



How to Change Your Office Network's IP Address

WhistleWare 4.1

Note: Whistle Communications recommends that only those individuals who are familiar with basic IP addressing concepts change a network's IP address.

Your InterJet is preconfigured with the following internal IP address and netmask:

Internal IP address: 192 . 168 . 1 . 1

Netmask: 255 . 255 . 255 . 0 (or netmask width 24)

The internal IP address for the InterJet uniquely identifies it on your Office network. Using the default internal IP address and netmask for the InterJet, the InterJet assigns the following default IP address for your Office network: 192 . 168 . 1 . 0.

During InterJet installation, you are asked to either accept the default IP address and netmask for the InterJet or change them to appropriate values for your network. If you change them, the InterJet uses the information that you specify to determine your network's new address and netmask. For example, if you change the IP address and netmask for the InterJet to 10 . 0 . 0 . 1 with netmask width 8 (10 . 0 . 0 . 1/8), the InterJet automatically determines your network's address and netmask to be 10 . 0 . 0 . 0/8.

Understanding the Network Address and Netmask

Your Office network has an IP address—also called a *network number*—that, when combined with a netmask, specifies the range of IP addresses available for machines on your network. All machines on your network use the same network address as part of their unique IP addresses.

The netmask is a 32-bit number in dotted decimal notation that specifies which bytes of an IP address identify the network address and which identify a machine's address. For example, the netmask 255 . 255 . 255 . 0 specifies that the first three bytes of an IP address identify the network address, while the remaining byte identifies the machine's unique address.

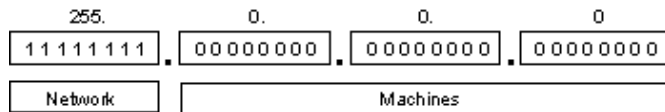
Alternatively, you can express a netmask as a *netmask width* rather than as a number in dotted decimal notation. A netmask width is a number between 4 and 32 that represents the number of bits in a netmask. This number specifies the number of bits that *mask* the network address in an IP address. For example, a netmask width of 24 masks the first 24 bits in an IP address. The remaining 8 bits in the address identify a specific host. To specify a netmask on the InterJet, you use a netmask width.

Examples:

If your network's address is 10 . 0 . 0 . 0 and your netmask width is 8 (or 10 . 0 . 0 . 1/8), the first 8 bits of the address (or first byte) identify the network, and the remaining 24 bits (or 3 bytes) are available to uniquely identify the machines on your network. In dotted decimal notation, 0 represents all the possible combinations of 8 bits—or powers of 2—which is 256 unique numbers.

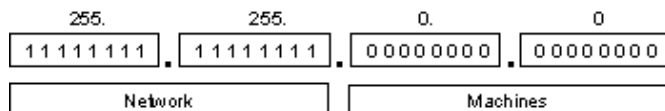
Therefore, if you have 24 available bits, the total number of IP addresses that $10.0.0.0/8$ represents is 2^{24} , or 16,777,216 IP addresses! Two of these addresses, however, are reserved and cannot be assigned to machines: one is for the network address itself ($10.0.0.0$), and the other is used by machines to send broadcast messages on your network ($10.255.255.255$).

The following illustrates an 8-bit netmask:



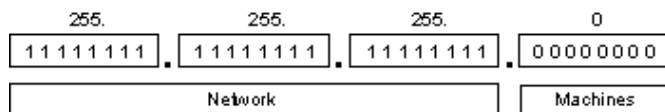
Taking this example further, if you "mask" another 8 bits of the network address $10.0.0.0$ and use them to identify the network, you use a netmask of 16. This netmask leaves 16 bits for identifying the machines. Therefore, the number of available IP addresses becomes 2^{16} , or 65,536. Again, you must subtract the two reserved addresses, so the actual number of IP addresses that you can assign to machines is 65,534.

The following illustrates a 16-bit netmask:



Finally, if you mask another 8 bits of the network address $10.0.0.0$, you use the netmask width 24. This combination creates 2^8 , or 256 unique IP addresses. Therefore, you have 254 ($256 - 2$) IP addresses for machines on your network.

The following illustrates a 24-bit netmask:



Using Reserved Private Addresses

If you want to change the address and netmask for your Office network, you normally use a *reserved private address*. A reserved private address is not publicly known on the Internet and is intended for machines that are behind a firewall. The address/netmask combination that you choose depends on how many client machines your network includes. Typically, a network that includes the InterJet has fewer than 100 machines on it. However, you can choose a network address/netmask combination that provides more IP addresses than your network actually requires.

The following table includes the reserved private addresses that are available for your Office network; their standard, or *natural*, netmask widths; and the number of IP addresses available for client machines on your network for each address/netmask combination. The network IP address ranges available for your Office network assume that you are using a standard netmask. If you use another netmask, the ranges are different.

Network Type	IP Addresses Available for Office Network	Standard Netmask Width	IP Addresses Available for Machines
Class A	10.0.0.0	8	16,777,214
Class B	172.16.0.0 to 172.31.0.0	16	65,534
Class C	192.168.0.0 to 192.168.255.0	24	254

Important note for Secure Remote Access users: If your InterJet has the Secure Remote Access feature, *you must specify the standard netmask* for the network address that you choose; otherwise remote Windows computers cannot use Network Neighborhood to access the InterJet and other machines on your network. To display network resources in Network Neighborhood, your remote computer must share the same network address with the computers on your Office network, as determined by your network's netmask. However, the Microsoft implementation of PPTP—which Secure Remote Access uses—does not allow you to specify your network's netmask on your remote computer. Instead, PPTP on your remote computer assumes that your network is using one of the standard netmasks, depending on the IP address that it receives from the InterJet. Therefore, if you specify a non-standard netmask, remote computers will *not* share the same network address as the computers on your network.

Changing Your Network's Address or Netmask

You can use WhistleWare to change the IP address for your Office network. When changing the address, you may also need to do the following:

- ◆ Specify a new range of IP addresses for DHCP (Dynamic Host Configuration Protocol).
- ◆ Specify a new range of IP addresses for remote access, if your InterJet has the Secure Remote Access feature.

To change your network's IP address or netmask, follow these steps.

Step 1: Specify IP addresses on the InterJet.

1. Start your Web browser, then type `interjet` in the **Location** or **Address** box.

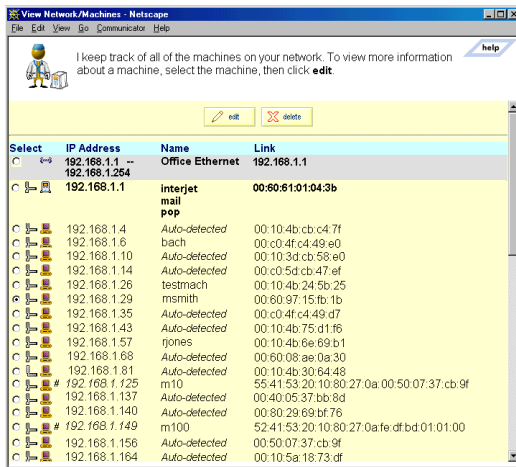
The InterJet home page appears, showing the System Agent View.

2. Point to the **Office Net** object.

The Office Network menu appears.

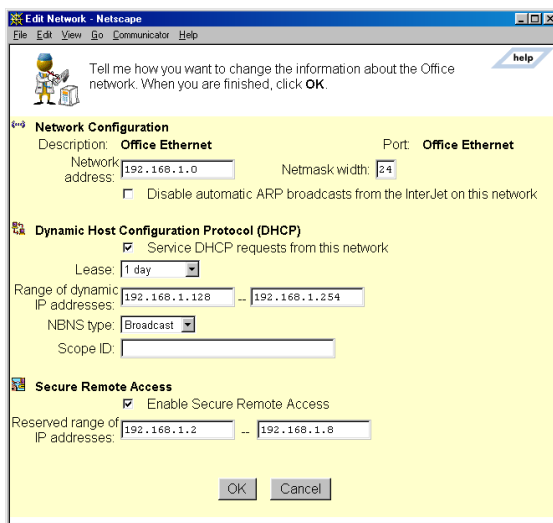
3. Click **Network/Machines List**.

The View Network/Machines page appears.



4. On the Network/Machines list, click the option button for **Office Ethernet** at the top of the page.
5. Click **edit**.

The Edit Office Network page appears.



6. Option: Specify a new IP address for your network in the **Network address** box.
7. Option: Specify a new netmask in the **Netmask width** box.
8. Under **Dynamic Host Configuration Protocol (DHCP)**, determine whether the **Service DHCP requests from this network** check box is selected.

If this check box is selected, machines on your network can request dynamic IP addresses from the InterJet DHCP server.

9. If the **Service DHCP requests from this network** check box is selected, specify a new range of IP address for DHCP client machines on your Office network by typing the first and last addresses in the boxes.

This range must fall within the overall range of IP addresses available on the network, as specified by the network address and netmask. Make sure you specify a range that provides enough IP addresses for DHCP clients on your network. Examples:

- ◆ If you chose the network address 10.0.0.0 with netmask 8, and you have 50 machines on your network that use DHCP, then you could specify the following DHCP range, which provides 101 dynamic IP addresses:

10.0.0.100 to 10.0.0.200

- ◆ If you chose the network address 192.168.1.0 with netmask 24, and you have 50 machines on your network that use DHCP, then you could specify the following DHCP range, which provides 101 dynamic IP addresses:

192.168.1.100 to 192.168.1.200

10. If your InterJet has the Secure Remote Access feature, under **Secure Remote Access**, specify a new range of IP addresses that you want to reserve for remote access computers.

This range can include up to ten IP addresses, must be within your Office network IP range, and must not overlap your Office network DHCP range.

11. Click **OK**.

Important: Once you click **OK**, the InterJet automatically assigns itself a new IP address on your Office network, as appropriate for the network address and netmask that you specified. However, because your computer's IP address is no longer within the range of addresses for your Office network, you cannot access the InterJet and use WhistleWare. To reset your computer so that its IP address is within the new range of addresses for your Office network, proceed to steps 2 and 3.

Step 2: Restart DHCP client machines on your network.

You must restart all client machines on your Office network that receive dynamic IP addresses from the InterJet DHCP server. Restarting these machines allows them to receive new IP addresses from the InterJet that are within the range of IP addresses on your network. Until you restart these machines, they are unable to communicate on your network.

Step 3: Reconfigure client machines that use static IP addresses.

If your network includes any machines—such as printers and servers—that use static IP addresses, you must reconfigure them with new IP addresses. For each of these machines, specify a static IP address that is within the range of addresses for your network but *outside* the range of addresses that you specified for DHCP.