

Program title: UPNP

UPNP Operation Manual

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1. Summarize

UPNP full name is Universal plug-and-play (Universal Plug and Play). UPnP is a framework designed for intelligent appliances, wireless devices and personal computers for (peer-to-peer) network connection. It is a easy to use, flexible and standards-based connection, designed for families, small businesses, public places, or connect to the Internet or ad-hoc network management network. General speaking, it is to allow automatic access network equipment. Due to this characteristic, it will play an important role in the age of things. Here we just use one of its small applications - private network penetration.

2. Function

2.1 Auto port-mapping function

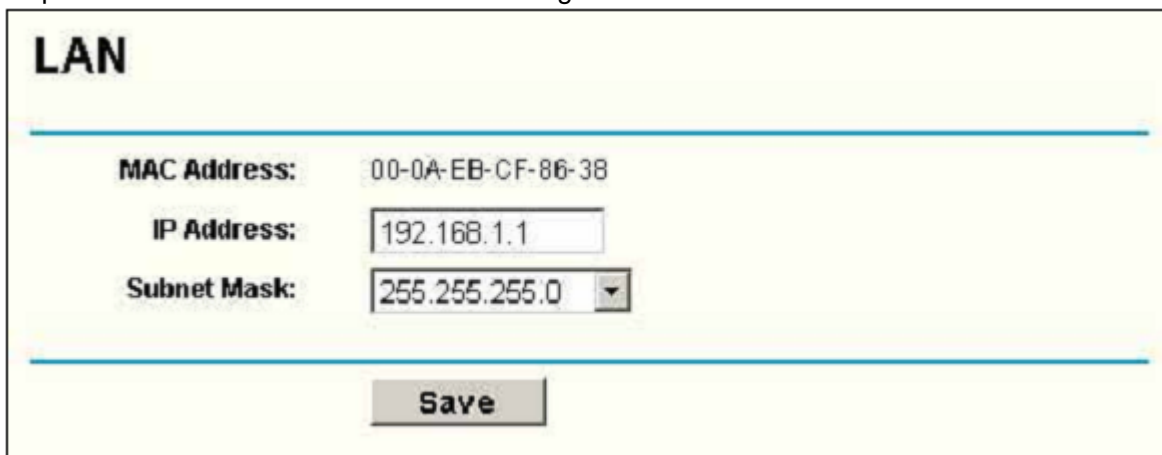
Private network penetrate through: Usually a router only has one single public IP and use the private network IP (172.xxx 10.xxx 192.xxx) to connect a number of computers in the LAN. We can establish a map relationship between the private LAN IP+port and the public network IP +port via IP+port symbol (similar to NAT implementation principle). We can access the private network machine on internet by accessing the external network IP with corresponding map port number.

3. Operation

3.1. Router configuration

3.1.1 TP-LINK settings

1) In the 【Network parameters】 -> 【LAN port settings】 set correct(private) network address e.g.: Ip:192.168.1.1 Mask: 255.255.255.0.see figure 1.



The image shows a screenshot of a web-based configuration interface for a LAN port. The title is "LAN". Below the title, there are three rows of configuration fields:

- MAC Address: 00-0A-EB-CF-86-38
- IP Address: 192.168.1.1
- Subnet Mask: 255.255.255.0

At the bottom of the form, there is a "Save" button.

Figure 1

2) And then **【Network parameters】** -> **【WAN port settings】** set router outside the network address. We can use static, dynamic, or PPPoE dial up to set router's external ip address which can be access to router from internet.

For example, we use the static IP to set the router's external network IP like:

- IP: 222.88.88.235
- Mask: 255.255.255.0
- Gateway: 222.88.88.1.

You can set other items if necessary. See figure 2

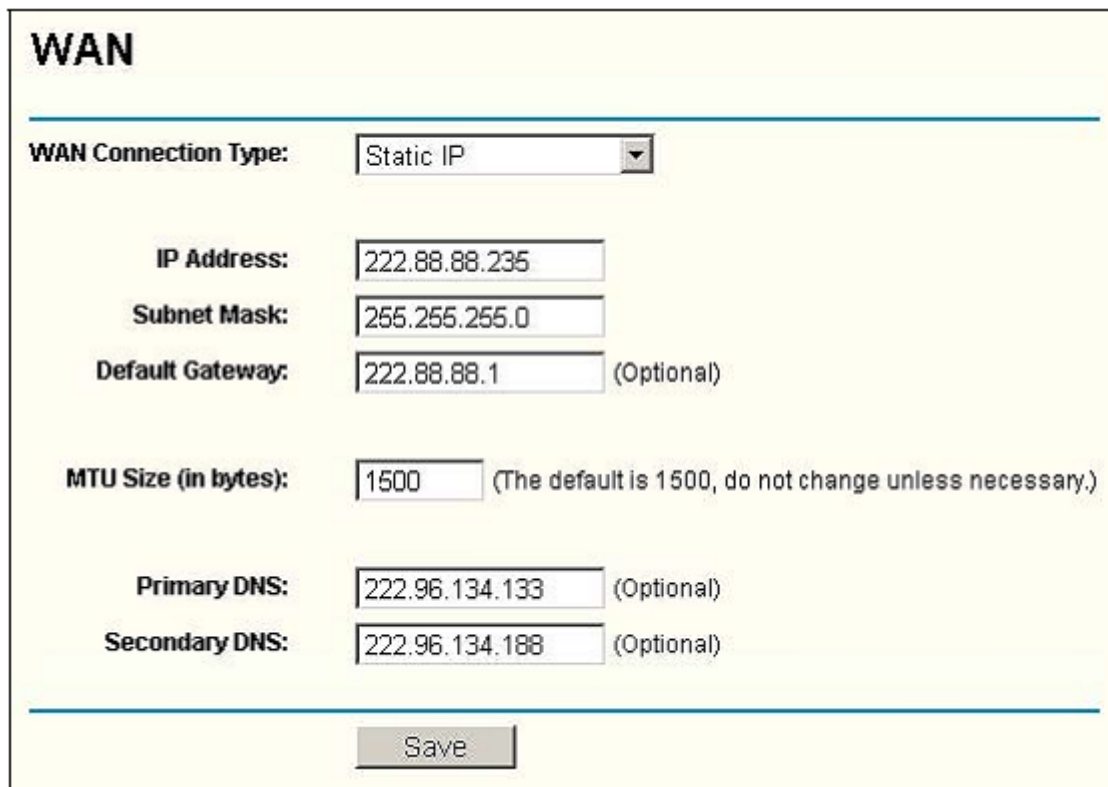


Figure 2

3) And Then in the **【Forward rule】** -> **【UPnP settings】** click "Enable UPnP". See figure 3

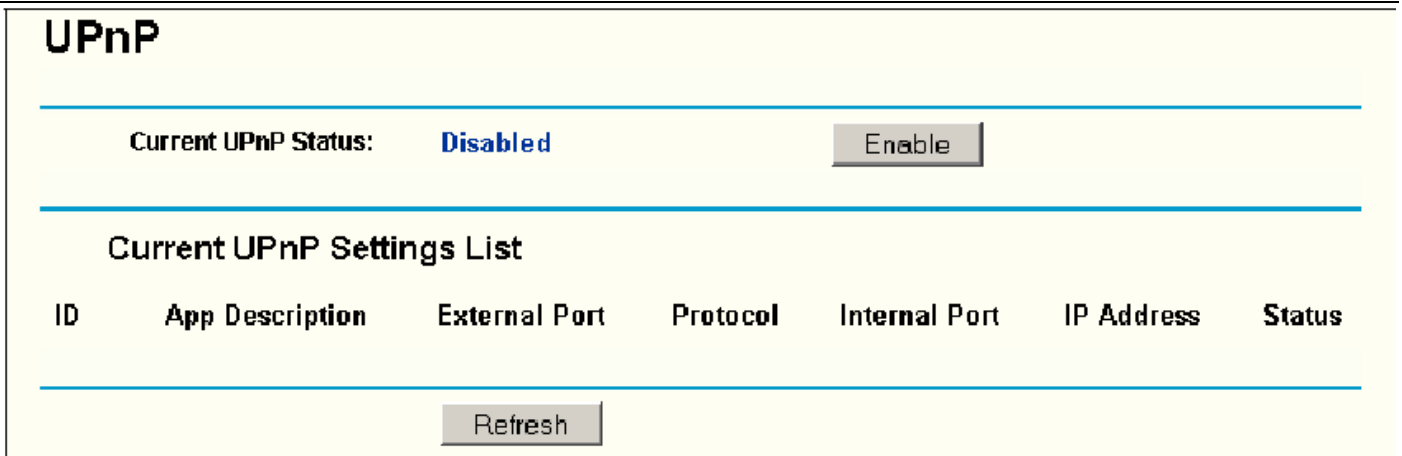


Figure 3

5) Display: Current UPnP Status: Enabled .This completes the router settings. At this point the router will maintain a UPnP port mapping table, when the device sends the command and application is successful, here will display the corresponding mapping. See figure 4

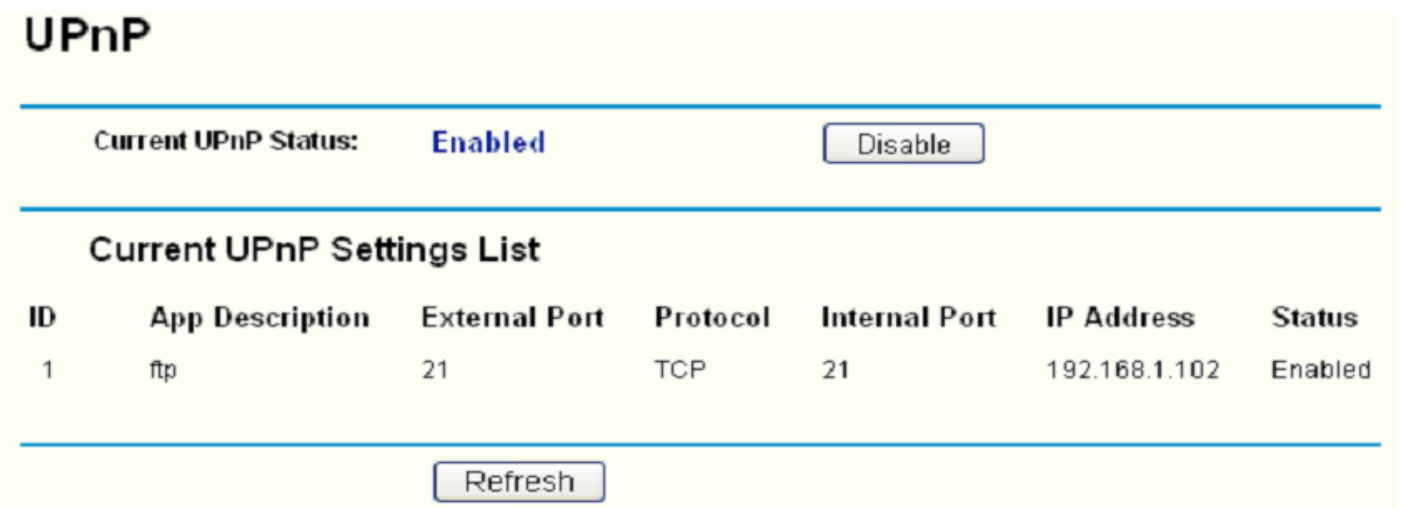


Figure 4

3.2. Local and web configuration instructions

3.2.1 DVR method of local settings

1) Connect the device to the router, in the 【main menu】 -> 【system settings】 -> 【network settings】, network device IP address will be set to Private Network Router IP address. See figure 5

- IP: 192.168.1.2~192.168.1.255
- Mask: 255.255.255.0
- Gateway: 192.168.1.1.

NETWORK

IP Address: 10 . 15 . 5 . 81 DHCP

Subnet Mask: 255 . 255 . 0 . 0

Gateway: 10 . 15 . 0 . 1

TCP Port: 37779 HTTP Port: 82

UDP Port: 37778 Max Connection: 10

Preferred DNS: 10 . 1 . 2 . 80

Alternate DNS: 10 . 1 . 2 . 81

Transfer Mode: Latency

LAN Download

ADVANCED SETTING

<input checked="" type="checkbox"/> UPNP	Port Forwarding
<input type="checkbox"/> EMAIL	10.1.0.3: 25
<input type="checkbox"/> FTP	Record FTP : 0.0.0.0
<input type="checkbox"/> ALARM SERVER	Private : 10.1.0.2

Default Save Cancel

figure 5

2) in 【main menu】 -> 【system configuration】 -> 【network setting】 -> 【advanced configuration】 -> 【Universal Plug and Play】 Double-click to go to the following page. See figure 6.

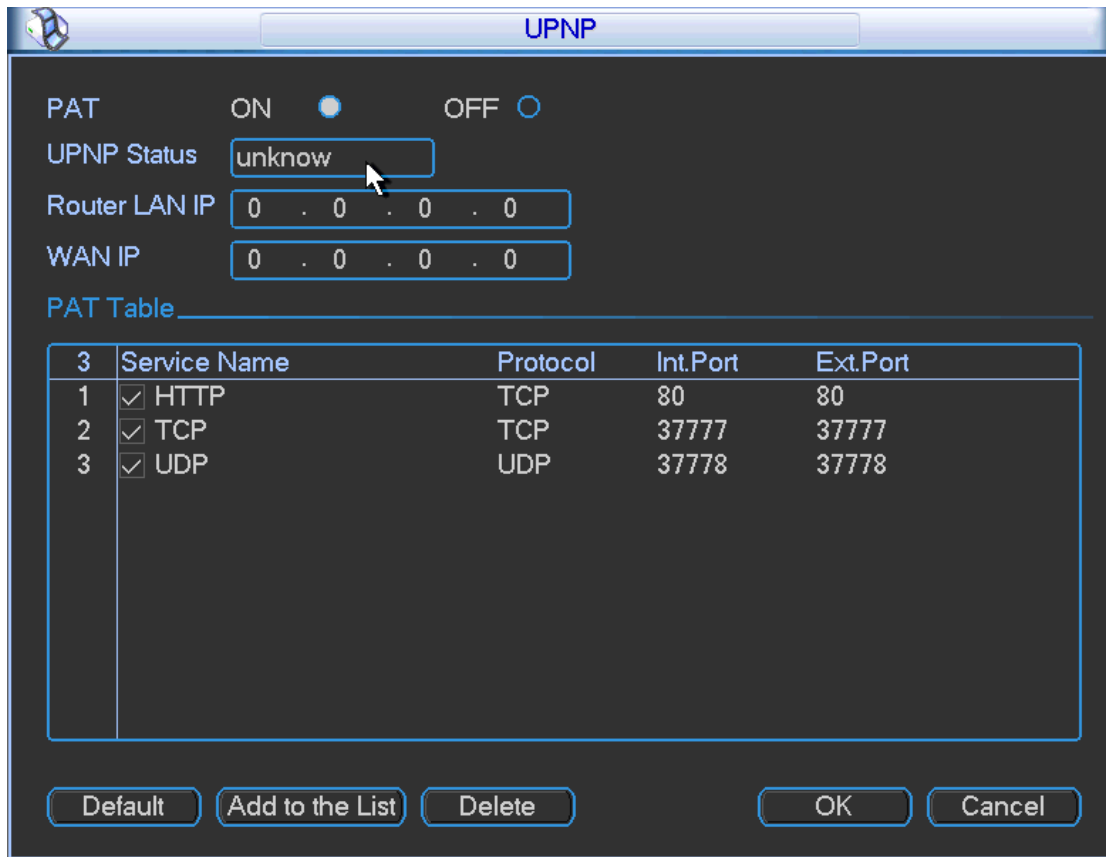


Figure 6

Instruction:

- **UPNP on off** : Turn on or off the UPNP function of the device.
- **Status**: When the UPNP is offline, it shows unknown. when the UPNP works it shows success.
- **Port Mapping list**: This port mapping one to one relationship with the router's port mapping setting.
- **Enable Switch** : : Suggest that the function of port mapping is enabled in this port.
- **List**:
 - ◇ Service name: Defined by user
 - ◇ protocol: Protocol type
 - ◇ inside: Port that has been mapped in the router
 - ◇ outside: Port that has been mapped locally
 - ◇ Attention Please: While setting the router's out port, use 1024~5000 port Not to use well-known port: 1~255 and the system port 256~1023 to avoid conflict
- **UPNP default port setting**

The device has three default port mapping list, which mapped out the HTTP, TCP and UDP port of the DVR. (If there are multiple DVRs in the same intranet, when you want to access them by web Client, you need to set the three ports differently)

N0.1

- Server name: HTTP ; //mapping HTTP port.
- Protocol: TCP;
- Internal port: 80; //HTTP port used by DVR
- external port : 80; //80 port is not suitable for the external port, cause it has been tied up to the router.

N0.2

- Server name: TCP; //TCP device data transfer port
- Protocol: TCP;
- Internal port: 37777; // TCP port used by DVR
- external port: 37777; // must be identical with the internal port number, to ensure the normal data transmission.

N0.3

- Server name: UDP ; //UDP device data transfer port
- Protocol: UDP;
- Internal port: 37778; // UDP port used by DVR
- External port: 37778; // must be identical with the internal port number, to ensure the normal data transmission. See figure 7

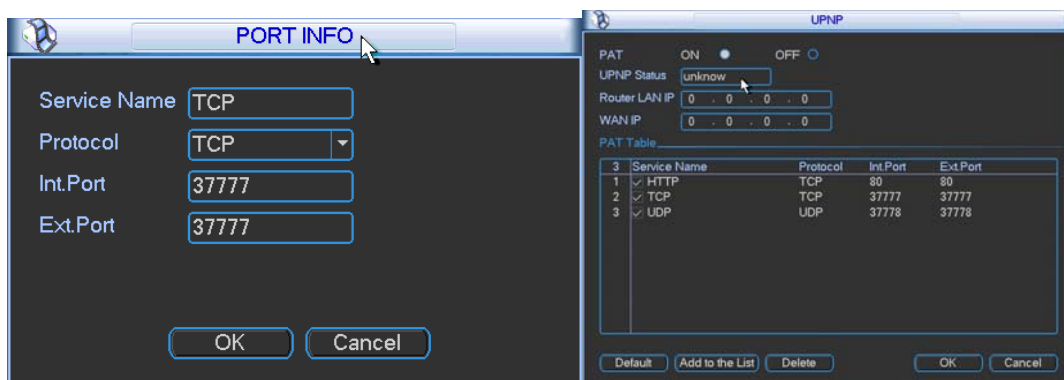


Figure 7

3) Add mapping by clicking the 'Add'. For transfer protocol TCP and UDP, their internal port and external port number must be the same in order to ensure the normal data transmission.

Select a map, click the "Delete " to delete the mapping. See figure 8

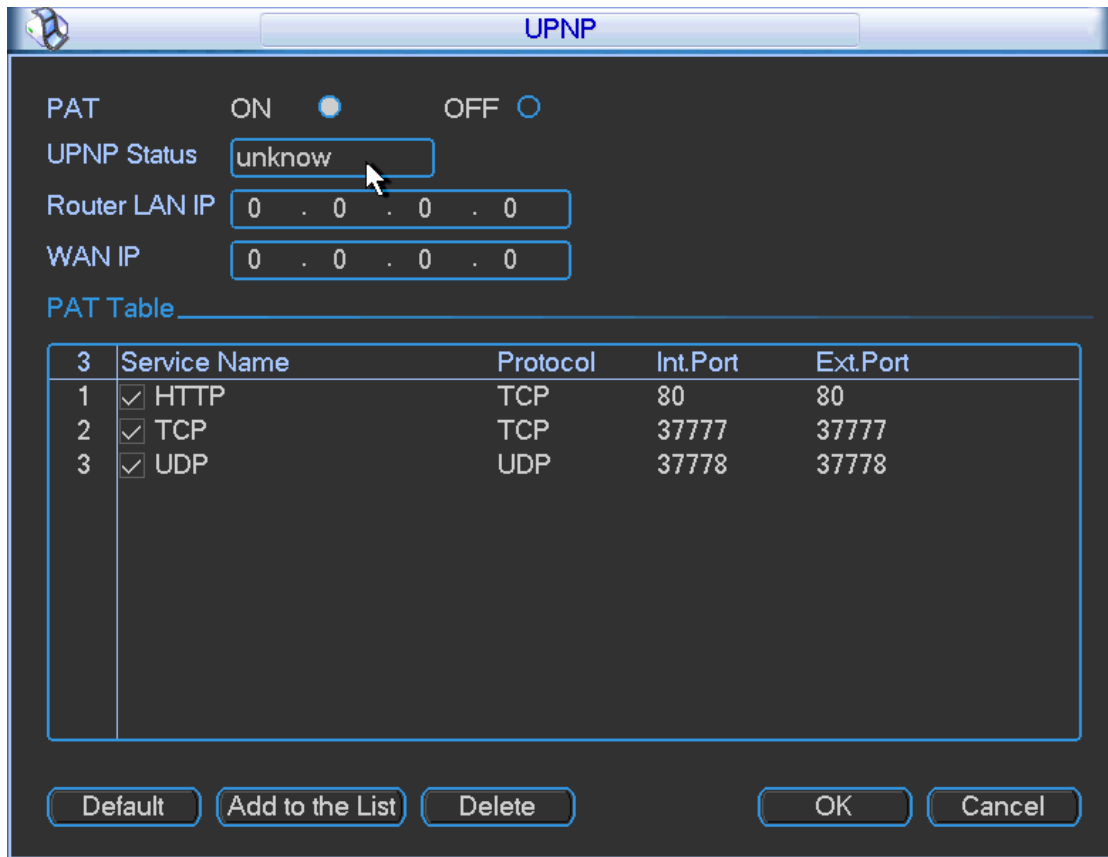


figure 8

By double-clicking on certain mapping, one can modify the mapping information. See figure 9

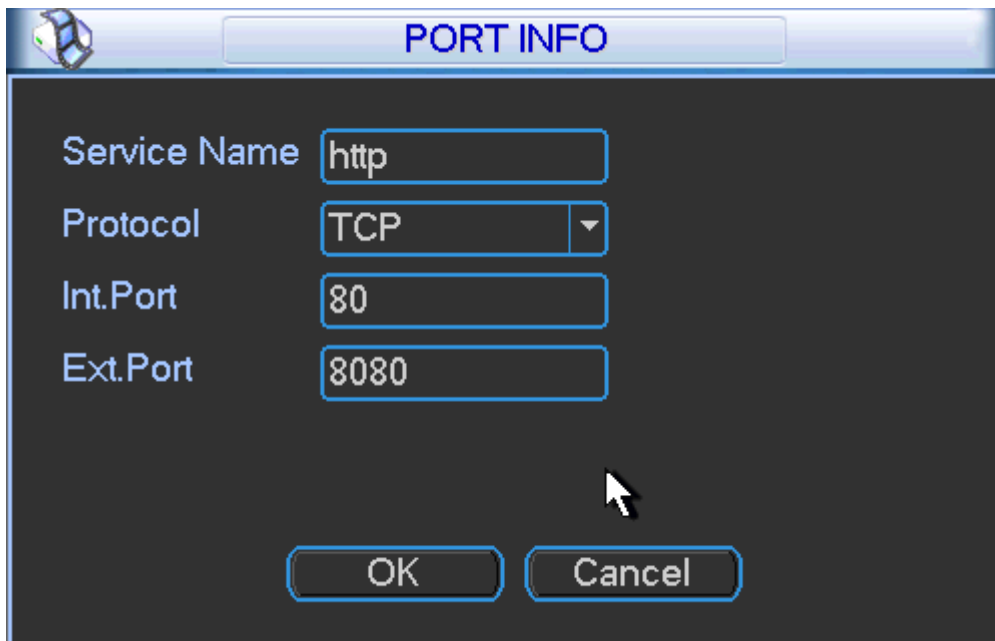


Figure 9

One can determine the validity of certain mapping using the enable switch before each mapping.

2.2 Web Client Settings

It is similar to the local operation of the DVR.

1) Set device IP address, then connect the device to the router. See figure 10

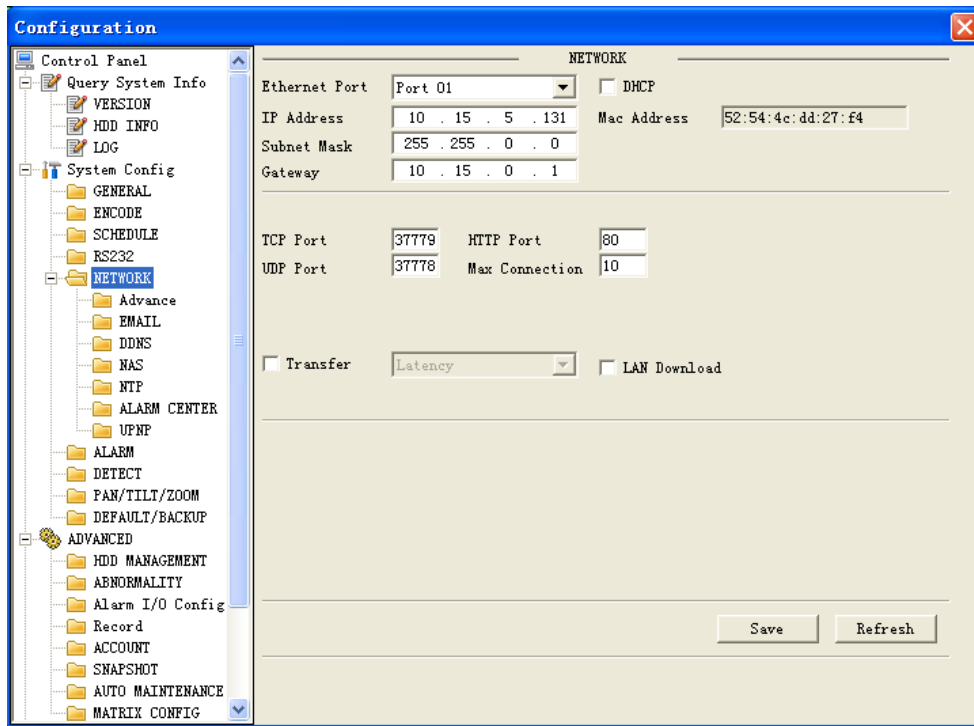


Figure 10

2) Enter the UPNP configuration interface, default setting shown as the following. See figure 11

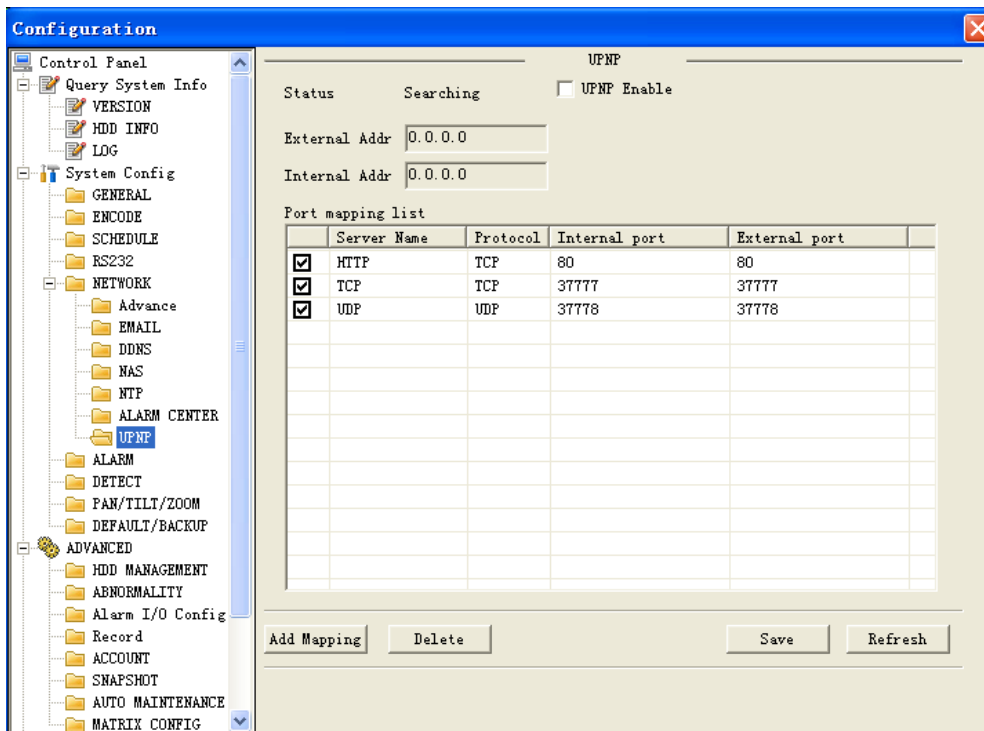


Figure 11

3) You can also add, delete or modify operation here.

4. Access Methods

1) When the mapping is working, go to the router's option interface, [Forwarding] -> [UPNP] in the UPNP mapping list, one can see as following:

2) By accessing the mapping list, the router's external network IP is 10.6.3.77, the device's real IP address is 192.168.1.108. We choose 8080 as the external port of a mapping, when accessing, we should input <http://10.6.3.77:8080>. The router will find out the device real IP address by searching the mapping list, and access the device then. User from internal network can access the device through <http://192.168.1.108:80>, while user from the external network also can access the device though <http://10.6.3.77:8080>. It means that the penetration from external network address <http://10.6.3.77:8080> to the internal address <http://192.168.1.108:80> is complete.



5. Testing Methods

Set the port mapping list locally or on the web client, then access the router's UPNP interface to see if it works. Pay attention to the port number of your DVR, when it comes to the setting of the port that your web client uses, please avoid 80, because 80 is the port number of your router when you use web client to access it. Secondly, when TCP or UDP port is being set, one must make sure that it is identical to the internal port number, because the web side and the device side have not been able to self-adapt their port.

Note

- This document is for reference only.
- Slight difference may be found in user interface.
- All the designs and software here are subject to change without prior written notice.
- If there is any uncertainty or controversy, please refer to the final explanation of us.
- Please visit our website for more information.