Examen

Ver dirección IP inicial

```
li@uss:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host noprefixroute
       valid_lft forever preferred_lft forever
2: ens18: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether bc:24:11:3b:4f:71 brd ff:ff:ff:ff:ff:ff
    altname enp0s18
    inet 192.168.1.208/24 metric 100 brd 192.168.1.255 scope global dynamic ens18
       valid_lft 602731sec preferred_lft 602731sec
    inet6 fe80::be24:11ff:fe3b:4f71/64 scope link
       valid_lft forever preferred_lft forever
```

Edita el archivo para modificar la dirección IP

- sudo nano /etc/netplan/50-cloud-init.yaml

```
network:
  version: 2
  ethernets:
    ens18:
      dhcp4: false
      addresses:
        - 192.168.1.53/24
      routes:
        - to: 0.0.0.0/0
          via: 192.168.1.1
      nameservers:
        addresses:
          - 1.1.1.1
          - 8.8.8.8
```

Cambios completados

```
li@uss:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host noprefixroute
       valid_lft forever preferred_lft forever
2: ens18: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether bc:24:11:3b:4f:71 brd ff:ff:ff:ff:ff:ff
    altname enp0s18
    inet 192.168.1.53/24 brd 192.168.1.255 scope global ens18
       valid_lft forever preferred_lft forever
    inet6 fe80::be24:11ff:fe3b:4f71/64 scope link
       valid_lft forever preferred_lft forever
```

Cambiar contraseña

```
li@uss:~$ passwd
Changing password for li.
Current password:
New password:
Retype new password:
passwd: password updated successfully
```

Actualizar el sistema

```
li@uss:~$ sudo apt update && sudo apt upgrade_
```

Conexión SSH desde el host local a la máquina virtual

Instalar netdiscover

```
li@uss:~$ sudo apt install netdiscover
```

- sudo netdiscover

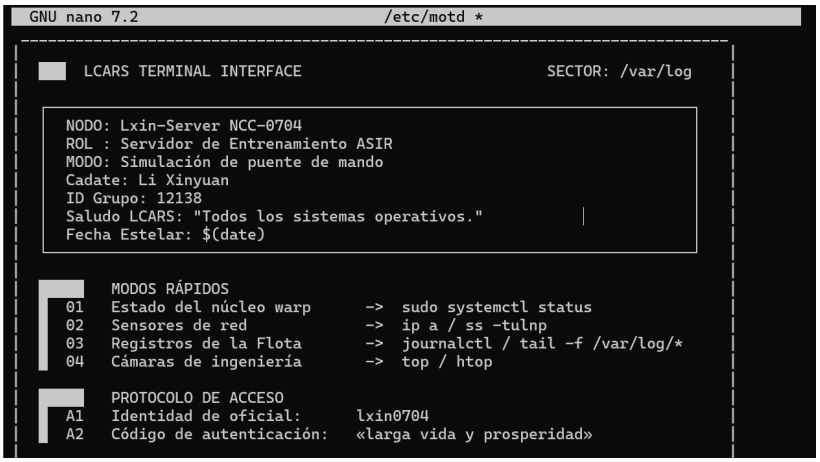
```
Currently scanning: 172.16.104.0/16   |   Screen View: Unique Hosts

1866 Captured ARP Req/Rep packets, from 21 hosts.   Total size: 111798
_____________________________________________________________________________
  IP            At MAC Address     Count     Len  MAC Vendor / Hostname
_____________________________________________________________________________
192.168.1.228   dc:45:46:0a:6b:a3     39    2340  Unknown vendor
192.168.1.176   c4:75:ab:25:ab:cf   1800  108000  Intel Corporate
192.168.1.1     cc:2d:21:2b:27:90      8     480  Tenda Technology Co.,Ltd.Dongguan branch
192.168.1.30    68:1d:ef:3c:80:bb      1      42  Shenzhen CYX Technology Co., Ltd.
```

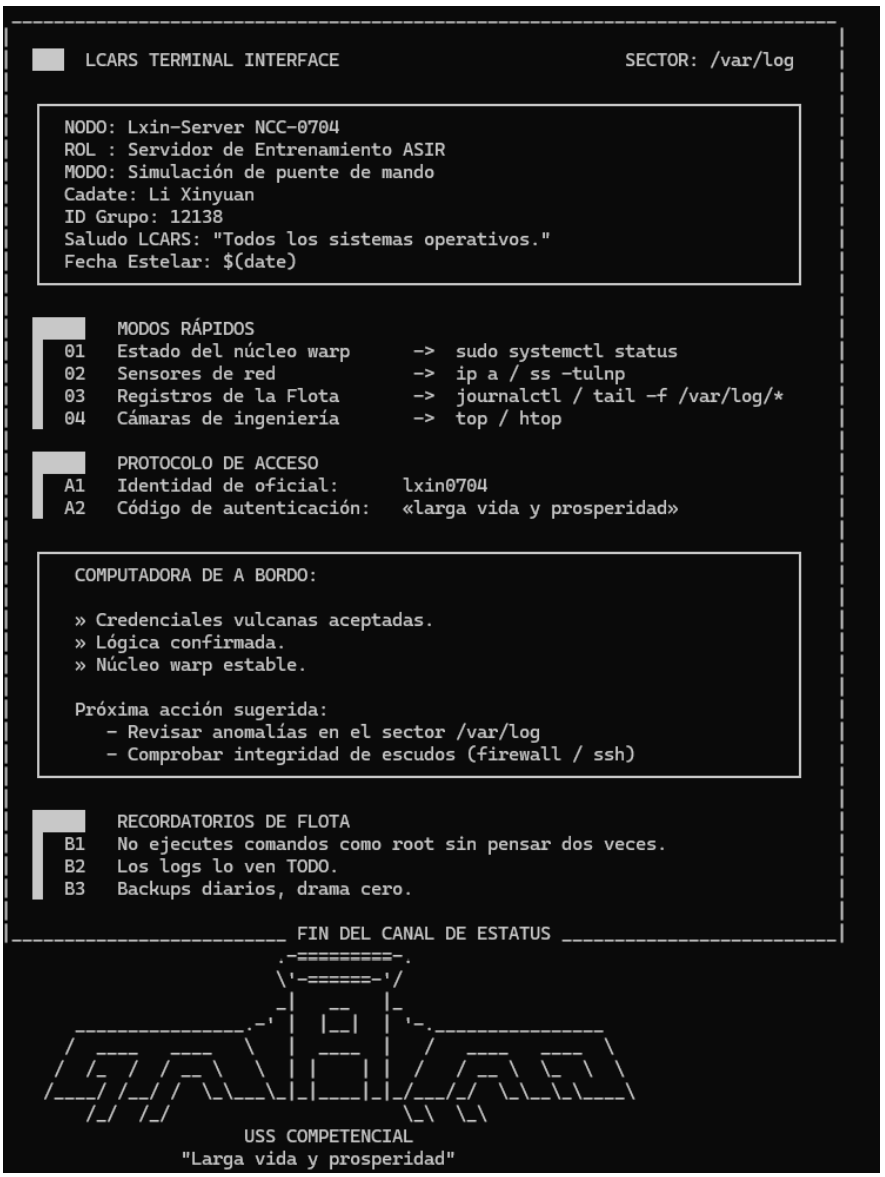
1.

Editar el archivo MOTD

- sudo nano /etc/motd



Iniciar sesión



2.

Instalar, habilitar y verificar Apache, MySQL y PHP:

- sudo apt update
- sudo apt install -y apache2 mysql-server php php-mysql libapache2-mod-php

```
li@uss:/$ sudo apt update
```

```
li@uss:/$ sudo apt install -y apache2 mysql-server php php-mysql libapache2-mod-php
```

- sudo mysql_secure_installation

```
li@uss:/$ sudo mysql_secure_installation

Securing the MySQL server deployment.

Connecting to MySQL using a blank password.
```

Habilitar:

- sudo systemctl start apache2
- sudo systemctl enable apache2

```
li@uss:/$ sudo systemctl start apache2
```

```
li@uss:/$ sudo systemctl enable apache2
Synchronizing state of apache2.service with SysV service script with /usr/lib/systemd/systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install enable apache2
```

- sudo systemctl start mysql
- sudo systemctl enable mysql

```
li@uss:/$ sudo systemctl start mysql
li@uss:/$ sudo systemctl enable mysql
Synchronizing state of mysql.service with SysV service script with /usr/lib/systemd/systemd-sysv-install
Executing: /usr/lib/systemd/systemd-sysv-install enable mysql
```

Verificación:

- sudo systemctl status apache2

```
li@uss:/$ sudo systemctl status apache2
● apache2.service - The Apache HTTP Server
     Loaded: loaded (/usr/lib/systemd/system/apache2.service; enabled; preset: enabled)
     Active: active (running) since Tue 2025-11-18 11:23:07 UTC; 12min ago
       Docs: https://httpd.apache.org/docs/2.4/
   Main PID: 10410 (apache2)
```

- sudo systemctl status mysql

```
li@uss:/$ sudo systemctl status mysql
● mysql.service - MySQL Community Server
     Loaded: loaded (/usr/lib/systemd/system/mysql.service; enabled; preset: enabled)
     Active: active (running) since Tue 2025-11-18 11:33:01 UTC; 3min 24s ago
   Main PID: 12310 (mysqld)
     Status: "Server is operational"
```

- sudo mysql -u root -p

```
li@uss:/$ sudo mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 10
Server version: 8.0.43-0ubuntu0.24.04.2 (Ubuntu)

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql>
```

3.

Instalar y habilitar UFW（Si UFW no está instalado）

- sudo apt install ufw -y

```
li@uss:/$ sudo apt install ufw -y
```

- sudo ufw enable

```
li@uss:/$ sudo ufw enable
Command may disrupt existing ssh connections. Proceed with operation (y|n)? y
Firewall is active and enabled on system startup
```

Permitir SSH、HTTP、HTTPS

- sudo ufw allow ssh
- sudo ufw allow http
- sudo ufw allow https

```
li@uss:/$ sudo ufw allow ssh
Rule added
Rule added (v6)
li@uss:/$ sudo ufw allow http
Rule added
Rule added (v6)
li@uss:/$ sudo ufw allow https
Rule added
Rule added (v6)
```

Verificación

```
li@uss:/$ sudo ufw status
Status: active

To                         Action      From
--                         ------      ----
22/tcp                     ALLOW       Anywhere
80/tcp                     ALLOW       Anywhere
443                        ALLOW       Anywhere
22/tcp (v6)                ALLOW       Anywhere (v6)
80/tcp (v6)                ALLOW       Anywhere (v6)
443 (v6)                   ALLOW       Anywhere (v6)
```

Cree un archivo PHP para mostrar el estado del firewall en una página web

- sudo nano firewall_status.php

```
li@uss:/var/www/html$ sudo nano firewall_status.php
```

```
<!DOCTYPE html>
<html lang="es">
<head>
    <meta charset="UTF-8">
    <title>Estado del Escudo Deflector</title>
    <style>
        body { background-color: black; color: #00FFFF; font-family: Arial, sans-serif; }
        .panel { border: 2px solid #FF9999; padding: 20px; margin: 20px auto;
max-width: 600px; }
        h1, h2 { color: #FF9999; }
    </style>
</head>
<body>
    <div class="panel">
        <h1>USS Enterprise NCC-1701-D - Escudo Deflector</h1>
        <h2>Estado del Escudo</h2>
        <?php
        $ufw_status = shell_exec('sudo ufw status');
        echo "<pre>$ufw_status</pre>";
        ?>
        <p>Escudos levantados. Solo permitido SSH, HTTP y HTTPS.</p>
    </div>
</body>
</html>
```

```
 GNU nano 7.2                                  firewall_status.php
<!DOCTYPE html>
  <html lang="es">
  <head>
      <meta charset="UTF-8">
      <title>Estado del Escudo Deflector</title>
      <style>
          body { background-color: black; color: #00FFFF; font-family: Arial, sans-serif; }
          .panel { border: 2px solid #FF9999; padding: 20px; margin: 20px auto; max-width: 600px; }
          h1, h2 { color: #FF9999; }
      </style>
  </head>
  <body>
      <div class="panel">
          <h1>USS Enterprise NCC-1701-D - Escudo Deflector</h1>
          <h2>Estado del Escudo</h2>
          <?php
          $ufw_status = shell_exec('sudo ufw status');
          echo "<pre>$ufw_status</pre>";
          ?>
          <p>Escudos levantados. Solo permitido SSH, HTTP y HTTPS.</p>
      </div>
  </body>
  </html>
```

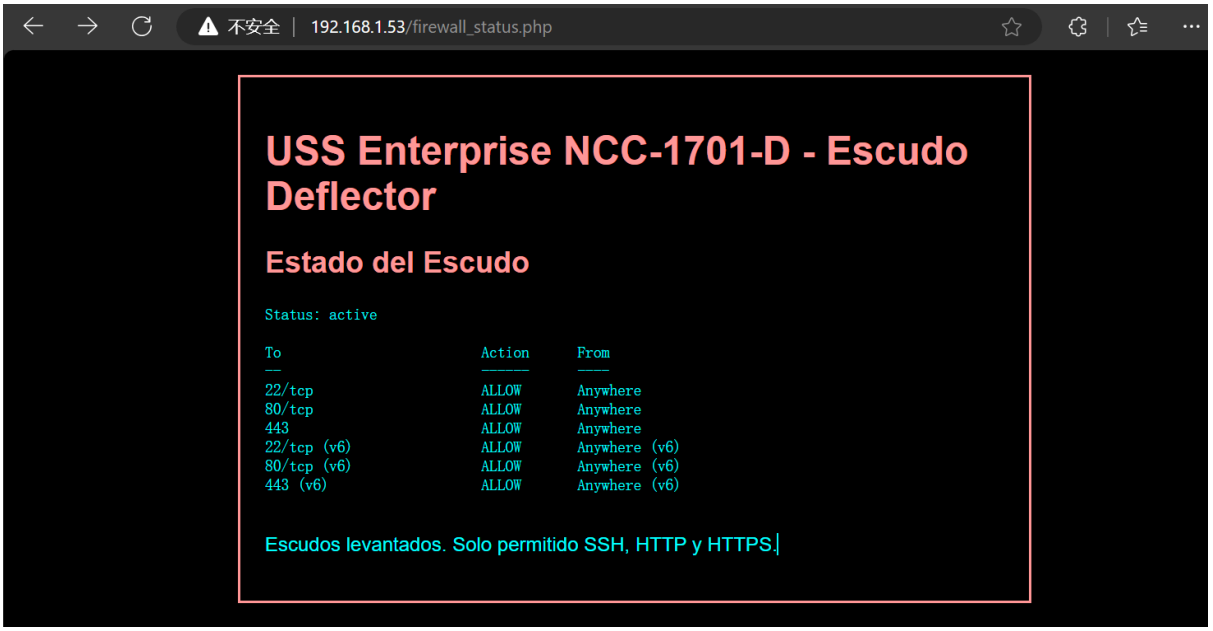
Conceder permiso a PHP para ejecutar el comando ufw status.

- sudo visudo

Añadir al final del documento：www-data ALL=(ALL) NOPASSWD: /usr/sbin/ufw status

```
# Allow members of group sudo to execute any command
%sudo   ALL=(ALL:ALL) ALL

# See sudoers(5) for more information on "@include" directives:

@includedir /etc/sudoers.d
 www-data ALL=(ALL) NOPASSWD: /usr/sbin/ufw status
```

Acceso al navegador：http://IP/firewall_status.php



4.

Instalar Docker

- sudo apt install -y apt-transport-https ca-certificates curl software-properties-common gnupg lsb-release

- curl -fsSL https://download.docker.com/linux/ubuntu/gpg | sudo gpg --dearmor -o /usr/share/keyrings/docker-archive-keyring.gpg

- echo "deb [arch=$(dpkg --print-architecture) signed-by=/usr/share/keyrings/docker-archive-keyring.gpg] https://download.docker.com/linux/ubuntu $(lsb_release -cs) stable" | sudo tee /etc/apt/sources.list.d/docker.list > /dev/null

- sudo apt update && sudo apt install -y docker-ce docker-ce-cli containerd.io docker-buildx-plugin docker-compose-plugin

Crear script de generación de datos de telemetría

- sudo nano telem_generator.php

```
li@uss:/var/www/html$ sudo nano telem_generator.php
```

```
<?php
  $telemetry = [
      'apache_status' => shell_exec('systemctl is-active apache2'),
      'mysql_status' => shell_exec('systemctl is-active mariadb'),
      'php_version' => phpversion(),
      'docker_version' => shell_exec('docker --version 2>/dev/null') ?: 'Docker
no instalado',
      'kernel_version' => shell_exec('uname -r'),
      'uptime' => shell_exec('uptime -p')
  ];

  header('Content-Type: application/json');
  echo json_encode($telemetry, JSON_PRETTY_PRINT);
  ?>
```

```
 GNU nano 7.2                                  telem_generator.php
<?php
  $telemetry = [
      'apache_status' => shell_exec('systemctl is-active apache2'),
      'mysql_status' => shell_exec('systemctl is-active mariadb'),
      'php_version' => phpversion(),
      'docker_version' => shell_exec('docker --version 2>/dev/null') ?: 'Docker no instalado',
      'kernel_version' => shell_exec('uname -r'),
      'uptime' => shell_exec('uptime -p')
  ];

  header('Content-Type: application/json');
  echo json_encode($telemetry, JSON_PRETTY_PRINT);
  ?>
```

Crear página de visualización de telemetría:

- sudo nano telem_panel.html

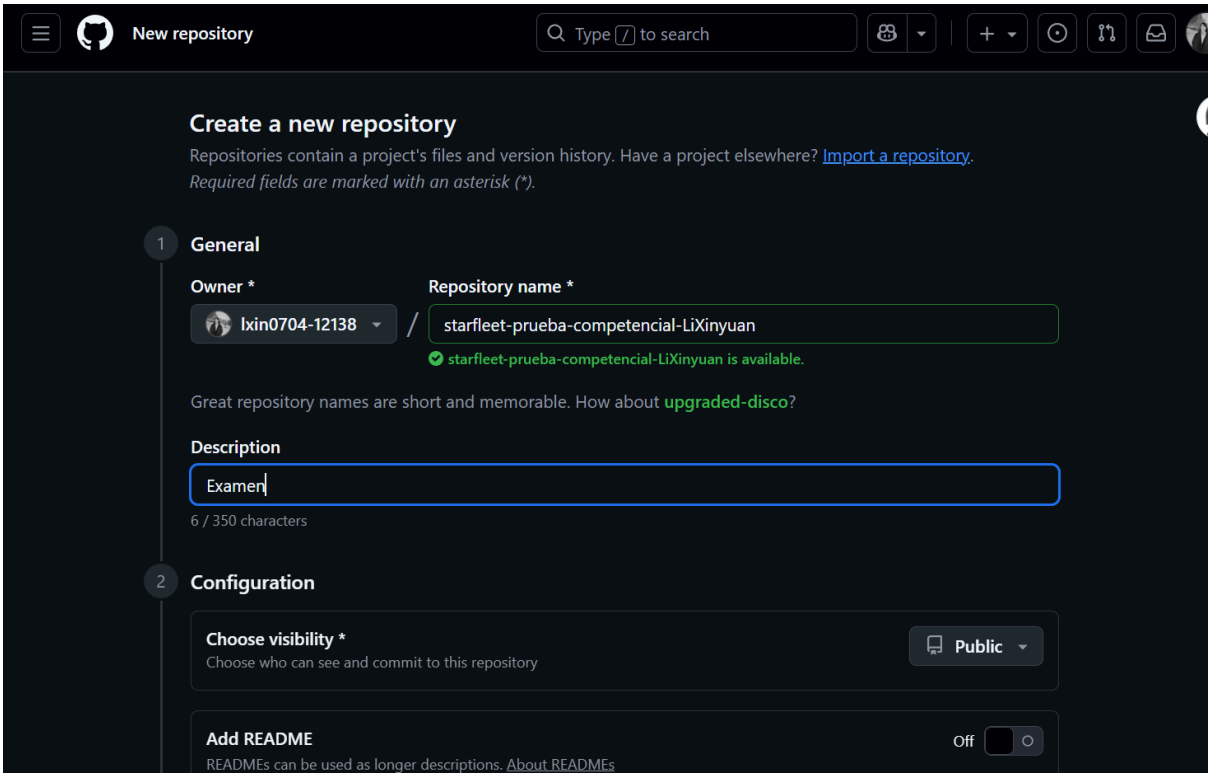

```
<!DOCTYPE html>
  <html lang="es">
  <head>
    <meta charset="UTF-8">
    <title>Panel de Diagnóstico de Ingeniería</title>
    <style>
      body { background-color: black; color: #00FFFF; font-family: Arial,
sans-serif; }
      .lcars-panel { border: 3px solid #FF9999; padding: 15px; margin: 10px
auto; max-width: 800px; }
      .lcars-title { color: #FF9999; border-bottom: 2px solid #FF9999;
padding-bottom: 5px; }
      .telemetry-item { margin: 10px 0; padding: 5px; border: 1px solid
#00FFFF; }
      .telemetry-label { color: #FF9999; font-weight: bold; }
    </style>
  </head>
  <body>
    <div class="lcars-panel">
      <h1 class="lcars-title">Panel de Diagnóstico de Ingeniería - USS
Enterprise NCC-1701-D</h1>
      <div id="telemetry-data" class="telemetry-item">
        Cargando datos de telemetría...
      </div>
    </div>

    <script>
      fetch('telem_generator.php')
        .then(response => response.json())
        .then(data => {
          const telemetryDiv = document.getElementById('telemetry-data');
          telemetryDiv.innerHTML = `
            <div><span class="telemetry-label">Estado Apache:</span>
${data.apache_status}</div>
            <div><span class="telemetry-label">Estado MySQL:</span>
${data.mysql_status}</div>
            <div><span class="telemetry-label">Versión PHP:</span>
${data.php_version}</div>
```

```
                    <div><span class="telemetry-label">Versión Docker:</span>
${data.docker_version}</div>
                    <div><span class="telemetry-label">Versión Kernel:</span>
${data.kernel_version}</div>
                    <div><span class="telemetry-label">Tiempo Activo:</span>
${data.uptime}</div>
                `;
            })
            .catch(error => {
                document.getElementById('telemetry-data').innerHTML = `
                    <div class="error">Error al cargar telemetría:
${error.message}</div>
                `;
            });
        </script>
    </body>
    </html>
```

Acceder a través del navegador http://IP/telem_panel.html

5.

Crear repositorio GitHub e inicializar
https://github.com/



- mkdir starfleet-prueba-competencial-LiXinyuan

```
li@uss:/var/www/html$ cd
li@uss:~$ mkdir starfleet-prueba-competencial-LiXinyuan
li@uss:~$ cd starfleet-prueba-competencial-LiXinyuan
li@uss:~/starfleet-prueba-competencial-LiXinyuan$
```

- git init

```
li@uss:~/starfleet-prueba-competencial-LiXinyuan$ git init
hint: Using 'master' as the name for the initial branch. This default branch name
hint: is subject to change. To configure the initial branch name to use in all
hint: of your new repositories, which will suppress this warning, call:
hint:
hint:   git config --global init.defaultBranch <name>
hint:
hint: Names commonly chosen instead of 'master' are 'main', 'trunk' and
hint: 'development'. The just-created branch can be renamed via this command:
hint:
hint:   git branch -m <name>
Initialized empty Git repository in /home/li/starfleet-prueba-competencial-LiXinyuan/.git/
```

Copiar archivos al directorio

- cp /var/www/html/firewall_status.php .
- cp /var/www/html/telem_generator.php .
- cp /var/www/html/telem_panel.html .
- cp /etc/motd .

```
li@uss:~/starfleet-prueba-competencial-LiXinyuan$ cp /var/www/html/firewall_status.php .
li@uss:~/starfleet-prueba-competencial-LiXinyuan$ ls
firewall_status.php
li@uss:~/starfleet-prueba-competencial-LiXinyuan$ cp /var/www/html/telem_generator.php .
li@uss:~/starfleet-prueba-competencial-LiXinyuan$ cp /var/www/html/telem_panel.html .
li@uss:~/starfleet-prueba-competencial-LiXinyuan$ cp /etc/motd .
li@uss:~/starfleet-prueba-competencial-LiXinyuan$ ls
firewall_status.php  motd  telem_generator.php  telem_panel.html
```

Editar el archivo README.md

```
li@uss:~/starfleet-prueba-competencial-LiXinyuan$ sudo nano README.md
```

```
  GNU nano 7.2                                                README.md *
Examen del cadate:Li Xinyuan
ID Grupo:12138
Saludo LCARS:"Todos los sistemas operativos."
Fecha: 2025/11/18
```

Configurar la información global del usuario

- git config --global user.name "lxin0704-12138"
- git config --global user.email "lxin0704@gmail.com"

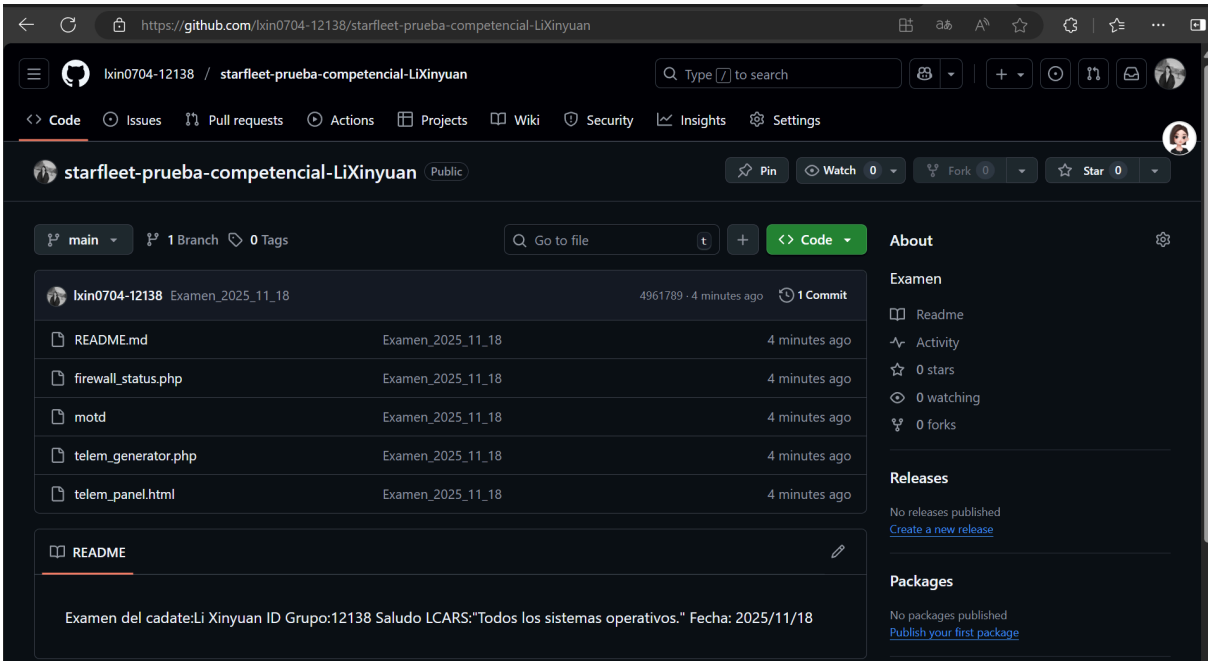
```
li@uss:~/starfleet-prueba-competencial-LiXinyuan$ git config --global user.name "lxin0704-12138"
li@uss:~/starfleet-prueba-competencial-LiXinyuan$ git config --global user.email "lxin0704@gmail.com"
```

Confirmar en Git

- git add .
- git commit -m "Examen_2025_11_18"
- git branch -M main
- git remote add origin https://github.com/lxin0704-12138/starfleet-prueba-competencial-LiXinyuan.git
- git push -u origin main

```
li@uss:~/starfleet-prueba-competencial-LiXinyuan$ git add .
li@uss:~/starfleet-prueba-competencial-LiXinyuan$ git commit -m "Examen_2025_11_18"
[master (root-commit) 4961789] Examen_2025_11_18
 5 files changed, 146 insertions(+)
 create mode 100644 README.md
 create mode 100644 firewall_status.php
 create mode 100644 motd
 create mode 100644 telem_generator.php
 create mode 100644 telem_panel.html
li@uss:~/starfleet-prueba-competencial-LiXinyuan$ git branch -M main
li@uss:~/starfleet-prueba-competencial-LiXinyuan$ git remote add origin https://github.com/lxin0704-12138/starfleet-pru
eba-competencial-LiXinyuan.git
li@uss:~/starfleet-prueba-competencial-LiXinyuan$ git push -u origin main
```

```
li@uss:~/starfleet-prueba-competencial-LiXinyuan$ git push -u origin main
Username for 'https://github.com': lxin0704-12138
Password for 'https://lxin0704-12138@github.com':
Enumerating objects: 7, done.
Counting objects: 100% (7/7), done.
Compressing objects: 100% (7/7), done.
Writing objects: 100% (7/7), 2.98 KiB | 2.98 MiB/s, done.
Total 7 (delta 0), reused 0 (delta 0), pack-reused 0
To https://github.com/lxin0704-12138/starfleet-prueba-competencial-LiXinyuan.git
 * [new branch]      main -> main
branch 'main' set up to track 'origin/main'.
```



Inicie sesión en el sitio web de GitHub, abra el contenedor creado y seleccione «Subir archivos» (subir archivos PDF, capturas de pantalla, etc.).
https://github.com/