

UGANDA MARTYRS UNIVERSITY NKOZI

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SYSTEM ADMINISTRATION

The ICT department at Uganda Martyrs University is implementing a focused automation project to enhance server maintenance and security. Your team is tasked with developing and deploying an automated solution that includes:

- **Backup Automation:** Specifically, backing up the university's "Student Records" directory.
- **System Monitoring:** Monitoring the system's RAM usage and displaying a real-time alert on the screen when usage exceeds a set threshold.
- **Scheduled Logouts:** Automatically logging out any active user sessions at 13:00 hrs daily to allow for system maintenance.

```
ayebale@ubuntuserver:~$ mkdir StudentRecords
ayebale@ubuntuserver:~$ ls -l
Jesus
joseph
Records
Student
StudentRecords
ayebale@ubuntuserver:~$ sudo touch backup.sh
[sudo] password for ayebale:
ayebale@ubuntuserver:~$ ls -l
backup.sh
Jesus
joseph
Records
Student
StudentRecords
ayebale@ubuntuserver:~$ █
```

Project Objectives

1. Automated Backup for Student Records

- Develop a Bash script that archives and backs up the "Student Records" directory.
- Use tools like `tar` to create a compressed archive of the directory.
- Schedule this backup to run daily at 22:00 hrs via a cron job.

```

ayebale@ubuntu-server:~$ sudo nano backup.sh
ayebale@ubuntu-server:~$ ./backup.sh
./backup.sh: line 5: date+%Y-%m-%d %H-%M-%S: command not found
tar: Removing leading '/' from member name star (child):
/home/ayebale/backups/student_records_backup.tar.gz: Cannot open: No such file or directory
tar (child): Error is not recoverable: exiting now
tar: /home/ayebale/backups/student_records_backup.tar.gz: Cannot write: Broken pipe
tar: Child returned status 2
tar: Error is not recoverable: exiting now
find: missing argument to '-exec'
Backup completed: /home/ayebale/backups/student_records_backup.tar.gz
ayebale@ubuntu-server:~$

```

```

ayebale@ubuntu-server:/backups$ sudo rm *
ayebale@ubuntu-server:/backups$ cd
ayebale@ubuntu-server:~$ sudo ./backup.sh
tar: Removing leading '/' from member names
ayebale@ubuntu-server:~$ cd /backups
ayebale@ubuntu-server:/backups$ ls
student_records_backup_2025-04-05.tar.gz
ayebale@ubuntu-server:/backups$ sudo rm *
ayebale@ubuntu-server:/backups$ cd
ayebale@ubuntu-server:~$ sudo ./backup.sh
tar: Removing leading '/' from member names
ayebale@ubuntu-server:~$ cd /backups
ayebale@ubuntu-server:/backups$ ls
student_records_backup_2025-04-05.tar.gz

```

2. RAM Usage Monitoring and Alerts

- Write a script (using Bash or Python) that continuously monitors the system's RAM usage.
- Set a threshold (e.g., 80% usage) that, when exceeded, triggers an immediate on-screen alert (e.g., using `notify-send` or a terminal message).
- Ensure the alert clearly indicates the current RAM usage and suggests checking for resource-intensive processes.

```

ayebale@ubuntu-server:~$ ./ram_monitor.sh
-bash: ./ram_monitor.sh: No such file or directory
ayebale@ubuntu-server:~$ ls
2025-04-05_14-28-43.tar.gz  2025-04-05_14-30-24.tar.gz  2025-04-05_14-31-39.tar.gz  backups  backup.sh  Jesus  Joseph  Records  Student  StudentRecords
ayebale@ubuntu-server:~$ ls
2025-04-05_14-28-43.tar.gz  2025-04-05_14-30-24.tar.gz  2025-04-05_14-31-39.tar.gz  backups  backup.sh  Jesus  Joseph  Records  Student  StudentRecords
ayebale@ubuntu-server:~$ ls
2025-04-05_14-28-43.tar.gz  2025-04-05_14-30-24.tar.gz  2025-04-05_14-31-39.tar.gz  backups  backup.sh  Jesus  Joseph  Records  StudentRecords
ayebale@ubuntu-server:~$ ./ram_monitor.sh

./ram_monitor.sh: line 17: notify-send: command not found
./ram_monitor.sh: line 17: notify-send: command not found
^C
ayebale@ubuntu-server:~$ ^C
ayebale@ubuntu-server:~$ ./ram_monitor.sh
** RAM Usage Alert: 99% - Check resource-intensive processes.
** RAM Usage Alert: 99% - Check resource-intensive processes.
^C
ayebale@ubuntu-server:~$ if

```

```

ayebale@ubuntuuser:/backups$ free -m
              total        used        free      shared    buff/cache   available
Mem:           3916         519        2995           1         627        3396
Swap:          2331           0         2331

ayebale@ubuntuuser:/backups$ ls
ram_monitor.sh  student_records  backup_2025-04-05.tar.gz
ayebale@ubuntuuser:/backups$ cd
ayebale@ubuntuuser:~$ sudo nano ram_monitor.sh
ayebale@ubuntuuser:~$ sudo ./ram_monitor.sh
sudo: ./ram_monitor.sh: command not found
ayebale@ubuntuuser:~$ ls
2025-04-05_14-28-43.tar.gaz  2025-04-05_14-31-39.tar.gaz  backup.sh  joseph  Records  StudentRecords
2025-04-05_14-30-24.tar.gaz  backups  Jesus  ram_monitor.sh  Student
ayebale@ubuntuuser:~$ sudo chmod +x ram_monitor.sh
ayebale@ubuntuuser:~$ sudo ./ram_monitor.sh
^C
ayebale@ubuntuuser:~$ stress --vm 2 --vm-bytes 2695M --timeout 30s
stress: info: [2132] dispatching hogs: 0 cpu, 0 io, 2 vm, 0 hdd
stress: info: [2132] successful run completed in 40s
ayebale@ubuntuuser:~$ stress --vm 2 --vm-bytes 2695M --timeout 30s
stress: info: [2212] dispatching hogs: 0 cpu, 0 io, 2 vm, 0 hdd
stress: info: [2212] successful run completed in 31s
ayebale@ubuntuuser:~$ sudo nano ram_monitor.sh
[sudo] password for ayebale:
ayebale@ubuntuuser:~$ stress --vm 2 --vm-bytes 2695M --timeout 30s
stress: info: [2243] dispatching hogs: 0 cpu, 0 io, 2 vm, 0 hdd
stress: info: [2243] successful run completed in 32s
ayebale@ubuntuuser:~$ sudo nano ram_monitor.sh
ayebale@ubuntuuser:~$ sudo nano logout users.sh

```

<https://youtu.be/5uqKhGz7GZ8>