

Task 1: System Monitoring Setup

Install monitoring tools (htop, nmon, sysstat)

```
sudo yum install -y epel-release
```

```
sudo yum install -y htop nmon sysstat
```

```
[root@localhost ~]# sudo yum install -y epel-release
CentOS Stream 10 - BaseOS                9.3 kB/s | 5.2 kB      00:00
CentOS Stream 10 - BaseOS                2.4 MB/s | 6.7 MB      00:02
CentOS Stream 10 - AppStream             7.8 kB/s | 5.2 kB      00:00
CentOS Stream 10 - AppStream            261 kB/s | 3.4 MB      00:13
CentOS Stream 10 - Extras packages        14 kB/s | 5.9 kB      00:00
Extra Packages for Enterprise Linux 10 - x86_64 28 kB/s | 11 kB      00:00
Extra Packages for Enterprise Linux 10 - x86_64 1.6 MB/s | 5.3 MB      00:03
Jenkins-stable                          11 kB/s | 2.9 kB      00:00
Package epel-release-10-6.el10_0.noarch is already installed.
Dependencies resolved.
Nothing to do.
Complete!
[root@localhost ~]#
```

```
[root@localhost ~]# sudo yum install -y htop nmon sysstat
Last metadata expiration check: 0:00:55 ago on Sat 30 Aug 2025 08:41:36 AM IST.
Dependencies resolved.
=====
Package                                Architecture      Version            Repository          Size
=====
Installing:
htop                                   x86_64            3.3.0-5.el10_0     epel                196 k
nmon                                   x86_64            16q-3.el10_1       epel                78 k
sysstat                               x86_64            12.7.6-2.el10      appstream           526 k
Installing dependencies:
hwloc-libs                            x86_64            2.11.1-3.el10      baseos              2.1 M
lm_sensors-libs                       x86_64            3.6.0-20.el10      appstream           42 k
ocl-icd                               x86_64            2.3.2-8.el10       baseos              67 k
pcp-conf                               x86_64            6.3.7-5.el10       appstream           30 k
pcp-libs                              x86_64            6.3.7-5.el10       appstream           654 k
Transaction Summary
-----
Install 8 Packages
Total download size: 3.6 M
Installed size: 7.0 M
```

Enable sysstat for continuous metric collection

```
sudo systemctl enable --now sysstat
```

Check disk usage

```
df -hT # filesystem usage
```

```
du -sh /var/www/html /usr/share/nginx/html # web roots usage
```

```

root@localhost ~]# sudo systemctl enable --now sysstat
root@localhost ~]# df -hT
filesystem                Type      Size  Used Avail Use% Mounted on
dev/mapper/cs_vbox-root   xfs       17G   1.6G   16G   9% /
devtmpfs                  devtmpfs  4.0M    0   4.0M   0% /dev
tmpfs                     tmpfs     853M    0   853M   0% /dev/shm
tmpfs                     tmpfs     342M   4.9M   337M   2% /run
tmpfs                     tmpfs     1.0M    0    1.0M   0% /run/credentials/systemd-journald.service
dev/sda2                  xfs      960M  227M   734M  24% /boot
tmpfs                     tmpfs     1.0M    0    1.0M   0% /run/credentials/getty@tty1.service
tmpfs                     tmpfs     171M   4.0K   171M   1% /run/user/0
root@localhost ~]# du -sh
.      84K
root@localhost ~]#

```

Check resource-intensive processes

```

[root@localhost ~]# ps -eo pid,ppid,cmd,%mem,%cpu --sort=-%mem | head
  PID     PPID  CMD                                %MEM %CPU
   758         1 /usr/bin/python3 -sP /usr/s         2.4  0.2
      1         0 /usr/lib/systemd/systemd --         2.3  1.7
   774         1 /usr/sbin/NetworkManager --         0.9  0.0
  1327         1 /usr/lib/systemd/systemd --         0.7  0.1
   644         1 /usr/lib/systemd/systemd-ud         0.6  0.0
  1398        794 sshd-session: root [priv]         0.6  0.0
   759         1 /usr/lib/systemd/systemd-lo         0.5  0.0
   787         1 /usr/lib/systemd/systemd-ho         0.5  0.0
   598         1 /usr/lib/systemd/systemd-jo         0.4  0.0
[root@localhost ~]# ps -eo pid,ppid,cmd,%mem,%cpu --sort=-%cpu | head
  PID     PPID  CMD                                %MEM %CPU
  1752    1403 ps -eo pid,ppid,cmd,%mem,%c  0.2  100
  1590         2 [kworker/0:14-events]              0.0  2.0
      1         0 /usr/lib/systemd/systemd --         2.3  1.7
  1585         2 [kworker/0:9-events]               0.0  1.7
      8         2 [kworker/0:0-xfs-conv/dm-0]         0.0  1.4
   211         2 [kworker/0:3-ata_sff]              0.0  0.4
   758         1 /usr/bin/python3 -sP /usr/s         2.4  0.2
  1327         1 /usr/lib/systemd/systemd --         0.7  0.1
      11        2 [kworker/u4:0-events_unboun        0.0  0.1
[root@localhost ~]#

```

Automated logging (create script)

sudo vi /usr/local/bin/collect_metrics.sh

```
#!/bin/bash
LOG_DIR="/var/log/monitoring"
mkdir -p $LOG_DIR
LOG_FILE="$LOG_DIR/system_metrics_$(date +%F).log"

echo "=====$(date) =====" >> $LOG_FILE
uptime >> $LOG_FILE
top -b -nl | head -n 20 >> $LOG_FILE
df -hT --total >> $LOG_FILE
ps -eo pid,ppid,cmd,%mem,%cpu --sort=-%cpu | head >> $LOG_FILE
```

```
[root@localhost ~]# sudo vi /usr/local/bin/collect_metrics.sh
[root@localhost ~]# sudo chmod +x /usr/local/bin/collect_metrics.sh
[root@localhost ~]#
```

sudo chmod +x /usr/local/bin/collect_metrics.sh

```
[root@localhost ~]# sudo vi /usr/local/bin/collect_metrics.sh
[root@localhost ~]# sudo chmod +x /usr/local/bin/collect_metrics.sh
[root@localhost ~]# echo "*/15 * * * * root /usr/local/bin/collect_metrics.sh" | sudo tee /etc/cron.d/monitoring_collect
*/15 * * * * root /usr/local/bin/collect_metrics.sh
[root@localhost ~]# echo "*/15 * * * * root /usr/local/bin/collect_metrics.sh"
*/15 * * * * root /usr/local/bin/collect_metrics.sh
[root@localhost ~]# sudo tee /etc/cron.d/monitoring_collect
^Z
[1]+  Stopped                  sudo tee /etc/cron.d/monitoring_collect
[root@localhost ~]#
```

CPU[] 1.4% Tasks: 29, 7 thr, 82 kthr; 0 running									
Mem[] 241M/1.67G Load average: 0.04 0.07 0.02									
Swp[] 0K/2.00G Uptime: 01:22:22									
Main []									
PID	USER	PR	NI	VIRT	RES	SHR	S	CPU%MEM%	TIME+ Command
1	root	20	0	48756	40376	10404	S	0.0 2.3	0:10.41 /usr/lib/systemd/systemd --switched-root --system --deserialize=47
598	root	20	0	33128	9552	8400	S	0.0 0.5	0:01.19 /usr/lib/systemd/systemd-journald
636	root	20	0	15860	5980	5084	S	0.0 0.3	0:00.14 /usr/lib/systemd/systemd-userdbd
644	root	20	0	34912	11172	7972	S	0.0 0.6	0:00.21 /usr/lib/systemd/systemd-udev
711	root	16	-4	20384	2864	1984	S	0.0 0.2	0:00.05 /usr/sbin/auditd
713	root	16	-4	20384	2864	1984	S	0.0 0.2	0:00.00 /usr/sbin/auditd
752	dbus	20	0	8764	3996	3356	S	0.0 0.2	0:00.29 /usr/bin/dbus-broker-launch --scope system --audit
755	dbus	20	0	4896	2696	2312	S	0.0 0.2	0:01.15 dbus-broker --log 4 --controller 9 --machine-id 2db15ad2ad204206a23cbd586a7d76e9 --max-bytes 53687091
758	root	20	0	126M	42636	16976	S	0.0 2.4	0:00.99 /usr/bin/python3 -sP /usr/sbin/firewalld --nofork --nopid
759	root	20	0	18928	9828	7396	S	0.0 0.6	0:00.49 /usr/lib/systemd/systemd-logind
768	chrony	20	0	84592	4348	3672	S	0.0 0.2	0:00.09 /usr/sbin/chronyd -F 2
774	root	20	0	322M	17380	14564	S	0.0 1.0	0:01.11 /usr/sbin/NetworkManager --no-daemon
779	root	20	0	322M	17380	14564	S	0.0 1.0	0:00.15 /usr/sbin/NetworkManager --no-daemon
781	root	20	0	322M	17380	14564	S	0.0 1.0	0:00.00 /usr/sbin/NetworkManager --no-daemon
782	root	20	0	322M	17380	14564	S	0.0 1.0	0:00.14 /usr/sbin/NetworkManager --no-daemon
794	root	20	0	8892	6052	4900	S	0.0 0.3	0:00.04 sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
812	root	20	0	8320	3532	2636	S	0.0 0.2	0:00.06 /usr/sbin/crond -n
815	root	20	0	7224	4716	3948	S	0.0 0.3	0:00.05 login -- root
855	root	20	0	126M	42636	16976	S	0.0 2.4	0:00.00 /usr/bin/python3 -sP /usr/sbin/firewalld --nofork --nopid
869	root	20	0	159M	6688	5024	S	0.0 0.4	0:00.08 /usr/sbin/rxyslogd -n
893	root	20	0	159M	6688	5024	S	0.0 0.4	0:01.19 /usr/sbin/rxyslogd -n
894	root	20	0	159M	6688	5024	S	0.0 0.4	0:00.21 /usr/sbin/rxyslogd -n
1327	root	20	0	22224	13432	10360	S	0.0 0.8	0:00.49 /usr/lib/systemd/systemd --user
1329	root	20	0	13628	2840	1668	S	0.0 0.2	0:00.00 (sd-pam)
1338	root	20	0	7344	3968	3328	S	0.0 0.2	0:00.03 -bash
1398	root	20	0	15508	10660	8612	S	0.0 0.6	0:00.05 sshd-session: root [priv]
1402	root	20	0	15896	7880	5316	S	0.0 0.5	0:00.22 sshd-session: root@pts/0
1403	root	20	0	7344	4112	3472	S	0.0 0.2	0:00.09 -bash
1937	root	20	0	18256	7452	6172	T	0.0 0.4	0:00.02 sudo tee /etc/cron.d/monitoring_collect
1939	root	20	0	18256	2760	1368	S	0.0 0.2	0:00.00 sudo tee /etc/cron.d/monitoring_collect
1940	root	20	0	8408	1588	1588	T	0.0 0.1	0:00.00 tee /etc/cron.d/monitoring_collect
2931	root	20	0	8408	1636	1508	S	0.0 0.1	0:00.00 /usr/sbin/anaconda -s
3026	root	20	0	16304	5868	4972	S	0.0 0.3	0:00.00 systemd-userwork: waiting...
3030	root	20	0	16304	5868	4972	S	0.0 0.3	0:00.00 systemd-userwork: waiting...
3031	root	20	0	16304	5984	5088	S	0.0 0.3	0:00.00 systemd-userwork: waiting...
F1Help F2Setup F3Search F4Filter F5Tree F6SortBy F7Nice F8Kill F9Quit									

Task 2 – User Management & Access Control

```
[root@localhost ~]# sudo useradd sarah
useradd: warning: the home directory /home/sarah already exists.
useradd: Not copying any file from skel directory into it.
Creating mailbox file: File exists
[root@localhost ~]# sudo passwd sarah
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: password updated successfully
[root@localhost ~]# sudo useradd mike
useradd: warning: the home directory /home/mike already exists.
useradd: Not copying any file from skel directory into it.
Creating mailbox file: File exists
[root@localhost ~]# sudo passwd mike
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: password updated successfully
[root@localhost ~]#
[root@localhost ~]#
```

sudo useradd sarah

sudo passwd sarah # set strong password (e.g., Strong#Passw0rd!)

sudo useradd mike

sudo passwd mike # set strong password (e.g., Stronger#Passw0rd2)

Create isolated directories

```
[root@localhost ~]# mkdir -p /home/Sarah/workspace
[root@localhost ~]# chown -R sarah:sarah /home/Sarah
[root@localhost ~]# chmod 700 /home/Sarah/workspace
[root@localhost ~]# mkdir -p /home/mike/workspace
[root@localhost ~]# chown -R mike:mike /home/mike
[root@localhost ~]# chmod 700 /home/mike/workspace
[root@localhost ~]#
```

mkdir -p /home/Sarah/workspace

chown -R sarah:sarah /home/Sarah

chmod 700 /home/Sarah/workspace

mkdir -p /home/mike/workspace

chown -R mike:mike /home/mike

chmod 700 /home/mike/workspace

Set password policy (expire in 30 days)

```
[root@localhost ~]# sudo chage -M 30 sarah
[root@localhost ~]# sudo chage -M 30 mike
[root@localhost ~]#
```

sudo chage -M 30 sarah

sudo chage -M 30 mike

Enforce complexity policy (edit PAM config)

sudo vi /etc/security/pwquality.conf

```
Configuration for systemwide password quality limits
Defaults:

Number of characters in the new password that must not be present in the
old password.
difok = 1

Minimum acceptable size for the new password (plus one if
credits are not disabled which is the default). (See pam_cracklib manual.)
Cannot be set to lower value than 6.
minlen = 12

The maximum credit for having digits in the new password. If less than 0
it is the minimum number of digits in the new password.
dcredit = -1

The maximum credit for having uppercase characters in the new password.
If less than 0 it is the minimum number of uppercase characters in the new
password.
ucredit = -1

The maximum credit for having lowercase characters in the new password.
If less than 0 it is the minimum number of lowercase characters in the new
password.
lcredit = -1

The maximum credit for having other characters in the new password.
If less than 0 it is the minimum number of other characters in the new
password.
ocredit = -1
```

```
minlen = 12
ucredit = -1
lcredit = -1
dcredit = -1
ocredit = -1
```

```

[root@localhost ~]# ls -ld /home/Sarah/workspace
drwx-----. 2 sarah sarah 6 Aug 30 12:44 /home/Sarah/workspace
[root@localhost ~]# ls -ld /home/mike/workspace
drwx-----. 2 mike mike 6 Aug 30 12:46 /home/mike/workspace
[root@localhost ~]# sudo chage -l sarah
Last password change                : Aug 30, 2025
Password expires                    : Sep 29, 2025
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 ~]# sudo chage -l mike
Last password change                : Aug 30, 2025
Password expires                    : Sep 29, 2025
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 ~]# █

```

ls -ld /home/Sarah/workspace

ls -ld /home/mike/workspace

sudo chage -l sarah

sudo chage -l mike

```

[root@localhost ~]# ls -ld
dr-xr-x---. 5 root root 4096 Aug 30 11:05 .
[root@localhost ~]# chage -l
Usage: chage [options] LOGIN

Options:
  -d, --lastday LAST_DAY      set date of last password change to LAST_DAY
  -E, --expiredate EXPIRE_DATE set account expiration date to EXPIRE_DATE
  -h, --help                  display this help message and exit
  -i, --iso8601               use YYYY-MM-DD when printing dates
  -I, --inactive INACTIVE     set password inactive after expiration
                              to INACTIVE
  -l, --list                   show account aging information
  -m, --mindays MIN_DAYS      set minimum number of days before password
                              change to MIN_DAYS
  -M, --maxdays MAX_DAYS     set maximum number of days before password
                              change to MAX_DAYS
  -R, --root CHROOT_DIR       directory to chroot into
  -P, --prefix PREFIX_DIR     directory prefix
  -W, --warndays WARN_DAYS    set expiration warning days to WARN_DAYS

[root@localhost ~]# █

```

Task 3 – Backup Configuration for Web Servers

Create backup directory

```
[root@localhost ~]# sudo mkdir -p /backups
[root@localhost ~]# sudo chmod 755 /backups
[root@localhost ~]#
```

```
sudo mkdir -p /backups
sudo chmod 755 /backups
```

Create backup scripts

```
sudo vi /usr/local/bin/backup_apache.sh
```

```
#!/bin/bash
# Backup Script for Apache (Sarah)
# Backs up Apache config and document root

BACKUP_DIR="/backups"
DATE=$(date +%F)
BACKUP_FILE="$BACKUP_DIR/apache_backup_${DATE}.tar.gz"
LOG_FILE="/var/log/backup/apache_backup.log"

# Create compressed backup
tar -czf $BACKUP_FILE /etc/httpd/ /var/www/html/ 2>> $LOG_FILE

# Verify backup integrity
echo "[$(date)] Backup created: $BACKUP_FILE" >> $LOG_FILE
echo "[$(date)] Verifying backup contents..." >> $LOG_FILE
tar -tzf $BACKUP_FILE >> $LOG_FILE 2>&1

# Generate checksum
sha256sum $BACKUP_FILE > $BACKUP_FILE.sha256
echo "[$(date)] SHA256 checksum generated: $BACKUP_FILE.sha256" >> $LOG_FILE
```

```
#!/bin/bash
# Backup Script for Apache (Sarah)
# Backs up Apache config and document root
```

```
BACKUP_DIR="/backups"
DATE=$(date +%F)
```



```
BACKUP_FILE="$BACKUP_DIR/apache_backup_$(date +%Y%m%d).tar.gz"
LOG_FILE="/var/log/backup/apache_backup.log"
```

```
# Create compressed backup
```

```
tar -czf $BACKUP_FILE /etc/httpd/ /var/www/html/ 2>> $LOG_FILE
```

```
# Verify backup integrity
```

```
echo "[$(date)] Backup created: $BACKUP_FILE" >> $LOG_FILE
```

```
echo "[$(date)] Verifying backup contents..." >> $LOG_FILE
```

```
tar -tzf $BACKUP_FILE >> $LOG_FILE 2>&1
```

```
# Generate checksum
```

```
sha256sum $BACKUP_FILE > $BACKUP_FILE.sha256
```

```
echo "[$(date)] SHA256 checksum generated: $BACKUP_FILE.sha256" >> $LOG_FILE
```

```
[root@localhost ~]# sudo vi /usr/local/bin/backup_apache.sh
[root@localhost ~]# sudo chmod +x /usr/local/bin/backup_apache.sh
[root@localhost ~]#
```

```
sudo chmod +x /usr/local/bin/backup_apache.sh
```

Nginx (Mike)

```
sudo vi /usr/local/bin/backup_nginx.sh
```

```
#!/bin/bash
# Backup Script for Nginx (Mike)
# Backs up Nginx config and document root

BACKUP_DIR="/backups"
DATE=$(date +%F)
BACKUP_FILE="$BACKUP_DIR/nginx_backup_$DATE.tar.gz"
LOG_FILE="/var/log/backup/nginx_backup.log"

# Create compressed backup
tar -czf $BACKUP_FILE /etc/nginx/ /usr/share/nginx/html/ 2>> $LOG_FILE

# Verify backup integrity
echo "[$(date)] Backup created: $BACKUP_FILE" >> $LOG_FILE
echo "[$(date)] Verifying backup contents..." >> $LOG_FILE
tar -tzf $BACKUP_FILE >> $LOG_FILE 2>&1

# Generate checksum
sha256sum $BACKUP_FILE > $BACKUP_FILE.sha256
echo "[$(date)] SHA256 checksum generated: $BACKUP_FILE.sha256" >> $LOG_FILE
```

```
#!/bin/bash
# Backup Script for Nginx (Mike)
# Backs up Nginx config and document root

BACKUP_DIR="/backups"
DATE=$(date +%F)
BACKUP_FILE="$BACKUP_DIR/nginx_backup_$DATE.tar.gz"
LOG_FILE="/var/log/backup/nginx_backup.log"

# Create compressed backup
tar -czf $BACKUP_FILE /etc/nginx/ /usr/share/nginx/html/ 2>> $LOG_FILE

# Verify backup integrity
echo "[$(date)] Backup created: $BACKUP_FILE" >> $LOG_FILE
echo "[$(date)] Verifying backup contents..." >> $LOG_FILE
tar -tzf $BACKUP_FILE >> $LOG_FILE 2>&1

# Generate checksum
sha256sum $BACKUP_FILE > $BACKUP_FILE.sha256
echo "[$(date)] SHA256 checksum generated: $BACKUP_FILE.sha256" >> $LOG_FILE
```

```
[root@localhost ~]# sudo vi /usr/local/bin/backup_apache.sh
[root@localhost ~]# sudo chmod +x /usr/local/bin/backup_apache.sh
[root@localhost ~]# sudo vi /usr/local/bin/backup_nginx.sh
[root@localhost ~]# sudo chmod +x /usr/local/bin/backup_nginx.sh
[root@localhost ~]#
```

`sudo chmod +x /usr/local/bin/backup_nginx.sh`

`sudo crontab -e`

Schedule cron jobs (every Tuesday at 12 AM)

`0 0 * * 2 /usr/local/bin/backup_apache.sh`

`0 0 * * 2 /usr/local/bin/backup_nginx.sh`

```
0 0 * * 2 /usr/local/bin/backup_apache.sh
0 0 * * 2 /usr/local/bin/backup_nginx.sh
```

Apache (Sarah's Web Server)

`sudo yum install -y httpd`

```
[sarah@localhost root]$ sudo yum install -y httpd
Last metadata expiration check: 1:54:00 ago on Sat 30 Aug 2025 11:38:22 AM IST.
Package httpd-2.4.63-4.el10.x86_64 is already installed.
Dependencies resolved.
Nothing to do.
Complete!
[sarah@localhost root]$ sudo systemctl start httpd
[sarah@localhost root]$ sudo systemctl enable httpd
Created symlink '/etc/systemd/system/multi-user.target.wants/httpd.service' -> '/usr/lib/systemd/system/httpd.service'.
[sarah@localhost root]$ sudo systemctl status httpd
● httpd.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/httpd.service; enabled; preset: disabled)
   Active: active (running) since Sat 2025-08-30 13:32:46 IST; 23s ago
  Invocation: 88046952c2df42e4b19c8d26e478c5aa
     Docs: man:httpd.service(8)
   Main PID: 23020 (httpd)
    Status: "Total requests: 0; Idle/Busy workers 100/0; Requests/sec: 0; Bytes served/sec: 0 B/sec"
     Tasks: 177 (limit: 10696)
    Memory: 17.5M (peak: 17.8M)
       CPU: 295ms
    CGroup: /system.slice/httpd.service
            └─23020 /usr/sbin/httpd -DFOREGROUND
              └─23021 /usr/sbin/httpd -DFOREGROUND
                └─23022 /usr/sbin/httpd -DFOREGROUND
                  └─23023 /usr/sbin/httpd -DFOREGROUND
                    └─23063 /usr/sbin/httpd -DFOREGROUND

Aug 30 13:32:45 localhost.localdomain systemd[1]: Starting httpd.service - The Apache HTTP Server...
Aug 30 13:32:46 localhost.localdomain httpd[23020]: httpd.service: Referenced but unset environment variable evaluates to an empty string: OPTIONS
Aug 30 13:32:46 localhost.localdomain httpd[23020]: AH00558: httpd: Could not reliably determine the server's fully qualified domain name, using localhost.localdomain.
Aug 30 13:32:46 localhost.localdomain systemd[1]: Started httpd.service - The Apache HTTP Server.
Aug 30 13:32:46 localhost.localdomain httpd[23020]: Server configured, listening on: port 80

[sarah@localhost root]$
```

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

```
[sarah@localhost root]$ sudo firewall-cmd --permanent --add-service=http
success
[sarah@localhost root]$ sudo firewall-cmd --permanent --add-service=https
success
[sarah@localhost root]$ sudo firewall-cmd --reload
success
[sarah@localhost root]$ sudo vi /etc/httpd/conf.d/sarah_site.conf
[sarah@localhost root]$
```

```
<VirtualHost *:80>
    ServerAdmin sarah@techcorp.com
    ServerName sarah.local
    DocumentRoot /var/www/html/sarah
    ErrorLog /var/log/httpd/sarah_error.log
    CustomLog /var/log/httpd/sarah_access.log combined
</VirtualHost>
```

```
[sarah@localhost root]$ sudo mkdir -p /var/www/html/sarah
[sarah@localhost root]$ echo "<h1>Welcome to Sarah's Apache site</h1>" | sudo tee /var/www/html/sarah/index.html
<h1>Welcome to Sarah's Apache site</h1>
[sarah@localhost root]$ sudo chown -R apache:apache /var/www/html/sarah
[sarah@localhost root]$ sudo chmod -R 755 /var/www/html/sarah
[sarah@localhost root]$ sudo systemctl restart httpd
[sarah@localhost root]$
```

```
sudo mkdir -p /var/www/html/sarah
echo "<h1>Welcome to Sarah's Apache site</h1>" | sudo tee
/var/www/html/sarah/index.html
sudo chown -R apache:apache /var/www/html/sarah
sudo chmod -R 755 /var/www/html/sarah
```

```
sudo systemctl restart httpd
```

```
[sarah@localhost root]$ curl http://localhost
<h1>Welcome to Sarah's Apache site</h1>
[sarah@localhost root]$ curl http://localhost/sarah
<!DOCTYPE HTML PUBLIC "-//IETF//DTD HTML 2.0//EN">
<html><head>
<title>404 Not Found</title>
</head><body>
<h1>Not Found</h1>
<p>The requested URL was not found on this server.</p>
</body></html>
[sarah@localhost root]$
```

Verify

```
curl http://localhost
curl http://localhost/sarah
```



Nginx (Mike's Web Server)

```
[root@localhost ~]# sudo usermod -aG wheel mike
[root@localhost ~]# # give the full permission for mike user
[root@localhost ~]# su mike
[mike@localhost root]$ sudo yum install -y epel-release
[sudo] password for mike:
Last metadata expiration check: 2:04:25 ago on Sat 30 Aug 2025 11:38:22 AM IST.
Package epel-release-10-6.el10_0.noarch is already installed.
Dependencies resolved.
Nothing to do.
Complete!
[mike@localhost root]$
```

`sudo usermod -aG wheel mike`

`sudo yum install -y epel-release`

`sudo yum install -y nginx`

```
[mike@localhost root]$ sudo yum install -y nginx
Last metadata expiration check: 2:07:19 ago on Sat 30 Aug 2025 11:38:22 AM IST.
Dependencies resolved.
=====
Package                                Architecture      Version           Repository        Size
=====
Installing:
nginx                                   x86_64            2:1.26.3-1.el10  appstream         33 k
Installing dependencies:
nginx-core                             x86_64            2:1.26.3-1.el10  appstream         662 k
nginx-filesystem                       noarch            2:1.26.3-1.el10  appstream         12 k
=====
Transaction Summary
-----
Install 3 Packages

Total download size: 707 k
Installed size: 1.9 M
Downloading Packages:
(1/3): nginx-filesystem-2:1.26.3-1.el10.noarch.rpm           2.7 kB/s | 12 kB  00:04
(2/3): nginx-2:1.26.3-1.el10.x86_64.rpm                     5.1 kB/s | 33 kB  00:06
(3/3): nginx-core-2:1.26.3-1.el10.x86_64.rpm                 37 kB/s | 662 kB  00:17
-----
Total
-----
33 kB/s | 707 kB  00:21
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing                :
  Running scriptlet: nginx-filesystem-2:1.26.3-1.el10.noarch 1/1
  Installing             : nginx-filesystem-2:1.26.3-1.el10.noarch 1/3
  Installing             : nginx-core-2:1.26.3-1.el10.x86_64 2/3
  Installing             : nginx-2:1.26.3-1.el10.x86_64 3/3
  Running scriptlet: nginx-2:1.26.3-1.el10.x86_64 3/3
Installed:
  nginx-2:1.26.3-1.el10.x86_64      nginx-core-2:1.26.3-1.el10.x86_64      nginx-filesystem-2:1.26.3-1.el10.noarch

Complete!
[mike@localhost root]$
```

```

[mike@localhost root]$ sudo systemctl stop httpd
[mike@localhost root]$ sudo systemctl disable httpd
Removed '/etc/systemd/system/multi-user.target.wants/httpd.service'.
[mike@localhost root]$ sudo systemctl start nginx
[mike@localhost root]$ sudo systemctl enable nginx
Created symlink '/etc/systemd/system/multi-user.target.wants/nginx.service' -> '/usr/lib/systemd/system/nginx.service'.
[mike@localhost root]$ sudo systemctl status nginx
● nginx.service - The nginx HTTP and reverse proxy server
   Loaded: loaded (/usr/lib/systemd/system/nginx.service; enabled; preset: disabled)
   Active: active (running) since Sat 2025-08-30 13:50:50 IST; 24s ago
  Invocation: aa592b50c640413b9ffe2c60d514f7b1
    Main PID: 23794 (nginx)
      Tasks: 2 (limit: 10696)
     Memory: 2.3M (peak: 2.8M)
        CPU: 94ms
    CGroup: /system.slice/nginx.service
            └─23794 "nginx: master process /usr/sbin/nginx"
              23795 "nginx: worker process"

Aug 30 13:50:50 localhost.localdomain systemd[1]: Starting nginx.service - The nginx HTTP and reverse proxy server...
Aug 30 13:50:50 localhost.localdomain nginx[23791]: nginx: the configuration file /etc/nginx/nginx.conf syntax is ok
Aug 30 13:50:50 localhost.localdomain nginx[23791]: nginx: configuration file /etc/nginx/nginx.conf test is successful
Aug 30 13:50:50 localhost.localdomain systemd[1]: Started nginx.service - The nginx HTTP and reverse proxy server.
[mike@localhost root]$

```

Start and Enable the Service

```

# Stop Apache if running
sudo systemctl stop httpd
sudo systemctl disable httpd

```

```

# Then start nginx
sudo systemctl start nginx
sudo systemctl enable nginx
sudo systemctl status nginx

```

Configure Firewall for Nginx

```

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

```

```

[mike@localhost root]$ sudo firewall-cmd --permanent --add-service=http
Warning: ALREADY_ENABLED: http
success
[mike@localhost root]$ sudo firewall-cmd --permanent --add-service=https
Warning: ALREADY_ENABLED: https
success
[mike@localhost root]$ sudo firewall-cmd --reload
success
[mike@localhost root]$

```

Create a Server Block for Mike

```
sudo vi /etc/nginx/conf.d/mike_site.conf
```

```
server {  
    listen 80;  
    server_name mike.local;  
  
    root /usr/share/nginx/html/mike;  
    index index.html;  
  
    access_log /var/log/nginx/mike_access.log;  
    error_log /var/log/nginx/mike_error.log;  
}
```

Setup Document Root

```
sudo mkdir -p /usr/share/nginx/html/mike
```

```
echo "<h1>Welcome to Mike's Nginx site</h1>" | sudo tee /usr/share/nginx/html/mike/index.html
```

```
sudo chown -R nginx:nginx /usr/share/nginx/html/mike
```

```
sudo chmod -R 755 /usr/share/nginx/html/mike
```

```
[mike@localhost root]$ sudo vi /etc/nginx/conf.d/mike_site.conf  
[mike@localhost root]$ sudo mkdir -p /usr/share/nginx/html/mike  
[mike@localhost root]$ echo "<h1>Welcome to Mike's Nginx site</h1>" | sudo tee /usr/share/nginx/html/mike/index.html  
<h1>Welcome to Mike's Nginx site</h1>  
[mike@localhost root]$ sudo chown -R nginx:nginx /usr/share/nginx/html/mike  
[mike@localhost root]$ sudo chmod -R 755 /usr/share/nginx/html/mike  
[mike@localhost root]$
```

Test Config and Restart

← → ↻ 🏠 ⚠ Not secure 192.168.31.245

📁 root

Welcome to Mike's Nginx site

```
[mike@localhost root]$ sudo nginx -t
nginx: the configuration file /etc/nginx/nginx.conf syntax is ok
nginx: configuration file /etc/nginx/nginx.conf test is successful
[mike@localhost root]$ sudo systemctl restart nginx
[mike@localhost root]$ curl http://localhost/mike
<html>
<head><title>301 Moved Permanently</title></head>
<body>
<center><h1>301 Moved Permanently</h1></center>
<hr><center>nginx/1.26.3</center>
</body>
</html>
[mike@localhost root]$
```