

**Filière WM 2024**  
**Module: Administration linux avancée**

**Installation et Configuration d'un serveur DHCP,  
DNS, APACHE sous Linux**

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**Date: le 06/05/2024**

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Année Universitaire : 2023/2024

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# **I. Introduction**

Le présent rapport explore la configuration de serveurs DHCP, DNS, et Apache sous Linux. Ces services sont essentiels pour la gestion des réseaux et des services web. Le serveur DHCP automatise la distribution d'adresses IP, le serveur DNS traduit les noms de domaine en adresses IP, et le serveur Apache héberge des sites web. L'objectif est de configurer ces services pour le domaine `eidia.uemf` et d'afficher une page web dynamique via Apache.

## **II. Fondements Théoriques**

### **1. Dynamic Host Configuration Protocol (DHCP)**

- Le DHCP est un protocole de réseau permettant aux appareils de recevoir automatiquement une configuration IP lors de leur connexion. Il attribue dynamiquement des adresses IP et d'autres paramètres réseau tels que la passerelle par défaut et les serveurs DNS.

### **2. Domain Name System (DNS)**

- Le DNS est un système qui traduit les noms de domaine en adresses IP et vice versa. Cette traduction permet aux utilisateurs d'accéder aux ressources Internet en utilisant des noms faciles à retenir plutôt que des adresses IP numériques.

### **3. Apache HTTP Server**

- Apache est un serveur web open-source qui héberge des sites web. Il permet de servir des pages web statiques et dynamiques en utilisant des modules comme PHP.

### III. Objectifs de Configuration

- Configurer un serveur DHCP pour attribuer dynamiquement des adresses IP. - Configurer un serveur DNS pour le domaine eidia.uemf. - Configurer un serveur Apache pour héberger et afficher une page web dynamique.

### IV. Logiciels Utilisés

- **ISC DHCP Server**: Pour la configuration du serveur

~~ISC DHCP~~ **BIND**: Pour la configuration du serveur DNS.

- **Apache, MySQL, PHP, phpMyAdmin** : Pour la configuration du serveur web et la gestion des bases de données.

### V. Configuration du Serveur DHCP

#### 1. Installation du Serveur DHCP

'''

```
sudo apt-get update  
sudo apt-get install isc-dhcp-server
```

```

mr1@marouanealthammou:~$ sudo apt-get update
Hit:1 http://security.ubuntu.com/ubuntu bionic-security InRelease
Hit:2 http://ma.archive.ubuntu.com/ubuntu bionic InRelease
Hit:3 http://ma.archive.ubuntu.com/ubuntu bionic-updates InRelease
Hit:4 http://ma.archive.ubuntu.com/ubuntu bionic-backports InRelease
Reading package lists... Done
mr1@marouanealthammou:~$ sudo apt-get install isc-dhcp-server
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  libirs-export160 libiscfg-export160
Suggested packages:
  isc-dhcp-server-ldap policycoreutils
The following NEW packages will be installed:
  isc-dhcp-server libirs-export160 libiscfg-export160
0 upgraded, 3 newly installed, 0 to remove and 291 not upgraded.
Need to get 0 B/508 kB of archives.
After this operation, 1,795 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Preconfiguring packages ...
Selecting previously unselected package libiscfg-export160.

```

## 2. Configuration du Fichier dhcpd.conf

'''

sudo nano /etc/dhcp/dhcpd.conf

'''

Ajoutez les directives de configuration suivantes :

'''plaintext

```

subnet 192.168.1.0 netmask 255.255.255.0 {
    range 192.168.1.100 192.168.1.200;
    option routers 192.168.1.1;
    option domain-name-servers 8.8.8.8, 8.8.4.4;
    default-lease-time 600;
    max-lease-time 7200;
}
'''

```

```

GNU nano 2.9.3 /etc/dhcp/dhcpd.conf

# subnet 10.17.224.0 netmask 255.255.255.0 {
#     option routers rtr-224.example.org;
# }
# subnet 10.0.29.0 netmask 255.255.255.0 {
#     option routers rtr-29.example.org;
# }
# pool {
#     allow members of "foo";
#     range 10.17.224.10 10.17.224.250;
# }
# pool {
#     deny members of "foo";
#     range 10.0.29.10 10.0.29.230;
# }
#}
subnet 192.168.1.0 netmask 255.255.255.0 {
    range 192.168.1.100 192.168.1.200;
    option routers 192.168.1.1;
    option domain-name-servers 8.8.8.8, 8.8.4.4;
    default-lease-time 600;
    max-lease-time 7200;
}

```

### 3. Configurer l'Interface Réseau

bash sudo nano /etc/default/isc-dhcp-server

Ajoutez la ligne suivante :

INTERFACESv4="enp0s3"

```
GNU nano 2.9.3 /etc/default/isc-dhcp-server

# Defaults for isc-dhcp-server (sourced by /etc/init.d/isc-dhcp-server)

# Path to dhcpd's config file (default: /etc/dhcp/dhcpd.conf).
#DHCPDv4_CONF=/etc/dhcp/dhcpd.conf
#DHCPDv6_CONF=/etc/dhcp/dhcpd6.conf

# Path to dhcpd's PID file (default: /var/run/dhcpd.pid).
#DHCPDv4_PID=/var/run/dhcpd.pid
#DHCPDv6_PID=/var/run/dhcpd6.pid

# Additional options to start dhcpd with.
# Don't use options -cf or -pf here; use DHCPD_CONF/ DHCPD_PID instead
#OPTIONS=""

# On what interfaces should the DHCP server (dhcpd) serve DHCP requests?
# Separate multiple interfaces with spaces, e.g. "eth0 eth1".
INTERFACESv4="enp0s3"
INTERFACESv6=""
```

### 4. Redémarrer le Serveur DHCP

sudo service isc-dhcp-server restart

```
mar@marouanealthammou:~$ sudo service isc-dhcp-server status
● isc-dhcp-server.service - ISC DHCP IPv4 server
   Loaded: loaded (/lib/systemd/system/isc-dhcp-server.service; enabled; vendor
   Active: active (running) since Wed 2024-03-06 10:15:48 +01; 5s ago
     Docs: man:dhcpd(8)
    Main PID: 9924 (dhcpd)
      Tasks: 1 (limit: 4915)
   CGroup: /system.slice/isc-dhcp-server.service
           └─9924 dhcpd -user dhcpd -group dhcpd -f -4 -pf /run/dhcp-server/dhc

mar06 10:15:48 marouanealthammou sh[9924]: Wrote 0 leases to leases file.
mar06 10:15:48 marouanealthammou dhcpd[9924]: PID file: /run/dhcp-server/dhcp
mar06 10:15:48 marouanealthammou dhcpd[9924]: Wrote 0 leases to leases file.
mar06 10:15:48 marouanealthammou dhcpd[9924]: Listening on LPF/enp0s3/08:00:2
mar06 10:15:48 marouanealthammou sh[9924]: Listening on LPF/enp0s3/08:00:27:2
mar06 10:15:48 marouanealthammou sh[9924]: Sending on LPF/enp0s3/08:00:27:2
mar06 10:15:48 marouanealthammou sh[9924]: Sending on Socket/fallback/fallb
mar06 10:15:48 marouanealthammou dhcpd[9924]: Sending on LPF/enp0s3/08:00:2
mar06 10:15:48 marouanealthammou dhcpd[9924]: Sending on Socket/fallback/fa
mar06 10:15:48 marouanealthammou dhcpd[9924]: Server starting service.
lines 1-19/19 (END)
```



```

root@marouaneAithammou-Client:/home/aithammouclient# ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.1.100 netmask 255.255.255.0 broadcast 192.168.1.255
    inet6 fe80::32ab:6a82:4173:acc7 prefixlen 64 scopeid 0x20<link>
    ether 08:00:27:ae:78:84 txqueuelen 1000 (Ethernet)
    RX packets 195 bytes 211408 (211.4 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 516 bytes 49380 (49.3 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 963 bytes 75803 (75.8 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 963 bytes 75803 (75.8 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

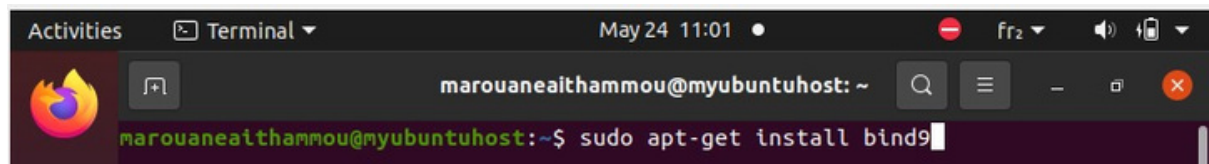
root@marouaneAithammou-Client:/home/aithammouclient#

```

## VI. Configuration d'un Serveur DNS\*\*

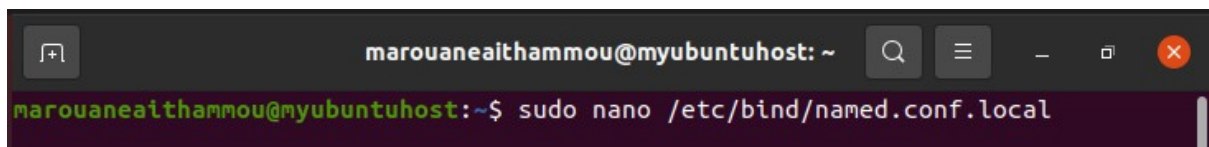
### 1. Installation de BIND

```
sudo apt-get install bind9
```



### 2. Configuration du Fichier de Zones

```
sudo nano /etc/bind/named.conf.local
'''
```



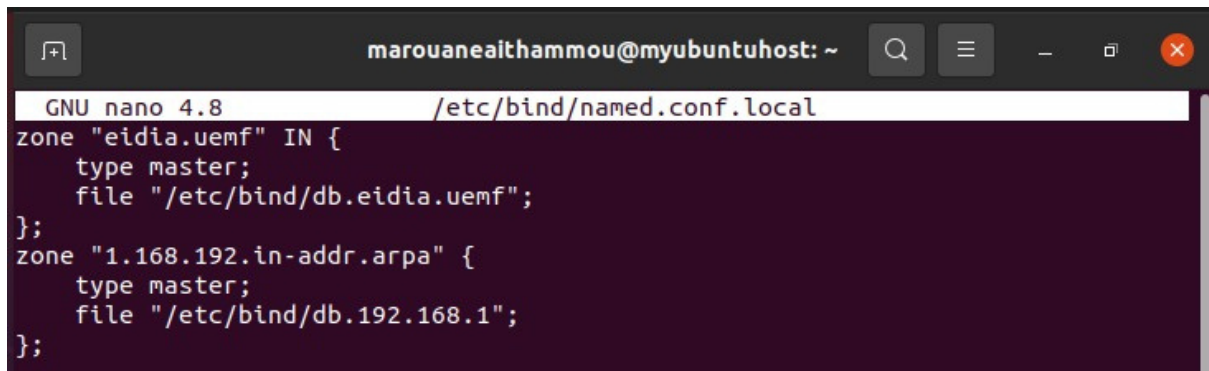
Ajoutez les lignes suivantes :

```

'''plaintext zone
"eidia.uemf" IN {
    type master; file
    "/etc/bind/db.eidia.uemf";
}; zone "1.168.192.in-addr.arpa" IN
{
    type master; file
    "/etc/bind/db.192.168.1";
}

```

```
};
```



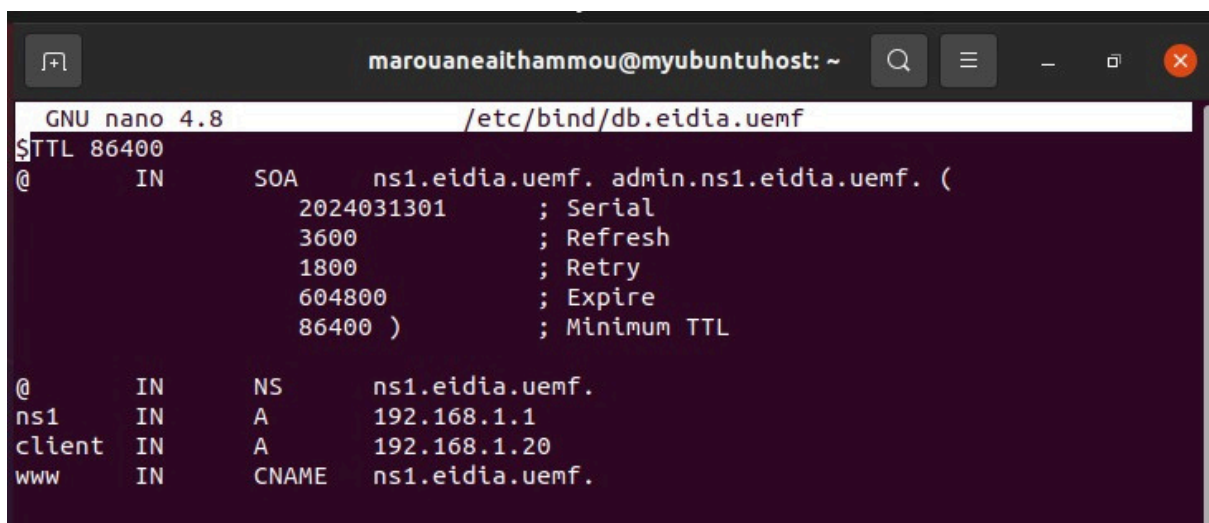
```
marouanealthammou@myubuntuhost: ~  
GNU nano 4.8 /etc/bind/named.conf.local  
zone "eidia.uemf" IN {  
    type master;  
    file "/etc/bind/db.eidia.uemf";  
};  
zone "1.168.192.in-addr.arpa" {  
    type master;  
    file "/etc/bind/db.192.168.1";  
};
```

### 3. Configuration du Fichier de Zone Directe

```
sudo nano /etc/bind/db.eidia.uemf
```

Ajoutez les enregistrements DNS :

```
$TTL 86400  
@      IN      SOA      ns1.eidia.uemf. admin.ns1.eidia.uemf. (  
                2024031301      ; Serial  
                3600             ; Refresh  
                1800             ; Retry  
                604800           ; Expire  
                86400 )          ; Minimum  
@      IN      NS       ns1.eidia.uemf.  
ns1    IN      A        192.168.1.1  
client IN      A        192.168.1.20  
www    IN      CNAME    ns1.eidia.uemf.
```



```
marouanealthammou@myubuntuhost: ~  
GNU nano 4.8 /etc/bind/db.eidia.uemf  
$TTL 86400  
@      IN      SOA      ns1.eidia.uemf. admin.ns1.eidia.uemf. (  
                2024031301      ; Serial  
                3600             ; Refresh  
                1800             ; Retry  
                604800           ; Expire  
                86400 )          ; Minimum TTL  
@      IN      NS       ns1.eidia.uemf.  
ns1    IN      A        192.168.1.1  
client IN      A        192.168.1.20  
www    IN      CNAME    ns1.eidia.uemf.
```



#### 4. Configuration du Fichier de Zone Inverse

sudo nano /etc/bind/db.192.168.1

```
marouaneithammou@myubuntuhost: ~  
marouaneithammou@myubuntuhost:~$ sudo nano /etc/bind/named.conf.local  
[sudo] password for marouaneithammou:  
marouaneithammou@myubuntuhost:~$ sudo nano /etc/bind/named.conf.local  
marouaneithammou@myubuntuhost:~$ sudo nano /etc/bind/db.eidia.uemf  
marouaneithammou@myubuntuhost:~$ sudo nano /etc/bind/db.192.168.1
```

Ajoutez les enregistrements DNS inverses :

\$TTL 86400

```
@      IN      SOA      ns1.eidia.uemf. admin.ns1.eidia.uemf. (  
                2024031301      ; Serial  
                3600      ; Refresh  
                1800      ; Retry  
                604800      ; Expire  
                86400 )      ; Minimum
```

```
@      IN      NS       ns1.eidia.uemf.  
1      IN      PTR      ns1.eidia.uemf.  
20     IN      PTR      client.eidia.uemf.  
...
```

```
GNU nano 4.8 /etc/bind/db.192.168.1  
$TTL 86400  
@      IN      SOA      ns1.eidia.uemf. admin.ns1.eidia.uemf. (  
                2024031301      ; Serial  
                3600      ; Refresh  
                1800      ; Retry  
                604800      ; Expire  
                86400 )      ; Minimum TTL  
  
@      IN      NS       ns1.eidia.uemf.  
1      IN      PTR      ns1.eidia.uemf.  
20     IN      PTR      client.eidia.uemf.  
www    IN      CNAME    ns1.eidia.uemf.
```

#### 5. \*\*Configuration du Fichier resolv.conf

```
sudo nano /etc/resolv.conf
```

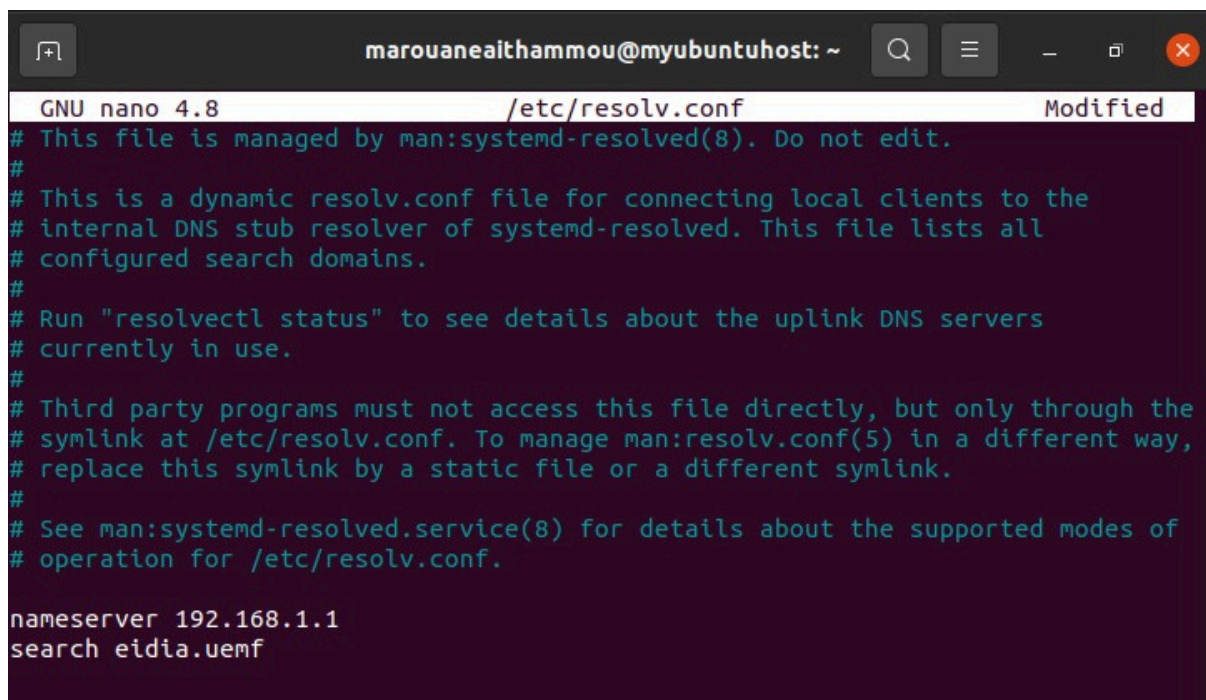
```
...
```

```
marouanealthammou@myubuntuhost:~$ sudo nano /etc/resolv.conf
```

Ajoutez les lignes suivantes :

```
search eidia.uemf
```

```
nameserver 192.168.1.1
```



```
marouanealthammou@myubuntuhost: ~
GNU nano 4.8 /etc/resolv.conf Modified
# This file is managed by man:systemd-resolved(8). Do not edit.
#
# This is a dynamic resolv.conf file for connecting local clients to the
# internal DNS stub resolver of systemd-resolved. This file lists all
# configured search domains.
#
# Run "resolvectl status" to see details about the uplink DNS servers
# currently in use.
#
# Third party programs must not access this file directly, but only through the
# symlink at /etc/resolv.conf. To manage man:resolv.conf(5) in a different way,
# replace this symlink by a static file or a different symlink.
#
# See man:systemd-resolved.service(8) for details about the supported modes of
# operation for /etc/resolv.conf.

nameserver 192.168.1.1
search eidia.uemf
```

## 7. Redémarrage du Service BIND\*\*

```
sudo systemctl restart bind9
```

```

marouaneathammou@myubuntuhost:/$ sudo systemctl restart bind9
marouaneathammou@myubuntuhost:/$ sudo systemctl status bind9
● named.service - BIND Domain Name Server
   Loaded: loaded (/lib/systemd/system/named.service; enabled; vendor preset:
   Active: active (running) since Fri 2024-05-24 15:48:18 +01; 9s ago
     Docs: man:named(8)
    Main PID: 6843 (named)
      Tasks: 8 (limit: 3997)
     Memory: 21.9M
    CGroup: /system.slice/named.service
            └─6843 /usr/sbin/named -f -u bind

May 24 15:48:18 myubuntuhost named[6843]: network unreachable resolving './DNS>
May 24 15:48:18 myubuntuhost named[6843]: network unreachable resolving './NS/>
May 24 15:48:18 myubuntuhost named[6843]: network unreachable resolving './DNS>
May 24 15:48:18 myubuntuhost named[6843]: network unreachable resolving './NS/>
May 24 15:48:18 myubuntuhost named[6843]: network unreachable resolving './DNS>
May 24 15:48:18 myubuntuhost named[6843]: network unreachable resolving './NS/>
May 24 15:48:18 myubuntuhost named[6843]: network unreachable resolving './DNS>
May 24 15:48:18 myubuntuhost named[6843]: network unreachable resolving './NS/>
May 24 15:48:18 myubuntuhost named[6843]: resolver priming query complete
May 24 15:48:18 myubuntuhost named[6843]: managed-keys-zone: Unable to fetch D>

```

## 8. Test de Résolution DNS

nslookup www.eidia.uemf

```

marouaneathammou@myubuntuhost:/$ nslookup www.eidia.uemf
Server:          192.168.1.1
Address:         192.168.1.1#53

www.eidia.uemf canonical name = ns1.eidia.uemf.
Name:   ns1.eidia.uemf
Address: 192.168.1.1

```

## VII. Configuration du Serveur Apache

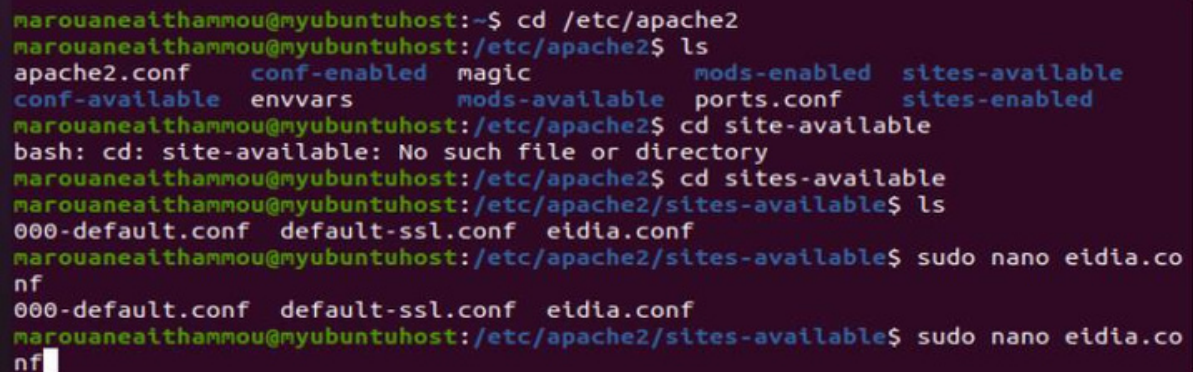
## 1. Installation d'Apache, MySQL, PHP, et phpMyAdmin

```
sudo apt-get install apache2
sudo apt-get install mysql-server
sudo apt-get install php libapache2-mod-php php-mysql
sudo apt-get install phpmyadmin
```

## 2. Configuration d'Apache pour le Domaine eidia.uemf

- Créez un fichier de configuration pour le domaine :

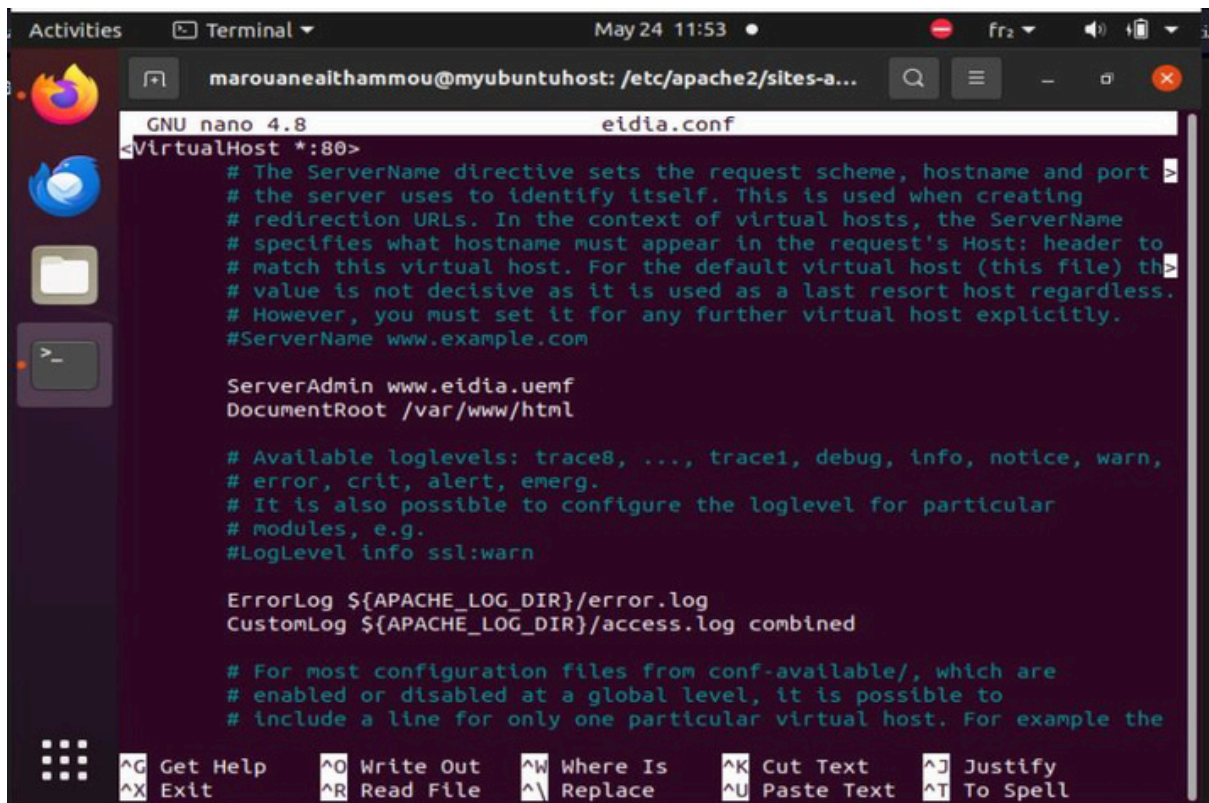
```
sudo nano /etc/apache2/sites-available/eidia.conf
```



```
marouanealthammou@myubuntuhost:~$ cd /etc/apache2
marouanealthammou@myubuntuhost:/etc/apache2$ ls
apache2.conf  conf-enabled  magic          mods-enabled  sites-available
conf-available  envvars      mods-available  ports.conf    sites-enabled
marouanealthammou@myubuntuhost:/etc/apache2$ cd site-available
bash: cd: site-available: No such file or directory
marouanealthammou@myubuntuhost:/etc/apache2$ cd sites-available
marouanealthammou@myubuntuhost:/etc/apache2/sites-available$ ls
000-default.conf  default-ssl.conf  eidia.conf
marouanealthammou@myubuntuhost:/etc/apache2/sites-available$ sudo nano eidia.co
nf
000-default.conf  default-ssl.conf  eidia.conf
marouanealthammou@myubuntuhost:/etc/apache2/sites-available$ sudo nano eidia.co
nf
```

- Ajoutez les configurations suivantes :





```
GNU nano 4.8 eidia.conf
<VirtualHost *:80>
# The ServerName directive sets the request scheme, hostname and port
# the server uses to identify itself. This is used when creating
# redirection URLs. In the context of virtual hosts, the ServerName
# specifies what hostname must appear in the request's Host: header to
# match this virtual host. For the default virtual host (this file) th
# value is not decisive as it is used as a last resort host regardless.
# However, you must set it for any further virtual host explicitly.
#ServerName www.example.com

ServerAdmin www.eidia.uemf
DocumentRoot /var/www/html

# Available loglevels: trace8, ..., trace1, debug, info, notice, warn,
# error, crit, alert, emerg.
# It is also possible to configure the loglevel for particular
# modules, e.g.
#LogLevel info ssl:warn

ErrorLog ${APACHE_LOG_DIR}/error.log
CustomLog ${APACHE_LOG_DIR}/access.log combined

# For most configuration files from conf-available/, which are
# enabled or disabled at a global level, it is possible to
# include a line for only one particular virtual host. For example the
^G Get Help      ^O Write Out    ^W Where Is     ^K Cut Text     ^J Justify
^X Exit          ^R Read File    ^\ Replace      ^U Paste Text   ^T To Spell
```

### 3. Activer le Site et Redémarrer Apache

```
sudo a2ensite eidia.conf
sudo systemctl restart apache2
```

### 4. \*\*Ajouter une Page Web Dynamique\*\*

- Créez un fichier index.php :

```
sudo nano /var/www/eidia/index.php
```



```
marouanealthammou@myubuntuhost:/var/www$ cd html
marouanealthammou@myubuntuhost:/var/www/html$ ls
index.php  info.php
marouanealthammou@myubuntuhost:/var/www/html$ sudo nano index.php
```

- Ajoutez du contenu PHP pour afficher des données depuis la base de données :

```
marouanealthammou@myubuntuhost: /var/www/html
GNU nano 4.8 index.php
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <title>User Information</title>
</head>
<body>
  <h1>welcome to EIDIA website </h1>
  <h2>User Information</h2>
  <?php
    $servername = "localhost";
    $username = "phpmyadmin";
    $password = "4158";
    $database = "phpmyadmindb";

    $conn = new mysqli($servername, $username, $password, $database);

    if ($conn->connect_error) {
      die("Connection failed: " . $conn->connect_error);
    }

    $sql = "SELECT * FROM users LIMIT 1";
    $result = $conn->query($sql);

    if ($result->num_rows > 0) {
```

<b>^G</b> Get Help	<b>^O</b> Write Out	<b>^W</b> Where Is	<b>^K</b> Cut Text	<b>^J</b> Justify
<b>^X</b> Exit	<b>^R</b> Read File	<b>^_</b> Replace	<b>^U</b> Paste Text	<b>^T</b> To Spell



## VIII. Tests de Validation

- **\*\*DHCP\*\*** : Simulations de connexion de clients et vérification de l'attribution des adresses IP. -
- \*\*DNS\*\*** : Utilisation des commandes `nslookup` et `dig` pour tester la résolution DNS. -
- \*\*Apache\*\*** : Accès au domaine `eidia.uemf` via un navigateur pour vérifier l'affichage de la page web dynamique.



## IX. Problèmes Rencontrés et Solutions

- Résolution DNS : Problème initial résolu en ajustant les serveurs DNS dans la configuration DHCP. - Permissions Apache: Résolu en ajustant les permissions des fichiers et répertoires web.

## X. Conclusion

La configuration des serveurs DHCP, DNS, et Apache a été menée avec succès. Cette configuration offre une gestion automatisée des adresses IP, une traduction fiable des noms de domaine, et un hébergement web dynamique, améliorant ainsi l'efficacité et la flexibilité du réseau.