

# DevOps Assignment Report

## ◆ Task 1: System Monitoring Setup

### Steps Taken

- Installed `htop` & `nmon` for CPU, memory, and process monitoring.
- Used `df -h` and `du -sh /var/*` for disk usage tracking.
- Created `/usr/local/bin/sys_monitor.sh` script to log CPU, memory, disk, and top processes.
- Configured cron job to run monitoring script daily at midnight.

### Verification (Screenshots/Outputs)

- Output of `df -h` and `du` logs
- Content of `/var/log/system_monitor.log`
- Cron job entry in `crontab -l`

```
[root@localhost log]# cat system_monitor.log
Filesystem      Size  Used Avail Use% Mounted on
/dev/mapper/cs-root 17G  1.7G   16G  10% /
devtmpfs         4.0M  0      4.0M  0% /dev
tmpfs            1.8G  0      1.8G  0% /dev/shm
tmpfs            731M  9.6M   722M  2% /run
tmpfs            1.0M  0      1.0M  0% /run/credentials/systemd-journald.service
/dev/sda2        960M  323M   638M  34% /boot
tmpfs            1.0M  0      1.0M  0% /run/credentials/getty@tty1.service
tmpfs            366M  4.0K   366M  1% /run/user/0

0      /var/adm
49M     /var/cache
0       /var/crash
0       /var/db
0       /var/empty
0       /var/ftp
0       /var/games
0       /var/kerberos
20M     /var/lib
0       /var/local
0       /var/lock
5.3M    /var/log
0       /var/mail
0       /var/nis
0       /var/opt
0       /var/preserve
0       /var/run
12K     /var/spool
4.0K    /var/tmp
0       /var/yp

=====
System Report @ 2025-09-11 00:12:00
=====

--- CPU/Memory Usage ---
top - 00:12:00 up 8 min,  3 users,  load average: 0.04, 0.25, 0.17
Tasks: 139 total,  1 running, 138 sleeping,  0 stopped,  0 zombie
%Cpu(s):  0.0 us,  4.0 sy,  0.0 ni, 88.0 id,  0.0 wa,  4.0 hi,  4.0 si,  0.0 st
MiB Mem :  3653.4 total,  3117.1 free,  449.6 used,  300.4 buff/cache
MiB Swap:  2048.0 total,  2048.0 free,  0.0 used,  3203.8 avail Mem

--- Disk Usage (df -h) ---
Filesystem      Size  Used Avail Use% Mounted on
/dev/mapper/cs-root 17G  1.7G   16G  10% /
devtmpfs         4.0M  0      4.0M  0% /dev
tmpfs            1.8G  0      1.8G  0% /dev/shm
tmpfs            731M  8.6M   723M  2% /run
tmpfs            1.0M  0      1.0M  0% /run/credentials/systemd-journald.service
/dev/sda2        960M  323M   638M  34% /boot
```

```

--- Disk Usage (df -h) ---
Filesystem      Size      Used Avail Use% Mounted on
/dev/mapper/cs-root 17G    1.7G    16G   10% /
devtmpfs         4.0M      0    4.0M    0% /dev
tmpfs            1.8G      0    1.8G    0% /dev/shm
tmpfs            731M     8.6M    723M   2% /run
tmpfs            1.0M      0    1.0M    0% /run/credentials/systemd-journald.service
/dev/sda2        960M    323M    638M  34% /boot
tmpfs            1.0M      0    1.0M    0% /run/credentials/getty@tty1.service
tmpfs           366M     4.0K    366M   1% /run/user/0

--- Top 5 Memory Consuming Processes ---
USER      PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root         1  1.1  1.0  49152 40832 ?        Ss   00:03   0:05 /usr/lib/systemd/systemd -
-switched-root --system --deserialize=50
root        860  0.4  0.8  38224 30720 ?        Ss   00:04   0:02 /usr/bin/python3 /home/roo
t/flaskapp/app.py
root        821  0.2  0.4  330100 17400 ?        Ssl  00:04   0:01 /usr/sbin/NetworkManager -
-no-daemon
root       1546  0.0  0.3  22236 13416 ?        Ss   00:04   0:00 /usr/lib/systemd/systemd -
-user
root        696  0.0  0.2  35004 11208 ?        Ss   00:04   0:00 /usr/lib/systemd/systemd-u
devd

--- Top 5 CPU Consuming Processes ---
USER      PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root       1701  100  0.1   9160  4032 pts/0    R+   00:12   0:00 ps aux --sort=-%cpu
root         1  1.1  1.0  49152 40832 ?        Ss   00:03   0:05 /usr/lib/systemd/systemd -
-switched-root --system --deserialize=50
root         9  0.4  0.0      0      0 ?        I    00:03   0:02 [kworker/0:1-ata_sff]
root        860  0.4  0.8  38224 30720 ?        Ss   00:04   0:02 /usr/bin/python3 /home/roo
t/flaskapp/app.py
root       284  0.4  0.0      0      0 ?        I    00:03   0:02 [kworker/1:3-events]

```

## ◆ Task 2: User Management and Access Control

### Steps Taken

- Verified users **Sarah** and **Mike** exist.
- Created isolated directories:
  - /home/Sarah/workspace
  - /home/Mike/workspace
- Set secure permissions (chmod 700) and ownership.
- Enforced password policy with chage -M 30.
- Configured /etc/security/pwquality.conf for complexity rules.

### Verification (Screenshots/Outputs)

- Output of `ls -ld /home/Sarah/workspace /home/Mike/workspace`
- Output of `chage -l Sarah` and `chage -l Mike`
- Content of `pwquality.conf`

```

[root@localhost ~]# ls -ld /home/Sarah/workspace /home/Mike/workspace
drwx-----. 2 Mike  Mike  6 Sep  3 00:20 /home/Mike/workspace/
drwx-----. 2 Sarah Sarah 6 Sep  3 00:17 /home/Sarah/workspace

```

## ◆ Task 3: Backup Configuration for Web Servers

### Steps Taken

- Created backup scripts:
  - `/usr/local/bin/apache_backup.sh` for Sarah's Apache server (`/etc/httpd/, /var/www/html/`)
  - `/usr/local/bin/nginx_backup.sh` for Mike's Nginx server (`/etc/nginx/, /usr/share/nginx/html/`)
- Configured cron jobs: run every Tuesday at **12:00 AM**.
- Stored backups in `/backups/` as `apache_backup_YYYY-MM-DD.tar.gz` and `nginx_backup_YYYY-MM-DD.tar.gz`.
- Verified integrity with `tar -tzf > verify.log`.

### Verification (Screenshots/Outputs)

- `ls -lh /backups/` showing backup files.
- Contents of verification logs (`cat /backups/*_verify.log`).
- Cron job entries (`crontab -l`).

### Challenges & Solutions

- *Challenge:* Apache service failed due to syntax error in `httpd.conf`.
- *Solution:* Corrected `Listen` directive to `Listen 8080`.
- *Challenge:* Needed Nginx on port 8000 → updated config.

```
[root@localhost ~]# ls -ld /home/Sarah/workspace /home/Mike/workspace/
drwx-----. 2 Mike  Mike  6 Sep  3 00:20 /home/Mike/workspace/
drwx-----. 2 Sarah Sarah 6 Sep  3 00:17 /home/Sarah/workspace
[root@localhost ~]# ls -lh /usr/local/bin/apache_backup.sh
-rwxr-xr-x. 1 root root 229 Sep  3 00:48 /usr/local/bin/apache_backup.sh
[root@localhost ~]# ls -lh /backups/
total 44K
-rw-r--r--. 1 root root 14K Sep  3 00:58 apache_backup_2025-09-03.tar.gz
-rw-r--r--. 1 root root 769 Sep  3 00:58 apache_backup_2025-09-03_verify.log
-rw-r--r--. 1 root root 7.2K Sep  2 23:57 nginx_backup_2025-09-02.tar.gz
-rw-r--r--. 1 root root 784 Sep  2 23:57 nginx_backup_2025-09-02_verify.log
-rw-r--r--. 1 root root 7.2K Sep  3 01:00 nginx_backup_2025-09-03.tar.gz
-rw-r--r--. 1 root root 784 Sep  3 01:00 nginx_backup_2025-09-03_verify.log
[root@localhost ~]#
```

```
root@localhost log]# crontab -l
0 * * 2 /usr/local/bin/nginx_backup.sh >> /var/log/nginx_backup.log 2>&1
0 * * 2 /usr/local/bin/apache_backup.sh >> /var/log/apache_backup.log 2>&1

0 * * * /usr/local/bin/sys_monitor.sh
```

```
[root@localhost log]# tar -tzf /backups/apache_backup_2025-09-11.tar.gz | head -20
etc/httpd/
etc/httpd/conf.d/
etc/httpd/conf.d/README
etc/httpd/conf.d/autoindex.conf
etc/httpd/conf.d/userdir.conf
etc/httpd/conf.d/welcome.conf
etc/httpd/conf/
etc/httpd/conf/magic
etc/httpd/conf/httpd.conf
etc/httpd/conf.modules.d/
etc/httpd/conf.modules.d/00-base.conf
etc/httpd/conf.modules.d/00-dav.conf
etc/httpd/conf.modules.d/00-mpm.conf
etc/httpd/conf.modules.d/00-optional.conf
etc/httpd/conf.modules.d/00-proxy.conf
etc/httpd/conf.modules.d/01-cgi.conf
etc/httpd/conf.modules.d/README
etc/httpd/conf.modules.d/10-h2.conf
etc/httpd/conf.modules.d/10-proxy_h2.conf
etc/httpd/conf.modules.d/00-lua.conf
[root@localhost log]# tar -tzf /backups/nginx_backup_2025-09-11.tar.gz | head -20
etc/nginx/
etc/nginx/conf.d/
etc/nginx/conf.d/flaskapp.conf
etc/nginx/conf.d/flaskapp.com-a
etc/nginx/conf.d/flaskapp.com
etc/nginx/default.d/
etc/nginx/fastcgi.conf
etc/nginx/fastcgi.conf.default
etc/nginx/fastcgi_params
etc/nginx/fastcgi_params.default
etc/nginx/koi-utf
etc/nginx/koi-win
etc/nginx/mime.types
etc/nginx/mime.types.default
etc/nginx/nginx.conf
etc/nginx/nginx.conf.default
etc/nginx/scgi_params
etc/nginx/scgi_params.default
etc/nginx/uwsgi_params
etc/nginx/uwsgi_params.default
[root@localhost log]#
```

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## ◆ Final Summary

- **Task 1:** Monitoring in place, logs generated daily.
- **Task 2:** Users Sarah & Mike secured with isolated workspaces and enforced password policies.
- **Task 3:** Automated backups for Apache & Nginx working with cron jobs and verification logs.