

## What is NAT vs. Port Forwarding

**NAT or Network Address Translation**, which is actually a misnomer, is used to refer to a method of sharing usually a single public ip address amongst several hosts on a private LAN, using private ip addresses. It does this by opening multiple communication sessions, one (or more, as required) per private ip address, using different ports to keep the sessions separate - one very important thing to note is that these sessions all originate from the private LAN, and the router knows, because of the port number used, which of the internal ip addresses to send the response to.

The reason why I said NAT was a misnomer, is that it is not just a simple network address translation, but a more complex network/port address to network address translation. NAT is the term commonly used, but you will find that some manufacturers have their own terms - for example Cisco calls the function "NAT overload" and Paradyne calls it PNAT.

Now the problem with NAT is that if the communication session originates on the outside of the router, the router does not know which of the internal LAN hosts to send the data to, so it simply discards it - this is where port forwarding comes in.

**Port forwarding** allows you to specify which internal LAN host should be the target on a communication session arriving at the router's external interface, based on the port on which it arrives.

As an example, I could have my ISP assign me a public ip address of a.b.c.d whilst I use an internal network of 192.168.0.x - I could forward port 80 to my web server at 192.168.0.2, and ports 25 & 110 to my mail server at 192.168.0.3 - and to the outside world it would appear that I have a single server, located at a.b.c.d, handling both my web & mail services.

It should be noted that NAT is used primarily on consumer grade and small business networks - medium and large business are usually better able to handle the costs of multiple public ip addresses required for ecommerce networks.