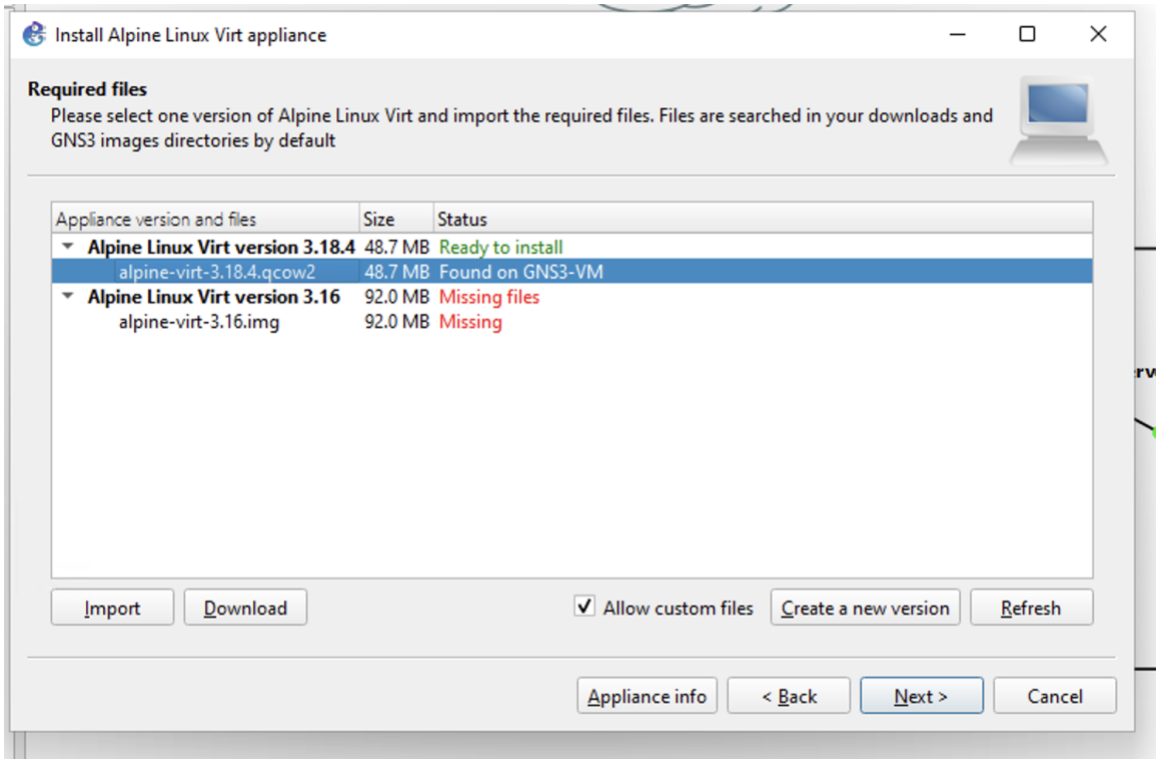
Lab Guide: Alpine Linux Deployment, Configuring Services and FortiGate Integration

1. Adding Alpine Linux to GNS3



- In the GNS3 left-hand menu, click the **"+" (New Template)** icon.
- Select **"Install an appliance from the GNS3 server (recommended)"**.
- Search for "Alpine".
- Select **"Alpine Linux virt"** and click **Install**. Follow the Wizard.
- Choose the latest version click on download button to have GNS3 fetch it and download automatically
- Import the `.qcow2` file when completed.
- Click **Next** and **Finish**. The template will now appear in your "End Devices" list.

2. Deploying Services on Alpine Linux

Step 1: Configure Static IP

- **Access Interfaces File:** `vi /etc/network/interfaces`
- **Configure Static IP:** *(In the vi editor Press `i` to insert, paste the content below, then press `Esc`, type `:wq`, and press `Enter`)*

```
auto eth0
iface eth0 inet static
      address 10.0.4.50
      netmask 255.255.255.0
      gateway 10.0.4.1
```

- **Apply Changes:** `rc-service networking restart`
- **Update System:** `apk update`

Step 2: OpenSSH Server Configuration

- **Install Package:** `apk add openssh`
- **Enable & Start:**
  - `rc-update add sshd default`
  - `rc-service sshd start`
- **Root Access (Optional):**
  - Edit `/etc/ssh/sshd_config` and set `PermitRootLogin yes`.
  - Restart service: `rc-service sshd restart`.

Step 3: Nginx Web Server Configuration

- **Install Package:** `apk add nginx`
- **Create Configuration File:** `vi /etc/nginx/nginx.conf`
- *(In the vi editor Press `i` to insert, paste the content below, then press `Esc`, type `:wq`, and press `Enter`)*

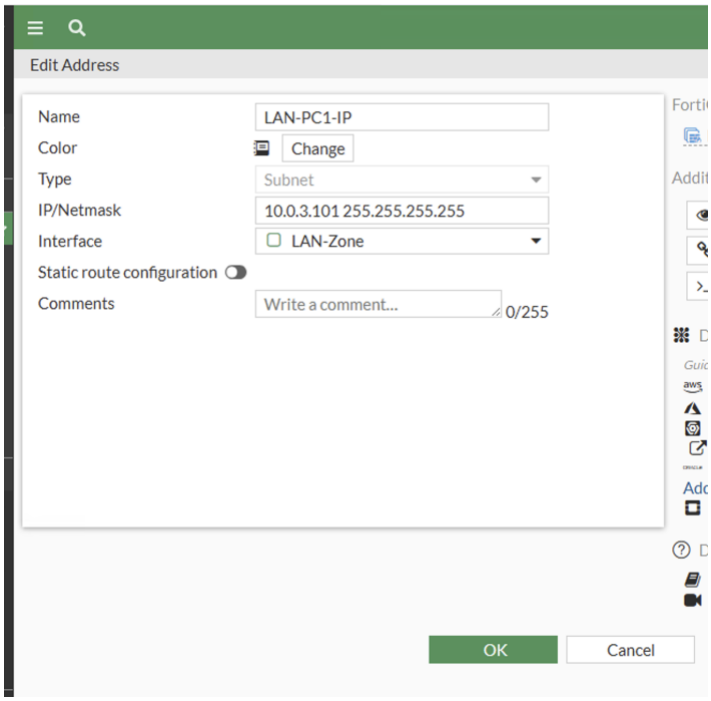
```
worker_processes  1;
events { worker_connections 1024; }
http {
    server {
        listen 80;
        location / {
            root /var/www/localhost/htdocs;
            index index.html;
        }
    }
}
EOF
```

- **Deploy Content & Permissions:**
  - `echo "<h1>Lab Success!</h1>" > /var/www/localhost/htdocs/index.html`
  - `chown -R nginx:nginx /var/www/localhost/htdocs`
  - `chmod -R 755 /var/www/localhost/htdocs`
- **Enable & Start:**
  - `rc-update add nginx default`
  - `rc-service nginx start`

3. Firewall Integration (FortiGate UI)

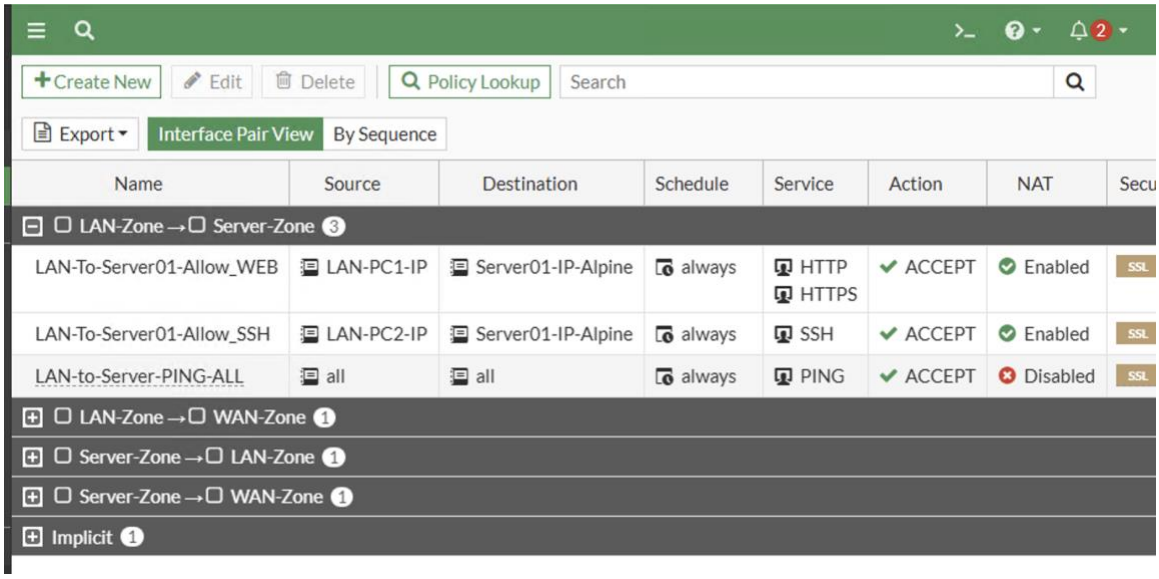
To ensure your LAN PCs can reach the Alpine servers, you must define the "Objects" (IP addresses) and then create a "Policy" to allow the traffic.

Step 1: Create Address Objects



- Go to **Policy & Objects > Addresses**.
- Click **Create New > Address**. (repeat for all 4 servers).
    - **Name:** `Server01-IP-Alpine`
    - **Type:** Subnet/IP Range.
    - **IP/Netmask:** `10.0.4.50/255.255.255.255` (Ensure this matches the IP set on your end devices).
    - **Interface:** Select the interface the Alpine server is connected to (or `any`).
    - Click **OK**.

Step 2: Create Firewall Policy



- Go to **Policy & Objects > Firewall Policy**.
- Click **Create New**.
    - **Name:** `Allow_LAN_to_Alpine_Services`.
    - **Incoming Interface:** Select the interface facing your **LAN PCs**.
    - **Outgoing Interface:** Select the interface facing your **Alpine Servers**.
    - **Source:** Select the `all` object or the specific address object of your LAN PCs.
    - **Destination:** Select your `Alpine_Server_1` (and any other server objects).
    - **Schedule:** `always`.
    - **Service:** Select `SSH` and `HTTP` (or create a custom group containing TCP 22 and 80).
    - **Action:** `ACCEPT`.
    - **NAT:** Usually **OFF** if you are routing between subnets in a lab, or **ON** if you are doing simple port forwarding.
- Logging: In the Firewall Policy settings, ensure Log Allowed Traffic is set to All Sessions.

4. Lab Verification Checklist

- **SSH Test:** Run `ssh root@192.168.1.50` from your LAN-PCs.
- **Web Test:** Navigate to `http://192.168.1.50` in your LAN-PCs.

Record which specific PCs were able to successfully reach the services to verify your firewall policy implementation.