

## Network Computers

# About network computers

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### Summary

Every computer on a network has both a hardware and a software connection. Network controller circuitry in the computer controls the hardware connection. The software connection is maintained through a set of values stored in a *host* entry in the **/machines** directory of the domain you choose.

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When you add a computer to the network, you must create this host entry. You can do so automatically or manually. You also can change the host entry at any time—for example, to change the network address, assign an alias to the computer, or add the computer to a netgroup. In addition, you can set up the computer to use or ignore network time.

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### Computer as host

Each computer on a network is called a *host* because it hosts processes.

All computers on a NetInfo network host *client* processes. Client processes are those that use network services and resources.

Some computers may also host *server* processes. Server processes are those that provide services and resources—such as file, mail, and printing services—to other computers on the network.

When you add a computer to a network, you specify whether it will host client or both client and server processes. You use SimpleNetworkStarter to make this choice ;../Reference/Tools/SimpleNetworkStarter/AboutSimpleNetworkStarter.rtf;; at the time you set the computer up. You use NFSManager to add file sharing services anytime ;../Reference/Tools/NFSManager/AboutNFSManager.rtf;;.

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## The network connection

When you add a computer to a network, you're building both hardware and software connections.

You can use either Ethernet or Token Ring circuitry to connect a computer to a NEXTSTEP network.

When you attach a computer to a network and turn it on, the computer begins the boot process with the software in read-only memory (ROM). The ROM software passes control to the routines on the boot disk. The configuration process begins when the computer begins to execute the */etc/rc* scripts. When the computer activates its daemon processes, the network daemons request connection to the network.

In order for the computer to join the network, the network must recognize the computer. It does so by checking information you provide in a *host entry* in the */machines* directory of the domain where you've installed the computer.

You can create a host entry with SimpleNetworkStarter when you first set up the network ;../Setup/AboutSetup.rtf;;. Or you can use HostManager to add a computer manually ;AddComputerManually.rtf;; or automatically ;AddComputerAutomatically.rtf;;.

## The host entry

The information in the host entry is stored as a set of property keys and values:

<b>Property key</b>	<b>Value</b>
48429_SA1PointRule2.eps ↵ name	The computer's host name. It should be no more than eight lowercase characters—including letters, digits, dashes (-), and underbars (_). Avoid the reserved names <b>localhost</b> , <b>broadcasthost</b> , and <b>mailhost</b> .
ip_address	A unique Internet address. (See "Network addresses" below.)
en_address	A unique Ethernet or Token Ring address. (See "Network addresses" below.)
serves	A NetInfo property of the /machines directory that specifies a domain name and domain database tagname that enables binding between a parent, current, and child domains.
netgroups	The netgroups a computer belongs to. A netgroup name may be up to 256 characters.
alias	An alternate host name that you can use to refer to a network computer. The same naming guidelines that apply to the host name apply to the alias.
owner	The name of the computer's user, up to 256 characters. The system doesn't use this information, but you may want it for your records.
system_type	The type of computer. The system doesn't use this information, but you may need it for your records.

You can examine the information in host entry with NetInfoManager  
;../NetInfo/ExamineHostEntry.rtf;~.

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## **Automatic host addition**

If you want to add computers automatically—for example, if you want some users to be able to attach their own computers—you first need to enable automatic host addition.

When you enable automatic host addition, you simplify the process of adding a computer by letting the system determine the network addresses for the computer. The network can read the Ethernet (or Token Ring) address directly. But you need to specify a range of Internet addresses. Then the system automatically assigns the next available address in the range.

You can set up password protection when you enable automatic host addition. When they add a computer to the network, you can require that the users have to know the **root** password for the computer that hosts the master NetInfo server. If you want users to be able to add their own computers to the network, but you don't want them to know the **root** password, you can create a *network password*. The network password may be up to eight characters, in any combination of upper and lower case. A third option is no password protection at all.

If you want to add computers to the entire network automatically, you must enable automatic host addition in the root domain (*/*). Otherwise, you can enable it only in the domain where you want to add computers automatically.

**CAUTION** You should only enable host addition in one midlevel domain. Otherwise, as a computer connects to the network, it will bind unpredictably to whichever domain server responds first.

You can enable automatic host addition when you first set up a network with SimpleNetworkStarter  
;../Reference/Tools/SimpleNetworkStarter/AboutSimpleNetworkStarter.rtf;~. Or you

can use HostManager to enable or disable automatic host addition at any time ;EnableAutomaticHostAddition.rtf;;-.

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## Network addresses

Network addresses identify individual computers on a network, groups of computers, or an entire network. All NEXTSTEP computers have two addresses:

**Ethernet (or Token Ring) address** This address identifies the computer to the local network and is contained in the network controller circuitry of the computer. If you change this hardware—for example, by changing the network controller card—you change the computer's address. The Ethernet address is a series of numbers and letters separated by colons. You must determine the computer's Ethernet address before you add it to the network ;AddComputerManually.rtf;Ethernet address;-.

**Internet (IP) address** This address identifies the computer and its local network to the Internet. An Internet address is a 32-bit integer, generally written in dotted notation like this: x.x.x.x. where x is an integer from **0** to **255**. Valid addresses start at **0.0.0.1**. and range through **255.255.255.254**. Part of the address identifies the local network while another part identifies the host computer. When you add a computer, HostManager automatically assigns the next available Internet address on your local network. However, you can assign a computer a particular address yourself if you prefer.

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## Network time

Many operations on a network—such as creating and saving files or sending and receiving mail—are time-stamped. So the computers on a network should synchronize their times.

Most networks have one or more *time servers* that keep the network time. Individual computers on the network set their internal clocks to match these time servers.

When you add a computer to the network automatically, it's set to use network time. If you add a computer manually, you need to tell it to use network time  
;UseNetworkTime.rtf; ;-.

If you want a computer to use its own clock, you can tell it to ignore network time. This computer is likely to lose or gain time compared to other computers on the network, especially if your network includes computers at sites in different time zones. At some point, a slower computer may balk at getting data that's time-stamped from the future. Users may also be confused by the variations in time stamps.

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## **Netgroups**

A computer may be part of one or more *netgroups*. A netgroup is a way to designate a group of computers.

You can set up server processes to refer to specific netgroups. For example, you can set up a file server to export a directory to a netgroup. Then only computers that are part of that netgroup can mount the directory. You can further restrict access to the files by specifying whether the computers can read or write in that directory.

Netgroups are only a way to label computers. You don't set up netgroups in their own directory as you do user groups, for example. You simply enter one or more netgroup names each time you add a computer. All computers that have the same netgroup name become part of the netgroup.

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## **Host names and aliases**

A computer may have one or more aliases - alternate host names used to refer to the computer. If multiple users work on the same computer, you may want them to refer to it by alias names for diagnostic purposes. If you have a shell script to use on several subnets, you may want to use the same host name in the script to designate a particular server, e.g., a time server, which would be the alias name for computers hosting that particular process.

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**Related topics** (*click a LinkDiamond.tiff ↗*)

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**Concepts**

To understand where to add computers and how the host information is stored, you need to understand the way NetInfo directories are organized.

;[../NetInfo/AboutNetInfo.rtf](#);↗ **About the NetInfo network information system**

**SA1pt-XrefDashedRuleBlack.eps ↗How to**

;[AddComputerAutomatically.rtf](#);↗ Add a computer automatically

;[AddComputerManually.rtf](#);↗ Add a computer manually

;[ChangeHostEntry.rtf](#);↗ Change a host entry

;[ChangeNetworkAddressAutomatically.rtf](#);↗ Change a network address automatically

;[../NetInfo/ExamineHostEntry.rtf](#);↗ Examine a host entry

;[CreateAliasHostName.rtf](#);↗ Create an alias host name

;[UseNetworkTime.rtf](#);↗ Use network time

;[RemoveComputer.rtf](#);↗ Remove a computer

;[EnableAutomaticHostAddition.rtf](#);↗ Enable automatic host addition