

GROUP 5 CASTPONR PROJECT

Automated Package Update System – Project Report

GROUP MEMBERS

JEHOSAPHAT OPOKU-GYAN 052441360074

ADDO KORANTENG, JULIET 052441360373

OSMAN, IBRAHIM 052441360260

ANNAN, GODFRED 052441360144

1. Introduction

The Automated Package Update System is a Linux shell script designed to automatically check for and install system updates using the `apt` package manager. The system ensures the operating system remains secure and up-to-date by running on a scheduled basis, logging all activities, and keeping records for audit purposes.

2. Project Objectives

- Automate the process of updating and upgrading packages.
 - Log update results for future reference and troubleshooting.
 - Schedule weekly updates using `cron`.
 - Maintain security by auditing logs located in `/var/log/apt`.
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3. Skills Used

1. **Package Management (Week 3)**
 - Used `apt update`, `apt upgrade`, and `apt autoremove` to manage packages.
2. **Automation (Week 4)**
 - Scheduled the script to run weekly using the `cron` scheduler.

3. Scripting (Week 6)

- Created `update_system.sh` with proper error handling and logging features.

4. Security (Week 5)

- Audited update activity via `/var/log/apt` to ensure package integrity and security.

4. Implementation

4.1 Script Creation

The script `update_system.sh` was placed in:

```
~/myproject/scripts/update_system.sh
```

Key Features:

- Logs start and end time of updates.
- Captures all `apt` command output into a log file.
- Automatically removes unused packages.

Code:

```
#!/bin/bash
# Simple Automated Update Script

LOG_FILE="$HOME/myproject/logs/update.log"

echo "==== Update started at $(date) =====> "$LOG_FILE"

sudo apt update >> "$LOG_FILE" 2>&1
sudo apt upgrade -y >> "$LOG_FILE" 2>&1
sudo apt autoremove -y >> "$LOG_FILE" 2>&1

echo "==== Update finished at $(date) =====> "$LOG_FILE"
echo "" >> "$LOG_FILE"
```

4.2 Scheduling the Script

The script was scheduled to run every Sunday at 3 AM using `cron`.

Crontab Entry:

```
0 3 * * 0 bash /home/jasper/myproject/scripts/update_system.sh
```

4.3 Logging and Security

- Update activities are stored in:

`~/myproject/logs/update.log`

- Additional security logs are found in:

`/var/log/apt`

- These logs can be reviewed to verify successful updates and detect potential issues.
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5. Deliverables

- **Script:** `~/myproject/scripts/update_system.sh`
 - **Documentation:** `~/myproject/docs/project_readme.md`
 - **Screenshots:**
 - Output of:
`tail ~/myproject/logs/update.log`
 - Output of:
`crontab -l`
 - **Optional:** Email notifications using `mailutils` (disabled in final version).
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6. Conclusion

This project successfully automated the Linux package update process, reduced manual maintenance, and improved system security. By integrating package management, automation, scripting, and logging, the system ensures updates are applied consistently with minimal user intervention.

```

# Edit this file to introduce tasks to be run by cron.
#
# Each task to run has to be defined through a single line
# indicating with different fields when the task will be run
# and what command to run for the task
#
# To define the time you can provide concrete values for
# minute (m), hour (h), day of month (dom), month (mon),
# and day of week (dow) or use '*' in these fields (for 'any').
#
# Notice that tasks will be started based on the cron's system
# daemon's notion of time and timezones.
#
# Output of the crontab jobs (including errors) is sent through
# email to the user the crontab file belongs to (unless redirected).
#
# For example, you can run a backup of all your user accounts
# at 5 a.m every week with:
# 0 5 * * 1 tar -zcf /var/backups/home.tgz /home/
#
# For more information see the manual pages of crontab(5) and cron(8)
#
# m h dom mon dow   command
0 3 * * * /home/jasper/myproject/scripts/full_backup.sh
*/15 * * * /home/jasper/myproject/scripts/health_check.sh
0 0 * * * /home/jasper/myproject/scripts/setup_env.sh >> /home/jasper/myproject/logs/setup.log 2>&1
0 3 * * 0 bash /home/jasper/myproject/scripts/update_system.sh | mail -s "Update Log" jehoshaphatopoku1@gmail.com
jasper@jasper-VMware-Virtual-Platform:~$

```

```

jasper@jasper-VMware-Virtual-Platform:~$ tail -n 10 /myproject/logs/update.log
Install: git:amd64 (1:2.43.0-1ubuntu7.3, automatic), bridge-utils:amd64 (1.7.1-1ubuntu2, automatic), pigz:amd64 (2.8-1, automatic), containerd:amd64 (1.7.27-0ubuntu1-24.04.1, automatic), ubuntu-fan:amd64 (0.12.16+24.04.1, automatic), docker.io:amd64 (27.5.1-0ubuntu3-24.04.2), runc:amd64 (1.2.5-0ubuntu1-24.04.1, automatic), liberror-perl:amd64 (0.17029-2, automatic), git-man:amd64 (1:2.43.0-1ubuntu7.3, automatic)
End-Date: 2025-08-11 20:03:40

Start-Date: 2025-08-14 06:48:33
Commandline: apt autoremove -y
Requested-By: jasper (1000)
Remove: libgl1-amd64 (21.3.9-0ubuntu2), libglapi-mesa:amd64 (24.2.8-1ubuntu1-24.04.1)
End-Date: 2025-08-14 06:48:33
===== Update finished at Thu Aug 14 07:02:36 AM GMT 2025 =====

```