robustel | Application Note

Static Routing for ROS

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Doc ID:	**Static Routing for ROS**
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robustOS

Contents

Chapter 1 Introduction

1.1 Overview

RobustOS (hereinafter referred to as “the ROS”) is a new operating system for Robustel's IoT gateway released in 2015. It is a modular and open software platform which could support third party development based on SDK/API. Meanwhile, it supports different routing and VPN protocols for different application scenarios. This newer platform provides a different web configuration interface than the existing platform.

Static routing is a form of routing that occurs when a router uses a manually-configured routing entry, rather than information from a dynamic routing traffic. In many cases, static routes are manually configured by a network administrator by adding entries into a routing table, though this may not always be the case. Unlike dynamic routing, static routes are fixed and do not change if the network is changed or reconfigured. Static routing and dynamic routing are not mutually exclusive. Both dynamic routing and static routing are usually used on a router to maximize routing efficiency and to provide backups in the event that dynamic routing information fails to be exchanged. Static routing can also be used in stub networks, or to provide a gateway of last resort.

This application note has been written for customer with a good understanding of Robustel products and a basic experience of Static routing. It shows customer how to configure and test the Static routing between the ROS and Cisco router through the cellular network.

This application note applies to the ROS firmware of R2000 and R3000. However, the followings will take R2000 as an example

1.2 Assumptions

The features of Static Routing have been fully tested and this application note has been written by technically competent engineer who is familiar with the Robustel products and the application requirements.
This application note is based on:

- Product model: Robustel GoRugged R2000, an industrial cellular VPN router
- Firmware version: R2000_ROS_V2.0.6
- Configuration: This application note assumes the Robustel products are set to factory default. Most of configuration steps are only shown if they are different from the factory default settings.

The central Cisco router must be assigned a public IP address to its WAN port. The IP address can be dynamic or static. If the central Cisco router working with dynamic public IP address, a DNS service must be used to park dynamic public IP address to a static domain.

1.3 Rectifications

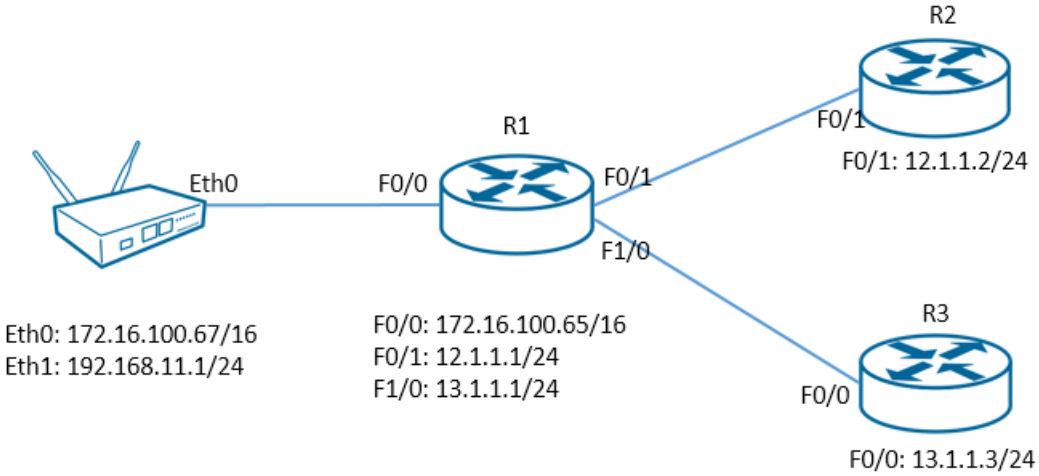
Requests for corrections or rectifications to this application note will be appreciated, and if there are any request for new application notes please email to: support@robustel.com.

1.4 Version

Updates between document versions are cumulative. Therefore, the latest document version contains all updates made to previous versions.

Release Date	Firmware Version	Change Description
2017-02-17	v.1.0.0	Initial Release

Chapter 2 Topology



1. Cisco 2811 Routers run with Static routing protocol.
2. The R2000 works with Static routing protocol.
3. The R2000 updates its own route table and transmit data to remote side successfully.

Chapter 3 Configuration

3.1 Cisco Configuration

Enter the configuration mode and check the IOS version of Cisco router, but you need to be in Enable mode in advance (e.g. typing “configure terminal”).

```
version 12.4
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
```

The entries below is the settings of Static routing on Cisco router R1.

```
hostname R1
!
boot-start-marker
boot-end-marker
!
interface FastEthernet0/0
 ip address 172.16.100.65 255.255.0.0
 duplex auto
 speed auto
!
interface FastEthernet0/1
 ip address 12.1.1.1 255.255.255.0
 duplex auto
 speed auto
!
interface FastEthernet1/0
 ip address 13.1.1.1 255.255.255.0
 duplex auto
 speed auto
!
```

The entries below is the settings of Static routing on Cisco router R2.

```
hostname R2
!
boot-start-marker
boot-end-marker
!
interface FastEthernet0/1
 ip address 12.1.1.2 255.255.255.0
 duplex auto
```

```
 speed auto
!
ip classless
ip route 172.16.0.0 255.255.0.0 12.1.1.1
```

The entries below is the settings of Static routing on Cisco router R3.

```
hostname R3
!
boot-start-marker
boot-end-marker
!
interface FastEthernet0/0
 ip address 13.1.1.3 255.255.255.0
 duplex auto
 speed auto
!
ip classless
ip route 172.16.0.0 255.255.0.0 13.1.1.1
```

3.2 R2000_ROS Configuration

3.2.1 Configure IP Address of LAN

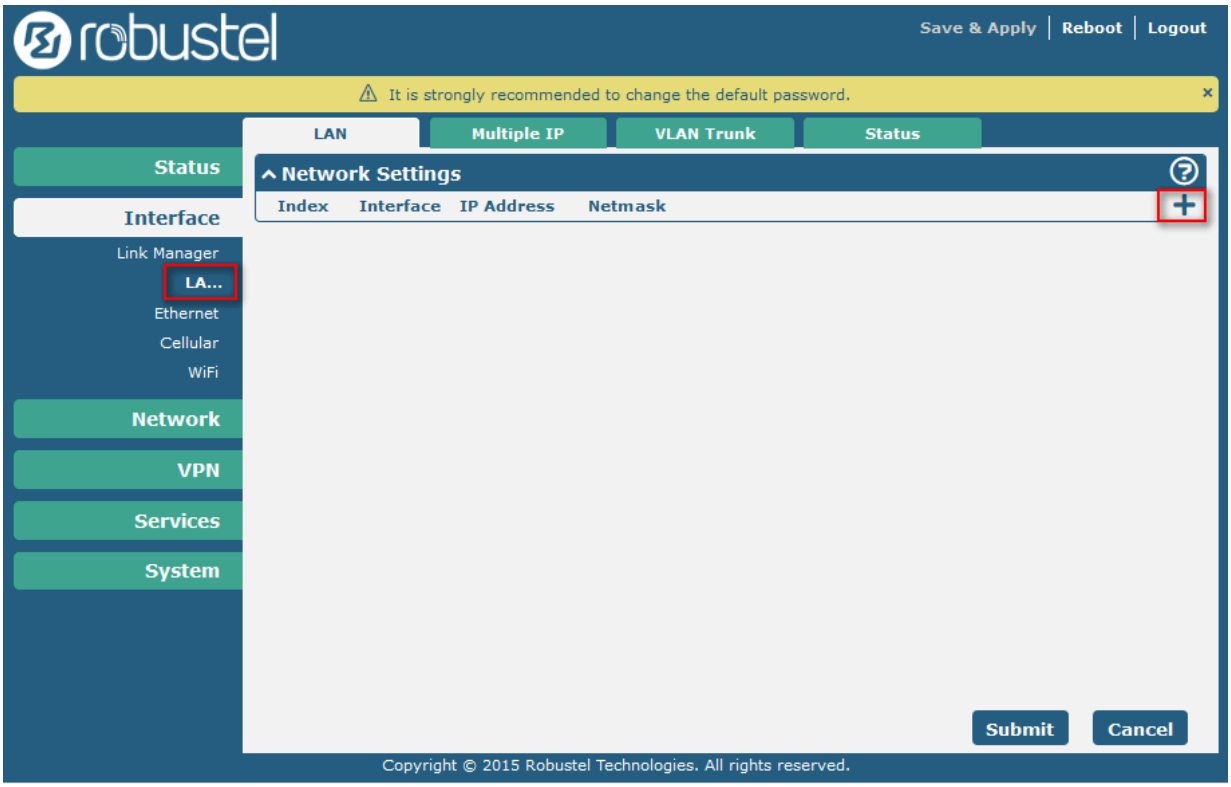
1. Connect the power supply, and log-in the Web GUI of R2000.

You need to know the following factory settings before you have logged in the Web GUI.

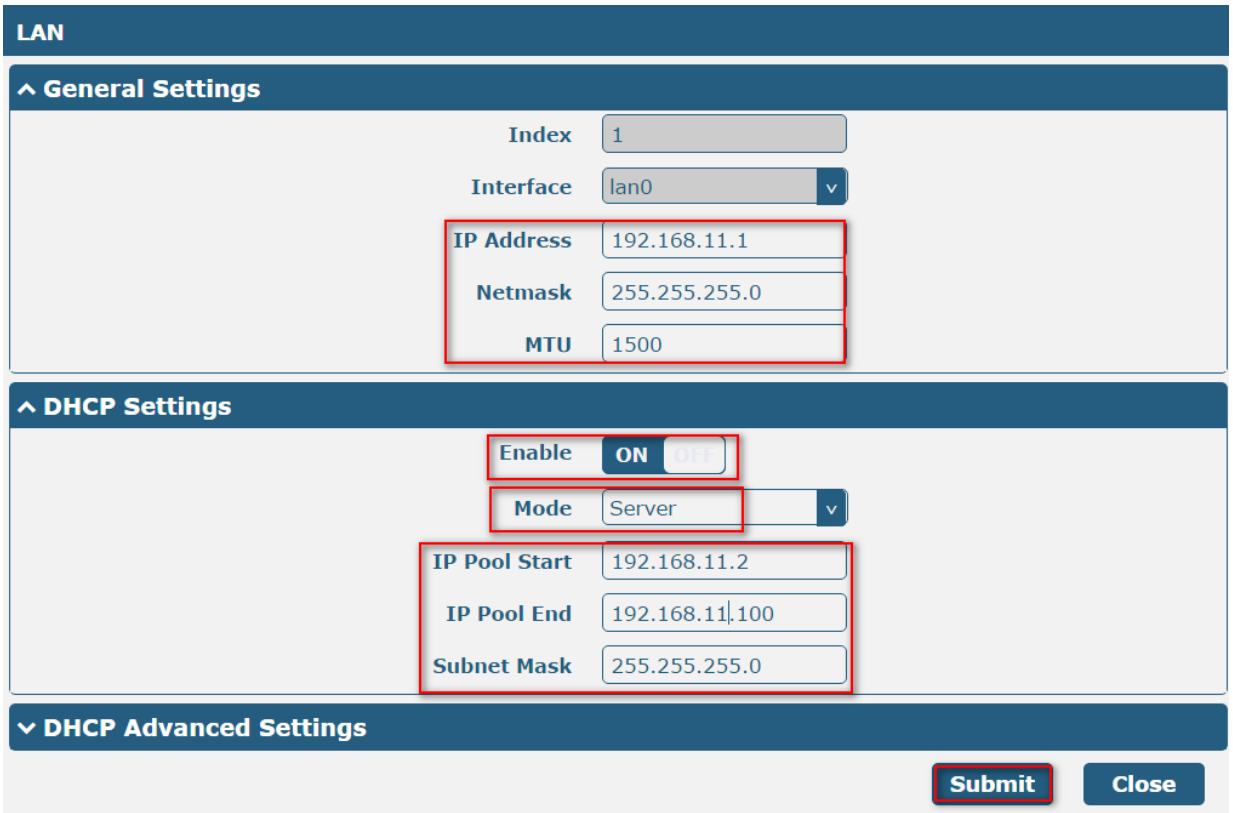
Item	Description
Username	Admin
Password	Admin
Eth0	192.168.0.1/255.255.255.0, LAN mode
Eth1	192.168.0.1/255.255.255.0, LAN mode
DHCP Server	Enabled

2. Browse to **Interface > LAN > LAN**.

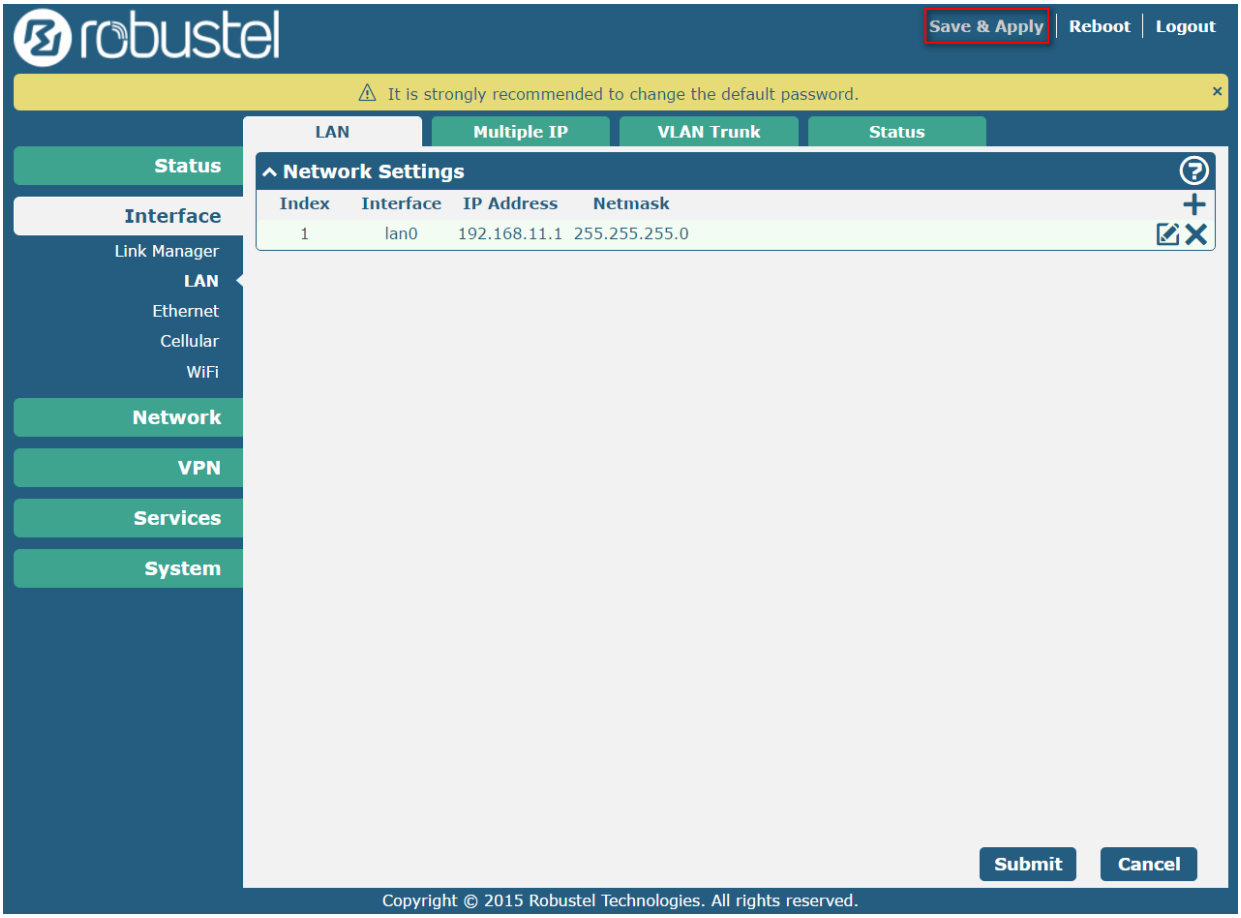
- Click the edit button of “lan0”.



- Set its IP address and Netmask, and the parameters of “DHCP Settings” are set accordingly.
- Click “Submit”.



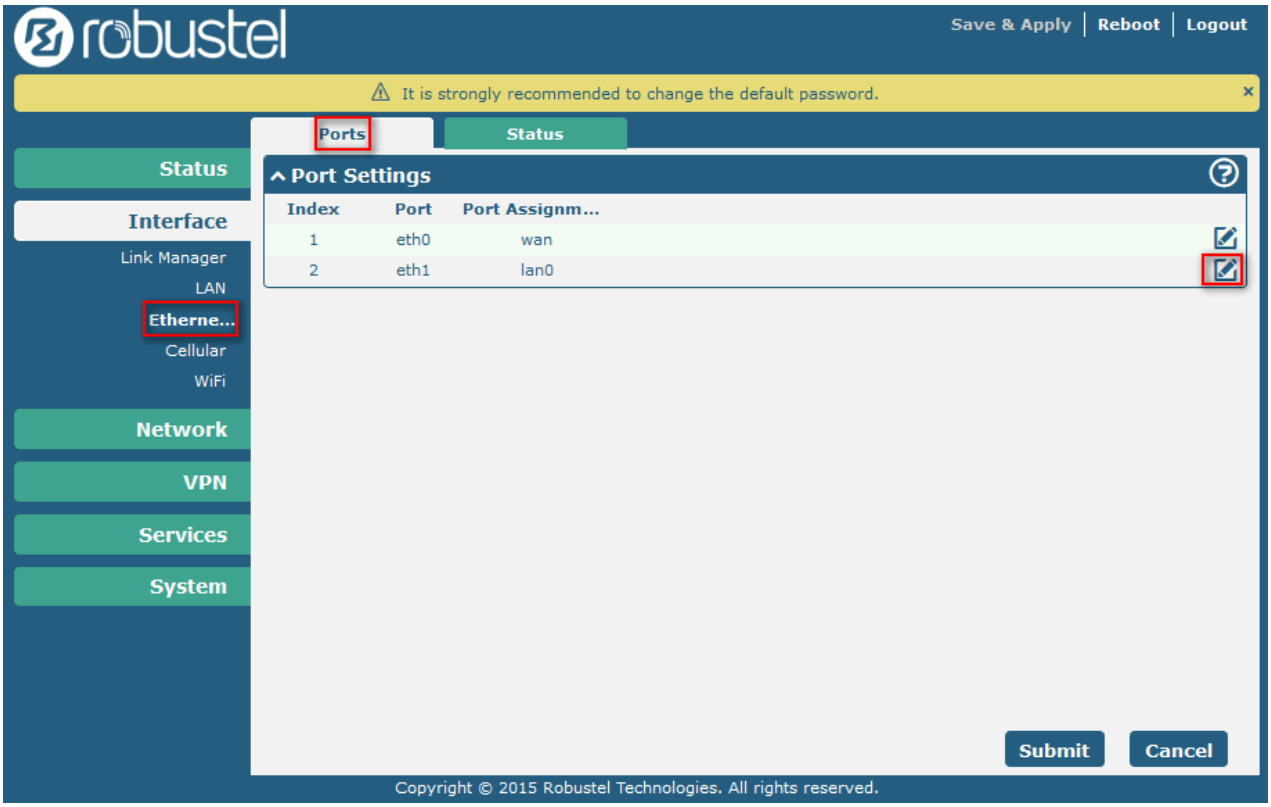
- Click “Save & Apply”.



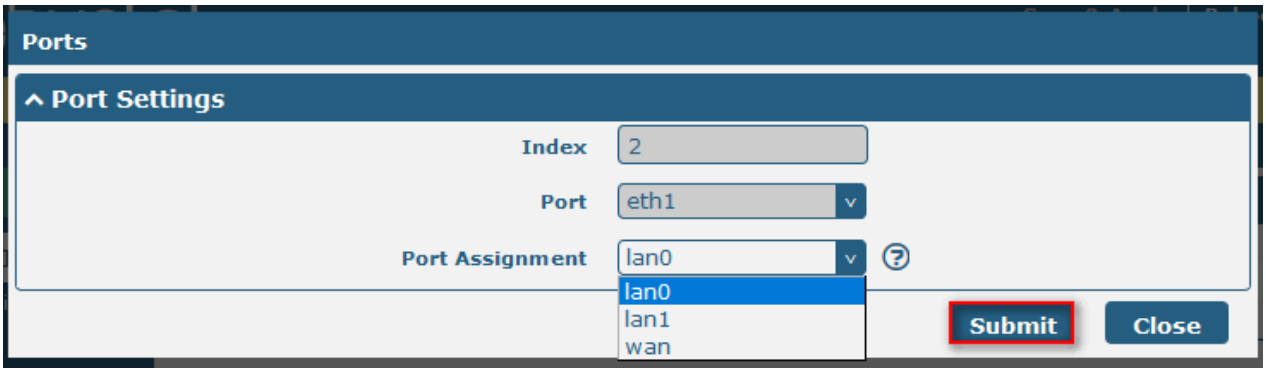
Item	Description	Setting
IP Address	Set the IP address of lan0.	Enter accordingly
Netmask	Set the Netmask of lan0.	Enter accordingly
MTU	Set the MTU of lan0.	1500

3. Browse to **Interface > Ethernet > Ports**.

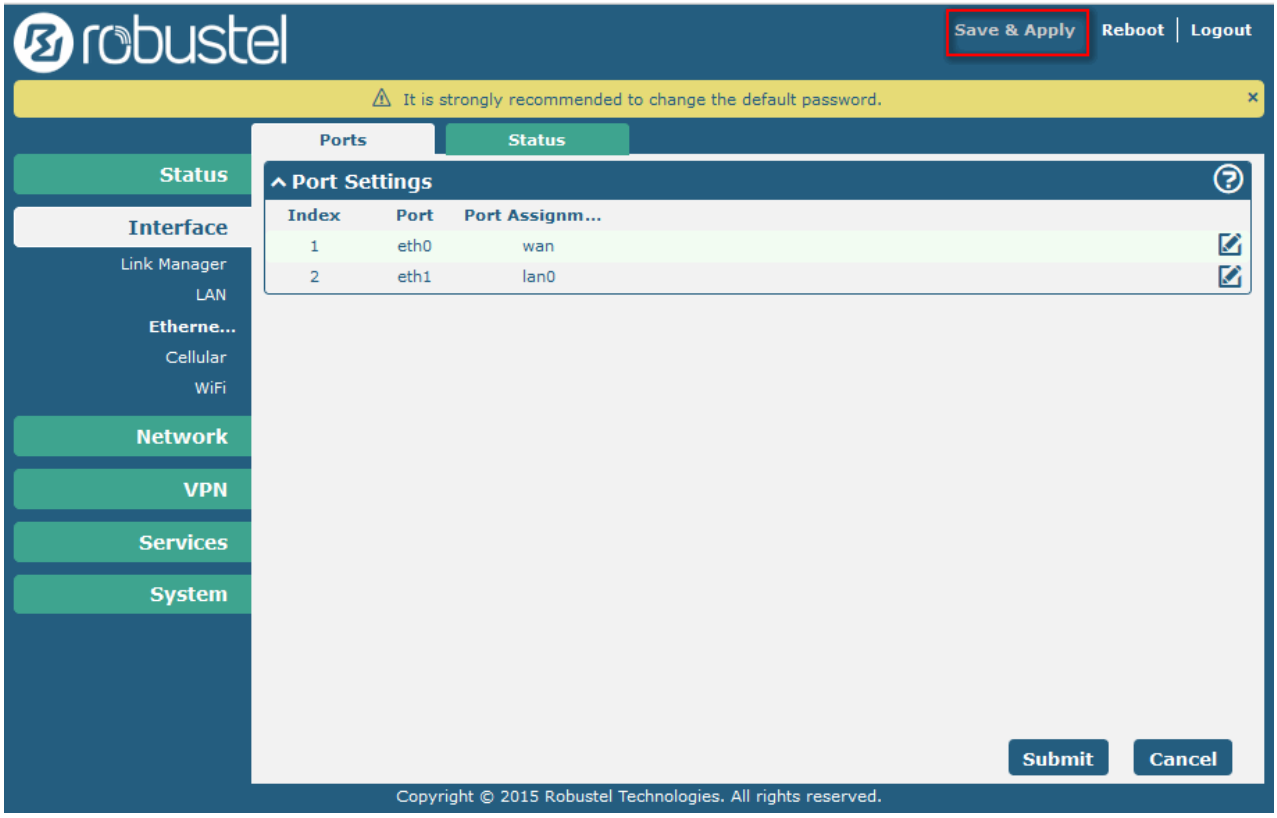
- Click the edit button of “eth1”.



- Assign lan0 to the eth1 port.
- Click “Submit”.



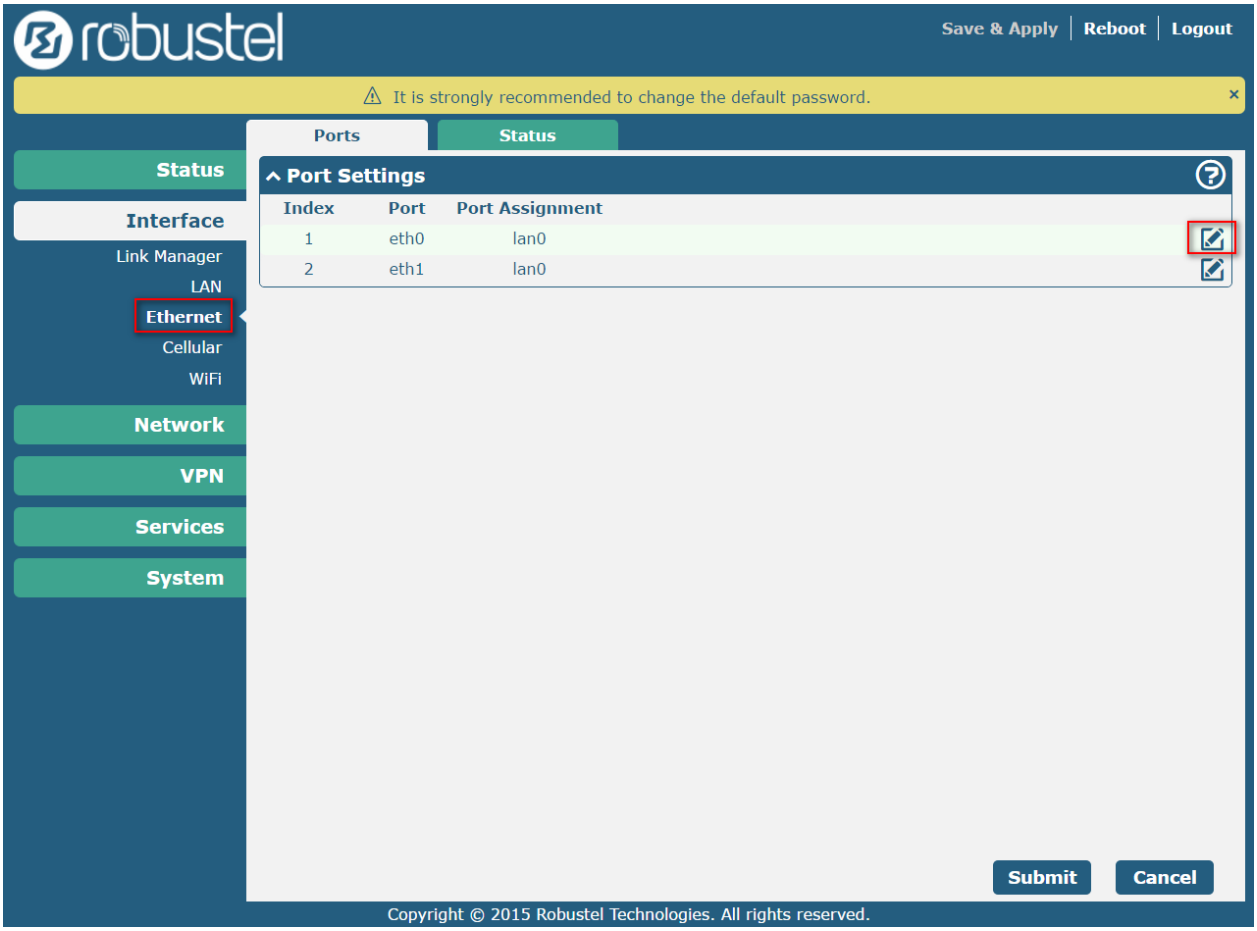
- Click “Save & Apply”.



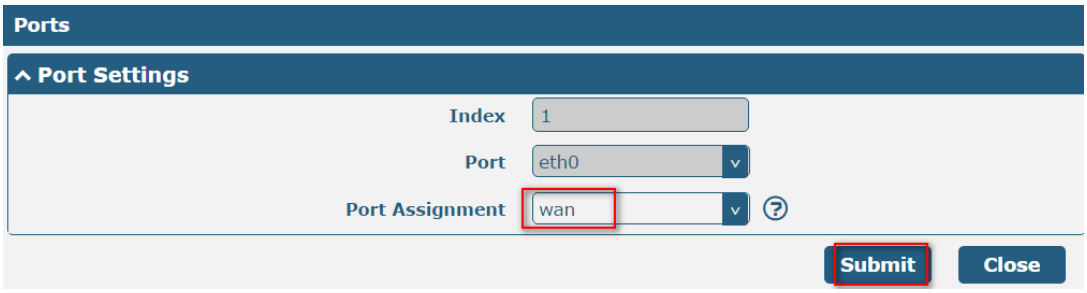
3.2.2 Configure Link Manager

1. Browse to **Ethernet > Ports**

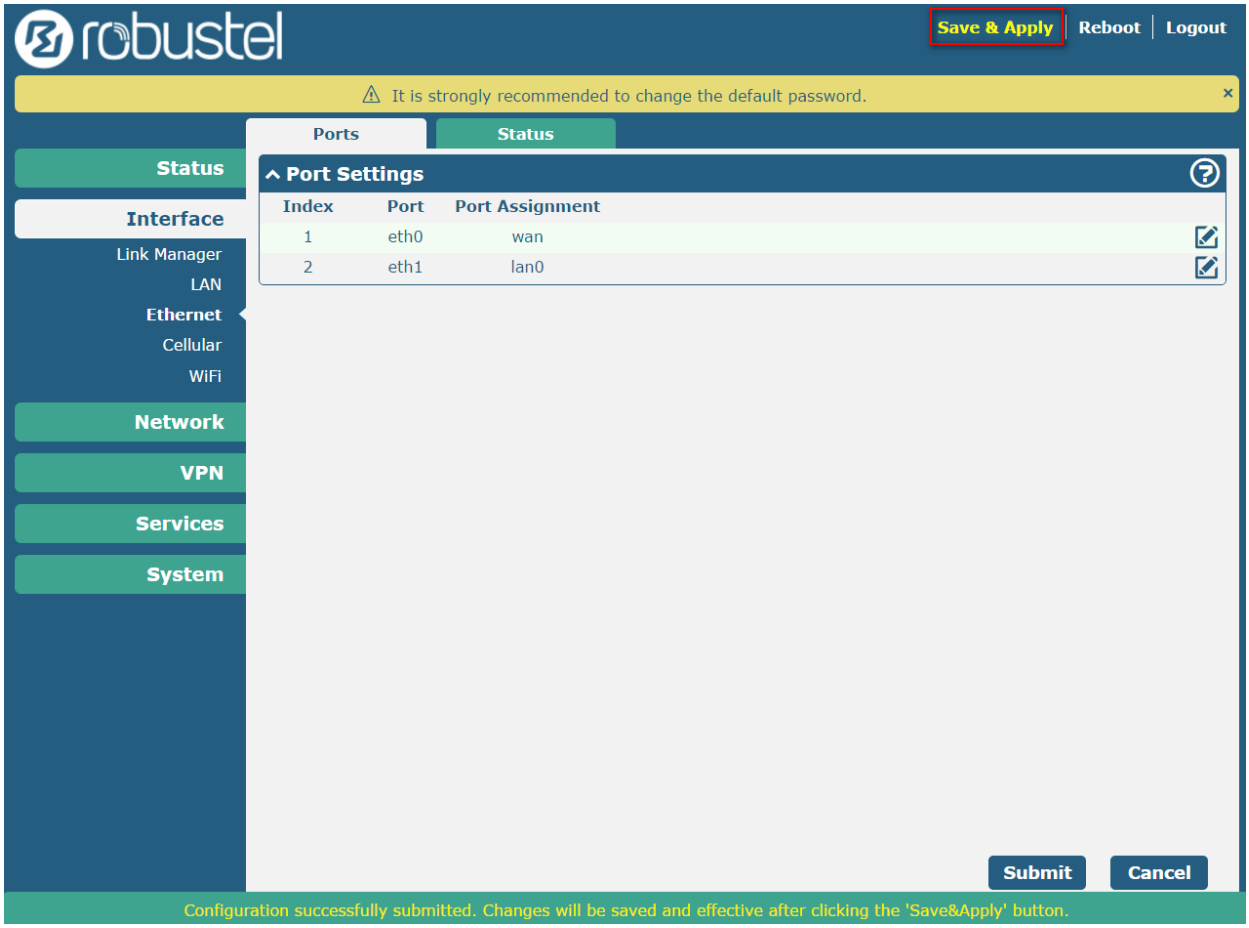
- Click the edit button of “eth0”.



- Assign “wan” to the eth0 port and click “Submit”.

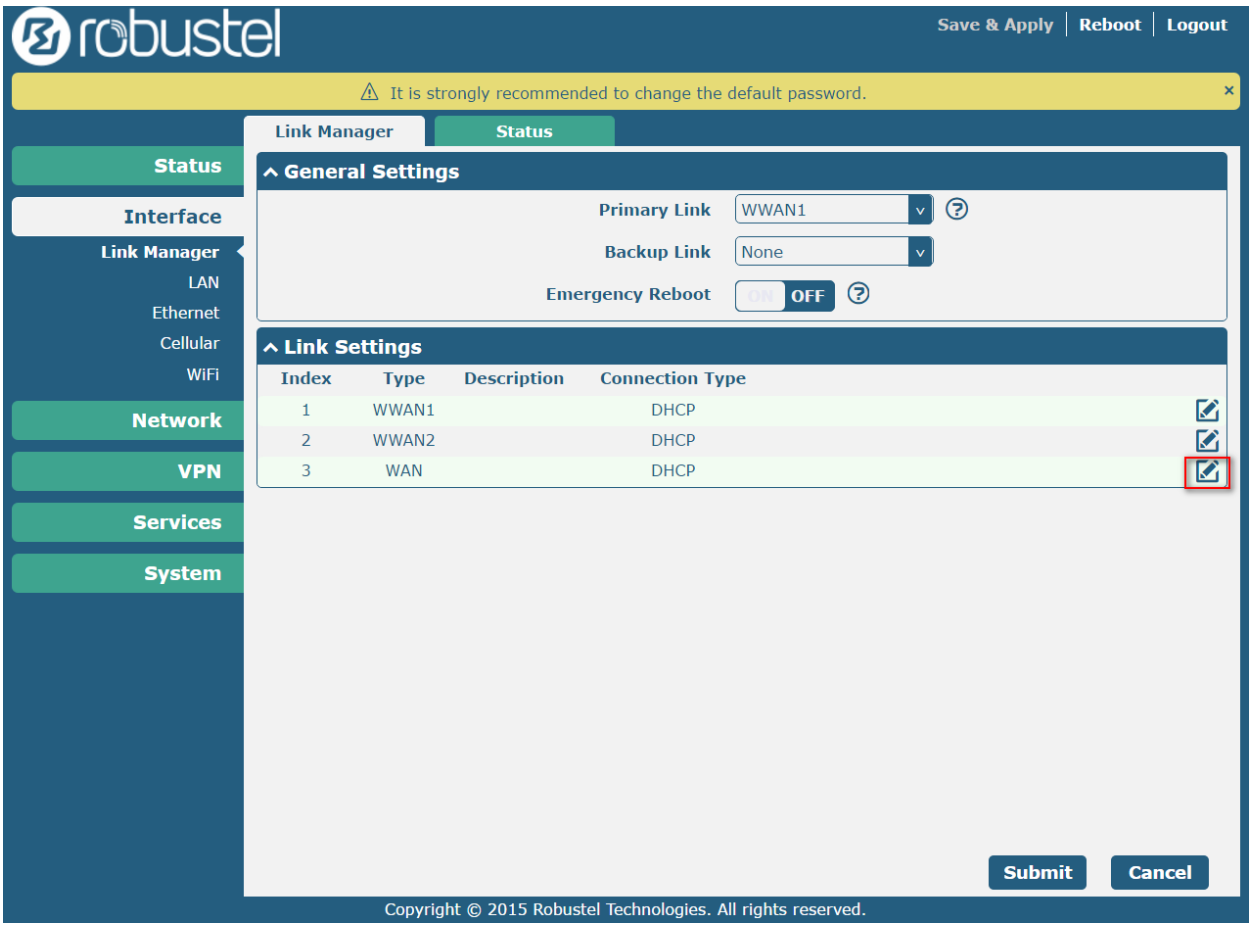


- Click “Save & Apply”.

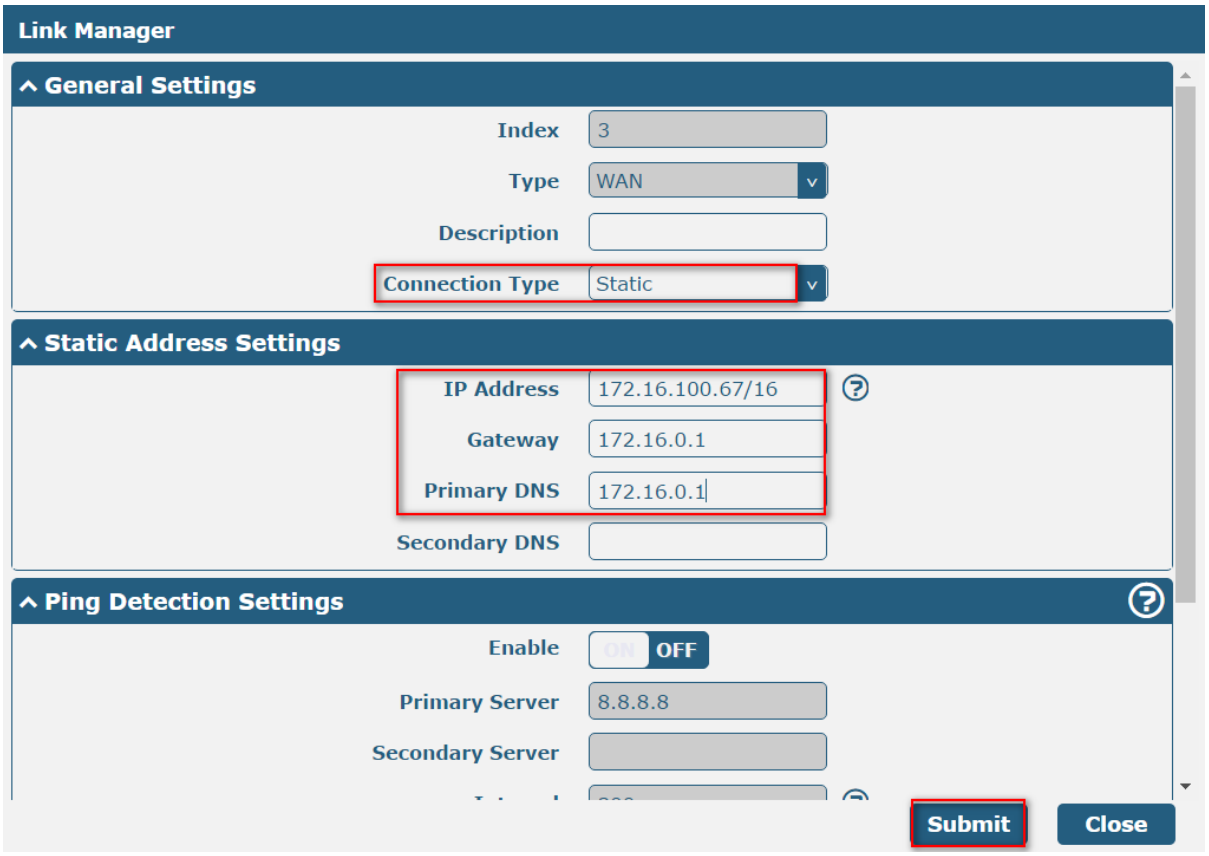


2. Browse to **Interface > Link Manager**.

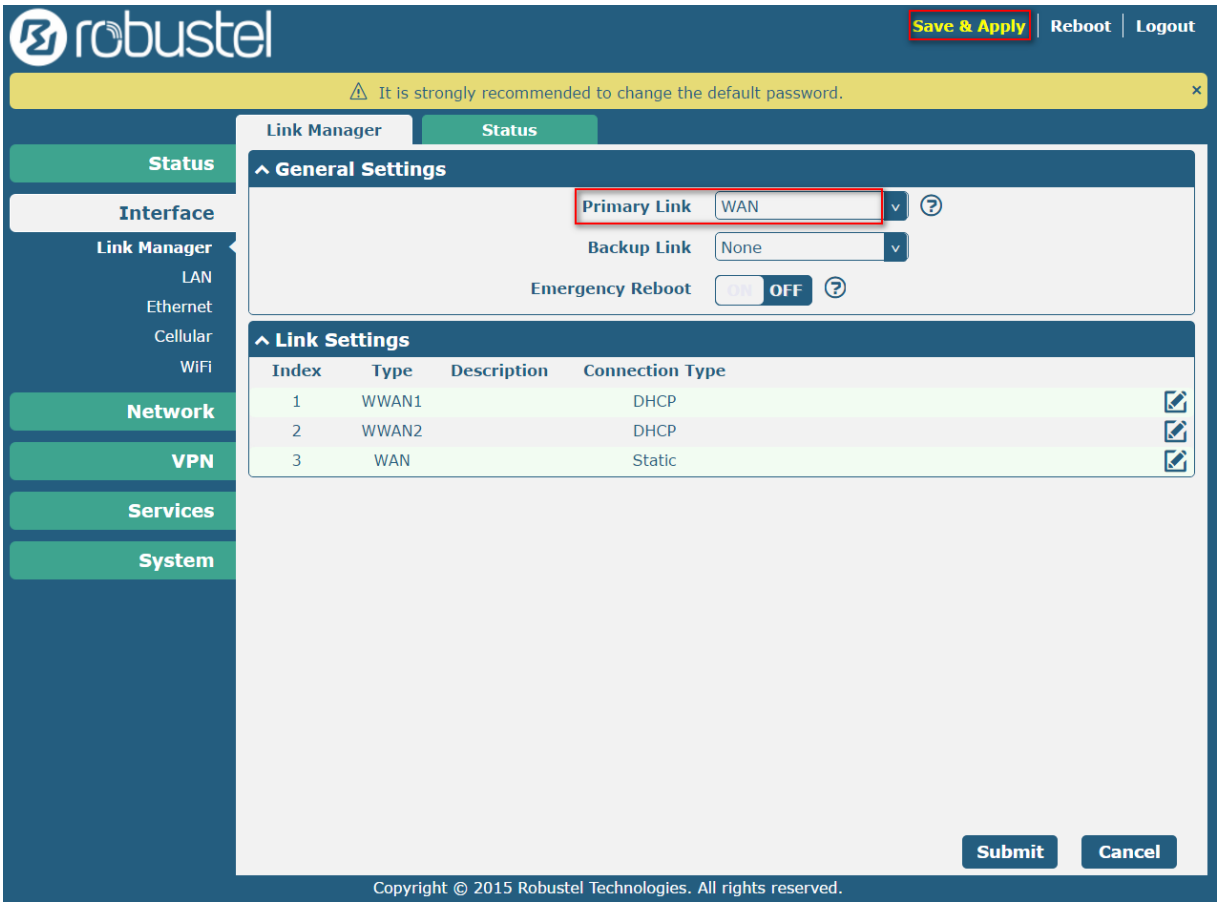
- Click the edit button of “wan”.



- Enter the configuration correctly as below and click “Submit”.



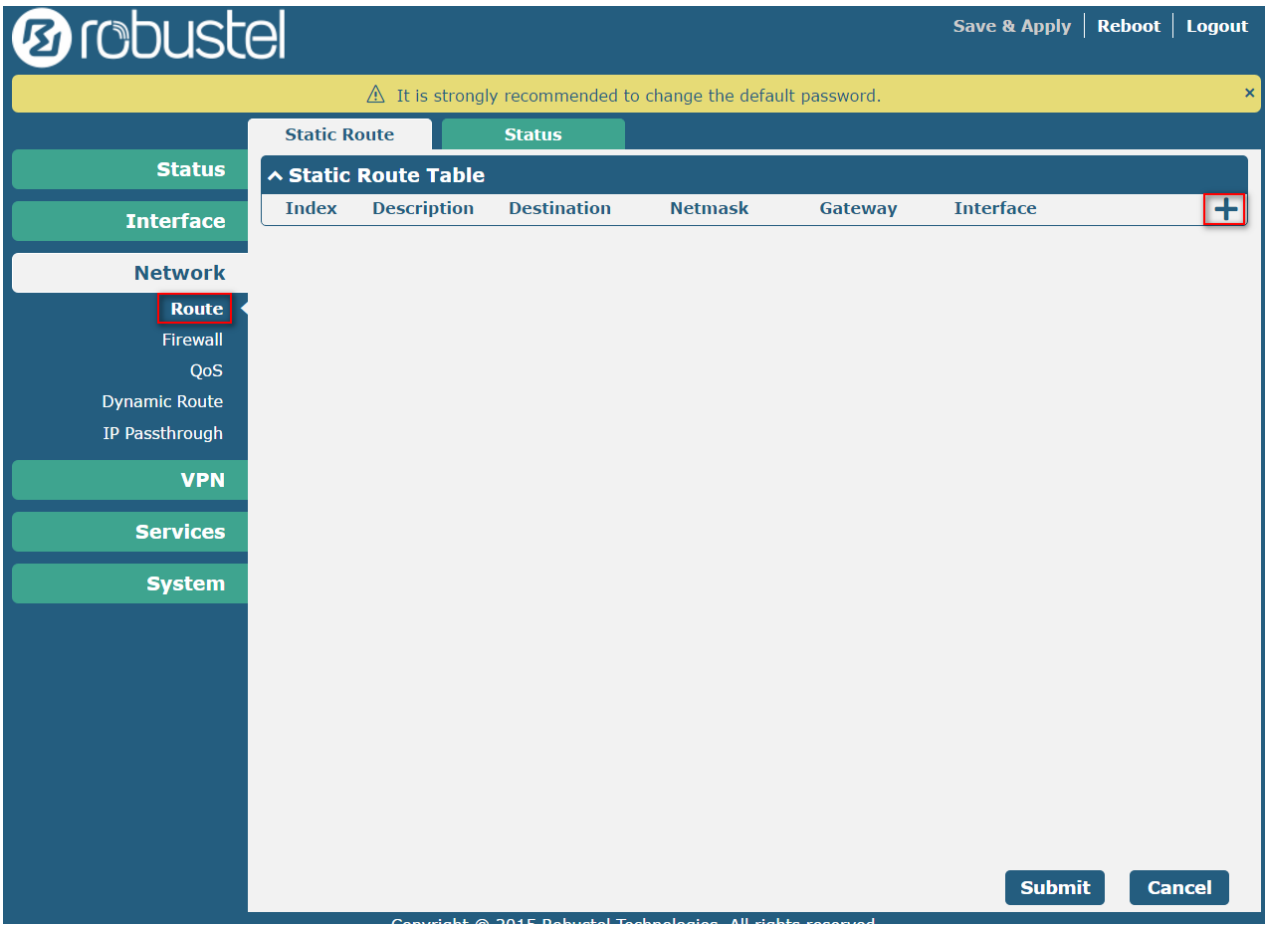
- Assign “WAN” to the “Primary Link” and click “Save & Apply”.



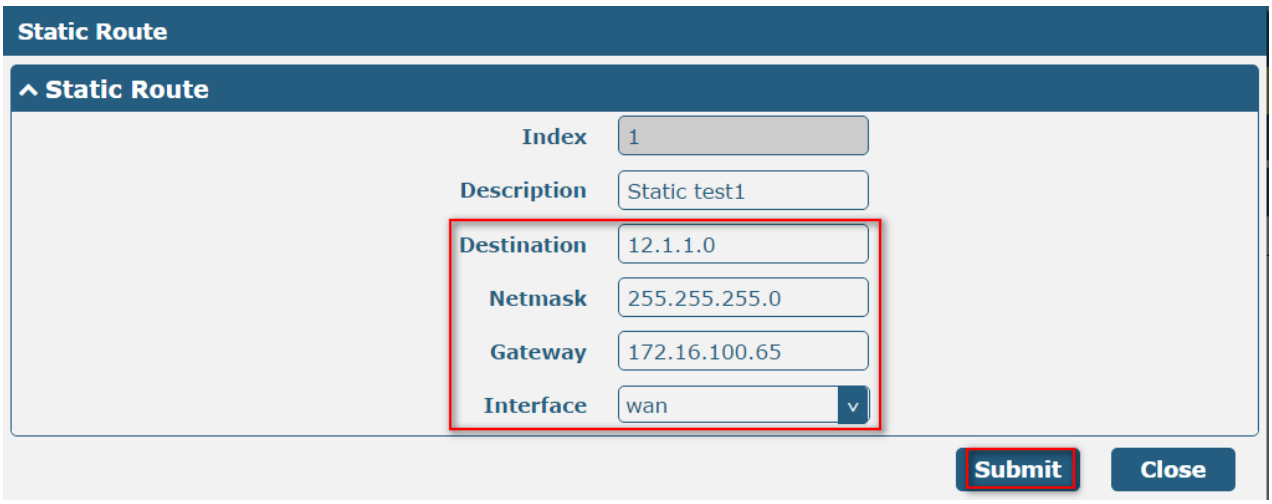
3.2.3 Configure Static Routing

1. Browse to **Network > Static Route**

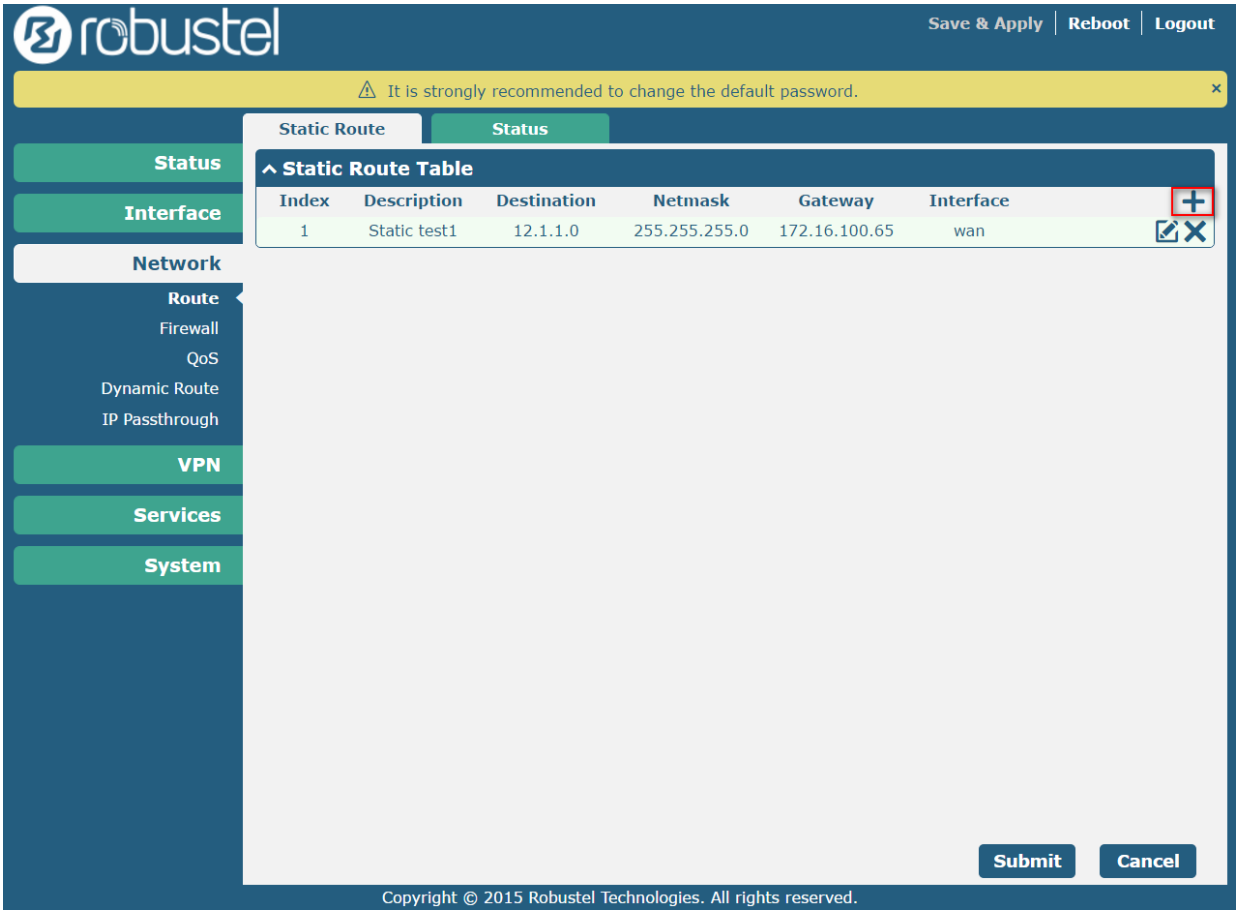
- Click the edit button of Static Route Table.



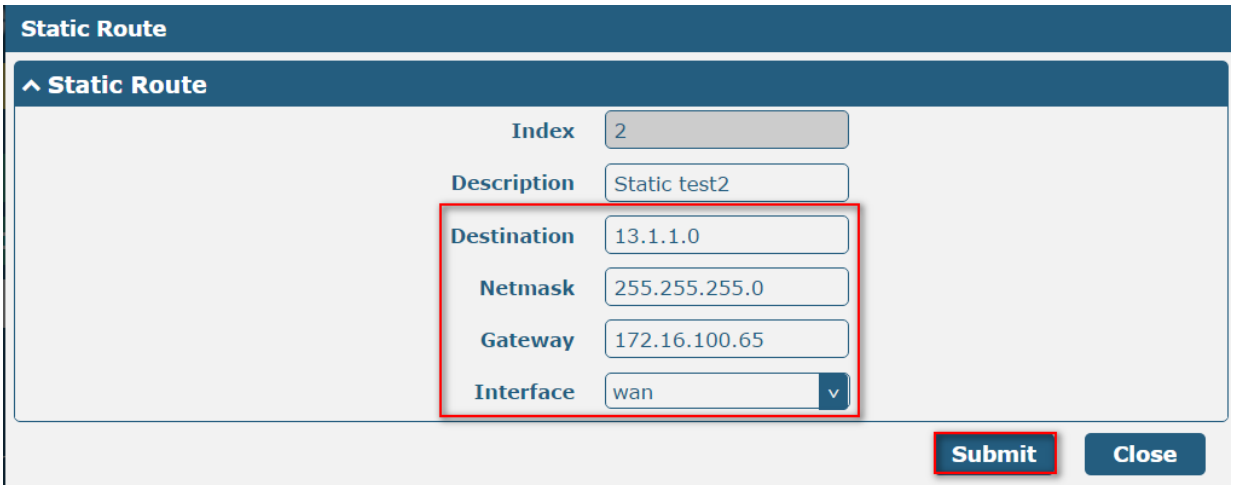
- Set its Destination and Netmask, and set Gateway accordingly, and then set “wan” as the outbound interface.
- Click “Submit”.



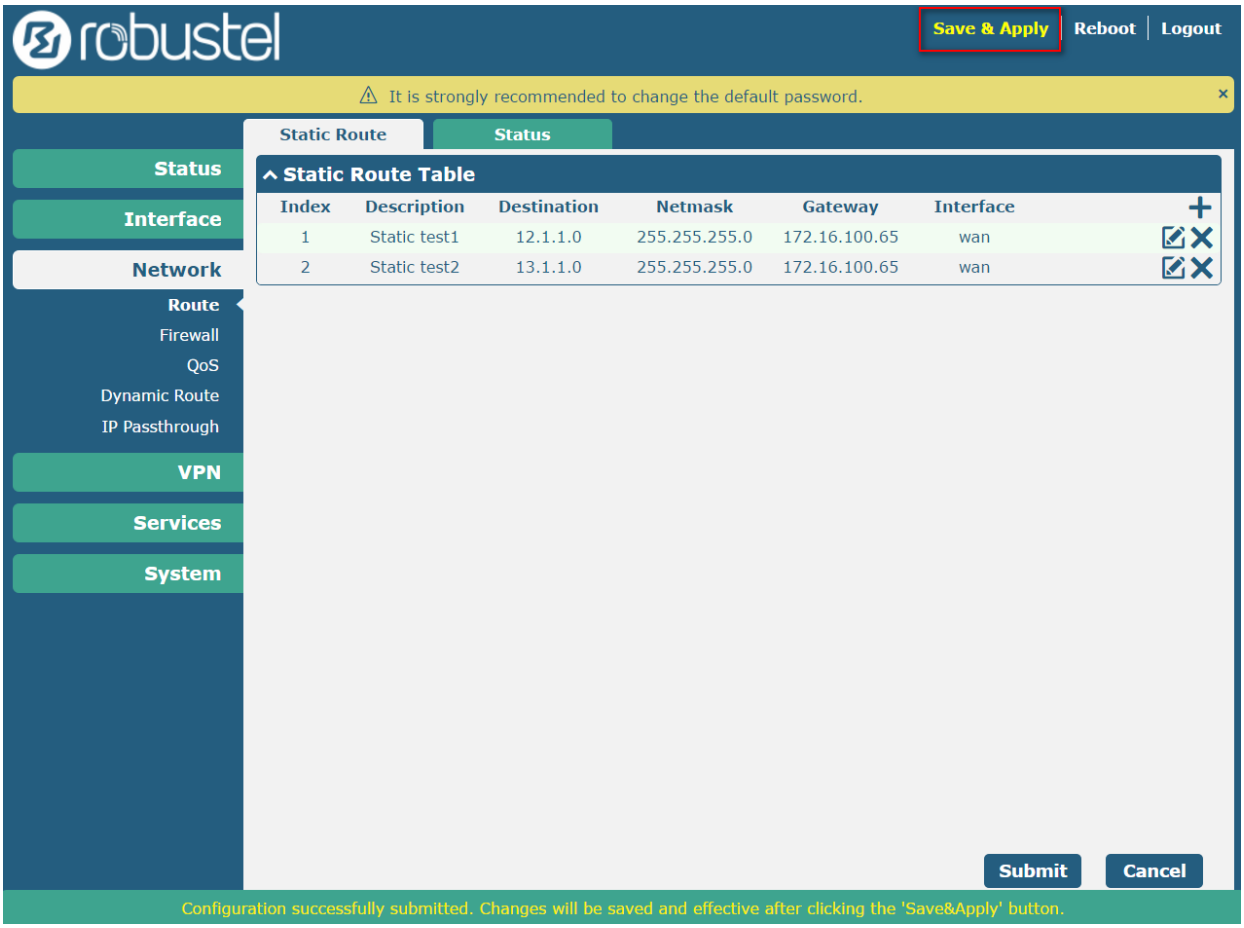
- Click the edit button of Static Route Table again.



- Set its Destination and Netmask, and set Gateway accordingly, and then set “wan” as the outbound interface.
- Click “Submit”.



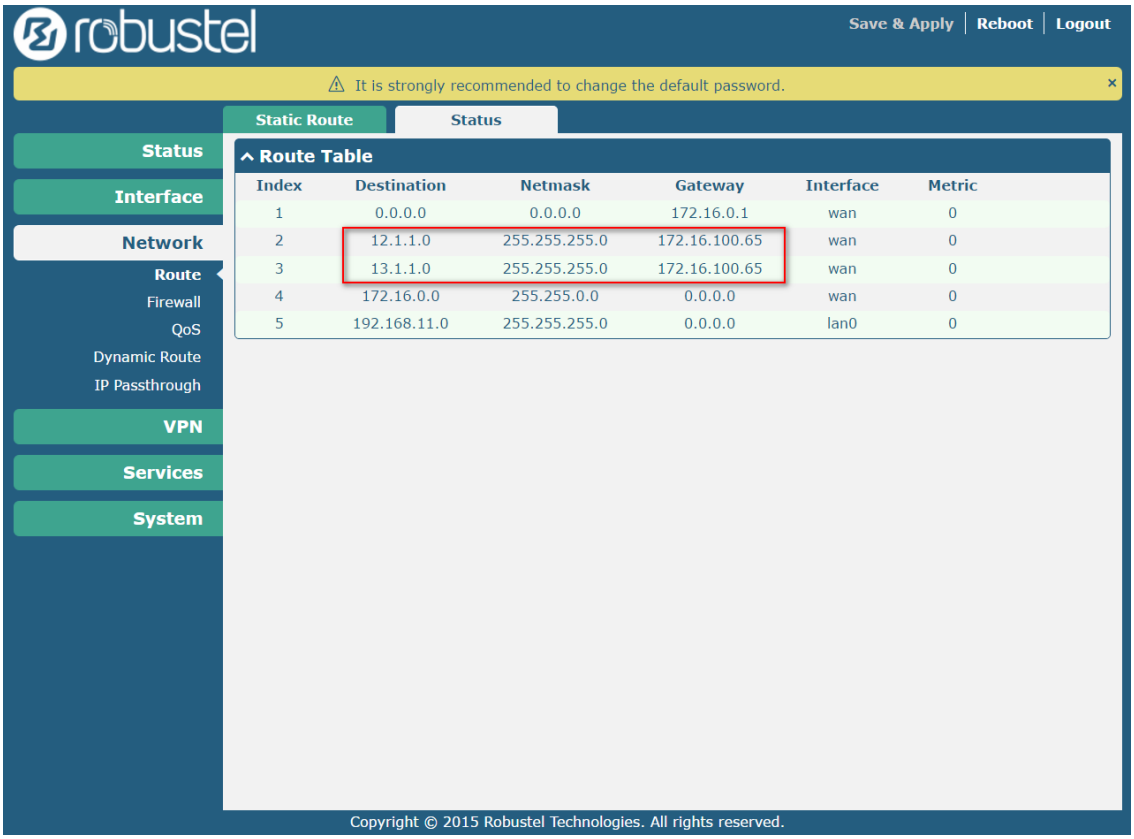
- Click “Save & Apply”.


robustel
Save & Apply
Reboot
Logout
It is strongly recommended to change the default password.
Static Route
Status
Status
Interface
Network
Route
Firewall
QoS
Dynamic Route
IP Passthrough
VPN
Services
System
Static Route Table
Index Description Destination Netmask Gateway Interface
1 Static test1 12.1.1.0 255.255.255.0 172.16.100.65 wan
2 Static test2 13.1.1.0 255.255.255.0 172.16.100.65 wan
Submit
Cancel
Configuration successfully submitted. Changes will be saved and effective after clicking the 'Save&Apply' button.

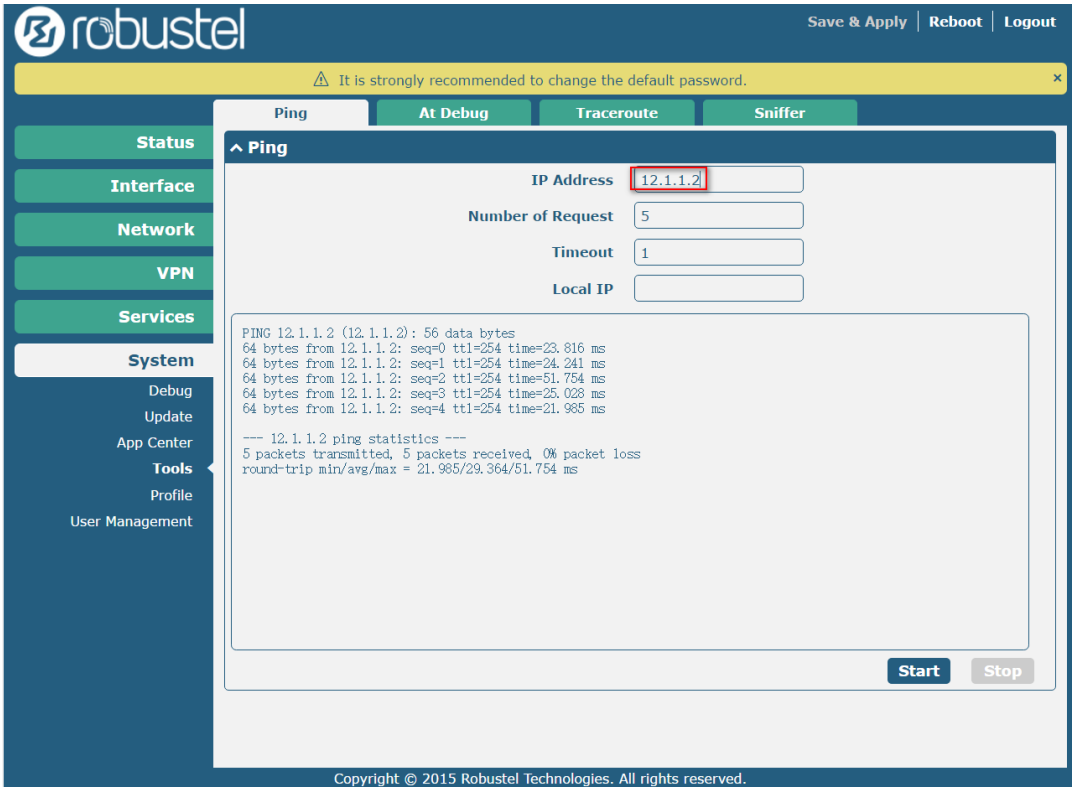
Chapter 4 Testing

4.1 Check in R2000

1. Check the Route Table of R2000.
   Path: Network > Route > Status.



2. Ping 12.1.1.2 and 13.1.1.3 in R2000.
   Path: System > Tools > Ping.


robustel
Save & Apply | Reboot | Logout
It is strongly recommended to change the default password.
Ping
At Debug
Traceroute
Sniffer
Status
Interface
Network
VPN
Services
System
Debug
Update
App Center
Tools
Profile
User Management
Ping
IP Address 12.1.1.2
Number of Request 5
Timeout 1
Local IP
PING 12.1.1.2 (12.1.1.2): 56 data bytes
64 bytes from 12.1.1.2: seq=0 ttl=254 time=23.816 ms
64 bytes from 12.1.1.2: seq=1 ttl=254 time=24.241 ms
64 bytes from 12.1.1.2: seq=2 ttl=254 time=51.754 ms
64 bytes from 12.1.1.2: seq=3 ttl=254 time=25.028 ms
64 bytes from 12.1.1.2: seq=4 ttl=254 time=21.985 ms
--- 12.1.1.2 ping statistics ---
5 packets transmitted, 5 packets received, 0% packet loss
round-trip min/avg/max = 21.985/29.364/51.754 ms
Start
Stop
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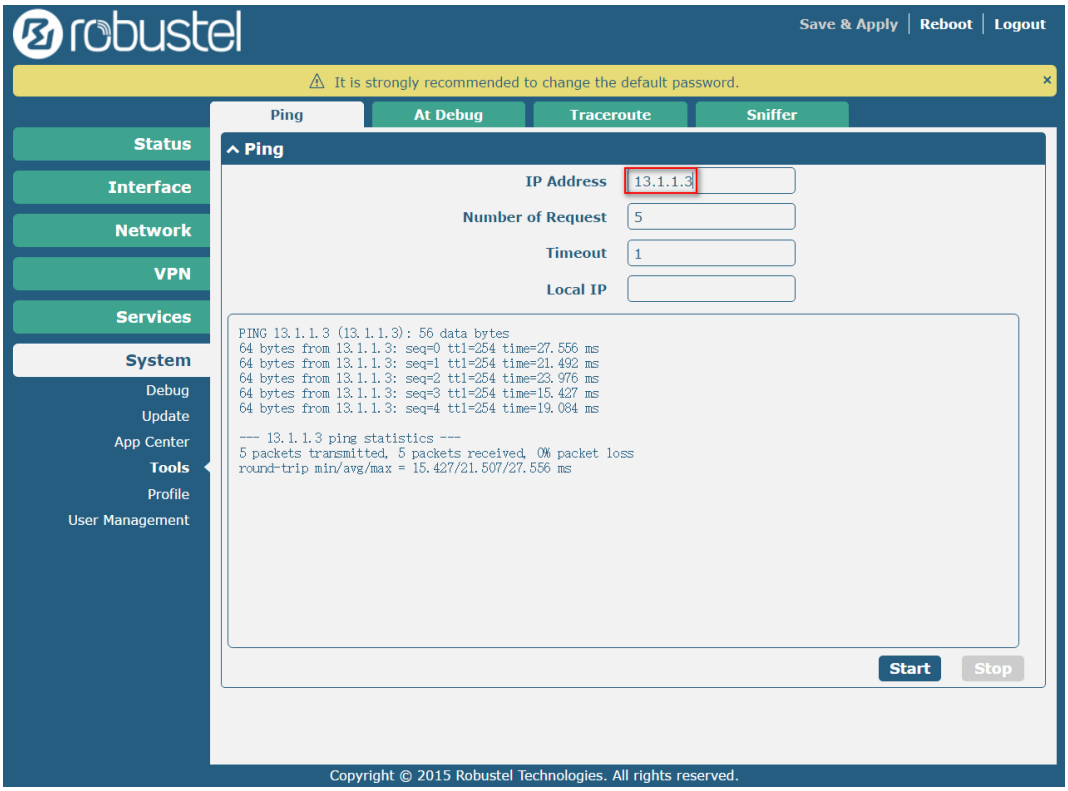
robustel
Save & Apply | Reboot | Logout
It is strongly recommended to change the default password.
Ping
At Debug
Traceroute
Sniffer
Status
Interface
Network
VPN
Services
System
Debug
Update
App Center
Tools
Profile
User Management
Ping
IP Address 13.1.1.3
Number of Request 5
Timeout 1
Local IP
PING 13.1.1.3 (13.1.1.3): 56 data bytes
64 bytes from 13.1.1.3: seq=0 ttl=254 time=27.556 ms
64 bytes from 13.1.1.3: seq=1 ttl=254 time=21.492 ms
64 bytes from 13.1.1.3: seq=2 ttl=254 time=23.976 ms
64 bytes from 13.1.1.3: seq=3 ttl=254 time=15.427 ms
64 bytes from 13.1.1.3: seq=4 ttl=254 time=19.084 ms
--- 13.1.1.3 ping statistics ---
5 packets transmitted, 5 packets received, 0% packet loss
round-trip min/avg/max = 15.427/21.507/27.556 ms
Start
Stop
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4.2 Check in Router

1. Enter command as below in R2.

```
R2# ping 172.16.100.67

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.16.100.67, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 64/88/104 ms
R2#
R2#
```

```
R2#sh ip route static
S    172.16.0.0/16 [1/0] via 12.1.1.1
R2#
```

2. Enter command as below in R3.

```
R3#ping 172.16.100.67

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.16.100.67, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 60/80/92 ms
R3#
```

```
R3#sh ip route static
S    172.16.0.0/16 [1/0] via 13.1.1.1
R3#
```