Port forwarding for ZTE H298A

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).

![Login page of a ZTE H298A router](image1.png)

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 **Internet > Security > Port Forwarding**. See Image 2.
Click on **Create New Item** in order to create a new port forwarding rule. This rule will use IPv4 addresses. The new section should appear with all relevant fields that need to be configured (see Image 3).

The **Name field** can be filled in with any name, which will be used to indicate which service is being served.

Select the **Protocol type** (TCP or UDP).

The **WAN Host IP address** fields can be left unpopulated if local service needs to be accessible from any location on internet (any IPv4 address). In this case, the values in all fields will be 0.

If access is needed from a specific IPv4 address or from a range of IPv4 addresses, this section needs to be configured (e.g. 141.0.144.129 ~ 141.0.144.130). In the example illustrated in Image 3, the SFTP server is running in LAN. The SFTP server is located on the LAN client with IPv4 address **192.168.1.100**. The server will be listening for connections on TCP port 22, so TCP 22 must be listed. The list port ranges in sections **WAN port** and **LAN Host port**.

Once all the parameters are listed, click **Apply**. This will save your new router configuration.
Alternatively, port forwarding can be configured in a way that port mapping is performed. An example of this is illustrated in Image 4. In this case, WAN port 12001 traffic has been forwarded to the local web server which is listening for connections on port 8080. The router does a port translation.

Please also note that ports 80 and 443 should never be used on WAN, 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 as shown on Image 4 (e.g. you can use ports on WAN 12000, 12001 and map them to LAN ports 80, 443 respectively).
A list of commonly used ports is illustrated in Image 5. For additional information on TCP/UDP port numbers, please refer to https://en.wikipedia.org/wiki/List_of_TCP_and_UDP_port_numbers.

<table>
<thead>
<tr>
<th>Port Number(s)</th>
<th>Protocol</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>TCP</td>
<td>FTP data</td>
</tr>
<tr>
<td>21</td>
<td>TCP</td>
<td>FTP control</td>
</tr>
<tr>
<td>22</td>
<td>TCP</td>
<td>SSH</td>
</tr>
<tr>
<td>23</td>
<td>TCP</td>
<td>Telnet</td>
</tr>
<tr>
<td>25</td>
<td>TCP</td>
<td>SMTP</td>
</tr>
<tr>
<td>53</td>
<td>UDP/TCP</td>
<td>DNS</td>
</tr>
<tr>
<td>67</td>
<td>UDP</td>
<td>DHCP Server</td>
</tr>
<tr>
<td>68</td>
<td>UDP</td>
<td>DHCP Client</td>
</tr>
<tr>
<td>69</td>
<td>UDP</td>
<td>TFTP</td>
</tr>
<tr>
<td>80</td>
<td>TCP</td>
<td>HTTP (WWW)</td>
</tr>
<tr>
<td>110</td>
<td>TCP</td>
<td>POP3</td>
</tr>
<tr>
<td>161</td>
<td>UDP</td>
<td>SNMP</td>
</tr>
<tr>
<td>443</td>
<td>TCP</td>
<td>SSL</td>
</tr>
<tr>
<td>514</td>
<td>UDP</td>
<td>Syslog</td>
</tr>
<tr>
<td>16,384 – 32,767</td>
<td>UDP</td>
<td>RTP (voice, video)</td>
</tr>
</tbody>
</table>
DMZ for ZTE H298A

If a LAN device needs to be placed in a demilitarized zone, navigate to DMZ as illustrated in Image 6 (Internet > Security > 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 6. DMZ configuration on router

Select On and list the IPv4 address of LAN device in the LAN Host field. Click Apply to save new router configuration.
IPv6 filters (equivalent to IPv4 port forwarding)

If IPv6 servers are available for the LAN device, access can be granted via IPv6 filters. In order to configure IPv6 filters, navigate to Internet > Security > Filter Criteria > IP Filter – IPv6. This is illustrated in Image 7.

Click on IP Filter – IPv6. You should then be presented with a page similar to Image 8.

Click On in order to activate the IPv6 filter.

Use any Name for the IPv6 filter.

Click Allow to permit connections to the web server.

Select transport protocol – TCP in case of the web server.
List the **Destination Port Range** which will be used for the local server (port 8080). Define the **Destination IPv6 Address** prefix which will be used in LAN (e.g. 2a01:4b00:8003:5300::/64).

The **Ingress** port should be **WAN-DHCP-CONNECTION**.

The **Egress** port should be **LAN**.

If the remote address (internet side) is known, this can be configured in the **Source IPv6 Address** field.

![Image 8. Defining IPv6 filter parameters](image)
DHCP Binding

Specific LAN clients can have the 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 illustrated in Image 9. Navigate to section LAN Devices.

9. Navigate to LAN Devices

Click on LAN Settings as illustrated in Image 10. This will open another screen with DHCP Binding options.
10. Navigate to section LAN Settings

After clicking on **LAN Settings**, link screen as illustrated in Image 11 should appear.
11. DHCP Binding section of router user interface

After clicking **DHCP Binding**, define relevant parameters. **Name** can be anything. Check MAC address of the attached LAN client. Input **MAC address**.

List wanted IPv4 for the LAN client. IPv4 addresses can be in range from **192.168.1.100** to **192.168.1.254**. An example of configuration is illustrated in Image 12.
12. Linking MAC address to IPv4 LAN address