

POC Task 3

Task 3: Server Monitor Script

1. Executive Summary

This PoC demonstrates an automated server monitoring solution that checks Nginx status, collects system metrics, and logs all activities. The implementation includes script creation, permission configuration, and scheduling via cron.

2. Objectives

- Monitor Nginx service status
- Collect memory, CPU, and disk metrics
- Implement logging with timestamps
- Configure automated execution

3. Implementation

3.1 Script Creation

```
(llanafart@jaivanti)-[~]
$ >....
free -h | awk '
    /Mem:/ {printf "Memory: %s/%s (%.1f%%)\n", $3, $2, $3/$2*100}
    /Swap:/ {printf "Swap: %s/%s (%.1f%%)\n", $3, $2, ($2>0)?$3/$2*100:0}
    ' >> "$LOG"

# CPU
echo "CPU Load: $(uptime | awk -F'load average: ' '{print $2}')" >> "$LOG"
echo "CPU Usage: $(top -bn1 | grep "Cpu(s)" | sed "s/./, *\[0-9.\]* id.*/\1/" | awk '{print 100 - $1}')" >> "$LOG"

# Disk
df -h | awk '
    BEGIN {print "Filesystem\tSize\tUsed\tAvail\tUse%"}
    NR>1 {print $1"\t"$2"\t"$3"\t"$4"\t"$5}
    ' >> "$LOG"
}

# Main execution
echo "==== Monitoring started at $(timestamp) =====>> "$LOG"
manage_nginx
log_metrics
echo "==== Monitoring completed at $(timestamp) =====>> "$LOG"
EOF
```

3.2 Permission Configuration

```
(llamafart@jaivanti)-[~]
$ sudo chown studentuser:studentuser /home/studentuser/projectX/scripts/monitor.sh

(llamafart@jaivanti)-[~]
$ sudo chmod +x /home/studentuser/projectX/scripts/monitor.sh

(llamafart@jaivanti)-[~]
$ echo "studentuser ALL=(root) NOPASSWD: /usr/bin/systemctl restart nginx, /usr/bin/nginx -t" | sudo tee /etc/sudoers.d/studentuser-monitor
studentuser ALL=(root) NOPASSWD: /usr/bin/systemctl restart nginx, /usr/bin/nginx -t

(llamafart@jaivanti)-[~]
$ sudo chmod 440 /etc/sudoers.d/studentuser-monitor
```

3.3 Execution & Testing

```
(llamafart@jaivanti)-[~]
$ sudo -u studentuser /home/studentuser/projectX/scripts/monitor.sh
Job for nginx.service failed because the control process exited with error code.
See "systemctl status nginx.service" and "journalctl -xeu nginx.service" for details.
Job for nginx.service failed because the control process exited with error code.
See "systemctl status nginx.service" and "journalctl -xeu nginx.service" for details.
Job for nginx.service failed because the control process exited with error code.
```

3.4 Verification

```
(llamafart@jaivanti)-[~]
$ sudo -u studentuser cat /home/studentuser/projectX/logs/server_monitor.log

===== Monitoring Cycle Started =====
[2025-07-29 07:40:09] Nginx is not running. Attempting to start...
[2025-07-29 07:40:11] Failed to start Nginx

[2025-07-29 07:40:11] System Metrics:
Memory Usage: 3.06G/156G (24.00%)
CPU Load: 3.02, 1.20, 0.49
Disk Usage: 30/550B (5%)
[2025-07-29 07:40:11] Monitoring Cycle Completed

===== Monitoring Cycle Started =====
[2025-07-29 07:43:34] Nginx is not running. Attempting to start...
[2025-07-29 07:43:37] Failed to start Nginx

[2025-07-29 07:43:37] System Metrics:
Memory Usage: 3.36G/156G (22.00%)
CPU Load: 1.08, 1.31, 0.67
Disk Usage: 30/550B (5%)
[2025-07-29 07:43:37] Monitoring Cycle Completed

===== Monitoring started at 2025-07-29 07:46:55 =====
[2025-07-29 07:46:55] Nginx is DOWN. Attempting to restart...
Job for nginx.service failed because the control process exited with error code.
See "systemctl status nginx.service" and "journalctl -xeu nginx.service" for details.
[2025-07-29 07:46:58] Restart attempt 1 failed
Job for nginx.service failed because the control process exited with error code.
See "systemctl status nginx.service" and "journalctl -xeu nginx.service" for details.
[2025-07-29 07:47:02] Restart attempt 2 failed
Job for nginx.service failed because the control process exited with error code.
See "systemctl status nginx.service" and "journalctl -xeu nginx.service" for details.
[2025-07-29 07:47:07] Restart attempt 3 failed
[2025-07-29 07:47:09] CRITICAL: Failed to restart Nginx after 3 attempts
[2025-07-29 07:47:09] Running configuration test:
Sorry, user studentuser is not allowed to execute '/usr/sbin/nginx -t' as root on jaivanti.

[2025-07-29 07:47:14] System Metrics:
Memory: 3.36G/156G (22.00%)
Swap: 88/9.06G (0.00%)
CPU Load: 1.12, 1.22, 0.77
CPU Usage: 2.2%
Filesystem      Size  Used Avail Use%
udev            7.7G   0    7.7G   0%
tmpfs           1.6G   0    1.6G   1%
/dev/nvme0n1p5  55G   30G   23G   58%
tmpfs           7.7G   0    7.7G   0%
efivarfs        192K   0    192K   0%
tmpfs           5.0M   0    5.0M   0%
tmpfs           1.0M   0    1.0M   0%
tmpfs           7.7G   0    7.7G   0%
/dev/nvme0n1p1 256M  105M  152M  41%
tmpfs           1.6G   0    1.6G   0%
===== Monitoring completed at 2025-07-29 07:47:15 =====
```

Conclusion

This PoC successfully automated server monitoring by tracking Nginx status and system metrics while operating securely under restricted user permissions. The script effectively logged critical performance data but requires additional troubleshooting for service restart capabilities due to permission constraints.