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Network Time was written using THINK C™. Portions of the Network Time program are copyright Apple Computer, Incorporated. and Symantec Corporation. Code for the System 6 pop-up menu was contributed by Mike Engber. Code for error messages was influencedin large part by code written by Joe Holt.

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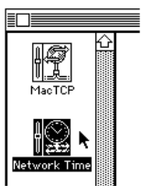
Once you have done this, Network Time is installed; unlike other control panels you may use, **there is no need to restart your Macintosh.** The next step is to configure the settings in the Network Time control panel.

▲ **Note** Network Time fully supports System 7 Balloon Help™. You may turn on Balloon Help at any time to assist you through the configuration process; most of the information in this manual is covered in the Network Time help balloons. ▲

Configuring Network Time

Configuring Network Time is relatively straightforward; you configure it just like any other control panel. However, some of the information that Network Time requires may be unfamiliar to you.

To configure Network Time using System 6, choose Control Panel from the Apple menu. The Control Panel should open, with the General section displayed.



Then, scroll if necessary to locate the Network Time icon, and click it to display the Network Time section.

To configure Network Time using System 7, choose Control Panels from the Apple menu. The Control Panels folder should open.

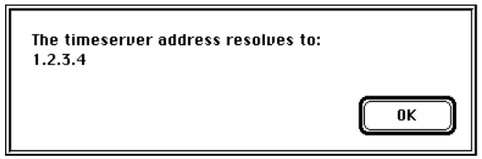
Then, double-click the Network Time control panel icon, or select the icon and choose Open from the File menu.

Request For Comments 868.[1] Network Time prefers to use NTP if it can since it is much more accurate than the older protocol. Check with your local network administrator to see if any of the machines on your network can act as an NTP or TIME server. Most UNIX machines are shipped with the TIME server software, and a program for UNIX machines to run NTP is freely available from the University of Delaware. If you need help finding a time server or getting the NTP software, see "Appendix B: Finding time servers."

Once you have identified a time server to use, type the address in the "Time server" box. The name must be in standard domain name form, or in dotted decimal notation.

Upper- and lower-case letters ('A'–'Z'), numerals ('0'–'9') and the period ('.') and hyphen ('-') can be typed in this box; all other characters will produce a beep. You can make sure the address is valid by clicking on the "Verify" button.

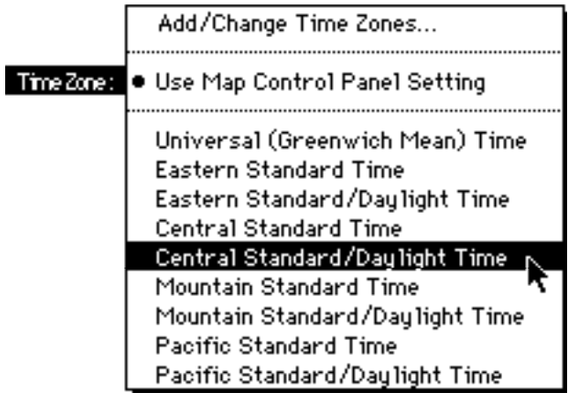
▲ **Note** The "Verify" button will be disabled if MacTCP is not installed on the Macintosh. Also, Network Time needs to open MacTCP to verify the time server address. ▲



A dialog box like the one above will display the address in standard decimal form. If an error occurs during the

[1] The Network Information Center Request For Comments documents can be obtained from the Network Information Center, or electronically from the Network Information Center FTP server , "nic.ddn.mil".

RAM by itself, choose one of the time zones from the “Time Zone” pop-up menu.



For instance, if you live in Chicago, you would select “Central Standard/Daylight Time” from the menu, because Chicago is on Central Standard Time during the winter and Central Daylight Time during the summer. If you live in Indianapolis, where daylight savings time is not used, you would choose “Central Standard Time.”

If you cannot find your local time zone in the pop-up menu, or if you would like to view or change the time zone and daylight savings settings for one of the time zones, please turn to “Appendix A: Adding and changing time zones.”

Telling Network Time when and how to set the clock

The next step in configuring Network Time is to set up the checkboxes that specify options for setting the time on your Macintosh. Find the section of the control panel labeled “Set the time:”.

Keep in mind that these options are additive. That is, each of them works in combination with the others. So, for instance, if you have Network Time configured to set the time both “At every startup” and “Every 24 hours”, Network Time will set the time at startup time and then every 24 hours thereafter. So it is possible if you start your machine every morning and shut it down every night that Network Time will never get a chance to set the time “Every 24 hours” because it is always setting the time “At every startup”. The “Wait for MacTCP” setting works similarly. Whether you check “At every startup” or “Every ✕ hours”, Network Time will always wait for MacTCP to be opened and only then will decide whether or not it is time to set the clock. Here are some hints for using these options:

- If you use a program like AppleTalk Remote Access to connect to your network once per day and then disconnect, select the “Wait for MacTCP” and “At every startup” boxes, but don’t select the “Every ✕ hours” box. That way, Network Time will wait for MacTCP to be opened and then set the clock only once during the time the machine is on.

- If you restart your Macintosh often, select “Every ✕ hours” but not “At every startup”. That way, no matter how many times you restart, Network Time will always wait until a specific amount of time has elapsed since the last time it set the clock.

- If you select only “At every startup”, Network Time will only update daylight savings time when it goes to set the clock. If you select “Every ✕ hours”, Network Time will update daylight savings time immediately when the change takes effect.

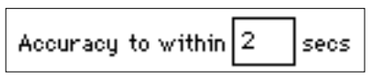
- You must specify at least one of either “At every startup” or “Every ✕ hours” or Network Time will report an error when you restart your machine.

The final checkbox in this section is “Using NTP only”. When this box is checked, Network Time will only attempt to use the

Note that the “Retry in X minutes” value will override the value set in the “Every X hours” box. For instance, if an error occurs while setting the time and Network Time is configured to set the time “Every 2 hours”, but also to “Retry in 180 minutes”, Network Time will wait the 180 minutes (or 3 hours) before attempting to set the time again. Also note that if the “Retry in X minutes” box is not checked and an error occurs, but the “Every X hours” box is checked, Network Time will wait that number of hours before attempting to set the time again. If only the “At every startup” box is checked when an error occurs, Network Time will not attempt to set the time again.

Configuring the accuracy

The final configuration option in the Network Time control panel is the accuracy setting.



The accuracy setting is rarely used by Network Time since usually it can set the clock to within milliseconds of the actual time. But, on extremely slow networks, or extremely busy networks where packets can get lost, the accuracy setting specifies the widest acceptable discrepancy between actual time and the time to which Network Time sets the clock. You can specify a value between 1 and 60 seconds, though any value between 2 and 5 seconds should be ample. If Network Time cannot guarantee that the time will be accurate to within this number of seconds, it will report an error. Again, most users will never have to concern themselves with this value.

Using Network Time

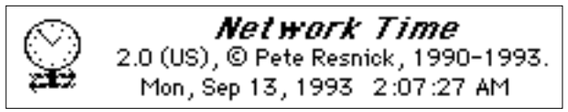
Once configured, Network Time does most of its work in the background without any intervention from the user. There are some things that you can do when the control panel is open.

open MacTCP if it is not already open. Also, if an error occurs while setting the time manually, Network Time will always display an error message, but it will never attempt to automatically retry, even if the “Retry in ✕ minutes” checkbox is checked. Network Time will honor the setting in the “Using NTP only” checkbox.

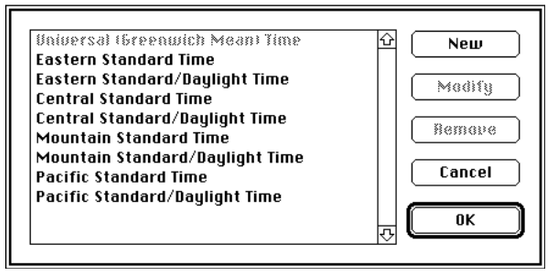
If Network Time successfully sets the clock, the date and time in the area labeled “The time was last set:” will be updated appropriately. Network Time always uses the date and time displayed in this area to determine the next time it should set the time if the “Every ✕ hours” feature is enabled.

Viewing information about Network Time

The top of the Network Time control panel has information that will be of use to you.

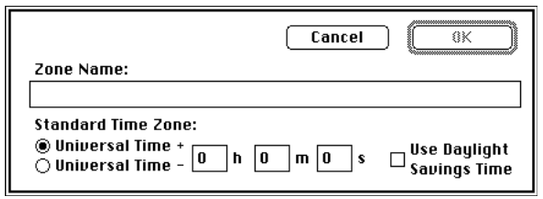


If you click on the clock icon in the upper left-hand corner of the Network Time control panel, a dialog box will appear displaying information about the program and the author. Next to the icon, the current version of Network Time is always displayed. The current version, as of the writing of this manual is 2.0. Network Time always keeps track of the current version so that the program installed in memory is the same version as the control panel itself and matches the version that created the Network Time Preferences file. (The structure of this file is discussed in “Appendix E: Technical specifications”). Just below the version information, the current date and time are always displayed.



Adding a new time zone

To add a new time zone to the list, simply click on the New button. The standard time zone configuration dialog box will appear on the screen.

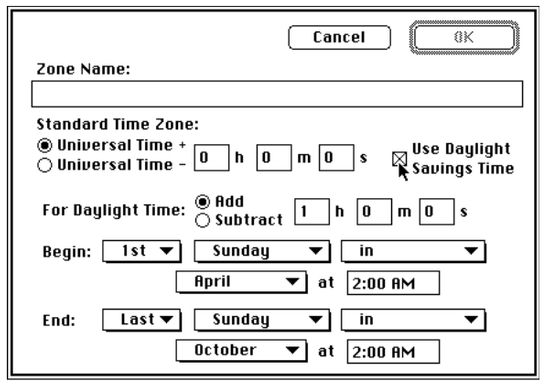


The first thing you must do is choose a name for the time zone. Network Time does not care what name you choose; you can type anything you like for a name, but Network Time will not allow a time zone to have no name. A common convention is to give a name which describes the standard time zone and, if you are using one, the daylight savings time zone. So, if you live in Great Britain, you might choose a name like “Greenwich Mean/British Summer Time” for your time zone.

After you have selected a time zone name, you must specify the standard time zone given in offset from Universal Time. Type the amount of time difference between your local time zone and Universal Time (which is commonly called Greenwich Mean Time). If you lived in California, for instance, the time is 8 hours less than Universal Time. Therefore, you should type “8” in the hours box, and “0” in the

Configuring for daylight savings time

If you want to create a time zone which uses daylight savings time, click in the box labeled “Use Daylight Savings Time” in the time zone configuration box. Several new settings will appear at the bottom of the dialog box.



Here you must specify the rules for when daylight savings time begins and ends. The first thing you should do is check the offset used for daylight savings time. The default is to add one hour to the time when daylight savings is in effect. *Almost everywhere uses this convention; daylight savings time is almost always one hour ahead of standard time.* You should probably leave that setting alone.

Then you must choose the rules which determine when daylight savings time begins and ends. Network Time provides very extensive options to specify when these transitions occur using the pop-up menus at the bottom of the time zone configuration dialog box. You can start or stop daylight savings time:

1. *On a particular day of the week in a given month.* Using this option, you select whether the transition will occur on the first, second, third, fourth, or last occurrence of a certain day of the week in the month