Subnet Mask

It is called a subnet mask because it is used to identify network address of an IP address by perfoming a bitwise AND operation on the netmask. ASubnet mask is a 32-bit number that masks an IP address, and divides the IP address into network address and host address.

Subnet mask is a [mask](http://www.webopedia.com/TERM/M/mask.html) used to determine what [subnet](http://www.webopedia.com/TERM/S/subnet.html) an [IP address](http://www.webopedia.com/TERM/I/IP_address.html) belongs to. An IP address has two components, the network address and the [host](http://www.webopedia.com/TERM/H/host.html) address. For example, consider the IP address **150.215.017.009**. Assuming this is part of a Class B network, the first two numbers (**150.215**) represent the Class B network address, and the second two numbers (**017.009**) identify a particular host on this network.

A subnet mask is data used for [bitwise operations](https://www.computerhope.com/jargon/b/bitwoper.htm) on a network of [IP addresses](https://www.computerhope.com/jargon/i/ip.htm) that has been divided into two or more groups. This process, know as subnetting, enables each device within a subnetwork to communicate, while still allowing the exchange of information between subnets via the use of a [network router](https://www.computerhope.com/jargon/r/router.htm). Dividing a network into subnets can improve security and balance overall network traffic.

How does Network address translation works?

The network address translation (NAT) functionality provided by the Routing and Remote Access service enables computers on a private network to access computers on a public network, such as the Internet. In Windows Server 2003, the Routing and Remote Access NAT/Basic Firewall component is typically referred to as a routing protocol component. Strictly speaking, NAT is not a routing protocol; it does not send and receive traffic nor does it instigate changes to the routing table. However, the Routing and Remote Access service interfaces with the NAT/Basic Firewall component through the routing protocol interface, and, in this sense, NAT functions just like a routing protocol. Although NAT is not a true routing protocol, it is installed as if it were by using the Routing and Remote Access snap-in.

This document explains how Routing and Remote Access NAT works. It covers the components of Routing and Remote Access NAT architecture, a typical network behind a NAT-enabled router, optional NAT subsystems designed to simplify configuration for smaller networks, and NAT processes and interactions. The latter section explains how NAT works with TCP/IP, how address and port translation work, how dynamic and static mappings and IP reservations work, how NAT editors work, and includes a flowchart showing how inbound and outbound packets are processed.