

## Documentation with output file demonstrating its operation

**Step 1:** Keep all four files in the same directory i.e. two shell scripts and two C files.

```
smakwana@silo:~/Desktop/CDNetworks$ ls -l
total 16
-rw----- 1 smakwana students 1914 Dec  3 11:05 generate_logs.c
-rw----- 1 smakwana students 180 Dec  3 11:07 generate.sh
-rw----- 1 smakwana students 3889 Dec  3 11:05 query_logs.c
-rw----- 1 smakwana students 151 Dec  3 11:07 query.sh
```

**Step 2:** Give all permissions to both shell scripts. So, that the shell script can be executed.

```
smakwana@silo:~/Desktop/CDNetworks$ chmod ugo+rwx generate.sh
smakwana@silo:~/Desktop/CDNetworks$ chmod ugo+rwx query.sh
smakwana@silo:~/Desktop/CDNetworks$ ls -l
total 16
-rw----- 1 smakwana students 1914 Dec  3 11:05 generate_logs.c
-rwxrwxrwx 1 smakwana students 180 Dec  3 11:07 generate.sh
-rw----- 1 smakwana students 3889 Dec  3 11:05 query_logs.c
-rwxrwxrwx 1 smakwana students 151 Dec  3 11:07 query.sh
```

**Step 3:** Run generate.sh file with argument DATA\_PATH (Here LOGS). So, it will create a directory named "DATA\_PATH" and store the logs in it.

```
smakwana@silo:~/Desktop/CDNetworks$ ./generate.sh LOGS
smakwana@silo:~/Desktop/CDNetworks$ cd LOGS/
smakwana@silo:~/Desktop/CDNetworks/LOGS$ ls
server_logs.txt
```

**Step 4:** Now run a query.sh with DATA\_PATH as an argument. Enter the query according to the given format: QUERY IP cpu\_id time\_start time\_end. Time\_start and time\_end or enter EXIT to exit from the code.

```
smakwana@silo:~/Desktop/CDNetworks$ ./query.sh LOGS
>QUERY 192.168.1.10 1 2014-10-31 00:00 2014-10-31 00:05
CPU1 usage on 192.168.1.10:
(2014-10-31 00:00, 12%), (2014-10-31 00:01, 42%), (2014-10-31 00:02, 65%), (2014-10-31 00:03, 49%), (2014-10-31 00:04, 2%),
(2014-10-31 00:05, 10%),
>QUERY 192.168.1.12 0 2014-10-31 00:00 2014-10-31 00:05
CPU0 usage on 192.168.1.12:
(2014-10-31 00:00, 86%), (2014-10-31 00:01, 9%), (2014-10-31 00:02, 65%), (2014-10-31 00:03, 80%), (2014-10-31 00:04, 12%),
(2014-10-31 00:05, 10%),
>EXIT
```

**Snapshot with more time duration**

```
smakwana@silo:~/Desktop/CDNetworks$ ./query.sh LOGS
>QUERY 192.168.2.105 1 2014-10-31 10:10 2014-10-31 11:05
CPU1 usage on 192.168.2.105:
(2014-10-31 10:10, 90%), (2014-10-31 10:11, 92%), (2014-10-31 10:12, 38%), (2014-10-31 10:13, 1%), (2014-10-31 10:14, 32%), (2014-10-31 10:15, 35%),
(2014-10-31 10:16, 96%), (2014-10-31 10:17, 24%), (2014-10-31 10:18, 86%), (2014-10-31 10:19, 69%), (2014-10-31 10:20, 91%), (2014-10-31 10:21, 20%),
(2014-10-31 10:22, 82%), (2014-10-31 10:23, 67%), (2014-10-31 10:24, 92%), (2014-10-31 10:25, 21%), (2014-10-31 10:26, 4%), (2014-10-31 10:27, 29%),
(2014-10-31 10:28, 40%), (2014-10-31 10:29, 60%), (2014-10-31 10:30, 76%), (2014-10-31 10:31, 56%), (2014-10-31 10:32, 43%), (2014-10-31 10:33, 17%),
(2014-10-31 10:34, 85%), (2014-10-31 10:35, 76%), (2014-10-31 10:36, 13%), (2014-10-31 10:37, 97%), (2014-10-31 10:38, 73%), (2014-10-31 10:39, 68%),
(2014-10-31 10:40, 50%), (2014-10-31 10:41, 11%), (2014-10-31 10:42, 1%), (2014-10-31 10:43, 31%), (2014-10-31 10:44, 2%), (2014-10-31 10:45, 91%),
(2014-10-31 10:46, 81%), (2014-10-31 10:47, 58%), (2014-10-31 10:48, 41%), (2014-10-31 10:49, 72%), (2014-10-31 10:50, 39%), (2014-10-31 10:51, 64%),
(2014-10-31 10:52, 4%), (2014-10-31 10:53, 1%), (2014-10-31 10:54, 16%), (2014-10-31 10:55, 33%), (2014-10-31 10:56, 18%), (2014-10-31 10:57, 45%),
(2014-10-31 10:58, 57%), (2014-10-31 10:59, 6%), (2014-10-31 11:00, 85%), (2014-10-31 11:01, 96%), (2014-10-31 11:02, 87%), (2014-10-31 11:03, 91%),
(2014-10-31 11:04, 21%),
>QUERY 192.168.3.0 0 2014-10-31 23:30 2014-10-31 23:59
CPU0 usage on 192.168.3.0:
(2014-10-31 23:30, 19%), (2014-10-31 23:31, 68%), (2014-10-31 23:32, 41%), (2014-10-31 23:33, 59%), (2014-10-31 23:34, 94%), (2014-10-31 23:35, 71%),
(2014-10-31 23:36, 13%), (2014-10-31 23:37, 30%), (2014-10-31 23:38, 59%), (2014-10-31 23:39, 52%), (2014-10-31 23:40, 66%), (2014-10-31 23:41, 7%),
(2014-10-31 23:42, 3%), (2014-10-31 23:43, 5%), (2014-10-31 23:44, 41%), (2014-10-31 23:45, 68%), (2014-10-31 23:46, 82%), (2014-10-31 23:47, 20%),
(2014-10-31 23:48, 18%), (2014-10-31 23:49, 81%), (2014-10-31 23:50, 41%), (2014-10-31 23:51, 38%), (2014-10-31 23:52, 56%), (2014-10-31 23:53, 97%),
(2014-10-31 23:54, 74%), (2014-10-31 23:55, 49%), (2014-10-31 23:56, 22%), (2014-10-31 23:57, 74%), (2014-10-31 23:58, 43%),
(2014-10-31 23:59, 10%),
>EXIT
```

Users can enter QUERY or QUERY or EXIT or exit. Both are acceptable.

```
smakwana@silo:~/Desktop/CDNetworks$ ./query.sh LOGS
>query 192.168.1.10 1 2014-10-31 00:00 2014-10-31 00:05
CPU1 usage on 192.168.1.10:
(2014-10-31 00:00, 12%), (2014-10-31 00:01, 42%), (2014-10-31 00:02, 65%), (2014-10-31 00:03, 49%), (2014-10-31 00:04, 2%)
>exit
smakwana@silo:~/Desktop/CDNetworks$
```

## Snapshots of incorrect query

1) If executed without entering the directory name

```
smakwana@silo:~/Desktop/CDNetworks$ ./generate.sh
Usage: ./generate.sh DATA_PATH
```

```
smakwana@silo:~/Desktop/CDNetworks$ ./query.sh
Usage: ./query.sh DATA_PATH
```

2) If the user enters RUN instead of QUERY, only QUERY, no end time, and no start time and end time.

```
smakwana@silo:~/Desktop/CDNetworks$ ./query.sh LOGS
>RUN 192.168.1.10 1 2014-10-31 00:00 2014-10-31 00:05
Valid Commands are QUERY or EXIT

>QUERY
No data found. The reason would be one of the following:
1) Usage: QUERY IP cpu_id time_start time_end
2) Range of IP: 192.168.0.0 to 192.168.0.255, 192.168.1.0 to 192.168.1.255, 192.168.2.0 to 192.168.2.255, 192.168.3.0 to 192.168.3.231
3) cpu_id is either 0 or 1
4) start_time and end_time are in YYYY-MM-DD HH:MM format
5) Range of time: 2014-10-31 00:00 to 2014-10-31 23:59

>RUN 192.168.1.10 1 2014-10-31 00:00
No data found. The reason would be one of the following:
1) Usage: QUERY IP cpu_id time_start time_end
2) Range of IP: 192.168.0.0 to 192.168.0.255, 192.168.1.0 to 192.168.1.255, 192.168.2.0 to 192.168.2.255, 192.168.3.0 to 192.168.3.231
3) cpu_id is either 0 or 1
4) start_time and end_time are in YYYY-MM-DD HH:MM format
5) Range of time: 2014-10-31 00:00 to 2014-10-31 23:59

>RUN 192.168.1.10 1
No data found. The reason would be one of the following:
1) Usage: QUERY IP cpu_id time_start time_end
2) Range of IP: 192.168.0.0 to 192.168.0.255, 192.168.1.0 to 192.168.1.255, 192.168.2.0 to 192.168.2.255, 192.168.3.0 to 192.168.3.231
3) cpu_id is either 0 or 1
4) start_time and end_time are in YYYY-MM-DD HH:MM format
5) Range of time: 2014-10-31 00:00 to 2014-10-31 23:59
```

3) If the IP Address is out of range or CPU ID is not 0 or 1.

```
smakwana@silo:~/Desktop/CDNetworks$ ./query.sh LOGS
>QUERY 192.168.3.232 0 2014-10-31 23:30 2014-10-31 23:59
No data found. The reason would be one of the following:
1) Usage: QUERY IP cpu_id time_start time_end
2) Range of IP: 192.168.0.0 to 192.168.0.255, 192.168.1.0 to 192.168.1.255, 192.168.2.0 to 192.168.2.255, 192.168.3.0 to 192.168.3.231
3) cpu_id is either 0 or 1
4) start_time and end_time are in YYYY-MM-DD HH:MM format
5) Range of time: 2014-10-31 00:00 to 2014-10-31 23:59

>QUERY 192.168.3.0 2 2014-10-31 23:30 2014-10-31 23:59
No data found. The reason would be one of the following:
1) Usage: QUERY IP cpu_id time_start time_end
2) Range of IP: 192.168.0.0 to 192.168.0.255, 192.168.1.0 to 192.168.1.255, 192.168.2.0 to 192.168.2.255, 192.168.3.0 to 192.168.3.231
3) cpu_id is either 0 or 1
4) start_time and end_time are in YYYY-MM-DD HH:MM format
5) Range of time: 2014-10-31 00:00 to 2014-10-31 23:59
```