

**Programming Assignment 2**  
**Maintaining file consistency in your Gnutella-style P2P system**  
**CS550- Advanced Operating System**  
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**Output File:**

**1. WELCOME screen**

This window (fig 1) is shown as soon as user starts the application. Apart from greeting, it displays all file names inside the directory, port number on which server is running, all user command list, file consistency method-PUSH or PULL (here PUSH is activated hence, REFRESH command is not available) and finally, a prompt for user.

```
WW      WW  EEEEE LL   CCCCC 000000 MMMM  MMM EEEEE
WW      WW  EE    LL   CCC    000 000 MM MM  MM MM EE
WW  WW  WW  WW  EE    LL   CC    00  00 MM  MM  MM EE
WW  WW  WW  WW  EEEEE LL   CC    00  00 MM  MM  EEEEE
WWW    WWW    EE    LL   CCC    000 000 MM  MM  EE
WWW    WWW    EEEEE LLLLLL CCCCC 000000 MM  MM  EEEEE

INFO: Following file is added from the directory "peer_1_sharedFolder/"
> file9_1.txt
> file8_1.txt
> file6_1.txt
> file4_1.txt
> file10_1.txt
> file2_1.txt
> file5_1.txt
> file7_1.txt
> file3_1.txt
> file1_1.txt
>>>INFO: Server is now running at port 6126
>>>INFO: PUSH system activated.
>>>Please choose from the following Command List when prompted.
> SEARCH to update file List
> UPDATE to update file List. Delete or add new "Master" file in runtime.
>>>Please enter the Command.
>>>
```

Figure 1 Welcome window

**2. SEARCH command**

Fig 2 shows sequence of events. User enters "SEARCH" and presses Enter. Then, the user is asked to enter the file name. As soon as user enters the file name, query request is sent. If required file is available, peers holding the file are shown with the index.

```

>>>Please enter the Command.
>>>SEARCH
>>>Please enter the file name.
>>>file5_5.txt
>>>INFO: Sending Request to...
> 6127
>>>Waiting for the response.
>>>INFO: Following Peers have file
> 1: @ 6130
>>>Select the peer to download the file from e.g. 1 if first peer:
>>>

```

Figure 2 File Search

User can select a peer using index. If valid index is provided, then file downloads and file list is updated and again user is prompted.

```

> 1: @ 6130
>>>Select the peer to download the file from e.g. 1 if first peer:
>>>1
>>>INFO: Downloading file file5_5.txt.
>>>INFO: File downloaded.
>>>Please choose from the following Command List when prompted.
> SEARCH to update file List
> UPDATE to update file List. Delete or add new "Master" file in runtime.
>>>Please enter the Command.
>>>

```

Figure 3 File Search - ports select option

Other peer, upon receiving the query request, displays information shown in figure 4, 5.

```

>>>INFO: A new peer with port 6126 PINGed you.
>>>INFO: A peer requested a file named file5_5.txt
>>>INFO:The file named file5_5.txt is NOT available. Forwarding...
>>>INFO:The file file5_5.txt request is Forwarded.

```

Figure 4 Query Request: file not available

```

>>>INFO: A peer requested a file named file5_5.txt
>>>INFO: Requested file "file5_5.txt" is available and Query Hit is sent.

```

Figure 5 Query request: file available (Query Hit)

### 3. UPDATE command

Once user enters "UPDATE" and file list is updated accordingly. Here, file5\_5.txt was manually removed from the directory and UPDATE command was used.

```

>>>UPDATE
>>>INFO: File list is being updated.
>>>INFO: File "file5_5.txt" is deleted from the list.
>>>INFO: File list is up to date.

```

Figure 6 UPDATE command

#### 4. REFRESH command

If PULL is set, REFRESH could be used. User enters REFRESH command, followed by file name when prompted again. File version is checked and accordingly displays information.

```

>>>###WARNING: File file2_2.txt is invalid. Use REFRESH to download the new copy.
>>>REFRESH
>>>Please enter the file name to refresh.
>>>file2_2.txt
>>>INFO: Downloading file file2_2.txt.
>>>INFO: File version Updated.

```

Figure 7 REFRESH command

Peer holding the file informs its user about the request and action.

```

>>>INFO: Requested file "file2_2.txt" is being uploaded.
>>>INFO: File file2_2.txt requested by a peer 6126 was sent.

```

Figure 8 REFRESH effect peer holding the file.

#### 5. Working of PUSH method.

Peer holding the master file broadcasts invalidate message upon knowing the change in the file.

```

>>>INFO: File file5_5.txt requested by a peer 6126 was sent.
>>>Broadcasting INVALIDATE message about the file file5_5.txt

```

Figure 9 Peer broadcasting Invalidation of the file

Case 1: Peer holding the cached copy of file upon the receiving the message, responds accordingly

```

>>>INFO: Invalidation message received from 6130 about a file file5_5.txt with version number 2.
>>>###WARNING: Invalid file, file5_5.txt found. Deleting from the system and updating the file list.
>>>INFO: Forwarding invalidation message..

```

Figure 10 Peer responding to Invalidation message

Case 2: Peer not holding the file, responds as shown in fig. 11.

```
>>>INFO: Forwarding invalidation message..  
>>>INFO: Invalidation message received from 6130 about a file file5_5.txt with version number 6126.  
>>>INFO: Forwarding invalidation message..
```

Figure 11 Peer responding to invalidation message

## 6. Working of PULL method.

Case 1: When TTR expires and master file is unchanged.

```
>>>###WARNING: TTR of File file5_5.txt reached 0. File marked as invalid.  
>>>INFO: Polling new TTR value of file file5_5.txt.  
>>>INFO: TTR of File file5_5.txt is updated.
```

Figure 12 PULL method: case 1

Case 2: When TTR expires and master file is changed.

```
>>>###WARNING: TTR of File file5_7.txt reached 0. File marked as invalid.  
>>>INFO: Polling new TTR value of file file5_7.txt.  
>>>###WARNING: File file5_7.txt is invalid. Use REFRESH to download the new copy.
```

Figure 13 PULL method: case 2

Peer holding the file responds as shown in figure 14.

```
>>>INFO: PULL request received for a file named file5_5.txt.
```

Figure 14 Peer response.