

BUILDING THE MODERN WEB: THE LEMP STACK



LINUX



NGINX



MYSQL



PHP

— INNOV-TECH INFRASTRUCTURE

Stack LEMP.

Configuration du Serveur srv-web01
Hébergement multi-sites sur une seule machine

📄 Portail RH: [portal-rh.ing-infraName.lan](#) (PHP)

🌐 Site Web: [prod-web.innov-tech.com](#) (Statique)

ENJEU PRINCIPAL

Virtual Hosts Nginx pour diriger chaque domaine vers le bon site

Linux · Nginx · MariaDB · PHP

— OVERVIEW

Le Stack LEMP : Vue Générale

Pile logicielle moderne pour héberger des sites web. Alternative performante au stack LAMP, optimisée pour la production.

L

Linux
Système
d'exploitation

E

Engine X
Serveur Web

M

MariaDB
Base de données

P

PHP
PHP-FPM

★ Avantages Clés



Léger



Rapide



Sécurisé



Production

L
INUX ENGINE X MARIA DB P H P

```
ls /etc/nginx
pes          nginx.conf
ore.rules    proxy_params
ules         scgi_params
i.conf.1.4.1 sites-available
less /etc/nginx/nginx.conf
less /etc/nginx/sites-available/de
ls /usr/share/nginx/html/

less /usr/share/nginx/html/index.f
ls -lh /etc/nginx/sites-enabled/

34 Jän  2 21:31 default -> /etc/ng
1
ls -lh /etc/nginx/sites-available/

2014 default
```

```
boolean
('PSI_INTERNAL_XML', false);
ersion_compare("5.2", PHP_VERSION, ">")) {
le("PHP 5.2 or greater is required!!!");
extension_loaded("pcr") {
extension_loaded("pcr") requires the pcr extension to php in order to work
hp';
SI_DEBUG')) {
_config.html");
MiB | 100% | no | 100% | no | 100% | 192.168.1.101

($url = new Tempe
echo $tpl->fetch();
die();
javascript
1: strtolower(
```

— LEMP ARCHITECTURE

Rôle de Chaque Composant



Linux

Debian 13

Système d'Exploitation

Base de toute l'infrastructure serveur



Nginx

Engine X

Serveur Web & Reverse Proxy

Gère les requêtes HTTP/HTTPS et fichiers statiques



MariaDB

MySQL

Système de Gestion de BDD

Stocke les données des applications web



PHP-FPM

v8.x

Interpréteur PHP

Exécute les scripts PHP de manière performante

STACK ARCHITECTURE

4

Composants Intégrés



Nginx et PHP-FPM


RÉPARTITION DES RÔLES

↔ Nginx agit comme un proxy vers PHP-FPM

⚙️ Fonctionnement

- 1 Client envoie une requête
- 2 Nginx traite les fichiers statiques
- 3 Fichiers .php envoyés à PHP-FPM
- 4 PHP-FPM exécute le code PHP
- 5 Résultat HTML retourné à Nginx
- 6 Nginx envoie la réponse au client

FLUX DE REQUÊTES

 Client Browser

 Nginx Web Server

 PHP-FPM PHP Processor

```
root@ubuntu-s-1vcpu-512mb-10gb-fra1-01: ~ -- ssh root@167.99.12...
root@ubuntu-s-1vcpu-512mb-10gb-fra1-01:~# sudo apt install nginx
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  fontconfig-config fonts-dejavu-core libdeflate0 libfontconfig1 libgd3
  libjpeg-turbo8 libjpeg8 liblerc4 libnginx-mod-http-geoip2
  libnginx-mod-http-image-filter libnginx-mod-http-xslt-filter
  libnginx-mod-mail libnginx-mod-stream libnginx-mod-stream-geoip2 libpcre3
  libtiff6 libwebp7 libxpm4 nginx-common nginx-core
Suggested packages:
  libgd-tools fcgiwrap nginx-doc ssl-cert
The following NEW packages will be installed:
  fontconfig-config fonts-dejavu-core libdeflate0 libfontconfig1 libgd3
  libjpeg-turbo8 libjpeg8 liblerc4 libnginx-mod-http-geoip2
  libnginx-mod-http-image-filter libnginx-mod-http-xslt-filter
  libnginx-mod-mail libnginx-mod-stream libnginx-mod-stream-geoip2 libpcre3
  libtiff6 libwebp7 libxpm4 nginx nginx-common nginx-core
0 upgraded, 22 newly installed, 0 to remove and 0 not upgraded.
Need to get 3282 kB of archives.
After this operation, 9472 kB of additional disk space will be used.
Do you want to continue? [Y/n]
```

Virtual Hosts (Server Blocks)

DÉFINITION

Un Server Block sous Nginx permet d'héberger plusieurs sites sur un seul serveur

DANS CE PROJET



Portail RH

PHP Dynamique

portal-rh.ing-infraName.lan



Site Web

Statique

prod-web.innov-tech.com

RÉSULTAT



Un seul serveur · Plusieurs sites
Gestion claire et professionnelle

ÉLÉMENTS DU SERVER BLOCK

🔌 Port d'écoute **listen**

🌐 Nom de domaine **server_name**

📁 Dossier du site **root**

⚙️ Règles spécifiques **location**

```
# Exemple de configuration
server {
    listen 80;
    server_name example.com;
    root /var/www/example;
}
```

- Session data for User B
- Profile image for User B



Installation et Sécurisation de phpMyAdmin

Étape 5 : Mise en place du Serveur Web et des VHosts

✓ Stack LEMP ✓ Debian 13 ✓ Nginx ✓ Virtual Hosts

Qu'est-ce que phpMyAdmin ?



Interface Web

Gestion facile de MariaDB/MySQL depuis votre navigateur

Requêtes SQL

Exécutez des commandes SQL sans utiliser le terminal

Gestion des Données

Créez des tables, bases de données et insérez des données

Contrôle d'Accès

Gérez les utilisateurs et les permissions de base de données

Installation de phpMyAdmin



Pourquoi l'installer ?

- ✓ Outil essentiel pour gérer MariaDB
- ✓ Interface web intuitive et graphique
- ✓ Évite l'utilisation du terminal
- ✓ Facilite l'administration des bases de données



Commande d'installation

```
# Installer phpMyAdmin  
sudo apt install phpmyadmin -y
```

- ⓘ Suivre les instructions pour configurer la base de données lors de l'installation

Commandes d'Installation

<> Commande d'installation

```
# Installer phpMyAdmin  
sudo apt install phpmyadmin  
-y
```



À savoir :

L'option `-y` répond automatiquement "oui" aux demandes de confirmation



Configuration requise

1

Sélection du serveur web

Choisir **nginx** lors de l'installation

2

Configuration de la base

Configurer avec **dbconfig-common**

3

Mot de passe root

Définir le mot de passe pour l'utilisateur root de MariaDB

```
phpwebcounter/stable 1.0-6 all
phpwebcounter-extra/stable 20071108-4.1 all
root@srv-rachid-web01:~# sudo apt install php-fpm php-mysql php-cli php-mbstring php-xml -y
Installation de :
```

```
  php-cli  php-fpm  php-mbstring  php-mysql  php-xml
```

```
Installation de dépendances :
```

```
  libargon2-1  libsodium23  php8.4-cli  php8.4-fpm  php8.4-mysql  php8.4-readline
  libonig5     php-common  php8.4-common  php8.4-mbstring  php8.4-opcache  php8.4-xml
```

```
Paquets suggérés :
```

```
  php-pear
```

```
Sommaire :
```

```
  Mise à niveau de : 0. Installation de : 17Supprimé : 0. Non mis à jour : 0
```

```
Taille du téléchargement : 6 479 kB
```

```
  Espace nécessaire : 29,3 MB / 17,3 GB disponible
```

```
Réception de : 1 http://deb.debian.org/debian trixie/main amd64 libargon2-1 amd64 0~20190702+dfsg-4+b2
[21,4 kB]
```

```
Réception de : 2 http://security.debian.org/debian-security trixie-security/main amd64 libsodium23 amd6
4 1.0.18-1+deb13u1 [165 kB]
```

```
Réception de : 3 http://deb.debian.org/debian trixie/main amd64 libonig5 amd64 6.9.9-1+b1 [189 kB]
```

```
Réception de : 4 http://security.debian.org/debian-security trixie-security/main amd64 php8.4-common am
d64 8.4.16-1~deb13u1 [767 kB]
```

```
Réception de : 5 http://deb.debian.org/debian trixie/main amd64 php-common all 2:96 [13,3 kB]
```

```
Réception de : 6 http://deb.debian.org/debian trixie/main amd64 php-cli all 2:8.4+96 [4 416 B]
```

```
Réception de : 7 http://deb.debian.org/debian trixie/main amd64 php-fpm all 2:8.4+96 [4 024 B]
```

```
Réception de : 8 http://deb.debian.org/debian trixie/main amd64 php-mbstring all 2:8.4+96 [3 972 B]
```

```
Réception de : 9 http://deb.debian.org/debian trixie/main amd64 php-mysql all 2:8.4+96 [3 968 B]
```

Intégration dans Nginx

Créer le lien symbolique

- ✓ phpMyAdmin installé mais pas encore accessible
- ✓ Créer un lien symbolique vers notre Virtual Host
- ✓ Utiliser un chemin sécurisé (ex: /pma)

 Intégrer dans le Virtual Host RH existant pour accès sécurisé

Commande d'intégration

```
# Créer le lien symbolique
sudo ln -s /usr/share/phpmyadmin
/var/www/portal-rh.ing-infraName.lan/html/
```

 URL d'accès :

<http://portal-rh.ing-infraName.lan/pma>

Listing 2: Lancement du script de sécurité MariaDB

```
Windows PowerShell x Windows PowerShell x + v - □ X
them. This is intended only for testing, and to make the installation
go a bit smoother. You should remove them before moving into a
production environment.

Remove anonymous users? [Y/n] n
... skipping.

Normally, root should only be allowed to connect from 'localhost'. This
ensures that someone cannot guess at the root password from the network.

Disallow root login remotely? [Y/n] n
... skipping.

By default, MariaDB comes with a database named 'test' that anyone can
access. This is also intended only for testing, and should be removed
before moving into a production environment.

Remove test database and access to it? [Y/n] n
... skipping.

Reloading the privilege tables will ensure that all changes made so far
will take effect immediately.

Reload privilege tables now? [Y/n] n
... skipping.

Cleaning up...

All done! If you've completed all of the above steps, your MariaDB
installation should now be secure.
```

Commandes d'Intégration

Créer le lien symbolique

```
# Créer le lien symbolique  
sudo ln -s /usr/share/phpmyadmin  
/var/www/portal-rh.ing-infraName.lan/html/
```

Source

```
/usr/share/phpmyadmin
```

Destination

```
/var/www/portal-rh.ing-infraName.lan/html/
```

URL d'accès

HTTP Accès via navigateur :

```
http://portal-rh.ing-  
infraName.lan/pma
```

Avantages :

Chemin sécurisé, intégré au Virtual Host RH existant

3.1. Création de la structure de répertoires

```
Cleaning up...
```

```
All done! If you've completed all of the above steps, your MariaDB  
installation should now be secure.
```

```
Thanks for using MariaDB!
```

```
root@srv-rachid-web01:~# sudo mkdir -p /var/www/portal-rh.ing-infraName.lan/html
```

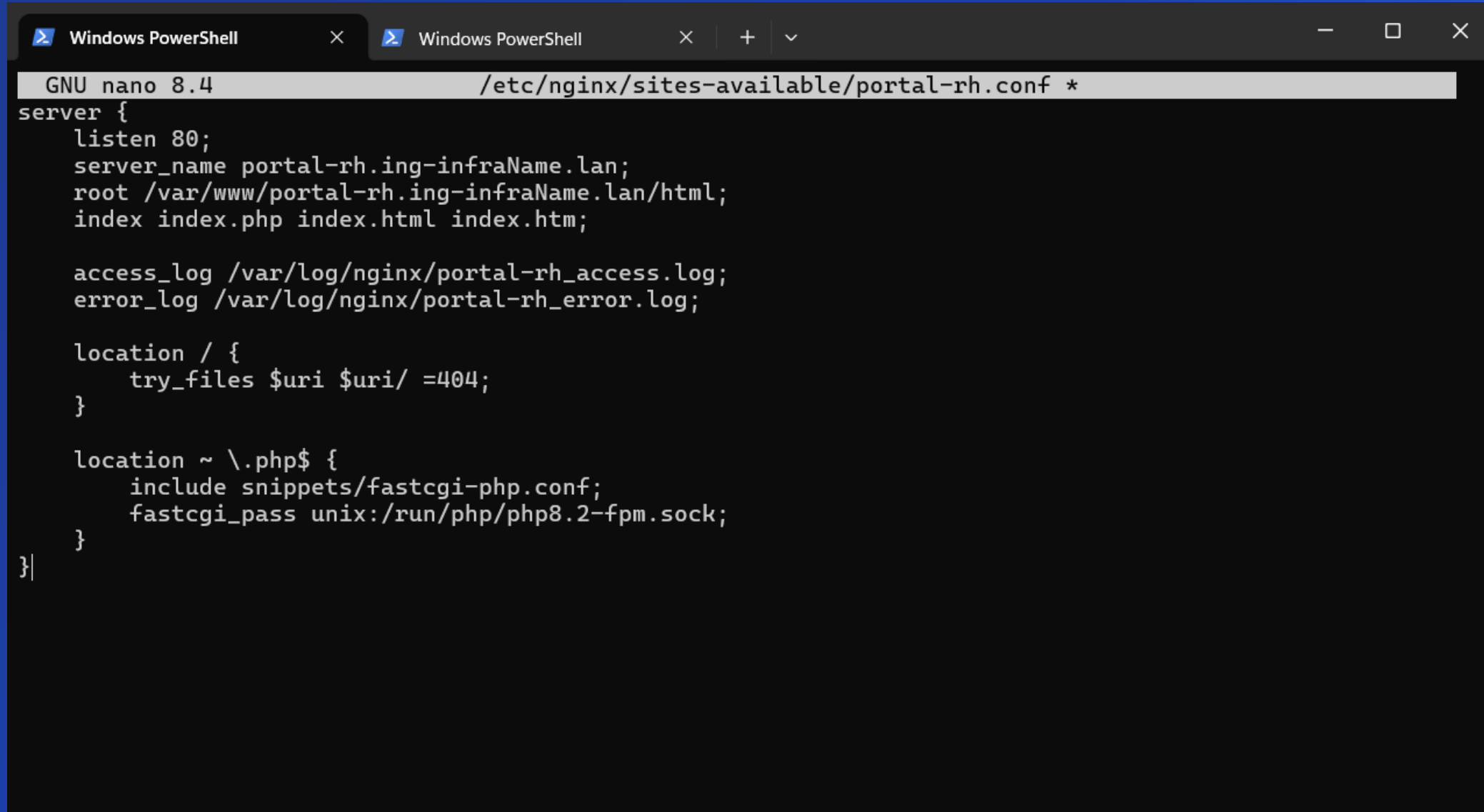
```
root@srv-rachid-web01:~# sudo chown -R www-data:www-data /var/www/portal-rh.ing-infraName.lan/html
```

```
root@srv-rachid-web01:~# sudo chmod -R 755 /var/www/portal-rh.ing-infraName.lan/html
```

```
root@srv-rachid-web01:~# sudo nano /var/www/portal-rh.ing-infraName.lan/html/info.php
```

```
root@srv-rachid-web01:~# |
```

3.2. Création du Server Block Nginx



```
GNU nano 8.4 /etc/nginx/sites-available/portal-rh.conf *
server {
    listen 80;
    server_name portal-rh.ing-infraName.lan;
    root /var/www/portal-rh.ing-infraName.lan/html;
    index index.php index.html index.htm;

    access_log /var/log/nginx/portal-rh_access.log;
    error_log /var/log/nginx/portal-rh_error.log;

    location / {
        try_files $uri $uri/ =404;
    }

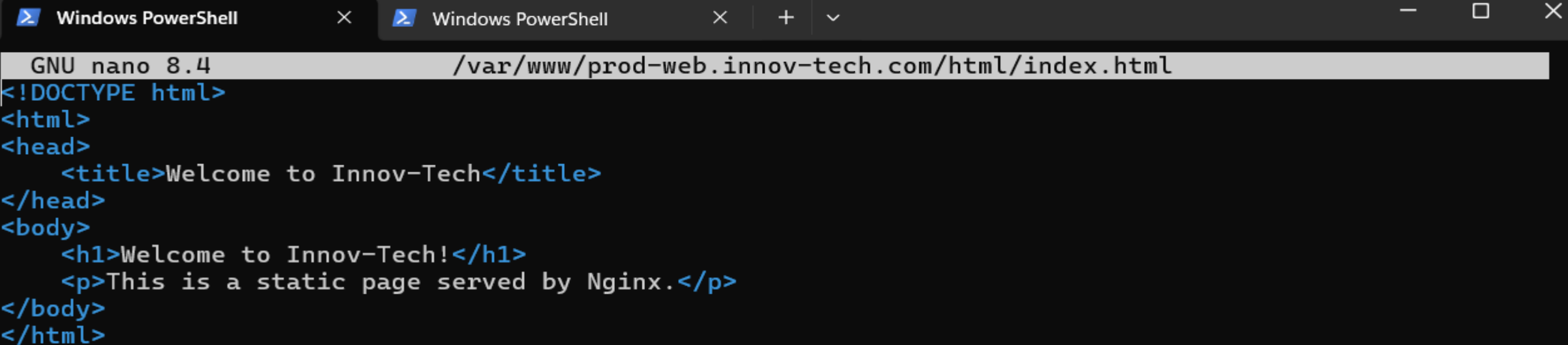
    location ~ /\.php$ {
        include snippets/fastcgi-php.conf;
        fastcgi_pass unix:/run/php/php8.2-fpm.sock;
    }
}
```

Listing 5: Activation du Virtual Host PHP

```
root@srv-rachid-web01:~# sudo ln -s /etc/nginx/sites-available/portal-rh.conf /etc/nginx/sites-enabled/  
root@srv-rachid-web01:~# sudo nginx -t  
nginx: the configuration file /etc/nginx/nginx.conf syntax is ok  
nginx: configuration file /etc/nginx/nginx.conf test is successful  
root@srv-rachid-web01:~# sudo systemctl reload nginx  
root@srv-rachid-web01:~#
```

Étape 4 : Configuration d'un Second Virtual Host (Statique : prod-web.innovtechName.com)

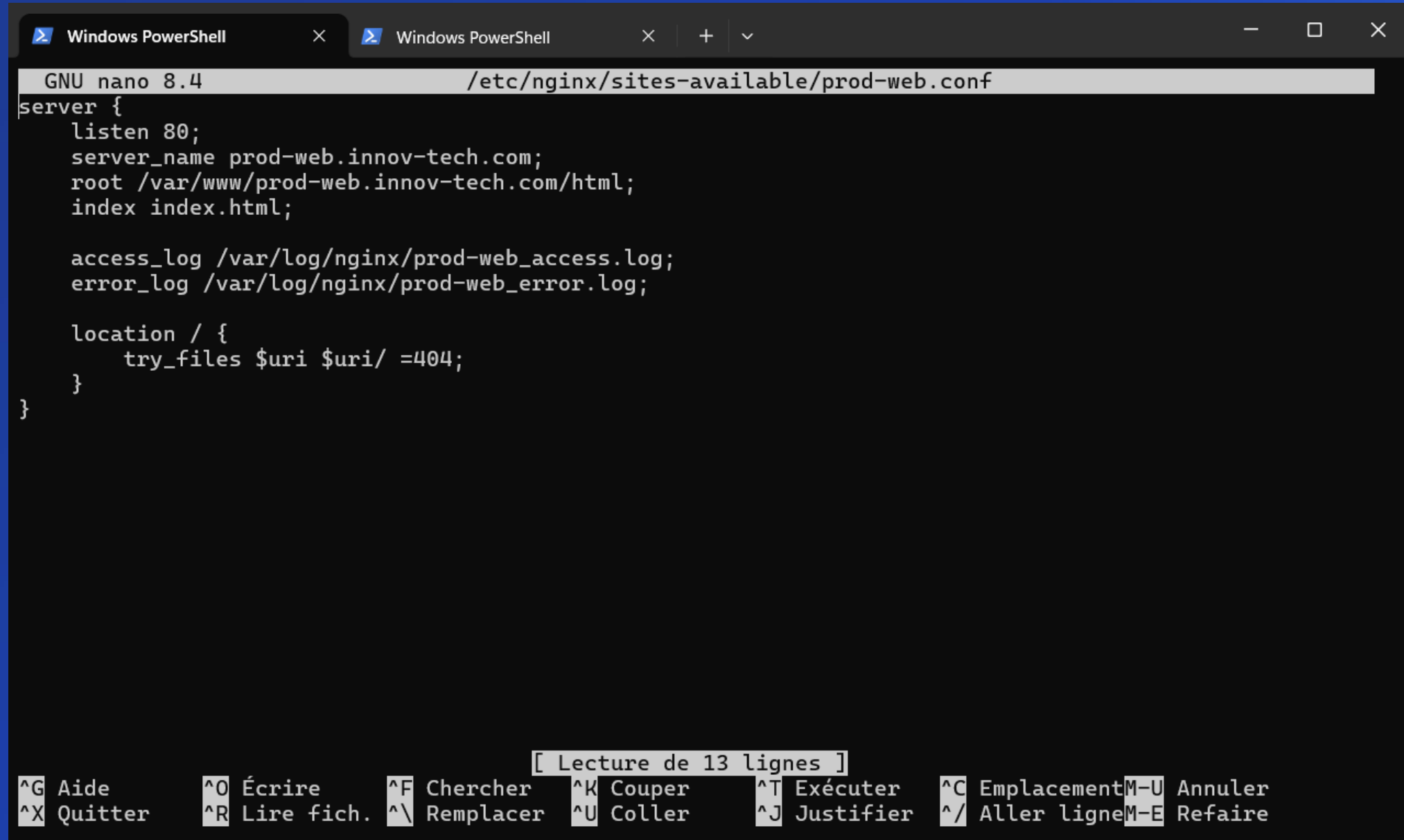
```
root@srv-rachid-web01:~# sudo mkdir -p /var/www/prod-web.innov-tech.com/html
root@srv-rachid-web01:~# sudo chown -R www-data:www-data /var/www/prod-web.innov-tech.com/html
root@srv-rachid-web01:~# sudo nano /var/www/prod-web.innov-tech.com/html/index.html
root@srv-rachid-web01:~# sudo nano /etc/nginx/sites-available/prod-web.conf
root@srv-rachid-web01:~# sudo nano /etc/nginx/sites-available/prod-web.conf
```



The screenshot shows a Windows PowerShell terminal window with two tabs. The active tab is titled "Windows PowerShell" and displays the GNU nano 8.4 editor. The editor is editing the file `/var/www/prod-web.innov-tech.com/html/index.html`. The content of the file is as follows:

```
GNU nano 8.4 /var/www/prod-web.innov-tech.com/html/index.html
<!DOCTYPE html>
<html>
<head>
  <title>Welcome to Innov-Tech</title>
</head>
<body>
  <h1>Welcome to Innov-Tech!</h1>
  <p>This is a static page served by Nginx.</p>
</body>
</html>
```

4.1. Création du Server Block Statique



```
GNU nano 8.4 /etc/nginx/sites-available/prod-web.conf
server {
    listen 80;
    server_name prod-web.innov-tech.com;
    root /var/www/prod-web.innov-tech.com/html;
    index index.html;

    access_log /var/log/nginx/prod-web_access.log;
    error_log /var/log/nginx/prod-web_error.log;

    location / {
        try_files $uri $uri/ =404;
    }
}
```

[Lecture de 13 lignes]

^G Aide	^O Écrire	^F Chercher	^K Couper	^T Exécuter	^C Emplacement	M-U Annuler
^X Quitter	^R Lire fich.	^\ Remplacer	^U Coller	^J Justifier	^/ Aller ligne	M-E Refaire

4.2. Activation et Redémarrage

```
root@srv-rachid-web01:~# sudo ln -s /etc/nginx/sites-available/prod-web.conf /etc/nginx/sites-enabled/  
root@srv-rachid-web01:~# sudo nginx -t  
nginx: the configuration file /etc/nginx/nginx.conf syntax is ok  
nginx: configuration file /etc/nginx/nginx.conf test is successful  
root@srv-rachid-web01:~# sudo systemctl reload nginx  
root@srv-rachid-web01:~# |
```

Test Final

⌄ Configuration du client

📄 Mettre à jour /etc/hosts

Ajouter les entrées DNS si DNS non configuré

```
# Ajouter au fichier hosts
192.168.1.50 portal-rh.ing-infraName.lan
prod-web.innov-tech.com
```

i La machine client doit pouvoir résoudre les noms de domaine

🏆 Vérifications à effectuer

1

Test PHP

<http://portal-rh.ing-infraName.lan/info.php>

2

Test Site Statique

<http://prod-web.innov-tech.com>

3

Test phpMyAdmin

<http://portal-rh.ing-infraName.lan/pma>

Commandes de Test

1 <>

Test PHP

```
# URL de test  
http://portal-rh.ing-  
infraName.lan/info.php
```

Doit afficher phpinfo()

2 📄

Site Statique

```
# URL de test  
http://prod-web.innov-  
tech.com
```

Doit afficher la page HTML
statique

3 📄

phpMyAdmin

```
# URL de test  
http://portal-rh.ing-  
infraName.lan/pma
```

Doit afficher l'écran de
connexion



Fichier Modifier Affichage

```
# Copyright (c) 1993-2009 Microsoft Corp.
#
# This is a sample HOSTS file used by Microsoft TCP/IP for Windows.
#
# This file contains the mappings of IP addresses to host names. Each
# entry should be kept on an individual line. The IP address should
# be placed in the first column followed by the corresponding host name.
# The IP address and the host name should be separated by at least one
# space.
#
# Additionally, comments (such as these) may be inserted on individual
# lines or following the machine name denoted by a '#' symbol.
#
# For example:
#
#       102.54.94.97     rhino.acme.com       # source server
#       38.25.63.10    x.acme.com           # x client host

# localhost name resolution is handled within DNS itself.
#       127.0.0.1      localhost
#       ::1            localhost

# Added by Docker Desktop
192.168.97.146 host.docker.internal
192.168.97.146 gateway.docker.internal
# To allow the same kube context to work on the host and the container:
127.0.0.1 kubernetes.docker.internal

192.168.217.141 portal-rh.ing-infraName.lan
192.168.217.141 prod-web.innov-tech.com
```

```
key.txt suricat_log.txt Read MEI.txt
Fichier Modifier Affichage

# Copyright (c) 1993-2009 Microsoft Corp.
#
# This is a sample HOSTS file used by Microsoft TCP/IP for Windows.
#
# This file contains the mappings of IP addresses to host names. Each
# entry should be kept on an individual line. The IP address should
# be placed in the first column followed by the corresponding host name.
# The IP address and the host name should be separated by at least one
# space.
#
# Additionally, comments (such as these) may be inserted on individual
# lines or following the machine name denoted by a '#' symbol.
#
# For example:
#
#       102.54.94.97       rhino.acme.com       # source server
#       38.25.63.10       x.acme.com           # x client host

# localhost name resolution is handled within DNS itself.
#       127.0.0.1         localhost
#       ::1              localhost

# Added by Docker Desktop
192.168.97.146 host.docker.internal
192.168.97.146 gateway.docker.internal
# To allow the same kube context to work on the host and the container:
127.0.0.1 kubernetes.docker.internal

192.168.217.141 portal-rh.ing-infraName.lan
192.168.217.141 prod-web.innov-tech.com
```

PHP Version 8.4.16

System	Linux srv-rachid-web01 6.12.57+deb13-amd64 #1 SMP PREEMPT_DYNAMIC Debian 6.12.57-1 (2025-11-05)
Build Date	Dec 18 2025 21:19:25
Build System	Linux
Build Provider	Debian
Server API	FPMPFastCGI
Virtual Directory Support	disabled
Configuration File (php.ini) Path	/etc/php8.4/fpm
Loaded Configuration File	/etc/php8.4/fpm/php.ini
Scan this dir for additional .ini files	/etc/php8.4/fpm/conf.d
Additional .ini files parsed	/etc/php8.4/fpm/conf.d/10-mysqlnd.ini, /etc/php8.4/fpm/conf.d/10-opcache.ini, /etc/php8.4/fpm/conf.d/10-pdo.ini, /etc/php8.4/fpm/conf.d/15-xsl.ini, /etc/php8.4/fpm/conf.d/20-calendar.ini, /etc/php8.4/fpm/conf.d/20-ctype.ini, /etc/php8.4/fpm/conf.d/20-dbm.ini, /etc/php8.4/fpm/conf.d/20-xml.ini, /etc/php8.4/fpm/conf.d/20-ftp.ini, /etc/php8.4/fpm/conf.d/20-gettext.ini, /etc/php8.4/fpm/conf.d/20-iconv.ini, /etc/php8.4/fpm/conf.d/20-mbstring.ini, /etc/php8.4/fpm/conf.d/20-mysql.ini, /etc/php8.4/fpm/conf.d/20-pdo_mysql.ini, /etc/php8.4/fpm/conf.d/20-phar.ini, /etc/php8.4/fpm/conf.d/20-posix.ini, /etc/php8.4/fpm/conf.d/20-readline.ini, /etc/php8.4/fpm/conf.d/20-shmop.ini, /etc/php8.4/fpm/conf.d/20-simplexml.ini, /etc/php8.4/fpm/conf.d/20-sockets.ini, /etc/php8.4/fpm/conf.d/20-system.ini, /etc/php8.4/fpm/conf.d/20-sysvsem.ini, /etc/php8.4/fpm/conf.d/20-sysvshm.ini, /etc/php8.4/fpm/conf.d/20-tokenizer.ini, /etc/php8.4/fpm/conf.d/20-xmlreader.ini, /etc/php8.4/fpm/conf.d/20-xmlwriter.ini, /etc/php8.4/fpm/conf.d/20-xsl.ini
PHP API	20240924
PHP Extension	20240924
Zend Extension	420240924
Zend Extension Build	API20240924.NTS
PHP Extension Build	API20240924.NTS
PHP Integer Size	64 bits
Debug Build	no
Thread Safety	disabled
Zend Signal Handling	enabled
Zend Memory Manager	enabled
Zend Multibyte Support	provided by mbstring
Zend Max Execution Timers	disabled
IPv6 Support	enabled
DTrace Support	disabled
Registered PHP Streams	https, ftps, compress.zlib, php, file, glob, data, http, ftp, phar
Registered Stream Socket Transports	tcp, udp, unix, udg, ssl, tls, tlsv1.0, tlsv1.1, tlsv1.2, tlsv1.3
Registered Stream Filters	zlib.*, string.rot13, string.toupper, string.tolower, convert.*, consumed, dechunk, convert.iconv.*

This program makes use of the Zend Scripting Language Engine:
Zend Engine v4.4.16, Copyright (c) Zend Technologies

← → ↻ ⚠ Not secure prod-web.innov-tech.com

🗄️ | 📁 Sheets 📁 isga 🗨️ New chat · GitHub C... 📁 cours 📁 lab 📁 tools 📁 social 🗨️ Native VLAN Config... 🗨️ Nafid

Welcome to Innov-Tech!

This is a static page served by Nginx.

Bonnes Pratiques de Sécurité



Utiliser HTTPS

Certificat SSL pour chiffrer les communications



Restreindre l'accès par IP

Autoriser uniquement les IP de confiance



Mot de passe fort

Complexité et unicité du mot de passe root



Mises à jour régulières

Maintenir phpMyAdmin à jour



Désactiver root login

Utiliser un utilisateur dédié



Authentification deux facteurs

Renforcer la sécurité du login

Résumé

1

Installer phpMyAdmin

`sudo apt install phpmyadmin -y`

2

Créer le lien symbolique

`sudo ln -s /usr/share/phpmyadmin /var/www/portal-rh.ing-infraName.lan/html/`

3

Configurer l'accès sécurisé

Intégrer dans le Virtual Host existant

4

Tester les trois URL

Vérifier PHP, site statique et phpMyAdmin



Maintenir la sécurité

HTTPS, restriction IP, mot de passe fort, mises à jour régulières