“Expert Cloud Consulting”

SOP | Monitoring and alerts shell script

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Monitoring and alerts shell script.

Problem Statement

Modern IT infrastructure requires continuous monitoring to ensure system availability, performance, and reliability. High usage of server resources such as **CPU**, **memory**, or **disk space** can lead to performance degradation or system failures if not addressed proactivel

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Objective

To design and implement a shell script that:

- Monitors server resource usage**:**
  - CPU usage ○ Memory usage
  - Disk usage
- Triggers email alerts when**:**
  - CPU usage exceeds a specified threshold ○ Memory usage exceeds a specified threshold ○ Disk usage exceeds a specified threshold

This script provides automated alerts to system administrators, enabling quick response to potential issues and ensuring system health and uptime.

Step 1: Creating a script that shows cpu, memory, disk usage in percent

For cpu we make use of top(for resource usage visualization) command, for memory and disk we use dd command(it is for convert and copy file

```
#!/bin/bash

# Set thresholds
CPU_THRESHOLD=60
MEM_THRESHOLD=60
DISK_THRESHOLD=50

# Get usage values
CPU=$(top -bn1 | grep "Cpu(s)" | awk '{print 100 - $8}' | cut -d. -f1)a
MEM=$(free | awk '/Mem:/ {printf "%.0f", $3/$2 * 100}')
DISK=$(df / | awk 'NR==2 {print $5}' | sed 's/%//')

# Email address to receive alerts
EMAIL="akshataujawane19@gmail.com"

# Hostname (for email subject)
HOST=$(hostname)
TIMESTAMP=$(date '+%Y-%m-%d %H:%M:%S')

# Check and send alerts
if [ "$CPU" -gt "$CPU_THRESHOLD" ]; then
    echo "High CPU usage detected: $CPU%" | mail -s "CPU Alert on $HOST" $EMAIL fi

if [ "$MEM" -gt "$MEM_THRESHOLD" ]; then
    echo "High Memory usage detected: $MEM%" | mail -s "Memory Alert on $HOST" $EMAIL fi

if [ "$DISK" -gt "$DISK_THRESHOLD" ]; then
    echo "High Disk usage detected: $DISK%" | mail -s "Disk Alert on $HOST" $EMAIL
fi
```

Step 2: Configuring the Mail Server

To enable email alerts from the shell script, we need to configure a mail service that can send emails using your Gmail account. This involves installing mailutils and setting up **Postfix** as the Mail Transfer Agent (MTA).

Install mailutils and Postfix

sudo apt update sudo
apt install mailutils

Set Up Gmail App Password

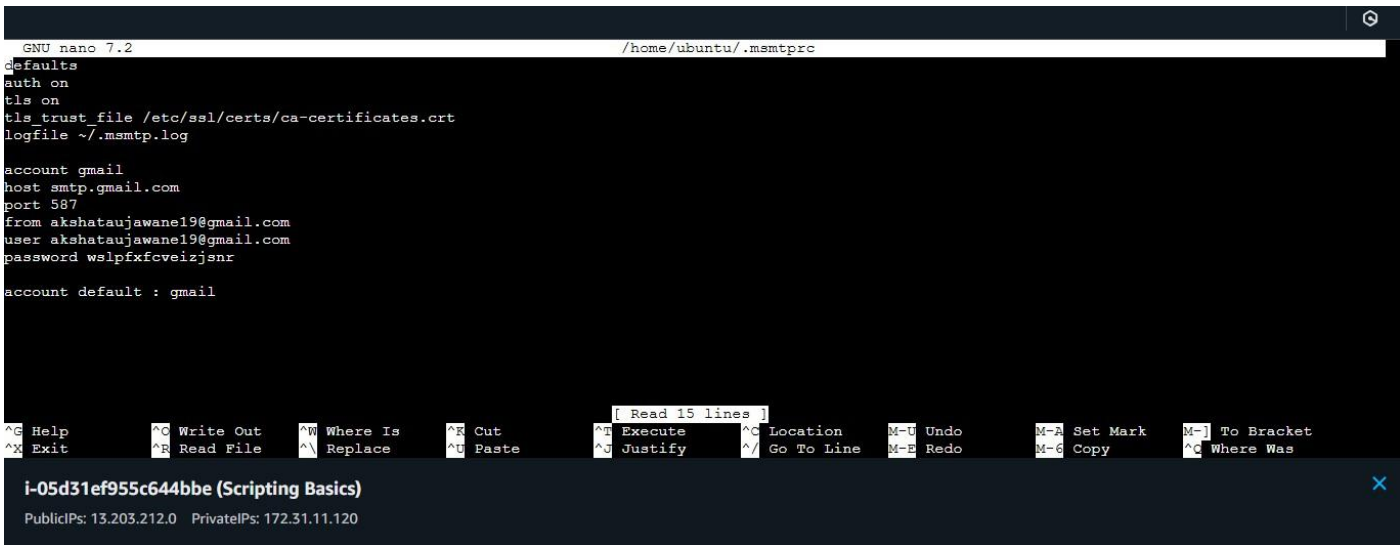
To allow your script to send emails via Gmail SMTP securely:

1. Log into your Gmail account.
2. Go to Google Account > Security > 2-Step Verification and enable it (if not already done).
3. After enabling, go to App Passwords.
4. Generate a new app password (e.g., for “Mail” or “Postfix”).
5. Copy and securely save this 16-character app password — it will be used in the next step.

Configure .mailrc

Automating the Script Using Cron

To continuously monitor system resources without manual execution, we’ll schedule the



monitoring script to run every minutes using a cron job

crontab -e

Add the Cron Job Entry

*** * * * * /home/ubuntu/alert.sh**

Explanation:

Field	Value	Description
Minute	*/5	Every 5 minutes
Hour	*	Every hour
Day of Month	*	Every day
Month	*	Every month
Day of Week	*	Every day of the week

This cron job tells the system to run the script located at /home/ubuntu/alert.sh every 5 minutes

Simulating the stress

To test whether the monitoring script correctly detects high resource usage and sends email alerts, we need to simulate artificial stress on the system. This includes stressing the CPU**,** memory**,** and disk**.**

stress-ng --cpu 1 --cpu-load 80 --timeout 600

Simulating Disk Load

Use the dd command to simulate disk usage **dd**

if=/dev/zero of=/tmp/testfile bs=1M count=500

To remove - **rm /tmp/testfile**

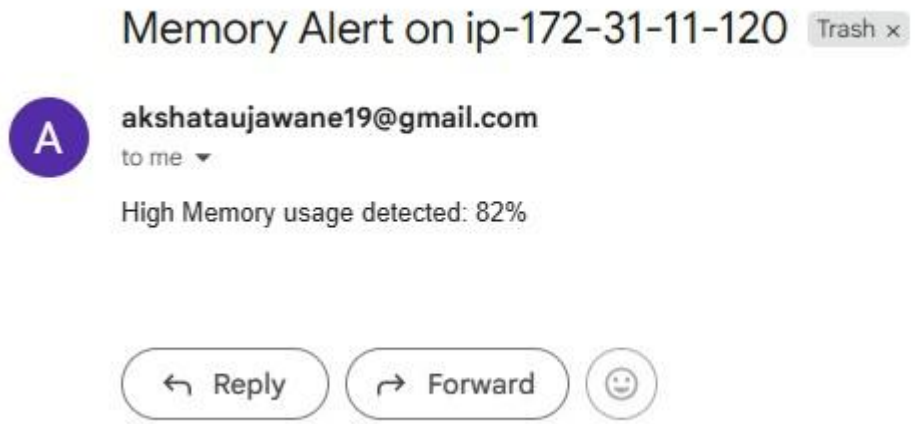
Simulating Memory Load

To simulate high memory usage:

dd if=/dev/zero of=/dev/null bs=1M count=5000

To remove – **kill $(pgrep dd)**

Now whenever there is stress on cpu or memory or disk a notification will be sent through email For example, similar to below ones


Memory Alert on ip-172-31-11-120
Trash ×
A
akshataujawane19@gmail.com
to me
High Memory usage detected: 82%
Reply
Forward


Disk Alert on ip-172-31-11-120
Trash ×
A
akshataujawane19@gmail.com
to me
High Disk usage detected: 77%
Reply
Forward


CPU Alert on ip-172-31-11-120
Trash ×
A
akshataujawane19@gmail.com
to me
High CPU usage detected: 100%
Reply
Forward