

Introduction to Subnetting

Subnetting a network means to use the subnet mask to divide the network and break a large network up into smaller, more efficient and manageable segments, or subnets.

With subnetting, the network is not limited to the default Class A, B, or C network masks and there is more flexibility in the network design.

Subnet addresses include the network portion, plus a subnet field and a host field. The ability to decide how to divide the original host portion into the new subnet and host fields provides addressing flexibility for the network administrator.

The 32-Bit Binary IP Address

Network

7 6 5 4 3 2 1 0
2 2 2 2 2 2 2 2
Octet (8 bits)

Network

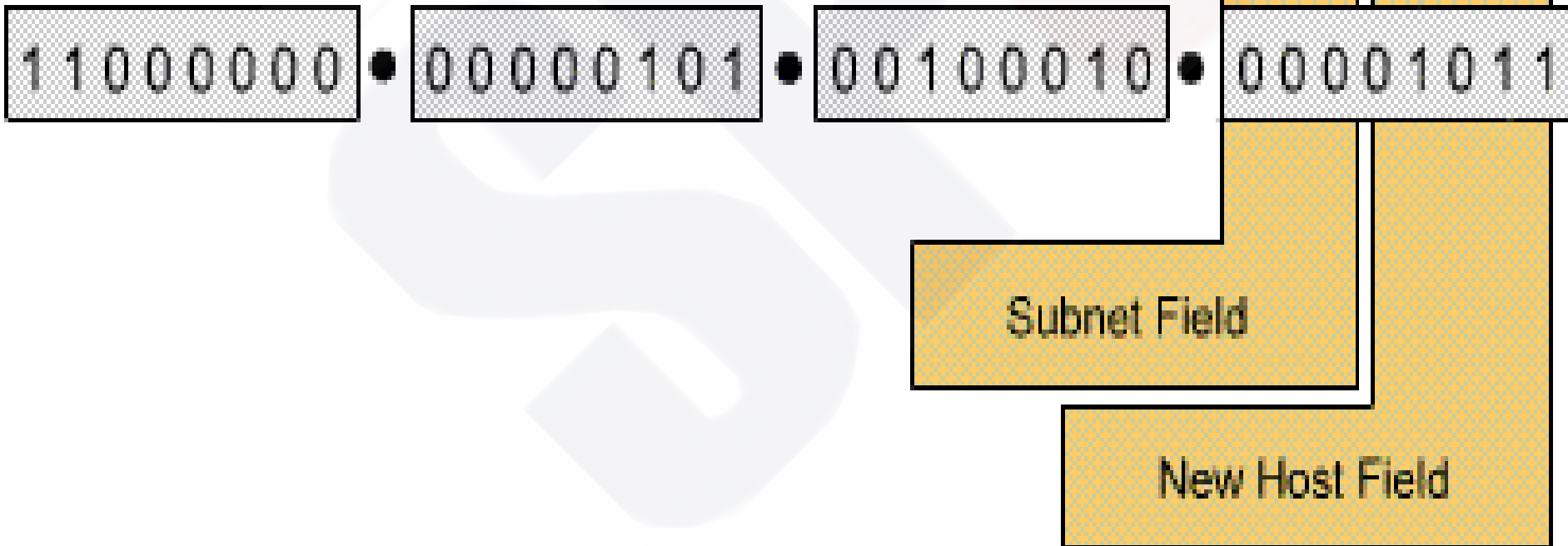
7 6 5 4 3 2 1 0
2 2 2 2 2 2 2 2
Octet (8 bits)

Network

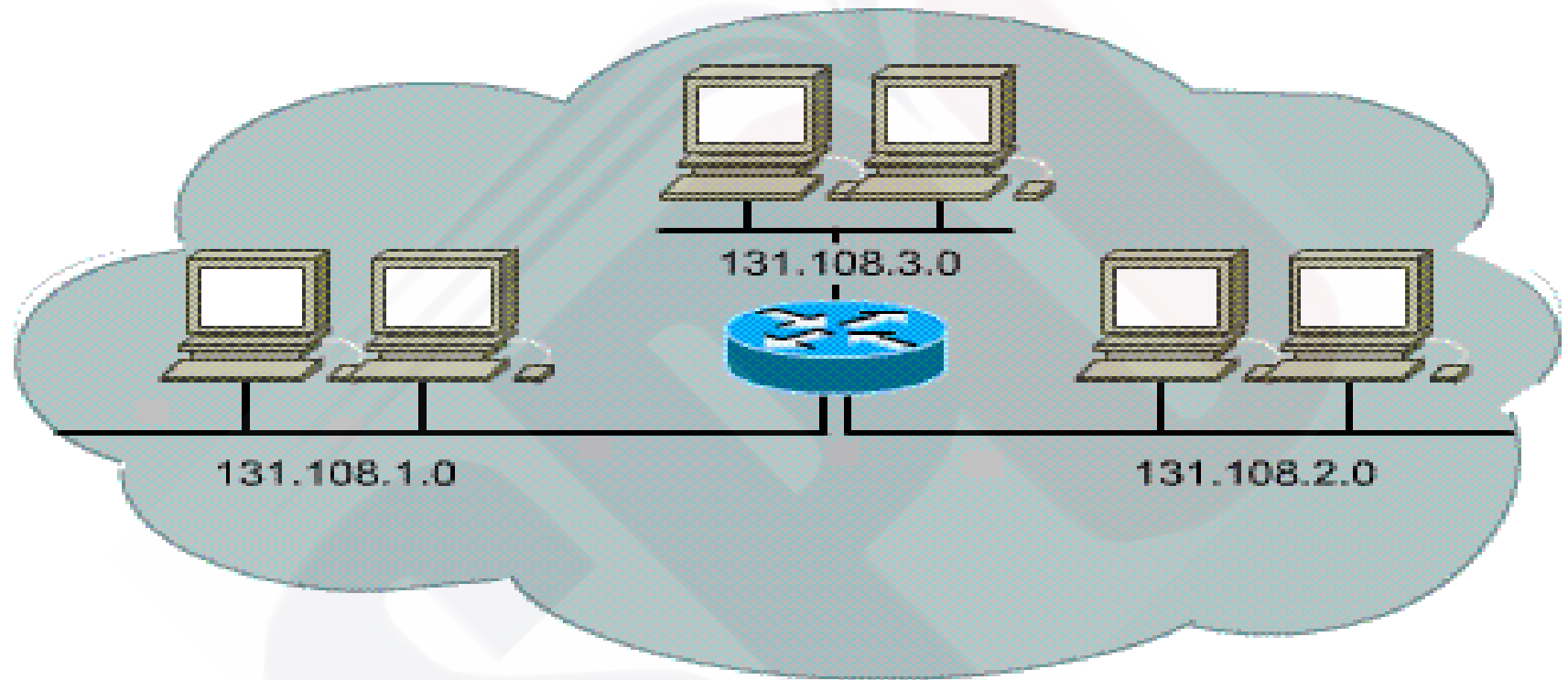
7 6 5 4 3 2 1 0
2 2 2 2 2 2 2 2
Octet (8 bits)

SM Host

7 6 5 4 3 2 1 0
2 2 2 2 2 2 2 2
Octet (8 bits)

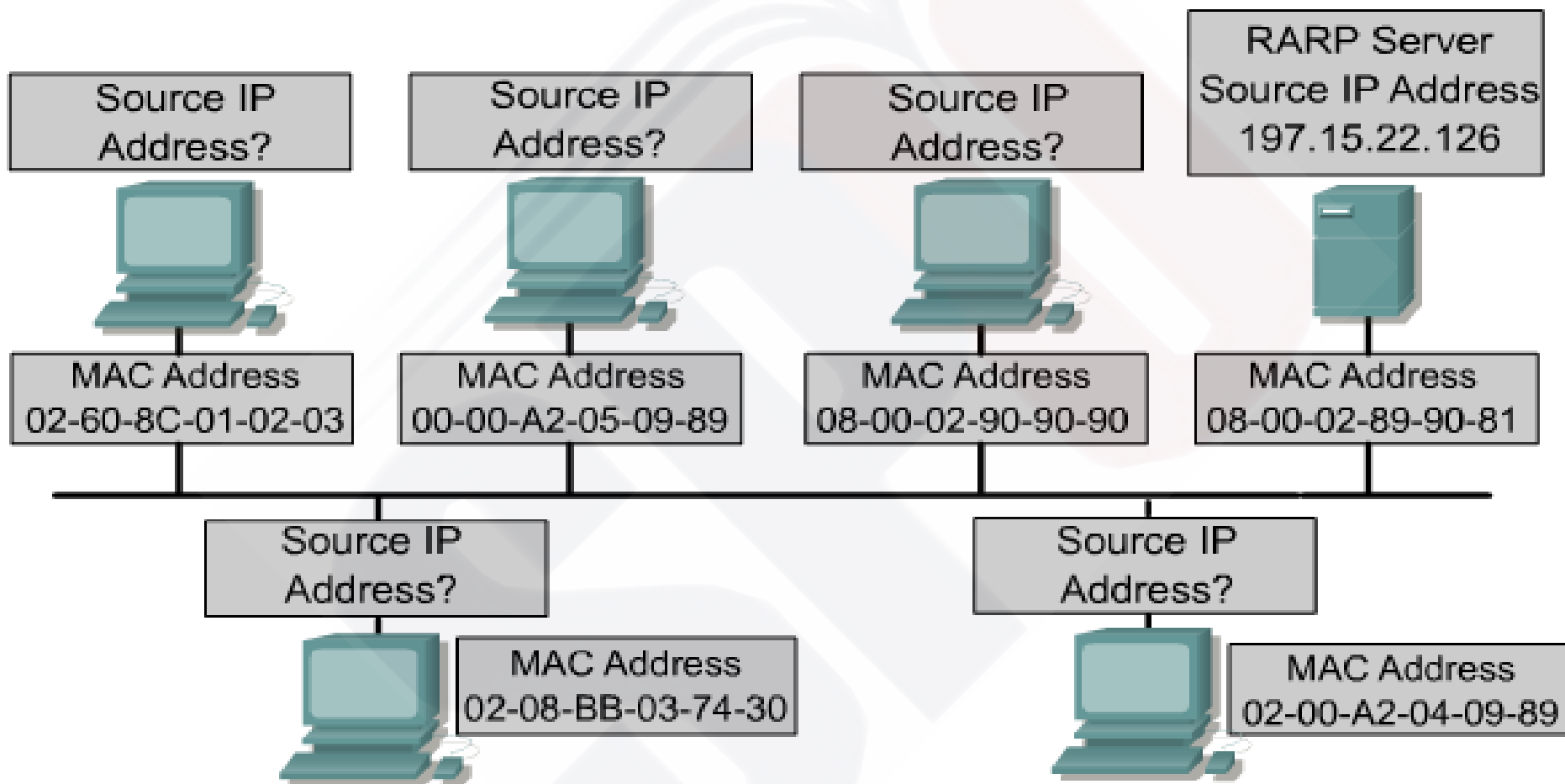


Addressing with Subnetworks



Internally, networks may be divided into smaller networks called sub-networks, or simply sub-nets. By providing a third level of addressing, sub-nets provide extra flexibility for the network administrator. For example, a class "B" network provided by the InterNIC, can be broken up into many sub-networks. In this example, 131.108.1.0, 131.108.2.0, and 131.108.3.0 are all sub-nets within the network 131.108.0.0.

Obtaining an Internet Address



The hosts have a physical address by having a network interface card that allows connection to the physical medium. IP addresses have to be assigned to the host in some method. The two methods of IP address assignment are static or dynamic.

Static Assignment of an IP Address

Static assignment works best on small networks.

The administrator manually assigns and tracks IP addresses for each computer, printer, or server on the intranet.

Network printers, application servers, and routers should be assigned static IP addresses.

