

Concurrent Socket Server

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date

CNT4504 - Computer Networks & Distributed Processing

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# **Introduction**

# **Project Purpose:**

*To create:*

* A multithreaded server that listens to a port & accepts requests from a client server, to then operate to return the requested information to the client
* A multithreaded client that requests information from the server & creates a user-specified number of requests (threads).

# **Project Goals:**

## ***Server Program:***

* Listen to client requests at a specific port
* concurrently handle clients
* Perform the following operations:
  + - Determine the date and time on the server,
    - Find how long the server has been running since last boot-up
    - Determine the current memory usage on the server
    - List the network connections on the server
    - Create a list of the users currently connected to the server
    - Create a list of the programs that are currently running on the server
* Collect and send the values obtained from performing the operations above to the client

## ***Client Program:***

* Prompt the user for the IP address of the server to connect to
* Prompt the user for the port to connect to
* Prompt the user to select one of the operations (mentioned in the server portion)
* Ask the user to select how many requests to send to the server
* Output the client & the corresponding response (output requested by that client)

## ***Testing & Analysis:***

* Run/Test the programs and collect the following data for each operation:

# **Paper – What to Expect:**

* Client-Server Setup & configuration: the design & operations of the client and server programs
* Testing & data collection: collecting the previously specified data from running the programs
* Data Analysis: Analyzing the collected data to determine the effects of increasing the number of clients on the turnaround time for individual clients and on the Average turnaround time in general, the difference in the average turnaround time for the iterative server and the concurrent server, give some insight into when you should use an iterative server or a concurrent one, a well as determining the primary cause(s) of the effects on the individual client turnaround time and average turnaround time.
* Conclusion: conclusions drawn from data analysis
* Lessons learned: What I learned from this assignment

# **Client-Server Setup && Configuration**

## **Server Program Design & Operation:**

## **Client Program Design & Operation:**

# **Testing & Data Collection**

## **How the Programs Were Tested:**

## **Data Collected:**

### **Date & Time**

|  |  |  |
| --- | --- | --- |
| Number of Requests | Total Turnaround Time | Average individual request Turnaround time |
| 1 |  |  |
| 5 |  |  |
| 10 |  |  |
| 15 |  |  |
| 20 |  |  |
| 25 |  |  |
| 100 |  |  |

### **Uptime**

|  |  |  |
| --- | --- | --- |
| Number of Requests | Total Turnaround Time | Average individual request Turnaround time |
| 1 |  |  |
| 5 |  |  |
| 10 |  |  |
| 15 |  |  |
| 20 |  |  |
| 25 |  |  |
| 100 |  |  |

### **Memory Used**

|  |  |  |
| --- | --- | --- |
| Number of Requests | Total Turnaround Time | Average individual request Turnaround time |
| 1 |  |  |
| 5 |  |  |
| 10 |  |  |
| 15 |  |  |
| 20 |  |  |
| 25 |  |  |
| 100 |  |  |

### **Netstat**

|  |  |  |
| --- | --- | --- |
| Number of Requests | Total Turnaround Time | Average individual request Turnaround time |
| 1 |  |  |
| 5 |  |  |
| 10 |  |  |
| 15 |  |  |
| 20 |  |  |
| 25 |  |  |
| 100 |  |  |

### **Current Users**

|  |  |  |
| --- | --- | --- |
| Number of Requests | Total Turnaround Time | Average individual request Turnaround time |
| 1 |  |  |
| 5 |  |  |
| 10 |  |  |
| 15 |  |  |
| 20 |  |  |
| 25 |  |  |
| 100 |  |  |

### **Running Processes**

|  |  |  |
| --- | --- | --- |
| Number of Requests | Total Turnaround Time | Average individual request Turnaround time |
| 1 |  |  |
| 5 |  |  |
| 10 |  |  |
| 15 |  |  |
| 20 |  |  |
| 25 |  |  |
| 100 |  |  |

# **Data Analysis**

## **Effect of increasing the number of clients on the Turnaround time for individual clients**

## **Effect of increasing the number of clients on the average Turnaround time**

## **Primary Cause(s) of the effect on individual client turnaround time and average turnaround time**

## **Contrast between the Average turnaround time for the iterative server vs the concurrent server**

## **When to use the iterative server vs when to use the concurrent server**

# **Conclusion**

# **Lessons Learned:**