MacTCP Administrator's Guide

MacTCP™ is a software product from Apple Computer, Inc. that allows a Macintosh computer to connect to a TCP/IP network. It includes a software driver for the Mac OS that implements the TCP/IP protocols. These protocols provide core transmission services that are used by third-party applications such as electronic mail, remote login, file transfer, remote printing, and database access.

The MacTCP driver includes these features:

- a control panel interface for configuring the driver
- a driver-level interface that allows the implementation of application protocols such as the File Transfer Protocol (FTP) and Telnet.
- a domain name resolver that maps domain names to IP addresses (The domain name resolver is compatible with domain name server implementations that comply with RFC 1034 and 1035.)

Network Connection Requirements

To use the MacTCP product, you need the following hardware and software:

On a LocalTalk network you need a Macintosh connected to the LocalTalk cable. If the Macintosh TCP/IP connection is on LocalTalk, a DDP-IP router is required that can handle AppleTalk packets containing encapsulated TCP/IP information, such as a Shiva FastPath, Cayman GatorBox, or others.

- On an Ethernet network you need a Macintosh with an Ethernet connection such as the EtherTalk NB Card, the Ethernet NB Card, a built-in Ethernet interface, or a third-party Ethernet device. Apple Ethernet connections require EtherTalk software version 2.5 or later. Third-party Ethernet devices must be compatible with the MacTCP driver.
- On a Token Ring network you need a Macintosh that uses the NuBus™ expansion slot architecture, such as one of the Macintosh II family of computers, and an appropriate networking card, such as the TokenTalk NB Card, the Token Ring 4/16 NB Card, or a third-party Token Ring card that supports the .TOKN interface specification. Apple Token Ring connections also require TokenTalk Phase 2 and TokenTalk Prep software, version 2.5 or later (the software for the Token Ring card) and the MacTCP Token Ring Extension software contained in this product. Third-party Token Ring cards must be compatible with Apple Computer's MacTCP Token Ring Extension software, or the manufacturer must provide its own extension software that is compatible with the MacTCP driver.

Configuring MacTCP

This section describes how to configure the MacTCP driver on a Macintosh computer. It assumes that you are the network administrator who has configuration authority for MacTCP and access to valid IP addresses and host names.

Note: If you are not the network administrator, you must check with the administrator to obtain a valid IP address before configuring MacTCP.

A Configuration Overview

To configure the MacTCP driver to communicate with other IP hosts on the TCP/IP network, you must complete these steps:

1. Obtain a valid IP address and other IP information from the network administrator (or from your network records) and write it down.
2. Configure the link level information in the MacTCP Control Panel.
3. Set the IP address and subnet (if any) for the Macintosh, or specify the address of the network server from which the address will be obtained.
4. Enter the domain name and the domain name server's IP address.
5. Restart the Macintosh.
6. Modify the MacTCP Hosts file and the hosts file on at least one other IP host.

MacTCP Configuration Files

The MacTCP driver uses these two configuration files:

- MacTCP Prep
- MacTCP Hosts

MacTCP Prep

The MacTCP driver stores all configuration information within the driver itself, as well as in a file named MacTCP Prep, which is stored in the Preferences folder.

The MacTCP Prep file is created automatically by the MacTCP software if changes are made to the MacTCP configuration settings. If no changes are made, a MacTCP Prep file is not created. If a MacTCP Prep file exists, the software always takes configuration information from the prep file. If you update your system to a new version of the MacTCP driver and a MacTCP Prep file already exists, the current configuration is retained.

If you receive a new version of the MacTCP driver that has been preconfigured and you want the new configuration settings, remove any existing MacTCP Prep file before you install the new driver.

MacTCP Hosts

Hosts files are used by the TCP/IP software as a local (system-specific) form of hostname resolution. If there is no domain name server on the network, hosts files are the only available method to resolve host names into the required IP addresses. Although they duplicate the function of a domain name server, hosts files are often maintained even when domain name servers are present, to provide backup or to customize certain host connections. See *Configuring the MacTCP Hosts File*.

Opening the MacTCP Control Panel

The MacTCP control panel is used to set link level information and to set the IP address in decimal notation. Choose Control Panels from the Apple menu. The Control Panels window appears with a scrollable list of icons, as shown in FIGURE 49.

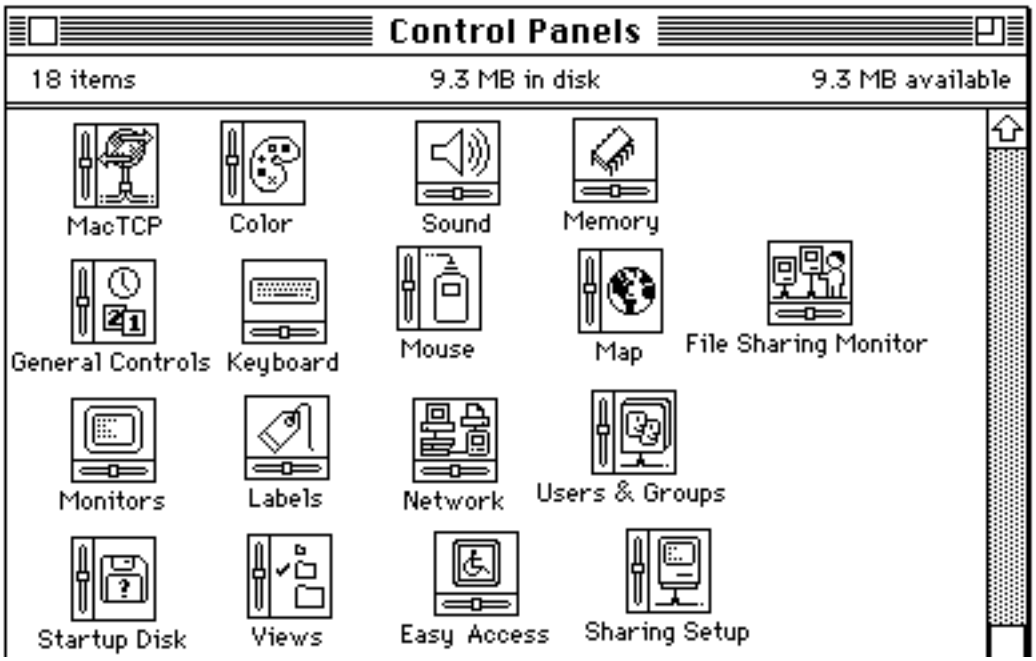

FIGURE 49 The Control Panels window in version 7.x

Click the MacTCP icon. (It may be necessary to use the scroll bar to bring the MacTCP icon into view.) The MacTCP control panel appears as shown in FIGURE 50.

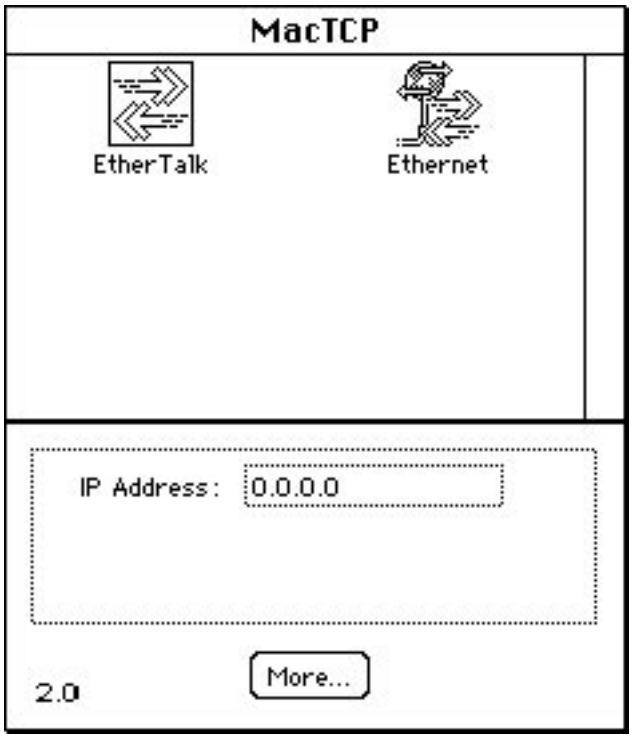

FIGURE 50 The MacTCP control panel in version 7.x

Setting Link Level Information

The top half of the MacTCP control panel displays the available link level protocols on which the MacTCP driver can run. Different icons are displayed depending on your network configuration. This section provides some tips on setting link-level information in the control panel.

Note: You may need to consult your network administrator to determine which link-level information applies to your Macintosh.

- LocalTalk Connection with a DDP-IP Gateway

  If the Macintosh resides on an AppleTalk network using LocalTalk cable with a DDP-IP gateway to the TCP/IP network, the upper section of the MacTCP control panel will contain an icon like this one.

FIGURE 51 LocalTalk icon

The box beneath the icon should display the network zone where your DDP-IP gateway is located. If necessary, choose a different zone from the pop-up menu.

- Macintosh with one Ethernet Connection

  If the Macintosh has one Ethernet NB Card on an AppleTalk network using Ethernet cable, the upper section of the MacTCP control panel contains the icons shown in FIGURE 52.

FIGURE 52 Ethernet icons

Select the Ethernet icon to allow your Macintosh computer to use TCP/IP to communicate with other TCP/IP hosts on the network.

Note: If your Macintosh computer is using an Ethernet interface card, make sure that the card's software is installed. You can learn the hardware address of your Ethernet interface card by pressing the Option key while clicking the Ethernet icon. The hardware address of the card is displayed beneath the icon, as shown below:

- Macintosh with Two Ethernet Connections

  If the Macintosh has two Ethernet NB Cards on an AppleTalk network using Ethernet cable, the upper section of the MacTCP control panel contains the icons like these:

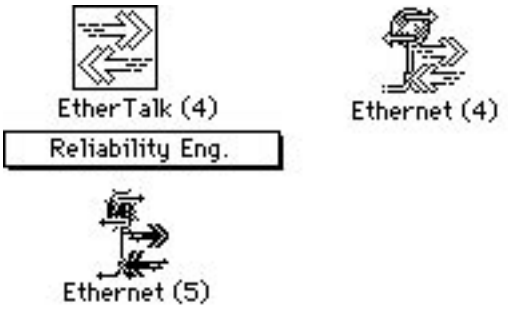

FIGURE 53 Two Ethernet cards, installed in slots 4 and 5

(If the Ethernet NB Cards are located in slots other than 4 and 5, the numbers in the icon names will be different.) Select the Ethernet (5) icon to allow your Macintosh computer to use TCP/IP to communicate with other TCP/IP hosts on that network.

- EtherTalk Connection with a DDP-IP Gateway

  If the Macintosh is on an EtherTalk segment connected to the TCP/IP host through a DDP-IP gateway, the upper section of the MacTCP control panel contains the icons like these:

FIGURE 54 EtherTalk icon when a DDP-IP gateway is present

Make sure that the EtherTalk icon is selected and the pop-up menu shows the zone in which the DDP-IP gateway is located. Or, if the other Ethernet connection is on the same network as the mail server, click that icon.

- Macintosh with Token Ring

  If the Macintosh is on a Token Ring network and the mail server is either on the same Token Ring network or on an Ethernet network connected to Token Ring by an IP router or Ethernet-to-Token Ring bridge, the upper section of the MacTCP control panel contains the icons shown in FIGURE 55.

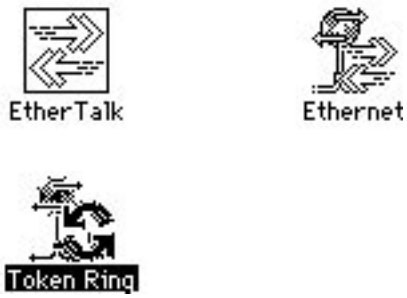

FIGURE 55 Token Ring

Select the Token Ring icon to allow your Macintosh computer to use TCP/IP to communicate with other TCP/IP hosts on that network.

Note: If you have a Token Ring card installed in your computer, the Token Ring icon that appears in the MacTCP control panel includes the NuBus slot number. This number differs from the physical card slot number that is displayed in the Token Ring control panel.

Setting the IP Address in the Control Panel

You may either type the IP address (in decimal notation) in the MacTCP control panel now and skip ahead to the section “Using the Administrator Dialog Box,” and type the IP address information there. An IP Address box is displayed in the lower-half of the control panel window, as shown in FIGURE 56.

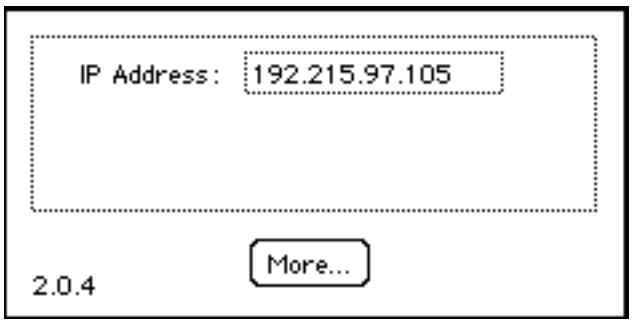

FIGURE 56 The IP Address box

Click in the box and type the valid IP address for the Macintosh system. (You must use an address that is unique on the network. Make sure you obtain a valid address from the network administrator or from your network records.)

Specifying IP Information in the Administrator Dialog

Open the Administrator dialog by clicking the More button on the MacTCP control panel.

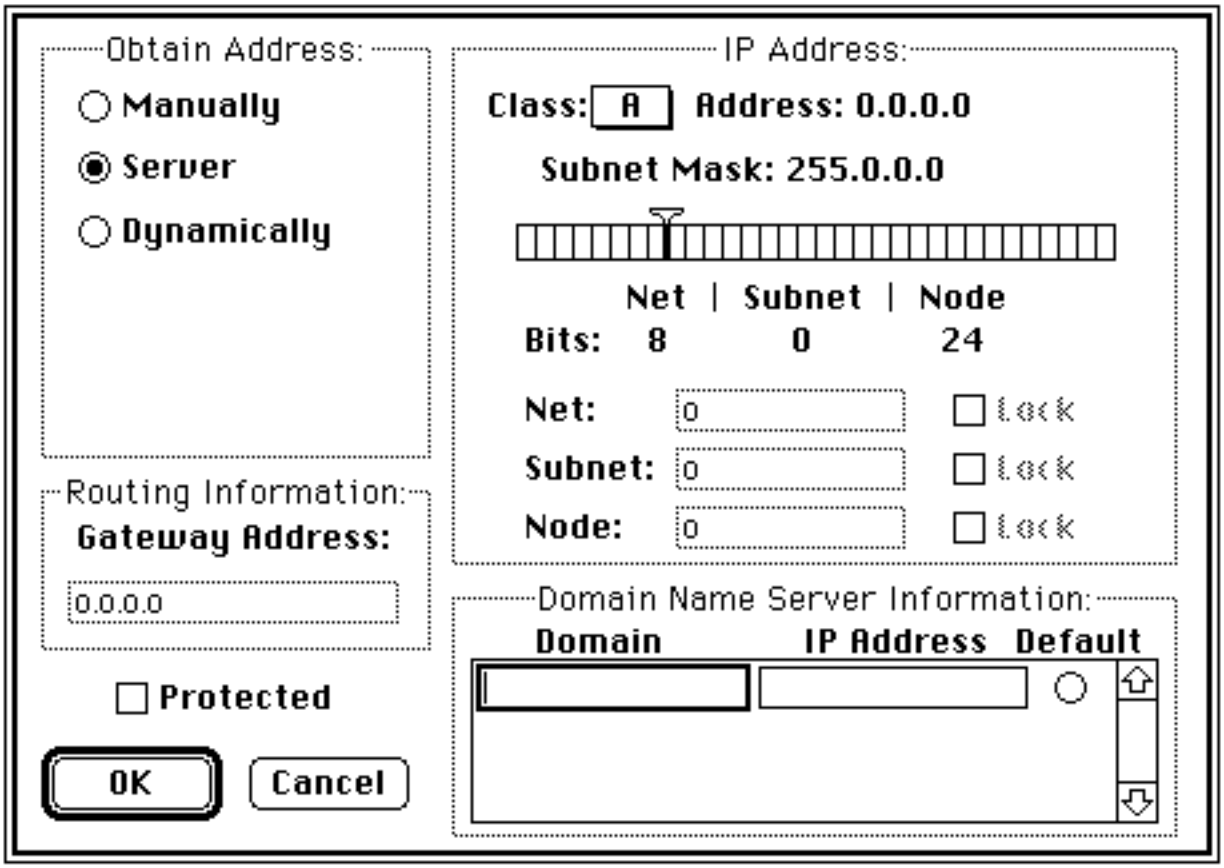

FIGURE 57 A view of the Administrator dialog box

If you set the IP address in the control panel window, the “Manually” button will be selected. If you did not set the decimal address in the MacTCP control panel, you can use the Administrator dialog box to select the preferred method for setting the IP address, and supply the required IP parameters.

▲ ***Important:*** The Quarterdeck gateway must always have the same IP address. Don’t use the “Dynamic” option in the MacTCP configuration.

- Manually

  If you select “Manually” when configuring MacTCP, you must set the address manually using the fields in the IP Address box. See *Setting the IP Address Manually*.

- Server

  If you select “Server,” the IP address must be obtained from a server that supports RARP or BootP, or from or a MacIP-compatible Datagram Delivery Protocol-Internet Protocol (DDP-IP) gateway on an AppleTalk network. The server must statically associate an IP address with the Macintosh host—it cannot be configured to return any available address within a valid range.

- Dynamically

  If you select Dynamically, the node portion of the address will be allocated dynamically within the range of node numbers specified. This is not a valid option for the Mac running the Quarterdeck gateway.

Setting the IP Address Manually

To set the address manually, click the Manually button located in the Obtain Address box. Then follow these steps:

1 Set the address class (A, B, or C).

Move to the IP Address box and position the pointer on the Class box. Class A, the default setting, is currently shown in the box. Press the mouse button and a menu of classes appears as shown in FIGURE 58. The check mark indicates which class is the current setting. If you want to change the class, press the mouse button as you drag the pointer to B or C.

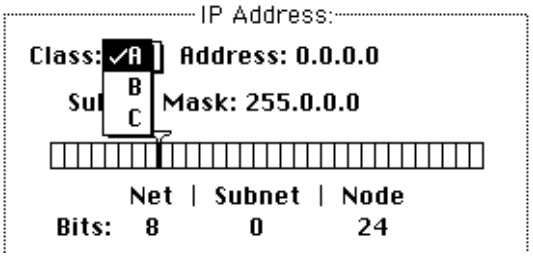

FIGURE 58 The menu of address classes

If you change the class, the new value that appears in the Net box is the minimum value allowable for the selected address class. For instance, if you select class C, the value in the Net box changes to 12582912, which is the minimum value that can be used for class C addresses.

Note that changing the class causes the slider on the ruler to move. The address, subnet mask, and bits allocated to net, subnet, and node also change.

2 Set the subnet mask.

Perform this step only if a subnet mask is in use on your network.

Use the slider on the ruler to set the subnet mask. Each box in the ruler represents one bit of the 32-bit IP address. A dark line on the ruler indicates the number of bits allocated to the net portion of the address (as determined by the class selected).

The slider can be moved anywhere along the ruler to the right of this darkened line. Place the pointer on the slider, press the mouse button, and drag the slider to the appropriate location on the ruler. When you move the slider, the subnet mask, the subnet bits, and the node bits change.

If you do not move the slider, the Subnet box remains dimmed.

3 Type the IP address in the Net, Subnet, and Node boxes.

This example uses integer format for the IP address.

In integer format, the IP address is broken down into bits (4 sets with 8 bits per set). The bits are allocated to net, subnet, and node according to address class and subnet mask, and are then displayed as a decimal number. For instance, the integer-format address `90.25.3.240`, broken down into bits, looks like this:

`01011010.00011001.00000011.11110000`

If the address class is A (8 bits compose the net portion of the address) and the subnet mask is `255.255.252.0` (or 14 bits of subnet and 10 bits of node), then the integer form of the address is as follows:

- Net: `90`
- Subnet: `1600`
- Node: `1008`

If you want to set the IP address in integer format, type this information in the Net, Subnet, and Node boxes as shown in FIGURE 59.

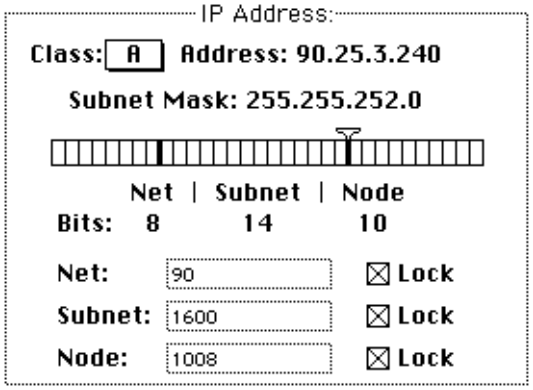

FIGURE 59 Values set in the Net, Subnet, and Node boxes

FIGURE 59 shows values set and locked in the Net, Subnet, and Node boxes.

4 Set the net number.

The Net box contains the lowest net number that can be used, determined by the address class that was selected. Click twice in the Net box and type the net portion of the IP address in integer form. If you try to type a number over the maximum allowed for the selected IP address class, the last digit in the number you typed is rejected; you must retype a valid number. If you type a number under the minimum allowed for the selected IP address class, a valid number is automatically assigned when you save your changes; therefore, be sure to type a number over the minimum allowed for the selected IP address class.

If you click the Lock box to the right of the Net box, the net number is protected. The Net box is dimmed, and you cannot change its value unless you click the Lock box again to deselect it.

5 Set the subnet number.

Note that you can set the subnet number only if you set the subnet mask. Click the Subnet box and type the subnet portion of the IP address in integer format. If you click the Lock box to the right of the Subnet box, the subnet number is protected. The Subnet box is dimmed, and you cannot change the value in the box unless you click the Lock box again to deselect it.

6 Set the node number.

You now have two choices: set the node number, or have the node number assigned dynamically.

If you decide to set the node number, click the Node box and type the node portion of the IP address in integer format. If you click the Lock box to the right of the Node box, the node number is protected. The

Node box is dimmed, and you cannot change the value in the box unless you click the Lock box again to deselect it.

If you want the node number to be assigned dynamically every time the Macintosh starts up, see the section "Setting the Node Number Dynamically" later in this chapter.

Getting the IP Address from a Network Server

If you select the Server button in the Obtain Address box, the network address is obtained automatically from a network server. On an Ethernet network, the protocols BootP or RARP are used to assign an address. On an AppleTalk network, a DDP-IP gateway sets the address.

To have a server provide the address, click the Server button in the Obtain Address box. (When you bring up the Administrator dialog box for the first time, Server is the default setting).

There is no need to set class, subnet mask, or net, subnet, or node numbers; they will be set by the server. The Macintosh computer that uses this configuration is assigned an address every time it starts up, as long as you have a properly configured server.

After you restart your computer, the class, subnet mask, and net, subnet, and node numbers assigned by the server are reflected in the Administrator dialog box and in the IP Address box on the MacTCP control panel.

Setting the Gateway Address

Some gateways use the Routing Information Protocol (RIP) to exchange network routing information. The MacTCP software automatically monitors RIP traffic to determine active gateways. If your network does not use RIP, you must manually set the address of a gateway.

Note: The default gateway address can also be configured from a server using the BootP protocol.

To set the gateway address manually, go to the Routing Information section of the Administrator dialog box. Click the pointer in the Gateway Address box and type the decimal IP address of your gateway.

Setting Domain Name Server Information

This part of the Administrator dialog box allows you to set the IP address of domain name servers and the domains over which they have authority. The box allows you to set this information for one or more domain name servers.

Click the pointer in the Domain box and specify a domain name. Press the Tab key to move the pointer to the IP Address box, and type the address of that domain. As you type the IP address, additional boxes are displayed to allow you to enter more domain name server names and IP addresses.

Click the Default button to designate your default domain name server and your domain name extension. Generally, the default should be a domain name server that has authority over your domain.

If a default name extension and server are identified in the Administrator dialog box, they are used for all nonqualified requests. For example, if the name "homer" is passed to the Domain Name Resolver (DNR) and the default extension is "pundit.edu," the name "homer.pundit.edu" is used in the query; however, if the name "homer.drama.pundit.edu" is passed to the DNR, the extension is not appended.

The extension of the name passed to the DNR determines which name servers are chosen. Servers that match the full extension are found first, followed by servers that serve the ancestor of the full extension. For example, for the name “homer.drama.pundit.edu,” the server that serves “drama.pundit.edu” would be found first, followed by the server that serves “pundit.edu.” If no servers are found, the default server is used. If you did not set a default, the DNR returns “noNameServer.” In the Administrator dialog box, you should type a default domain name and select the Default button.

Once a list of servers that support the domain is found, those servers are queried in the order of their distance from the querying host. First servers on the local network are queried, followed by servers on other networks.

Closing the Control Panel

When you have finished entering the appropriate information in the Administrator dialog box, the MacTCP driver is configured. The configuration settings are stored in the MacTCP driver and also in a file called MacTCP Prep.

Click the OK button in the Administrator dialog box to close it, and then click the close box to close the control panel. The configuration changes take effect the next time the driver is used. If the configuration changes cannot be made immediately, an alert is displayed stating that you must restart your Macintosh computer for the configuration changes to take effect. When you click the OK button, the MacTCP control panel closes. When you restart, the MacTCP driver is configured on your computer.

You have now successfully installed and configured the MacTCP driver on your Macintosh computer. To enable the Macintosh to communicate with other IP hosts on the network, you must modify the MacTCP Hosts file.

Configuring the MacTCP Hosts File

Each IP host on a TCP/IP network can use a resident “hosts” file to perform the address resolution function that is often provided globally by a domain name server system. This file can be used as an alternative to the domain name server, or as a redundant backup in case the domain name server is temporarily unavailable.

Typically, the “hosts” file contains a list of host names that are accessible on the network, as well as the full IP address for each host. Additional information may be included, as described below. Each system can communicate with the hosts listed in the “hosts” file, unless a domain name server system provides more extensive access.

Although the same type of information is typically included in all “hosts” files, the syntax for entries in the MacTCP Hosts file is not the same as the syntax used in UNIX `/etc/hosts` files.

MacTCP Hosts File Syntax

The MacTCP Hosts file syntax conforms to the master file syntax specified in RFC 1035. Please refer to this RFC if you need more information than the basics presented here. Please also note that the `$INCLUDE` features has not been implemented in the MacTCP Hosts file.

A line in the Hosts file uses this syntax:

```
name  type  data  [;comment]
```

For example:

```
acct.abc.com A 128.1.0.9 ;address for acct
```

Any combination of tabs and spaces can be used as a delimiter between each field within a line. Lines end with Return and Line Feed characters.

The fields in the Hosts file are as follows:

- *name* is a host or domain name. If this field ends in a period, it represents an absolute address. If there is no terminating period in this field, the name represents a relative address.
- *type* is a code that represents the type of entry represented by this line. It can be any one of the following codes:

  `A` (address). This code in the second field means that the line will specify a hostname-to-IP address mapping.

  `NS` (name server). This code indicates a hostname-to-domain name mapping.

  `CNAME` (canonical name). This code means that the line will contain a hostname-to-official name mapping.
- *data* is the name or address that will be mapped to the name in the first field. The information in this third field must correlate with the code you specify in the *type* field.

  If *type* = `A`, the data field must contain an IP address.

  If *type* = `NS`, the data field must contain the name of the domain name server that has authority over the domain specified in the name field.

  If *type* = `CNAME`, the data field must contain the canonical (or official) name for the name field.
- *comment* is an optional description or comment for the line. Comments must be preceded by a semicolon.

Relative Host Names in the Hosts File

The Hosts file allows you to specify a "default" domain name using the syntax "`$ORIGIN` *domain-name*", for example,

```
$ORIGIN abc.com
```

If you use this syntax, the specified domain name will be appended to all hostnames in the Hosts file that do *not* end with a period. If you want to append the domain name "abc.com" to all hostnames in the Hosts file, you will use "relative" hostnames, i.e., hostnames that do not end in a period. The following sample Hosts file uses relative hostnames:

```
$ORIGIN abc.com
venus               A               128.1.0.1         ;address for venus
mercury             A               128.1.0.2         ;default mail host
fred                CNAME           bonzini.abc.com   ;canonical name for
                                                      ;alias fred.abc.com
```

The above example is interpreted exactly the same as the following Hosts file, which uses absolute hostnames instead:

```
venus.abc.com       A               128.1.0.1         ;address for venus
mercury.abc.com     A               128.1.0.2         ;default mail host
```

```
fred.abc.com        CNAME           bonzini.abc.com   ;canonical name for
                                                      ;alias fred.abc.com
```

▲ ***Important:*** Host names that are terminated with a period are interpreted as absolute names and are not modified. For all other addresses, the default domain name will be appended to the specified host name. Please see RFC 1035 for more details on the `$ORIGIN` feature.

Absolute Host Names in the Hosts File

You can always use absolute hostnames in the Hosts file, either by not specifying a "default" domain name (described above), or by ending the hostnames with a period.

> **Note:** Hostnames that terminate in a period character are interpreted exactly as they are typed (minus the terminating period). This means that you can specify domain names other than the default domain name by terminating the hostname string in a period.

The example Hosts file shown immediately below does not define a default domain name and uses absolute hostnames throughout:

```
venus.abc.com       A               128.1.0.1         ;address for venus
mercury.abc.com     A               128.1.0.2         ;default mail host
abc.com             NS              mercury.abc.com   ;domain name server
                                                      ;for abc.com
fred.abc.com        CNAME           bonzini.abc.com   ;canonical name for
                                                      ;alias fred.abc.com
```

The next example Hosts file defines a default domain name and uses a mixture of relative and absolute hostnames:

```
$ORIGIN abc.com
venus               A               128.1.0.1         ;address for venus
mercury             A               128.1.0.2         ;default mail host
abc.com.            NS              mercury.abc.com   ;domain name server
                                                      ;for abc.com
fred.abc.com.       CNAME           bonzini.abc.com   ;canonical name for
                                                      ;alias fred.abc.com
```

COPYRIGHT

150 Pico Blvd., Santa Monica, CA 90405
(310) 392-9851

TRADEMARKS

License

United States:

This License is your proof of license.
Please treat it as valuable property.

QUARTERDECK END USER LICENSE AGREEMENT (THE “AGREEMENT”)

NOTICE TO END USER: CAREFULLY READ THE FOLLOWING LEGAL AGREEMENT. USE OF THE SOFTWARE (THE “SOFTWARE”) PROVIDED WITH THIS AGREEMENT CONSTITUTES YOUR ACCEPTANCE OF THESE TERMS. IF YOU DO NOT AGREE TO THE TERMS OF THIS AGREEMENT, PROMPTLY RETURN THE SOFTWARE AND THE ACCOMPANYING ITEMS (INCLUDING WRITTEN MATERIALS, BINDERS AND CONTAINERS) TO THE LOCATION WHERE YOU OBTAINED THEM FOR A FULL REFUND.

1. License Grant. Quarterdeck Corporation (“Quarterdeck”) grants to you (either as an individual or entity) a nonexclusive sublicense subject to the provisions hereof: (a) to use the SOFTWARE solely for your own internal personal or business purposes on a single computer (whether a standard computer or a workstation component of a multi-user network).

You may make and maintain up to three backup copies of the software, provided they are used only for backup purposes or by you personally on another workstation (such as at home) so long as the Software is not used on more than one machine at a time, and you keep possession of the backups. In addition, all the information appearing on the original disk labels (including the copyright notice) must be copied onto the backup labels.

2. Proprietary Rights. You acknowledge that the SOFTWARE is proprietary to Quarterdeck and its suppliers. You agree to hold the SOFTWARE in confidence, disclosing the SOFTWARE only to authorized employees having a need to use the SOFTWARE as permitted by this Agreement and to take all reasonable precautions to prevent disclosure to other parties.

3. Other Copies, except as otherwise provided herein. You will not make or have made, or permit to be made, any copies of the SOFTWARE or portions thereof, except as necessary for its use with a single licensed computer system under the terms and conditions of this Agreement. You agree that any such copies shall contain the same proprietary notices which appear on or in the SOFTWARE.

4. Ownership. Except as stated above, this Agreement does not grant you any rights to patents, copyrights, trade secrets, trade names, trademarks (whether registered or unregistered), or any other rights, franchises, or licenses in respect of the SOFTWARE. Title to and ownership of the SOFTWARE, any reproductions and any documentation shall remain with Quarterdeck and its suppliers. You will not adapt or use any trademark or

trade name which is likely to be similar to or confusing with that of Quarterdeck or any of its suppliers or take any other action which impairs or reduces the trademark rights of Quarterdeck or its suppliers.

5. Other Restrictions. This Agreement is your proof of license to use the SOFTWARE in accordance with these terms and must be retained by you. You may not rent or lease the SOFTWARE, but you may assign your rights under this Agreement on a permanent basis to an assignee of all of your rights, title and interest to such SOFTWARE provided you transfer this Agreement, all copies of the SOFTWARE and all accompanying written materials, and such assignee agrees to be bound by all the terms and conditions of this Agreement. YOU MAY NOT ALTER, MODIFY, REVERSE ENGINEER, DECRYPT, DECOMPILE, OR DISASSEMBLE THE SOFTWARE.

6. Limited Warranty. Quarterdeck warrants that the SOFTWARE will perform substantially in accordance with the accompanying written materials and that the printed materials and diskettes are free from any physical defects for a period of ninety (90) days from the date of purchase. Any warranties on the SOFTWARE, printed materials or diskettes as herein explicitly granted are limited to ninety (90) days.

7. Customer Remedies. Quarterdeck's entire liability and your sole and exclusive remedy shall be, at Quarterdeck's option, either to (a) correct the error, (b) help the end user work around or avoid the error or (c) authorize a refund, so long as the SOFTWARE, printed materials or diskettes are returned to Quarterdeck with a copy of your receipt. This Limited Warranty is void if failure of the SOFTWARE has resulted from accident, abuse, or misapplication. Any replacement SOFTWARE will be warranted for the remainder of the original warranty period.

8. No Other Warranties. QUARTERDECK DOES NOT WARRANT THAT THE QUARTERDECK SOFTWARE IS ERROR FREE. EXCEPT FOR PARAGRAPH SIX ABOVE, QUARTERDECK DISCLAIMS ALL WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT OF THIRD PARTY RIGHTS WITH RESPECT TO THE SOFTWARE, THE ACCOMPANYING WRITTEN MATERIALS OR DISKETTES. AS ALLOWED BY APPLICABLE LAW. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OF IMPLIED WARRANTIES OR LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY MAY LAST, OR THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM JURISDICTION TO JURISDICTION.

9. Export. You acknowledge that the laws and regulations of the United States restrict the export and re-export of commodities and technical data of United States origin, including the SOFTWARE. You agree that you will not export or re-export the SOFTWARE in any form without the appropriate United States and foreign government licenses and permission from Quarterdeck. You agree that its obligations pursuant to this section shall survive and continue after any termination or expiration of rights under this Agreement.

10. Severability. In the event of invalidity of any provision of this Agreement, the parties agree that such invalidity shall not affect the validity of the remaining portions of this Agreement. The United Nations Convention on Contracts for the International Sale of Goods is specifically disclaimed.

11. No Liability for Consequential Damages. IN NO EVENT SHALL QUARTERDECK BE LIABLE TO YOU FOR ANY CONSEQUENTIAL, SPECIAL, INCIDENTAL OR INDIRECT DAMAGES OF ANY KIND ARISING OUT OF THE USE OF THE SOFTWARE, EVEN IF QUARTERDECK HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT WILL QUARTERDECK'S LIABILITY FOR ANY CLAIM, WHETHER IN CONTRACT, TORT OR ANY OTHER THEORY OF LIABILITY, EXCEED THE LICENSE FEE PAID BY YOU.

12. U.S. GOVERNMENT RESTRICTED RIGHTS.

If this product is acquired under the terms of a: DoD contract: Use, duplication or disclosure by the Government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of 252.227-7013. Civilian agency contract: Use, reproduction or disclosure is subject to 52.227-19 (a) through (d) and restrictions set forth in the accompanying end user agreement. Unpublished-rights reserved under the copyright laws of the United States. Quarterdeck Corporation, 1901 Main Street, Santa Monica, CA 90405.

13. Governing Law. This Agreement is governed by the laws of the State of California.

14. Entire Agreement. This is the entire agreement between you and Quarterdeck which supersedes any prior agreement, whether written or oral, relating to the subject matter of this Agreement.

Should you have any questions concerning this Agreement, or if you desire to contact Quarterdeck for any reason, please write: Quarterdeck Corporation, 1901 Main Street, Santa Monica, CA 90405.