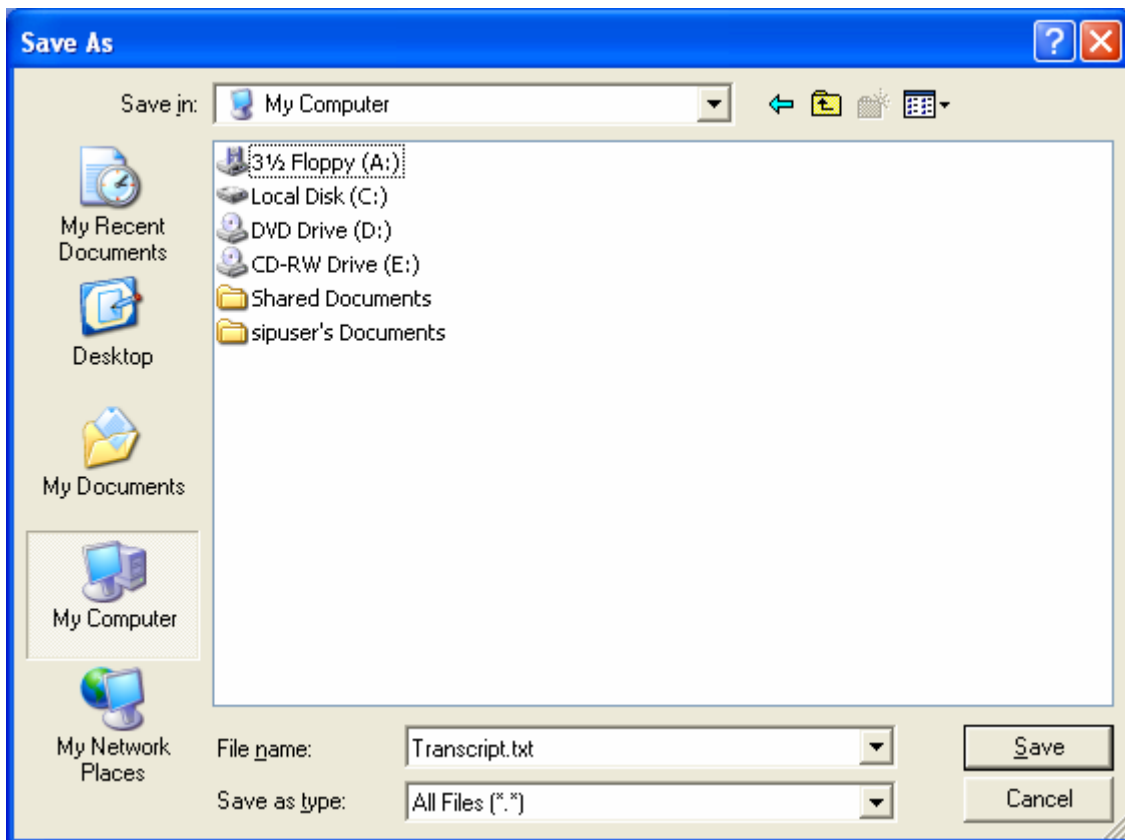
There is an option to rename the files and folders. The conditions are same as of other buttons like the root folder cannot be renamed, if so a message pops up.



The confirmation dialog box for renaming a file or folder is as follows.

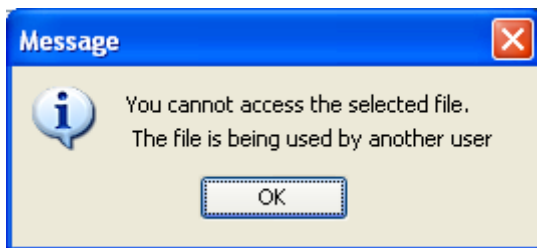


One of the important features of the tool is that the files can be downloaded from the server to the local machine. There is a 'Download' button in the buttons panel to do this. The user has to select a file that he needs to download and when the download button is hit, it shows up a 'File Save As' box which helps to navigate through the local machine and save the file at the required location. Following is the screenshot of the 'Download' option.



With this feature the user can download the necessary files from private and public workspaces to the local machine and work on them and then upload them to the tool by dragging and dropping them on the client. This makes the file transfer from the client to server easier.

As this tool also supports 'file sharing' feature, it is focused on a concept of restricting the use of same file by different users at the same time. Hence, when a user is using a file from the public workspace and another user tries to access the same file during that time, it shows up a message which says 'the file is being used by other user'. Following is the screenshot of the message box.



There is a list of files on the right panel in the client, which shows the names of the files that are being opened by the user. This means that each file that is being opened is monitored. When the user double clicks on a file, it means that the file is being obtained from the server and stored in a temporary folder in the local machine. This list is maintained in the database to retrieve the files during the next login. This list can handle up to ten files. There is a 'clear from list' option using which the files can be removed from the list. Only the files that are present in the list before closing the client will be restored. It is possible to open the files from the list and work on them. It is easier to find the path or location of the file from the list than to navigate through the folders. Hence, the location can be found by selecting the filename and placing the mouse over the

filename. There is panel on the right bottom that shows the details like the first name, last name, and designation etc., of the user.

When the user closes the client, all the files will be saved and are sent to the server. The server receives the files and sends them to their respective folders. The user need not worry about organizing the files. And when the user logs in for the next time, the problem of navigating through the folders to search for the files that he was working on before does not occur with the restoration feature.

### **3.6 Implementation of Promond:**

We have used Java Swings to develop the Graphical User Interface of the tool. NetBeans 1.5 IDE was helpful in developing the GUI.

The Eclipse 3.2 Integrated Development Environment was used to write, compile, run, test, debug and execute the project.

We used MySQL 5.0 as the database to maintain the data and the information of the users.

We have considered Windows environment while developing the tool. The client can run on any computer with Windows Operating System in it. The client program runs with JRE 5.0 installed in the system.

The server should be a Windows XP Professional version containing 'Internet Information Services' component in the administrative tools. The 'FileTransferProtocol' service should be enabled in the system that is serving as the server. It should have 'MySQL 5.0' and appropriate JDBC drivers to make it a server.

The server will be running and the client sends the requests and receives responses from the server. The exchange of requests and responses is done through sockets.

## Chapter 4:

### ***Conclusion:***

- The project is intended for professors and can help them in organizing their files and documents. It has served the purpose of remote access in a network.
- Multiple users can be connected to the server.
- This project can minimize the use of removable devices and mailing the data when changing the systems.
- Uploading and downloading files to the client has become easier.
- Access to public files by multiple users simultaneously is restricted to avoid confusion.
- The basic features that are implemented here can be applied to some other applications or scenarios where accessing the data remotely is needed.

### ***Future Work:***

- The project is developed for windows environment. It would be useful in future if portability issue is considered.
- Dragging files from the client was found difficult. A better way could be implemented in dragging files from the file tree.
- File Sharing can be done in more sophisticated way where for example, a common platform can be created where various people can work on documents simultaneously.

- Some more features could be added to the project to make it more useful, which we were not able to implement due to time constraints. This could make the project more viable software.

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## Cross – References:

1. Promond – Network File Access and File Standby, by Vinoth Pugazenthi
2. Promond – Email and Event Scheduler, by Prashanth Addepalli



## **APPENDIX A**

### **Installation:**

#### **Server:**

The server should be run on a computer have Windows XP Professional version of the operating system. MySQL 5.0 should be installed and all the necessary drivers should also be installed. The server should have Java Runtime Environment 6.0.

A folder with name 'Promond' should be created in the system. A folder for 'Public Files' is created in the 'Promond' folder. And then a folder for each user with his username being the folder name is created in the 'Promond' folder. The administrator has the right to create these folders whenever a new user account has to be created.

In the server, whenever a new user has to be added a directory with his name will be created and it will be set as an FTP website. On the client side the name of the directory will be the username with which the user has to login. This name will be set as the root folder for the tree structure and then the tree can be populated by adding folders and files.

The MySQL database should be inserted with a new record for each new user with values for the Username, Password, First Name, Last Name, Designation, Email ID fields. A new record has to be inserted with the username in the file details with the rest of the fields set to null (They need no be given any value). Since it contains the list of previously used files during the last exit from the client program, it will be populated with values after the very first logout of the user.

The Server.java is the main program and it should be run to be able to receive the requests from the client.

#### **Client:**

The client system should have Windows Operating System of any version. The client has to have the Java Runtime Environment 6.0. The client program should be installed on the system that is being used as a client. The client program will have the IP address of the server.

# APPENDIX B

**Promond: File Exploring and Sharing over the network**

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## Overview

- Introduction
- Issues behind the idea
- Scenario Description
- What Promond does
- Features implemented
- Architecture of Promond
- How Promond works
- Features
- Problems Encountered
- Technologies and Protocols used
- Advantages
- Conclusion and Future Work

## Introduction

- Importance of data transfer and sharing  
Every person working on computer would have faced the need to carry the data.
- Use of Remote Access  
Minimize the usage of data carrying devices and make use of modern technology
- Client-Server Architecture  
Main concept behind being connected to the data from anywhere in the world
- Improving the Productivity

## Issues behind the idea

- Exploring various ways to improve productivity of a person or an application
- Many fields now face the need to facilitate the data usage from remote location
- Developing a more personalized user-friendly tool
- The goal is to develop a tool with the basic and constructive features which can further be improved to be more sophisticated

## Scenario

- **Professor's world**
  - Need to work from different machines and different places
  - Works on different areas like courses, research, papers etc.
  - Accessing and organizing files
  - Transferring files
  - Sharing files

## Scenario Description

- Need to organize the files and use a medium to transfer them from one machine to another



## Scenario Description

- Working in a group over a project and need to share the files with other professors



## Scenario Description

- Avoid the confusion on editing files while working in a group



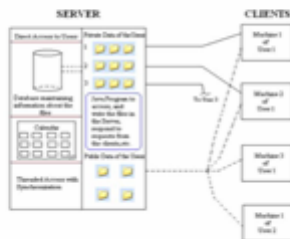
## What Promond does

- Promond is one such tool which is specific for a professor
- Using this tool files can be accessed from anywhere
- A platform to organize and transfer the files, share the files, create file restoration and schedule the day to day events and appointments
- Serves the purpose of use of personal systems or travel drives with the changing location

## Features Implemented

- Private and Public workspaces
- Uploading and downloading files through drag and drop
- File Sharing
- File Monitoring & Restoration
- Signaling
- Event Scheduler
- Email

## Architecture of Promond



## How Promond Works

- Create user accounts
- Uses the FTP service in windows in creating user accounts on server side
- Create public and private workspaces for users
- Organize the files in server
- Open and edit the files from the client
- Can organize folders and files on the client by adding, deleting and renaming
- Provides an easy way to upload and download files
- Restricts multiple access on same file

## Promond - Login

- Login window
- User login details maintained in the database



## Features

- File Arrangement:
  - Private Workspace:
    - Personal space for user to arrange his files
    - Files are arranged in a tree structure for easy navigation
  - Public Workspace:
    - Public space where all the users have access to view and edit the files
    - All the users can share the files with others by putting them in public workspace

## Screenshot of Client GUI



## Features (Contd..)

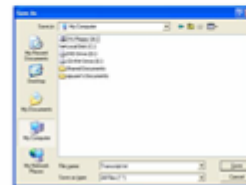
- File Access:
  - Files can be accessed from anywhere
  - Users can open the files from private and public workspaces and edit the files
  - File monitoring takes care of files from here to keep track of files being opened

## Features (Contd..)

- Uploading files:
  - Files can be uploaded to the client by dragging from the local machine and dropping on to the folders in the client
  - Files are sent to the server following the path obtained at drop location
  - Promond handles all types of files
  - Data carrying and transferring becomes easier

## Features (Contd..)

- Downloading files:
  - Files can be downloaded from the client to the local machine



## Features (Contd..)

- Modifying files and folders:
  - User can add folders to private and public workspaces
  - Should select a folder into which a new folder is to be added or else new folder is added to root folder



## Features (Contd..)

- Modifying files and folders:
  - Users can delete the files and folders
  - Should select the file or folder to be deleted
  - Can confirm before deletion



## Features (Contd..)

- Modifying files and folders:
  - Users can rename the files and folders
  - Select a file or folder to be renamed
  - Enter a new name for the selected node



## Features (Contd..)

- Public Workspace:
  - Users can share files with others by putting files on to the public workspace
  - Can open files and edit them
  - Can organize files and folders using add, delete and rename options
  - Implements drag and drop to upload and download files from local machine or from private workspace

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## Features (Contd..)

- Multiple Access to public files:
  - No file monitoring but can auto-save the files
  - Only one user can access a file at a time
  - Locks the access by maintaining a list of public files in the server



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## Features (Contd..)

- Closing the client:
  - All the files are saved and sent back to the server on exit
  - With the file monitoring option the recent file list is saved so that they can be opened automatically during the next login

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## Technologies and Protocols used

- Java
- MySQL Database
- TCP/IP
  - Connection-oriented service used to exchange data between the systems
- FTP
  - To access the files in the server

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## Advantages

- Easy to access files and work on them from any place
- Easy to upload and download files to and from the server
- User can well organize files and folders
- No problem in working on public files in a group

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## Future Work

- File sharing can be done in more sophisticated way by developing a platform where people can work on files simultaneously or signal other users when one have finished editing a file
- The tool can be made portable so that it can be used on different platforms
- Downloading files from the tool can be made in an other way i.e. by dragging from the client on to the local machine
- By considering security issues the file transfer can be made more secure
- Add more sophisticated features to be more helpful to the user

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## Conclusion

- Promond mainly serves the purpose of helping out professors in organizing their data, being their personal agent
- It implements various basic features hence can be applied to various fields that needs remote access
- Can minimize the use of USB drives, cds etc.
- Can facilitate work collaboration to some extent through file sharing

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