Setup WireGuard Site to Site VPN Tunnel on pfsense 2.7.2

> This guide was inspired by Marcus Rath

Introduction

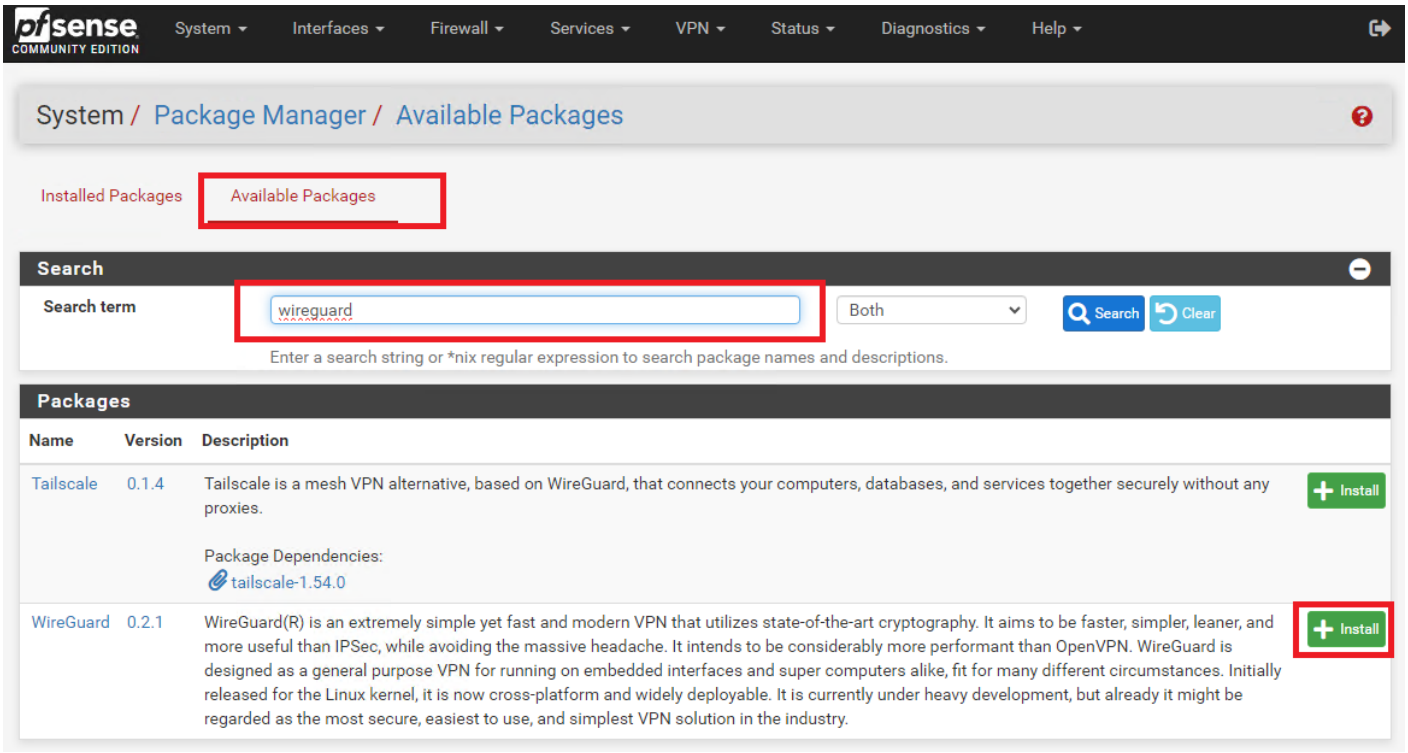
This guide will walk you through setting up a WireGuard site to site VPN tunnel on pfsense 2.7.2. For this guide we assume **Site A** with a **network subnet of 192.168.1.0/24**, **Site B with a network subnet of 192.168.24.0/24** and a **Tunnel Subnet of 10.10.12.0/30**. Obviously adjust these settings to your specific needs.

> Ensure that the **Tunnel Subnet** you choose does NOT overlap with any other network subnets currently in use in your network environment.

Install WireGuard Package on Both Sites

On **BOTH** site pfsense installations, install the **WireGuard package from System ---> Package Manager ---> Available Package**s. Enter **Wireguar**d in the **Search term** field, click search and then click on the **Install** button next to WireGuard package (**Figure 1**).

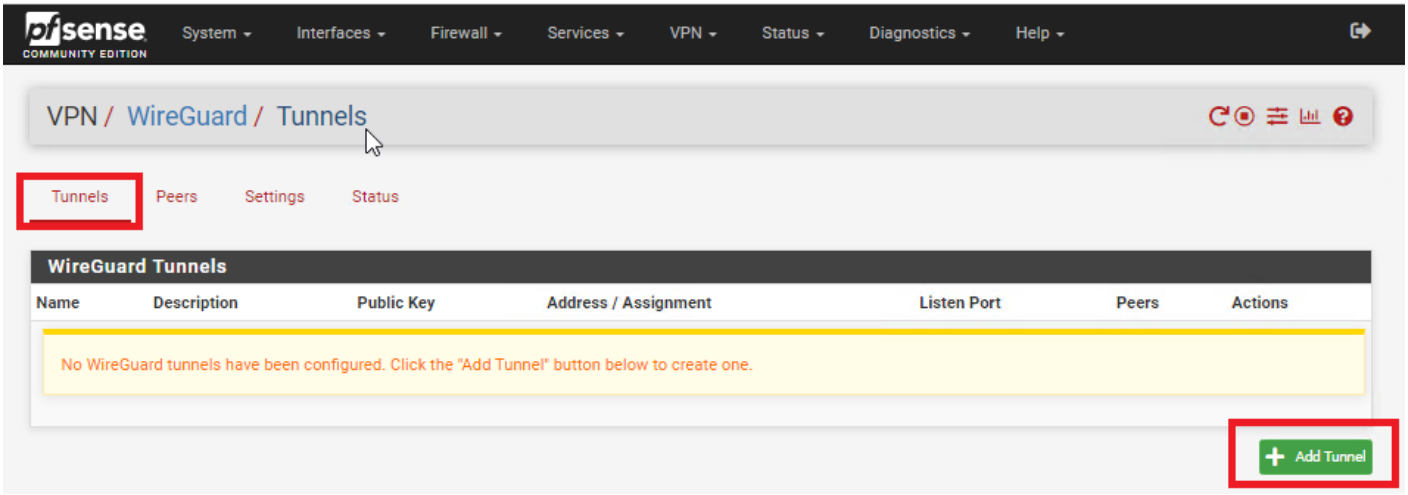
Figure 1



Create Tunnel on Site A

On **Site A**, refresh the pfsense web GUI and navigate to **VPN ---> Wireguard,** click on the **Tunnels** tab and then click on **Add Tunnel** button (**Figure 2**).

Figure 2

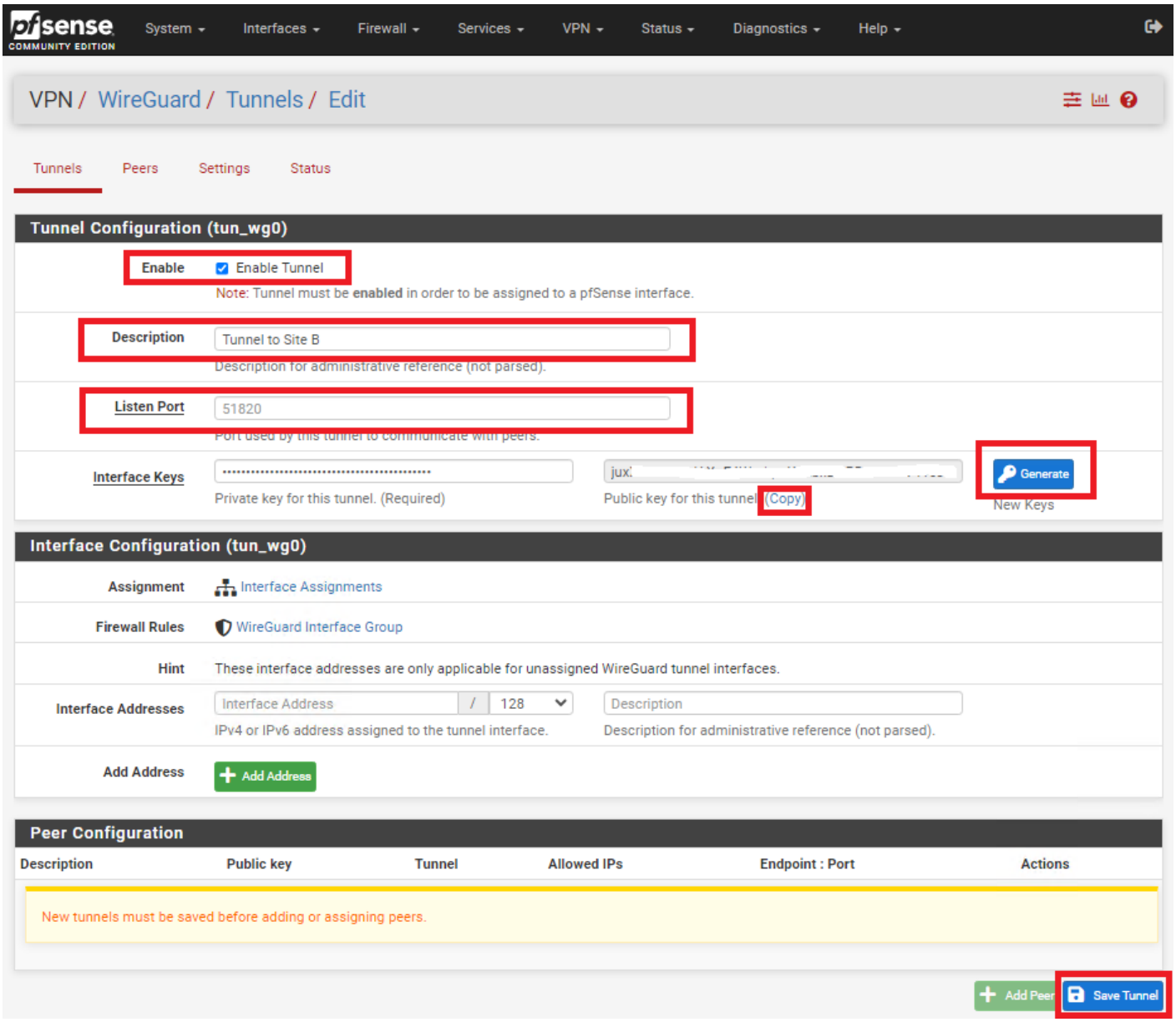


In the **Tunnel Configuration** fill/set in the following fields (**Figure 3**):

- **Enable:** Checked
- **Description:** Optionally, describe the purpose of this tunnel (Ex: Tunnel to Site B)
- **Listen Port:** Leave blank to use port UDP/51820 or enter a specific port number you with to use

- **Interface Keys:** click the **Generate** button to create a new Private/Public key pair and copy the **Public Key** that's generated in order to enter it in the Public Key field on Site B.
- Click the **Save Tunnel** button

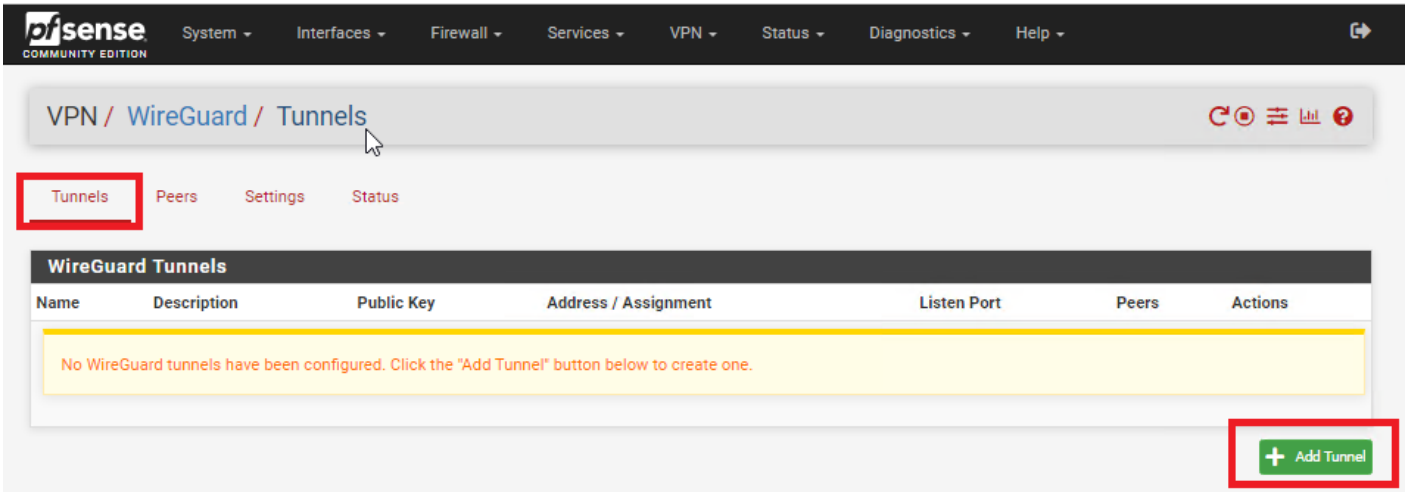
Figure 3



Create Tunnel on Site B

On **Site B**, refresh the pfsense web GUI and navigate to **VPN ---> Wireguard,** click on the **Tunnels** tab and then click on **Add Tunnel** button (**Figure 4**).

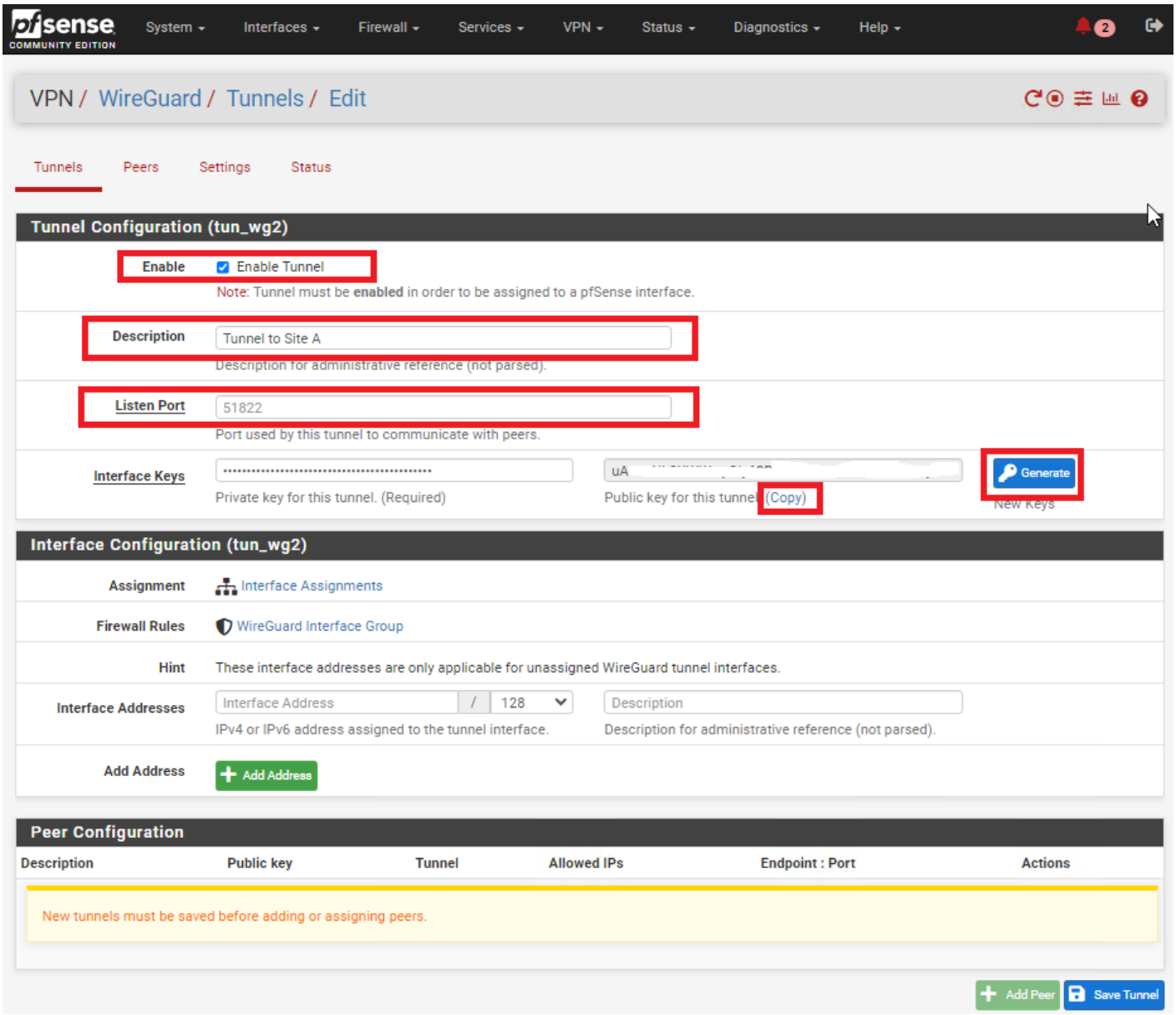
Figure 4



In the **Tunnel Configuration** fill/set in the following fields (**Figure 5**):

- **Enable:** Checked
- **Description:** Optionally, describe the purpose of this tunnel(Ex: Tunnel to Site A)
- **Listen Port:** Leave blank to use port UDP/51820 or enter a specific port number you with to use
- **Interface Keys:** click the **Generate** button to create a new Private/Public key pair and copy the **Public Key** that's generated in order to enter it in the Public Key field on Site B.
- Click the **Save Tunnel** button

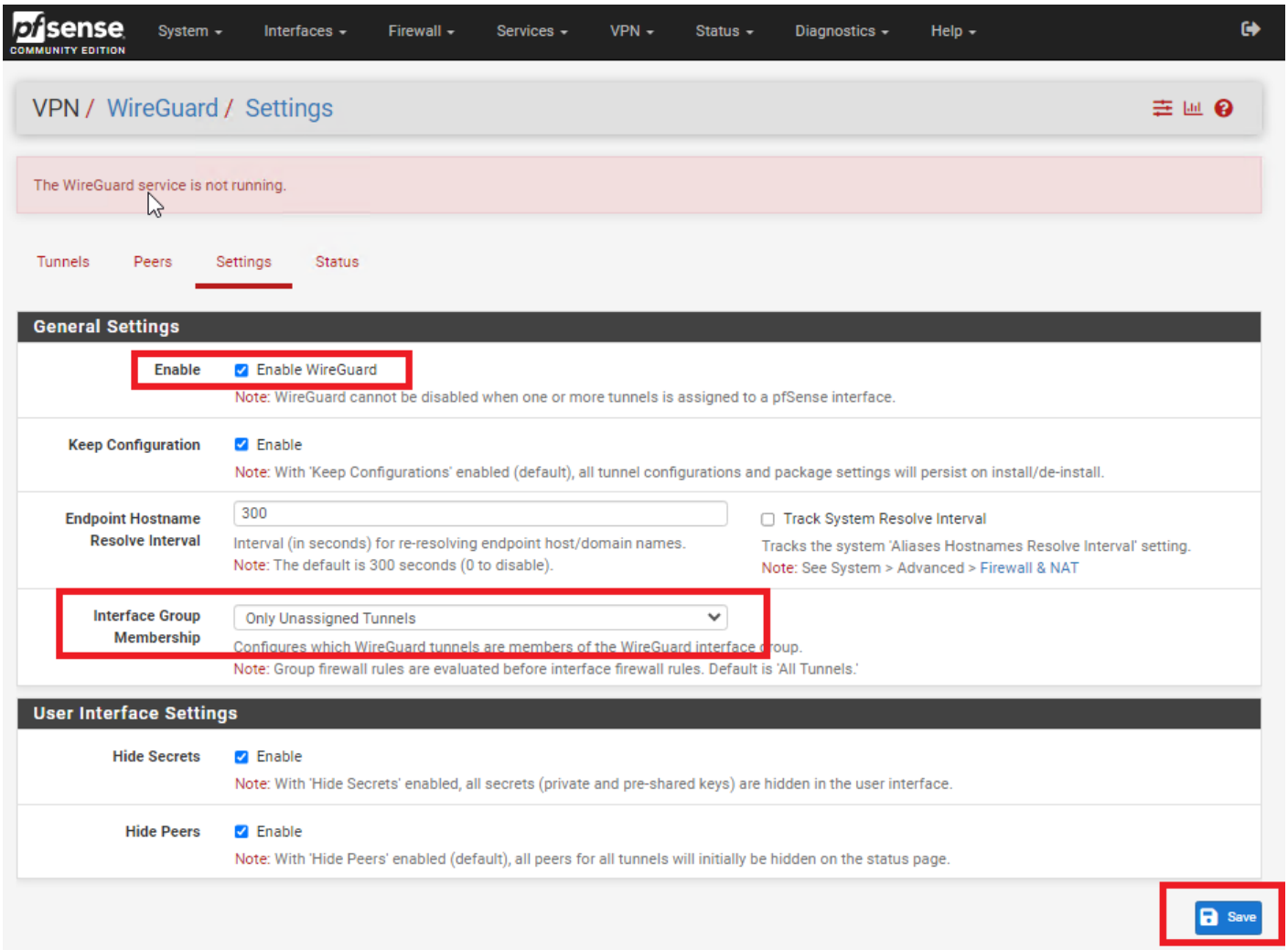
Figure 5



Enable WireGuard on Both Sites

On **BOTH** sites, navigate to **VPN ---> WireGuard**, click on the **Settings** tab and click on the **Enable WireGuard** checkbox, select **Only Unassigned Tunnels** on the **Interface Group Membership** drop-down and then click on the **Save** button (**Figure 6**).

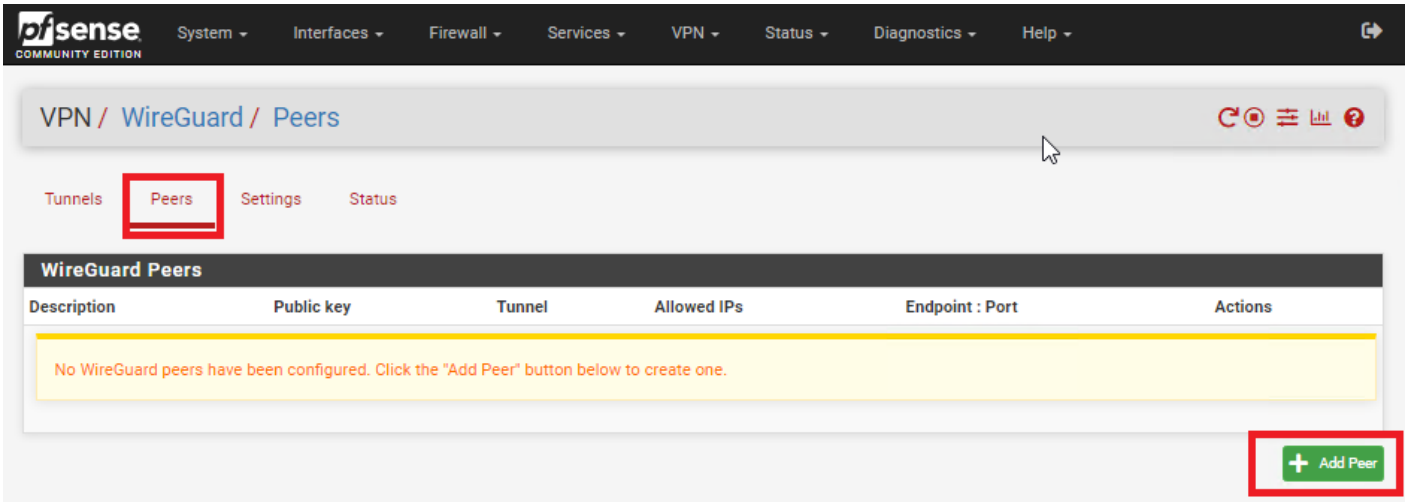
Figure 6



Add Peer on Site A

On **Site A**, navigate to **VPN ---> WireGuard**, click on the **Peers** tab and then click on the **Add Peer** button (**Figure 7**).

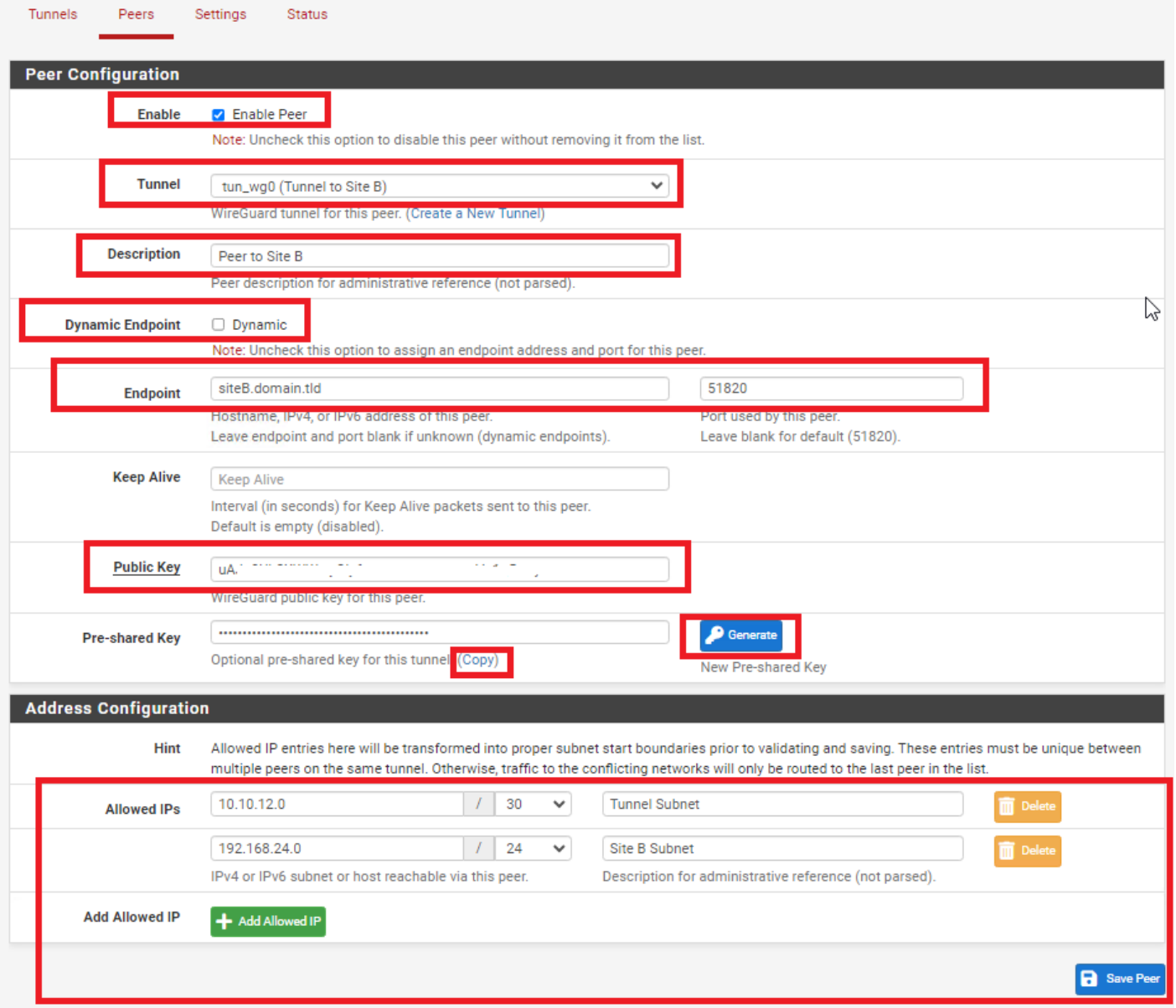
Figure 7



In the **Peer Configuration** fill/set in the following fields (**Figure 8**):

- **Enable:** Checked
- **Tunnel**: Select the Tunnel previously configured from the drop-down list
- **Description:** Optionally, describe the purpose of this Peer (Ex: Peer to Site B)
- **Dynamic Endpoint:** Unchecked
- **Endpoint**: Fill in the Internet IP or Hostname as well as the port number for **Site B**
- **Public Key**: Paste the previously copied **Public Key** from the **Tunnel** on **Site B**
- **Pre-shared Key:** Click the Generate button to generate a new pre-shared key and copy it in order to paste in the Peer configuration of **Site B**
- **Allowed IPs**: Enter an **UNUSED** Network address (Example: 10.10.12.0) with a CIDR of **30** (For a total of two IPs) in the first field, click the **Add Allowed IP** and then enter the Network Address and corresponding CIDR of the subnet for **Site B**
- Click the **Save Peer** button

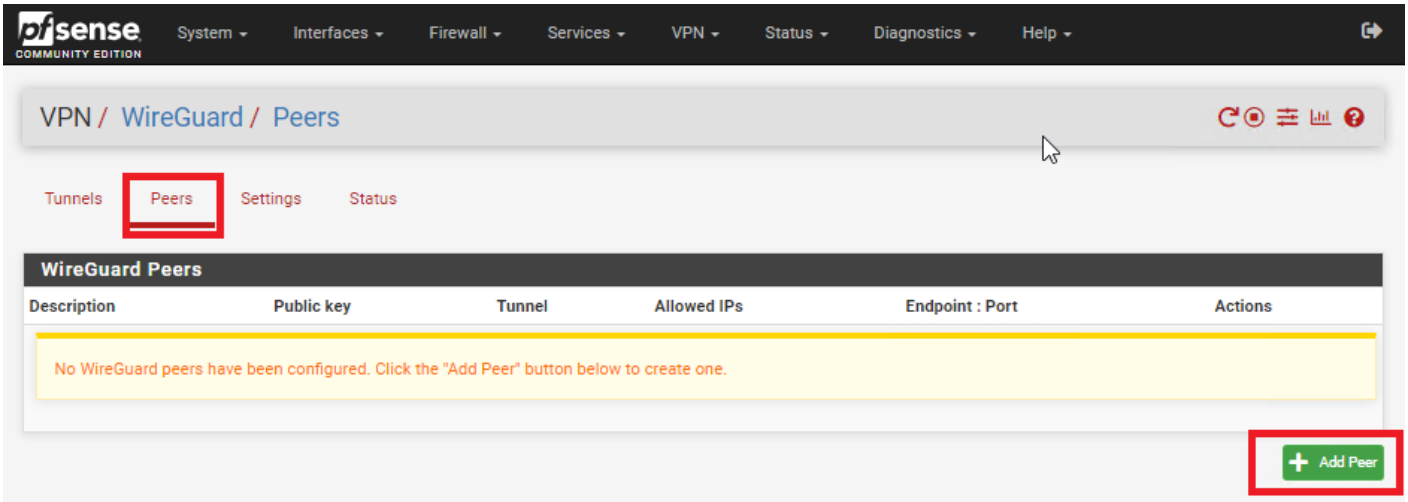
Figure 8



Add Peer on Site B

On **Site B**, navigate to **VPN ---> WireGuard**, click on the **Peers** tab and then click on the **Add Peer** button (**Figure 9**).

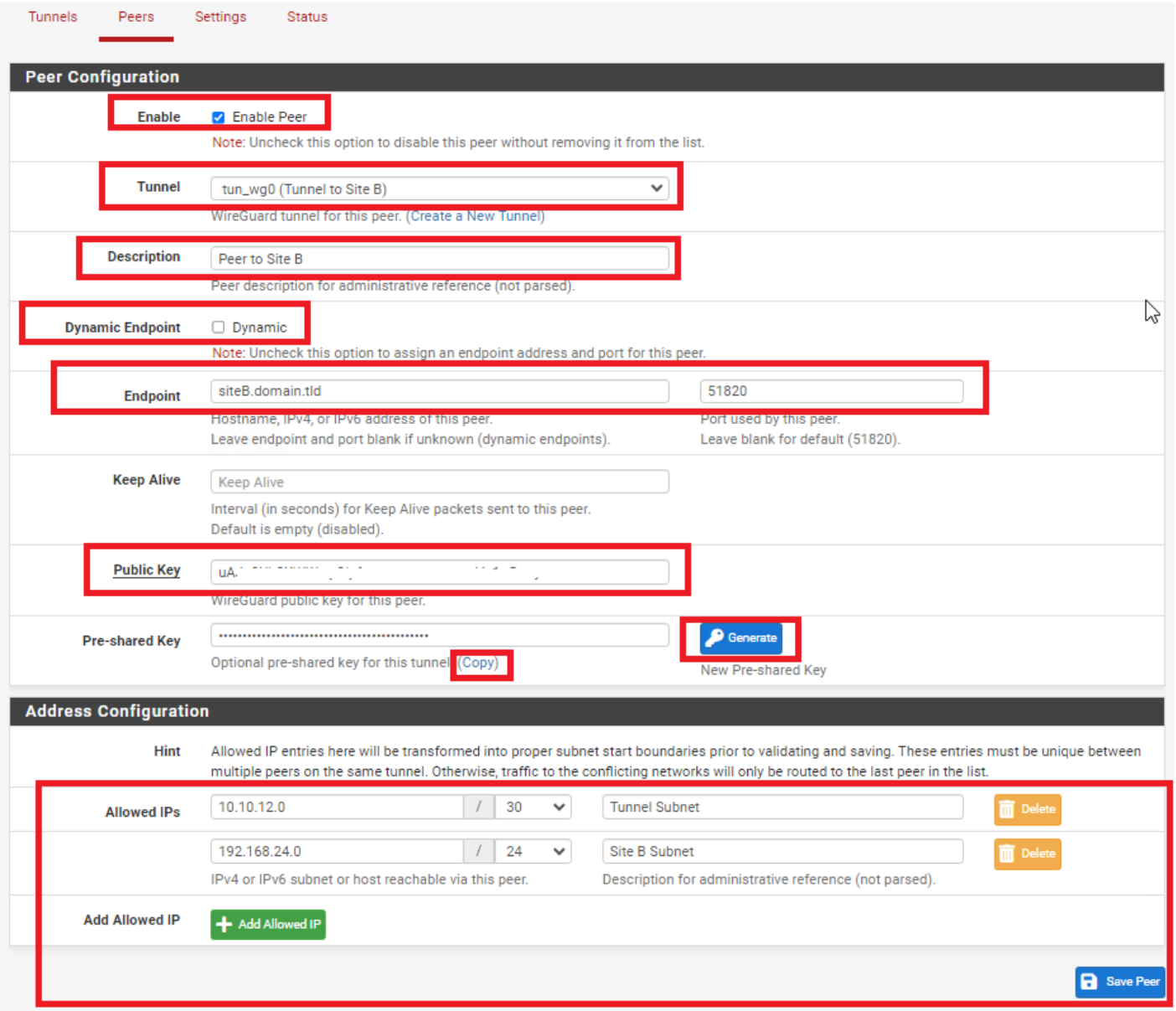
Figure 9



In the **Peer Configuration** fill/set in the following fields (**Figure 10**):

- **Enable:** Checked
- **Tunnel**: Select the Tunnel previously configured from the drop-down list
- **Description:** Optionally, describe the purpose of this Peer (Ex: Peer to Site A)
- **Dynamic Endpoint:** Unchecked
- **Endpoint**: Fill in the Internet IP or Hostname as well as the port number for **Site A**
- **Public Key**: Paste the previously copied **Public Key** from the **Tunnel** on **Site A**
- **Pre-shared Key:** Paste the previously copied **Pre-Shared key** from the **Peer** on **Site A**
- **Allowed IPs**: Enter the **SAME Tunnel Subnet Network address and CIDR** you set on the **Peer** on **Site A**, click the **Add Allowed IP** and then enter the Network Address and corresponding CIDR of the subnet for **Site A**
- Click the **Save Peer** button

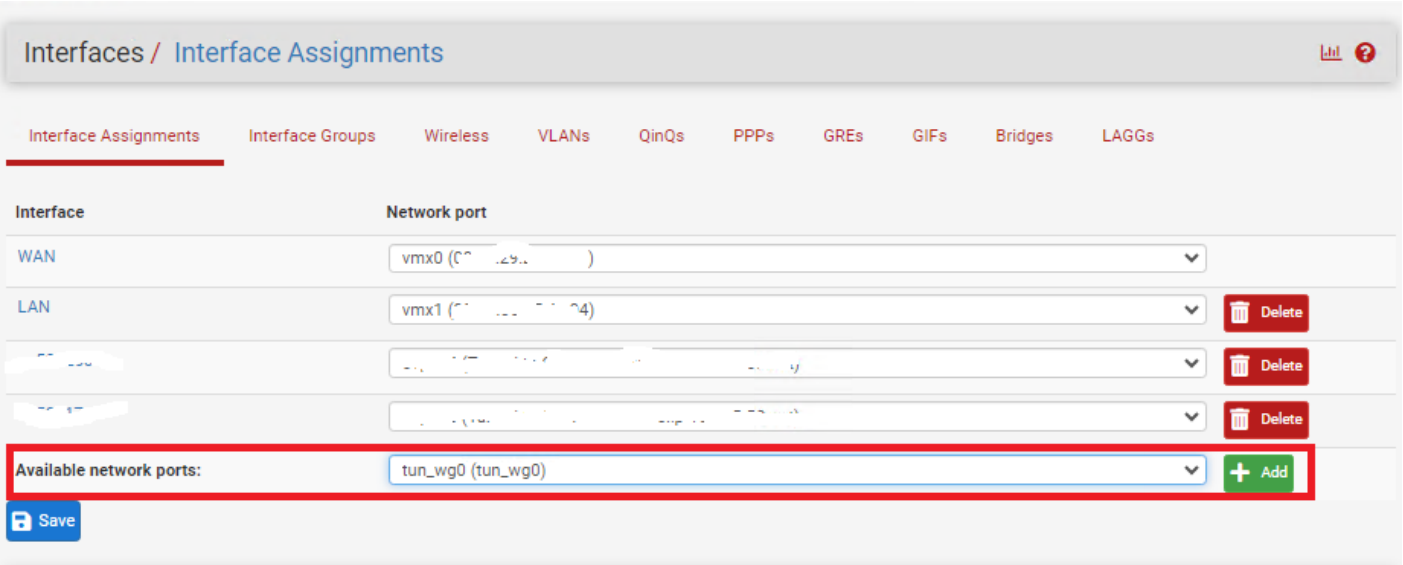
Figure 10



Configure Interface for Site A

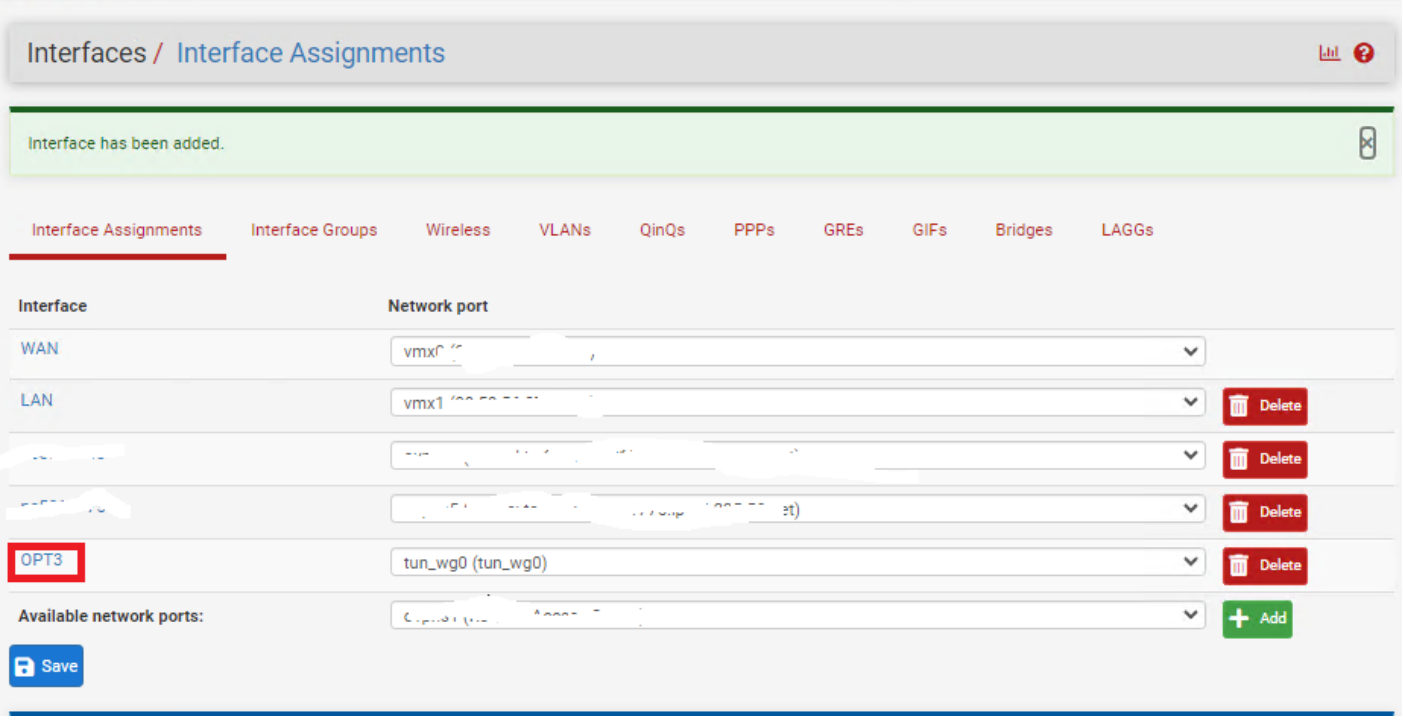
On **Site A**, navigate to **Interfaces ---> Assignments** and under **Available network ports** drop-down select the WireGuard tunnel you previously created and click the **Add** button (**Figure 11**).

Figure 11



Click on the new **OPT(X)** interface that was just created (**Figure 12**).

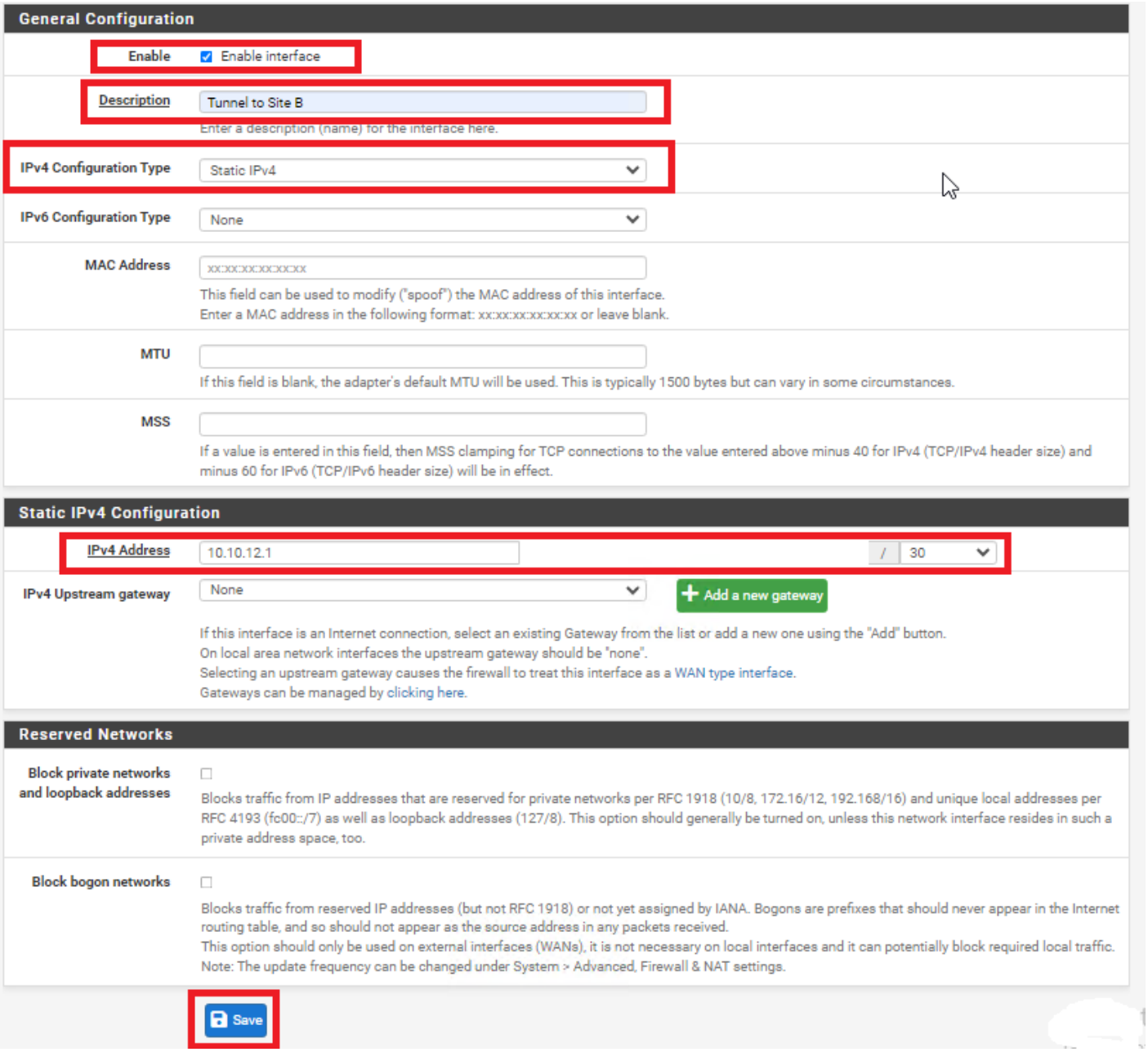
Figure 12



In the **General Configuration** page fill/set the following fields (**Figure 13**):

- **Enable:** Checked
- **Description:** Optionally, describe the purpose of this Interface (Ex: Tunnel to Site B)
- **IPv4 Configuration Type:** Static IPv4
- **IPv4 Address:** Enter an IP address for **Site A**. The IP address you enter here will be one of two possible IP addresses you can use from the /30 Tunnel Subnet you chose earlier. For this example, we used the Subnet Tunnel of **10.10.12.0/30** which gives us **10.10.12.1** and **10.10.12.2** as the only two usable IPs for this subnet. So, for this example we will use **10.10.12.1 for Site A**.
- Click the **Save** button and then click the **Apply Changes** button.

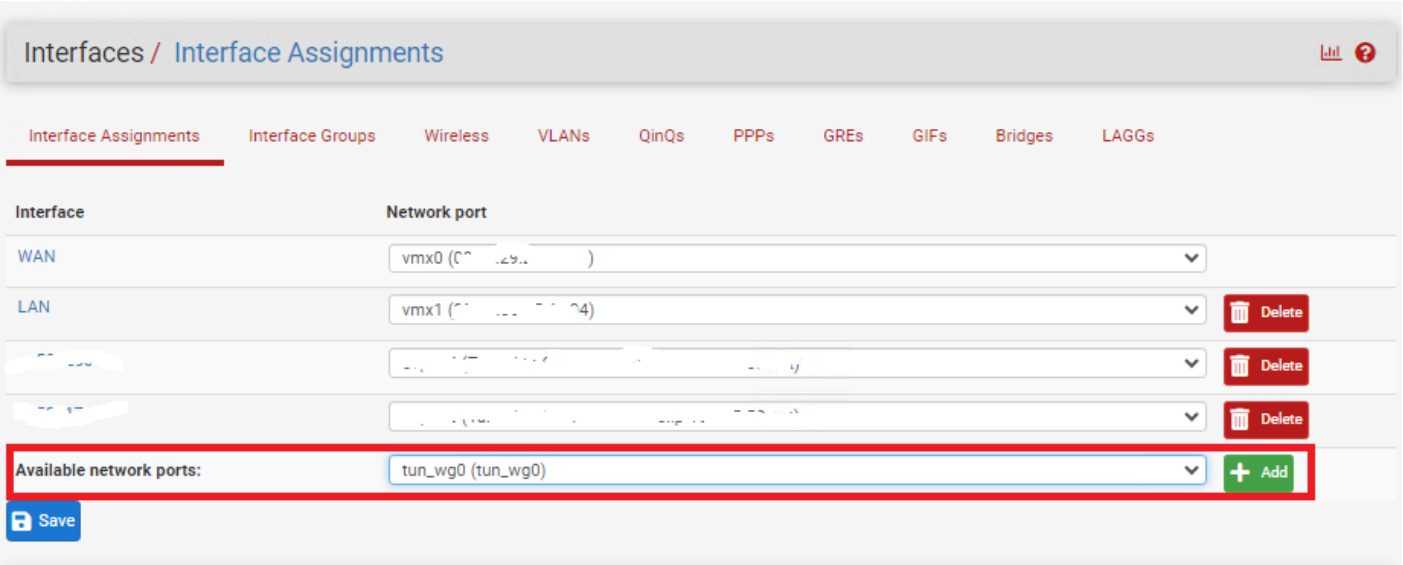
Figure 13



Configure Interface for Site B

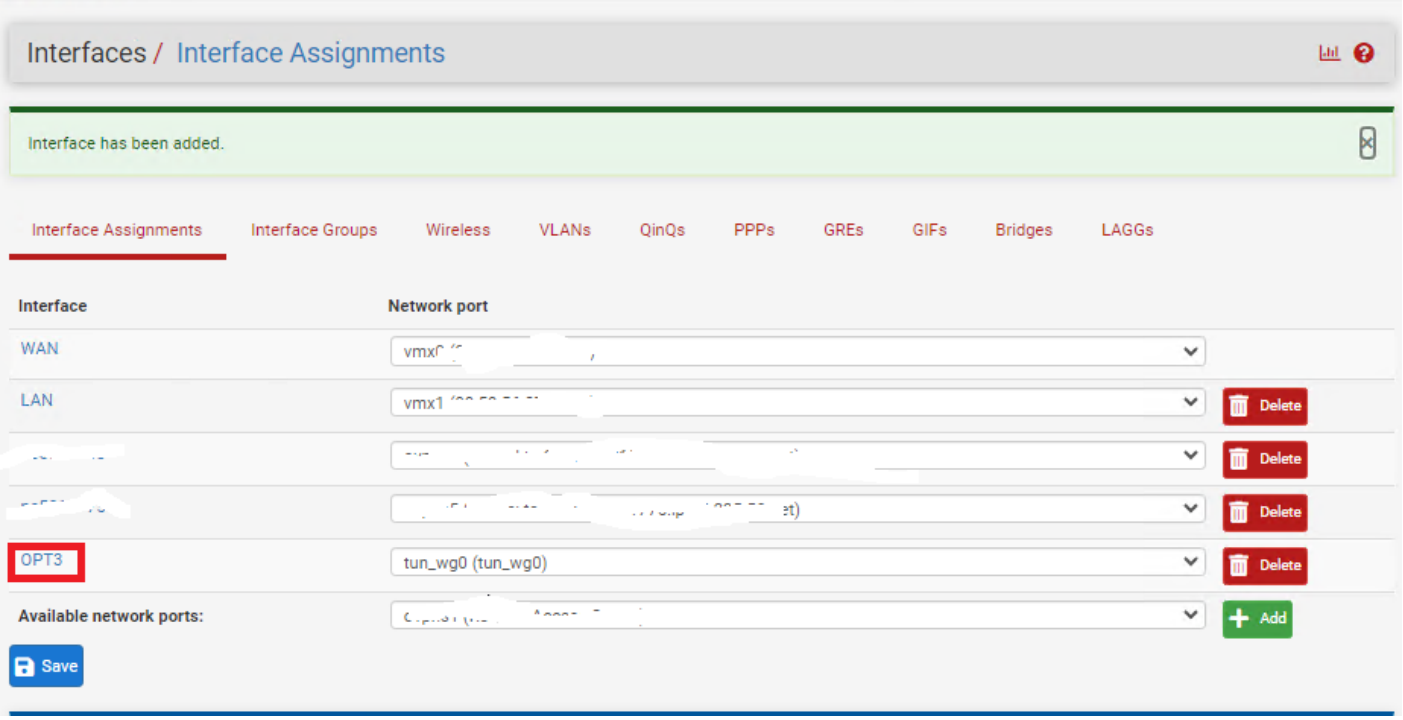
On **Site B**, navigate to **Interfaces ---> Assignments** and under **Available network ports** drop-down select the WireGuard tunnel you previously created and click the **Add** button (**Figure 14**).

Figure 14



Click on the new **OPT(X)** interface that was just created (**Figure 15**).

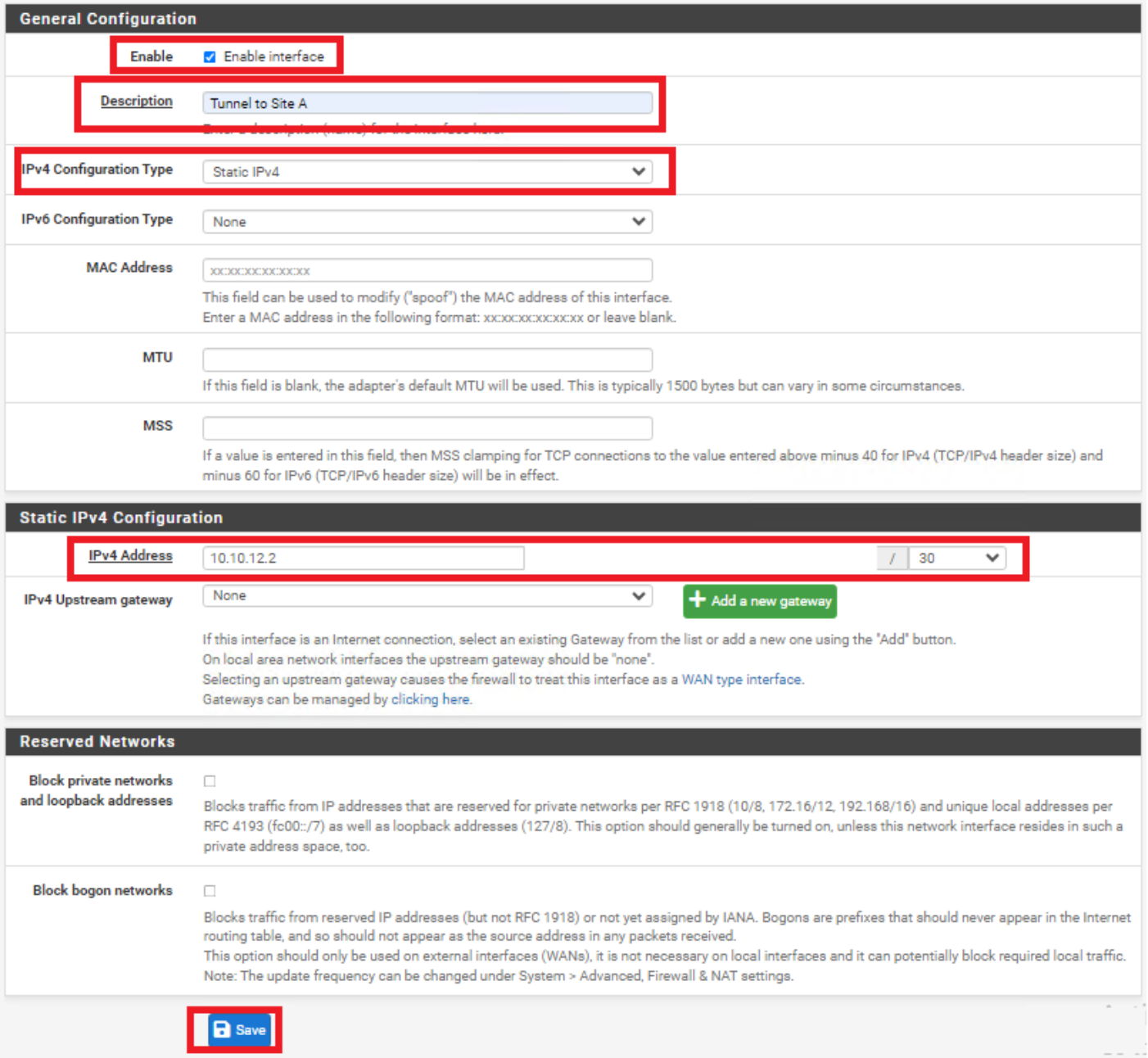
Figure 15



In the **General Configuration** page fill/set the following fields (**Figure 16**):

- **Enable:** Checked
- **Description:** Optionally, describe the purpose of this Interface (Ex: Tunnel to Site A)
- **IPv4 Configuration Type:** Static IPv4
- **IPv4 Address:** Enter an IP address for **Site B**. The IP address you enter here will be one of two possible IP addresses you can use from the /30 Tunnel Subnet you chose earlier. For this example, we used the Subnet Tunnel of **10.10.12.0/30** which gives us **10.10.12.1** and **10.10.12.2** as the only two usable IPs for this subnet. So, for this example we will use **10.10.12.2 for Site B**.
- Click the **Save** button and then click the **Apply Changes** button.

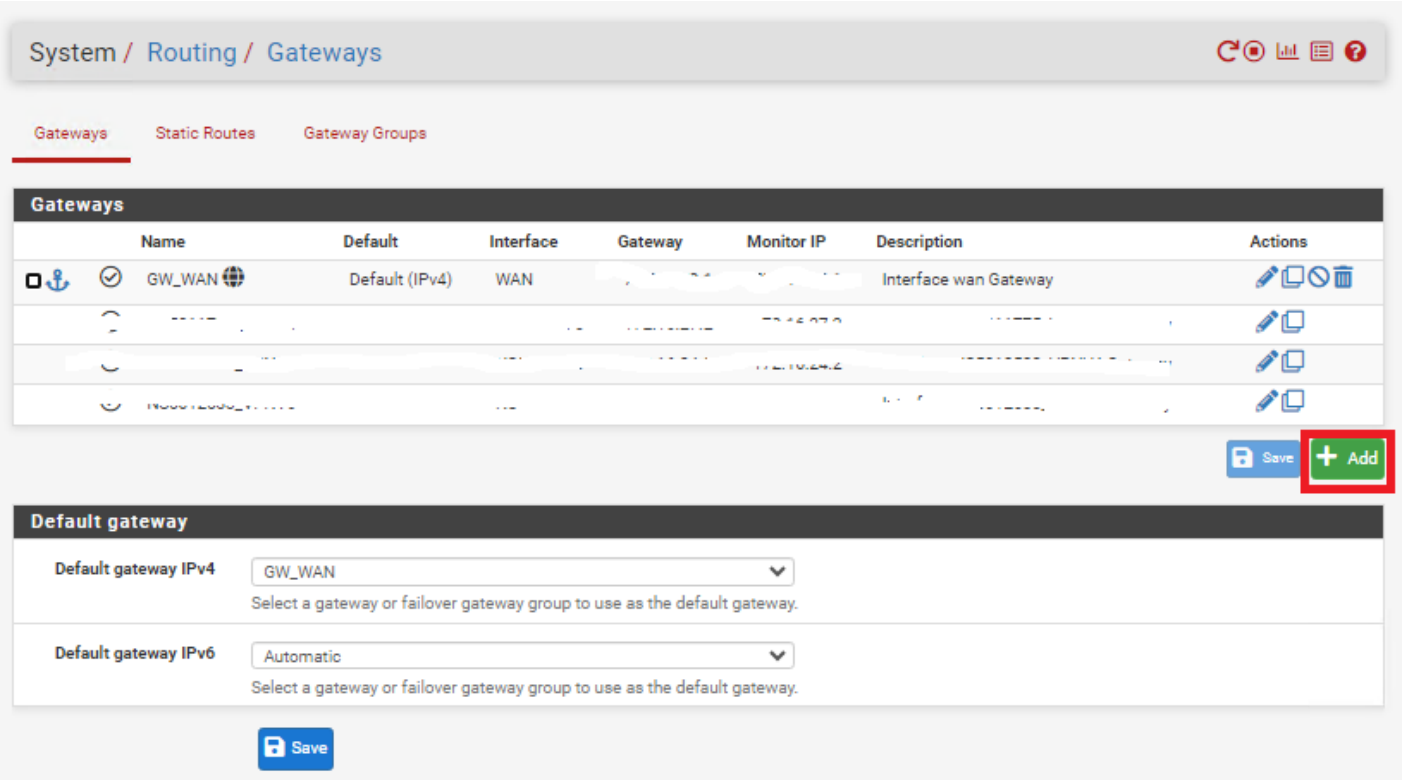
Figure 16



Create Gateway and Route on Site A

On **Site A** navigate to **System ---> Routing** and under the **Gateways** tab click the **Add** button (**Figure 17**).

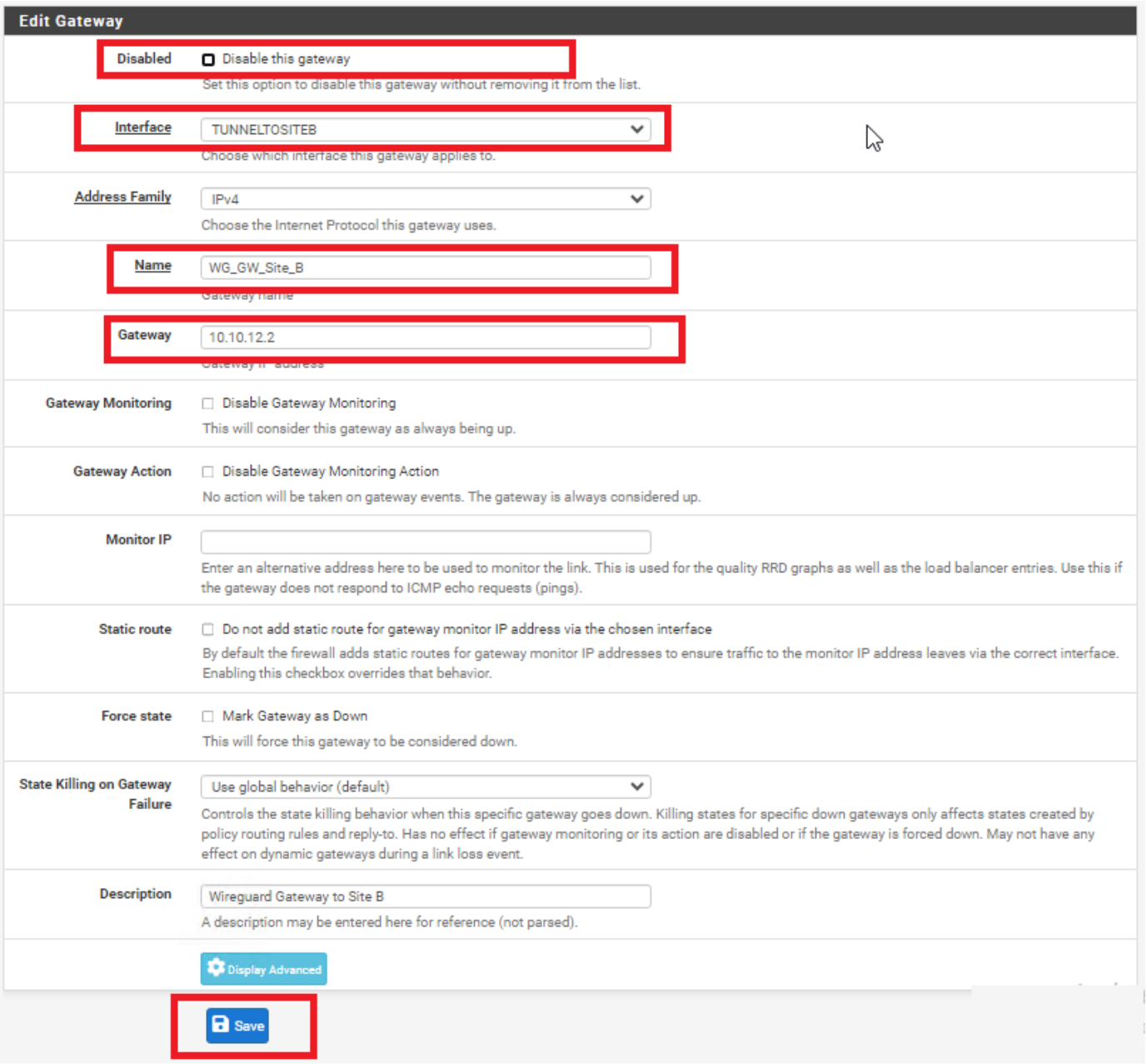
Figure 17



In the **Edit Gateway** page fill/set the following fields (**Figure 18**):

- **Disabled:** Unchecked
- **Interface:** Select the interface for **Site A** you created earlier
- **Name:** Enter a name for this gateway (Ex: WG_GW_Site_B)
- **Gateway:** Enter the **Tunnel Subnet IP** address for **Site B**. For this example we used **10.10.12.2** for **Site B**.
- **Description:** Optionally, enter a description (Ex: Wireguard Gateway to Site B)
- Click the **Save** button and then click the **Apply Changes** button.

Figure 18



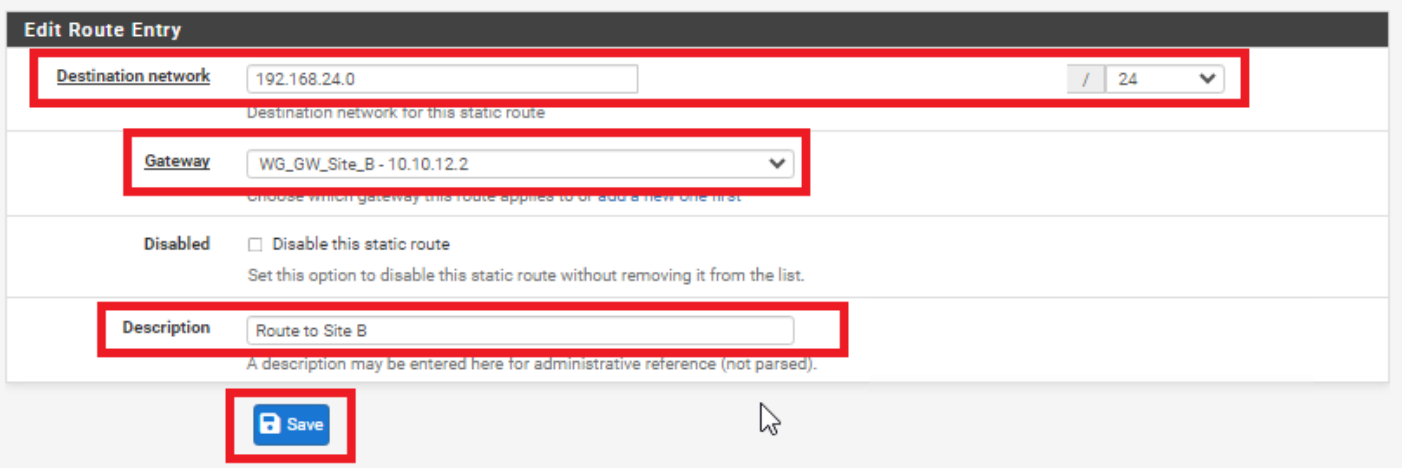
Next, on **Site A** navigate to **System ---> Routing** and under the **Static Routes** tab click the **Add** button (**Figure 19**).

Figure 19

In the **Edit Route Entry** page, fill/set the following fields (**Figure 20**):

- **Destination network:** Enter the network subnet for **Site B** (**NOT the tunnel subnet**). In this example, the network subnet we used for Site B was **192.168.24.0/24**.
- **Gateway:** Select the Gateway to **Site B** you created earlier
- **Description:** Optionally, enter a description (Ex: Route to Site B)
- Click the **Save** button and then click the **Apply Changes** button.

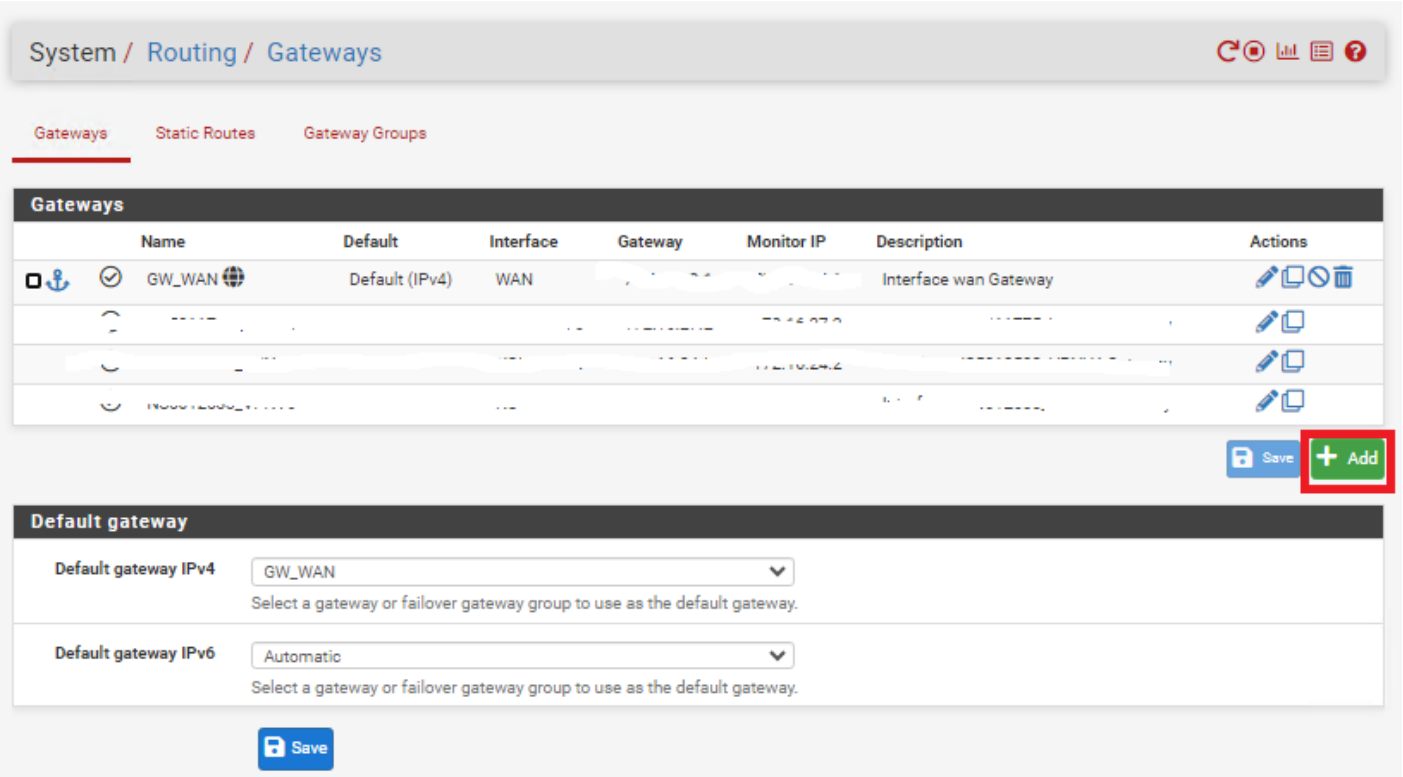
Figure 20



Create Gateway and Route on Site B

On **Site B** navigate to **System ---> Routing** and under the **Gateways** tab click the **Add** button (**Figure 21**).

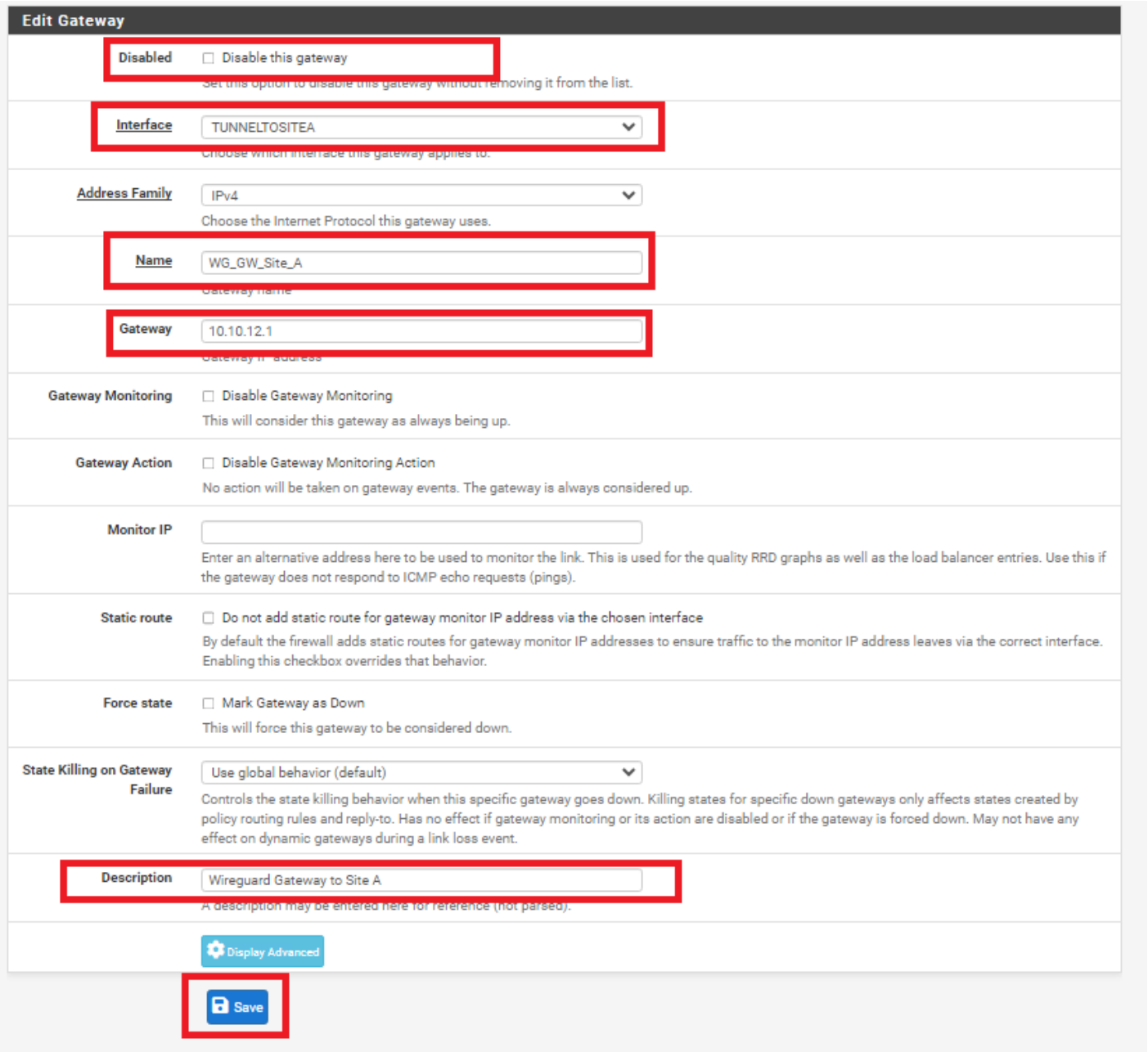
Figure 21



In the **Edit Gateway** page fill/set the following fields (**Figure 22**):

- **Disabled:** Unchecked
- **Interface:** Select the interface for **Site A** you created earlier
- **Name:** Enter a name for this gateway (Ex: WG_GW_Site_A)
- **Gateway:** Enter the **Tunnel Subnet IP** address for **Site A**. For this example we used **10.10.12.1** for **Site A**.
- **Description:** Optionally, enter a description (Ex: Wireguard Gateway to Site A)
- Click the **Save** button and then click the **Apply Changes** button.

Figure 22



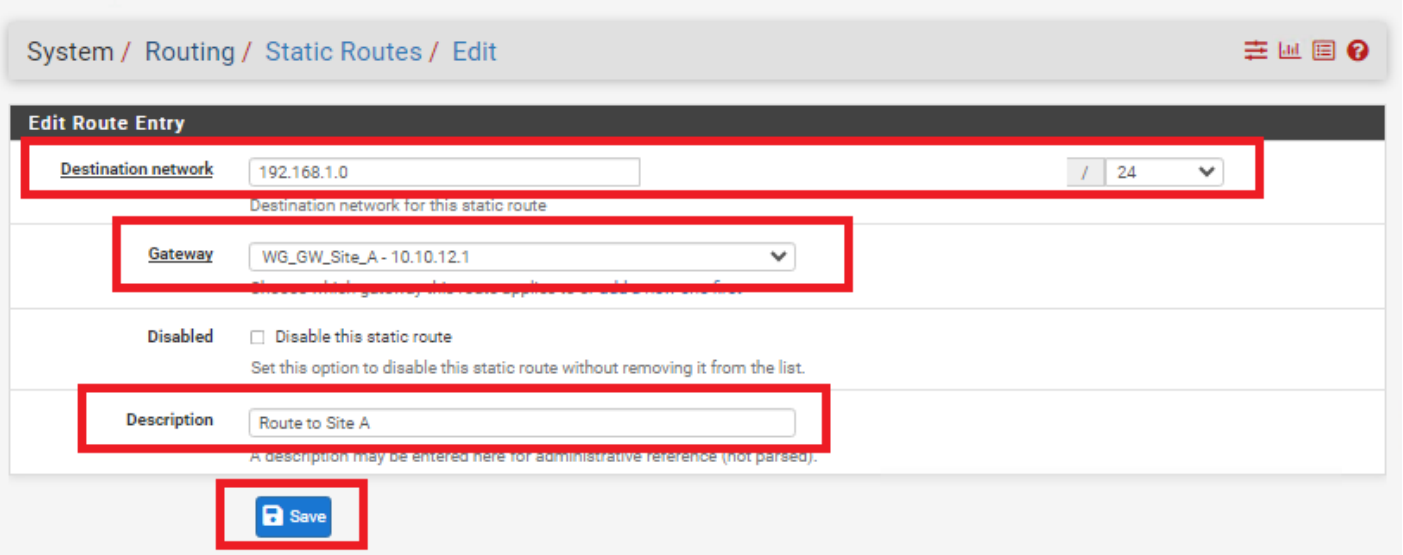
Next, on **Site B** navigate to **System ---> Routing** and under the **Static Routes** tab click the **Add** button (**Figure 23**).

Figure 23

In the **Edit Route Entry** page, fill/set the following fields (**Figure 24**):

- **Destination network:** Enter the network subnet for **Site A** (**NOT the tunnel subnet**). In this example, the network subnet we used for **Site A** was **192.168.1.0/24**.
- **Gateway:** Select the Gateway to **Site A** you created earlier
- **Description:** Optionally, enter a description (Ex: Route to Site A)
- Click the **Save** button and then click the **Apply Changes** button.

Figure 24



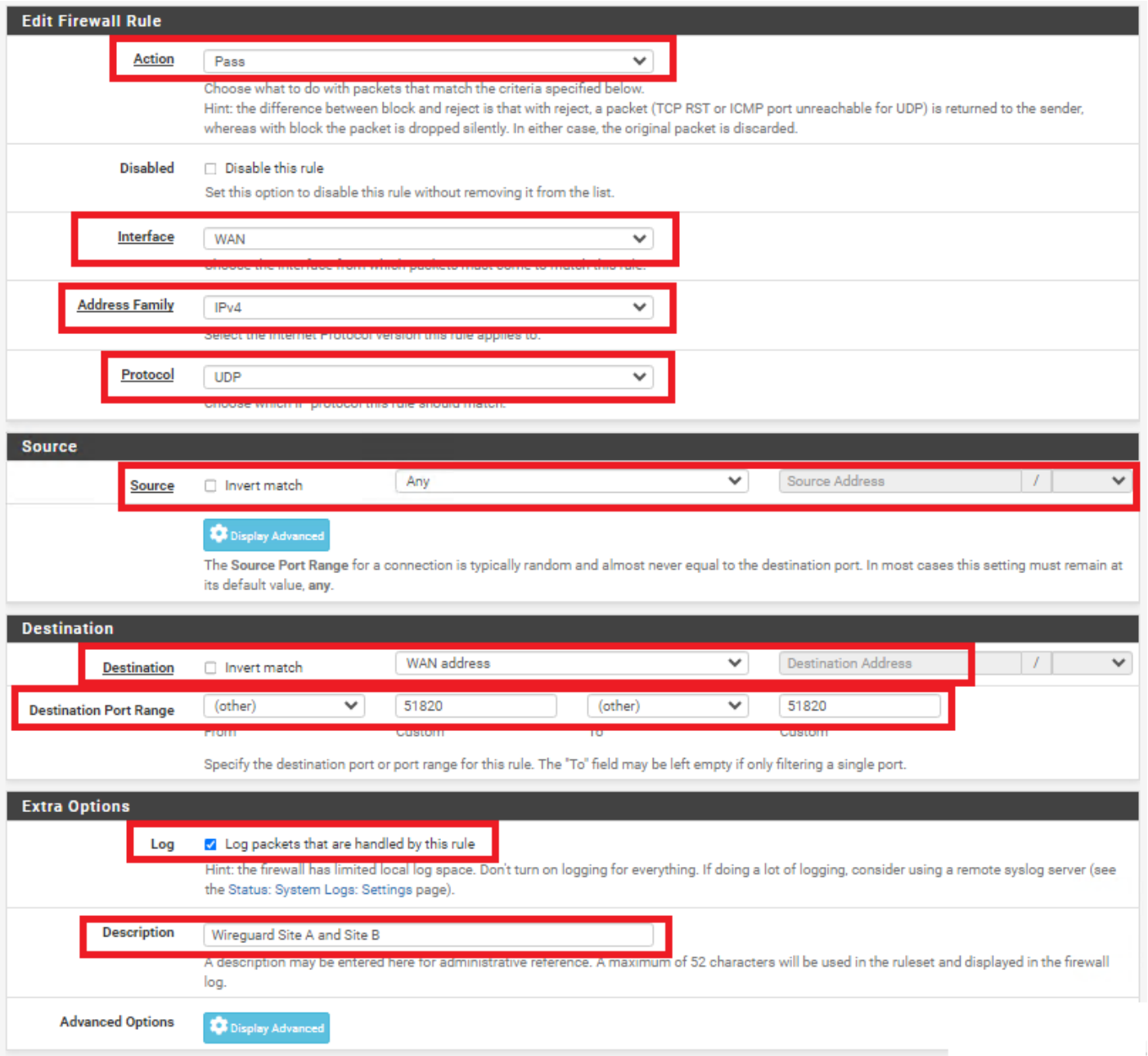
Add Firewall Rules on BOTH Firewalls

On **BOTH** firewalls, navigate to **Firewall ---> Rules** and under the **WAN** tab, click the **Add** button. In the **Edit Firewall Rule** page, fill/set the following fields (**Figure 25**).

- **Action:** Pass
- **Interface:** WAN
- **Address Family:** IPv4
- **Protocol:** UDP
- **Source:** Any
- **Destination:** WAN address

- **Destination Port Range:** (other) 51820 to (other) 51820
- **Log:** Optionally, check to Log packets that are handled by this rule
- **Description:** Optionally, enter a description (Ex: Wireguard Site A and Site B)
- Click the **Save** button and then click the **Apply Changes** button.

Figure 25

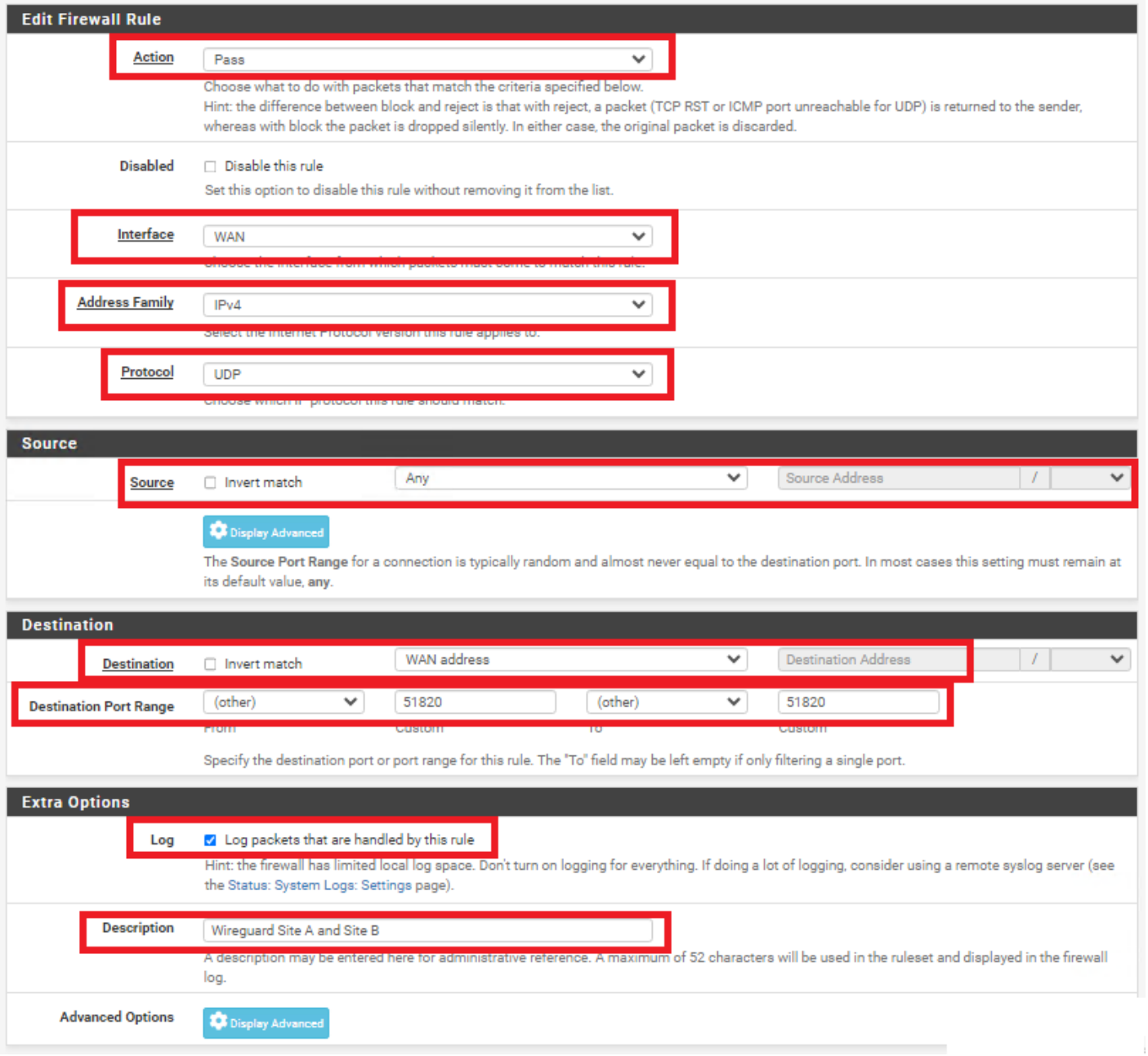


On **BOTH** firewalls, navigate to **Firewall ---> Rules** and under the **TUNNELTOSITE(X)** tab, click the **Add** button. In the **Edit Firewall Rule** page, fill/set the following fields (**Figure 25**).

- **Action:** Pass
- **Interface:** Ensure the interface you created earlier for each site is already selected
- **Address Family:** IPv4
- **Protocol:** Any (Start with **Any** and then you can tighten the rules further after you ensure tunnel is working properly)

- **Source:** Any (Start with **Any** and then you can tighten the rules further after you ensure tunnel is working properly)
- **Destination:** Any (Start with **Any** and then you can tighten the rules further after you ensure tunnel is working properly)
- **Destination Port Range:** Any (Start with **Any** and then you can tighten the rules further after you ensure tunnel is working properly)
- **Log:** Optionally, check to Log packets that are handled by this rule
- **Description:** Optionally, enter a description (Ex: Wireguard Traffic Site A and Site B)
- Click the **Save** button and then click the **Apply Changes** button.

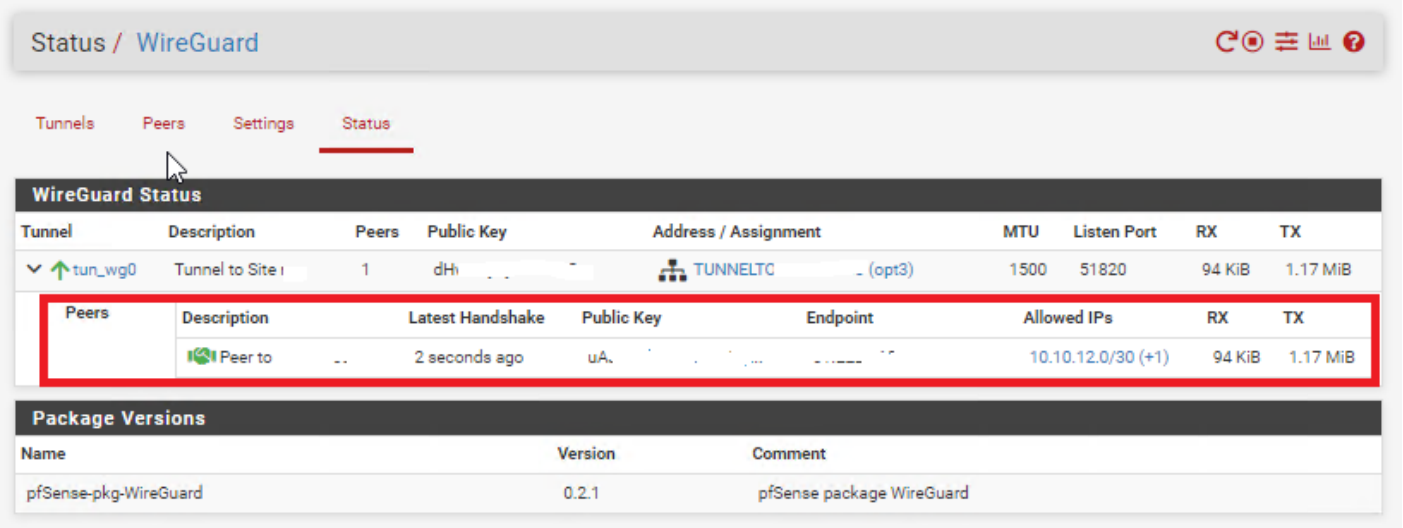
Figure 25



Check the Wireguard Status

On **BOTH** firewalls navigate to **Status ---> Wireguard**, locate the WireGuard tunnel you created, expand it and ensure the Peers are connected on BOTH firewalls (**Figure 26**).

Figure 26



Additionally, ensure you can ping and access resources on each remote network from the corresponding site.

Revision #16
Created 2024-01-18 18:26:24 UTC by Dino Edwards
Updated 2024-01-20 14:50:10 UTC by Dino Edwards