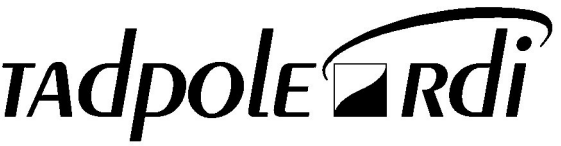
AutoNET

Reference Guide



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AutoNET Reference Guide

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Table of Contents

1 Introduction

This Reference Guide is intended for system administrators, programmers, and AutoNET users who possess a working knowledge of UNIX networking. This Reference Guide describes AutoNET, the AutoNET database, and how to use AutoNET with JOIN. It also provides detailed technical information for appropriate VWA facilities, which are not available in the UNIX man pages.

Before you proceed, observe the following conventions that are used in this Reference Guide.

- 

Precedes information that requires special attention
- Directories and variables are shown in *italics*.
- Commands, switches, primitives, and tokens are shown in **bold**.
- Filenames are shown in *italics*.
- References to other information is preceded by +.
- Screen messages and examples appear in `Courier` type within a box.

Contents of This Guide

In addition to this Introduction, this Reference Guide contains the following chapters and appendix.

- **Chapter 2, Overview** — provides an overview of AutoNET.
- **Chapter 3, AutoNET Database** — describes the purpose and contents of the AutoNET database.
- **Appendix A, File Formats** — describes the AutoNET file formats.

Supplemental Documentation

This Reference Guide is part of a set of documents provided by Tadpole-RDI for your convenience. Additional information can be found in the following supplemental documentation:

- "UltraBookIIi User Guide"
- "Solaris Software Installation Guide"
- "VWA Software Installation Guide"
- "VWA Control Panel User Guide"
- "FAX/MODEM User Guide"

2 Overview

This chapter provides an overview of AutoNET. Topics include:

- Introduction — see the next section.
- AutoNET operation — see page 2–4.
- AutoNET phases — see page 2–5.
- Starting AutoNET— see page 2–9.
- AutoNET optional switches — see page 2–10.
- Using AutoNET with JOIN— see page 2–12.
- Granting access— see page 2–14.

Introduction

In traditional UNIX networks, workstations are permanently connected to the network and servers are always available to the user. With the proliferation of portable computers, however, a method is required that will allow these devices to periodically connect to and disconnect from various networks and configure the machine with minimal user effort.

Typically, this “intermittent” connectivity is time-consuming and wrought with frustration, especially when connecting to a new network. Configuring network facilities for a UNIX workstation requires users to have some experiences with UNIX networking facilities and system

administration procedures. It also requires time and knowledge to edit various system files. All of this effort must be repeated every time the workstation is connected to a network for which the machine is not configured.

All of these problems and inconveniences are specific to portable workstation users. These mobile users typically move from site to site, connecting to different networks or, sometimes, to no network at all.

AutoNET is designed to solve these problems and limitations. AutoNET is a tool that performs dynamic network configuration for the workstation. Specifically, AutoNET:

- Minimizes user intervention for setting up new network configurations,
- Allows users to customize each network configuration for specific requirements.
- Automatically detects the network to which the workstation is connected and selects the appropriate configuration.
- Configures the workstation for the auto-sensed network.

Moreover, AutoNET saves all configurations that a user may have defined in its own database. As a result, the user does not need to repeat this effort when reconnecting the workstation to a previously defined network.

AutoNET provides a rich set of facilities that a workstation user typically needs. Facilities such as default route, name server configuration, remote filesystem access, and advertisement of local resources are provided on a network-by-network basis, without requiring users to have superuser authority.

Since superuser authorization is not required to access resources, AutoNET provides its own access and deny facilities. Using these facilities, a superuser can determine whether regular UNIX users can modify the network database and access privileged commands. In this way, an unauthorized user can be prevented from changing the way a workstation can be used.

Although access may be denied to facilities that were previously installed or configured, the user can still use them but cannot change them.

AutoNET can be used together with JOIN, a DHCP client that is part of VWA. When these two utilities are used in a network that has a DHCP server, the network configuration process for the workstation is completely transparent, requiring no user intervention. At boot time, the Joinc client contacts the server to obtain an IP address and system resource information. Then, together with AutoNET, JOIN configures the workstation to use the available advertised network resources. All of these actions occur automatically, without requiring the user to enter a single keystroke.

AutoNET also handles situations where a workstation is connected to an unknown or unconnected network. In these situations, the workstation boots, and allows the user to modify the database and restart the networking facilities without having to reboot the workstation.

AutoNET also allows a workstation to be left in standalone mode. This mode permits the workstation to operate as if it were disconnected from a network.

How AutoNET Works

AutoNET is uniquely designed to assist users of portable UNIX workstations with the tasks of configuring the system networking facility. AutoNET is also designed to overcome limitations of some Sun operating systems, such as Solaris, when it encounters an anomaly that would otherwise prevent the workstation from booting or operating properly. Such anomalies include:

- A workstation being disconnected from its primary, or "HOME," network.
- A workstation that is not connected to any network (that is, the physical interface to the network is not present).

Because portable workstation users face unique connectivity challenges, AutoNET has been specifically designed to allow workstations to operate under the following situations:

- Standalone — the workstation is not used in a network (that is, the physical interface to the network is not present).
- Mobile — the workstation is connected to different networks at different sites, including the user's "HOME" network.
- Telecommuter — the user has only one "HOME" network, but will also use the workstation as a standalone system when away from this network.

Typically, the system administrator configures a UNIX workstation by creating and changing a series of hierarchical text (ASCII) files. Instead of relying only on one set of system files that

need to be changed to deal with a variety of networking situations, AutoNET creates a database containing configured system files for each desired network.

The files used in the AutoNET database are identical in function and structure to their standard UNIX counterparts. For example, the *hosts* file in the database uses the identical structure to the file */etc/hosts*.

☞ Refer to the UNIX *hosts* man page for more information on the file format.

Using these design criteria, AutoNET binds itself to a network interface and obtains network layer information about the network to which the workstation is attached. The output from this function is one of the following:

- A list of possible networks to which the workstation can be connected.
- A disconnected interface.
- An indication of no network. This indication means the local workstation is the only workstation on the network, or that none of the auto-identifying methods could determine the network configuration.

AutoNET Phases

AutoNET goes through two phases when determining the network (if any) to which a workstation is connected:

- Network sensing
- Network attachment

These phases are described in the following sections.

Network Sensing

Before starting the network-sensing phase, AutoNET attempts to determine whether the network interface is physically attached to the workstation. AutoNET performs this phase by sending a number of test packets onto the network, and then checking for a carrier error indication.

If AutoNET detects that the interface is not connected, it bypasses its sensing phase and enters the network-attachment phase using the "default" configuration. Bypassing the network sensing phase avoids the unnecessary delay of the AutoNET sensing process when the workstation is not connected to any network.

During the network sensing phase, AutoNET obtains information about the network to which the workstation is attached. During this phase, AutoNET uses two main techniques to identify the network:

- First, AutoNET checks to see if JOIN is operating on the network and if JOIN can successfully identify the network.
- Second, AutoNET checks packets on the network to see if it recognizes the network to which the workstation is currently connected and queries routers on the net for a current netmask.

JOIN is a DHCP-based utility, produced by Competitive Automation. JOIN uses a client-server mechanism to obtain network information, and assumes a JOIN server is located on a host somewhere on the network.

The JOIN server dynamically assigns IP addresses to the workstation. IP addresses are obtained from a pool and will be re-used each time a network connection is made; however, a workstation is not guaranteed the same IP address when it reconnects to a network, unless specifically configured to do so.

For networks with a central-naming scheme, such as NIS, the JOIN server updates the central database with the current IP addresses. Changing the IP address in such networks does not cause a problem, since most workstations are identified by name instead of by number.

While AutoNET makes no constraints upon how a network is identified, it initially asks JOIN to identify the network configuration. If JOIN identifies the network configuration, AutoNET incorporates that information to ascertain the network that has been sensed and loads the appropriate network parameters. If JOIN cannot identify the network configuration, AutoNET attempts to ascertain the configuration using its own algorithms. If AutoNET succeeds, it uses the configuration recognized. Otherwise, AutoNET uses the default configuration (refer to "Disconnected Mode" on page 2–8 for more information).

AutoNET also uses "promiscuous mode" packet capture to send and receive IP packets. These packets are analyzed in an attempt to identify the primary network on which they are being sent.

Network Attachment

The second phase of AutoNET is the network-attachment phase. This phase uses a series of library utilities to configure the workstation for correct operation on the sensed network.

In this phase, AutoNET places the workstation into one of two modes of operation:

- Disconnected Mode
- Connected Mode

Disconnected Mode

Disconnected mode is the default mode, and occurs if a network cannot be identified during AutoNET's network-sensing phase. Disconnected mode does not imply that a network is not present, just that AutoNET is unable to recognize one. This may occur if the workstation is physically disconnected from the network or if AutoNET cannot identify the network.

In the latter case, the user can provide additional connection criteria and restart the network. In both cases, AutoNET determines that these are instances of a "default" network configuration. When attaching to a default network, only local parameters are initialized. No name service is started, since it is meaningless to start remote services when the interface is disconnected.

Connected Mode

During the network-sensing phase, AutoNET scans known configurations to determine the one most likely to be connected to the workstation. During this process, AutoNET accepts input from the JOIN facility while also using input derived from its sensing algorithms.

For example, if the network is identified by JOIN, AutoNET chooses that network configuration. Since JOIN specifically communicates with a server on the network, the values returned by JOIN uniquely identify the network, and no additional sensing methods are required. If an AutoNET configuration exists for this network, AutoNET merges the data pre-

sented by JOIN with the data contained in the AutoNET database before starting the network. Otherwise, AutoNET configures the workstation based on the information gathered by the JOIN client and saves this information in its database for future use.

If AutoNET does not have a configuration for the sensed network, it reclassifies the network as a "default" network, and treats the network interface as if the workstation was disconnected.

Starting AutoNET

AutoNET is typically started at boot time using the */etc/rc2.d/S39anet* script for Solaris 2.*x*. However, it may also be started from the command line by following this procedure:

1. Type **anet.**

2. To include any optional switches, press the spacebar and type one or more switches (refer to "AutoNET Optional Switches," on page 2–10.

If you include more than one switch, press the spacebar between each one.

3. Press RETURN.

If you start AutoNET without any optional switches, it performs the network-sensing procedure described on page 2–6, followed by the network-attachment procedure described on page 2–7.

AutoNET Optional Switches

AutoNET can be started with the following options:

-a <*net_addr*>
Uses *net_addr* as the sensed network address. This option causes AutoNET to bypass the sensing phase and use *net_addr* as the network address. If a network configuration for *net_addr* does not exist, a network attachment will not be performed.

-l
Lists a sensed network configuration. This option performs a network-sensing operation, then returns the most probable network address. It does not perform a network-attachment operation. When used with the **-a** option, it displays the network address as if it was a sensed address.

Using **-l** with **-a** only returns the *net_addr* parameter.

-c
Displays a matched configuration. This option is similar to the **-l** option, except that it also performs a network-match function and displays the resulting matched configuration. When used with the **-a** option, it lists the configuration of *net_addr* without attaching to the network. This option is useful for users who want to know what network would be attached if AutoNET was started without any switches.

-C
Indicates to AutoNET that the physical interface is connected to the workstation, eliminating the need for AutoNET to perform its network-attachment test. By default, AutoNET

always checks whether the interface is connected before starting its sensing phase. This option is provided for optimization purposes, to reduce latency when running AutoNET.

-d [<*debug*>]
Displays debug messages on the console device. This option displays debug messages as AutoNET functions are performed. It is recommended that you do not use this switch. If an integer *debug* is provided, this will provide debug messages at the level specified by *debug*. Higher levels produce additional output. This option has no effect on the actual execution of AutoNET.

-D
Indicates to AutoNET that the physical interface is not connected, so AutoNET will not have to perform its network-attachment test. By default, AutoNET always checks whether the interface is connected before starting its sensing phase. This option forces AutoNET to use the "default" configuration. This option is provided for optimization purposes, to reduce latency when running AutoNET.

-J
Instructs AutoNET to ignore the network configuration returned by the JOIN client. By default, AutoNET uses the configuration returned by the JOIN client and merges it into its own configuration. The workstation then uses the merged configuration.

-m netmask
specifies a netmask to use with the network address to select a network configuration directory to configure the machine. By default, AutoNET tries to detect the netmask by querying other hosts/routers on the attached network. If it fails, then it uses the default netmask based

on the known network address. This option is used to override the automatic netmask detection and force AutoNET to use a specific netmask to select a proper subnet configuration.

For example, if you type

anet -m 255.255.240.0

you are instructing AutoNET to used the specified netmask for a subnet for a class B network. If the network adresses are 128.24.34.X, AutoNET will use the network configuration in the /etc/VWA/128.24.2 directory to configure the machine. Without the -m option, if AutoNET fails to detect the netmask it will then use the /etc/VWA/128.24 directory since the default netmask for class B is 255.255.0.0.

-n
Indicate to AutoNET to use the default netmask based on the network address.

Using AutoNET with JOIN

During the network-sensing phase, if JOIN is started in conjunction with AutoNET, AutoNET checks whether JOIN has sensed a network connected to the workstation. If JOIN has not been started with AutoNET, AutoNET operates as if JOIN failed to recognize a network.

During the network-attachment phase, AutoNET inquires whether JOIN has found a network. If it has, AutoNET checks to see whether there is a database configuration for the sensed network.

- If an AutoNET configuration does not exist, and JOIN has determined a configuration, AutoNET uses the JOIN configuration as is and saves this configuration in its database.

- If AutoNET has a configuration, it merges the JOIN configuration into its own, and attaches to the network using the new configuration. This new configuration is not automatically saved in the configuration database directory.

JOIN configures workstations from the network administrator's perspective, while AutoNET configures the workstation from the workstation user's perspective. By using both facilities, workstation users can work within the constraints defined by the network administrator, while still being able to tailor the workstation to their own preferences.

Using AutoNET Without JOIN

The JOIN client can be prevented from performing the network configuration process by changing the value of the switch JOINC from YES to NO in the AutoNET default environment file, */etc/default/vwa*. This file can be edited by a superuser using a standard text editor, such as *vi*.

AutoNET Default Configuration File

The AutoNET default configuration file is */etc/default/vwa*. This file is an ASCII file that stores AutoNET's default operating variables. Currently, this file contains the three variables described in the following sections.

VWABINDIR=*directory_pathname*

This variable specifies the directory where all AutoNET executables reside. The VWA libraries use this variable to locate the supported programs. If the user moves these executables to another location, **VWABINPATH**, the **PATH** variable in */etc/init.d/autonet* has to be updated to specify the new location.

JOINC=YES or JOINC=NO

The */etc/init.d/autonet* script uses this variable to decide whether to use the JOIN client to obtain network configuration from the JOIN server. The user can set this variable to NO to prevent AutoNET from attempting to use the JOIN client when there is no JOIN server available, or when the user chooses not to use JOIN.

PROBENIS=YES or PROBENIS=NO

The */etc/init.d/autonet* script uses this variable to decide whether to search for an NIS server on the local network. If the NIS server fails to respond, AutoNET deems the network inoperable and reverts to its default configuration. However, this often occurs if the NIS server is on a different network that will only be accessible after the UltraBookIIi's network configuration is accepted. The user can set this variable to NO to prevent AutoNET from searching for an NIS server until setup is complete. At that point, AutoNET will resume.

Granting Access

AutoNET requires superuser privileges to perform its networking functions. Superuser privileges are provided by making AutoNET a Set-User-ID (SUID) program (mode 4755 — refer to the man page for *chmod*).

To prevent unauthorized users from modifying any of the AutoNET facilities, AutoNET checks the *access* and *deny* text files to verify that the login user (the name of the user when a login was performed) is permitted to perform operations as the "root" user.

- The *access* file lists the login name of users who are allowed to use privileged AutoNET facilities.

- The *deny* file lists the login name of users who may not use privileged AutoNET facilities.

If the user logs into the workstation as root, AutoNET does not check the *access* or *deny* file. Rather, the user is always granted access since, by definition, only the root user may modify the *access* and *deny* files.

If the user logs in using a name other than root, the *deny* file is checked to see if the user is specifically denied. If the user does not belong to the *deny* file, the *access* file is checked to see if the user has access.

> All users either have access or are denied. If a user is not specifically granted access, that user is denied access.

Both the *access* and *deny* files are located in the base VWA directory. This directory is either the fixed path */etc/VWA* or the path specified by the environment variable **VWABASE**.

Before processing the contents of these files, their ownership and permission are checked. If a file does not exist, or has the wrong permissions, AutoNET assumes that the files are corrupt and only allows the root user to perform

those operations requiring superuser privileges. The *access* and *deny* files should be owned by *root*, belong to group *bin*, and have a permission setting of 0644.

The following example shows how the *access* and *deny* files are used. Assume that an *access* file contains the following entry:

```
all
```

Also, assume that the *deny* file contains the following entry:

```
user1
```

In this example, all users but user1 are allowed to use AutoNET.

If the *access* file only contains:

```
user2
```

only user2 is allowed to use AutoNET — regardless of the contents of the *deny* file — since any user not granted specific access is denied.

If the *access* file contains:

```
root
```

and the *deny* file contains:

```
all
```

all users but root are denied access to AutoNET.

☞ The *access* and *deny* files distributed with AutoNET are listed in Appendix A.

3 AutoNET Database

This chapter describes the AutoNET database. Topics include:

- Understanding the AutoNET database — see the next section.
- Database hierarchy — see page 3–2.
- Network addressing — see page 3–4.
- Configuration directories — see page 3–4.
- Special configuration directories — see page 3–14.

Understanding the AutoNET Database

The AutoNET database is a hierarchical text-based database that AutoNET and other VWA facilities use to obtain and store information about networks known to the workstation. This database contains the *access*, and *deny* files described in Chapter 2, as well as two or more configuration directories.

A configuration directory contains specific information about a particular network known to the workstation. When you install AutoNET, the *default* and *orig* configuration directories are also installed. The *default* configuration directory contains the network configuration to be used in case AutoNET cannot match a network configuration.

A workstation that is disconnected from a network will automatically match the *default* configuration.

The *orig* configuration directory uses the configuration present during the AutoNET installation. This configuration can be used to either restore the workstation to the state it was in before you installed VWA, or as a basis for creating the first network configuration. This directory is automatically created as part of the VWA installation process.

☞ For more information on configuration directories, refer to page 3–4.

Database Hierarchy

The AutoNET database is located under a default database directory (usually */etc/VWA*, but may also be located elsewhere), and specified by the environment variable **VWABASE**. All of the network configuration directories reside under this base directory. This location is also where the *access* and *deny* files reside.

When an AutoNET function accesses this database, that function verifies that the path to the base directory is valid and contains the correct data. The environment variable is checked first, followed by the hard path. If the base directory is not valid, processing stops immediately, terminating with the error code **ENODIR**.

Below the base directory are the configuration directories that contain network information (described in the previous section and on page 3–4). Configuration directories have names that represent the network part of the IP address. These names are differentiated by the TCP/IP classing scheme. For example:

- Class A addresses use only the first octet of the IP address to specify the network, and range from 1.0.0.1 to 127.255.255.254.

- Class B addresses use the first two octets to specify the network, and range from 128.0.0.1 to 191.255.255.254.

- Class C addresses use the first three octets to specify the network, and range from 192.0.0.1 to 223.255.255.254.

If subnets exist, they are identified by the subnet number. See the discussion of **-m** in the previous chapter for more information.

☞ For more information about TCP/IP networking, refer to the "Solaris System Administration Manual."

The figure below shows the AutoNET hierarchy.

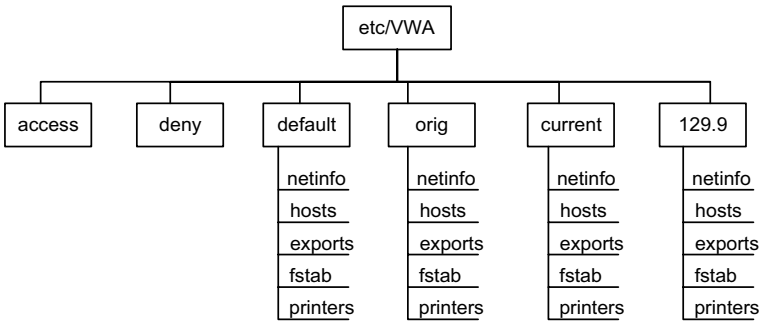

Figure 3-1. AutoNET Hierarchy

While AutoNET internally references IP and network addresses as unsigned long values, directory names are identified using string labels in "dot" notation. (Dot notation is used to specify the class ranges shown on this page and

on the previous page.) Trailing subnet and host numbers are removed from configuration directory names, leaving only the network address (described in the next section).

Network Addressing

The names of the configuration directories are created from the network address of a corresponding host's IP address. Since the Class A address ranges from 1.0.0.1 to 127.255.255.254, the network address ranges from 1 to 127. Therefore, a configuration directory for a Class A network has a name with a single number between "1" and "127", Class B networks use names from "128.0" to "191.255", and Class C networks use names between "192.0.0" and "223.255.255". In this way, the class of the network contained in the database can be easily identified.

Class D addresses are permitted, but their use is typically confined to multi-cast addressing.

Configuration Directories

Configuration directories contain the data that AutoNET uses to configure a workstation for a particular networking environment. This data consists of a set of files that hold the network-specific information used by the workstation on the selected network. The most important of these files is *netinfo*.

The *netinfo* file contains the IP address the workstation will use on the network. It also contains information used for configuring the workstation's environment on the network.

☞ For more information on the *netinfo* file, see below. To see the contents of a sample *netinfo* file, refer to page 3–15.

Other important files in the configuration directory are:

hosts
This file has the identical structure as the */etc/hosts* file. It can be used to replace the */etc/hosts* file, which may differ from network to network.

rfstab
This file contains a list of remote file systems to be mounted when the workstation is configured for this network.

exports
This file contains a list of local filesystems to be exported, allowing other NFS clients to access these filesystems. This file may also be referred to as *dfstab*.

netinfo File

The *netinfo* file is the primary selection file that AutoNET uses to obtain information needed to configure the workstation to the selected network. If this file does not exist in a configuration directory, AutoNET assumes there is no configuration for this network.

AutoNET opens the *netinfo* file to obtain the following information used to configure the workstation to the selected network:

- The hostname that the workstation will use on the network
- The IP address
- The subnet mask

- Any desired network naming service, such as NIS
- The NIS domain name
- The DNS domain name
- The DNS name server IP address(es)
- Filenames of other relevant system files

The *netinfo* file information is organized in pairs, indicating a resource and the value of the resource. The resource is set the same way that Bourne shell variables are set: RESOURCE=*value*, where RESOURCE is obtained from the list of known resources and *value* is the value that resource will take.

A resource token may also be referred to as a primitive and any tokenized value may also be referred to as a token.

If a line begins with "#", it is determined to be a comment and will not be parsed.

Primitive/token pairs are separated by a single equals ("=") sign, without any spaces. This is identical to the Bourne shell method of setting environment variables.

In-line comments are supported, but must be inserted after the primitive/token pair, since AutoNET stops processing the line once it reaches the comment character.

The only required primitives are **IPADDR** and **NETSERVICE**. The **IPADDR** primitive uniquely defines the network, and must be set to a valid IP address that the workstation will use on the network.

The IP address must be valid for the network. For example, an IP address of 12.0.10.5 will not work on a system with a network address of 28.

The **NETSERVICE** primitive specifies a name service to be used, if any, or none at all (**NETSERVICE=NONE**). There is no default value for this primitive. The user must include this primitive in the *netinfo* file for AutoNET to configure the workstation properly.

The following list describes currently supported primitives:

IPADDR
Sets the IP address on the workstation for the currently selected network. The value for this primitive is the IP address in the standard dot notation (for example,129.9.200.5). This address must be valid within the network configuration being selected. If the keyword **JOIN** is used in place of the IP address, AutoNET assumes that **JOIN** will obtain the IP address from a JOIN server. If no address is available, or if the address is not valid for this network, an **EINVAL** occurs and AutoNET terminates. The IP address can also be changed in the VWA Control Panel by using the Create a New Network process. This dialog displays the current IP address, which the user can highlight and type the new value over it

HOSTNAME
Allows the hostname to be changed on a selected network. If omitted, the hostname set at boot time is used. It is recommended that you use the workstation's usual hostname in this field, since it will allow the user to see the workstation for which this configuration is intended. If the VWA Control Panel is used to create or maintain this database, the VWA Control Panel will always obtain the workstation's hostname from the *hostname*(1) UNIX command and enter it into the *netinfo* file. The hostname can also be

changed in the VWA Control Panel by using the Create a New Network process. This dialog displays the current hostname, which the user can highlight and type the new name over it.

SUBNET
Allows the workstation's subnet mask to be changed. Although this primitive may be changed on any system, it will have no effect because subnetting is not currently supported by AutoNET. This primitive is useful for reference purposes, or if a network needs a subnet and the workstation will be on one of the subnets.

NETSERVICE
Type of name service. This primitive is required in the *netinfo* file for the network to be configured properly. It may be set to one of the following two tokens:

- **NONE** — do not use any naming service.
- **NIS** — use Sun's Network Information Services.

NIS was formerly known as Sun Yellow Pages (YP). The functionality of the two remains the same, only the name has changed.

To use any of these naming services, a domainname must be specified by setting the domainname before running AutoNET, or by using the **DOMAIN** primitive (described next). If the token is **NONE**, no name service will be started.

The token **NISPLUS** is not currently supported.

DOMAIN
Name of the domain for this network. The value of this token is a string consisting of the name of the domain. This primitive is required when using the **NETSERVICE** primitive. If

NETSERVICE is selected and the **DOMAIN** primitive is not used, no naming service will be started. If **NETSERVICE** is not used, this primitive is only informational, but will still set the domainname on the workstation.

DNSDOMAIN
Name of the DNS domain for this network. The value of this token is a string consisting of the DNS domain name. This primitive is required when using the **DNSSERVER** primitive. Both **DNSDOMAIN** and **DNSSERVER** must be defined in the *netinfo* file to automatically generate the *resolv.conf* file, add *dns* to the *hosts* line of the */etc/nsswitch.conf* file, and enable DNS on the system.

DNSSERVER
IP address(es) of the DNS server(s) available on this network. The value of this token is a string consisting of up to three IP addresses separated by commas and no spaces. This primitive is required when using the **DNSDOMAIN** primitive. Both **DNSSERVER** and **DNSDOMAIN** must be defined in the *netinfo* file to automatically generate the *resolv.conf* file, add *dns* to the *hosts* line of the */etc/nsswitch.conf* file, and enable DNS on the system.

HOSTFILE
Specifies the name of the file to be used as the *hosts* file for this network configuration. If this network uses a network naming service such as NIS, this file need only contain the current workstation name. For NIS, the host names of network hosts will be contained in the *hosts* map, and need not appear in the local *hosts* file. However, the addresses of frequently accessed hosts may be entered for reference purposes.

RFSTAB
Specifies the name of the file that contains the list of remotely accessible filesystems. This file lists only the remote filesystems available to be

mounted from remote hosts, and should not be confused with the obsolete System V Remote File Service (RFS), which is being discontinued as part of Solaris.

For Solaris 2.*x*, refer to the man page *vfstab*(4) for a description of the content in this file.

EXPORTS
Specifies the name of the file containing local filesystems that will be exported to other NFS clients.

For Solaris 2.*x*, this primitive causes the file specified by **EXPORTS** to replace the */etc/dfs/dfstab* file. The original file is saved in the current network configuration directory as *dfstab.old*. The token **NONE** is used to stop exporting any local file system by removing the file */etc/dfs/dfstab* and saving it as *dfstab.old* in the current network configuration directory.

See the man page of *share*(1m) for the format of this file.

☞ A sample *netinfo* file appears on page 3–15 and in Appendix A.

DEFPRINTER
This primitive is only available for Solaris 2.*x* systems. **DEFPRINTER** is used to specify a remote printer that is to be configured as the default printer for the workstation. The format of this primitive is:

```
DEFPRINTER=remote_hostname:printername:remotesystem_type
```

or

```
DEFPRINTER=NONE
```

remote_hostname is the name of the remote system where the remote printer is located.

printername is the name of the remote printer, and also the name to be used for the default printer on the workstation.

remotesystem_type is the type of remote system. Valid values are **s5** and **bsd**.

For example:

```
DEFPRINTER=bluejay:laserwriter:s5
```

NONE is used to tell AutoNET not to start the printer for the workstation; lpsched is not started. This token is used when the default printer is not configured for the current network (no remote printer exists) and a default printer was configured in the network to which the workstation had been previously connected.

DEFROUTE
This primitive specifies the hostname or IP address to be configured as the default route for the workstation.

For example:

```
DEFROUTE=bluejay
```

or

```
DEFROUTE=198.15.35.7
```

RESOLVER
This primitive is no longer used. See **DNSDOMAIN** and **DNSSSERVERS** on page 3–9.

Other primitives are listed in Appendix A, but are intended for future releases. They may be used in the *netinfo* file, but will not affect AutoNET operation.

hosts File

For host and address information, a configuration directory contains the *hosts* file that is used instead of the system's */etc*/*hosts* file. The *hosts* file has the same structure as the system's *hosts* file (refer to the *hosts* man page).

If the workstation is connected to a network that does not use a naming service, entries must be added for each host with which the user wants to communicate. This includes hosts used for remote logins, NFS filesystem mounts, remote printers, and other programs that require RPC access.

If the workstation is connected to a network that uses a naming service such as NIS, or if the workstation will be used in a standalone configuration, the *hosts* file need only contain entries for the workstation, the *localhost*, and the *loghost*. Typically, *localhost* and *loghost* correspond to the loopback IP address (127.0.0.1).

When AutoNET creates a configuration, these entries also resolve to the loopback IP address. However, it may be useful to add entries in the *hosts* file for hosts that are commonly accessed.

If you need to revise the contents of the *hosts* file, you can do so by using either a text editor such as *vi* or the VWA Control Panel.

When AutoNET starts and a network has been selected from the database, the file */etc*/*hosts* (and */etc*/*inet*/*hosts* if on a Solaris 2.*x* system) is relinked to the configuration directory's *hosts* file during the network-attachment phase. As a result, if you manually edit the */etc*/*hosts* file, your edits are also reflected in the configuration's *hosts* file.

VWA copies the original system */etc/hosts* file into the *orig* configuration directory when VWA is installed.

☞ For more information about the *hosts* file, refer to the *hosts* man page.

rfstab File

The *rfstab* file contains a list of filesystems on remote hosts that can be mounted (via NFS) on the local workstation.

Unlike the */etc/vfstab* file, the configuration *rfstab* file only contains information about remote filesystems, and does not contain local information. The filesystems contained in this list are mounted when AutoNET proceeds into the network-attachment phase.

Filesystems that are to be mounted on the workstation must be preceded by the name of the host on which the filesystem resides, separated by a colon. For example, the line:

```
foo:/usr/export/home /home/foo nfs hard,bg,intr 0 0
```

uses NFS protocols to mount the filesystem */usr/export/home* on host *foo* to the local mount point */home/foo*. The NFS options *bg* and *intr* are also used during the mount.

AutoNET uses this file in addition to the */etc/vfstab* file. See the man page *vfstab*(4) for the format of this file. For example, the line:

```
bluejay:/user1 - /mnt nfs - yes hard,bg,intr
```

uses NFS protocols to mount the filesystem */user1* on host *bluejay* to the local mount point */mnt*. The nfs options *bg* and *intr* are also used during the mount.

exports File

The *exports* file contains the list of local filesystems that will be made available for access by remote hosts on the network.

AutoNET uses this file instead of the file */etc/dfs/dfstab*, which is replaced by the file that **EXPORTS** specifies. The original file is saved in the current network configuration directory as *dfstab.old*. See the man page *share*(1m) for the format of this file. The following example shows a typical line in the *exports* file:

```
share -F nfs -o rw=foo,anon=0 -d "home dir on bluejay" /usr/export/home
```

This line exports the local filesystem */usr/export/home* with access granted read/write only to the NFS client *foo*, and anonymous access given to the *userid* of 0 (root).

☞ For more information, refer to the *exports* man page.

Special Configuration Directories

The AutoNET database contains three special configuration directories. Two of them, *default* and *orig*, are automatically created when you install AutoNET; the other, *current*, is created dynamically every time AutoNET attaches to a network configuration.

default Configuration

The *default* configuration directory contains the network information that AutoNET uses if it cannot find a network configuration that matches the network to which the workstation is connected. For example, if the workstation is disconnected from a network or is attached to a

new network, no network configuration exists and AutoNET relies on the *default* configuration directory to provide the necessary network information.

The following example shows a typical *netinfo* file for a default network:

```
HOSTNAME=foo
IPADDR=129.9.200.50
SUBNET=255.255.0.0
HOSTFILE=hosts
EXPORTS=exports
RFSTAB=rfstab
PRINTERS=printers
DOMAIN=NONE
NETSERVICE=NONE
```

In this example, the domainname is not set (**DOMAIN=NONE**) and no naming service is started (**NETSERVICE=NONE**). The **HOSTNAME** primitive should be set to the name the user typically uses for this workstation.

orig Configuration

The *orig* configuration directory contains the network information derived from the existing network when VWA is installed. During the installation:

- A *netinfo* file is created using the current network information obtained from the workstation (i.e., hostname and IP address).
- The */etc/hosts* file is copied to the configuration directory.
- NFS entries are extracted from the */etc/vfstab* file to create an *rfstab* file.

- The contents of */etc/defaultdomain* are used to initialize the **DOMAIN** primitive. If DOMAIN exists, the **NETSERVICE** primitive is then set. The contents of the *netinfo* file may vary, depending on the state of the workstation when VWA was installed.

current Configuration

The *current* configuration directory is actually a symbolic link to the last network configuration directory to which the workstation was attached. The user can use this directory to ascertain which configuration was last used by the workstation.

A File Formats

This appendix contains examples of the AutoNET file formats and descriptions of the values used in these files. Topics include:

- *netinfo* file contents — see the next section.
- *netinfo* primitives —see page A–2.
- *netinfo* tokens — see page A–4.
- *access* and *deny* files — see page A–5.

netinfo File

The following example shows a typical *netinfo* file, including primitives and token values:

```
# netinfo file for the host 'foo' on the bar network.
# JOIN is not being used, and this is a known host.  NIS is the
# network services which is available.

HOSTNAME=foo
IPADDR=129.9.200.50
SUBNET=255.255.0.0
HOSTFILE=hosts
EXPORTS=exports
RFSTAB=rfstab
DOMAIN=bar.com
NETSERVICE=NIS
DEFPRINTER=gracie
```

There are no spaces between the primitives (which are all upper case), the equal sign ("="), and the token value. The token NIS must also be uppercase.

netinfo Primitives

The following list is the complete set of *netinfo* primitives. Any primitive not included in this list is not supported, however, its use will not impact AutoNET or VWA operation.

HOSTNAME
Identifies the hostname to be used for this workstation when AutoNET starts.

IPADDR
Identifies the IP address that the workstation will use. This value must be a 4-octet string in "dot" notation.

SUBNET
Identifies the subnet mask that AutoNET is to use when initializing the interface. Subnets are not currently supported in the AutoNET database; however, this mask will be set on the interface.

NETSERVICE
Identifies the naming service to be used for this network attachment. Valid responses are **NONE** and **NIS**.

DOMAIN
Identifies the domain name of this network. The token is a string value, and is used in the *setdomainname*(2) system call.

DNSDOMAIN
Identifies the DNS domain name of this network. The token is a string value used in conjunction with **DNSSERVERS** to generate the appropriate *resolv.conf* file for this network.

DNSSERVERS
Identifies up to three DNS server(s) available for this network. The token is a string value consisting of up to three IP addresses separated by commas but no spaces, and is used in conjunction with **DNSDOMAIN** to generate the appropriate *resolv.conf* file for this network.

HOSTFILE
Specifies the name of the file to be used as a *hosts* file for the network. The default value for this primitive is *hosts*.

EXPORTS
Specifies the name of the file containing local filesystems that will be exported to other NFS clients. See the man pages for *share*(1m) for the format of this file.

RFSTAB
Specifies the name of the file containing remote NFS filesystems that can be mounted on the workstation. See the man pages for *vfstab*(4) for the format of this file.

PRINTERS
Specifies the name of the file containing information about printers (local or remote) that are available to the workstation. (This primitive is not currently supported.)

DEFPRINTER
Specifies the information for a remote printer to be configured as the default printer for the workstation. The format of this primitive is:

```
DEFPRINTER=remote_hostname:printer_name:remote_system_type
```

where:

remote_hostname is the name of the remote host.

printer_name is the name of the remote printer and the name used for the default printer on the workstation.

remote_system_type is the type of remote system. Valid values are **S5** or **bsd**.

(This primitive is only supported on Solaris 2.*x*.)

DEFROUTE
Specifies the hostname or IP address to be configured as the *default* router of the workstation.

netinfo Tokens

The following list is the complete set of predefined tokens. You can use any of these tokens in the primitive/token pairs. However, the use of the token is context-sensitive and may have different meanings for different primitives.

NONE
Indicates that there is no value for this primitive. For numeric primitives, this resolves to 0. For string primitives, this resolves to an empty string.

JOIN
Indicates an IP address is to be obtained by JOIN. It has value only for the **IPADDR** primitive.

DEFAULT
Tells AutoNET to use a default value, typically obtained from a system call. For example, the hostname will be found by executing the *hostname*(1) command, rather than being found in the database.

LOGNAME
Resolves to the name of the login user. This token is not currently used in AutoNET.

NIS
Indicates that the Sun Network Information Service (NIS) name service is to be used. This token has value only for the **NETSERVICE** primitive.

NISPLUS
Indicates that the Sun Network Information Service Plus (NIS+) name service is to be used. This token is not currently supported by AutoNET.

access/*deny* Files

The *deny* file distributed with the VWA installation is an empty file. The *access* file contains:

```
all
```

Notes