

[illegible]

## Disk usage monitoring

df -h

du -sh /var/\*

```
[root@localhost ~]# df -h
Filesystem      Size  Used Avail Use% Mounted on
/dev/mapper/cs-root 18G  4.3G   14G  25% /
devtmpfs        2.6G    0   2.6G   0% /dev
tmpfs           2.6G  84K   2.6G   1% /dev/shm
tmpfs           1.1G  26M   1.1G   3% /run
/dev/sda2       960M  423M  538M  44% /boot
tmpfs           526M  132K  526M   1% /run/user/1000
tmpfs           526M   56K  526M   1% /run/user/0
tmpfs           526M   76K  526M   1% /run/user/42
tmpfs           1.0M    0   1.0M   0% /run/credentials/systemd-journald.service

[root@localhost ~]# du -sh /var/*
0          /var/account
0          /var/adm
77M        /var/cache
0          /var/crash
0          /var/db
0          /var/empty
0          /var/ftp
0          /var/games
0          /var/kerberos
29M        /var/lib
0          /var/local
0          /var/lock
8.0M       /var/log
0          /var/mail
0          /var/nis
0          /var/opt
0          /var/preserve
0          /var/run
0          /var/spool
4.0K       /var/tmp
0          /var/yp
[root@localhost ~]#
```

## Top resource-consuming processes

ps aux --sort=-%cpu | head -10

ps aux --sort=-%mem | head -10

```
[root@localhost ~]# ps aux --sort=-%cpu | head -10
USER      PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root      36932 200  0.0 230840 4272 pts/3    R+   12:10   0:00 ps aux --sort=-%cpu
gdm       36322  1.7  4.2 4719520 226804 ?        S1   12:07   0:03 /usr/bin/gnome-shell
hero      32013  0.8  6.6 4903784 357680 ?        Ssl  11:46   0:12 /usr/bin/gnome-shell
gdm       35557  0.3  4.3 4721452 236228 tty1     S1+  11:58   0:02 /usr/bin/gnome-shell
hero      33660  0.2  0.5 640340 29856 ?        S1   11:46   0:03 /usr/libexec/ibus-extension-gtk3
root      1  0.2  0.6 44664 36476 ?        Ss   11:45   0:03 /usr/lib/systemd/systemd --switched-root --system --deserialize=43 rhgb
gdm       36605  0.1  1.9 1534560 102492 ?        S1   12:07   0:00 /usr/libexec/mutter-x11-frames
hero      34408  0.1  5.9 3000188 318100 ?        Ssl  11:47   0:02 /usr/bin/ptxis --gapplication-service
root      36254  0.1  0.1 19112 10264 ?        Ss   12:07   0:00 /usr/lib/systemd/systemd-logind
[root@localhost ~]#
```

```
[root@localhost ~]# ps aux --sort=-%mem | head -10
USER      PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
hero      32013  0.8  6.6 4903784 357684 ?        Ssl  11:46   0:12 /usr/bin/gnome-shell
hero      34408  0.1  5.9 3000188 318100 ?        Ssl  11:47   0:02 /usr/bin/ptxis --gapplication-service
gdm       35557  0.3  4.3 4721452 236228 tty1     S1+  11:58   0:02 /usr/bin/gnome-shell
gdm       36322  1.5  4.2 4723680 226792 ?        S1   12:07   0:03 /usr/bin/gnome-shell
hero      33748  0.0  1.9 1416364 102556 ?        S1   11:46   0:01 /usr/bin/gnome-software --gapplication-service
gdm       36605  0.1  1.9 1534560 102492 ?        S1   12:07   0:00 /usr/libexec/mutter-x11-frames
gdm       35882  0.0  1.9 1534200 102444 tty1     S1+  11:58   0:00 /usr/libexec/mutter-x11-frames
root      1737  0.0  0.8 360920 45524 ?        Ssl  11:46   0:00 /usr/bin/python3 -sP /usr/sbin/firewalld --nofork --nopid
gdm       35595  0.0  0.7 204968 41832 tty1     S+   11:58   0:00 /usr/bin/Xwayland :1024 -rootless -noreset -accessx -core -auth /run/user/42/.mutter-Xwaylandauth.0X6
TI3 -listenfd 4 -listenfd 5 -displayfd 6 -initfd 7 -byteswappedclients -enable-ei-portal
```

## Logging system metrics

```
sudo mkdir -p /var/log/system-monitoring
sudo nano /usr/local/bin/system_monitor.sh
```

```
[root@localhost ~]# sudo nano /usr/local/bin/system_monitor.sh
[root@localhost ~]# cat /usr/local/bin/system_monitor.sh
#!/bin/bash
echo "==== $(date) =====" >> /var/log/system-monitoring/metrics.log
df -h >> /var/log/system-monitoring/metrics.log
free -m >> /var/log/system-monitoring/metrics.log
ps aux --sort=-%cpu | head -5 >> /var/log/system-monitoring/metrics.log

[root@localhost ~]#
[root@localhost ~]#
[root@localhost ~]#
[root@localhost ~]# sudo chmod +x /usr/local/bin/system_monitor.sh
[root@localhost ~]# crontab -e
no crontab for root - using an empty one
crontab: installing new crontab
[root@localhost ~]#
```

```
[root@localhost ~]# sudo crontab -l
0 * * * * /usr/local/bin/system_monitor.sh
0 0 * * 2 /usr/local/bin/apache_backup.sh
0 0 * * 2 /usr/local/bin/nginx_backup.sh

[root@localhost ~]#
```

## Task 2: User Management

### Create users

```
sudo useradd sarah
sudo useradd mike
sudo passwd sarah
sudo passwd mike
```

```
[root@localhost ~]# cat /etc/passwd | grep -E 'sarah|mike'
sarah:x:1001:1001::/home/sarah:/bin/bash
mike:x:1002:1002::/home/mike:/bin/bash
[root@localhost ~]#
```

### Create isolated directories

```
sudo mkdir -p /home/sarah/workspace

sudo mkdir -p /home/mike/workspace

sudo chown -R sarah:sarah /home/sarah/workspace
sudo chown -R mike:mike /home/mike/workspace

sudo chmod 700 /home/sarah/workspace
```



```
sudo chmod 700 /home/mike/workspace
```

```
[root@localhost ~]# ls -ld /home/sarah/workspace
ls -ld /home/mike/workspace
ls -ld /home/sarah/workspace
ls -ld /home/mike/workspace
drwx-----. 2 sarah sarah 6 Jan  7 12:26 /home/sarah/workspace
drwx-----. 2 mike mike 6 Jan  7 12:26 /home/mike/workspace
drwx-----. 2 sarah sarah 6 Jan  7 12:26 /home/sarah/workspace
drwx-----. 2 mike mike 6 Jan  7 12:26 /home/mike/workspace
[root@localhost ~]#
[root@localhost ~]#
[root@localhost ~]#
```

## Enforce password expiry (30 days)

```
sudo chage -M 30 sarah
```

```
sudo chage -M 30 mike
```

```
sudo mkdir -p /home/mike/workspace
[root@localhost ~]# sudo chown -R sarah:sarah /home/sarah/workspace
[root@localhost ~]# sudo chown -R mike:mike /home/mike/workspace
[root@localhost ~]# sudo chmod 700 /home/sarah/workspace
sudo chmod 700 /home/mike/workspace
[root@localhost ~]# sudo chage -M 30 sarah
sudo chage -M 30 mike
[root@localhost ~]# chage -l sarah
Last password change           : Jan 07, 2026
Password expires                : Feb 06, 2026
Password inactive               : never
Account expires                 : never
Minimum number of days between password change : 0
Maximum number of days between password change : 30
Number of days of warning before password expires : 7
[root@localhost ~]# chage -l mike
Last password change           : Jan 07, 2026
Password expires                : Feb 06, 2026
Password inactive               : never
Account expires                 : never
Minimum number of days between password change : 0
Maximum number of days between password change : 30
Number of days of warning before password expires : 7
[root@localhost ~]#
```

## Task 2: Backup Automation

### Create backup directory

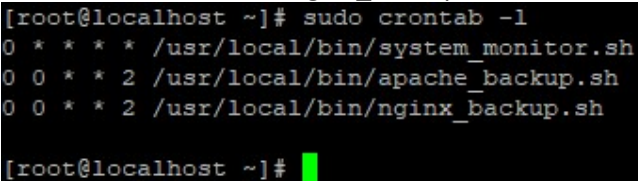
```
sudo mkdir /backups  
sudo chmod 700 /backups
```

```
sudo nano /usr/local/bin/apache_backup.sh  
sudo chmod +x /usr/local/bin/apache_backup.sh
```

```
sudo nano /usr/local/bin/nginx_backup.sh  
sudo chmod +x /usr/local/bin/nginx_backup.sh
```

### Cron jobs (Tuesday 12:00 AM)

```
sudo crontab -e  
0 0 * * 2 /usr/local/bin/apache_backup.sh  
0 0 * * 2 /usr/local/bin/nginx_backup.sh
```

A terminal window screenshot showing the output of the 'sudo crontab -l' command. The terminal displays the current crontab entries: '0 \* \* \* \* /usr/local/bin/system\_monitor.sh', '0 0 \* \* 2 /usr/local/bin/apache\_backup.sh', and '0 0 \* \* 2 /usr/local/bin/nginx\_backup.sh'. The prompt is '[root@localhost ~]#'.

```
[root@localhost ~]# sudo crontab -l  
0 * * * * /usr/local/bin/system_monitor.sh  
0 0 * * 2 /usr/local/bin/apache_backup.sh  
0 0 * * 2 /usr/local/bin/nginx_backup.sh  
[root@localhost ~]#
```

```
ls -lh /backups  
cat /backups/apache_verify.log  
cat /backups/nginx_verify.log
```

```

[root@localhost ~]# cat /usr/local/bin/apache_backup.sh
#!/bin/bash
DATE=$(date +%F)
tar -czvf /backups/apache_backup_${DATE}.tar.gz /etc/httpd /var/www/html \
>> /backups/apache_verify.log
tar -tzf /backups/apache_backup_${DATE}.tar.gz >> /backups/apache_verify.log
[root@localhost ~]#
[root@localhost ~]# sudo chmod +x /usr/local/bin/apache_backup.sh
[root@localhost ~]# sudo nano /usr/local/bin/nginx_backup.sh
[root@localhost ~]# sudo chmod +x /usr/local/bin/nginx_backup.sh
[root@localhost ~]# sudo crontab -e
crontab: installing new crontab
Backup of root's previous crontab saved to /root/.cache/crontab/crontab.bak
[root@localhost ~]#
[root@localhost ~]#
[root@localhost ~]# ls -lh /backups
total 0
[root@localhost ~]# cat /backups/apache_verify.log
cat: /backups/apache_verify.log: No such file or directory
[root@localhost ~]#
[root@localhost ~]# cat /backups/nginx_verify.log
cat: /backups/nginx_verify.log: No such file or directory
[root@localhost ~]#
[root@localhost ~]#

```

## Web Server Installation

### 1. Install Apache (HTTPD) – Sarah

sudo dnf install -y httpd

sudo systemctl start httpd

sudo systemctl enable httpd

systemctl status httpd

ls -ld /etc/httpd

ls -ld /var/www/html

```

[root@localhost ~]# systemctl status httpd
● httpd.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/httpd.service; enabled; preset: disabled)
   Active: active (running) since Wed 2026-01-07 12:49:19 IST; 8s ago
 Invocation: 5b4fb4ff761a40948f6c016d721ae408
    Docs: man:httpd.service(8)
  Main PID: 38980 (httpd)
   Status: "Started, listening on: port 80"
    Tasks: 177 (limit: 33238)
  Memory: 14M (peak: 14.7M)
     CPU: 134ms
  CGroup: /system.slice/httpd.service
          └─38980 /usr/sbin/httpd -DFOREGROUND
            └─38981 /usr/sbin/httpd -DFOREGROUND
              └─38982 /usr/sbin/httpd -DFOREGROUND
                └─38983 /usr/sbin/httpd -DFOREGROUND
                  └─38996 /usr/sbin/httpd -DFOREGROUND

Jan 07 12:49:19 localhost.localdomain systemd[1]: Starting httpd.service - The Apache HTTP Server
Jan 07 12:49:19 localhost.localdomain (httpd)[38980]: httpd.service: Referenced
Jan 07 12:49:19 localhost.localdomain httpd[38980]: AH00558: httpd: Could not r
Jan 07 12:49:19 localhost.localdomain httpd[38980]: Server configured, listenin
Jan 07 12:49:19 localhost.localdomain systemd[1]: Started httpd.service - The Apache HTTP Server
lines 1-22/22 (END)

```

```

ef="https://www.centos.org/legal">Legal</a></span> <span class="border-start ms-2 ps-2"><a class="link-light link-offset-3 link-underline-opacity-25 link-underline-opacity-100-hover link-underline-light" href="https://www.centos.org/1
rivity">Privacy</a></span> <span class="border-start ms-2 ps-2"><a class="
ight link-offset-3 link-underline-opacity-25 link-underline-opacity-100-ho
nk-underline-light" href="https://git.centos.org/centos/centos.org">Site s
/a></span>
    </div>
  </div>
</div>
</footer>
</body>
</html>
[root@localhost ~]#
[root@localhost ~]#
[root@localhost ~]#
[root@localhost ~]# ls -ld /etc/httpd
ls -ld /var/www/html
drwxr-xr-x. 5 root root 105 Jan  7 12:48 /etc/httpd
drwxr-xr-x. 2 root root 6 Sep  8 05:30 /var/www/html
[root@localhost ~]# █

```

curl <http://localhost>

## Install Nginx – Mike

```

sudo dnf install -y nginx
sudo systemctl start nginx
sudo systemctl enable nginx

```

Firewall

```

sudo firewall-cmd --permanent --add-service=http
sudo firewall-cmd --reload

```

```

[root@localhost ~]# sudo firewall-cmd --permanent --add-service=http
sudo firewall-cmd --reload
success
success
[root@localhost ~]# █

```