



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.

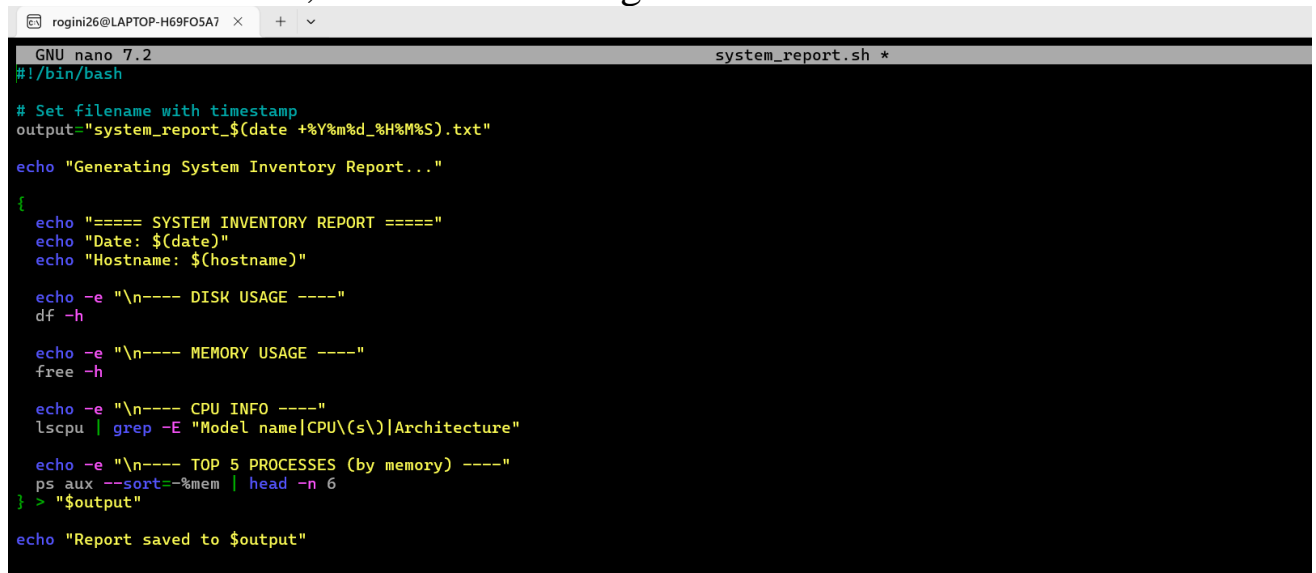
Step 2: Create the Shell Script File

```
rogini26@LAPTOP-H69F05A7:~$ 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:

A screenshot of a terminal window showing the nano editor editing a file named system_report.sh. The editor's title bar shows 'rogini26@LAPTOP-H69F05A7' and 'system_report.sh *'. The content of the file is a shell script that generates a system inventory report. It includes a shebang line, a comment about setting the filename with a timestamp, and several echo statements for headers and data. The data sections use 'df -h' for disk usage, 'free -h' for memory usage, 'lscpu | grep -E' for CPU info, and 'ps aux --sort=-%mem | head -n 6' for top processes. The script ends with an echo statement indicating the report is saved to \$output.

```
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"
```

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:

```
rogini26@LAPTOP-H69F05A7:~$ chmod +x system_report.sh
```

This gives the script permission to run as a program.

Step 6: Run the Script

```
rogini26@LAPTOP-H69F05A7:~$ ./system_report.sh
Generating System Inventory Report...
Report saved to system_report_20250707_111117.txt
```

A new report file like system_report_20250623_053919.txt will be created.

Step 7: View the Report

Report saved to system_report_20250707_111117.txt

rogini26@LAPTOP-H69F05A7:~\$ cat system_report_*.txt

===== SYSTEM INVENTORY REPORT =====

Date: Mon Jul 7 11:11:17 UTC 2025

Hostname: LAPTOP-H69F05A7

---- DISK USAGE ----

Filesystem	Size	Used	Avail	Use%	Mounted on
none	1.9G	0	1.9G	0%	/usr/lib/modules/5.15.167.4-microsoft-standard-WSL2
none	1.9G	4.0K	1.9G	1%	/mnt/wsl
drivers	476G	125G	352G	27%	/usr/lib/wsl/drivers
/dev/sdc	1007G	2.8G	953G	1%	/
none	1.9G	76K	1.9G	1%	/mnt/wslg
none	1.9G	0	1.9G	0%	/usr/lib/wsl/lib
rootfs	1.9G	2.4M	1.9G	1%	/init
none	1.9G	492K	1.9G	1%	/run
none	1.9G	0	1.9G	0%	/run/lock
none	1.9G	0	1.9G	0%	/run/shm
tmpfs	4.0M	0	4.0M	0%	/sys/fs/cgroup
none	1.9G	76K	1.9G	1%	/mnt/wslg/versions.txt
none	1.9G	76K	1.9G	1%	/mnt/wslg/doc
C:\	476G	125G	352G	27%	/mnt/c
tmpfs	381M	16K	381M	1%	/run/user/1000

---- MEMORY USAGE ----

	total	used	free	shared	buff/cache	available
Mem:	3.7Gi	510Mi	3.0Gi	3.1Mi	411Mi	3.2Gi
Swap:	1.0Gi	0B	1.0Gi			

---- CPU INFO ----

Architecture: x86_64
CPU(s): 8
On-line CPU(s) list: 0-7
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
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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.