

these bits is used to indicate that the address is a Class A address, only 126 Class A networks can exist in the entire Internet. However, each Class A network can accommodate more than 16 million hosts.



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Only about 40 Class A addresses are assigned to companies or organizations. The rest are either reserved for use by the Internet Assigned Numbers Authority (IANA) or are assigned to organizations that manage IP assignments for geographic regions, such as Europe, Asia, and Latin America.

Class B addresses

In a Class B address, the first two octets of the IP address are used as the network ID, and the second two octets are used as the host ID. Thus, a Class B address comes close to my hypothetical scheme of splitting the address down the middle, using half for the network ID and half for the host ID. It isn't identical to this scheme, however, because the first two bits of the first octet are required to be 10, to indicate that the address is a Class B address. Thus, a total of 16,384 Class B networks can exist. All Class B addresses fall within the range 128.x.y.z to 191.x.y.z. Each Class B address can accommodate more than 65,000 hosts.



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The problem with Class B networks is that even though they're much smaller than Class A networks, they still allocate far too many host IDs. Very few networks have tens of thousands of hosts. Thus, the careless assignment of Class B addresses can lead to a large percentage of the available host addresses being wasted on organizations that don't need them.

Class C addresses

In a Class C address, the first three octets are used for the network ID, and the fourth octet is used for the host ID. With only eight bits for the host ID, each Class C network can accommodate only 254 hosts. However, with 24 network ID bits, Class C addresses allow for more than 2 million networks.



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The problem with Class C networks is that they're too small. Although few organizations need the tens of thousands of host addresses provided by a Class B address, many organizations need more than a few hundred. The large discrepancy between Class B networks and Class C networks led to the development of subnetting, which I describe in the next section.