



# Placement Empowerment Program

## *Cloud Computing and DevOps Centre*

### Day 09 – System Inventory Report Generator

Generate a report summarizing system info such as disk usage, memory, CPU, and running processes.

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# Introduction

In modern Linux environments, keeping track of system performance and resource usage is essential for maintaining a healthy system. System administrators and developers often need quick access to critical system metrics such as disk usage, memory consumption, CPU information, and active processes.

This Proof of Concept (PoC) focuses on building a System Inventory Report Generator using a shell script. The script automates the collection of key system information and organizes it into a readable report. This helps users perform system audits, monitor performance, troubleshoot issues, or simply maintain logs for future reference.

By the end of this PoC, you will have a working automation script that can be scheduled to run periodically using cron and log the system state without manual intervention — a fundamental DevOps and Linux administration practice.

## Overview

The System Inventory Report Generator is a shell script-based automation tool designed to collect and summarize essential system information on a Linux machine.

This includes:

1. Disk usage details (available and used space)
2. Memory usage statistics (RAM and swap)
3. CPU information (architecture, cores, model)
4. Top running processes by memory usage

This PoC demonstrates how to:

1. Automate system data collection using Linux commands
2. Format the output into a human-readable report
3. Schedule the script to run at defined intervals using cron
4. Store and log system reports for future reference or audits

This tool is lightweight, customizable, and ideal for system admins, DevOps engineers, and Linux users who want to maintain visibility into

their system's health and performance.

### **Key steps in this PoC:**

#### ✓ Open the Terminal

Launch the terminal to begin writing and executing the shell script.

#### ✓ Create the Shell Script File

Use a text editor (e.g., nano) to create a script named `system_report.sh`.

#### ✓ Write Script Logic to Collect System Info

Use Linux commands like `df`, `free`, `lscpu`, and `ps` to gather:

Disk usage

Memory usage

CPU details

Top processes by memory usage

#### ✓ Format and Save the Report

Output the collected information to a timestamped `.txt` file.

#### ✓ Make the Script Executable

Use `chmod +x` to give the script permission to run.

#### ✓ Execute the Script

Run the script to generate the system report manually.

## **Objectives :**

#### ✓ Automate System Information Collection

Create a shell script to automatically gather key system metrics like disk, memory, CPU, and processes.

#### ✓ Generate Readable Inventory Reports

Output the collected information into a well-structured and timestamped text report.

#### ✓ Improve System Visibility

Enable users or administrators to regularly monitor the system's health and performance.

### ✓ **Support Scheduled Monitoring**

Integrate the script with cron to run at regular intervals (e.g., daily), ensuring ongoing monitoring without manual effort.

### ✓ **Enhance Troubleshooting and Audit Readiness**

Maintain historical system logs that help with identifying issues, capacity planning, or system audits.

## **Importance :**

### ✓ **Real-Time System Monitoring**

Regular system reports help you monitor your machine's health and identify performance issues early.

### ✓ **Simplifies Troubleshooting**

When something goes wrong, system logs and inventory reports provide valuable data for root cause analysis.

### ✓ **Improves Efficiency**

Automating system reporting saves time compared to manually checking each resource using separate commands.

### ✓ **Supports Preventive Maintenance**

Helps in detecting problems such as low disk space or high memory usage before they impact system performance.

### ✓ **Useful in Audits and Documentation**

Maintains historical logs of system state that can be used for audits, compliance, or system change tracking.

### ✓ **Essential for DevOps & System Admins**

Automating routine health checks is a key practice in DevOps and systems administration for scalable environments.

# Step-by-Step Overview

## Step 1: Open Terminal

Launch a terminal window on your Linux system.

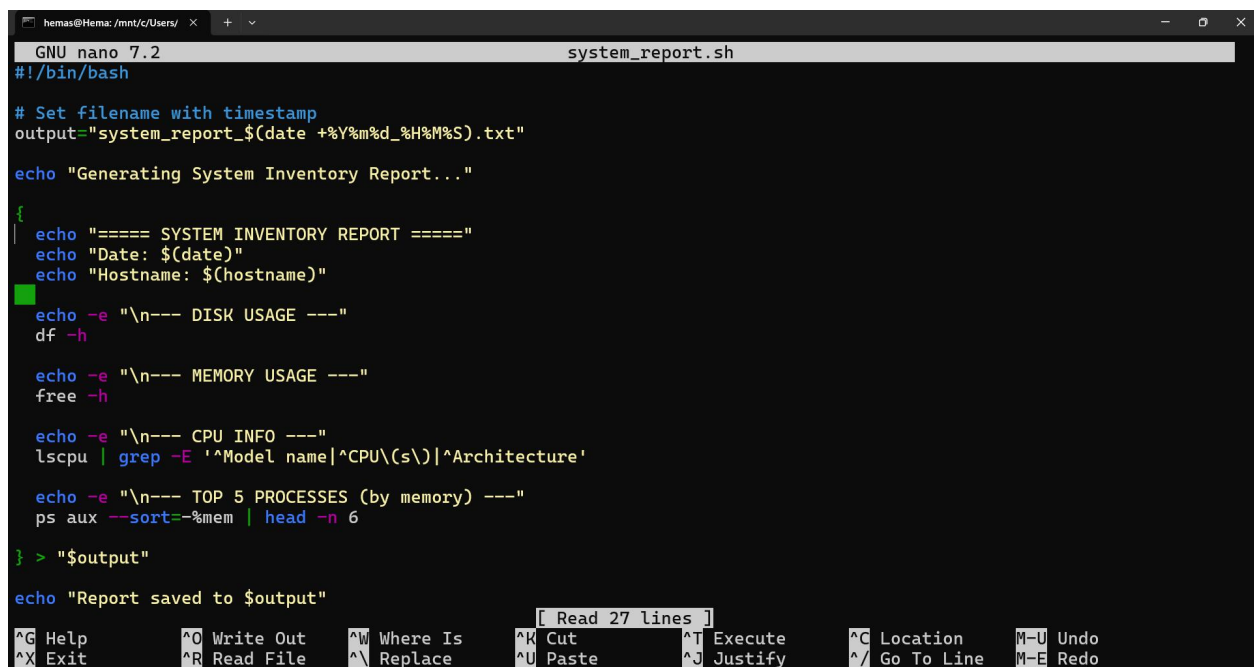
## Step 2: Create the Shell Script File

```
hemas@Hema: /mnt/c/Users/hemas$ nano system_report.sh
```

This opens the nano editor for a new file named system\_report.sh.

## Step 3: Write the Monitoring Script

In the nano editor, Paste the following code:



```
GNU nano 7.2 system_report.sh
#!/bin/bash

# Set filename with timestamp
output="system_report_$(date +%Y%m%d_%H%M%S).txt"

echo "Generating System Inventory Report..."

{
  echo "==== SYSTEM INVENTORY REPORT ====="
  echo "Date: $(date)"
  echo "Hostname: $(hostname)"

  echo -e "\n--- DISK USAGE ---"
  df -h

  echo -e "\n--- MEMORY USAGE ---"
  free -h

  echo -e "\n--- CPU INFO ---"
  lscpu | grep -E '^Model name|^CPU(s)|^Architecture'

  echo -e "\n--- TOP 5 PROCESSES (by memory) ---"
  ps aux --sort=-%mem | head -n 6
} > "$output"

echo "Report saved to $output"
```

[ Read 27 lines ]

<b>^G</b> Help	<b>^O</b> Write Out	<b>^W</b> Where Is	<b>^K</b> Cut	<b>^T</b> Execute	<b>^C</b> Location	<b>M-U</b> Undo
<b>^X</b> Exit	<b>^R</b> Read File	<b>^I</b> Replace	<b>^U</b> Paste	<b>^J</b> Justify	<b>^/_</b> Go To Line	<b>M-E</b> Redo

## Step 4: Save and Exit

Press Ctrl + O → Enter (to save)

Press Ctrl + X (to exit)

## Step 5: Make the Script Executable

Back in the terminal:

```
hemas@Hema: /mnt/c/Users/hemas$ chmod +x system_report.sh
```

This gives the script permission to run as a program.

## Step 6: Run the Script

```
hemas@Hema: /mnt/c/Users/hemas$ ./system_report.sh
Generating System Inventory Report...
Report saved to system_report_20250623_053919.txt
```

A new report file like system\_report\_20250623\_053919.txt will be created.

## Step 7: View the Report

```
hemas@Hema: /mnt/c/Users/hemas$ cat system_report*.txt
===== SYSTEM INVENTORY REPORT =====
Date: Mon Jun 23 05:39:19 UTC 2025
Hostname: Hema

--- DISK USAGE ---
Filesystem      Size  Used Avail Use% Mounted on
none            1.9G  0  1.9G   0% /usr/lib/modules/6.6.87.1-microsoft-standard-WSL2
none            1.9G  4.0K  1.9G   1% /mnt/wsl
drivers          476G  104G  372G  22% /usr/lib/wsl/drivers
/dev/sdd        1007G  1.5G  955G   1% /
none            1.9G   76K  1.9G   1% /mnt/wslg
none            1.9G  0  1.9G   0% /usr/lib/wsl/lib
rootfs          1.9G  2.7M  1.9G   1% /init
none            1.9G  504K  1.9G   1% /run
none            1.9G  0  1.9G   0% /run/lock
none            1.9G  0  1.9G   0% /run/shm
none            1.9G   76K  1.9G   1% /mnt/wslg/versions.txt
none            1.9G   76K  1.9G   1% /mnt/wslg/doc
C:\             476G  104G  372G  22% /mnt/c
tmpfs           1.9G   16K  1.9G   1% /run/user/1000

--- MEMORY USAGE ---
              total    used      free   shared  buff/cache   available
Mem:          3.7Gi    372Mi    3.0Gi    3.4Mi    382Mi    3.3Gi
Swap:         1.0Gi      0B      1.0Gi

--- CPU INFO ---
Architecture:    x86_64
CPU(s):          8
Model name:      12th Gen Intel(R) Core(TM) i3-1215U

--- TOP 5 PROCESSES (by memory) ---
USER      PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root      212  0.1  0.5 107016 22272 ?        Ssl   05:35   0:00 /usr/bin/python3 /usr/share/unattended-upgrades/unattended-upgrade-shutdown --wait-for-si
gnal
root       55  0.1  0.4  50352 16624 ?        S<s   05:35   0:00 /usr/lib/systemd/systemd-journald
systemd+  114  0.0  0.3  21452 12672 ?        Ss   05:35   0:00 /usr/lib/systemd/systemd-resolved
root       1  0.4  0.3  21640 12020 ?        Ss   05:35   0:00 /sbin/init
root      182  0.0  0.3 1755040 11904 ?        Ssl   05:35   0:00 /usr/libexec/wsl-pro-service -vv
```

## Outcomes:

### ✓ **System Inventory Shell Script Created**

You successfully created a working `system_report.sh` script to collect disk, memory, CPU, and process details.

### ✓ **Generated System Report Files**

The script creates a structured and timestamped report file every time you run it manually.

### ✓ **Learned Key Linux Monitoring Commands**

Hands-on usage of **df**, **free**, **lscpu**, **ps**, and output redirection using shell scripting.

### ✓ **Script Executable and Reusable**

You made the script executable using **chmod +x**, allowing it to be reused anytime with:

```
bash
Copy code
./system_report.sh
```

### ✓ **Report Saved for Documentation or Debugging**

Output is saved as `.txt` files which can be used for system documentation, audits, or performance checks.

### ✓ **Ready for Future Automation (Optional)**

Though you haven't used cron yet, the script is compatible with cron jobs, so automation can be added later easily.