

HES-SO Valais Wallis

Linux WEB Server

Digital Team Academy

Dasek Joiakim

15/12/2022

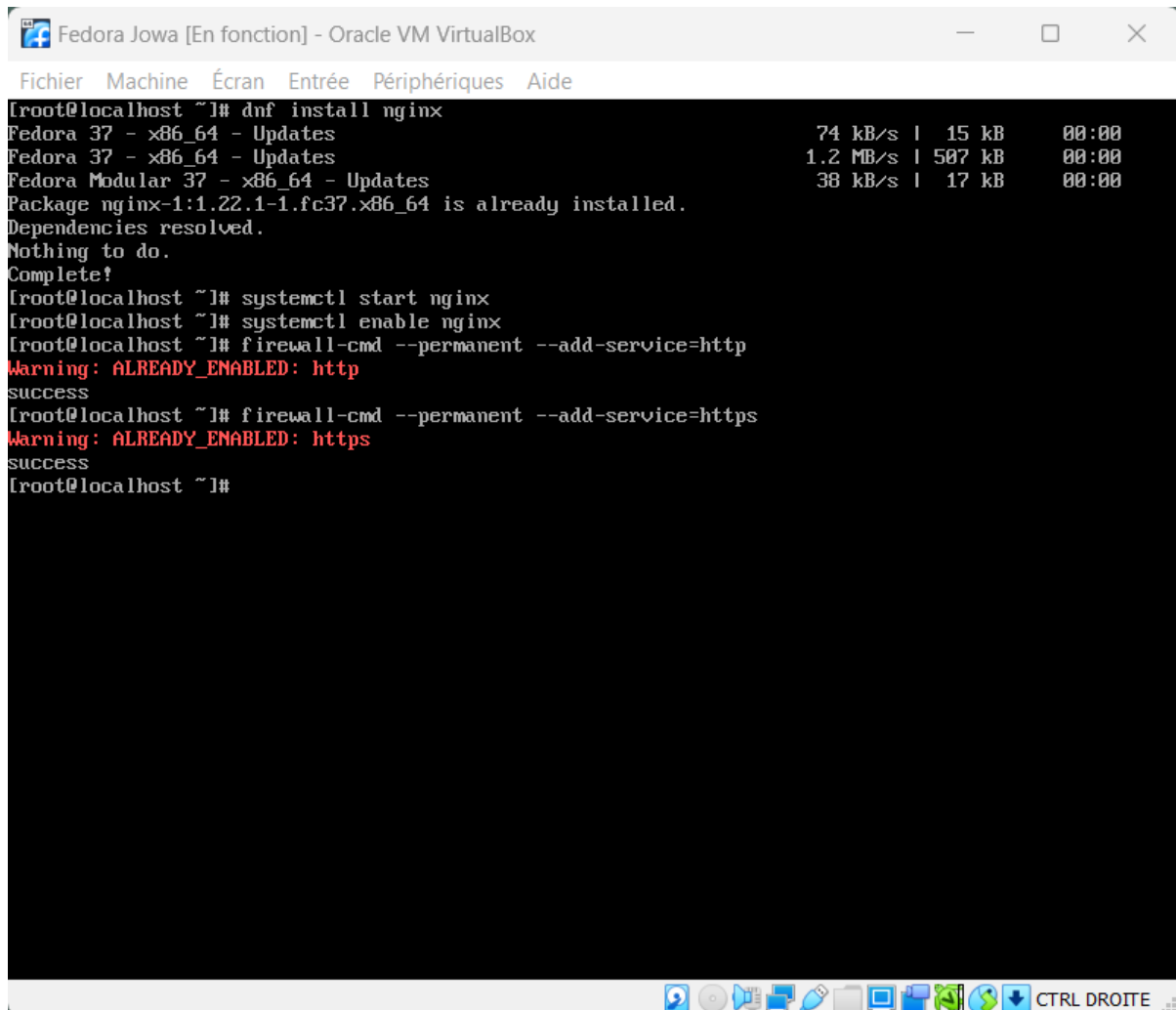
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Install

First of all we will install the "nginx" server on Fedora via the "DNF" package manager. Then we will use the "systemctl" command which is a daemon manager also called "services. Daemons" are programmes launched as fundraising tasks for the good of the operation of other services or programs. We will therefore launch "nginx" with the option Click on "start" then "enable" to activate it at start-up.

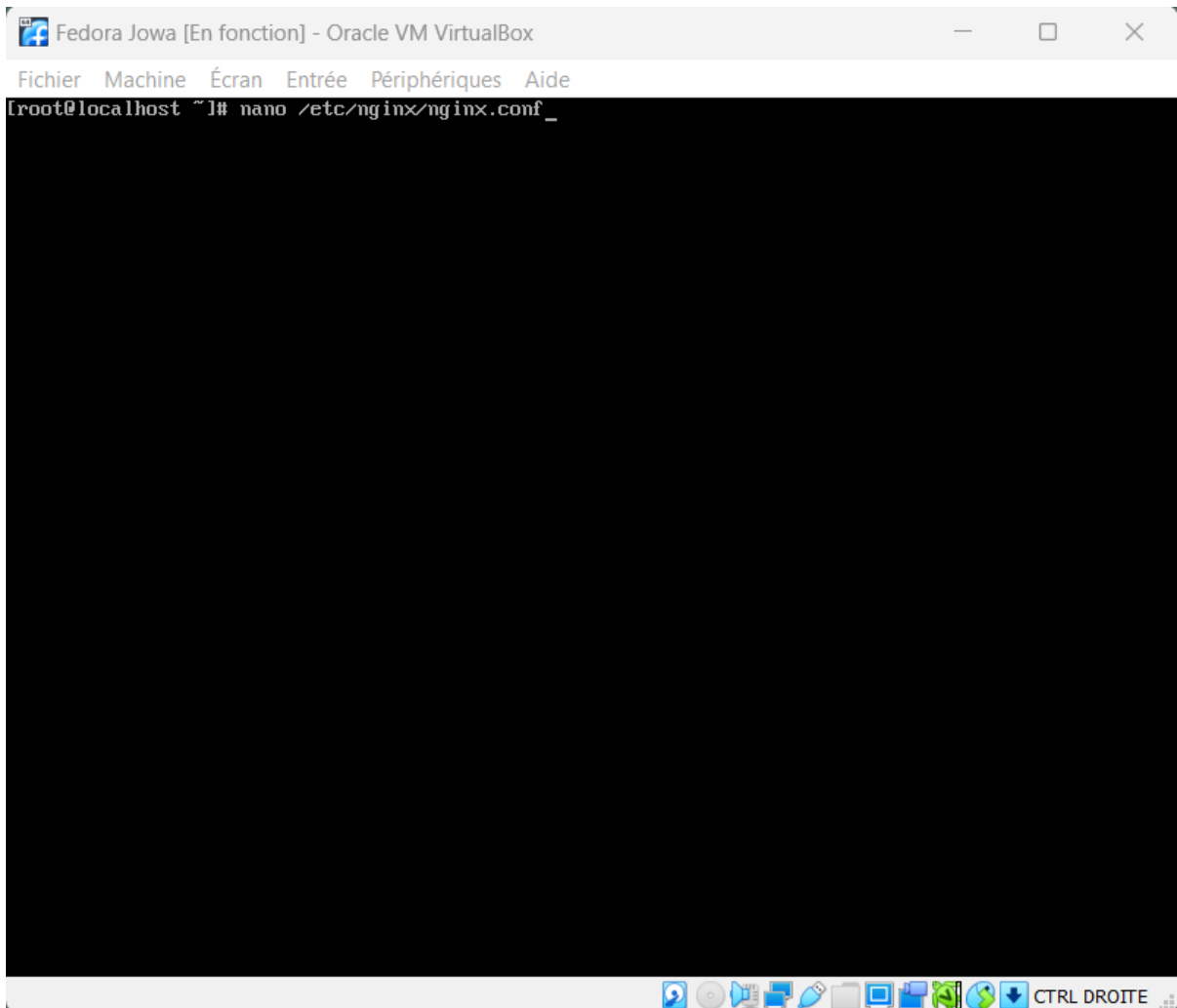
Then we need to allow "http" and "https" protocol in the firewall exceptions like in the following image:



```
Fedora Jowa [En fonction] - Oracle VM VirtualBox
Fichier Machine Écran Entrée Périphériques Aide
[root@localhost ~]# dnf install nginx
Fedora 37 - x86_64 - Updates          74 kB/s | 15 kB      00:00
Fedora 37 - x86_64 - Updates        1.2 MB/s | 507 kB    00:00
Fedora Modular 37 - x86_64 - Updates 38 kB/s | 17 kB     00:00
Package nginx-1:1.22.1-1.fc37.x86_64 is already installed.
Dependencies resolved.
Nothing to do.
Complete!
[root@localhost ~]# systemctl start nginx
[root@localhost ~]# systemctl enable nginx
[root@localhost ~]# firewall-cmd --permanent --add-service=http
Warning: ALREADY_ENABLED: http
success
[root@localhost ~]# firewall-cmd --permanent --add-service=https
Warning: ALREADY_ENABLED: https
success
[root@localhost ~]#
```

Create site on :80

By default the server already has a configuration on port 80, this configuration can be accessed via this path:

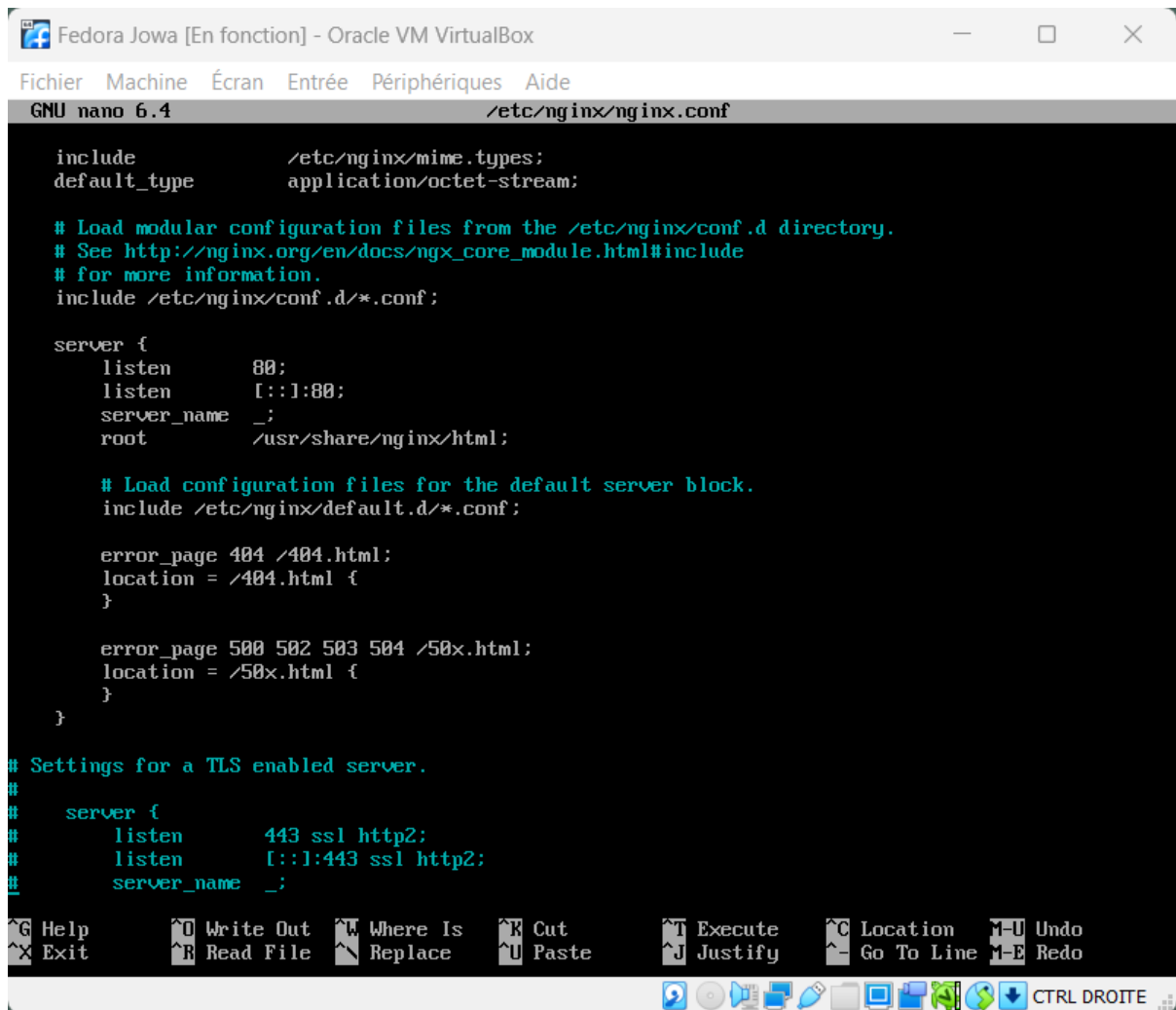


We see a block called "server" with several directives and values. The most important elements are :

- The listening port "listen 80;"
- The name of the server, in this case the ip address only: "server_name _;"
- The root folder containing the files and dependencies of the WEB application. "root /usr/share/nginx/html "
- And some redirection routes in case of "http" error code...

To save, press the "ctrl + x" keys, then press the "y" key and finally

"If you have not changed anything, simply press "ctrl + x":



```
Fedora Jowa [En fonction] - Oracle VM VirtualBox
Fichier Machine Écran Entrée Périphériques Aide
GNU nano 6.4 /etc/nginx/nginx.conf

include /etc/nginx/mime.types;
default_type application/octet-stream;

# Load modular configuration files from the /etc/nginx/conf.d directory.
# See http://nginx.org/en/docs/nginx_core_module.html#include
# for more information.
include /etc/nginx/conf.d/*.conf;

server {
    listen 80;
    listen [::]:80;
    server_name _;
    root /usr/share/nginx/html;

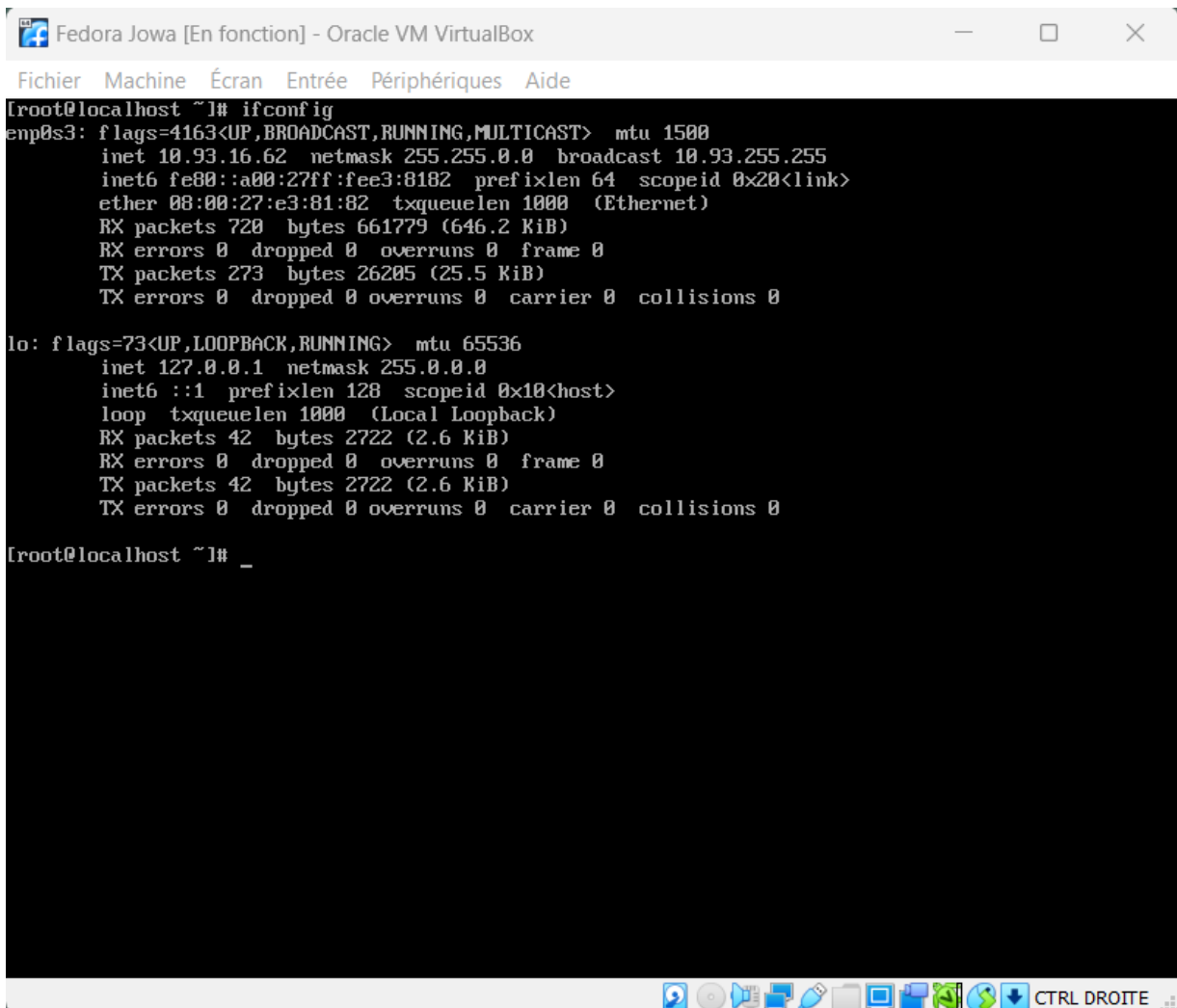
    # Load configuration files for the default server block.
    include /etc/nginx/default.d/*.conf;

    error_page 404 /404.html;
    location = /404.html {
    }

    error_page 500 502 503 504 /50x.html;
    location = /50x.html {
    }
}

# Settings for a TLS enabled server.
#
# server {
#     listen 443 ssl http2;
#     listen [::]:443 ssl http2;
#     server_name _;
# }
```

Then we want to know our IP address to access the WEB application:

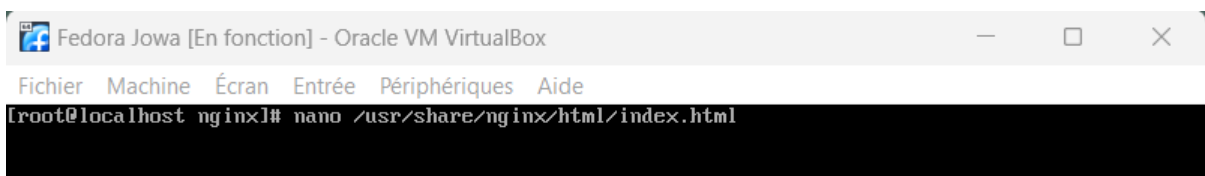


```
Fedora Jowa [En fonction] - Oracle VM VirtualBox
Fichier Machine Écran Entrée Périphériques Aide
[root@localhost ~]# ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 10.93.16.62 netmask 255.255.0.0 broadcast 10.93.255.255
    inet6 fe80::a00:27ff:fee3:8182 prefixlen 64 scopeid 0x20<link>
    ether 08:00:27:e3:81:82 txqueuelen 1000 (Ethernet)
    RX packets 720 bytes 661779 (646.2 KiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 273 bytes 26205 (25.5 KiB)
    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 42 bytes 2722 (2.6 KiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 42 bytes 2722 (2.6 KiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

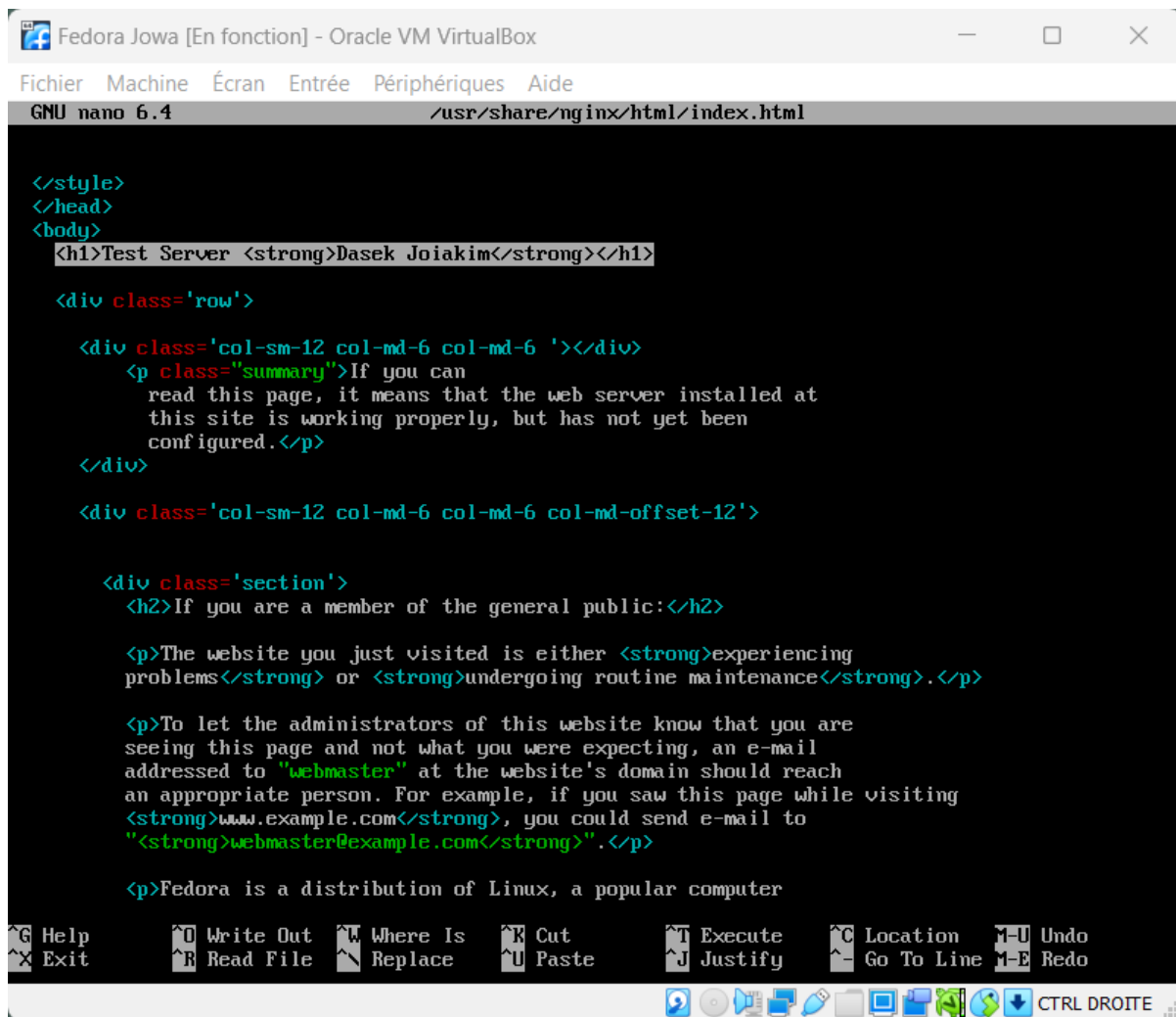
[root@localhost ~]# _
```

And finally we can edit the pre-existing "HTML" file via this path and the "nano" tool which allows edit files :



```
Fedora Jowa [En fonction] - Oracle VM VirtualBox
Fichier Machine Écran Entrée Périphériques Aide
[root@localhost nginx]# nano /usr/share/nginx/html/index.html
```

We will edit the HTML H1 tag, for "heading level 1" and customize the content as follows:



```
</style>
</head>
<body>
  <h1>Test Server <strong>Dasek Joiakim</strong></h1>

  <div class='row'>

    <div class='col-sm-12 col-md-6 col-md-6 '></div>
    <p class="summary">If you can
      read this page, it means that the web server installed at
      this site is working properly, but has not yet been
      configured.</p>
    </div>

    <div class='col-sm-12 col-md-6 col-md-6 col-md-offset-12'>

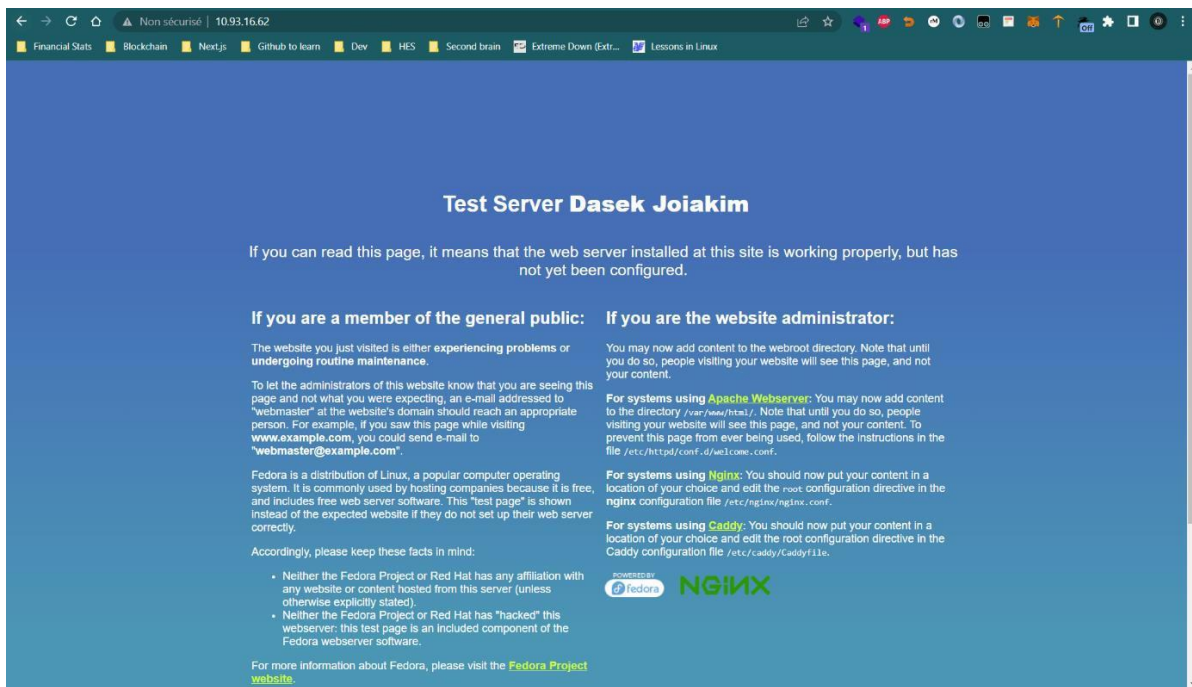
      <div class='section'>
        <h2>If you are a member of the general public:</h2>

        <p>The website you just visited is either <strong>experiencing
          problems</strong> or <strong>undergoing routine maintenance</strong>.</p>

        <p>To let the administrators of this website know that you are
          seeing this page and not what you were expecting, an e-mail
          addressed to "webmaster" at the website's domain should reach
          an appropriate person. For example, if you saw this page while visiting
          <strong>www.example.com</strong>, you could send e-mail to
          "<strong>webmaster@example.com</strong>".</p>

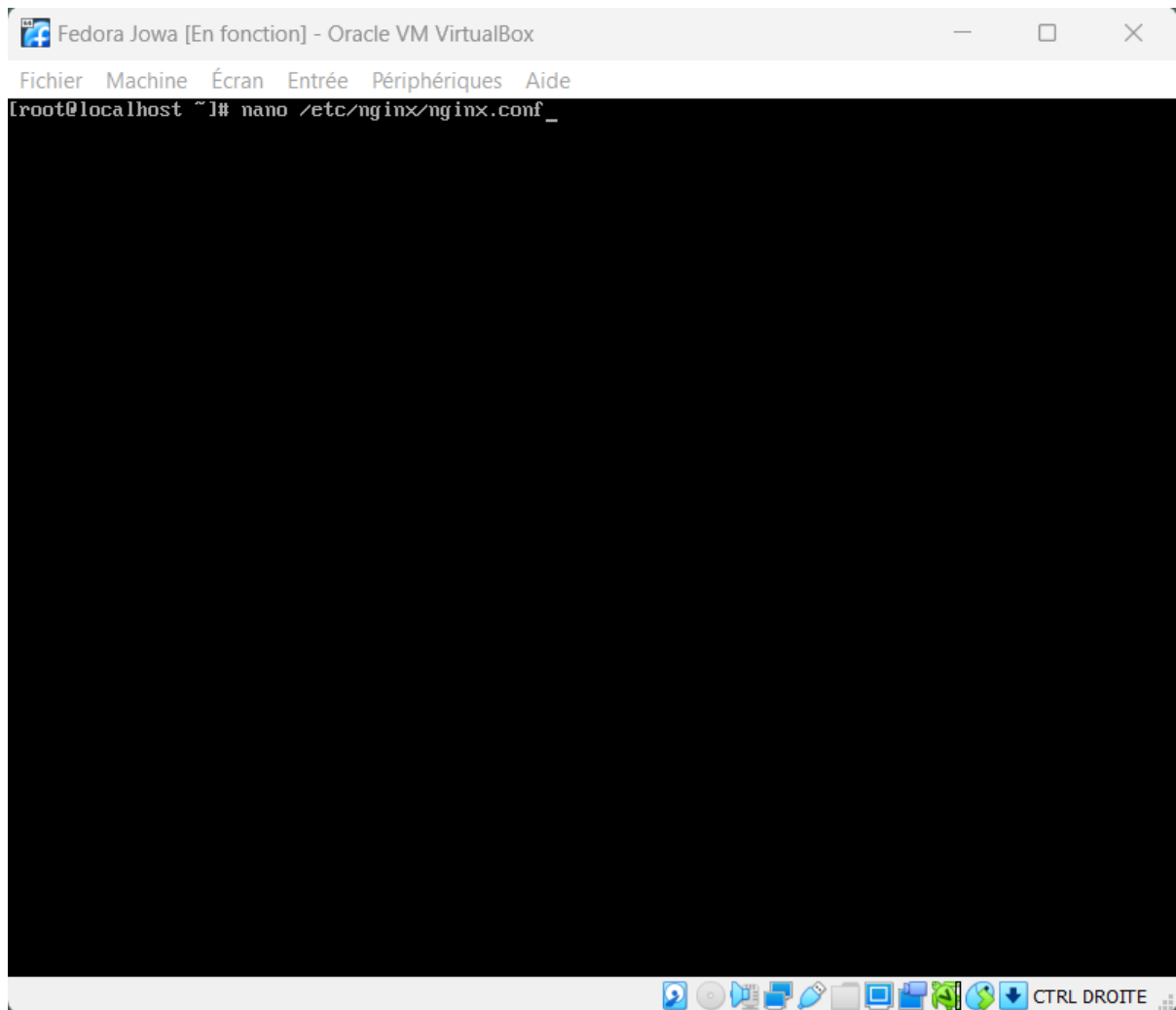
        <p>Fedora is a distribution of Linux, a popular computer
```

We visit the site and here we are on the index page:

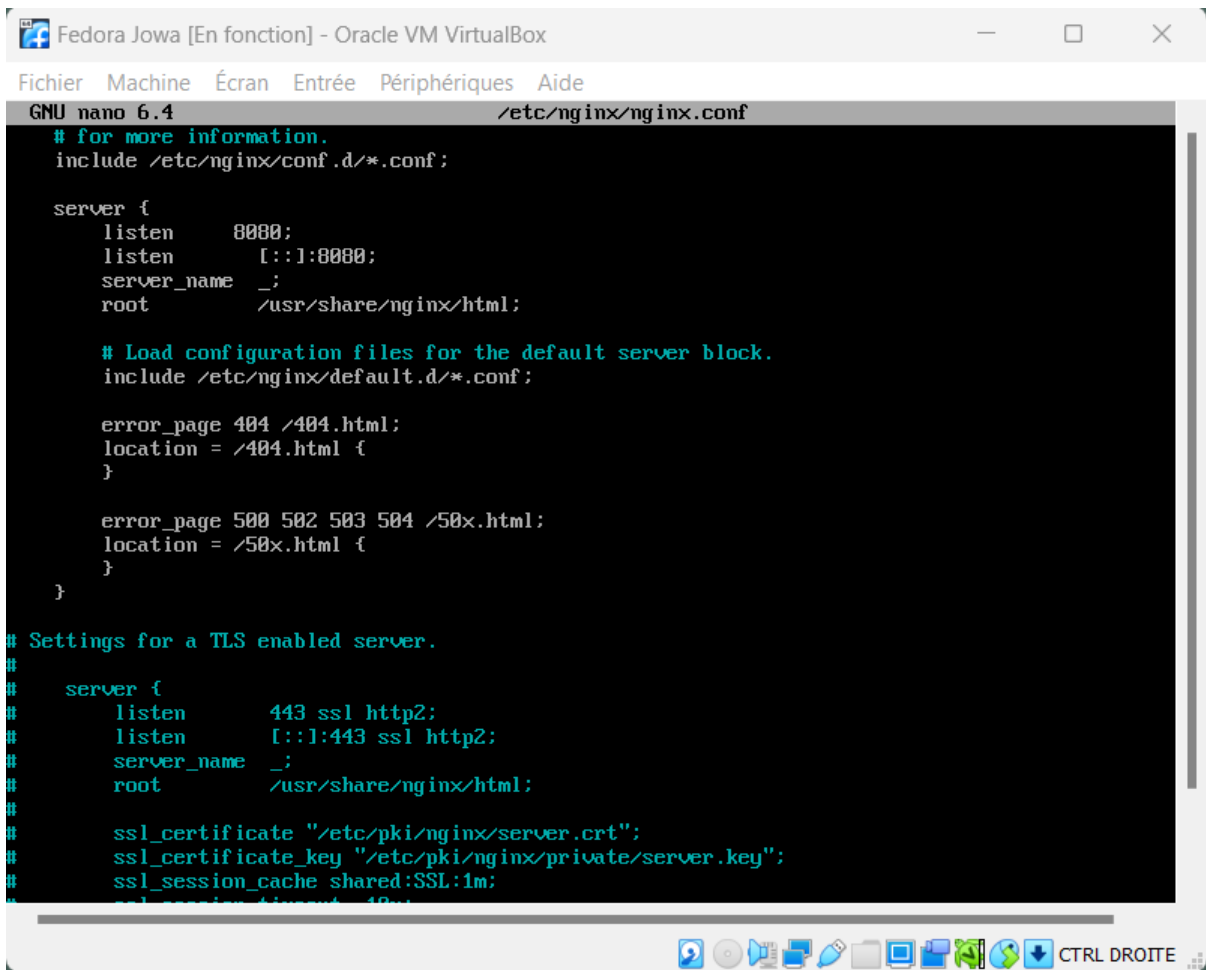


Create site on :8080

To change the port, we need to go back to the :



Thus, change the following port:



```
GNU nano 6.4 /etc/nginx/nginx.conf
# for more information.
include /etc/nginx/conf.d/*.conf;

server {
    listen      8080;
    listen      [::]:8080;
    server_name _;
    root        /usr/share/nginx/html;

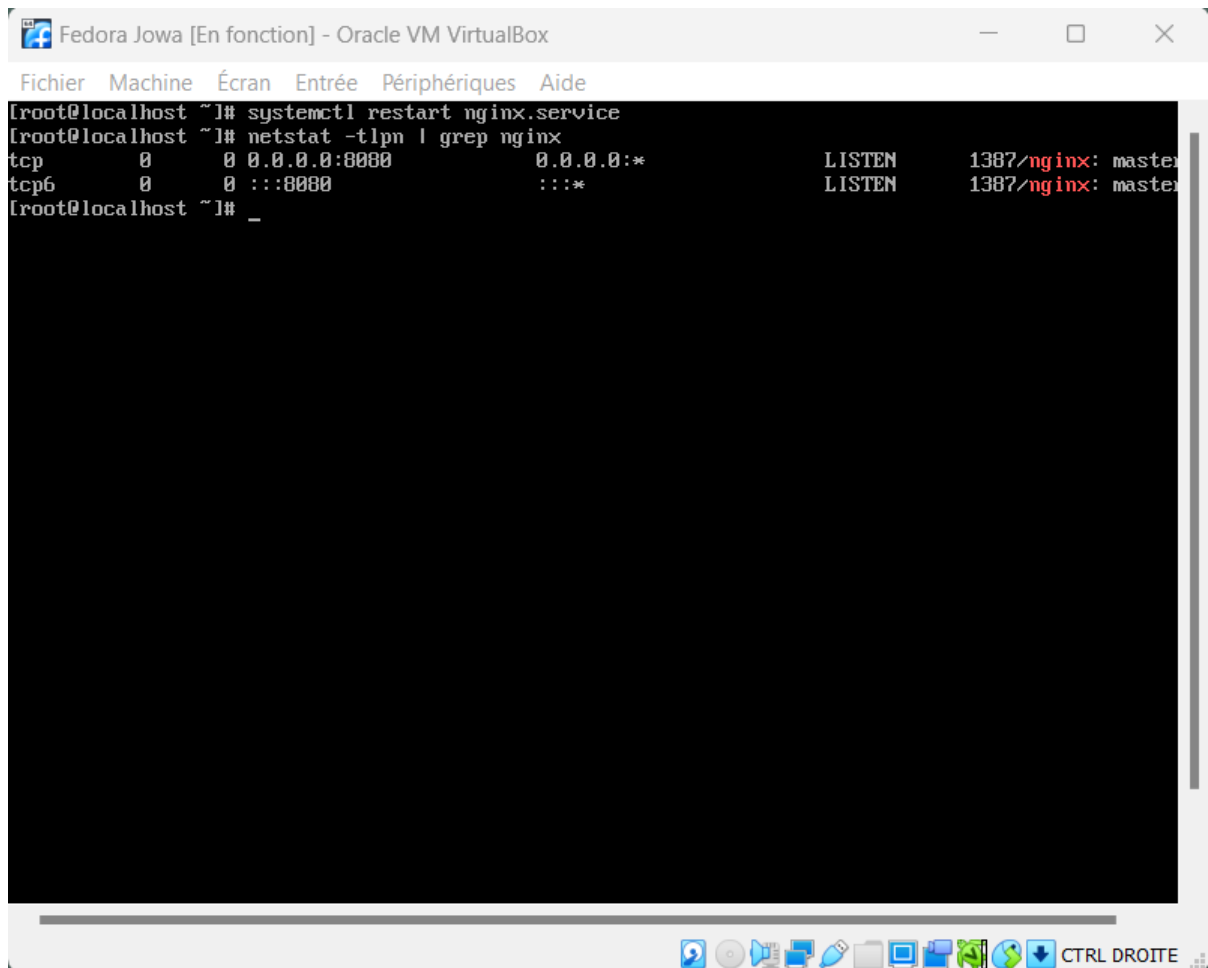
    # Load configuration files for the default server block.
    include /etc/nginx/default.d/*.conf;

    error_page 404 /404.html;
    location = /404.html {
    }

    error_page 500 502 503 504 /50x.html;
    location = /50x.html {
    }
}

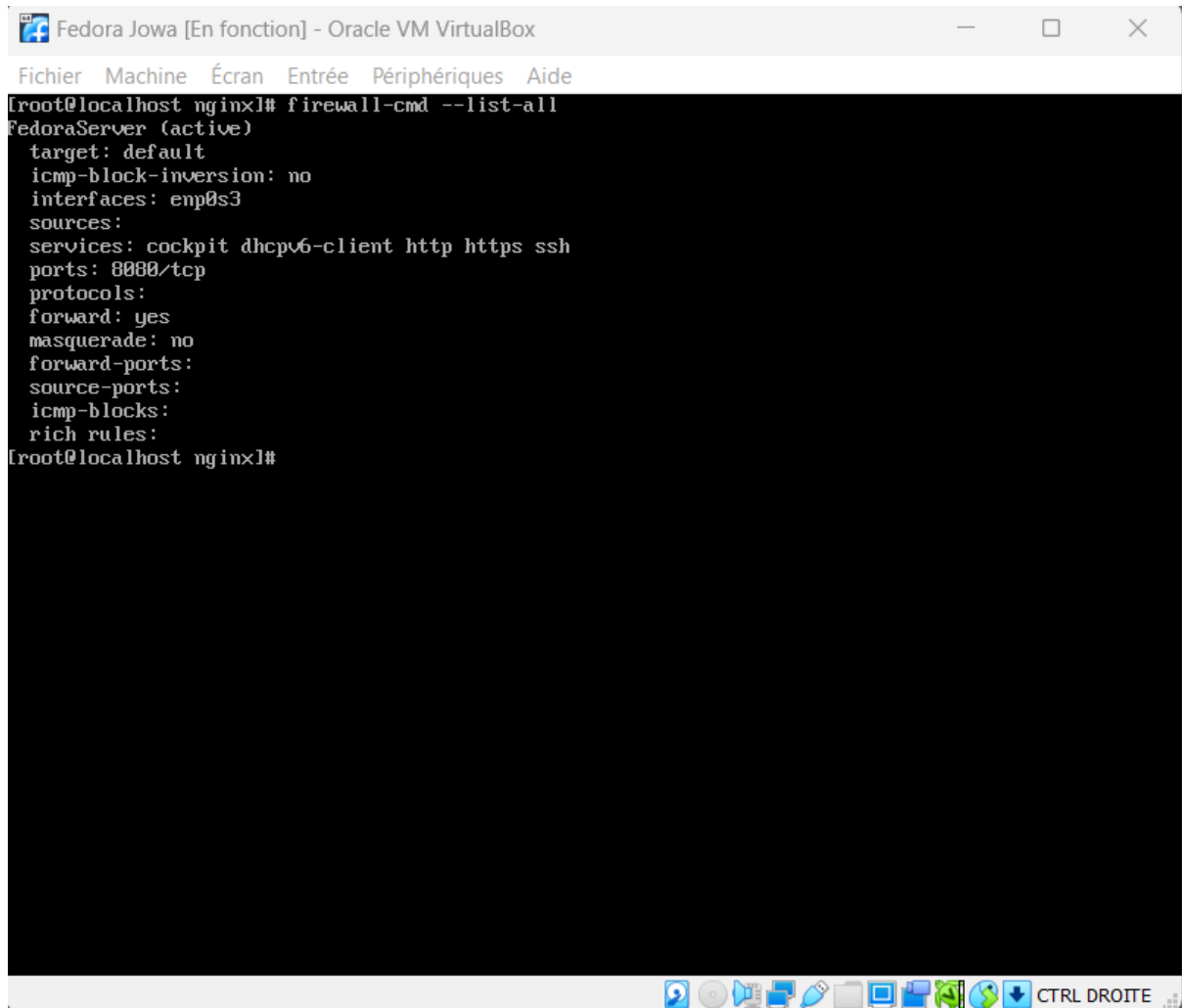
# Settings for a TLS enabled server.
#
#
server {
#     listen      443 ssl http2;
#     listen      [::]:443 ssl http2;
#     server_name _;
#     root        /usr/share/nginx/html;
#
#     ssl_certificate "/etc/pki/nginx/server.crt";
#     ssl_certificate_key "/etc/pki/nginx/private/server.key";
#     ssl_session_cache shared:SSL:1m;
#     ssl_session_timeout 5m;
}
```

After changing the configuration, we need to restart the service to take effect and check if port "8080" is listening, "netstat" for network status and options, the "|" to retrieve the response from the "netstat" command and use the right hand side of the "|" to search this result and filter out only lines that contain the word "nginx":



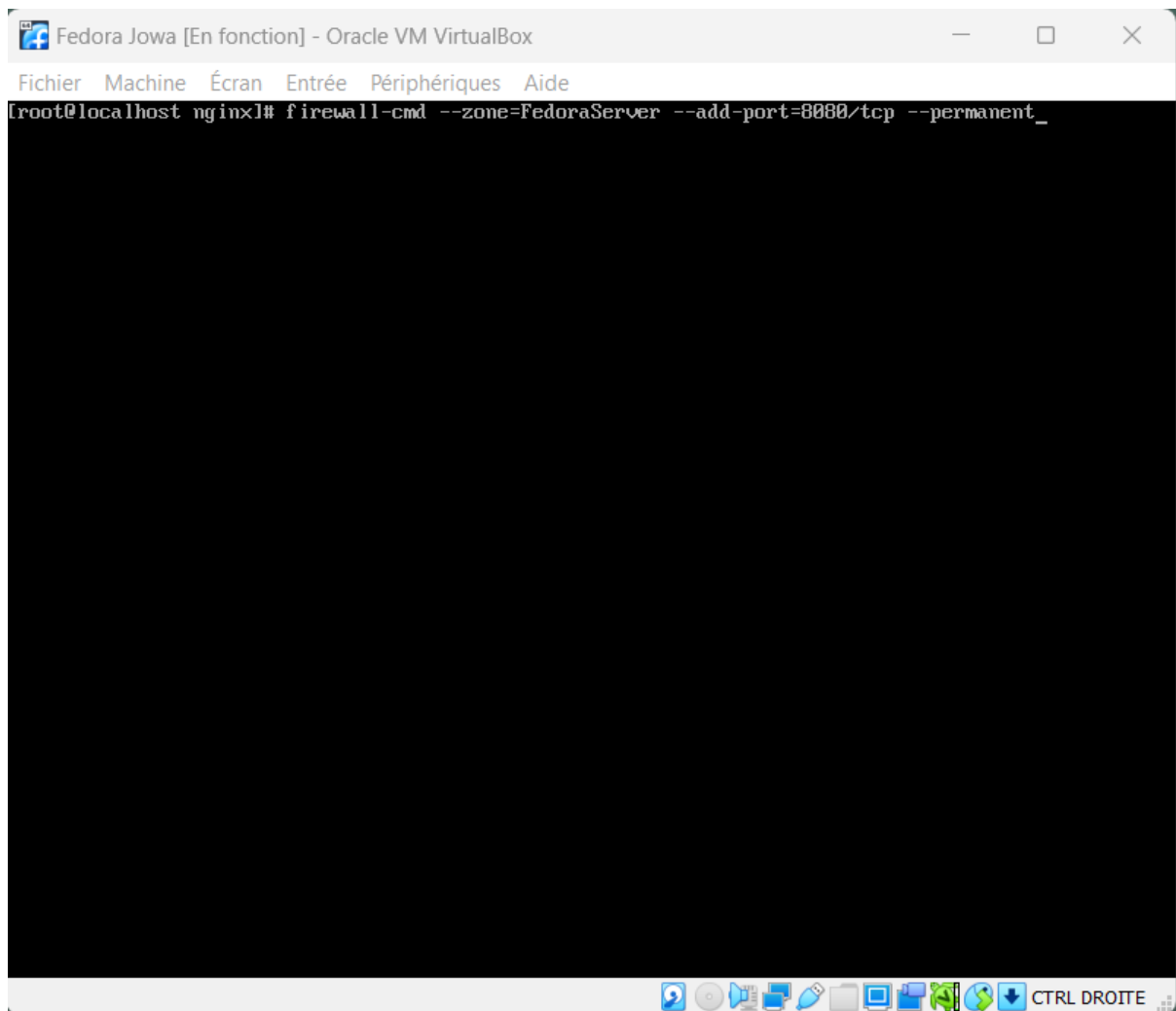
```
Fedora Jowa [En fonction] - Oracle VM VirtualBox
Fichier Machine Écran Entrée Périphériques Aide
[root@localhost ~]# systemctl restart nginx.service
[root@localhost ~]# netstat -tln | grep nginx
tcp        0      0 0.0.0.0:8080          0.0.0.0:*          LISTEN     1387/nginx: master
tcp6       0      0 :::8080             :::*                LISTEN     1387/nginx: master
[root@localhost ~]# _
```

Of course we need to add a port exception "8080" to the firewall. First of all we need to know the active and current area of the "Fedora" firewall which is called according to the following image "FerdoraServer":



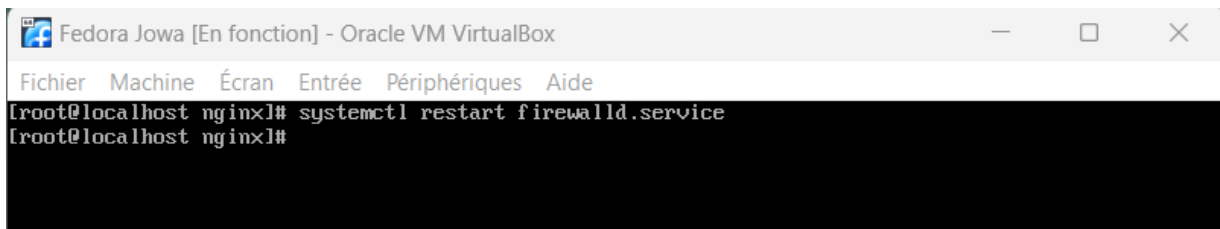
```
Fedora Jowa [En fonction] - Oracle VM VirtualBox
Fichier Machine Écran Entrée Périphériques Aide
[root@localhost nginx]# firewall-cmd --list-all
FedoraServer (active)
  target: default
  icmp-block-inversion: no
  interfaces: enp0s3
  sources:
  services: cockpit dhcpv6-client http https ssh
  ports: 8080/tcp
  protocols:
  forward: yes
  masquerade: no
  forward-ports:
  source-ports:
  icmp-blocks:
  rich rules:
[root@localhost nginx]#
```

We must therefore add port "8080" to the "FedoraServer" zone permanently to that after restarting the server, everything works:



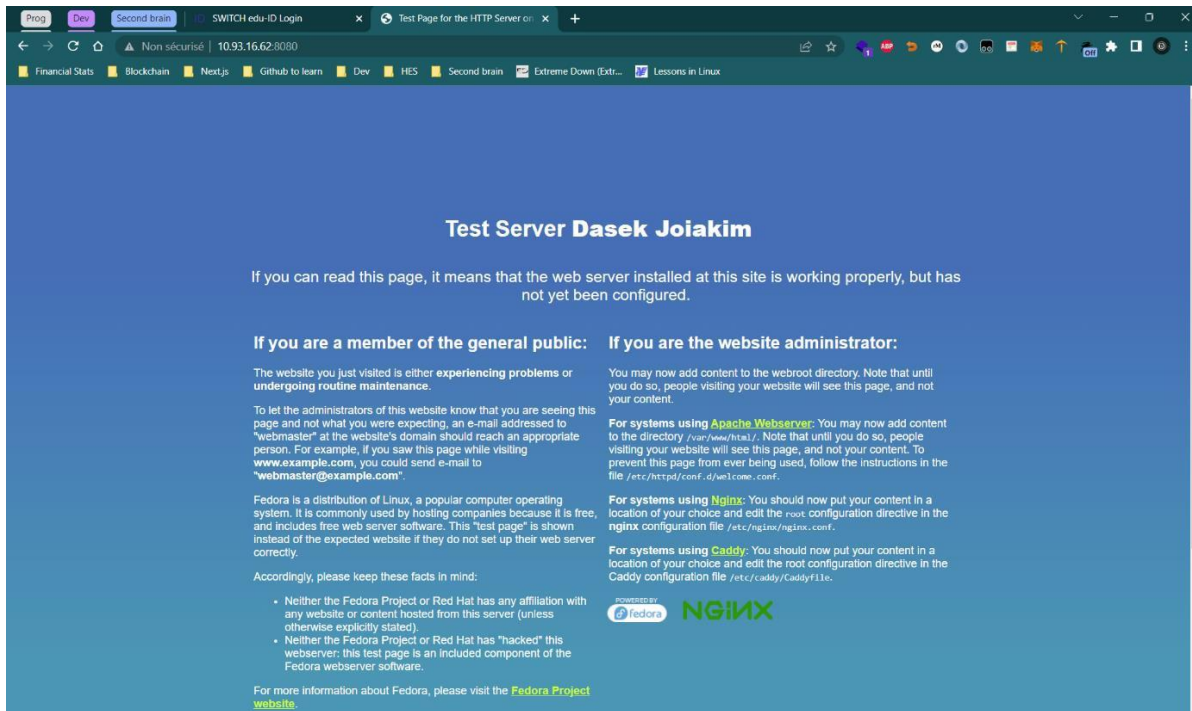
```
Fedora Jowa [En fonction] - Oracle VM VirtualBox
Fichier Machine Écran Entrée Périphériques Aide
[root@localhost nginx]# firewall-cmd --zone=FedoraServer --add-port=8080/tcp --permanent_
```

We need to restart the firewall service for the changes to take effect:



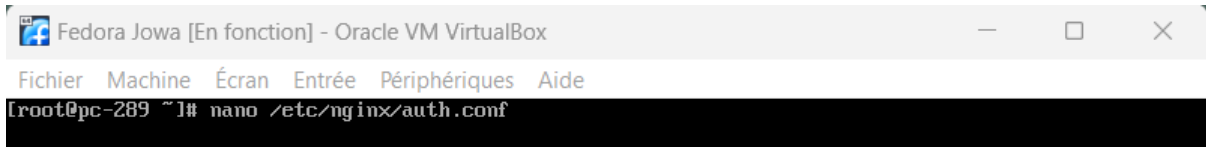
```
Fedora Jowa [En fonction] - Oracle VM VirtualBox
Fichier Machine Écran Entrée Périphériques Aide
[root@localhost nginx]# systemctl restart firewalld.service
[root@localhost nginx]#
```

Finally we can access the website with the port "8080":



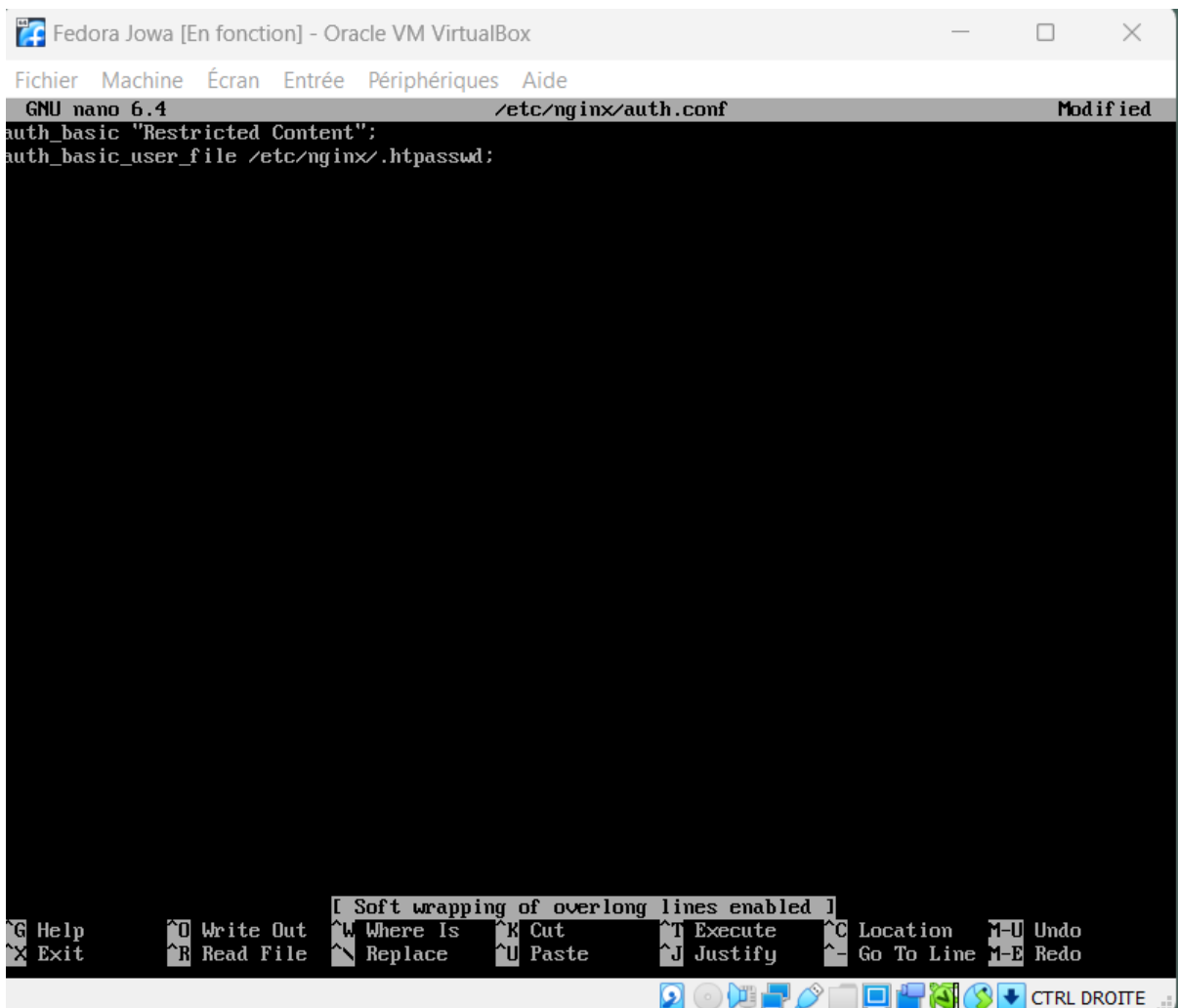
Authenticated access (optional)

To protect a folder from its contents. You will need to perform the following steps. First, create a configuration file in the "nginx" configuration directory:



```
Fedora Jowa [En fonction] - Oracle VM VirtualBox
Fichier Machine Écran Entrée Périphériques Aide
[root@pc-289 ~]# nano /etc/nginx/auth.conf
```

Then we will enter the data and the path to the hidden file ".htpasswd" which will contain sensitive data:



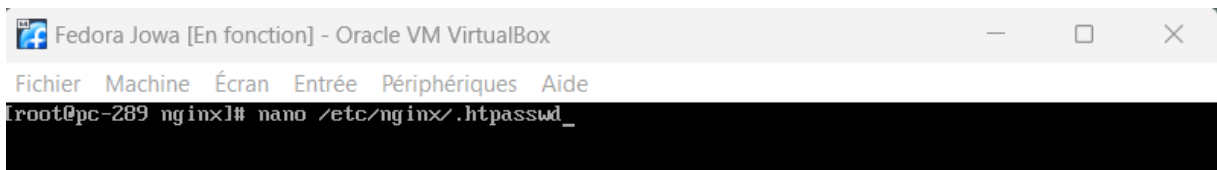
```
Fedora Jowa [En fonction] - Oracle VM VirtualBox
Fichier Machine Écran Entrée Périphériques Aide
GNU nano 6.4 /etc/nginx/auth.conf Modified
auth_basic "Restricted Content";
auth_basic_user_file /etc/nginx/.htpasswd;
```

[Soft wrapping of overlong lines enabled]

^G Help	^O Write Out	^W Where Is	^K Cut	^T Execute	^C Location	^U Undo
^X Exit	^R Read File	^_ Replace	^U Paste	^J Justify	^_ Go To Line	^E Redo

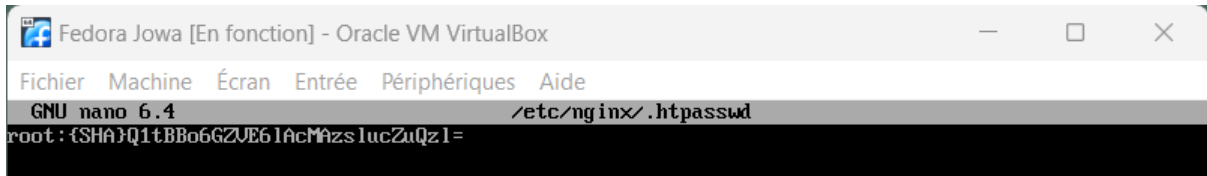
CTRL DROITE

We must therefore create this file in the same way as the previous one:



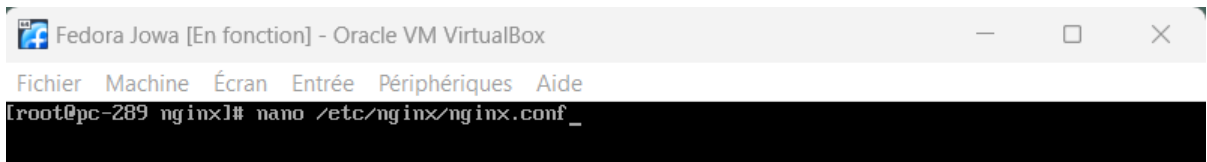
```
Fedora Jowa [En fonction] - Oracle VM VirtualBox
Fichier Machine Écran Entrée Périphériques Aide
root@pc-289 nginx1# nano /etc/nginx/.htpasswd_
```

And add these lines, we can use online tools to encrypt the password, here I used the hash function "SHA-1":



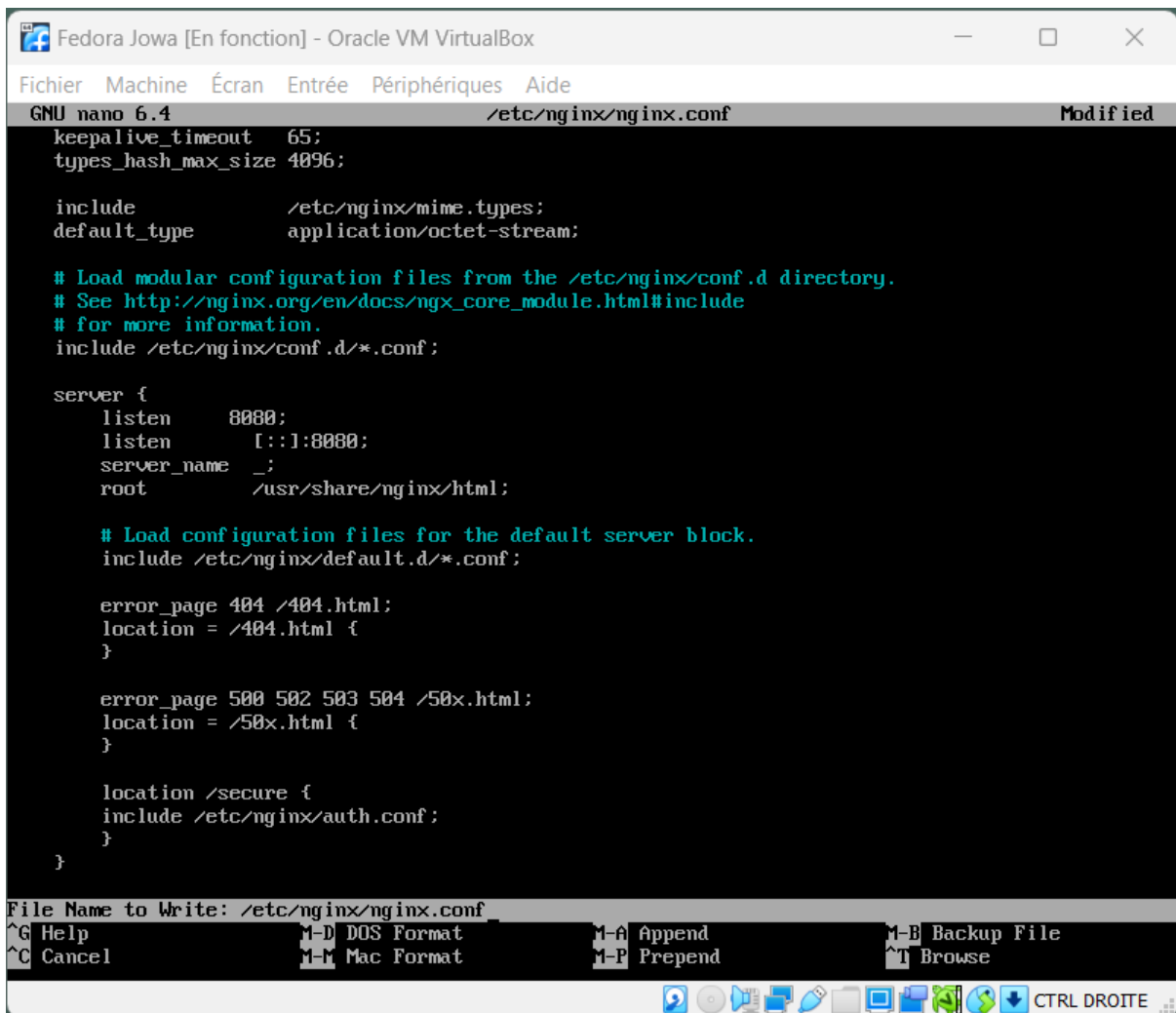
```
Fedora Jowa [En fonction] - Oracle VM VirtualBox
Fichier Machine Écran Entrée Périphériques Aide
GNU nano 6.4 /etc/nginx/.htpasswd
root: {SHA}Q1tBB06GZUE61AcMAslucZuQz1=
```

And finally we need to modify the nginx server configuration to add a route that points to a secure folder:



```
Fedora Jowa [En fonction] - Oracle VM VirtualBox
Fichier Machine Écran Entrée Périphériques Aide
root@pc-289 nginx1# nano /etc/nginx/nginx.conf_
```


And add these lines for the 'secure' route:



```
GNU nano 6.4 /etc/nginx/nginx.conf Modified
keepalive_timeout 65;
types_hash_max_size 4096;

include /etc/nginx/mime.types;
default_type application/octet-stream;

# Load modular configuration files from the /etc/nginx/conf.d directory.
# See http://nginx.org/en/docs/nginx_core_module.html#include
# for more information.
include /etc/nginx/conf.d/*.conf;

server {
    listen 8080;
    listen [::]:8080;
    server_name _;
    root /usr/share/nginx/html;

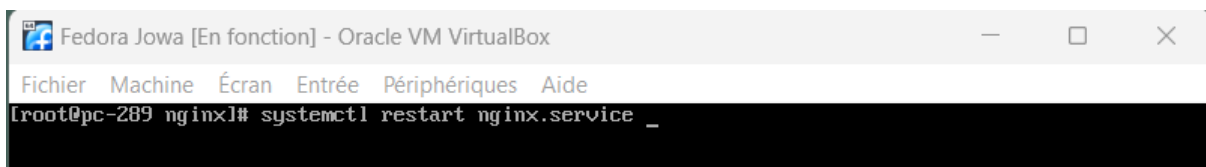
    # Load configuration files for the default server block.
    include /etc/nginx/default.d/*.conf;

    error_page 404 /404.html;
    location = /404.html {
    }

    error_page 500 502 503 504 /50x.html;
    location = /50x.html {
    }

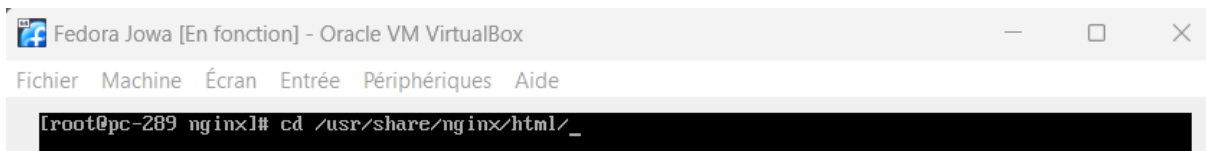
    location /secure {
        include /etc/nginx/auth.conf;
    }
}
```

The service must be restarted for this to take effect:

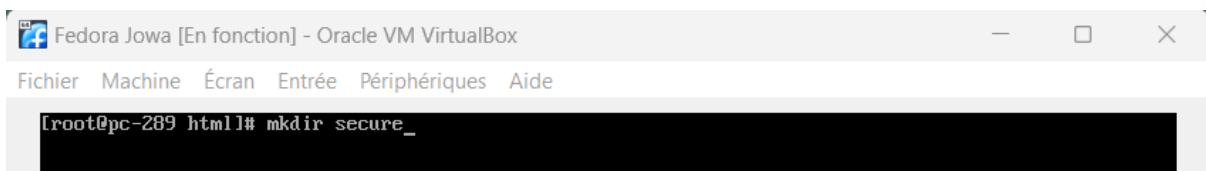


```
[root@pc-289 nginx]# systemctl restart nginx.service _
```

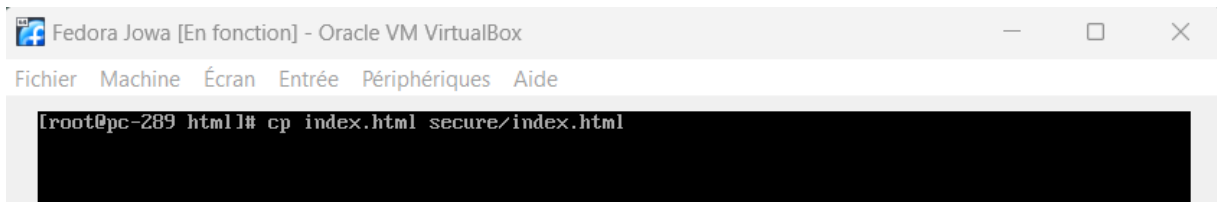
We need to move to the root of the WEB application, and add a new folder called
In the "secure" section, copy the "index.html" file and modify the "HTML" title tag:



```
[root@pc-289 nginx]# cd /usr/share/nginx/html/_
```

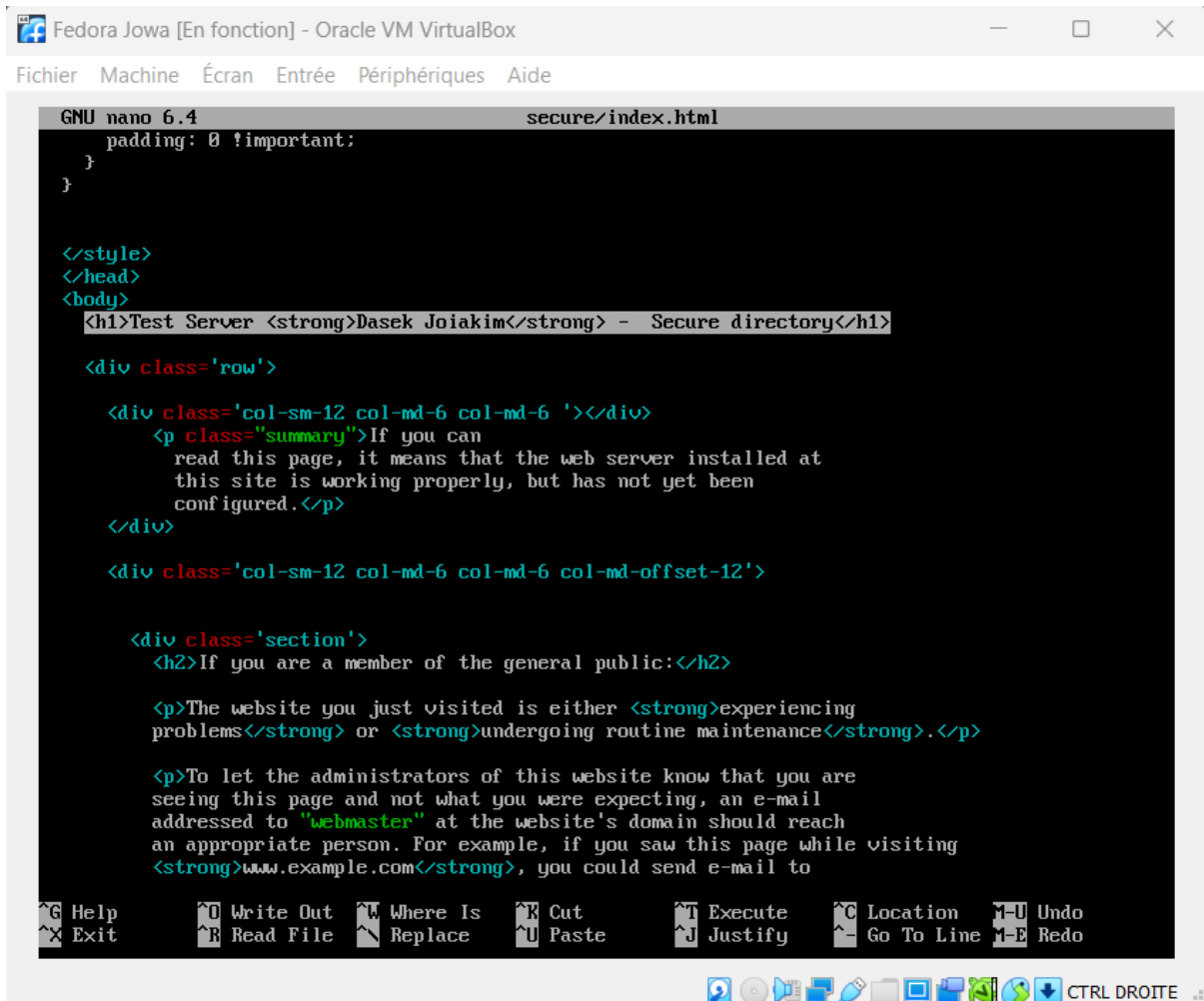


```
[root@pc-289 html]# mkdir secure_
```



```
[root@pc-289 html]# cp index.html secure/index.html
```

Then change the title:



```
GNU nano 6.4 secure/index.html
padding: 0 !important;
}
}

</style>
</head>
<body>
<h1>Test Server <strong>Dasek Joiakim</strong> - Secure directory</h1>

<div class='row'>

  <div class='col-sm-12 col-md-6 col-md-6 '></div>
  <p class="summary">If you can
  read this page, it means that the web server installed at
  this site is working properly, but has not yet been
  configured.</p>
</div>

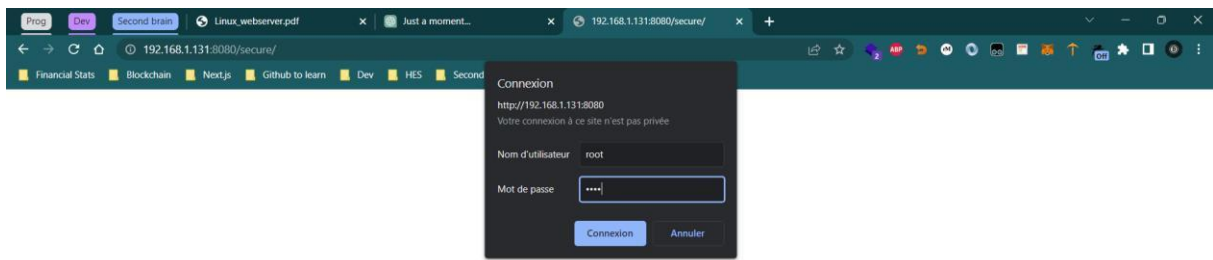
  <div class='col-sm-12 col-md-6 col-md-6 col-md-offset-12'>

    <div class='section'>
      <h2>If you are a member of the general public:</h2>

      <p>The website you just visited is either <strong>experiencing
      problems</strong> or <strong>undergoing routine maintenance</strong>.</p>

      <p>To let the administrators of this website know that you are
      seeing this page and not what you were expecting, an e-mail
      addressed to "webmaster" at the website's domain should reach
      an appropriate person. For example, if you saw this page while visiting
      <strong>www.example.com</strong>, you could send e-mail to
```

This allows us to test whether the route is secure:



We have secured a file:

