

## CN Assignment 2

3. For each server design, each server (except for design 2a) concurrently processes 10 client requests. Note that you should be able to run 10 concurrent client programs. Observe the following metrics.

a. Time required by the server to process all (i.e., 10) concurrent client requests

- Fork

```
real    0m0.004s
user    0m0.000s
sys     0m0.009s
hiteshgarg@hitesh--Ubuntu:~/cn/final_v2$
```

- Thread

```
real    0m0.004s
user    0m0.000s
sys     0m0.009s
hiteshgarg@hitesh--Ubuntu:~/cn/final_v2$ time ./clientt
```

- Select

```
real    0m0.004s
user    0m0.004s
sys     0m0.000s
hiteshgarg@hitesh--Ubuntu:~/cn/final_v2$ time ./clientt
```

- Poll

```
real    0m0.006s
user    0m0.000s
sys     0m0.006s
hiteshgarg@hitesh--Ubuntu:~/cn/final_v2$ time ./clientt
```

- Epoll

```
real    0m3.037s
user    0m0.000s
sys     0m0.048s
hiteshgarg@hitesh--Ubuntu:~/cn/final_v2$ time ./clientt
```

b. Server process's CPU utilization (use "top" or "htop" command) [2.5]

c. Server process's memory utilization (use "top" command) [2.5]

## - Fork

| PID  | USER      | PRI | NI | VIRT | RES   | SHR   | S | CPU% | MEM% | TIME+   | Command                            |
|------|-----------|-----|----|------|-------|-------|---|------|------|---------|------------------------------------|
| 4504 | hiteshgar | 20  | 0  | 815M | 62920 | 41376 | S | 0.0  | 0.4  | 0:00.00 | /usr/libexec/gnome-terminal-server |
| 4519 | hiteshgar | 20  | 0  | 815M | 62920 | 41376 | S | 0.0  | 0.4  | 0:00.00 | /usr/libexec/gnome-terminal-server |
| 8164 | hiteshgar | 23  | 3  | 2640 | 96    | 0     | S | 0.0  | 0.0  | 0:00.00 | ./serverf                          |
| 8165 | hiteshgar | 20  | 0  | 2640 | 96    | 0     | S | 0.0  | 0.0  | 0:00.00 | ./serverf                          |
| 8167 | hiteshgar | 20  | 0  | 2640 | 96    | 0     | S | 0.0  | 0.0  | 0:00.00 | ./serverf                          |
| 8168 | hiteshgar | 20  | 0  | 2640 | 96    | 0     | S | 0.0  | 0.0  | 0:00.00 | ./serverf                          |
| 8169 | hiteshgar | 20  | 0  | 2640 | 96    | 0     | S | 0.0  | 0.0  | 0:00.00 | ./serverf                          |
| 8170 | hiteshgar | 20  | 0  | 2640 | 96    | 0     | S | 0.0  | 0.0  | 0:00.00 | ./serverf                          |
| 8171 | hiteshgar | 20  | 0  | 2640 | 96    | 0     | S | 0.0  | 0.0  | 0:00.00 | ./serverf                          |
| 8172 | hiteshgar | 20  | 0  | 2640 | 96    | 0     | S | 0.0  | 0.0  | 0:00.00 | ./serverf                          |
| 8188 | hiteshgar | 20  | 0  | 2640 | 96    | 0     | S | 0.0  | 0.0  | 0:00.00 | ./serverf                          |
| 8189 | hiteshgar | 20  | 0  | 2640 | 96    | 0     | S | 0.0  | 0.0  | 0:00.00 | ./serverf                          |
| 8190 | hiteshgar | 20  | 0  | 2640 | 96    | 0     | S | 0.0  | 0.0  | 0:00.00 | ./serverf                          |
| 8191 | hiteshgar | 20  | 0  | 2640 | 96    | 0     | S | 0.0  | 0.0  | 0:00.00 | ./serverf                          |
| 8192 | hiteshgar | 20  | 0  | 2640 | 96    | 0     | S | 0.0  | 0.0  | 0:00.00 | ./serverf                          |
| 8193 | hiteshgar | 20  | 0  | 2640 | 96    | 0     | S | 0.0  | 0.0  | 0:00.00 | ./serverf                          |
| 8194 | hiteshgar | 20  | 0  | 2640 | 96    | 0     | S | 0.0  | 0.0  | 0:00.00 | ./serverf                          |
| 8195 | hiteshgar | 20  | 0  | 2640 | 96    | 0     | S | 0.0  | 0.0  | 0:00.00 | ./serverf                          |
| 8196 | hiteshgar | 20  | 0  | 2640 | 96    | 0     | S | 0.0  | 0.0  | 0:00.00 | ./serverf                          |

## - Thread

| PID  | USER      | PRI | NI | VIRT  | RES   | SHR   | S | CPU% | MEM% | TIME+   | Command                                  |
|------|-----------|-----|----|-------|-------|-------|---|------|------|---------|--|
| 4824 | hiteshgar | 20  | 0  | 3403M | 4052  | 1660  | S | 3.3  | 0.0  | 0:00.14 | ./serverp                                |
| 3876 | hiteshgar | 20  | 0  | 813M  | 56784 | 41700 | S | 1.3  | 0.4  | 0:02.99 | /usr/libexec/gnome-terminal-server       |
| 1304 | hiteshgar | 20  | 0  | 569M  | 18316 | 15848 | S | 0.0  | 0.1  | 0:00.03 | /usr/libexec/gnome-shell-calendar-server |
| 1308 | hiteshgar | 20  | 0  | 569M  | 18316 | 15848 | S | 0.0  | 0.1  | 0:00.00 | /usr/libexec/gnome-shell-calendar-server |
| 1310 | hiteshgar | 20  | 0  | 569M  | 18316 | 15848 | S | 0.0  | 0.1  | 0:00.00 | /usr/libexec/gnome-shell-calendar-server |
| 1313 | hiteshgar | 20  | 0  | 569M  | 18316 | 15848 | S | 0.0  | 0.1  | 0:00.00 | /usr/libexec/gnome-shell-calendar-server |
| 1314 | hiteshgar | 20  | 0  | 569M  | 18316 | 15848 | S | 0.0  | 0.1  | 0:00.00 | /usr/libexec/gnome-shell-calendar-server |
| 1323 | hiteshgar | 20  | 0  | 569M  | 18316 | 15848 | S | 0.0  | 0.1  | 0:00.00 | /usr/libexec/gnome-shell-calendar-server |

## - Select

| PID  | USER      | PRI | NI | VIRT | RES   | SHR   | S | CPU% | MEM% | TIME+   | Command                                  |
|------|-----------|-----|----|------|-------|-------|---|------|------|---------|--|
| 3876 | hiteshgar | 20  | 0  | 814M | 57824 | 41700 | S | 0.7  | 0.4  | 0:04.80 | /usr/libexec/gnome-terminal-server       |
| 5515 | hiteshgar | 20  | 0  | 2772 | 1320  | 1228  | S | 0.7  | 0.0  | 0:00.01 | ./servers                                |
| 1304 | hiteshgar | 20  | 0  | 569M | 18316 | 15848 | S | 0.0  | 0.1  | 0:00.03 | /usr/libexec/gnome-shell-calendar-server |
| 1308 | hiteshgar | 20  | 0  | 569M | 18316 | 15848 | S | 0.0  | 0.1  | 0:00.00 | /usr/libexec/gnome-shell-calendar-server |
| 1310 | hiteshgar | 20  | 0  | 569M | 18316 | 15848 | S | 0.0  | 0.1  | 0:00.00 | /usr/libexec/gnome-shell-calendar-server |
| 1313 | hiteshgar | 20  | 0  | 569M | 18316 | 15848 | S | 0.0  | 0.1  | 0:00.00 | /usr/libexec/gnome-shell-calendar-server |

## - Poll

| PID  | USER      | PRI | NI | VIRT | RES   | SHR   | S | CPU% | MEM% | TIME+   | Command                                  |
|------|-----------|-----|----|------|-------|-------|---|------|------|---------|--|
| 3876 | hiteshgar | 20  | 0  | 816M | 59408 | 41700 | S | 1.3  | 0.4  | 0:07.70 | /usr/libexec/gnome-terminal-server       |
| 5949 | hiteshgar | 20  | 0  | 2772 | 1380  | 1288  | S | 0.7  | 0.0  | 0:00.03 | ./serverp                                |
| 1304 | hiteshgar | 20  | 0  | 569M | 18316 | 15848 | S | 0.0  | 0.1  | 0:00.03 | /usr/libexec/gnome-shell-calendar-server |
| 1308 | hiteshgar | 20  | 0  | 569M | 18316 | 15848 | S | 0.0  | 0.1  | 0:00.00 | /usr/libexec/gnome-shell-calendar-server |
| 1310 | hiteshgar | 20  | 0  | 569M | 18316 | 15848 | S | 0.0  | 0.1  | 0:00.00 | /usr/libexec/gnome-shell-calendar-server |
| 1313 | hiteshgar | 20  | 0  | 569M | 18316 | 15848 | S | 0.0  | 0.1  | 0:00.00 | /usr/libexec/gnome-shell-calendar-server |

## - Epoll

| PID   | USER      | PRI | NI | VIRT | RES  | SHR  | S | CPU% | MEM% | TIME+   | Command  |
|-------|-----------|-----|----|------|------|------|---|------|------|---------|----------|
| 37760 | hiteshgar | 20  | 0  | 2772 | 1408 | 1312 | S | 1.3  | 0.0  | 0:00.12 | ./epolls |

