

# Learn about the mechanism of NAT (Network Address Translation) (Part 1)

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Modern **Internet** connection today must use **NAT (Network Address Translation) technology**. **NAT (Network Address Translation)** allows one or more **local IP addresses** to be mapped to one or more external **IP addresses** . To understand more about **NAT** as well as **NAT's** operation mechanism, please refer to the article below.

The **Internet** is more and more developed than our imagination. Although it is impossible to list the exact number, we can estimate the number of more than 100 million Hosts and more than 350 million people accessing the **Internet** daily. In fact, this rate doubles every year.

Modern **Internet** connection today must use **NAT (Network Address Translation) technology**. **NAT** allows one (or more) **local IP addresses** to be mapped to one (or more) external **IP addresses** .

**IP address** ( **IP - Internet Protocol** ) is a series of 32-bit (**IPv4**) or 128-bit (**IPv6**) numbers used to identify a network device on the network that helps them identify and communicate with each other. In a network model, each network device has only one **IP address** . It is understandable that **the IP address** is like the address where you live. Others can find you and send information to you via that address.

Along with the current **Internet** boom and the increasing demand for network systems, **the IPv4 address** space began to be limited. The solution is to redesign the **IP address** format, allowing more **IP addresses** (namely **IPv6** ). However, this solution is still in the research and development stage and it takes many years to implement.

Therefore, the best solution is to use **NAT (Network Address Translation) technology** . **NAT** or **Network Address Translation** allows a device such as the **Router** to act as an intermediary between the **Internet** (or **Public Network** : public network) and **Local** (or **Private** : local network). This means that a computer only has a unique **IP address** .

## What is NAT (Network Address Translation)?

Understandably, **NAT** is like a receptionist at a large office. If you want to meet someone in the company you have to go through and follow the receptionist's instructions. Or if you want to call and talk to someone but the person is not at the company or they are busy at the meeting, . you can leave a message for the receptionist then they will forward the message to the person You need to talk to inform. In another case you can talk to the receptionist and ask them to connect to the person you need to meet.

Or you can understand when someone wants to talk to you, but they only know the office phone number where you work. They will call your office and ask the receptionist to forward the call to you. Now the receptionist will conduct a check on the lookup table to find out your name and other extended information. And then they will forward the call to you on your extension.

## What does NAT (Network Address Translation) do?

**Network Address Translation ( NAT )** is like a **router** , forwarding packets between different network layers on a large network. **NAT** translates or changes one or both addresses inside a packet when the packet goes through a **Router** , or some other device. Usually **NAT** usually changes the address is usually the private address ( **Private IP** ) of a network connection to a public address (**IP Public**).

**NAT** can also be considered a basic firewall. **NAT** maintains a table of information about each packet sent. When a computer on the network connects to a website on the **Internet header of the source IP address that** is replaced by a pre-configured **public** address on the **NAT server** , after a packet returns to **NAT** based on the record table it has save to packets, change **the destination IP** address to the **PC 's** address in the network and forward it. Through that mechanism, network administrators can filter packets sent to or sent from an **IP address** and allow or prevent access to a specific port.

### More reference: General introduction about NAT

**NAT (Network Address Translation)** was developed by **Cisco** . **NAT** includes some basic types below:

#### Static NAT (static NAT)

**Static NAT** (static NAT) is a **NAT** method that has a double. A **Private IP address** will be mapped with a **Public IP address**.

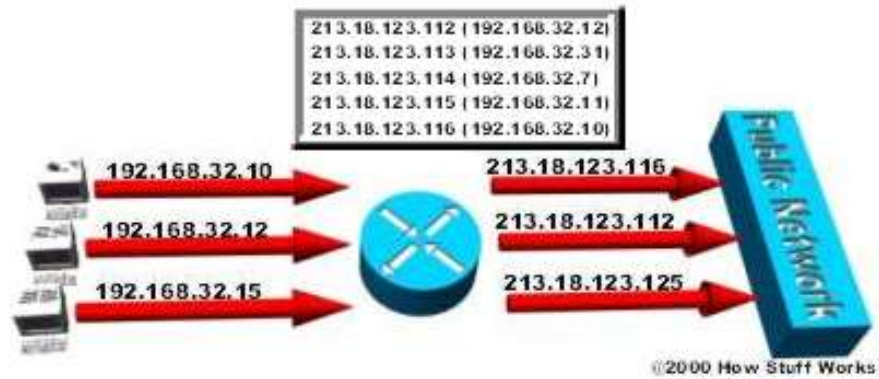
**Static NAT** is used when the device needs to be accessed from outside the network.



In **Static NAT** , the **IP address** of the computer is 192.168.32.10. It is always compiled by the **Router** to the **IP address** 213.18.123.110.

#### Dynamic NAT (dynamic NAT)

A **Private IP address** will be mapped with a **Public IP address** in the **Public IP address** group .



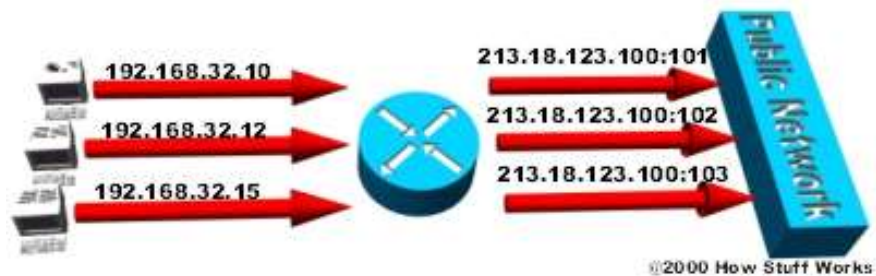
In **Dynamic NAT** , the computer with the **IP address** 192.168.32.10 is always compiled by the **Router** to the first address 213.18.123.100 in the **IP address** range from 213.18.123.100 to 213.18.123.150.

**See also: Trick to change dynamic NAT configuration**

### Overloading NAT

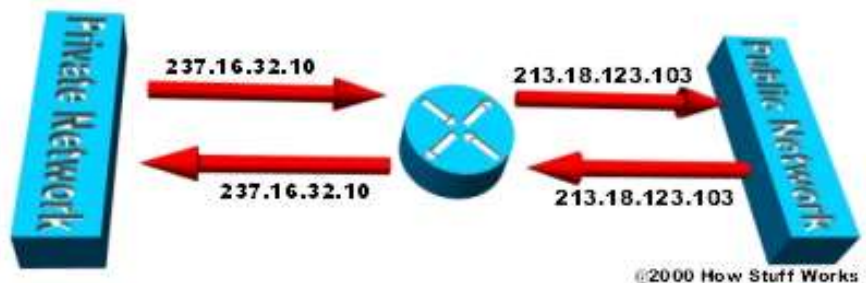
**NAT Overloading** is a dynamic NAT form (**Dynamic Overload**) . Many **Private IP addresses** will be mapped with a **Public IP address** through different **Ports** .

Just like **PAT (Port Address Translation)** , a NAT or **Port address** will have many different NAT levels.



In **Overloading NAT** , each computer on the local network (**Private Network**) is compiled by the **Router** to the same **IP address** 213.18.123.100 but on different communication ports.

### Overlapping NAT



When **the IP address** in the local network is **IP Public** being used on another network, the **Router** must maintain a table looking for these addresses to prevent and replace with a single **Public IP** .

It is important to note that the **NAT router** must compile the "internal" **address** into a single **public IP address** as well as compile the "external" address into a single **Private IP address** . You can use **static NAT** or use a combination of **dynamic DNS and NAT**.

The local network is usually **LAN (Local Area Network)** , or **Stub Domain**. A **Domain Stub** is a **LAN** using an **internal IP address** .

Most **Network Traffic** (which is stable, uninterrupted network traffic) in **Stub Domain** is local, so the internal network never gets exposed to the outside.

A **Stub Domain** can include both **Public IP** and **Private IP addresses** . Any computer using **Private IP addresses** must use **NAT (Network Address Translation)** to exchange information with other computers.

In the next section, Network Administrator will introduce you to **configure NAT**.

You finished reading the article "**Learn about the mechanism of NAT (Network Address Translation) (Part 1)**" edited by the [TipsMake](#) team. We hope this article has provided you with many useful tech tips and tricks. You can search for similar articles on tips and guides. Thank you for reading and for following us regularly.