
NAT (Network Address Translation)

Introduction

NAT (Network Address Translation) is a method of mapping one or more IP addresses and/or IP service ports into different specified values.

Two functions of NAT are as below:

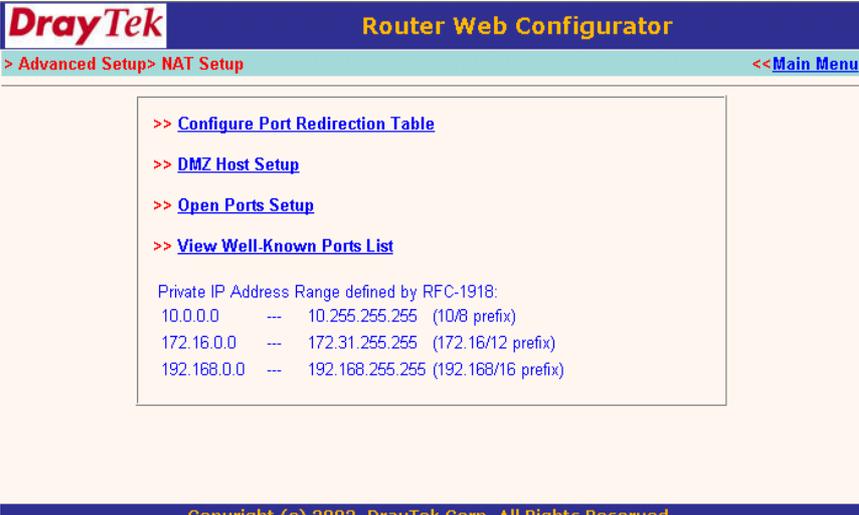
It allows the internal IP addresses of many computers on a LAN to be translated to the public ISP by only one or a few addresses, saving users cost.

It can play a security feature by obscuring the true addresses of important machines from potential hackers on the Internet.

NAT Setup

Usually you will use the router as a NAT-enabled router. NAT stands for Network Address Translation. It means the router gets one (in Single ISP, PPPoE, PPTP) or two (in Dual ISP mode) globally re-routeable IP addresses from the ISP. Local hosts will use private network IP addresses defined by RFC-1918 to communicate with the router. The router translates the private network addresses to a globally routeable IP address, which is then used to access the Internet. The following explains NAT features for specific applications.

Click **NAT Setup** to open the setup page. On the page you will see the private IP address definitions defined in RFC-1918. Usually we use the 192.168.1.0/24 subnet for the router.



DrayTek Router Web Configurator

> Advanced Setup > NAT Setup << Main Menu

- >> [Configure Port Redirection Table](#)
- >> [DMZ Host Setup](#)
- >> [Open Ports Setup](#)
- >> [View Well-Known Ports List](#)

Private IP Address Range defined by RFC-1918:

10.0.0.0	---	10.255.255.255	(10/8 prefix)
172.16.0.0	---	172.31.255.255	(172.16/12 prefix)
192.168.0.0	---	192.168.255.255	(192.168/16 prefix)

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Exposing Internal Servers to the Public Domain

The Port Redirection Table may be used to expose internal servers to the public domain or open a specific port number to internal hosts. Internet hosts can use the WAN IP address to access internal network services, such as FTP, WWW, etc.

The following example shows how an internal FTP server is exposed to the public domain. The internal FTP server is running on the local host addressed as 192.168.1.10.

Index	Service Name	Protocol	Public Port	Private IP	Private Port	Active
1	FTP	TCP	21	192.168.1.10	21	<input checked="" type="checkbox"/>
2		-	0		0	<input type="checkbox"/>
3		-	0		0	<input type="checkbox"/>
4		-	0		0	<input type="checkbox"/>
5		-	0		0	<input type="checkbox"/>
6		-	0		0	<input type="checkbox"/>
7		-	0		0	<input type="checkbox"/>
8		-	0		0	<input type="checkbox"/>
9		-	0		0	<input type="checkbox"/>
10		-	0		0	<input type="checkbox"/>

OK

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As shown above, the **Port Redirection Table** provides 10 port-mapping entries for internal hosts.

Service Name: Specifies the name for the specific network service.

Protocol: Specifies the transport layer protocol (TCP or UDP).

Public Port: Specifies which port should be redirected to the internal host.

Private IP: Specifies the private IP address of the internal host offering the service.

Private Port: Specifies the private port number of the service offered by the internal host.

Active: Check here to activate the port-mapping entry.

Click **OK**

Note that port forwarding can only be applied to external users only - i.e incoming traffic. The internet users behind your LAN can not access your external public IP address and come back in; the internal users shall access the server on its local private IP address, or you can set up an alias in a Windows hosts file. Please only redirect the ports you know you have to forward rather than forward all ports. Otherwise, the intrinsic firewall type security of NAT facility will be influenced.

DMZ Host Setup

Click **DMZ Host Setup** to open the setup page. The DMZ Host settings allow a defined internal user to be exposed to the Internet to use some special-purpose applications such as Netmeeting or Internet Games etc.

DMZ Enable: Check to enable the DMZ Host function.

DMZ Host IP: Enter the IP address of the DMZ host.



The screenshot shows the 'DMZ Host Setup' page in the DrayTek Router Web Configurator. The page title is 'DMZ Host Setup' and it is part of the 'NAT Setup' configuration. The page contains two main sections: 'Enable' and 'Private IP'. The 'Enable' section has a checkbox that is currently unchecked. The 'Private IP' section has four input fields for the IP address (0.0.0.0) and a 'Choose PC' button. At the bottom of the form are 'Cancel' and 'OK' buttons. The page footer contains the text 'Copyright (c) 2002, DrayTek Corp. All Rights Reserved.'

Open Port Setup

The Vigor router can support three variants of port mapping methods as below:

Port Redirection: The packet is forwarded to a specific local PC if the port number matches that defined. An user can also translate the port to another port locally.

Open Ports: As Port Redirection (above) but enables you to define a range of ports.

DMZ host: This opens up a single PC completely. All inward packets will be forwarded to the PC with the local IP address you designate. The only exceptions are packets received in response to outgoing requests from other local computers or incoming packets which match rules in the other two methods.

While you are using combinations of these three systems, there is a priority structure; i.e. if a rule in one method co-incides with a rule in another method, then there is strict precedence, so that the result should be predictable. The precedence is as follows :

Port Redirection > Open Ports > DMZ

e.g. The packet will be forwarded to the local address designated in **Port Redirection** if the port number of an incoming packet matches a rule in both **Port Redirection** and **Open Ports**.

DrayTek Router Web Configurator

> Advanced Setup > NAT Setup > Open Ports Setup << [Main Menu](#)

Open Ports Setup

Index	Comment	Local IP Address	Status
1.			x
2.			x
3.			x
4.			x
5.			x
6.			x
7.			x
8.			x
9.			x
10.			x

Cancel Clear All

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DrayTek Router Web Configurator

> Advanced Setup > NAT Setup > Open Ports Setup > Edit Open Ports Setup << [Main Menu](#)

Index No. 1

Enable Open Ports

Comment

Local Computer

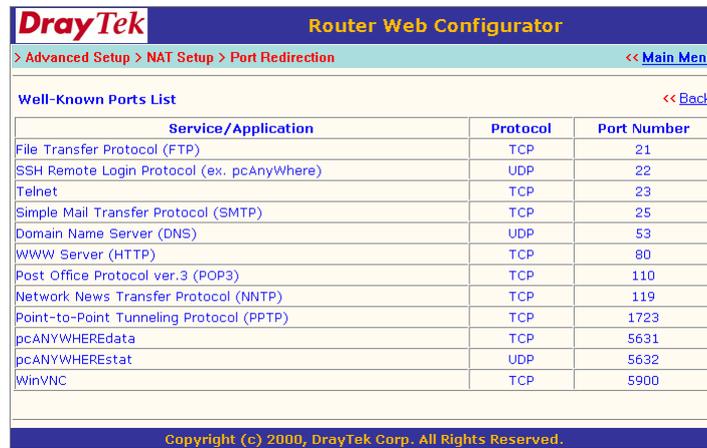
	Protocol	Start Port	End Port		Protocol	Start Port	End Port
1.	TCP	6336	6336	6.	----	0	0
2.	----	0	0	7.	----	0	0
3.	----	0	0	8.	----	0	0
4.	----	0	0	9.	----	0	0
5.	----	0	0	10.	----	0	0

Cancel Clear All OK

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Well-known Port Number List

This page provides some well-known port numbers for your reference.



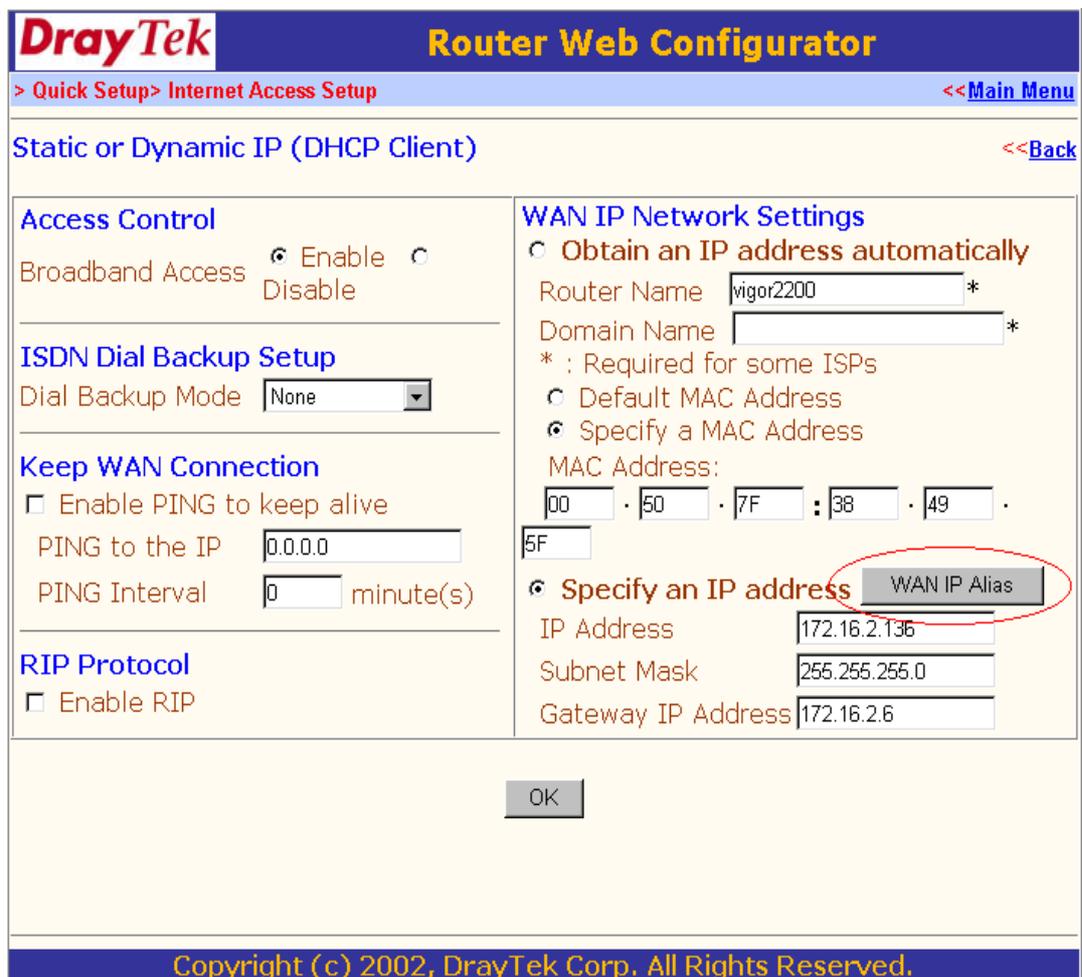
The screenshot shows the 'Well-Known Ports List' in the DrayTek Router Web Configurator. The table lists various services and their corresponding protocols and port numbers.

Service/Application	Protocol	Port Number
File Transfer Protocol (FTP)	TCP	21
SSH Remote Login Protocol (ex. pcAnywhere)	UDP	22
Telnet	TCP	23
Simple Mail Transfer Protocol (SMTP)	TCP	25
Domain Name Server (DNS)	UDP	53
WWW Server (HTTP)	TCP	80
Post Office Protocol ver.3 (POP3)	TCP	110
Network News Transfer Protocol (NNTP)	TCP	119
Point-to-Point Tunneling Protocol (PPTP)	TCP	1723
pcANYWHEREdata	TCP	5631
pcANYWHEREstat	UDP	5632
WinVNC	TCP	5900

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Multi-NAT Setup

If you have a group of static IPs then you can use the Multi-NAT features to set up multiple DMZ hosts or multiple open ports hosts in Vigor router. The following session will show you how to setup Multi-NAT feature.



The screenshot shows the 'WAN IP Network Settings' configuration page in the DrayTek Router Web Configurator. The 'Specify an IP address' option is selected, and the 'WAN IP Alias' button is highlighted with a red circle.

Access Control
Broadband Access Enable Disable

ISDN Dial Backup Setup
Dial Backup Mode

Keep WAN Connection
 Enable PING to keep alive
PING to the IP
PING Interval minute(s)

RIP Protocol
 Enable RIP

WAN IP Network Settings
 Obtain an IP address automatically
Router Name *
Domain Name *
* : Required for some ISPs
 Default MAC Address
 Specify a MAC Address
MAC Address:
 . . : . .

Specify an IP address **WAN IP Alias**
IP Address
Subnet Mask
Gateway IP Address

OK

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When you click the WAN IP Alias button, it will open a window for you to input your public IPs.

The Join NAT IP Pool check box means that the local user can use this IP to connect to the Internet.

If you do not check this check box, then the local user will not use this IP.

Index	Enable	Aux. WAN IP	Join NAT IP Pool
1.	v	203.69.175.4	v
2.	<input checked="" type="checkbox"/>	203.69.175.5	<input checked="" type="checkbox"/>
3.	<input checked="" type="checkbox"/>	203.69.175.6	<input checked="" type="checkbox"/>
4.	<input checked="" type="checkbox"/>	203.69.175.9	<input type="checkbox"/>
5.	<input type="checkbox"/>		<input type="checkbox"/>
6.	<input type="checkbox"/>		<input type="checkbox"/>
7.	<input type="checkbox"/>		<input type="checkbox"/>
8.	<input type="checkbox"/>		<input type="checkbox"/>

Close Clear All OK

After you set up the WAN IP Alias, then you can setup multiple DMZ and/or multiple open ports as follows:

