Implementasi Strategi Backup Otomatis dan Manajemen Sinkronisasi Data pada Sistem Operasi Ubuntu

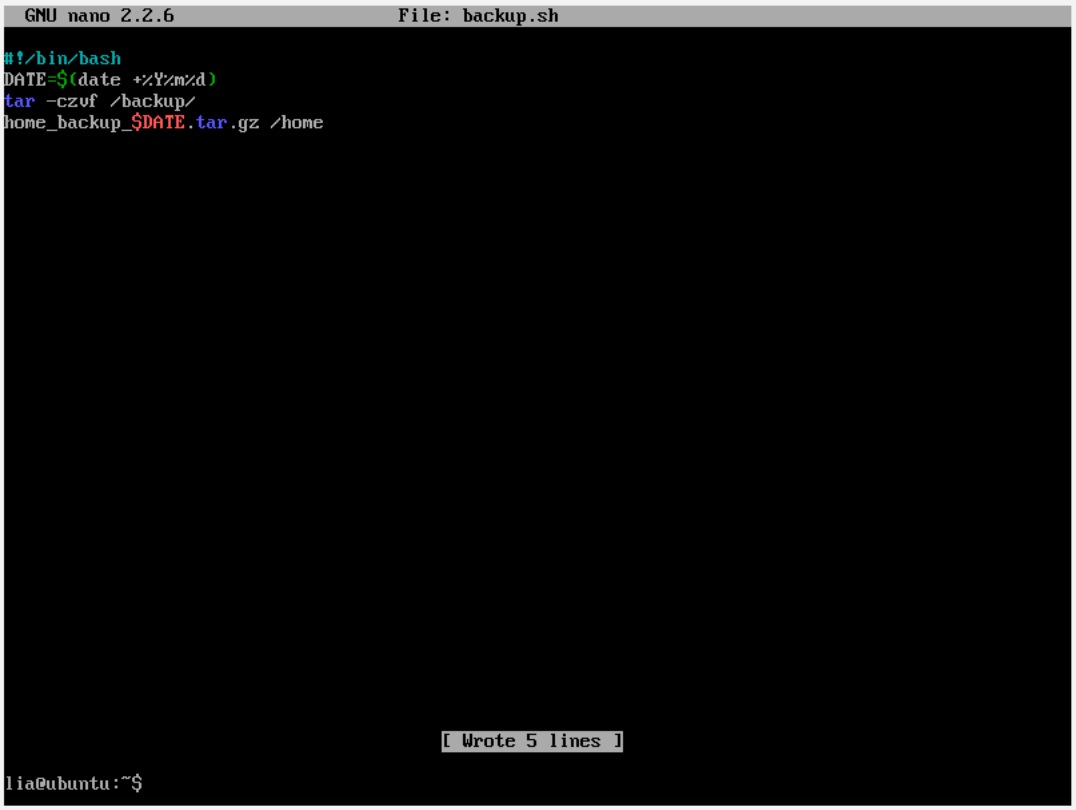
```
Your Hardware Enablement Stack (HWE) is supported until April 2019.
lia@ubuntu:~$ sudo tar -czvf /tmp/etc_backup.tar.gz /etc
[sudo] password for lia:
```

```
/etc/init/mounted-proc.conf
/etc/init/udevtrigger.conf
/etc/init/friendly-recovery.conf
/etc/init/ureadahead-other.conf
/etc/init/mountnfs.sh.conf
/etc/init/setvtrgb.conf
/etc/init/hostname.conf
/etc/init/acpid.conf
/etc/init/plymouth-splash.conf
/etc/init/systemd-logind.conf
/etc/init/network-interface-security.conf
/etc/init/mountall.conf
/etc/init/plymouth-upstart-bridge.conf
/etc/init/checkroot.sh.conf
/etc/init/mounted-run.conf
/etc/init/rcS.conf
/etc/init/plymouth-stop.conf
/etc/init/udev.conf
/etc/init/console-font.conf
/etc/init/plymouth-ready.conf
/etc/legal
/etc/landscape/
/etc/rc3.d/
/etc/rc3.d/README
/etc/rc3.d/S70pppd-dns
/etc/rc3.d/S70dns-clean
/etc/rc3.d/S20screen-cleanup
/etc/rc3.d/S20rsync
/etc/rc3.d/S99grub-common
/etc/rc3.d/S99ondemand
/etc/rc3.d/S99rc.local
/etc/rmt
/etc/shadow-
/etc/nsswitch.conf
/etc/calendar/
/etc/calendar/default
lia@ubuntu:~$
```

```
lia@ubuntu:~$ mkdir -p /tmp/etc_restore
```

```
lia@ubuntu:~$ sudo mkdir /backup
```

```
lia@ubuntu:~$ nano backup.sh_
```




```
lia@ubuntu:~$ chmod +x backup.sh_
```

```
lia@ubuntu:~$ chmod +x backup.sh
lia@ubuntu:~$ crontab -e_
```

```
                                        [ Wrote 5 lines ]

lia@ubuntu:~$ chmod +x backup.sh
lia@ubuntu:~$ crontab -e
no crontab for lia - using an empty one

Select an editor.  To change later, run 'select-editor'.
  1. /bin/ed
  2. /bin/nano        <---- easiest
  3. /usr/bin/vim.basic
  4. /usr/bin/vim.tiny

Choose 1-4 [2]:
```

```
lia@ubuntu:~$ select -editor_
```

```
lia@ubuntu:~$ select-editor

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Choose 1-4 [2]: 2_
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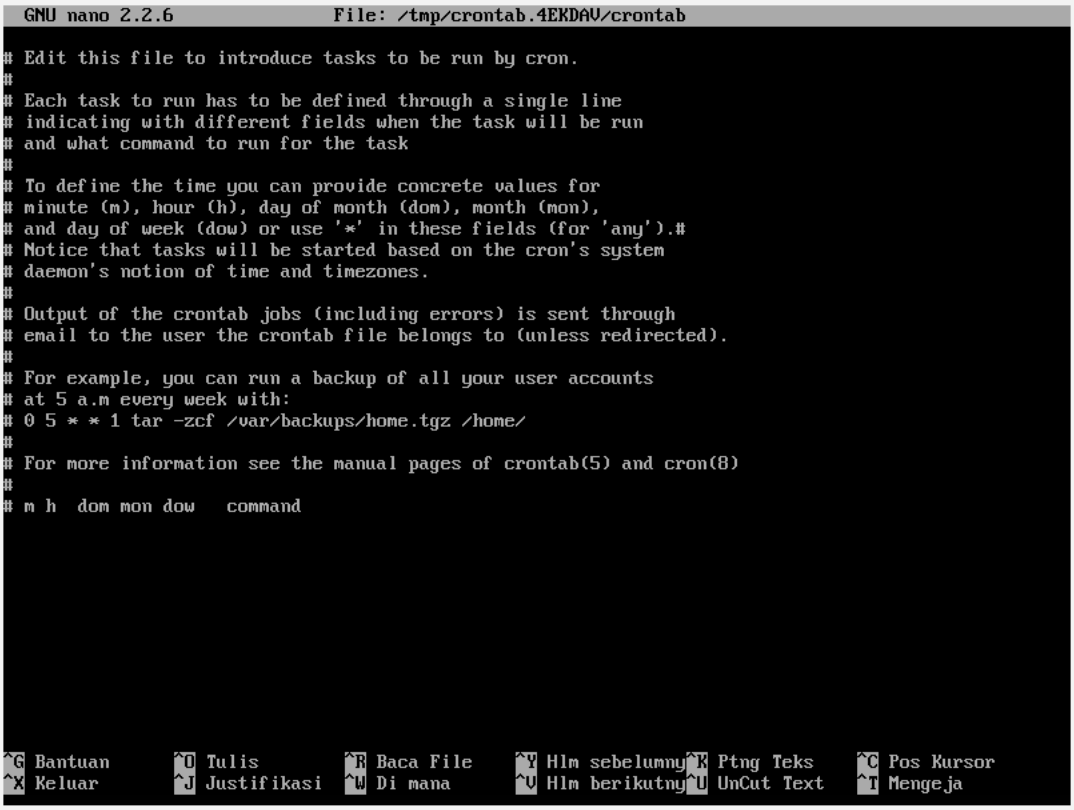
```
lia@ubuntu:~$ crontab -e_
```


GNU nano 2.2.6 File: /tmp/crontab.4EKDAV/crontab
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
^G Bantuan ^O Tulis ^R Baca File ^Y Hlm sebelumny^K Ptng Teks ^C Pos Kursor
^X Keluar ^J Justifikasi ^W Di mana ^V Hlm berikutny^U UnCut Text ^T Mengeja

```
 GNU nano 2.2.6                File: /tmp/crontab.MGtl7R/crontab                Modified

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# m h  dom mon dow   command
0 2 * * * /home/lia/backup.sh

^G Bantuan      ^O Tulis        ^R Baca File    ^Y Hlm sebelummy^K Ptng Teks    ^C Pos Kursor
^X Keluar       ^J Justifikasi  ^W Di mana      ^V Hlm berikutny^U UnCut Text   ^T Mengeja
```

```
                                        [ Wrote 24 lines ]

crontab: installing new crontab
lia@ubuntu:~$
```

```
                                        [ Wrote 24 lines ]

crontab: installing new crontab
lia@ubuntu:~$ crontab -l
```

```
                                [ Wrote 24 lines ]

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#
# m h  dom mon dow   command
0 2 * * * /home/lia/backup.sh

lia@ubuntu:~$ _
```

```
lia@ubuntu:~$ lsblk_
```

```
lia@ubuntu:~$ lsblk
NAME                      MAJ:MIN RM   SIZE RO TYPE MOUNTPOINT
sda                         8:0    0    25G  0 disk
├─sda1                      8:1    0   243M  0 part /boot
├─sda2                      8:2    0     1K  0 part
└─sda5                      8:5    0  24,8G  0 part
  ├─ubuntu--vg-root (dm-0)  252:0    0  22,8G  0 lvm  /
  └─ubuntu--vg-swap_1 (dm-1) 252:1    0     2G  0 lvm  [SWAP]
sr0                        11:0    1  1024M  0 rom
lia@ubuntu:~$ _
```

```
lia@ubuntu:~$ sudo mkdir -p /mnt/flashdisk_
```

```
lia@ubuntu:~$ sudo mkdir -p /mnt/flashdisk
[sudo] password for lia:
lia@ubuntu:~$ sudo rsync -av /home/lia/ /mnt/flashdisk _
```

```
example.txt
google-chrome-stable_current_x86_64.rpm
latihan.tar
lia.txt
samba.tar
.cache/
.cache/motd.legal-displayed
.rpmdb/
.rpmdb/.dbenv.lock
.rpmdb/Basenames
.rpmdb/Conflictname
.rpmdb/Dirnames
.rpmdb/Group
.rpmdb/Installtid
.rpmdb/Name
.rpmdb/Obsoletename
.rpmdb/Packages
.rpmdb/Providename
.rpmdb/Requirename
.rpmdb/Sha1header
.rpmdb/Sigmd5
.rpmdb/Triggername
.rpmdb/__db.001
.rpmdb/__db.002
.rpmdb/__db.003
rpmbuild/
rpmbuild/BUILD/
rpmbuild/BUILDROOT/
rpmbuild/RPMS/
rpmbuild/SOURCES/
rpmbuild/SPECS/
rpmbuild/SRPMS/
samba/

sent 242,452,370 bytes  received 694 bytes  37,300,471.38 bytes/sec
total size is 242,390,605  speedup is 1.00
lia@ubuntu:~$ _
```

```
sent 242,452,370 bytes  received 694 bytes  37,300,471.38 bytes/sec
total size is 242,390,605  speedup is 1.00
lia@ubuntu:~$ ls /mnt/flashdisk
```

```
rpmbuild/RPMS/
rpmbuild/SOURCES/
rpmbuild/SPECS/
rpmbuild/SRPMS/
samba/

sent 242,452,370 bytes  received 694 bytes  37,300,471.38 bytes/sec
total size is 242,390,605  speedup is 1.00
lia@ubuntu:~$ ls /mnt/flashdisk
backup.sh      example.txt                              latihan.tar  lia.txt  rpmbuild  samba.tar
backup.tar.gz  google-chrome-stable_current_x86_64.rpm  Lia.tar.gz   Lia.txt  samba
lia@ubuntu:~$ crontab -l
# Edit this file to introduce tasks to be run by cron.
#
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#
# m h  dom mon dow   command
0 2 * * * /home/lia/backup.sh

lia@ubuntu:~$
```

```
lia@ubuntu:~$ sudo cp ~/backup.sh /usr/local/bin/&&
> sudo chmod +x /usr/local/bin/backup.sh
lia@ubuntu:~$ cat ~/backup.sh
#!/bin/bash
DATE=$(date +%Y%m%d)
tar -czvf /backup/
home_backup_$DATE.tar.gz /home

lia@ubuntu:~$ cat ~/backup.sh
#!/bin/bash
DATE=$(date +%Y%m%d)
tar -czvf /backup/
home_backup_$DATE.tar.gz /home

lia@ubuntu:~$
```

Langkah-langkah Monitoring dan Verifikasi Penjadwalan (Cron) Monitoring dilakukan untuk memastikan bahwa tugas (task) telah terdaftar di sistem daemon cron dan siap dijalankan sesuai jadwal. Berikut adalah langkah-langkah yang dilakukan:

- Verifikasi Pendaftaran Jadwal Setelah melakukan pengeditan melalui perintah crontab -e, dilakukan verifikasi menggunakan perintah: crontab -l Perintah ini bertujuan untuk menampilkan seluruh daftar pekerjaan (cron jobs) yang sedang aktif untuk pengguna saat ini.
- Analisis Output Monitoring Berdasarkan hasil monitoring di terminal, sistem memberikan konfirmasi sebagai berikut:
    - Status Konfigurasi: Muncul notifikasi crontab: installing new crontab, yang menandakan bahwa perubahan jadwal telah berhasil disimpan dan diterima oleh sistem.
    - Validasi Baris Perintah: Baris 0 2 * * * /home/lia/backup.sh telah muncul dalam daftar, yang berarti script backup telah dijadwalkan secara tepat pada pukul 02:00 setiap harinya.
- Verifikasi Ketersediaan File Eksekusi Sebagai bagian dari monitoring integritas, dipastikan bahwa file yang dijadwalkan benar-benar ada dan memiliki izin eksekusi. Hal ini diverifikasi dengan perintah ls yang menunjukkan file backup.sh tersedia di direktori /home/lia/.
- Interaksi Langsung dengan Kernel dan Daemon: Monitoring melalui terminal (CLI) berinteraksi langsung dengan daemon cron dan file konfigurasi asli di dalam sistem Linux.
- Akurasi Data 100%: Berbeda dengan antarmuka web yang terkadang mengalami keterlambatan sinkronisasi (delay), output dari perintah crontab -l menunjukkan data real-time yang tersimpan di dalam /var/spool/cron/.
- Konfirmasi Sistem yang Valid: Status crontab: installing new crontab adalah bukti bahwa sistem telah berhasil melakukan validasi sintaks dan menuliskan jadwal tersebut ke dalam sistem file utama.
- Metode Standar Administrator: Penggunaan CLI merupakan standar tertinggi bagi administrator sistem untuk memastikan tidak ada lapisan perangkat lunak pihak ketiga yang memanipulasi tampilan status penjadwalan.

Kesimpulan:

Berdasarkan serangkaian kegiatan praktikum yang telah dilaksanakan, dapat disimpulkan bahwa:

- Efektivitas Backup Manual dan Otomatis: Penggunaan utilitas tar terbukti efektif untuk melakukan pengarsipan data secara manual, sementara integrasi shell script (backup.sh) dengan sistem cron memungkinkan proses backup berjalan secara otomatis tanpa intervensi manual.
- Keandalan Penjadwalan Sistem: Implementasi cron job dengan parameter 0 2 * * * telah terverifikasi sukses melalui perintah crontab -l, yang memastikan keamanan data melalui pencadangan rutin setiap pukul 02:00 pagi.
- Optimalisasi Sinkronisasi Data: Penggunaan utilitas rsync memberikan solusi backup yang efisien karena mampu melakukan sinkronisasi data dalam jumlah besar (242 MB) dari direktori lokal ke media penyimpanan eksternal (/mnt/flashdisk) dengan cepat dan akurat.
- Keunggulan Metode CLI: Meskipun monitoring dapat dilakukan melalui antarmuka web, penggunaan terminal (Command Line Interface) memberikan kontrol yang lebih mendalam, aman, dan ringan dalam manajemen sistem Linux.

Tugas Praktikum 13 Selesai.
Saidatul Awwaliyah (Teknik Informatika).