Port forwarding for ZTE H298N

Connect your personal computer via ethernet cable or via wifi to the router. Open a web browser and type **192.168.1.1** in the search line of the browser. You should then see a login page, as below (Image 1).

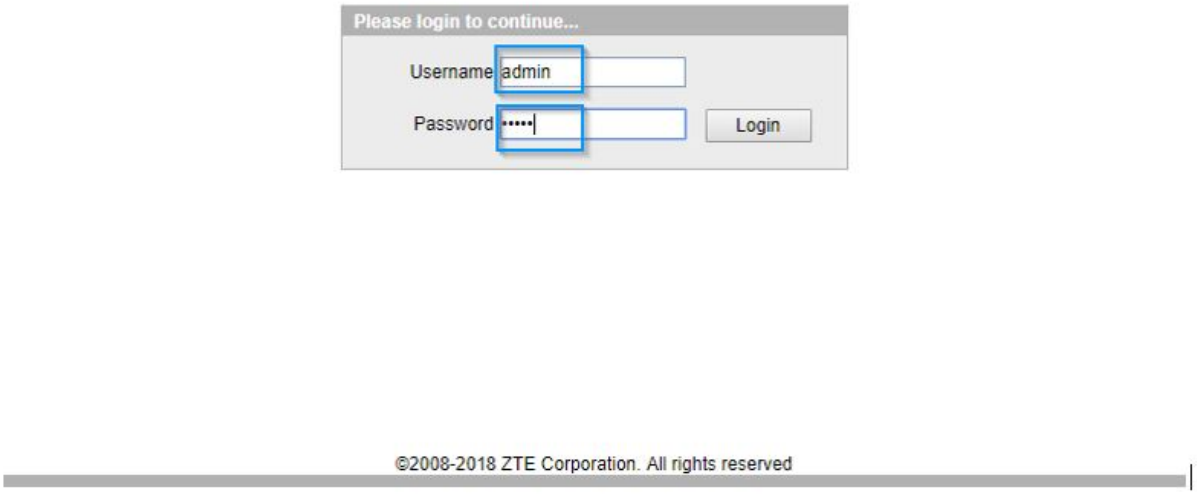

Image 1. Login screen of ZTE H298N router

In the Username field, type "**admin**". You'll be able to find the password associated with your router written on the back of the router itself. Once identified, type this into the Password field.

Once logged in, navigate to **Applications > Application List.** Select **Click here to add an application** in order to make new port mapping, as illustrated in Image 2.

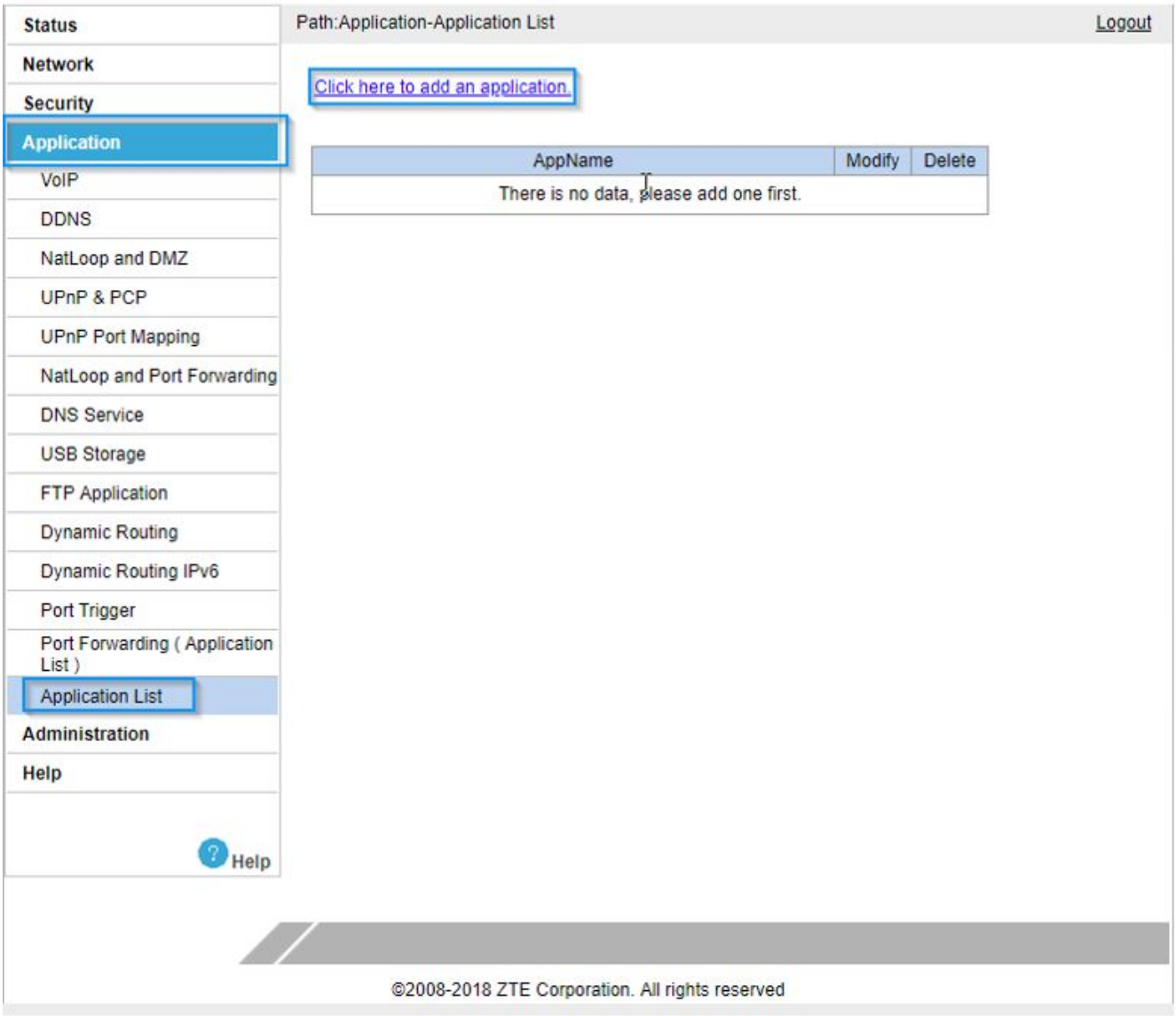

Image 2. Defining local application on router

You should then be presented with the webpage illustrated in Image 3. List any name in the **Application Name** field. In case of local web server, use **TCP Protocol**.

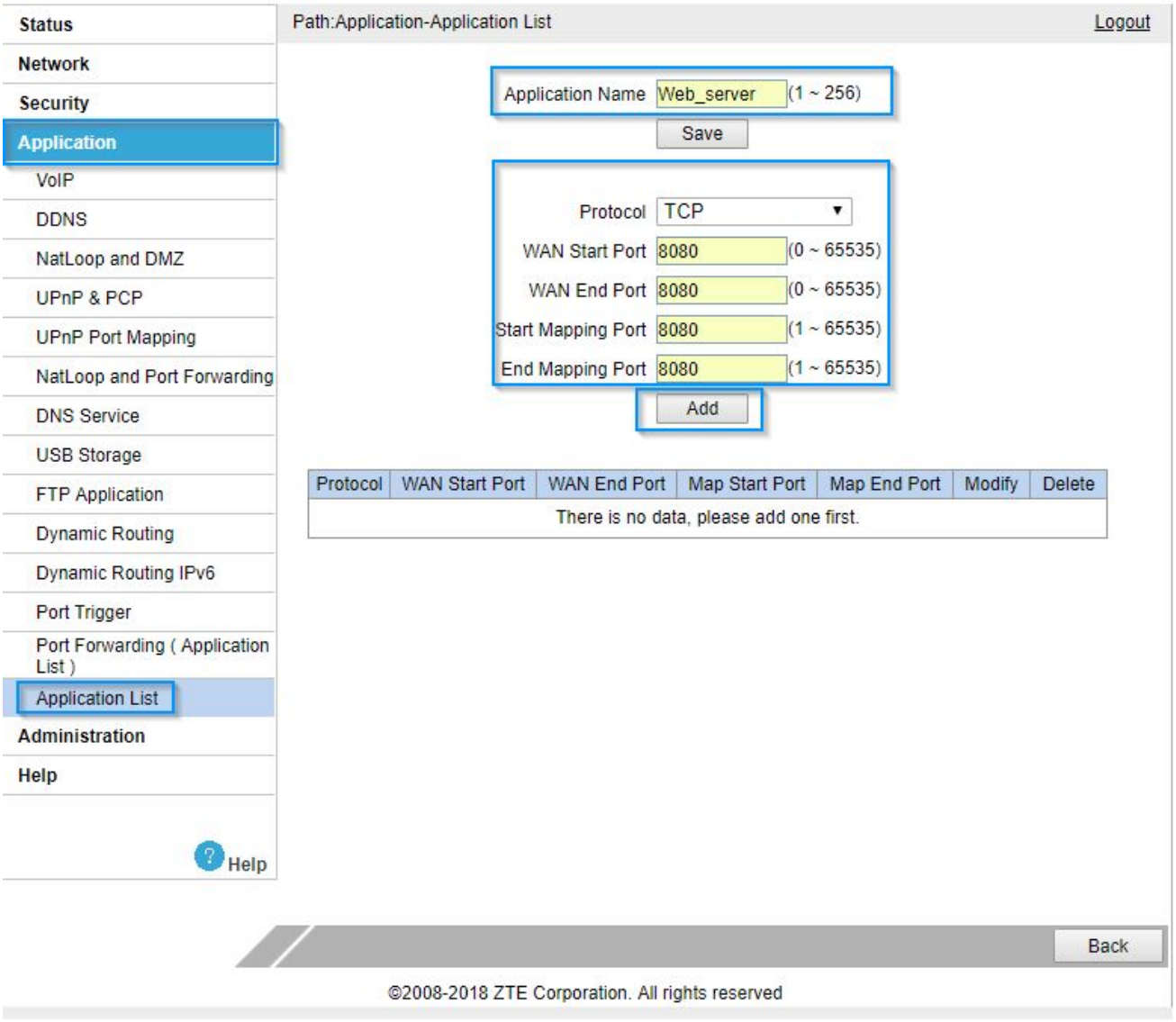

Image 3. Defining LAN application in router GUI

List the port that will be used for the local web server (in this case, the server will be listening for connections on TCP port 8080). Populate **WAN Start Port**, **WAN End Port**, **Start Mapping Port** and **End Mapping Port** with the value **8080**. Once completed, click **Add**. Confirmation should appear as illustrated in Image 4.

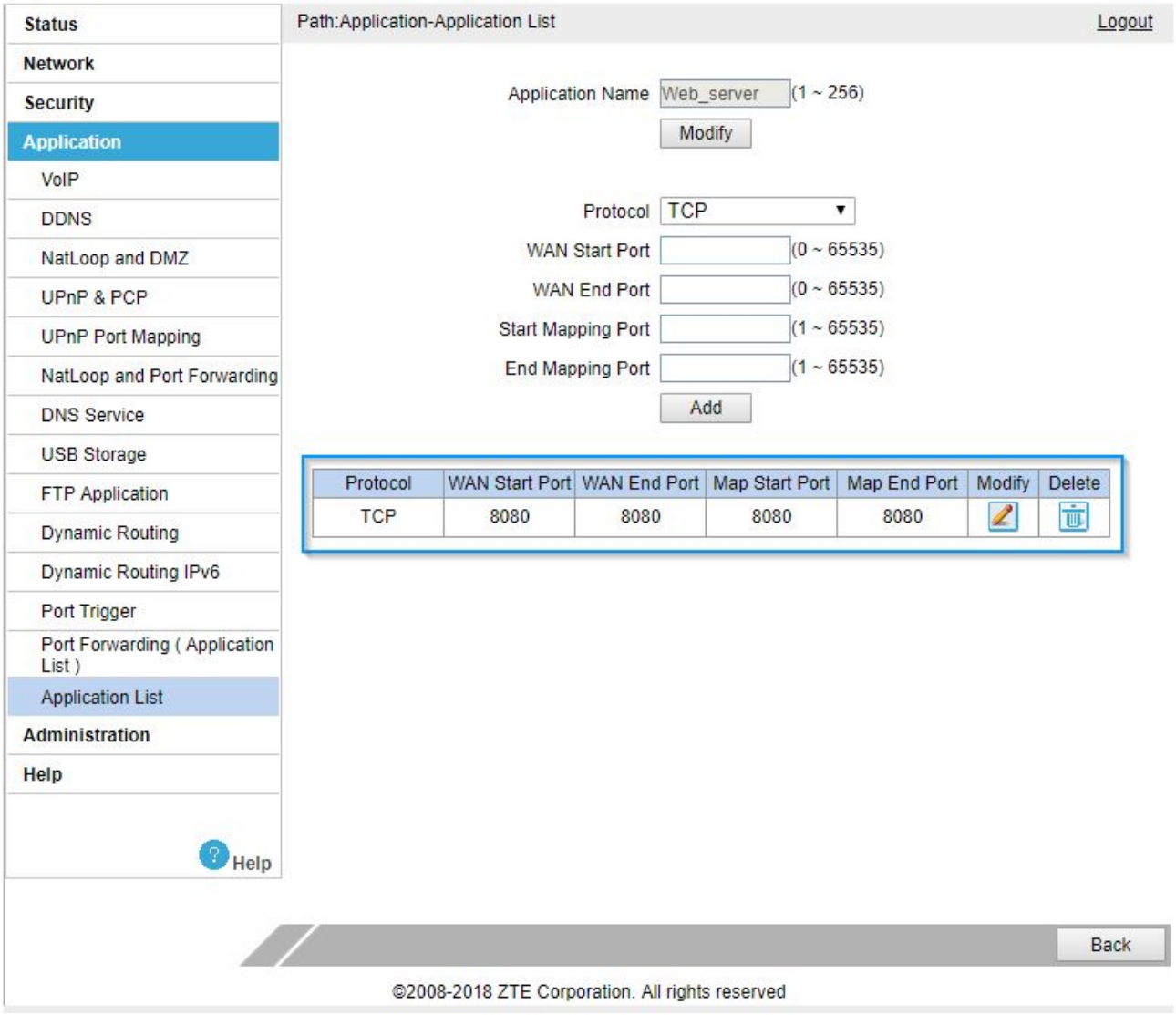

Image 4. Confirmation of application creation

After creating the application, navigate to **Application > Port Forwarding (Application List)**. This section will link the application with the relevant LAN device's IPv4 address. Enter **LAN Host IP Address** and click **Add**. This configuration is illustrated in Image 5.

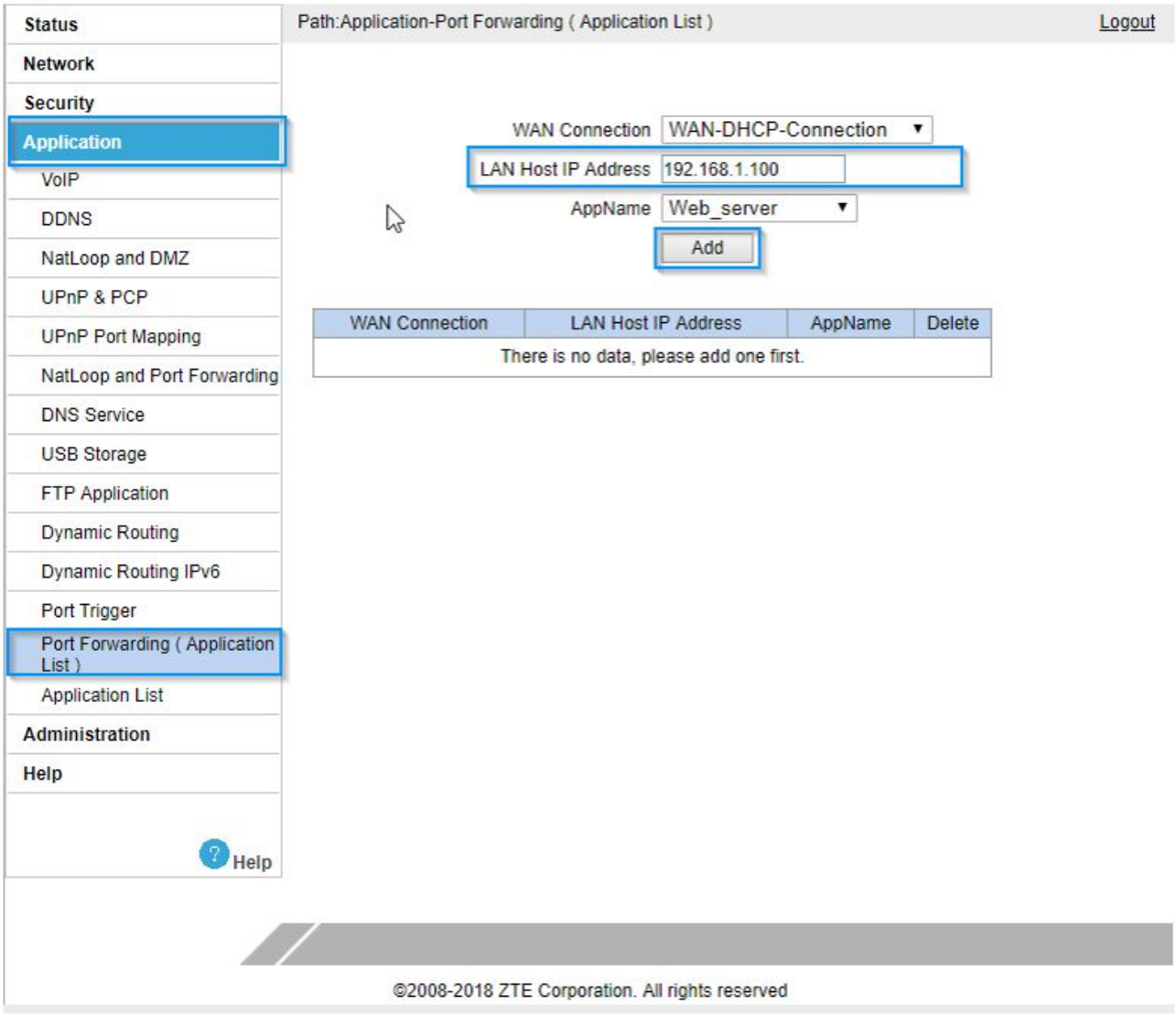

Image 5. Linking application with the LAN host

If the application is linked with the LAN device, you should see confirmation as illustrated in Image 6.

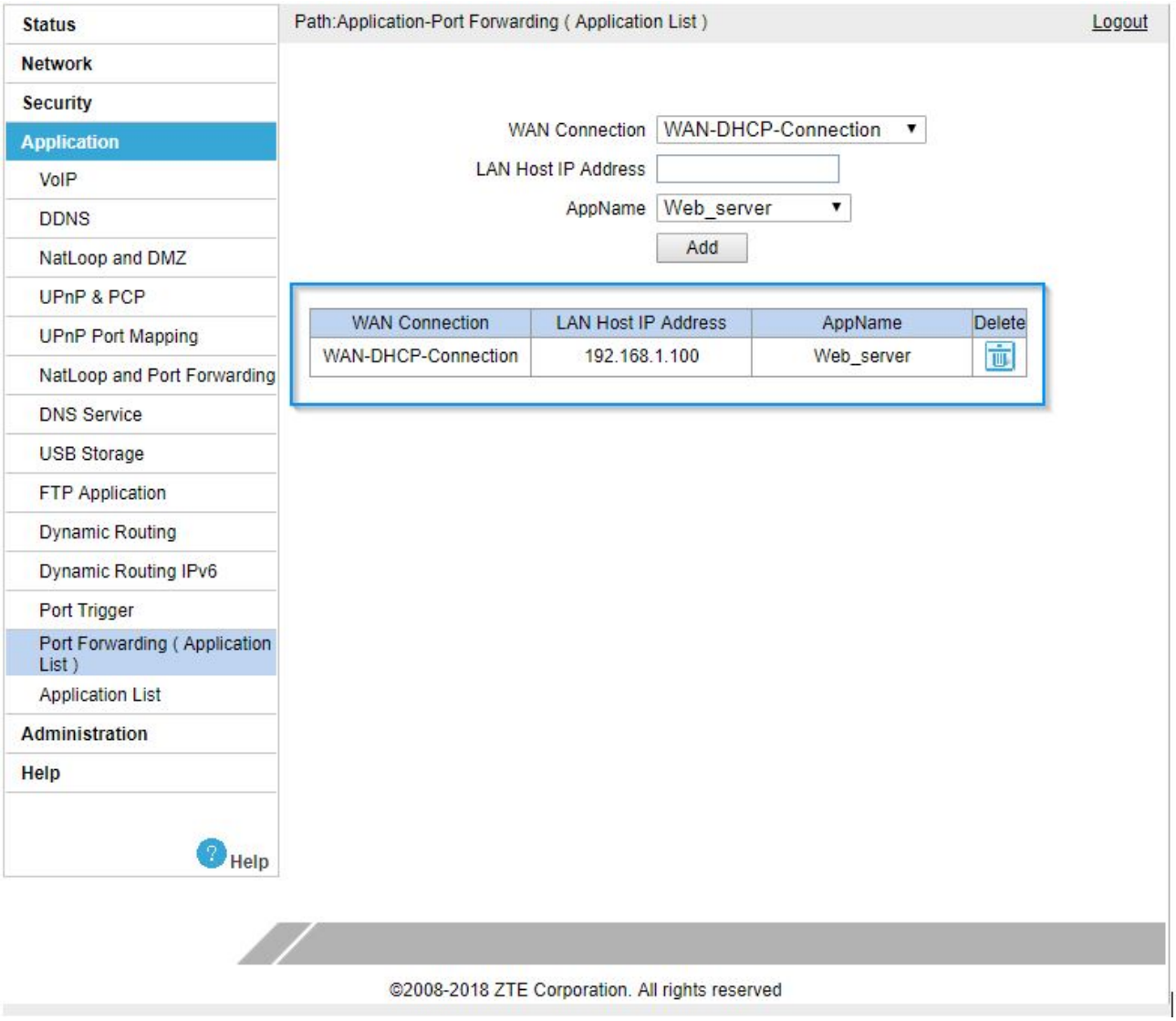

Image 6. Confirmation that port forwarding is configured

Alternatively, the router can be configured to perform port mapping (port translation) during port forwarding. In order to configure the router in this way, navigate to **Application > NatLoop and Port Forwarding** (see Image 7). In this example, the router will map traffic with destination port 12001 to port 8080. Inbound traffic on WAN ethernet port with destination port 21001 will be forwarded to LAN server. After all parameters are set, click **Add** to save router configuration.

Please also note that ports 80 and 443 **should never be used on WAN side**, as these ports are reserved for Hyperoptic Ltd. remote management. If you would like to use these ports on your server in a LAN, then you can use different ports on WAN side as shown on Image 7 (e.g. you can use ports on WAN side 12000, 12001 and map them to LAN ports 80, 443 respectively).

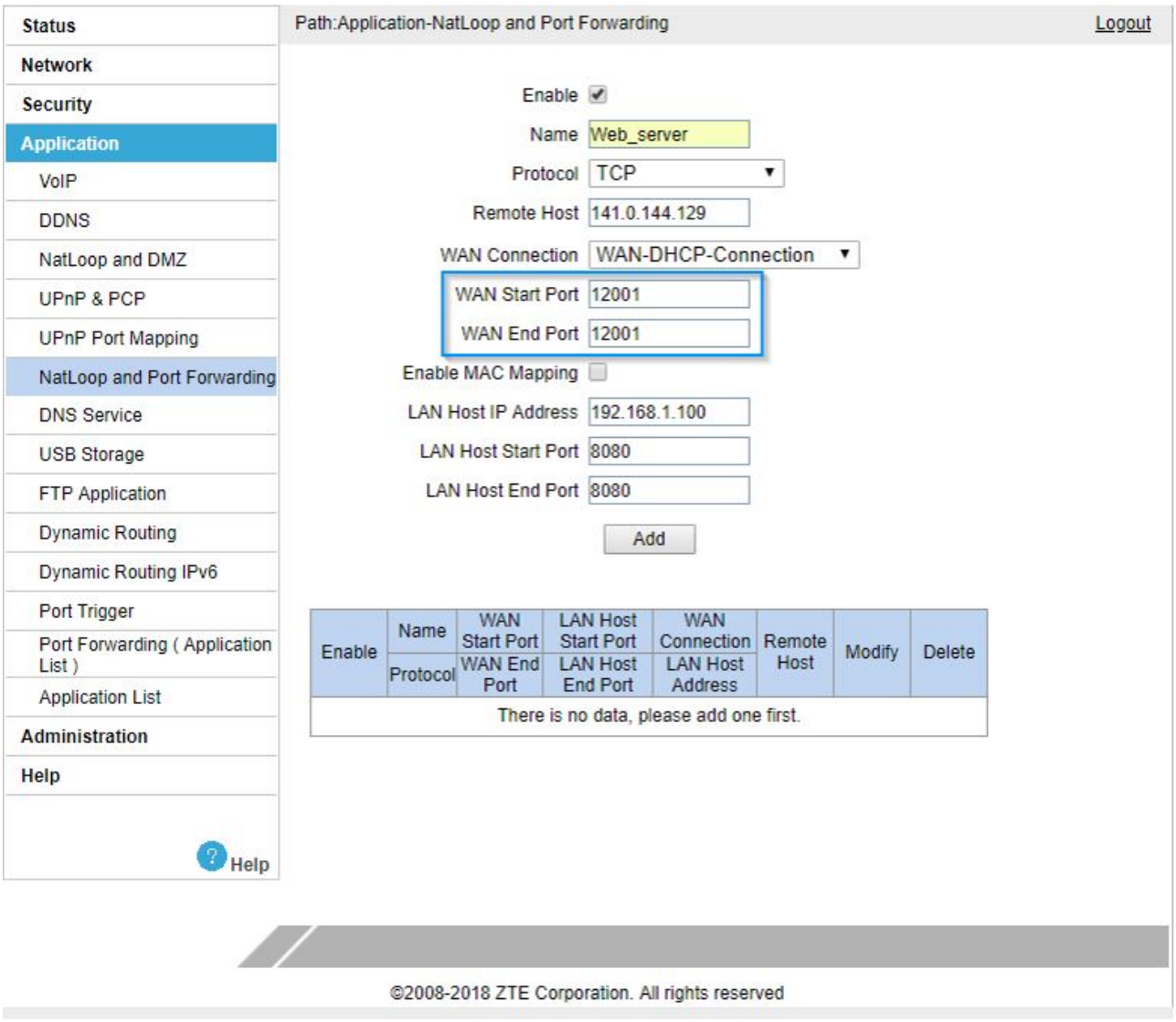

Image 7. Port forwarding with port mapping

A list of commonly used port is illustrated in Image 8. For additional information about TCP and UDP port numbers, please refer to https://en.wikipedia.org/wiki/List_of_TCP_and_UDP_port_numbers .

Port Number(s)	Protocol	Application
20	TCP	FTP data
21	TCP	FTP control
22	TCP	SSH
23	TCP	Telnet
25	TCP	SMTP
53	UDP, TCP	DNS
67	UDP	DHCP Server
68	UDP	DHCP Client
69	UDP	TFTP
80	TCP	HTTP (WWW)
110	TCP	POP3
161	UDP	SNMP
443	TCP	SSL
514	UDP	Syslog
16,384 – 32,767	UDP	RTP (voice, video)

Image 8. List of commonly used ports

DMZ for ZTE H298N

If a LAN device needs to be placed in a demilitarized zone, navigate to section DMZ as illustrated in Image 9 (**Application > NatLoop and DMZ**). Devices placed in DMZ will not be affected by a router's firewall. **Placing LAN devices in DMZ can therefore pose an IT security risk and this action should be taken with caution**.

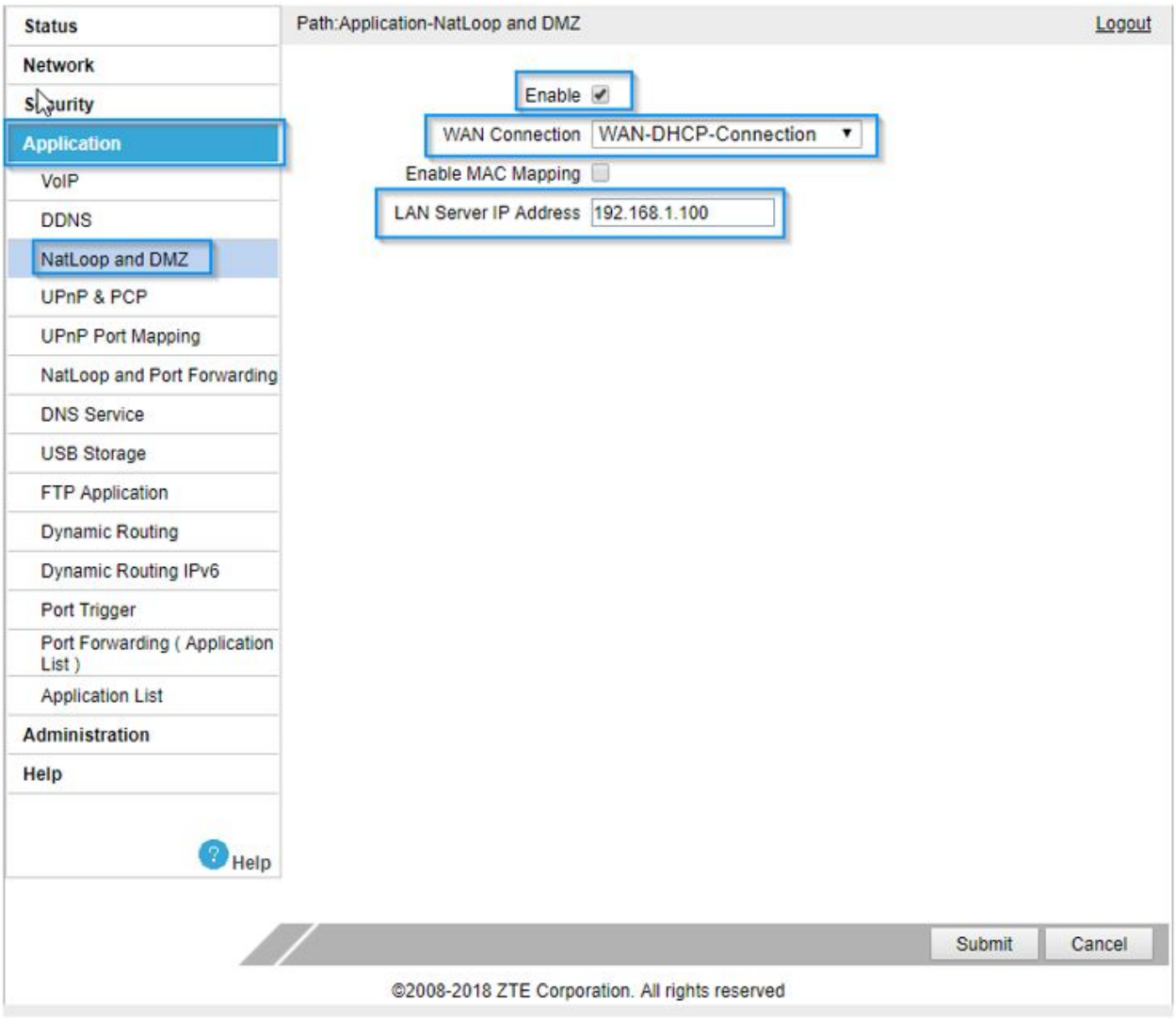

Image 9. DMZ configuration on router

Click **Enable**. Select **WAN Connection** as **WAN-DHCP-Connection**. List the **LAN Server IP address**. Click **Submit** to save router configuration.

IP Filter (IPv6)

IPv6 servers placed in LAN can be accessed from any remote IPv6 address. Access can be granted using the router's IPv6 filters. To configure a Hyperoptic router, navigate to **Security > IP Filters(IPv6)**. Image 10 illustrates an example of a local IPv6 web server.

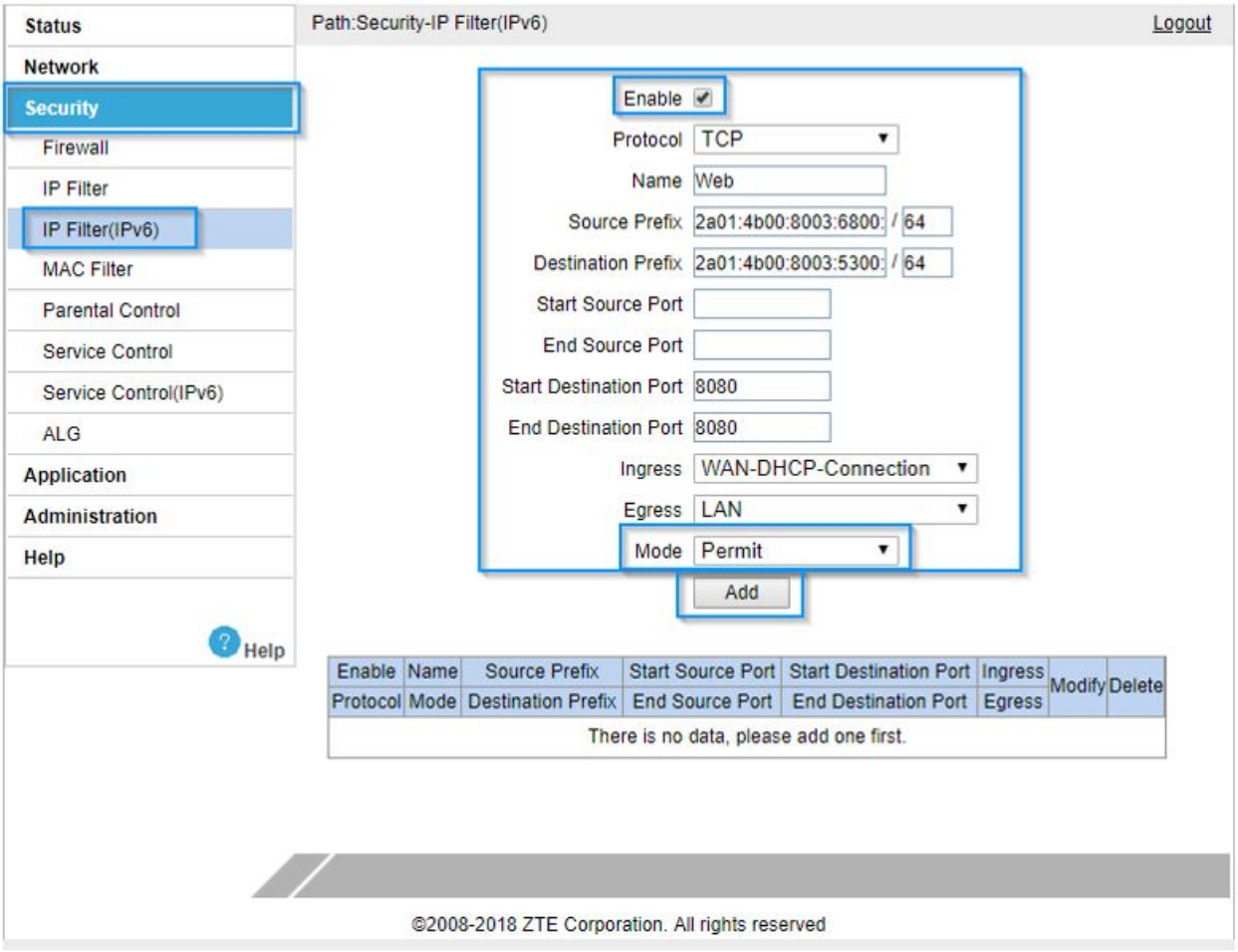

Image 10. IPv6 filter configuration

Click **Enable** to make the filter rule active.

For web servers, use **TCP** as **Protocol** type.

Use any **Name** for the filter.

List the **Source Prefix** (IPv6 address range of remote computers) - for example, **2a01:4b00:8003:6800::** with prefix length **64**.

For **Destination Prefix,** use the address range assigned to the router. In the example illustrated in Image 10, this range is **2a01:4b00:8003:5300::** with prefix length **64**.

Start Destination port and **End destination port** define the range of ports that will be allowed to pass through local router. In this case only one port is permitted – port **8080**.

Define **Ingress** and **Egress** ports as per Image 10.

Choose **Permit** mode and click **Add** to save router configuration. Once configured, confirmation should appear as illustrated in Image 11.

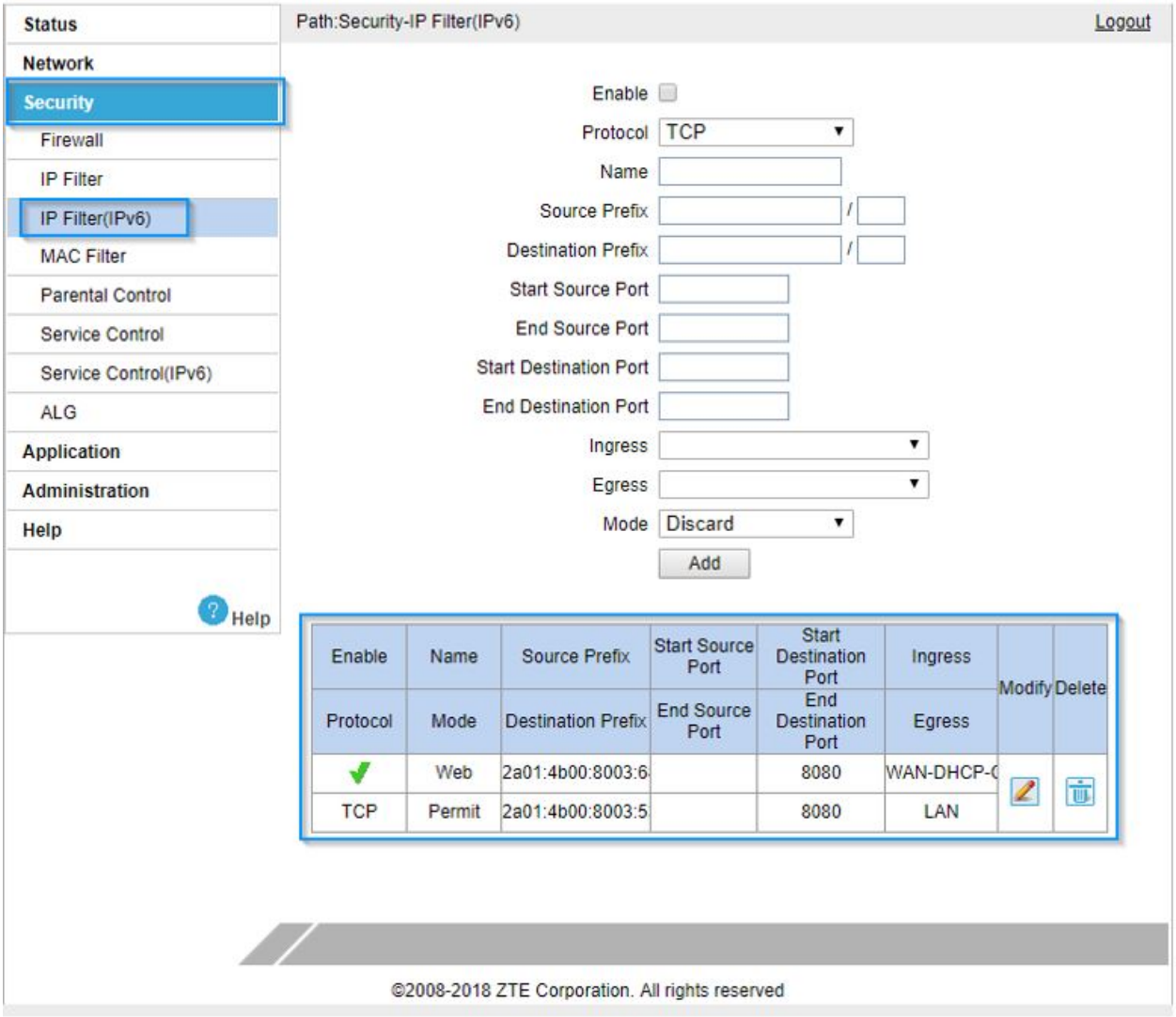

Image 11. Confirmation that IPv6 filter is made and Enabled

DHCP Binding for ZTE H298N

(Using user account)

Specific LAN client can have same IPv4 address all the time. In order to define which LAN client will have which IPv4 address, configuration of binding must be completed. This is described in photo 12. Navigate to section **Network > LAN**.

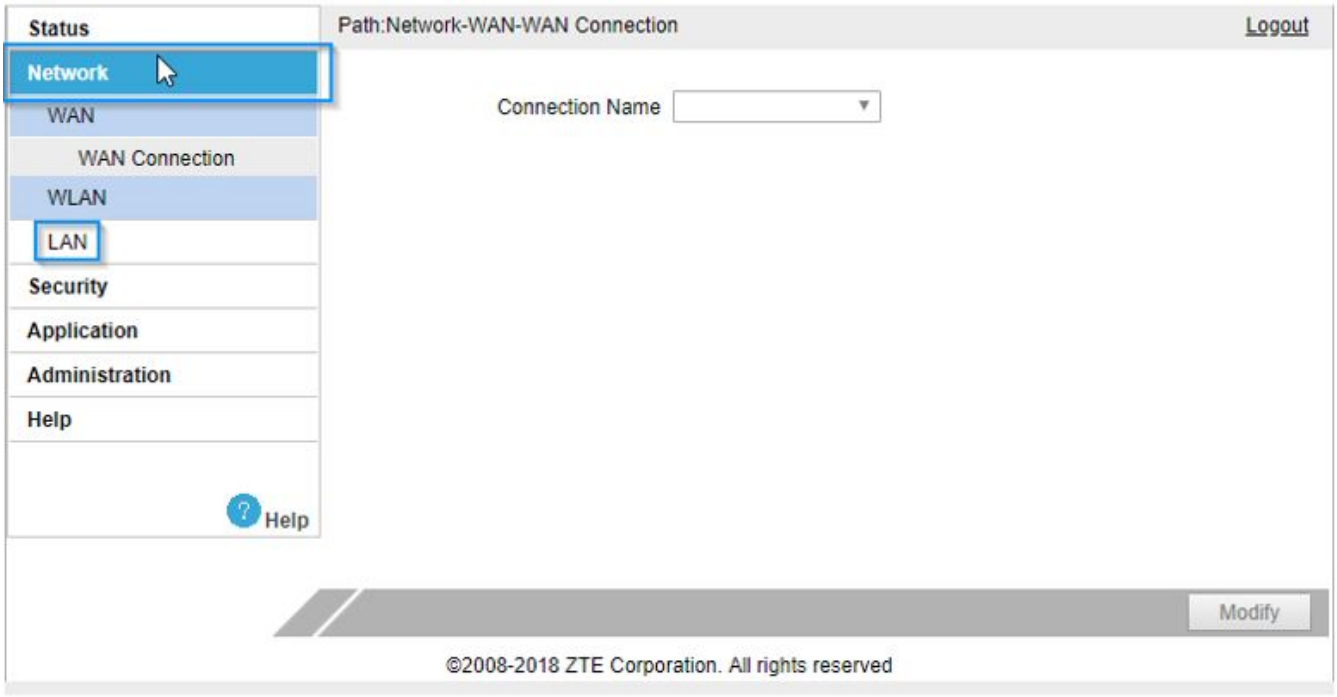

Photo 12. LAN section of router configuration

Click on **LAN** segment and then click on **DHCP Binding**. This is described in photo 13. List IPv4 wanted address and list MAC address of LAN client. After configuring these parameters click on **Add** to save settings.

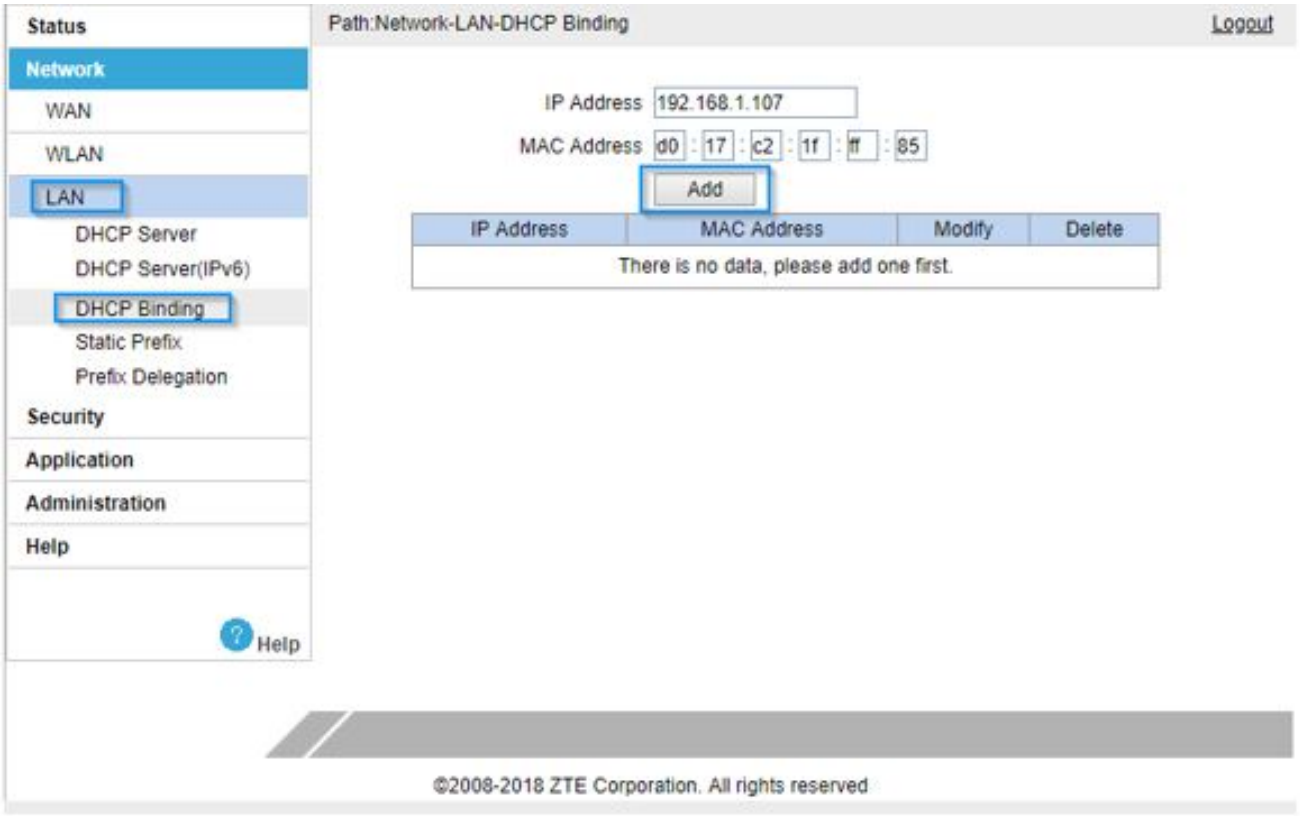

Photo 13. Configuring DHCP binding

Confirmation of configuration looks like described in photo 14.

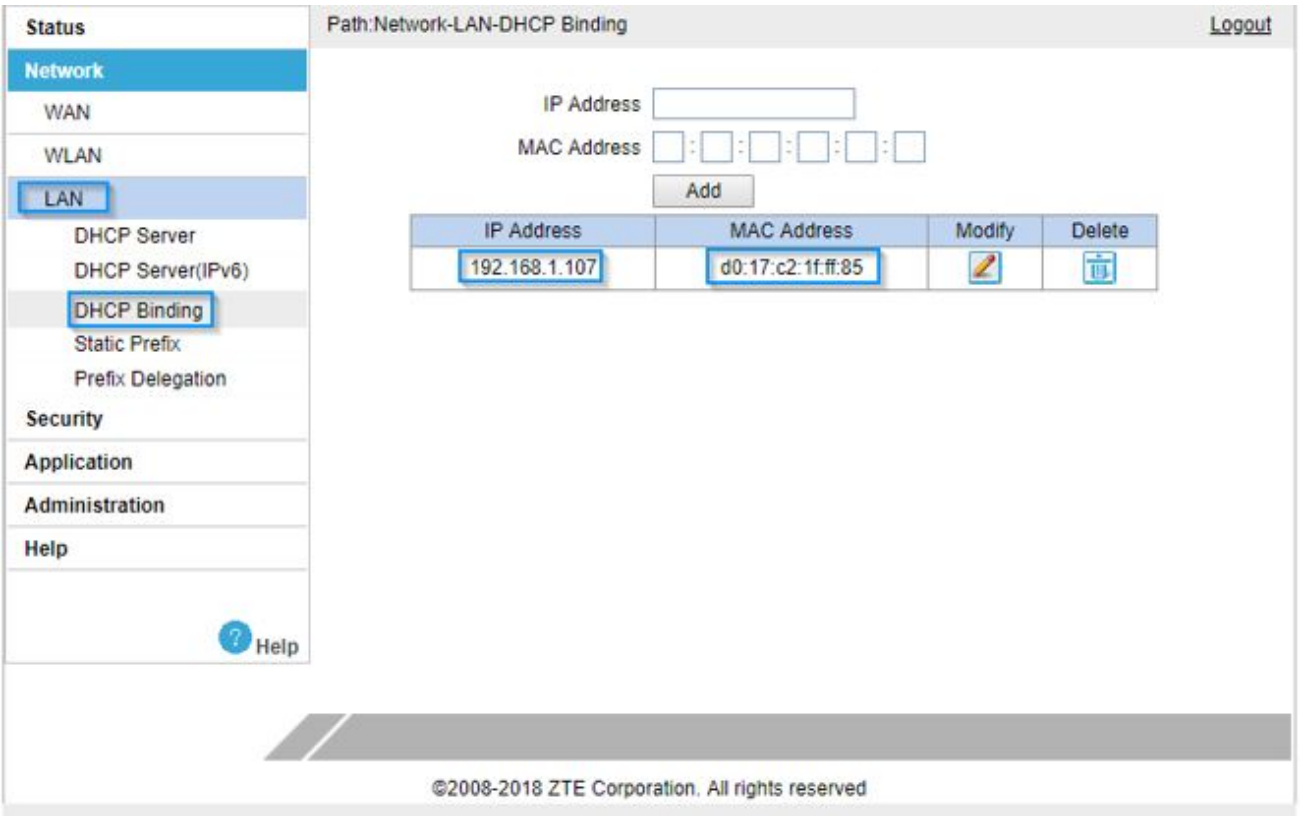

Photo 14. Confirmation of DHCP binding