



TECH MANUAL

COMP 4981 Message File Server

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1 Intro to Linux Message File Server

Type **make** in the terminal to compile the files.

Type `./msgqcs` to run the program.

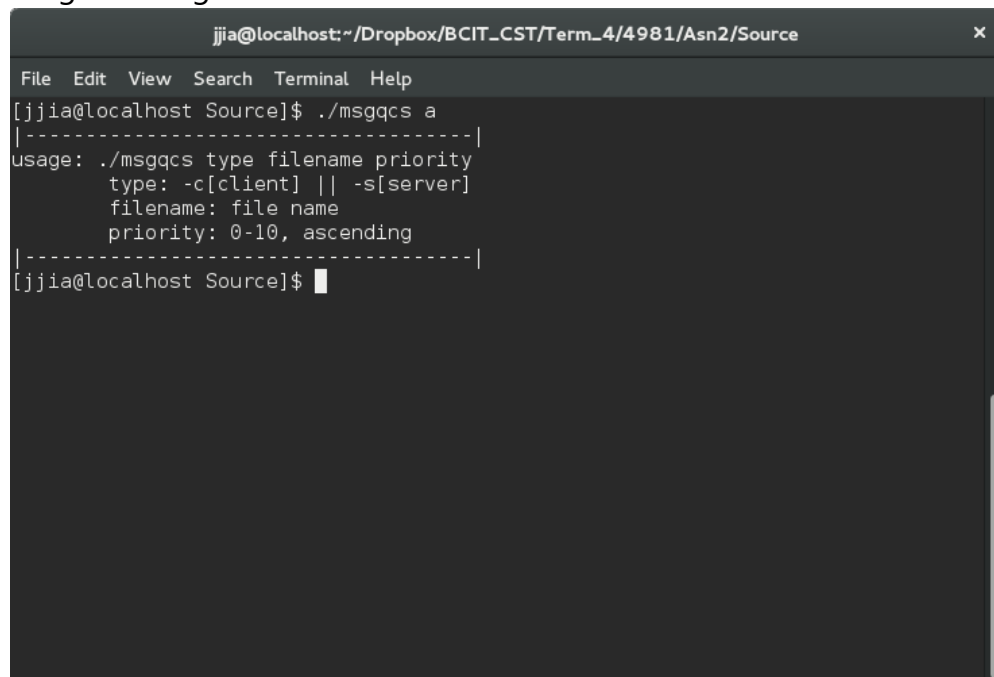
This application is a basic **Client** and **Server** system for Linux to demonstrate inter-process communications using message queues. The message file server receives packets of small information sent from a client through the kernel to communicate. Overview:

- Client specifies the filename and priority on the command line
- Client sends its process ID to the server through message queue
- Server sends its process ID back to the client when a query has been received
- Server creates a child process to handle the client
- Client receives the server's process ID, and sends the file name and priority level to the server
- Server's child process receives the filename, attempt to open and read from it, and send each packet with the size based off of the priority level
 - Priority 1 is 40 bytes
 - Priority 100 is 4000 bytes
- Client receives packets, and print each data on the screen

2 Starting Client and Server

Both the **Client** and **Server** is run by the same program.

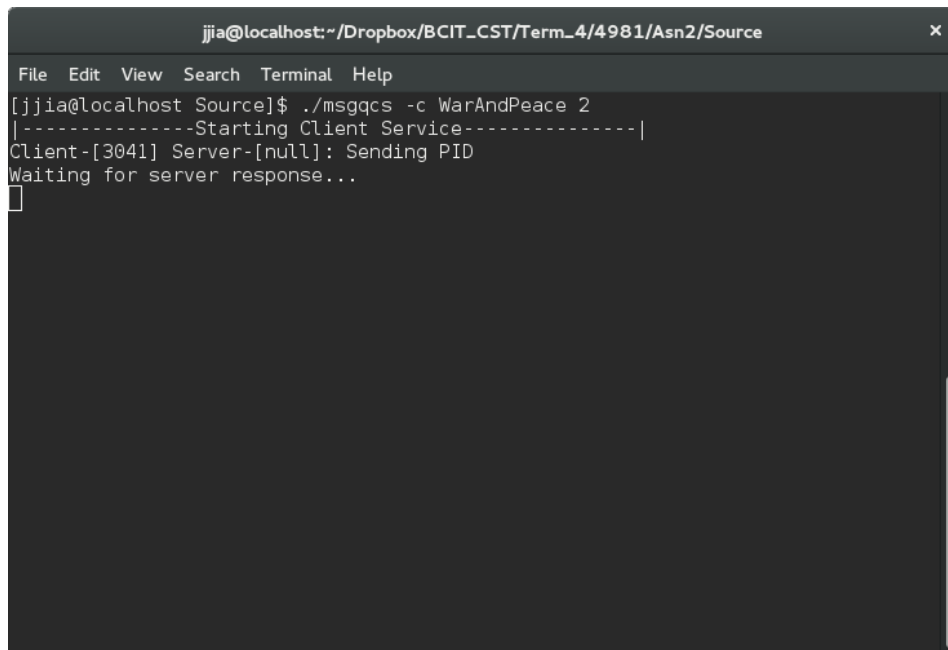
Program Usage:



```
jjia@localhost: ~/Dropbox/BCIT_CST/Term_4/4981/Asn2/Source
File Edit View Search Terminal Help
[jjia@localhost Source]$ ./msgqcs a
|-----|
usage: ./msgqcs type filename priority
       type: -c[client] || -s[server]
       filename: file name
       priority: 0-10, ascending
|-----|
[jjia@localhost Source]$
```

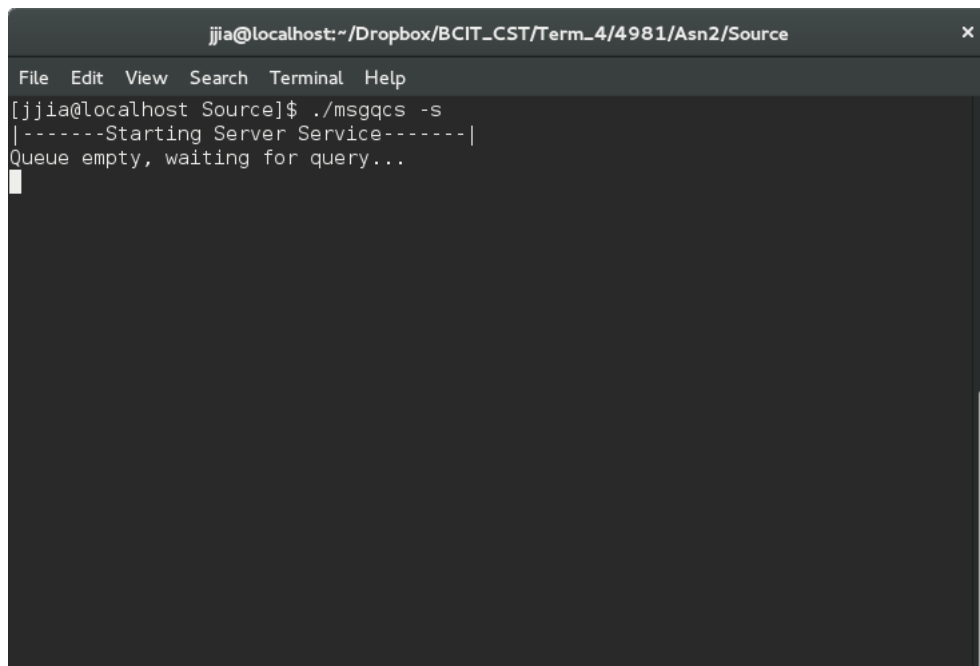
To specify which program to run enter:

- `./msgqcs -c [filename] [priority]` for **Client**
 - `[filename]` is the name of the file the server will open and read from
 - `[priority]` is the priority of the connection, ranging from 1 to 100 (1 being the smallest)

A terminal window titled 'jjia@localhost:~/Dropbox/BCIT_CST/Term_4/4981/Asn2/Source' with a menu bar (File, Edit, View, Search, Terminal, Help). The terminal shows the command './msgqcs -c WarAndPeace 2' being executed. The output is: '|-----Starting Client Service-----|', 'Client-[3041] Server-[null]: Sending PID', and 'Waiting for server response...'. A cursor is visible on the line 'Waiting for server response...'.

```
jjia@localhost:~/Dropbox/BCIT_CST/Term_4/4981/Asn2/Source
File Edit View Search Terminal Help
[jjia@localhost Source]$ ./msgqcs -c WarAndPeace 2
|-----Starting Client Service-----|
Client-[3041] Server-[null]: Sending PID
Waiting for server response...
█
```

- `./msgqcs -s` for **Server**

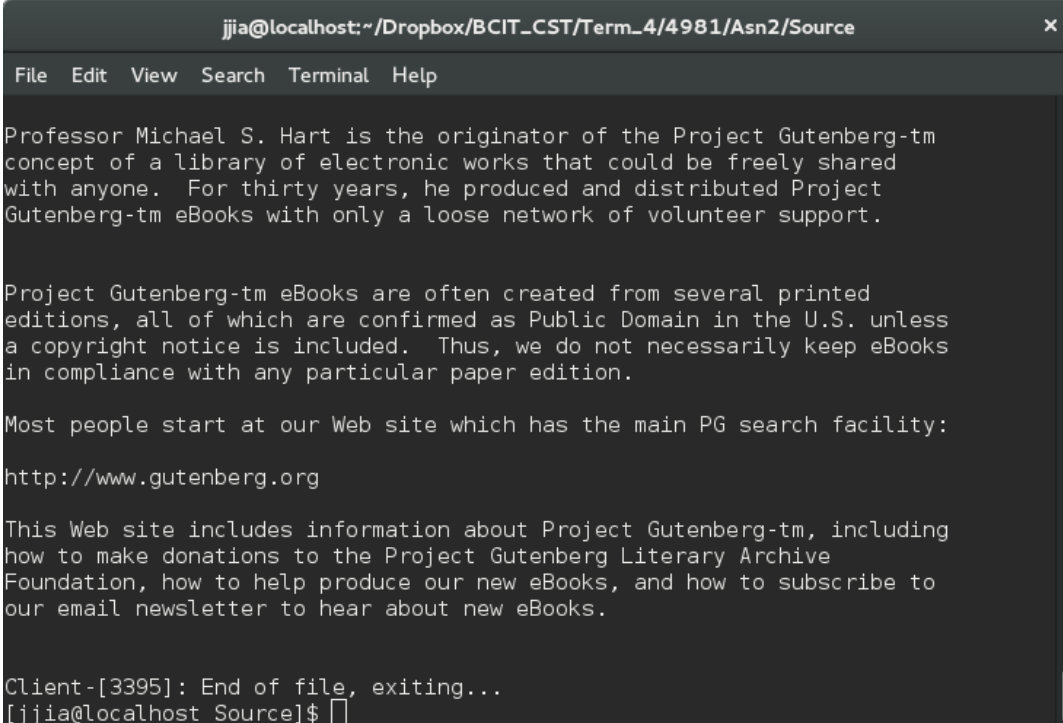
A terminal window titled 'jjia@localhost:~/Dropbox/BCIT_CST/Term_4/4981/Asn2/Source' with a menu bar (File, Edit, View, Search, Terminal, Help). The terminal shows the command './msgqcs -s' being executed. The output is: '|-----Starting Server Service-----|' and 'Queue empty, waiting for query...'. A cursor is visible on the line 'Queue empty, waiting for query...'.

```
jjia@localhost:~/Dropbox/BCIT_CST/Term_4/4981/Asn2/Source
File Edit View Search Terminal Help
[jjia@localhost Source]$ ./msgqcs -s
|-----Starting Server Service-----|
Queue empty, waiting for query...
█
```

3 Sending and receiving files

Multiple file communications between **Clients** and **Server**

Client 1 (Filename: WarAndPeace Priority: 1)



```
jjia@localhost:~/Dropbox/BCIT_CST/Term_4/4981/Asn2/Source
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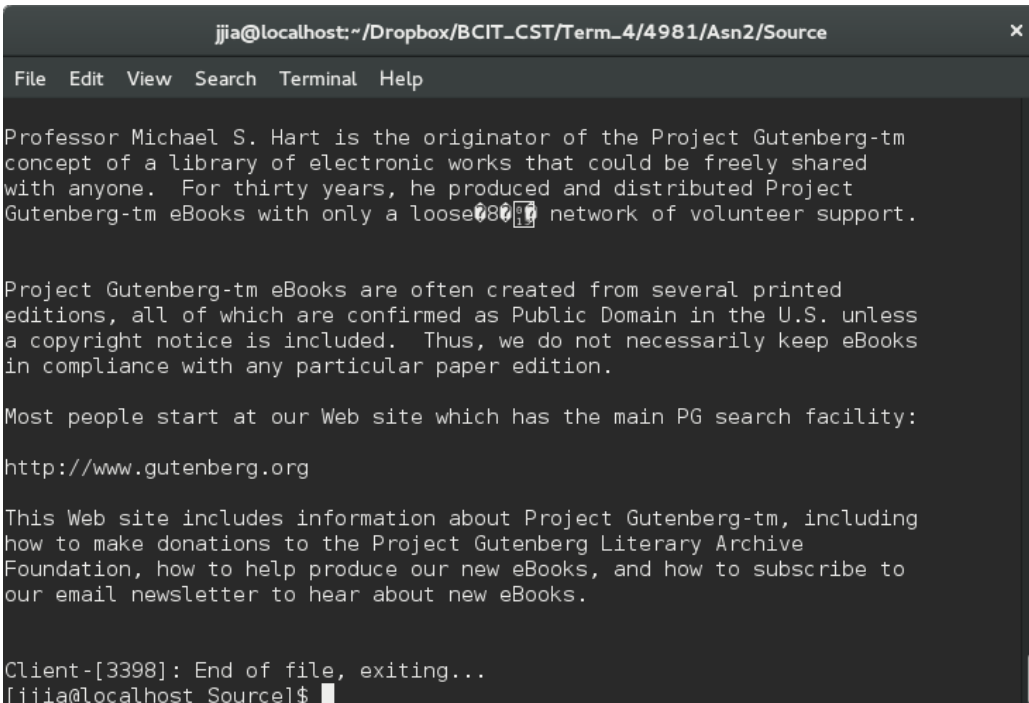
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Client-[3395]: End of file, exiting...
[jjia@localhost Source]$
```

Client 2 (Filename: WarAndPeace Priority: 50)



```
jjia@localhost:~/Dropbox/BCIT_CST/Term_4/4981/Asn2/Source
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our email newsletter to hear about new eBooks.

Client-[3398]: End of file, exiting...
[jjia@localhost Source]$
```

Client 3 (Filename: WarAndPeace Priority:100)

```
jja@localhost:~/Dropbox/BCIT_CST/Term_4/4981/Asn2/Source
File Edit View Search Terminal Help

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our email newsletter to hear about new eBooks.

Client-[3438]: End of file, exiting...
[jja@localhost Source]$
```

Server (Note: Client 3 finished first because it had the highest priority)

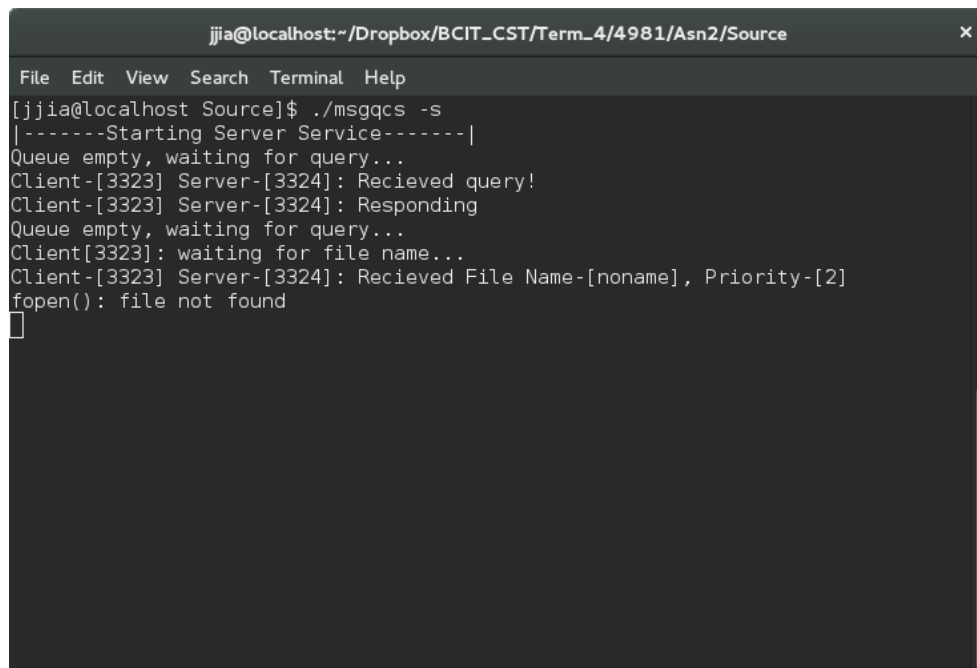
```
jja@localhost:~/Dropbox/BCIT_CST/Term_4/4981/Asn2/Source
File Edit View Search Terminal Help

|-----Starting Server Service-----|
Queue empty, waiting for query...
Client-[3395] Server-[3439]: Recieved query!
Client-[3395] Server-[3439]: Responding
Queue empty, waiting for query...
Client-[3398] Server-[3439]: Recieved query!
Client-[3398] Server-[3439]: Responding
Client[3395]: waiting for file name...
Client-[3395] Server-[3439]: Recieved File Name-[WarAndPeace], Priority-[1]
Queue empty, waiting for query...
Client-[3438] Server-[3439]: Recieved query!
Client-[3438] Server-[3439]: Responding
Client[3395]: Start transferring...
Client[3398]: waiting for file name...
Client-[3398] Server-[3439]: Recieved File Name-[WarAndPeace], Priority-[50]
Queue empty, waiting for query...
Client[3398]: Start transferring...
Client[3438]: waiting for file name...
Client-[3438] Server-[3439]: Recieved File Name-[WarAndPeace], Priority-[100]
Client[3438]: Start transferring...
Finished transferring for client: [3438]. exiting...
Finished transferring for client: [3398]. exiting...
Finished transferring for client: [3395]. exiting...
|
```

4 Notes

`[filename]` has to be a valid file on the server side. If not a message will be sent to the client indicating a **FILE_NOT_FOUND** error

Invalid file on the server

A terminal window titled 'jjia@localhost:~/Dropbox/BCIT_CST/Term_4/4981/Asn2/Source' with a menu bar (File, Edit, View, Search, Terminal, Help). The terminal output shows a server starting and then receiving a query from a client. The client sends a file name 'noname' and priority '2'. The server responds with 'fopen(): file not found'.

```
jjia@localhost:~/Dropbox/BCIT_CST/Term_4/4981/Asn2/Source
File Edit View Search Terminal Help
[jjia@localhost Source]$ ./msgqcs -s
|-----Starting Server Service-----|
Queue empty, waiting for query...
Client-[3323] Server-[3324]: Recieved query!
Client-[3323] Server-[3324]: Responding
Queue empty, waiting for query...
Client[3323]: waiting for file name...
Client-[3323] Server-[3324]: Recieved File Name-[noname], Priority-[2]
fopen(): file not found
█
```

Client receives an invalid file from server

```
jjia@localhost:~/Dropbox/BCIT_CST/Term_4/4981/Asn2/Source
File Edit View Search Terminal Help
[jjia@localhost Source]$ ./msgqcs -c noname 100
|-----Starting Client Service-----|
Client-[3631] Server-[null]: Sending PID
Waiting for server response...
Client-[3631] Server-[-1767843032]: Recieved response!
Client-[3631] Server-[3630]: Sending file name-[noname], Priority-[100]
Waiting for file...
fopen(): file not found
[jjia@localhost Source]$
```