



Netra Proxy Cache Array User's Manual

A Sun Microsystems, Inc.
Business
901 San Antonio Road
Palo Alto, , CA 94303-4900

Part No: 805-3512-10
Revision A, March 1998

USA 650 960-1300 fax 650 969-9131



Netra Proxy Cache Array User's Manual

Part No: 805-3512-10
Revision A, March 1998

Copyright 1998 Sun Microsystems, Inc. 901 San Antonio Road, Palo Alto, California 94303-4900 U.S.A. All rights reserved.

All rights reserved. This product or document is protected by copyright and distributed under licenses restricting its use, copying, distribution, and decompilation. No part of this product or document may be reproduced in any form by any means without prior written authorization of Sun and its licensors, if any.

Portions of this product may be derived from the UNIX[®] system, licensed from Novell, Inc., and from the Berkeley 4.3 BSD system, licensed from the University of California. UNIX is a registered trademark in the United States and in other countries and is exclusively licensed by X/Open Company Ltd. Third-party software, including font technology in this product, is protected by copyright and licensed from Sun's suppliers. RESTRICTED RIGHTS: Use, duplication, or disclosure by the U.S. Government is subject to restrictions of FAR 52.227-14(g)(2)(6/87) and FAR 52.227-19(6/87), or DFAR 252.227-7015(b)(6/95) and DFAR 227.7202-3(a).

Sun, Sun Microsystems, the Sun logo, and Solaris are trademarks or registered trademarks of Sun Microsystems, Inc. in the United States and in other countries. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. in the United States and in other countries. Products bearing SPARC trademarks are based upon an architecture developed by Sun Microsystems, Inc.

The OPEN LOOK[®] and Sun[™] Graphical User Interfaces were developed by Sun Microsystems, Inc. for its users and licensees. Sun acknowledges the pioneering efforts of Xerox Corporation in researching and developing the concept of visual or graphical user interfaces for the computer industry. Sun holds a nonexclusive license from Xerox to the Xerox Graphical User Interface, which license also covers Sun's licensees who implement OPEN LOOK GUIs and otherwise comply with Sun's written license agreements.

THIS PUBLICATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT.

Copyright 1998 Sun Microsystems, Inc., 901 San Antonio Road, Palo Alto, Californie 94303-4900 U.S.A. Tous droits réservés.

Ce produit ou document est protégé par un copyright et distribué avec des licences qui en restreignent l'utilisation, la copie et la décompilation. Aucune partie de ce produit ou de sa documentation associée ne peut être reproduite sous aucune forme, par quelque moyen que ce soit, sans l'autorisation préalable et écrite de Sun et de ses bailleurs de licence, s'il y en a.

Des parties de ce produit pourront être dérivées du système UNIX[®] licencié par Novell, Inc. et du système Berkeley 4.3 BSD licencié par l'Université de Californie. UNIX est une marque enregistrée aux Etats-Unis et dans d'autres pays, et licenciée exclusivement par X/Open Company Ltd. Le logiciel détenu par des tiers, et qui comprend la technologie relative aux polices de caractères, est protégé par un copyright et licencié par des fournisseurs de Sun.

Sun, Sun Microsystems, le logo Sun, et Solaris sont des marques déposées ou enregistrées de Sun Microsystems, Inc. aux Etats-Unis et dans d'autres pays. Toutes les marques SPARC, utilisées sous licence, sont des marques déposées ou enregistrées de SPARC International, Inc. aux Etats-Unis et dans d'autres pays. Les produits portant les marques SPARC sont basés sur une architecture développée par Sun Microsystems, Inc.

Les utilisateurs d'interfaces graphiques OPEN LOOK[®] et Sun[™] ont été développés de Sun Microsystems, Inc. pour ses utilisateurs et licenciés. Sun reconnaît les efforts de pionniers de Xerox Corporation pour la recherche et le développement du concept des interfaces d'utilisation visuelle ou graphique pour l'industrie de l'informatique. Sun détient une licence non exclusive de Xerox sur l'interface d'utilisation graphique, cette licence couvrant aussi les licenciés de Sun qui mettent en place les utilisateurs d'interfaces graphiques OPEN LOOK et qui en outre se conforment aux licences écrites de Sun.

CETTE PUBLICATION EST FOURNIE "EN L'ETAT" SANS GARANTIE D'AUCUNE SORTE, NI EXPRESSE NI IMPLICITE, Y COMPRIS, ET SANS QUE CETTE LISTE NE SOIT LIMITATIVE, DES GARANTIES CONCERNANT LA VALEUR MARCHANDE, L'APTITUDE DES PRODUITS A REPENDRE A UNE UTILISATION PARTICULIERE OU LE FAIT QU'ILS NE SOIENT PAS CONTREFAISANTS DE PRODUITS DE TIERS.



Contents

	Preface	xii
1.	Overview	1
	Netra Proxy Cache Server Features	1
	Features	2
	Hierarchies	3
	Netra Proxy Cache Array Features	6
	Array Features	6
	What Array Features Mean to You	7
	Technical Details	8
	The Role of DNS	10
	Monitoring and Managing	11
2.	Understanding the Netra Administration GUI	13
	Netra Administration Modules	13
	Types of Pages	14
	Types of Icons	19
	Accessing the Netra Administration GUI	20
	▼ To Access the Netra Administration GUI	20
3.	Loading the Proxy Cache Administration Page	23
	Loading the Proxy Cache Administration Page	24

- ▼ To Load the Proxy Cache Administration Page 24
- Starting the Proxy Cache Administration Server 26
- ▼ To Start the Proxy Cache Administration Server 26
- 4. Advanced Proxy Cache Configuration 27**
 - Viewing and Modifying Advanced Proxy Cache Configuration Properties 27
 - ▼ To View or Modify Advanced Proxy Cache Configuration Properties 28
 - Primary Configuration 29
 - ▼ To View or Modify Primary Configuration Properties 29
 - Proxy Cascade 32
 - ▼ To View or Modify Proxy Cascade Properties 32
 - Cache Policy 38
 - ▼ To View or Modify Cache Policy Properties 38
 - HTTP Policy 39
 - Gopher Policy 40
 - FTP Policy 41
 - URL Policy 42
 - Other 43
 - Access Control 43
 - ▼ To View or Modify Access Control Properties 43
 - Storage Management 48
 - ▼ To View or Modify Storage Management Properties 48
 - Timeouts 50
 - ▼ To View or Modify Timeouts 50
 - Log File Options 52
 - ▼ To View or Modify Log File Options 52
 - Web Server Accelerator Options 53
 - ▼ To View or Modify Web Server Accelerator Options 53
 - External Program Options 55

- ▼ To View or Modify External Program Options 55
- 5. Advanced Array Configuration 57**
 - Viewing and Modifying Advanced Array Configuration Properties 57
 - ▼ To View or Modify Advanced Array Configuration Properties 57
 - Networks 59
 - ▼ To View or Modify Advanced Array Configuration Properties (Networks Category) 59
 - Proxy Cache 60
 - ▼ To View or Modify Advanced Array Configuration Properties (Proxy Cache Category) 60
 - DNS 61
 - ▼ To View or Modify Advanced Array Configuration Properties (DNS Category) 61
- 6. Advanced Array Member Configuration 65**
 - Advanced Array Member Configuration Page 65
 - ▼ To View or Modify Advanced Array Member Configuration Properties 66
- 7. SNMP Configuration 69**
 - Viewing and Modifying SNMP Properties 69
 - ▼ To Configure SNMP Properties 69
- 8. Local Area Network Administration 71**
 - Local Area Network Requirements 71
 - LAN Procedures 72
 - Adding a Network Interface 72
 - ▼ To Add a Network Interface 72
 - Modify a Network Interface 73
 - ▼ To Modify a Network Interface 73
 - Delete a Network Interface 73
 - ▼ To Delete a Network Interface 73
- 9. Name Service Administration 75**

Name Services Used by the Netra Proxy Cache Server	76
Domain Name Service Background	76
Options for Resolving Names	77
Using DNS to Resolve Names	77
Local Name Service	78
Network Information Service	78
Name Service Procedures	78
DNS Administration	78
▼ To Configure the Netra Server to Use DNS	78
▼ To Modify DNS Resolver Configuration	79
▼ To Delete A DNS Configuration	79
Local Name Server Administration	80
▼ To Configure the Netra Server to Use a Local Name Server	80
NIS Administration	80
▼ To Configure the Netra Server to Use NIS to Resolve Names	80
▼ To Modify or Unconfigure an NIS Domain Name	81
10. Routing Administration	83
Netra System Router Alternatives	83
Dynamic Router	84
Static Router	84
Not a Router	84
Routing Procedures	84
Static Router	84
▼ To Configure the Netra System as a Static Router	84
▼ To Modify a Static Router	85
Dynamic Router	86
▼ To Configure the Netra System as a Dynamic Router	86
▼ To Modify a Dynamic Router	87

	Not a Router	87
	▼ To Configure the Netra System as Not a Router	87
11.	Administration Web Server	89
	Setting the Administration Password	89
	▼ To Set the Administration Password	89
	Controlling Host Access	90
	▼ To Control Host Access	90
12.	Root Password Administration	93
	Superuser Account	93
	Setting the Root Password	93
	▼ To Set the Root Password	93
13.	Netra System Administration	95
	Audio	95
	▼ To Adjust the Audio Volume	95
	Host Name	96
	▼ To Change the Host Name	96
	Solaris Log Files	97
	▼ To View or Clear Log Files	97
	Restart and Shutdown	98
	▼ To Restart or Shut Down the System	98
	Save and Restore Configuration	99
	Save and Restore Options	99
	Save and Restore Procedures	100
	▼ To Eject a Diskette	100
	▼ To Save the System Configuration	100
	▼ To Restore the System Configuration	101
	System Administrator Alias	102
	▼ To Set Up an Administrator Alias	102

System Defaults	102
▼ To Set System Defaults	102
14. Performing Administrative Tasks for the Proxy Cache Service and Array	105
Modifying Your Configuration	105
Backing Up Your Configuration	106
Restoring Your Configuration	106
▼ To Restore a Proxy Cache Configuration	106
Adding and Removing Hosts	107
▼ To Add a Host	107
▼ To Remove a Host	107
Moving an Array	108
▼ To Move an Array	108
15. Monitoring a Netra Proxy Cache Array and Proxy Cache Service	109
Proxy Cache and Array Monitoring Pages	109
▼ To Invoke the Array Status Monitor or Proxy Cache Monitoring	109
Array Status	110
Host Status	114
▼ To Load the Host Status Page	114
Proxy Cache Array Monitoring	117
▼ To Load the Proxy Cache Array Monitoring Page	117
Proxy Cache Monitoring for Host	119
▼ To Load the Proxy Cache Monitoring for Host Page	119
16. Netra Proxy Cache Array MIBs and Traps	123
Netra Proxy Cache Software MIB Definitions	124
Array MIB Definitions	126
Traps	129
17. Monitoring Proxy Cache Log Files	131

	Loading the Proxy Cache Log Administration Page	131
	▼ To Load the Proxy Cache Log Administration Page	131
	Managing Proxy Cache Service Log Files	133
18.	Adding a SCSI Disk	137
	Adding a SCSI Disk	137
	▼ To Add a SCSI Disk	137
19.	Troubleshooting and Technical Information	143
	Installation of Proxy Cache and Array Configuration Fails	143
	▼ To View Installation Error Logs	144
	Processes Associated with Netra Proxy Cache	145
	Netra Proxy Cache Man Pages	147
	Running the Netra Proxy Cache Array in an NIS-only Environment	147
	Load Distribution in an NIS-only Environment	147
	Resolving the Name of the Proxy Cache Service	148
	Proxy Cache and Array Packages	148
	Default Disk Partitions	150
	Multiple Arrays on the Same Subnet	151
	System Administrator and Proxy Webmaster Aliases	152
	Parent, Siblings, and the ICP	152
	Control Interface Down	153
	Proxy Cache Connect Timeout and Parent Failover	153
	Rules for Pattern Matching for TTL Selection Property	154
	Test and Load Objects	155
	Test Objects	156
	Load Objects	158
	Relationships Among Objects	159
A.	System Recovery	163
	Solaris and Netra Proxy Cache Restoration	163

- ▼ To Restore the Solaris Operating Environment and Netra Proxy Cache Packages 164
- ▼ To Restore the Netra Proxy Cache Configuration Properties 165
- B. Advanced Proxy Cache Configuration Examples 167**
 - Domains Inside Firewall and Local Domains Inside the Firewall 167
 - Limiting Access to the Server 169
 - Limiting by Source Address 169
 - Limiting by Time 170
 - Limiting by Domain in Request 170
 - Redirecting Requests 171
- C. Security Issues 173**
 - Update Daemon 173
 - Glossary 175**
 - Index 181**

Preface

The *Netra Proxy Cache Array User's Manual* tells you how to perform system administration tasks for a Netra Proxy Cache Array. Most of the manual describes the use of the Netra administration pages to perform these tasks.

This document is written for an experienced system administrator with a knowledge of the Solaris[™] operating environment and network administration.

How This Book Is Organized

Chapter 1," introduces you to the Netra Proxy Cache product, with examples of its use.

Chapter 2," explains how to navigate the Netra Administration web pages.

Chapter 3," explains how to load the page that gives you access to the proxy cache and array functions of the Netra Proxy Cache Server or Array.

Chapter 4," describes the advanced proxy cache configuration properties accessible through the Proxy Cache Administration page.

Chapter 5," describes the advanced array configuration properties accessible through the Proxy Cache Administration page.

Chapter 6," describes the advanced array member configuration page, which enables you to modify an array member or remove a member from the array.

Chapter 7," explains how to configure properties related to the Netra Proxy Cache Server and Array SNMP agents.

Chapter 8," explains how to use the web pages that enable you to configure Local Area Network (LAN) interfaces on the server.

Chapter 9," explains how to configure a Netra Proxy Cache Server as a name service client.

Chapter 10," explains how to configure a Netra Proxy Cache Server as a router.

Chapter 11," explains how to set the Netra administration password and how to control host access to the Netra Proxy Cache Server.

Chapter 12," explains how to set the root password on the Netra Proxy Cache Server.

Chapter 13," explains how to perform a variety of system administration task on the Netra Proxy Cache Server, such as rebooting and monitoring Solaris log files.

Chapter 14," presents instructions for proxy cache service- and array-related tasks not covered in the *Netra Proxy Cache Array Configuration Guide*.

Chapter 15," tells you how to use the monitoring web pages accessible through the Proxy Cache Administration page.

Chapter 16," describes the Management Information Bases (MIBs) shipped with the product.

Chapter 17," describes the categories of log files accessible through the Proxy Cache Administration page.

Chapter 18," presents a procedure for adding one or more SCSI disks to your Netra Proxy Cache Server.

Chapter 19," offers troubleshooting steps and provides technical details about the Netra Proxy Cache Server and Array.

Appendix A," explains how to reinstall your Solaris operating environment and Netra Proxy Cache software, should you ever experience a catastrophic disk failure.

Appendix B," presents examples of the use of advanced proxy cache properties.

Appendix C," presents security issues related to the propagation of configuration information in a Netra Proxy Cache Array.

The Glossary defines terms related to the proxy cache service and array software.

Using UNIX Commands

This document does not contain information on basic UNIX[®] commands and procedures such as shutting down the system, booting the system, and configuring devices.

See the *Solaris 2.x Handbook for SMCC Peripherals* (included with the Netra Proxy Cache product) for instructions on basic UNIX administration commands.

Typographic Conventions

TABLE P-1 Typographic Conventions

Typeface or Symbol	Meaning	Examples
AaBbCc123	The names of commands, files, and directories; on-screen computer output.	Edit your <code>.login</code> file. Use <code>ls -a</code> to list all files. <code>% You have mail.</code>
AaBbCc123	What you type, when contrasted with on-screen computer output.	<code>% su</code> Password:
AaBbCc123	Book titles, new words or terms, words to be emphasized. Command-line variable; replace with a real name or value.	Read Chapter 6 in the <i>User's Guide</i> . These are called <i>class</i> options. You <i>must</i> be <code>root</code> to do this. To delete a file, type <code>rm filename</code> .

Shell Prompts

TABLE P-2 Shell Prompts

Shell	Prompt
C shell	<code>machine_name%</code>
C shell superuser	<code>machine_name#</code>
Bourne shell and Korn shell	<code>\$</code>
Bourne shell and Korn shell superuser	<code>#</code>

Related Books

This manual, the *Netra Proxy Cache Array User's Manual*, is a companion to the *Netra Proxy Cache Array Configuration Guide* and to the hardware documentation that accompanies your Netra Proxy Cache Server.

Ordering Sun Documents

The SunDocsSM program provides more than 250 manuals from Sun Microsystems, Inc. If you live in the United States, Canada, Europe, or Japan, you can purchase documentation sets or individual manuals using this program.

For a list of documents and how to order them, see the catalog section of the SunExpress™ Internet site at <http://www.sun.com/sunexpress>.

Accessing Sun Documentation Online

The `docs.sun.com` Web site enables you to access Sun technical documentation online. You can browse the `docs.sun.com` archive or search for a specific book title or subject. The URL is <http://docs.sun.com/>. The current Netra Proxy Cache documentation is not available on this web site.

Sun Welcomes Your Comments

We are interested in improving our documentation and welcome your comments and suggestions. You can email your comments to us at the address shown below. Please include the part number of your document in the subject line of your email or fax message.

- Email: smcc-docs@sun.com

Overview

- “Netra Proxy Cache Server Features” on page 1
- “Netra Proxy Cache Array Features” on page 6
- “Monitoring and Managing” on page 11

The Netra Proxy Cache Server is a full-featured proxy cache server that is available with the bonus of array software. The array software enables multiple Netra Proxy Cache Servers to provide a single proxy cache service. We refer to such a group of Netra Proxy Cache Servers as a *Netra Proxy Cache Array*.

The array software extends the reliability and availability of the proxy cache service. It also makes it easy for you to add and remove servers to and from a Netra Proxy Cache Array.

A significant benefit of the array software is that—in addition to the reliability, availability, and scalability it gives you—members of your Netra Proxy Cache array become “instant proxy cache siblings”: Under array control, the Netra Proxy Cache Servers share cached data, effectively extending the cache over the entire set of machines. This feature is discussed in “Hierarchies” on page 3.

You have the option of configuring a Netra Proxy Cache Server as a single machine, rather than as part of an array.

Netra Proxy Cache Server Features

The Netra Proxy Cache hardware and software implement a proxy cache server with a set of comprehensive features. The Netra Proxy Cache product is shipped with array software, which, where there are multiple Netra Proxy Cache Servers, extends the reliability and availability of the proxy cache service.

Features

Netra Proxy Cache Servers support the following features:

- High-performance CPU with memory and disk amounts chosen for optimum performance in proxying and caching. (Details of the hardware configuration are spelled out in the hardware documentation that accompanies the product.)
- Compatible with the Squid, Harvest, and CERN proxy standards.
- Supports the Inter Cache Protocol (ICP).
- Caches HTTP 1.0, FTP, and Gopher objects. This list includes, among other types, GIF, JPEG, and .exe.
- Supports Secure Sockets Layer (SSL) tunneling.
- Supports persistent HTTP connections, commonly referred to as “keep-alives.”
- The cache persists across reboots.
- Configurable cache-object expiration times. The Netra Proxy Cache software ages and deletes a cache object based on attributes specified in its uniform resource locator (URL). The product offers a flexible scheme for cache-object expiration.
- Similar to the preceding point, the software offers a flexible scheme for setting a cache object to non-cacheable, again, based on its URL.
- Supports dynamic parent failover: If Netra Proxy Cache Server has multiple parents and is connected to a parent that fails, the server fails over to the next available parent. Furthermore, the Netra Proxy Cache Server detects when the original parent comes back online.
- Supports conditional retrievals; for example, can retrieve an object if it has been modified in the last day. You can modify the time threshold to suit your needs.
- Caching software imposes no limit on the amount of data cached.
- Enables you to build hierarchies of (or collections of peer) proxy servers. See “Hierarchies” on page 3.
- Offers a number of auditing features, including hit statistics, detailed user access logs, bandwidth usage statistics, and a number of other proxy- and cache-related statistics.
- Ships with an SNMP MIB and agent, so that you can manage a Netra Proxy Cache Server from an SNMP-conformant management platform, such as Solstice[™] Domain Manager.
- Offers a variety of filtering features, including blocking and redirecting of HTTP requests based on URL, hostname, or user.
- Shipped with a set of web-based tools for product configuration and monitoring.

Hierarchies

An important feature of Netra Proxy Cache Server is the ability it gives you to create hierarchies of proxy cache servers or, a related feature, create collections of sibling servers. You can create hierarchies simply by pointing proxy cache servers to succeeding proxy cache servers as you proceed toward a firewall. Alternatively, you can take advantage of Netra Proxy Cache software's support for the Inter Cache Protocol (ICP) to build sibling and parent relationships among proxy cache servers.

When you configure a set of Netra Proxy Cache Servers as an array, automatically, those servers become ICP siblings, so that the cache is extended over all of the machines in the the Netra Proxy Cache Array.

Figure 1-1 illustrates a simple hierarchy of proxy cache servers.

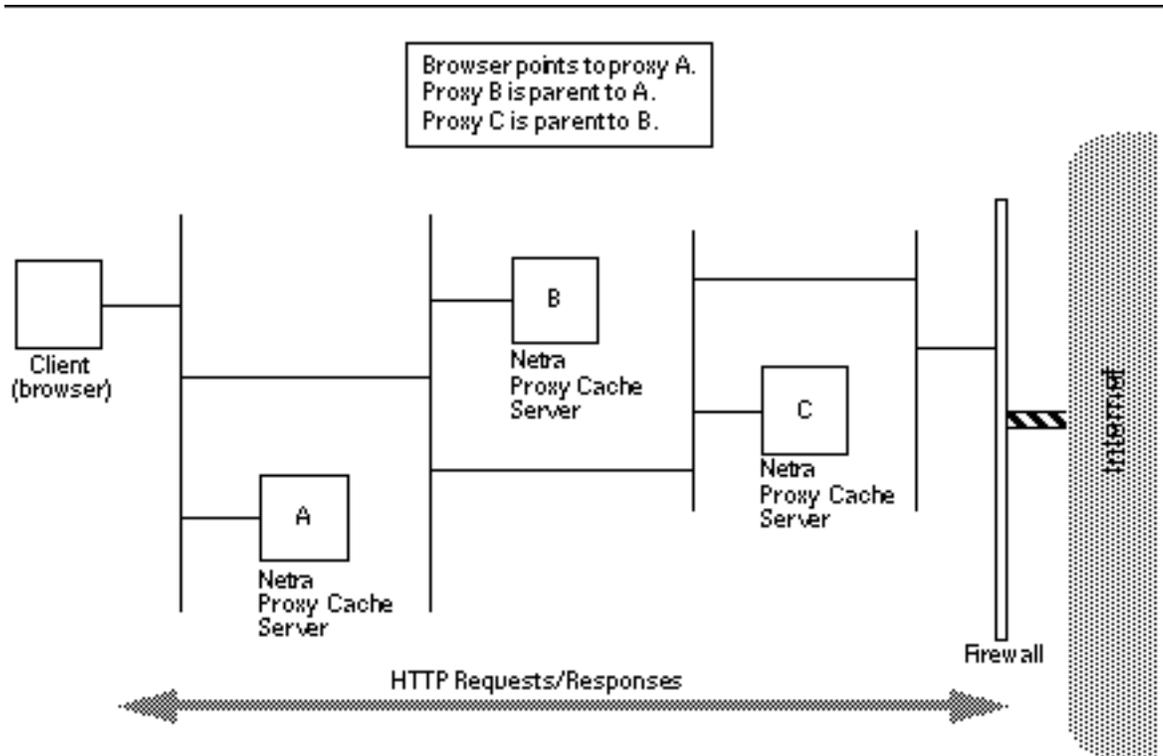


Figure 1-1 Simple Hierarchy

Referring to Figure 1-1, assume the client browser requests a web object that originated somewhere in the Internet and is, at the moment, not in Netra Proxy Cache Server A's cache. The following sequence ensues:

1. Machine A checks with its parent, machine B.

2. Likewise, B does not have the object in its cache and checks its parent, machine C. If C does not have the object, it goes out through the firewall to the web server to obtain it.
3. Machine C returns the object—obtained from a remote web server or its local cache—to machine B.
4. Machine B returns the object to machine A.
5. Machine A then returns the object to the requesting client.

If the object is cacheable, each proxy stores a copy upon receipt. Note that communication between parent proxies is over TCP connections.

Netra Proxy Cache software also supports a variation of the preceding scenario. This variation is illustrated in Figure 1-2.

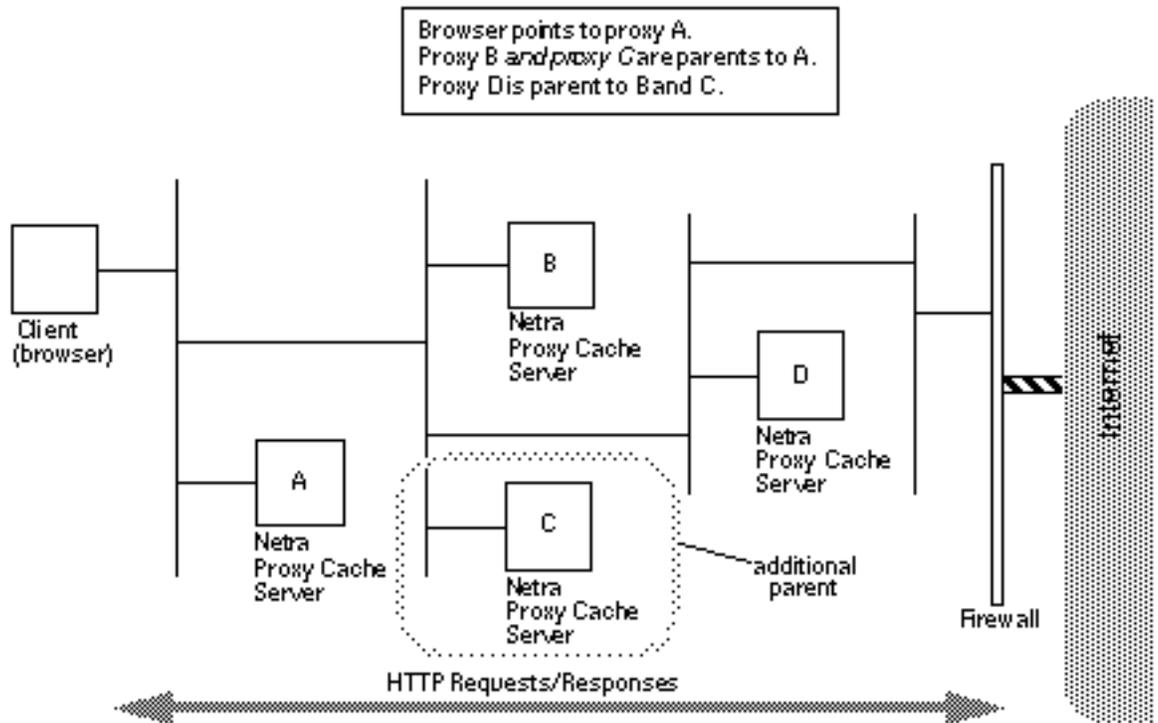


Figure 1-2 Multiple Parent Proxies

Referring to Figure 1-2, if a client requests an object of its proxy server, machine A, that is not in A's cache, machine A relays the request to its two parents, machines B and C. If one of the parents has the object, it returns the object to A. If neither has

the object, machine A forwards the request to the parent that responds faster, assuming that machine to be less loaded and/or have a better network connection.

If you configure multiple parents, the Netra Proxy Cache software allows you to give greater weight to one or the other, or set up one as the default. When no parent (of multiple parents) has a requested object, the “child” proxy always forwards the request to the default parent.

In addition to supporting hierarchies of parent proxies, the Netra Proxy Cache Server supports sibling proxies. The sibling scenario is illustrated in Figure 1-3.

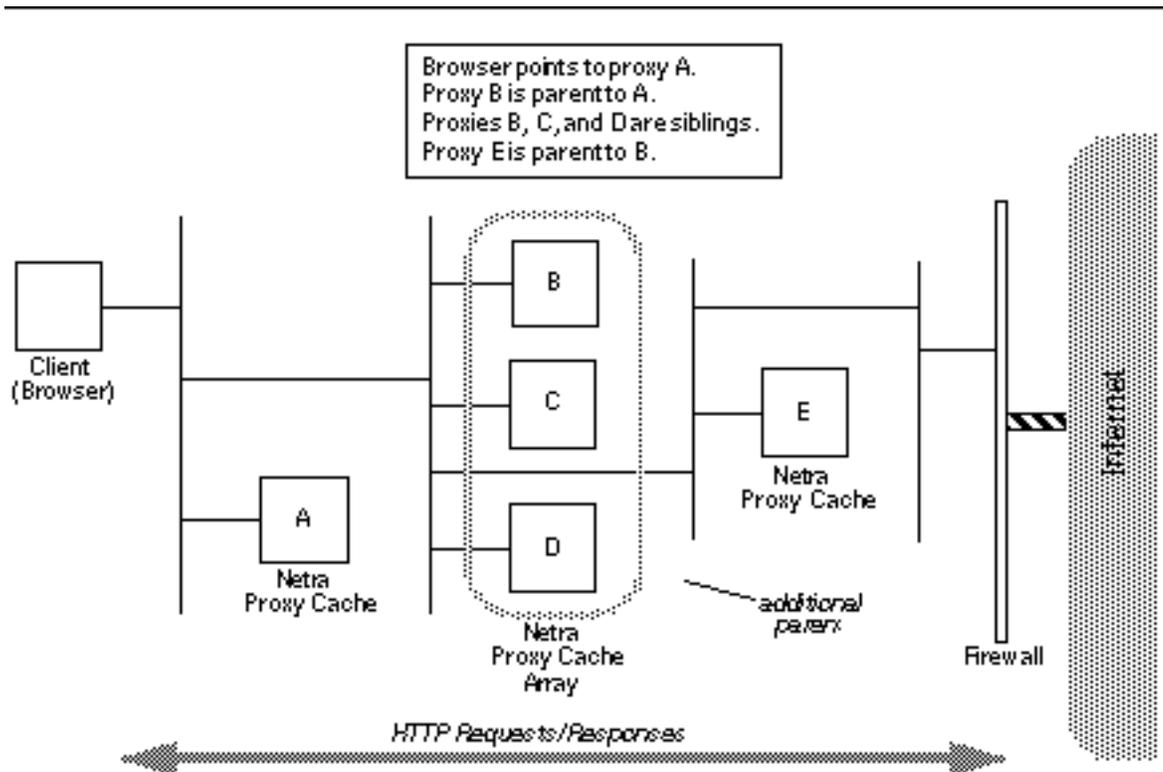


Figure 1-3 Sibling Proxies

Referring to Figure 1-3, assume a client browser requests an object that is, at the moment, not in Netra Proxy Cache Server A’s cache. The following sequence ensues:

1. Machine A checks with its parent, machine B. Machine A has no awareness of machines C and D.
2. Likewise, B does not have the object in its cache. Using ICP over UDP, machine B checks its siblings, machines C and D. If either of those machines has the object, it returns the object to machine B, which returns it to machine A.

If none of B, C, and D have the object, the request is forwarded to B's parent, machine E.

It is important to note that queries among siblings are over the relatively lightweight ICP exchanges, while communication among parents and transfer of web objects occurs over the relatively more resource-intensive TCP connections.

As indicated in Figure 1-3, the siblings (B, C, and D) form a Netra Proxy Cache Array. The establishment of sibling relationships occur automatically when you configure the array.

Note that you can add one or more Netra Proxy Cache Servers to any single proxy server shown in Figure 1-1, Figure 1-2, or Figure 1-3 to form a Netra Proxy Cache Array. For a proxy server that relies on a parent, pointing to single machine is no different from pointing to a Netra Proxy Cache Array. That is, the child proxy requires no additional configuration and needs no awareness that the proxy service is provided by multiple hosts.

Netra Proxy Cache Array Features

A Netra Proxy Cache Array consists of multiple hosts that, together, provide a single instance of a proxy cache service.

Array Features

The array software offers the following features:

- reliability
- scalability
- load balancing

How these features are provided is described in the following subsections.

Reliability

The array software provides reliability by:

1. monitoring individual host hardware and software, and upon failure of some component...
2. moving the service address of a service instance on a host to a different host.

Existing clients of a moved service address continue to be served. The DNS within the Netra Proxy Cache array removes the moved service address from proxy cache service provided by the array, so that new clients are never connected to it.

Scalability

The array software provides scalability by implementing a protocol that responds dynamically to changes in array membership. At a frequent and regular interval, the array daemon multicasts information messages over the control network. These information messages are, at once, a heartbeat and a means of conveying “health” information about each host.

When a host is removed—for example, if a machine is receiving a software upgrade—within milliseconds, the array detects the machine’s absence and removes the machine’s service address(es) from availability. Similarly, if a machine is added to the array, nearly immediately, the array detects the new host and makes its service address available for incoming client requests.

Load Balancing

The array software provides load balancing through a modified DNS round robin. The Netra Proxy Cache array forms its own DNS zone that consists of the service addresses associated with the proxy cache service. This zone is identified by its own domain name.

When a host fails or becomes overloaded, the array software removes the host from the array’s DNS round robin, so that the down host receives no new client requests. This process is discussed in greater detail in “The Role of DNS” on page 10.

What Array Features Mean to You

Some of the practical benefits of a Netra Proxy Cache Array are as follows:

- With no software configuration, you can halt a machine and remove it from the array, either permanently or temporarily, without interrupting service to your user community.
- With minimal software configuration, or by copying an existing configuration, you can add a machine to an array. Again, this occurs without any disruption of service.
- The collection of proxy cache service instances automatically communicate via the Inter Cache Protocol, which means that the cache of web objects is extended over all the machines in the array.
- User response is enhanced because of high availability and the extended cache provided by the array.

Technical Details

The array software consists of a daemon and software objects that run on each of the machines in a Netra Proxy Cache array. On a periodic basis, the array software monitors the health (reachability, load, presence of server processes) of the hardware resources and proxy cache service on each machine. The array software multicasts these individual-host snapshots over an isolated network, called a *control network*, to which each member of the Netra Proxy Cache array is connected. Netra Proxy Cache Servers are equipped with a second network interface to enable connection to a control network. This second interface is referred to as the *control interface*.

Note - The Internet Assigned Numbers Authority (IANA) has designated a multicast address (224.0.1.62) for use with Netra Proxy Cache Array software.

The result of the multicasts over the control network is that all hosts in the array are kept up to date on the health of each host. Responding to these regular updates, array software works to provide users with a continuous proxy cache service, in the face of hardware and software failures and in spite of varying loads on individual servers' resources.

The resource managed by array software is a *service address*. This is a logical IP address that is associated with the proxy cache service on a given machine. If a machine fails or becomes overloaded, array software can remove the availability of the service address or move the address to a different machine in the array.

A service address is associated with the network interface over which proxy cache server-client interactions occur. In terms of a Netra Proxy Cache array, this is the *service interface* and the network to which the interface is connected is the *service network*. The service network is, most often, the local area network (LAN) over which clients access a variety of network services.

The concepts of control and service networks are illustrated in Figure 1-4.

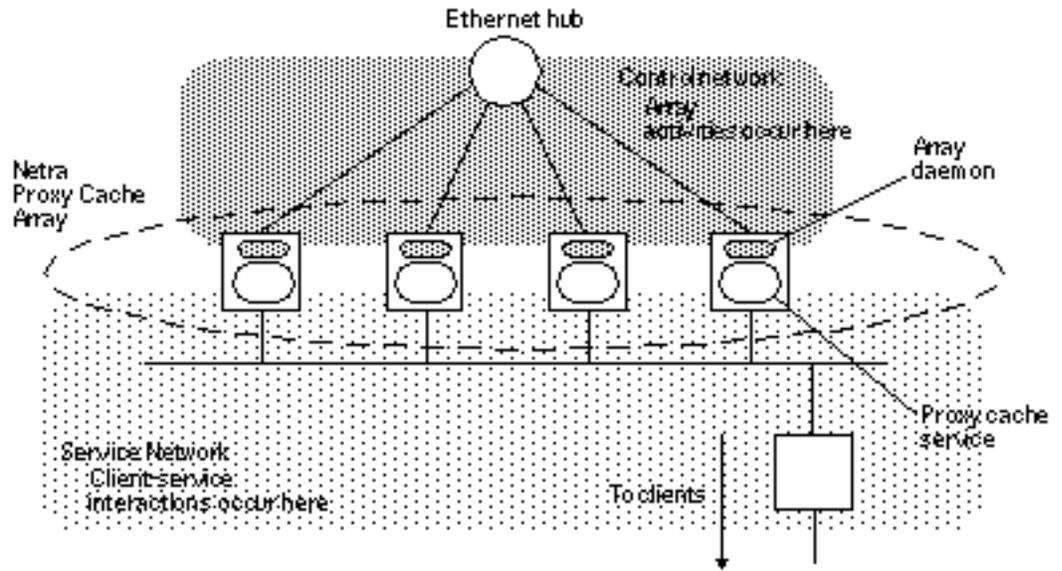


Figure 1-4 Control and Service Networks

Figure 1-5 illustrates the concepts of control and service interfaces and addresses.

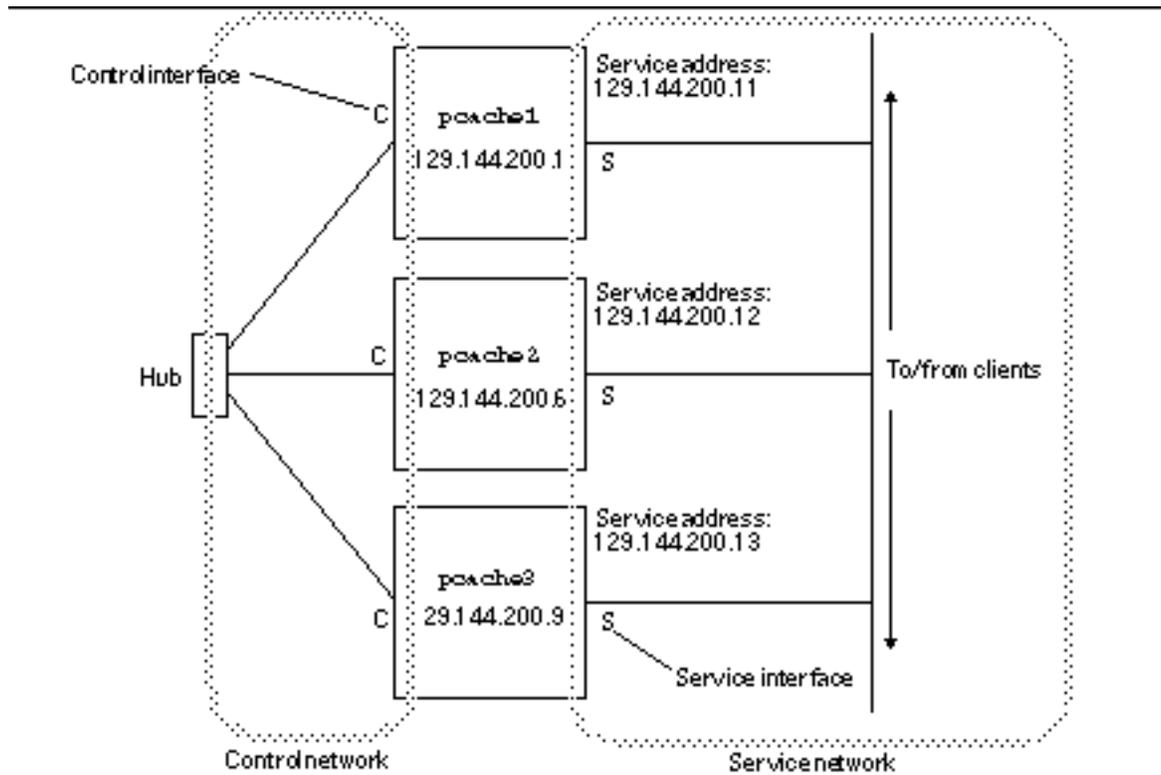


Figure 1-5 Example Netra Proxy Cache Configuration

The Role of DNS

The array software relies on the DNS to provide load balancing, as described in “Load Balancing” on page 7.

When all hosts and services are up and under a normal load, the array’s DNS works as a conventional DNS round robin. It is when there is a host or service failure, or if a host becomes overloaded, that the array software intervenes to balance the load across the array. The software accomplishes this by removing the service address of the failed or overloaded host from the array’s DNS zone. As a result of this intervention, no new client requests will be connected to a service address associated with a failed or overloaded object.

The threshold at which a host becomes overloaded, as well as the threshold at which a formerly-overloaded host is considered available again, are configurable parameters.

As part of its manipulation of the array's DNS zone, in a situation where one or more hosts in the array is moving back and forth between overload and normal load, the array software always keeps the least-loaded hosts in the zone.

In support of the array software's modification of the DNS round robin, you designate one host within the array as the DNS server for the domain formed by the array. (The choice of which host is arbitrary.) The DNS itself operates under control of the array software, so that if the DNS software or the host on which DNS is running fails, the service address of the DNS moves to a different machine in the array. Array software is designed so that one host runs the DNS and the remaining hosts in the array act as hot spares for the DNS host.

In addition to the array software's use of DNS for load balancing, the software also relies on the DNS outside of the array to resolve the name of the subdomain formed by the Netra Proxy Cache Array. This subdomain consists of the DNS zone formed by the service addresses in the array. This means you must configure your existing DNS to point to the array's DNS to resolve the name of the array's proxy cache service. An example of such a configuration is shown in Chapter 3 of the *Netra Proxy Cache Array Configuration Guide*.

Monitoring and Managing

The Netra Proxy Cache Server offers web-based tools that enable you to monitor:

- An individual server
- An array
- The state of the proxy cache service, for an array and a server

There are also web pages that enable you to monitor proxy-cache-related log files. See Chapter 15," for a description of the monitoring web pages. See Chapter 17," for a description of the various types of logs available.

The Netra Proxy Cache product is shipped with Management Information Bases (MIBs) that enable you to use any SNMP-conformant management platform (such as Solstice Domain Manager) to monitor and manage a Netra Proxy Cache Server. The software also supports a set of traps that notify you of critical events, ranging from a down server to a failure report on a server component.

The Netra Proxy Cache Server and Array MIBs are described in detail in Chapter 16."

Understanding the Netra Administration GUI

- “Netra Administration Modules” on page 13
- “Accessing the Netra Administration GUI” on page 20

The Netra Proxy Cache Server uses a Hyper Text Mark-up Language (HTML)-based GUI for its administration. Each screen is a hypertext document. A browser running on a client accesses these documents from an administration web server running on the Netra server.

Netra Administration Modules

An administration function in the Netra Administration GUI is called a *module* and is made up of a set of related tasks. For example, the User Accounts module contains tasks to add user accounts as well as to modify or delete them. These modules are grouped into five categories:

- Network Services Administration
- Network Connection Administration
- Security Administration
- System Administration
- Documentation

The modules are displayed as hypertext links on the Main Administration page of the GUI. Choosing a link displays the administration page for the module associated with the task.

Types of Pages

The Netra Administration GUI has five types of administration pages, described in the following subsections.

Navigation Page

A navigation page is used to choose tasks. A task is chosen by clicking on a link, which may be displayed as an underlined or emphasized word or phrase.

Some navigation pages are dynamic: they display only the options that are available on the particular Netra system. If information that changes the available options is entered, the navigation pages reflect these changes.

Figure 2-1 shows a navigation page for the Administration Web Server module.



Figure 2-1 Navigation Page

Task Page

A task page is also called a *form*. There are two types of forms: regular and special.

Regular forms provide the only way to change the system state. When a form is displayed, the values in the fields are either the current operating or default conditions. Information is entered into a regular form by typing it into the text boxes or by selecting the radio button options.

Regular forms have an OK button. If information is entered or changed in the form, then the OK button must be clicked to save or activate the changes, and hence change the system state.

Some forms also have a Reset button. To discard the changes, use the Reset button to return fields to their previous conditions.

The user-input elements in a form are described in Table 2-1.

TABLE 2-1 User-Input Elements

Element	Description
Text Box	Accepts one line of text input.
Text Area	Accepts multiple lines of text input.
Radio Buttons	A group of one or more buttons, only one of which can be chosen. Click on a radio button to choose it. This de-selects any other chosen radio button in its group. The only way to de-select a radio button is to choose another one.
Check Box	Selects an option. Click on the button to change its state.
Pop-up Menu	A list of options displayed in a menu. Only one option can be chosen. The chosen item is shown. Click and hold on the menu to display the list of options. Release over a new option to choose it.
Scrolling List	A list of options displayed in a window. Click on an option to choose it. Scrolling lists permit multiple selections.

Figure 2-2 shows a form for the Host Access module.



Figure 2-2 Task Page/Form

Special forms are based on regular forms. There are two types of special forms: an error form and a verify form.

- An error form, or error page, does not change the system state. It displays an Error icon, and enables the user to correct the error and re-type information in the form. Errors are marked on the form, alongside the relevant field.

Figure 2-3 shows an error form for the Host Access module.

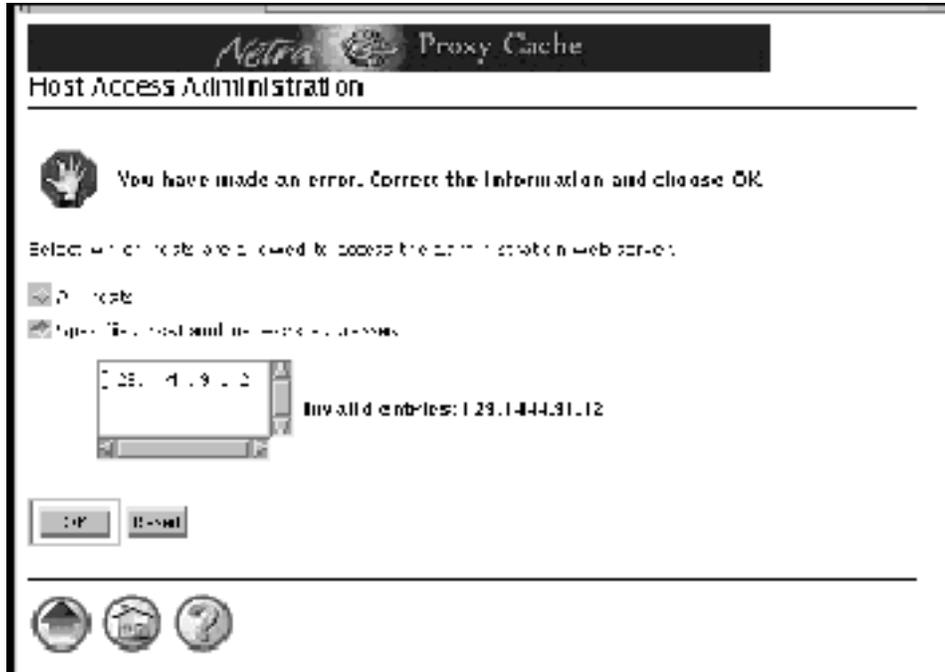


Figure 2-3 Error Form

Note - If the information typed into a form produces an error, the system state is not changed. The form is redisplayed with the erroneous data. The data must be corrected.

- A verify form is used only to confirm a previous choice.

Figure 2-4 shows a verify form for the deleting an array member from a Netra Proxy Cache Array.

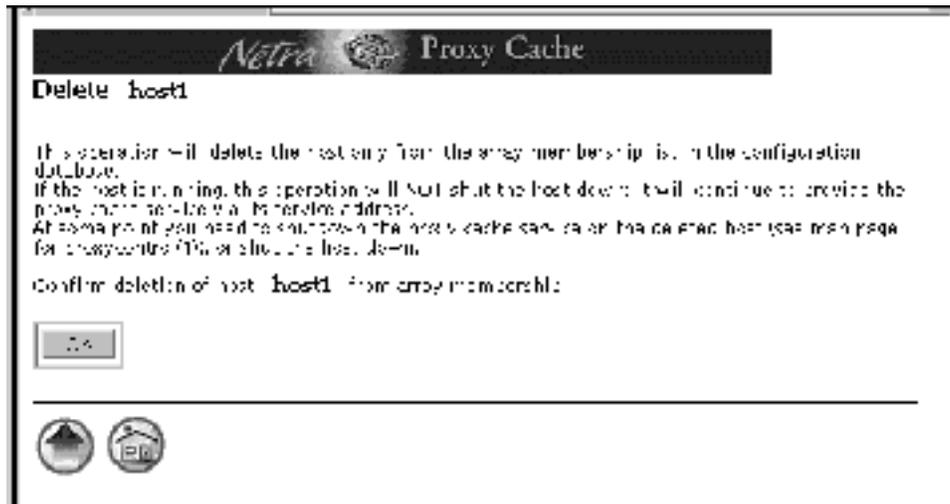


Figure 2-4 Verify Form

Help Page

The Netra Administration GUI also provides help pages that contain information which may assist filling out a form. By clicking on a help icon, the help window opens and it displays a help page for the respective module being configured. Some help pages have terms that are linked to the glossary page.

Figure 2-5 shows a help page for the Root Password module.

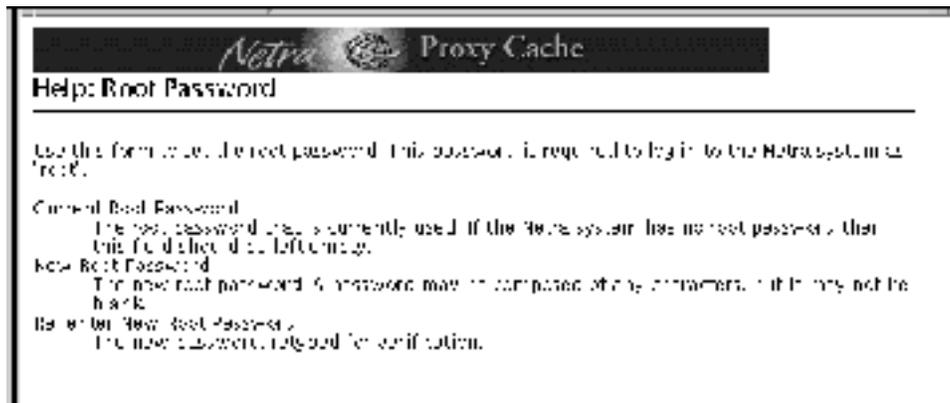


Figure 2-5 Help Page

In use, the help window may open directly over the Netra Administration GUI and obscure the module administration page from view. It is possible to move, iconify or close the help window, independent of the Netra Administration GUI.

When moved or iconified, the help window remains active. Clicking the help icons of other module administration pages updates the help window with the respective help page.

When closed, the help window is dismissed, and cannot be accessed until a help icon is clicked again.

Glossary Page

The glossary page is accessed using links in the help pages of a module. When a term that is a link is chosen, the term and its explanation are displayed at the top of the glossary page. The glossary page is displayed in a scrolling window. To return to the help page, use the Back Arrow icon.

Success Page and Reminder Page

Either of these pages is displayed once all the forms for a task have been filled out and the OK button has been chosen. A success page contains a Success icon and a reminder page contains a Reminder icon. A success page confirms that the system state has changed. A reminder page does the same, but also states a message indicating additional tasks are required.

Figure 2-6 shows a success page for the Host Access module.

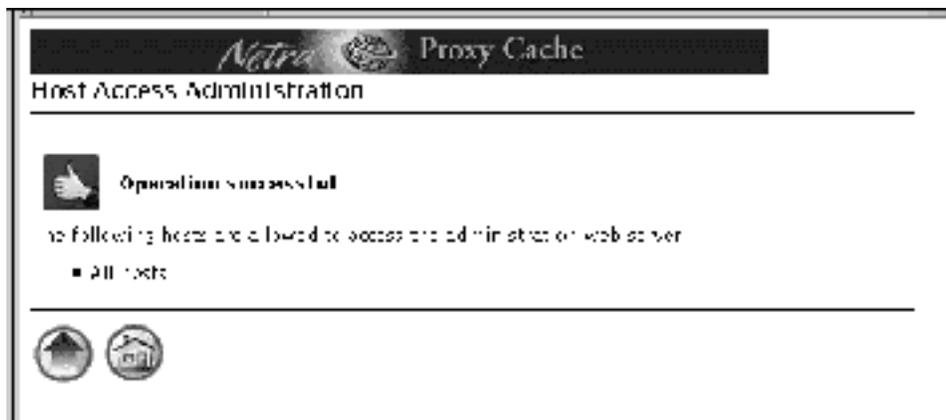


Figure 2-6 Success Page

Types of Icons

Navigation Icons

The Netra Administration GUI uses navigation icons for moving from one page to another. One or more of these navigation icons are located at the bottom of each administration page. The five navigation icons are displayed in Table 2-2.

TABLE 2-2 Navigation Icons

Icon	Description
	Home icon. Returns to the Netra Main Administration page. (Selecting the banner also does this.)
	Help icon. Opens the help window for displaying help pages that explain fields in the related form.
	Back Arrow icon. Goes back one page.
	Top of Module icon. Returns to a module's top-level page.
	Forward Arrow icon. Continues to the next configuration task. Displayed only during initial configuration.

Information Icons

Information icons are displayed when a task form is submitted. They tell the user the status of the configuration task at hand. The three information icons are displayed in Table 2-3.

TABLE 2-3 Information Icons

Icon	Description
	Reminder icon. Shows that a task has been completed successfully, but calls attention to an important message indicating an additional task is required.
	Error icon. Calls attention to errors in form entries.
	Success icon. Shows that a task has been completed successfully.

Accessing the Netra Administration GUI

The HTML-based Netra Administration GUI is accessed through a dedicated administration web server. A web browser and knowledge of the system administrator user name and password are required to access this GUI. Access the GUI as follows:

▼ To Access the Netra Administration GUI

1. **Start a browser on a machine that is network-accessible to the Netra Proxy Cache Server.**
2. **Open the following URL:**

```
http://  
  netra:81
```

Or

```
http://  
  netra.domain:81
```

Where *netra* is the host name or host address for the Netra server and *domain* is the qualified domain.

The latter format may be needed if a proxy server is being used. The Netra password screen is displayed.

3. Type setup for the User ID and then the password.

The Netra Welcome page is displayed.

4. In the Netra Welcome page, choose Administration.

The Main Administration page is displayed.

If you are configuring a Netra Proxy Cache Server for the first time, the initial configuration page is displayed.

Loading the Proxy Cache Administration Page

- “Loading the Proxy Cache Administration Page” on page 24
- “Starting the Proxy Cache Administration Server” on page 26

This chapter explains how to load the Proxy Cache Administration page. It is through this page that you can access features associated with the proxy cache service provided by a Netra Proxy Cache Array or Server.

Most often, you should load the Proxy Cache Administration page from the *administrative host*. This is the host on which you make configuration changes, as described in the *Netra Proxy Cache Array Configuration Guide*. It is on this host that the proxy cache administration server is started. From the administrative host, you can monitor and make configuration changes to any host or set of hosts in the array.

The proxy cache administration server needs to be started for all proxy cache-related functions except viewing log files and unconfiguring the proxy cache service. For example, if you want to make any configuration changes, or monitor the proxy cache service, the proxy cache administration server must be started.

The array software does not prevent you from starting the proxy cache administration server on a host other than the administrative host, then making configuration changes on that host. However, such activity raises the possibility of changes being made on multiple hosts. If this occurs, the last set of changes that are installed (through the Install Configuration link) are the changes that take effect.

Loading the Proxy Cache Administration Page

The following procedure assumes you are loading the Proxy Cache Administration page from the administrative host, on which the proxy cache administration server is already running.

▼ To Load the Proxy Cache Administration Page

1. **On your administrative host, open the Netra Main Administration page:**

`http://<administrative host name>:81`

2. **In the pop up authentication window, enter the administration name (setup) and the administration password for the Netra Proxy Cache Server.**
3. **Following successful login, click the Administration link in the Netra Welcome page.**
4. **In the Main Administration page, click Proxy Cache Service.**
The Proxy Cache Administration page, shown in Figure 3-1, is displayed.

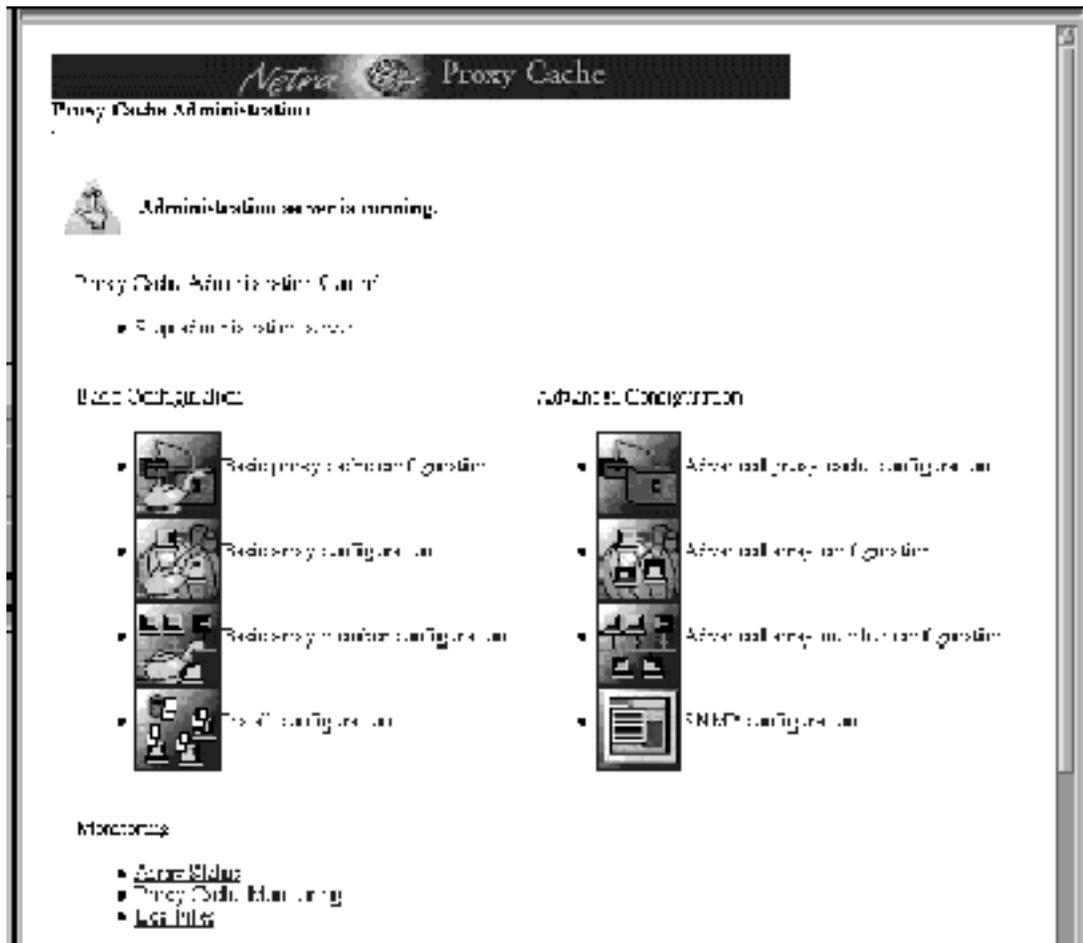


Figure 3-1 Proxy Cache Administration Page

If the page is displayed as shown in Figure 3-2, below, it indicates that the proxy cache administration server is not started.

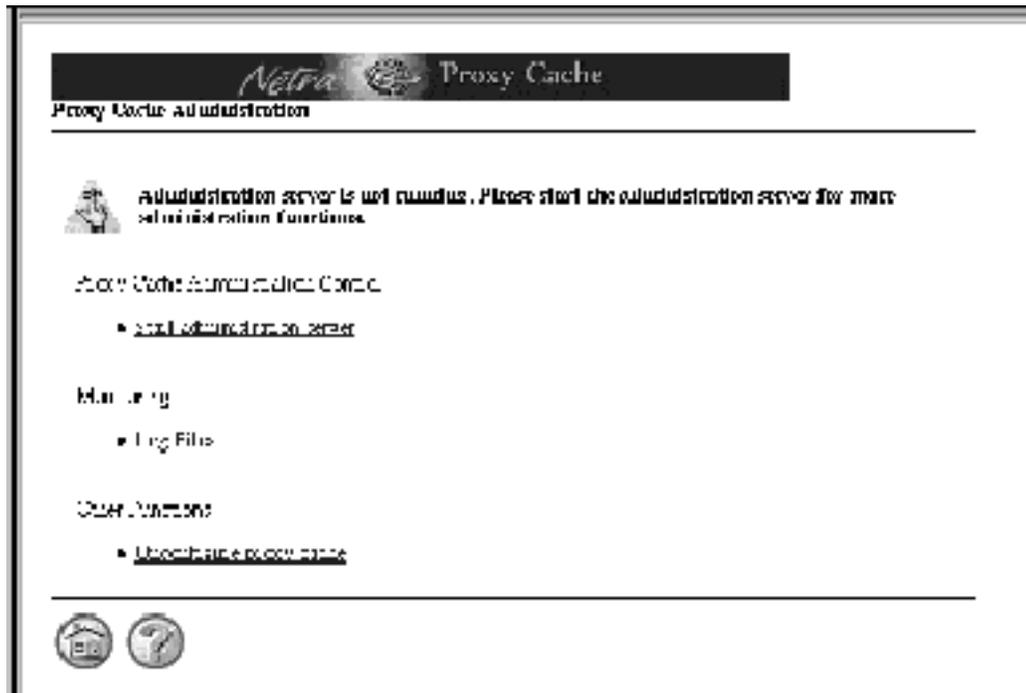


Figure 3-2 Proxy Cache Administration Page (Server Stopped)

Starting the Proxy Cache Administration Server

Use the following procedure if your Proxy Cache Administration page displays as is shown in Figure 3-2.

▼ To Start the Proxy Cache Administration Server

1. In the Proxy Cache Administration page, click **Start administration server**.
2. In the success page, click the **up-arrow icon**.

The Proxy Cache Administration page as it is shown in Figure 3-2 is displayed.

Advanced Proxy Cache Configuration

- “Viewing and Modifying Advanced Proxy Cache Configuration Properties” on page 27
- “Primary Configuration” on page 29
- “Proxy Cascade” on page 32
- “Cache Policy” on page 38
- “Access Control” on page 43
- “Storage Management” on page 48
- “Timeouts” on page 50
- “Log File Options” on page 52
- “Web Server Accelerator Options” on page 53
- “External Program Options” on page 55

This chapter explains how to perform advanced configuration of the proxy cache service. The chapter assumes you have completed configuration of your Netra Proxy Cache Array, as described in the *Netra Proxy Cache Array Configuration Guide*.

Viewing and Modifying Advanced Proxy Cache Configuration Properties

You view or modify advanced proxy cache configuration properties in web pages accessed through the Advanced Proxy Cache Configuration page. You reach this page through the Proxy Cache Administration page. See Chapter 3, “ for instructions on loading this page.

▼ To View or Modify Advanced Proxy Cache Configuration Properties

1. In the Proxy Cache Administration page, click **Advanced Proxy Cache Configuration**.

The Advanced Proxy Cache Configuration page, shown in Figure 4-1, is displayed.

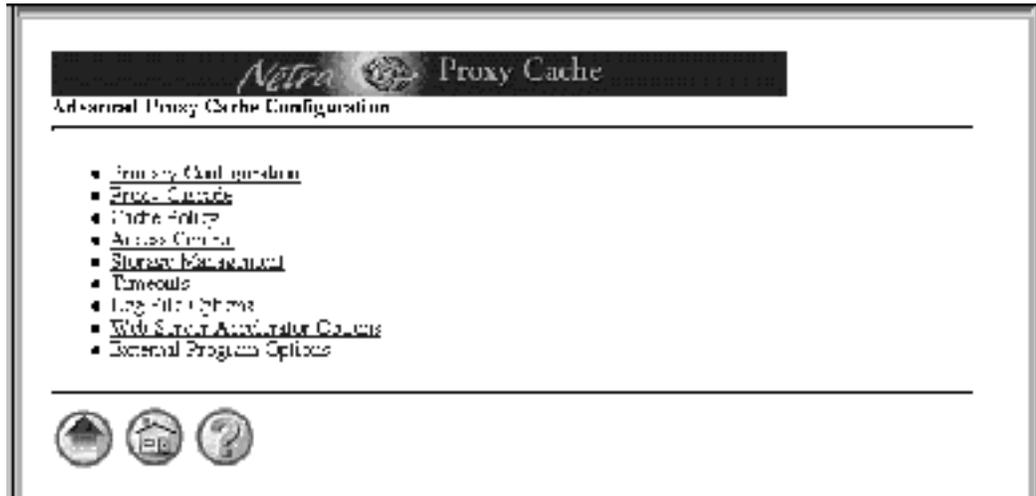


Figure 4-1 Advanced Proxy Cache Configuration Page

The Advanced Proxy Cache Configuration page presents a list of links (shown in Figure 4-1), each of which corresponds to a category of proxy cache properties. For all categories, you follow the same procedure for viewing or modifying a property.

1. In the **Advanced Proxy Cache Configuration page**, click the link for the **category in which a property resides**.
2. In the **page for that category**, view or make changes to the **value of a property**. Most properties have editable fields. A few have toggles (either one value or another) or pulldown menus.
3. **At the bottom of the category page**, click **OK**.
A page is displayed indicating the success or failure of your change. If a change fails, the page is redisplayed with the error indicated. Correct the error and click

OK again. With some errors a new page, containing an error message, is displayed. If this occurs, click the Back button on your browser to return to the category page.

If you click Reset, the values for the properties on a page revert to what they were when you first loaded the page.

4. **After a successful change, click the up-arrow icon to return to the Advanced Proxy Cache Configuration page.**

Alternatively, you can click the home icon to return to the Netra Main Administration page.

5. **If you make *any* changes to advanced proxy cache properties, you must use the Install Configuration function to install the changes on all machines in the array. You access this function by clicking the Install Configuration link in the Proxy Cache Administration page.**

See the *Netra Proxy Cache Array Configuration Guide* for instructions on the use of the Install Configuration function.

The remainder of this chapter is a description of the advanced proxy cache properties, broken down by the categories reflected in the links on the Advanced Proxy Cache Configuration page.

Primary Configuration

▼ To View or Modify Primary Configuration Properties

1. **In the Advanced Proxy Cache Configuration page, click Primary Configuration.**
The Primary Configuration page is displayed, as shown in Figure 4-2.

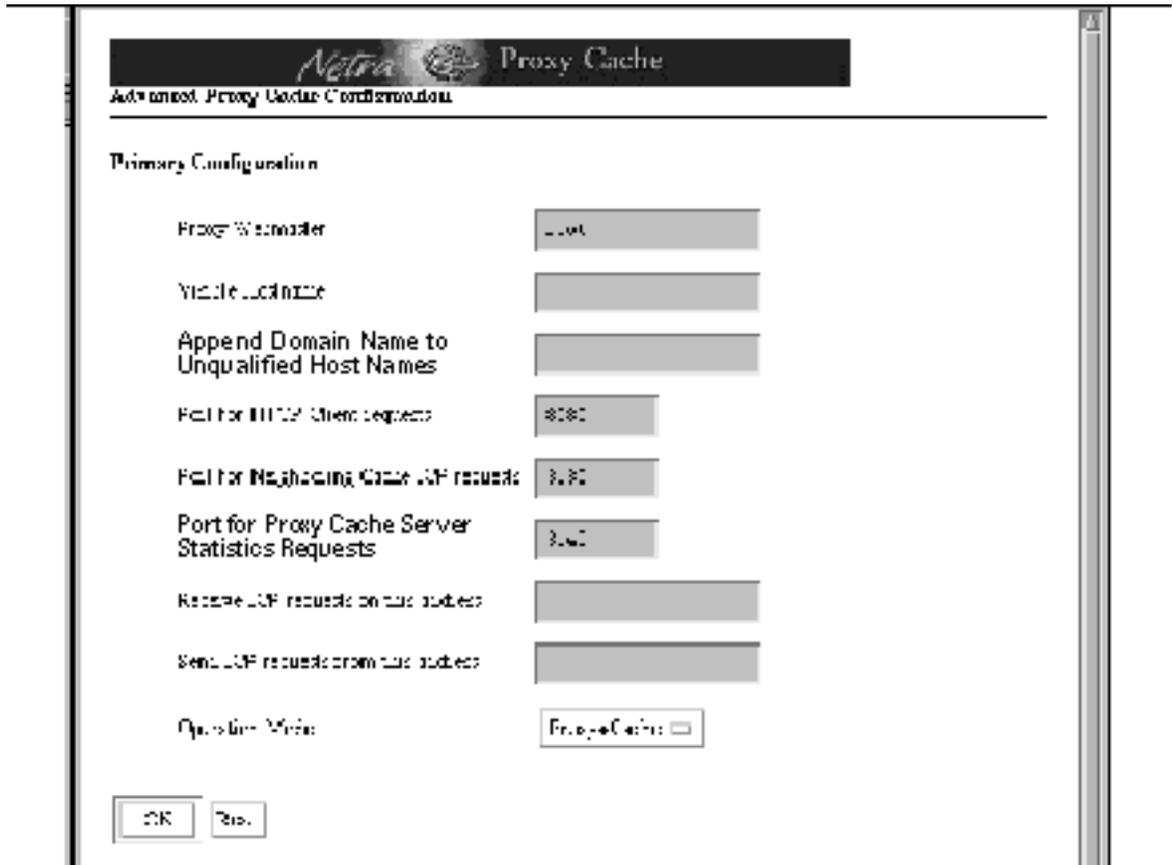


Figure 4-2 Primary Configuration Page

2. In the Primary Configuration page, accept or modify values for the following properties:

Proxy Webmaster

An electronic mail address of the person or group who is to receive notices of abnormal conditions in the Netra Proxy Cache Server. The default postmaster is root, which means that the recipients you specified for the Netra System Administrator Alias (see the *Netra Proxy Cache Array Configuration Guide*) will receive mail bound for the Proxy Webmaster.

Visible Hostname

Error messages generated by the Netra Proxy Cache Server contain the hostname you specify here. The default is the return from the `hostname` command.

Append Domain Name to Unqualified Host Names

If a URL refers to a host name without a . (period) in its name, the domain name you specify for this property is appended to host name to form a fully qualified domain name.

Port for HTTP Client Requests

The port number at which the Netra Proxy Cache Server listens for HTTP requests. Most users can accept the default of 8080. Do not use 81; the Netra Proxy Cache product uses this number for administrative purposes.

Port for Neighboring Cache ICP Requests

The UDP port number on which the host listens for Internet Cache Protocol (ICP) queries. A value of 0 disables neighbor caching. The default is 3130.

Port for Proxy Cache Server Statistics Requests

The TCP or UDP port on which the Netra Proxy Cache Server provides statistics. The SNMP subagent shipped with the product uses this feature to export the statistics via SNMP. Setting this property to 0 (zero) disables the providing of statistics. The default is 3140. Entering a non-zero value enables proxy cache monitoring, which is described in “Proxy Cache Array Monitoring” on page 117 and “Proxy Cache Monitoring for Host” on page 119.

Receive ICP Requests on this Address

If you enter an address, the Netra Proxy Cache Server accepts ICP requests only at the IP address specified here.

Send ICP Requests from this Address

If you enter an address, the Netra Proxy Cache Server sends ICP requests from the IP address specified here.

Operation Mode

Choose between Proxy+Cache (the default) and Proxy Only. If you choose Proxy Only, the Netra Proxy Cache Server does not cache any objects.

Proxy Cascade

▼ To View or Modify Proxy Cascade Properties

1. **In the Advanced Proxy Cache Configuration page, click Proxy Cascade.**
The Proxy Cascade page is displayed, an example of which is shown in Figure 4-3.

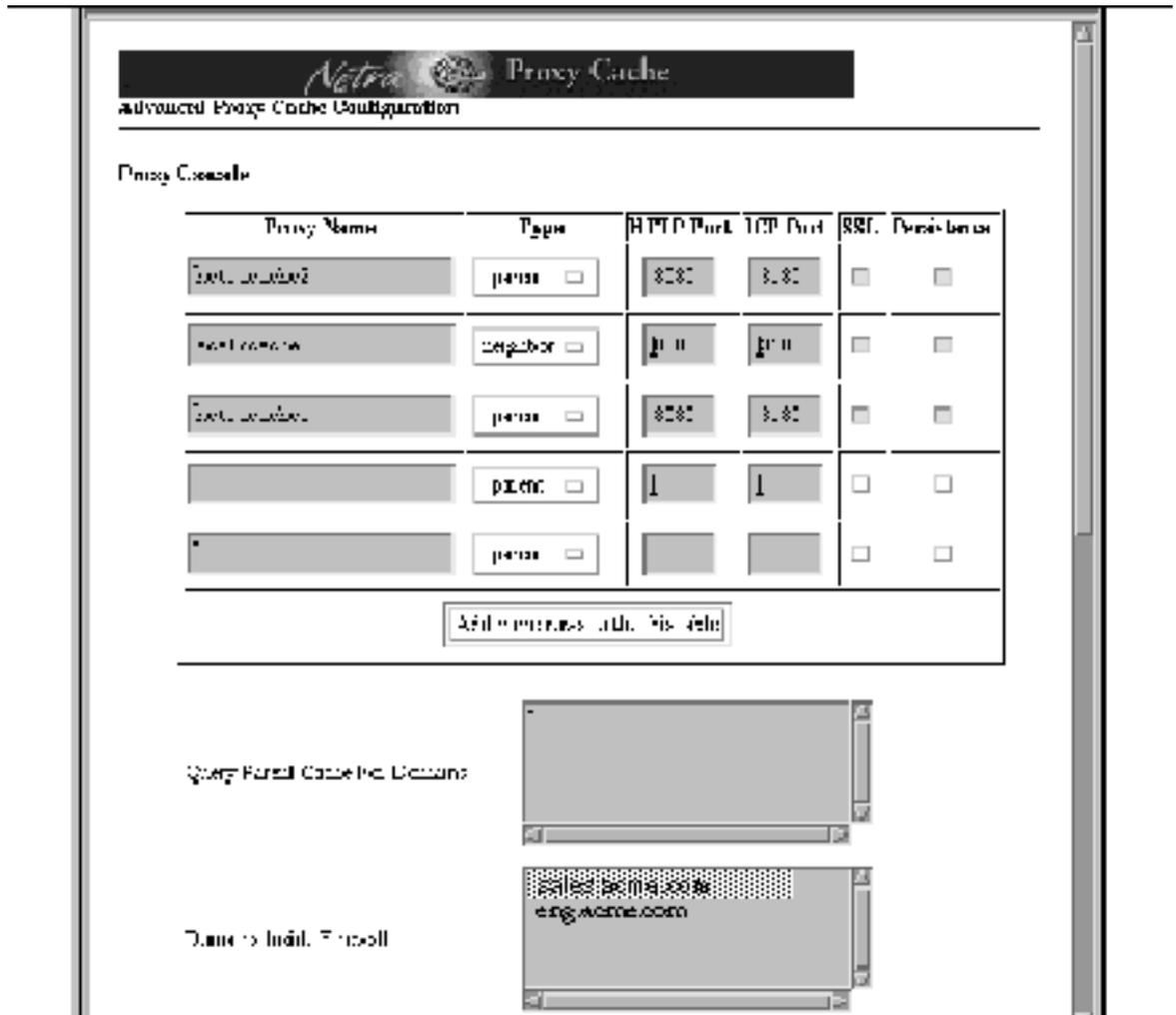


Figure 4-3 Proxy Cascade Page (Top Portion)

Note that the values shown in Figure 4-3 are for example purposes only.

1. In the top portion of the Proxy Cascade page, accept or modify values for the following properties:

Table of Parent and Sibling Proxy Caches

When you load the Proxy Cascade page the table of parents and siblings contains the hosts you entered when you last performed basic proxy cache configuration, as described in the *Netra Proxy Cache Array Configuration Guide* or *Netra Proxy Cache Server Configuration Guide*.

The Netra Proxy Cache Server supports associations with both parent and sibling proxy caches. In a Netra Proxy Cache Array, sibling configuration is automatic. That is, hosts in the array have a sibling relationship with one another, which implies an ability to communicate via ICP. You need not enter the host names in the array in this table. If you want to establish a sibling relationship with a host or hosts not in the array, specify the host(s) in the table.

If you have multiple parent proxies that do not support ICP, the proxy cache service contacts those parents in the order you list them here. If you have multiple parents that do support ICP, the proxy cache service determines the “closest” parent by comparing response times to its ICP queries.

The headings in the table of parent and sibling caches are as follows:

Proxy Name

Fully-qualified host name of the parent or sibling proxy cache host. If this host is not in the same domain as the Netra Proxy Cache host or array, you must specify the domain name; for example: `webcache.eng.acme.com`

Type

A toggle that can be either *parent* or *neighbor* (sibling). Upon a miss (not having a requested object) a Netra Proxy Cache Server checks its parents and siblings to see whether any have the object. A sibling only checks its local cache; if it does not have an object it does not ask a parent. A parent, by contrast, is responsible for returning the object, either from its own cache; from its own parent, further upstream (toward the source web server); or from the source web server. See “Parent, Siblings, and the ICP” on page 152 for a discussion of the Netra Proxy Cache Server’s support for parents and siblings.

HTTP Port

The HTTP port number on which the parent or sibling listens for HTTP requests.

ICP Port

The ICP port number on which the parent or sibling listens for ICP requests. A value of 0 means that the parent does not support ICP.

SSL

A checkbox indicating whether a host supports the tunneling of the Secure Sockets Layer protocol.

Persistence

A checkbox indicating whether a host supports the HTTP persistent connections feature, sometimes referred to as “keep-alive”.

Query Parent Cache for Domains

The Netra Proxy Cache Server contacts parent or siblings specified for this property only for matching domain names. An alternative form enables you to specify a host for non-matching domain names.

Entries have the form `<hostname> <domain name>` or `<hostname> !<domain name>`. For example, if you have a parent `wbyeats`, in the same domain as the Netra Proxy Cache Server, to which you want directed all traffic related to URLs that contain the domain names `sales.acme.com` and `eng.acme.com`, you make an entry:

```
wbyeats sales.acme.com eng.acme.com
```

If you have multiple entries for one host—for example, in addition to the above, if you had: `wbyeats fin.com`—the domains in those entries are combined to form a single list.

You can also have a reverse match on domain names, so that requests related to URLs that contain domain names that do not match the specified domains are directed to the specified host. So, for example, if you want `wbyeats` to field all requests related to domains *other than* the domain names `sales.acme.com`, you make an entry:

```
wbyeats !sales.acme.com
```

Note that with the reverse-match feature, you can specify only one domain name, either as the only domain name in an entry or as the last domain name in an entry. If you want to prevent use of a given parent for multiple domains, specify additional entries. For example:

```
wbyeats !sales.acme.com  
wbyeats !eng.acme.com
```

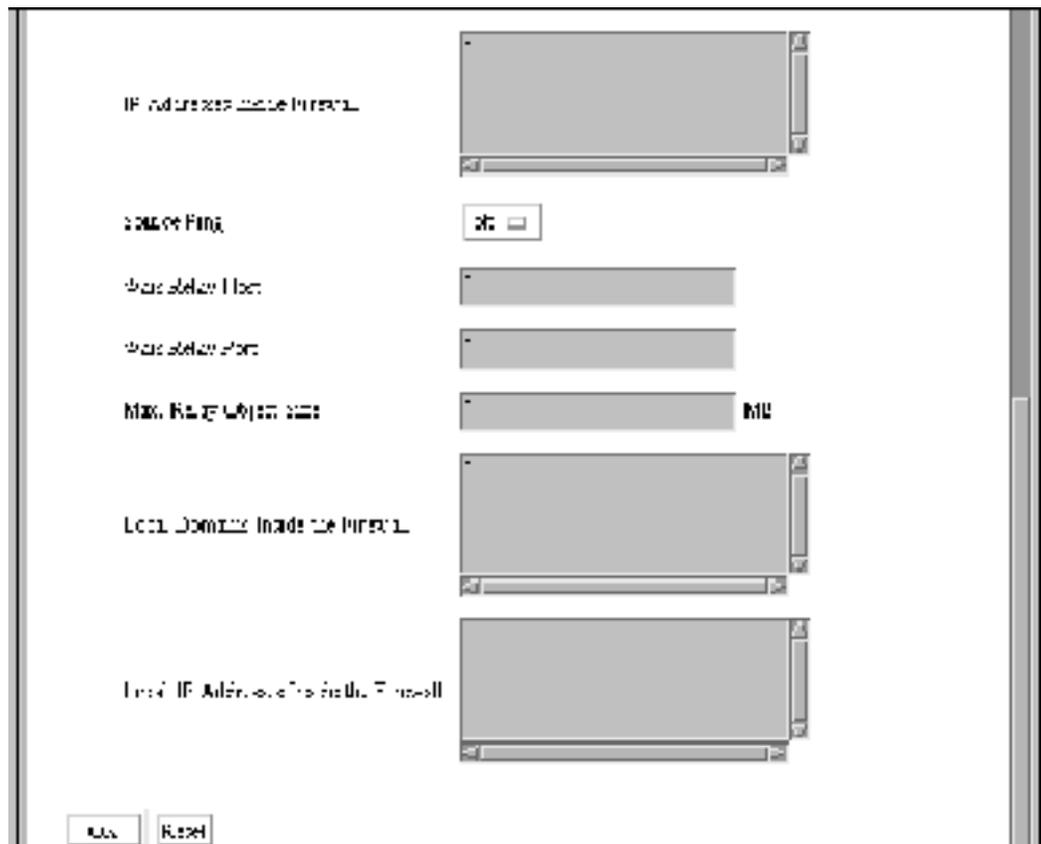
See “Parent, Siblings, and the ICP” on page 152 for an example of the use of this property.

Domains Inside Firewall

When you load the Proxy Cascade page the Domains Inside Firewall field contains the domains you entered when you last performed basic proxy cache configuration, as described in the *Netra Proxy Cache Array Configuration Guide*.

The Netra Proxy Cache Server considers domains you list for this property as being inside a firewall. For URLs containing domains *not* in this list, the software does not perform a name service resolution (for example, a DNS lookup) of a host name specified in a URL. Also for domains not in this list, if the Netra Proxy Cache Server does not have a requested object in its local cache, it always tries to fetch the object from a parent or sibling cache.

1. Scroll down to the remaining properties in the Proxy Cascade page, as shown in Figure 4-4.



The screenshot displays a configuration page with several fields and buttons. The fields are:

- IP addresses inside firewall: A large text area.
- Source File: A small text input field.
- Max. Delay (sec): A text input field.
- Max. Delay (min): A text input field.
- Max. Delay (max): A text input field with the value "100" displayed.
- Local Domains Inside the Firewall: A large text area.
- Local IP Address of the Firewall Firewall: A large text area.

At the bottom of the page, there are two buttons: "OK" and "Cancel".

Figure 4-4 Remaining Proxy Cascade Properties

IP Addresses Inside Firewall

The Netra Proxy Cache Server considers addresses you list for this property as being inside a firewall. When you specify one or more addresses, the Netra Proxy Cache Server performs a host name resolution (for example, a DNS or NIS lookup) of the address specified in a URL for all requests, to determine whether the address is inside the firewall. For addresses *not* in this list, if the Netra Proxy Cache Server does not have a requested object in its local cache, it always tries to fetch the object from a parent or sibling cache.

Note - Use of this property degrades server response time because of the overhead associated with host name resolutions.

Source Ping

Choose between off (the default) and on. By default, when the Netra Proxy Cache Server receives a request, it pings (sends ICP requests to) its parents and siblings. If Source Ping is on, the software also pings the host specified in the URL of an object it retrieves. This feature can be useful where parents and siblings are overloaded and the source web server is not. Note that Source Ping packets are never sent beyond a firewall.

The following three properties relate to the relaying of WAIS URLs:

Wais Relay Host

Enter the host name of the proxy server to which WAIS URLs will be relayed.

Wais Relay Port

Enter the port number on the above-named host name to which WAIS URLs are to be relayed.

Max. Relay Object Size (MB)

Enter the maximum size (in MB) of a WAIS object that can be received from the Wais Relay Host. The Netra Proxy Cache Server does not relay WAIS objects that exceed this limit.

Local Domains Inside the Firewall

When you load the Proxy Cascade page the Local Domains Inside the Firewall contains the domains you entered for the Domains Inside Firewall field when you last performed basic proxy cache configuration, as described in the *Netra Proxy Cache Array Configuration Guide*.

The Netra Proxy Cache Server retrieves URLs containing the domains you specify here directly from the source and not from a parent or sibling. These domains should be the same as or a subset of the domains you specify for Domains Inside Firewall (see description above). Specify here domains to which you have good network connectivity, and from which users request relatively small objects. For a given domain, consider whether going to a sibling cache to retrieve an object offers a large

advantage over going directly to the source. If it does not, you might want to list the domain here.

Local IP Addresses Inside the Firewall

The Netra Proxy Cache Server retrieves URLs containing the IP addresses you specify here directly from the source and not from a parent or sibling. These addresses should be a subset of the addresses you specify for IP Addresses Inside Firewall (see description above). Specify here addresses to which you have good network connectivity, and from which users request relatively small objects. For a given address, consider whether going to a sibling cache to retrieve an object offers a large advantage over going directly to the source. If it does not, you might want to list the address here.

Note - Use of this property degrades server response time because of the overhead associated with host name resolutions.

Cache Policy

▼ To View or Modify Cache Policy Properties

1. **In the Advanced Proxy Cache Configuration page, click Cache Policy.**
The Cache Policy page is displayed, as shown in Figure 4-5.

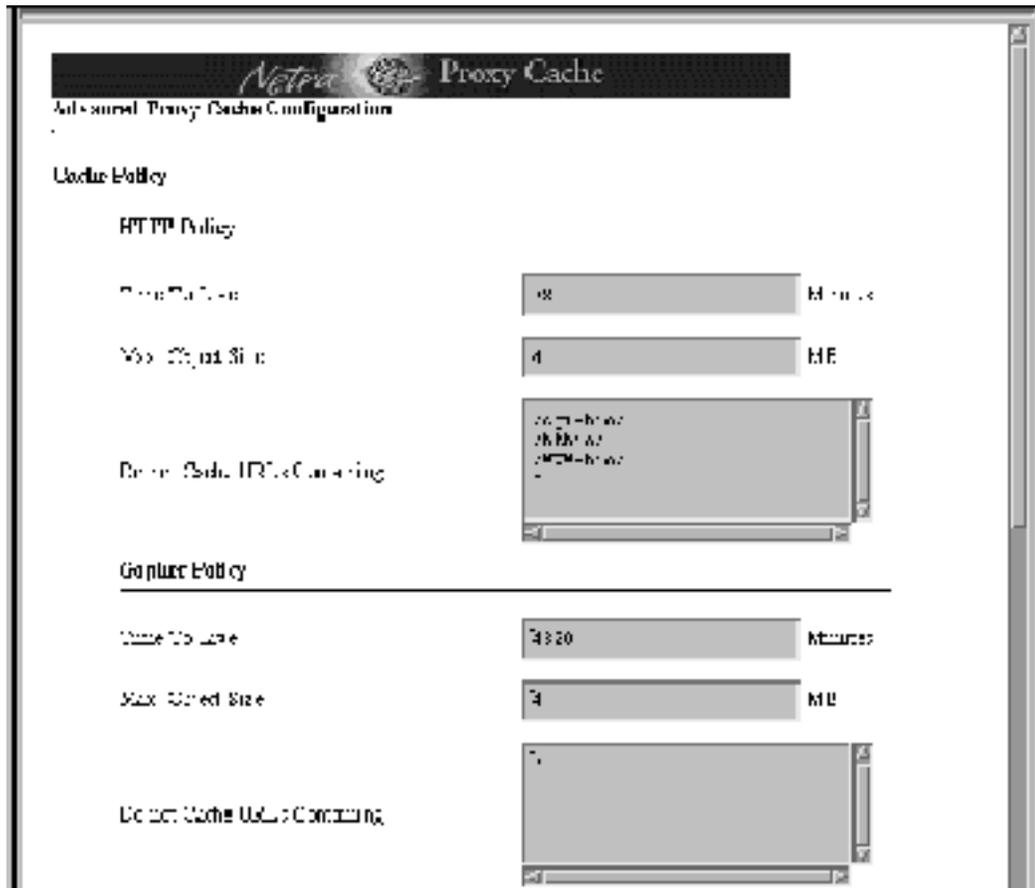


Figure 4-5 Cache Policy Properties (Top Portion)

2. Under the Cache Policy heading, enter or accept values for the properties described below.

The properties are divided into groups reflected in the following headings. Following Gopher Policy parameters (covered in “Gopher Policy” on page 40), you must scroll down the web page to view the remaining Cache Policy parameters.

HTTP Policy

Time To Live (min)

The limit on the length of time an HTTP object can remain in the cache. The default is 720 minutes (12 hours).

Max Object Size (MB)

The limit on the size of an HTTP object for caching. The Netra Proxy Cache Server proxies for, but does not cache, HTTP objects that exceed this limit. The default is four MB.

Do not Cache URLs Containing

The Netra Proxy Cache Server does not cache HTTP URLs containing strings you add to this list. The defaults are:

```
/cgi-bin/  
/htbin/  
/www-bin/  
?
```

Gopher Policy

Time To Live

The limit on the length of time a Gopher object can remain in the cache. The default, 4320 minutes, is three days.

Max Object Size

The limit on the size of a Gopher object for caching. The Netra Proxy Cache Server proxies for, but does not cache, Gopher objects that exceed this limit. The default is four MB.

Do not Cache URLs Containing

The Netra Proxy Cache Server does not cache Gopher URLs containing strings you add to this list. The default is ? (question mark).

Scroll down to view the remaining properties in the Cache Policy page, as shown in Figure 4-6.

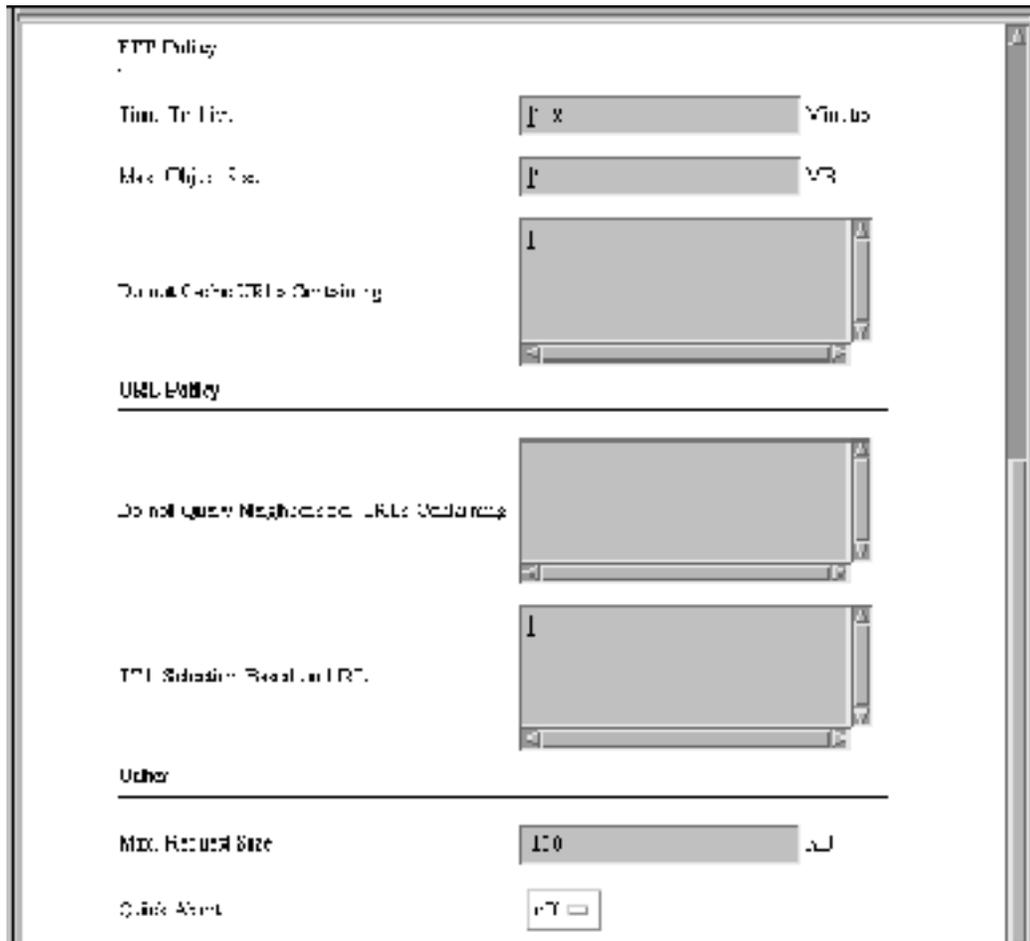


Figure 4-6 Remaining Cache Policy Properties

FTP Policy

Time To Live

The limit on the length of time an FTP object can remain in the cache. The default, 4320 minutes, is three days.

Max Object Size

The limit on the size of an FTP object for caching. The Netra Proxy Cache Server proxies for, but does not cache, FTP objects that exceed this limit. The default is four MB.

Do not Cache URLs Containing

The Netra Proxy Cache Server does not cache FTP URLs containing strings you add to this list. There are no defaults.

URL Policy

Do not Query Neighbors for URLs Containing

For URLs containing strings you add to this list, the Netra Proxy Cache Server looks in its own cache and does not query parent and sibling caches.

TTL Selection Based on URL

The Netra Proxy Cache Server enables you to set the TTL for URLs containing strings that you specify. You can specify the TTL in either of two ways: as an absolute value or as a percentage of an object's age. Entries have the following form:

```
<reg expression>  
<absolute TTL>  
<percentage>  
<maximum TTL>
```

where the variables mean the following:

<reg expression> is a regular expression that is matched against a URL. See "Rules for Pattern Matching for TTL Selection Property" on page 154 for rules for the regular expression.

<absolute TTL> is the TTL (in minutes) used by the Netra Proxy Cache Server if the percentage method is not used.

<percentage> is the percentage of the duration between an object's last-modified timestamp and the current time.

<maximum TTL> is the upper limit (in minutes) on the TTL.

The proxy cache uses the percentage method of determining the TTL if a matched object has a last-modified timestamp. If an object does not have such a timestamp, the absolute TTL is used instead. You can specify a negative value for <absolute TTL> thereby forcing the percentage method to be used. If a matched object then does not have the required timestamp, the TTL is set from a value set under Cache Policy (see Step 1 on page 28 under "Cache Policy" on page 38).

If neither the absolute TTL nor percentage methods result in a TTL for a matched object, the TTL is determined from the values set in the Cache Policy properties.

The Netra Proxy Cache Server checks all patterns in the list and uses the *last* match.

An example of a TTL-selection entry:

```
^http:// 1440 20 43200
```

The preceding example matches URLs that start with `http://`. If a URL contains a last-modified timestamp, the TTL for that URL is set to 20% of the difference between the timestamp and the current time. If the URL does not have such a timestamp, the TTL is set to 1440 minutes. In any event, the URL will not stay in the cache longer than 43200 minutes.

Other

Max Request Size

The maximum size of a request, in KB. The default is 100. This value should be large enough to accommodate users who use the `POST` method to upload files.

Quick Abort

By default, the Netra Proxy Cache Server completes the retrieval of an object even when the request for that object is aborted. This is potentially a benefit because the cache will then have the object should it be requested subsequently and the machine resources and bandwidth consumed to the point of the aborting of the request are not wasted. However, this feature can be a detriment where you have slow links or very busy caches. This feature also allows for the possibility of impatient users tying up a URL by repeatedly aborting and re-requesting non-cachable objects. You have the option of turning this “quick abort” feature on (meaning that object retrieval ceases if the request is aborted). The default is off.

Access Control

▼ To View or Modify Access Control Properties

1. In the **Advanced Proxy Cache Configuration** page, click **Access Control**.
The Access Control page is displayed, as shown in Figure 4-7.

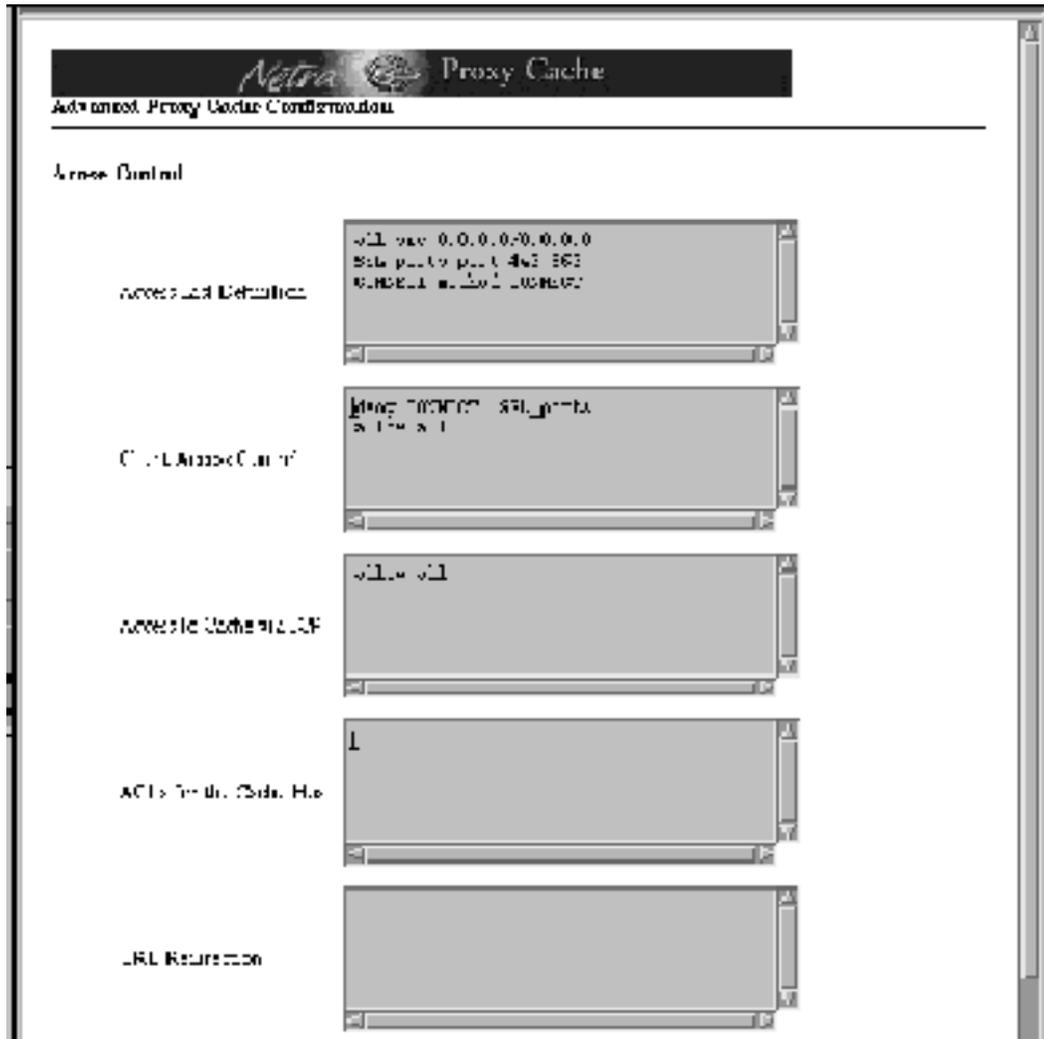


Figure 4-7 Access Control Properties

2. Under the Access Control heading, enter or accept values for the properties listed below.

Enter access control definitions one to a line. To edit an entry, click the entry in the table, then make any changes you want.

Access List Definition

Access lists enable you to control access to the functions of the Netra Proxy Cache Server based on characteristics of a request. To create an access list, you create a name (an arbitrary string), specify the type of access list (types are described below), and specify an argument that is used to match against the request. After creating an access list, you can specify that list for the following properties:

- Client Access Control
- Access to Cache via ICP
- ACLs for Cache Host
- URL Redirection

These properties are described below.

Access list definitions have the following form:

`<name> <type> <argument>`

Access list types are as follows:

- `src` Matches on the source address in a request. It takes an argument of the form: `<ip address>/<netmask>`. You can specify multiple pairings of IP address and netmask.
- `domain` Matches on the domain specified in a URL. It takes an argument of the form: `.<domain name>`. You can specify multiple domain names.
- `time` Matches on a time period specified in a URL. It takes an argument of the form: `<day of the week> <start time>-<end time>`. The variable `<day of the week>` is expressed as one of the following abbreviations:

TABLE 4-1 Day-of-Week Abbreviations

S	Sunday
M	Monday
T	Tuesday
W	Wednesday
H	Thursday
F	Friday
A	Saturday

The *<start time>*-*<end time>* variables are expressed as *<hour>:<minutes>*, using a 24-hour clock. So for example, to express a period in the mid-afternoon, you specify 14:15-16:30, meaning from 2:15 PM to 4:30 PM.

- *patternMatches* on a pattern specified in a URL. It takes an argument of the form: *<pattern to be matched>*. You can specify multiple patterns.
- *portMatches* on a port number specified in a URL. It takes an argument of the form: *<port number>*. You can specify multiple port numbers.
- *protoMatches* on a protocol specified in a URL. It takes an argument of the form: *<protocol>* (HTTP, FTP, Gopher, or WAIS). You can specify multiple protocols.
- *methodMatches* on a method (CONNECT, HEAD, POST, or GET) specified in a URL. It takes an argument of the form: *<method name>*. You can specify multiple methods.
- *serviceMatches* on the service specified in a request. It takes an argument of the form: *<ip address>/<netmask>*. "Service," in this context, is an instance of a service on a host in a Netra Proxy Cache Array, as identified by a service address and netmask.

Note - If you have multiple access lists of the same type, the Netra Proxy Cache Server, when determining which list a URL is in, works from top to bottom and stops after the first match.

An example of an access list:

```
adults domain sex.com
```

The preceding example creates an access list named *adults* of type *domain*. This list includes all URLs containing a destination domain of *sex.com*. In the HTTP Access property (described below), you can, for example, deny access to the *adults* list.

The defaults for Access List Definition are shown in Figure 4-7.

Client Access Control

An entry of the form:

```
allow (or deny) <access list> . . .
```

This and the following properties are used in conjunction with the access lists you create. For a given access list, you can allow or deny access to the HTTP port on the Netra Proxy Cache Server.

The defaults for Client Access Control are shown in Figure 4-7.

Access to Cache via ICP

An entry of the form:

```
allow (or deny) <access list> . . .
```

This and the following property are used in conjunction with the access lists you create. For a given access list, you can allow or deny access to the ICP port on the Netra Proxy Cache Server.

The defaults for Access to Cache via ICP is to allow all accesses.

ACLs for the Cache Host

An entry of the form:

```
<cache server> <access list> . . .
```

Enables you to limit the ICP queries sent to a given host (sibling or ICP-capable parent), based on the content of an access list. If you specify multiple access lists, the Netra Proxy Cache Server applies the first list that matches for a given URL.

URL Redirection

An entry of the form:

```
<access list> . . . : HOST <hostname> PATH <path>
```

Enables you to redirect a URL to a specified host and path. The access lists must be of types `domain`, `service`, or `pattern`. For example, the entry

```
adults : HOST restricted.acme.com PATH /forbidden.html
```

:

...redirects a URL that matches the `adults` access list to:

```
http://restricted.acme.com/forbidden.html
```

1. To create a URL Redirection entry, enter:

- The name of one or more access lists, followed by a colon
- The word `HOST` and a fully-qualified hostname
- The word `PATH` and an absolute pathname

Storage Management

▼ To View or Modify Storage Management Properties

1. Click **Storage Management** in the **Advance Proxy Cache Configuration** page. The page shown in **Figure 4-8** is displayed.

Netra Proxy Cache

Advanced Proxy Cache Configuration

Storage Management

High Water Mark for Memory (%)	90
Low Water Mark for Memory (%)	75
High Water Mark for Java Cache (%)	90
Low Water Mark for Java Cache (%)	75
Usage Collection (US) (table count)	
Time of Day for US (11:MM:SS)	

OK Reset

Figure 4-8 Storage Management Properties

2. Under the Storage Management heading, enter or accept values for the following properties:

High-water mark for Memory (%)

Removing of the least recently used objects in memory begins when the high-water mark is reached and ends when enough objects are removed so that the low-water mark (see following property) is reached. Note that objects removed from memory remain on disk. Enter a percentage. The default is 90%.

Low-water mark for Memory (%)

See the description of the high-water mark, above. Enter a percentage. The default is 75%.

High-water mark for Disk Cache (%)

Replacement of the least recently used objects in the disk cache begins when the high-water mark is reached and ends when enough objects are removed so that the low-water mark (see following property) is reached. Enter a percentage. The default is 90%.

Low-water mark for Disk Cache (%)

See the description of the high-water mark, above. Enter a percentage. The default is 75%.

Garbage Collection (GC) Rate (min)

Specifies how often, in minutes, the Netra Proxy Cache Server runs a full garbage collection. Garbage collection involves checking the expiration time of every object in the cache. In the course of normal operation, the Netra Proxy Cache Server removes expired objects, so that explicit garbage collection is not necessary. This feature can be of use if you have a frequent need to reclaim disk space. Note that the server does not process client requests during garbage collection. Enter a number of minutes if you want to use this feature or leave the field blank to disable garbage collection.

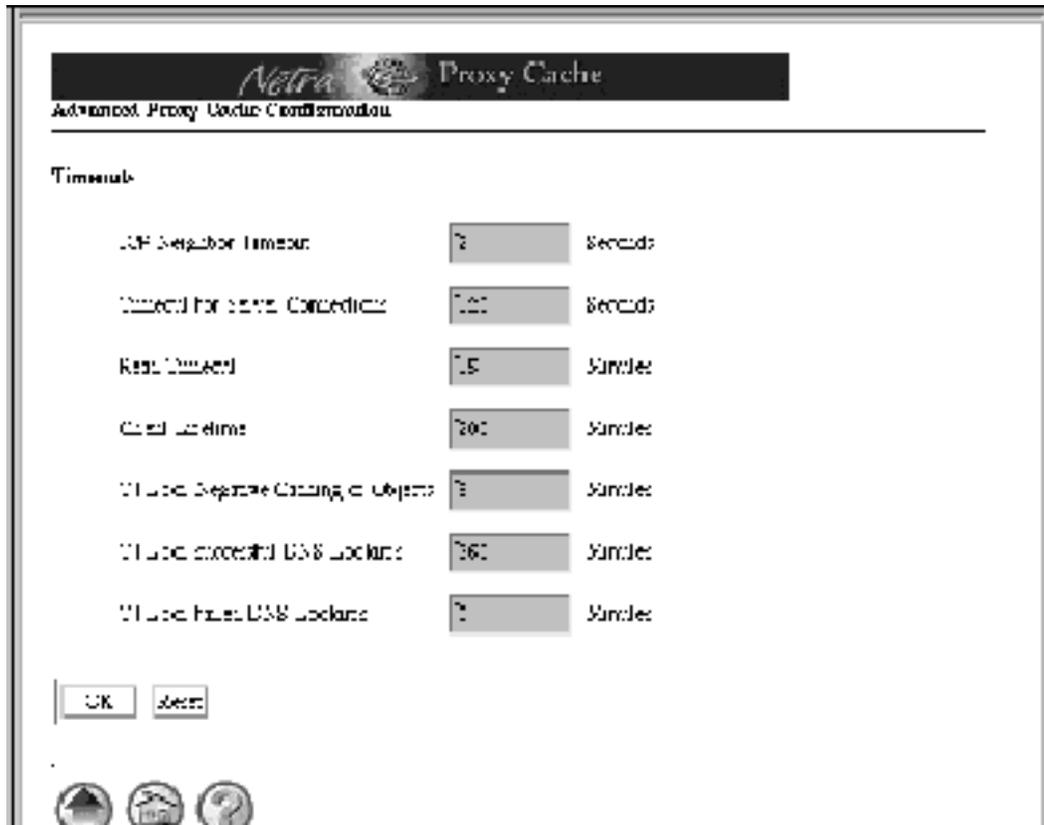
Time of Day for GC (HH:MM:SS)

Enables you to schedule garbage collection at an off-peak time. Time is expressed on a 24-hour clock. For example, if you want garbage collection to occur at 3:30 AM, enter 03:30:00.

Timeouts

▼ To View or Modify Timeouts

1. Click **Timeouts** in the **Advanced Proxy Cache Configuration** page. The page shown in **Figure 4-9** is displayed.



The screenshot shows the 'Advanced Proxy Cache Configuration' page for Netra Proxy Cache. The 'Timeouts' section is expanded, displaying the following settings:

Property	Value	Unit
UDP Separator Timeout	0	Seconds
Timeout for State Connections	100	Seconds
Read Timeout	15	Seconds
Connect Timeout	300	Seconds
UI Lock Separate Closing of Objects	0	Seconds
UI Lock successful USB Locking	360	Seconds
UI Lock failed USB Locking	0	Seconds

At the bottom of the configuration area, there are 'OK' and 'Cancel' buttons. Below the buttons are three small icons: a globe, a server rack, and a question mark.

Figure 4-9 Timeouts Properties

2. Under the **Timeouts** heading, enter or accept values for the following properties:

ICP Neighbor Timeout (sec)

The duration the Netra Proxy Cache Server waits for a response to an ICP query. Beyond the timeout you specify, the software gives up on the query target. The default value for this property is 2 seconds. You might consider increasing this value if the network connection between the local machine and a sibling is subject to delays.

Timeout for Server Connections (sec)

The maximum duration, in seconds, the server waits for a connection to be established. The default is two minutes. “Proxy Cache Connect Timeout and Parent Failover” on page 153 for a discussion of the relationship to this property to the operating system’s TCP connect timeout.

Read Timeout (min)

The duration beyond which the Netra Proxy Cache Server disconnects a connection on which no activity is occurring. The default value is 15 minutes.

Client Lifetime (min)

The maximum duration a client (browser) is allowed to remain connected to the cache process. This timeout prevents clients that go away without shutting down from consuming software resources. The default 200 minutes (3 hours, 20 minutes). If you have high-speed client connectivity or occasionally run out of file descriptors, you might want to reduce the default number.

TTL for Negative Caching of Objects (min)

The server caches the fact that a cache request failed (for example, the object identified by a specified URL cannot be found). This negative caching lasts for the number of minutes specified for this property. The default is five minutes.

TTL for Successful DNS Lookups (min)

The server caches the result of a successful host name lookup for the duration specified for this property. The default is six hours. Note that the proxy cache service does not observe the TTL specified in a DNS record.

TTL for failed DNS Lookups (min)

The server can cache the fact that a host name lookup failed. The default is zero minutes, which means that, by default, the server does not perform this type of negative caching.

Log File Options

▼ To View or Modify Log File Options

1. Click **Log File Options** in the **Advanced Proxy Cache Configuration** page. The page shown in **Figure 4-10** is displayed.

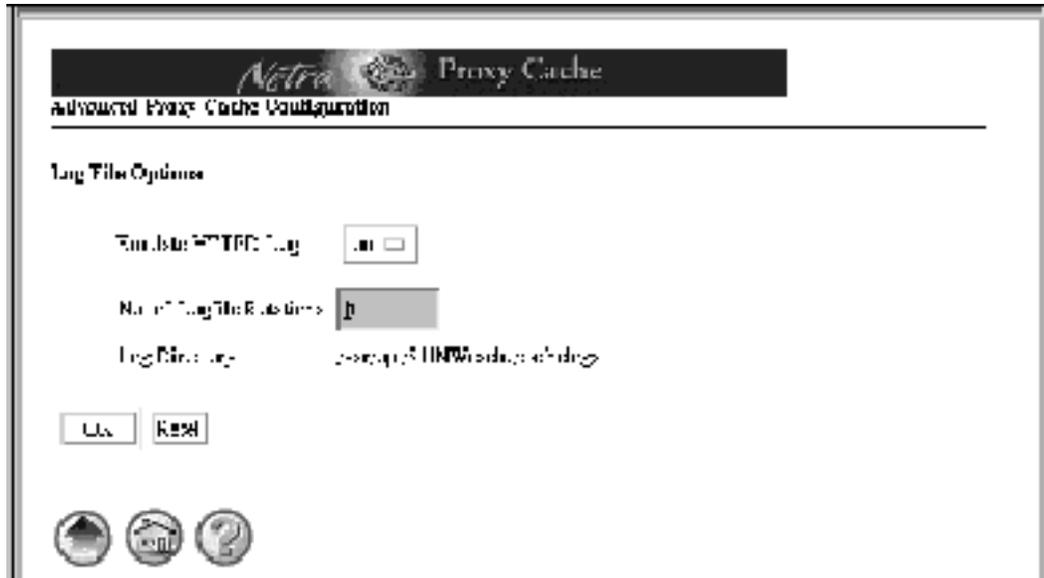


Figure 4-10 Logs File Options

2. Under the **Logs File Options** heading, enter or accept values for the following properties:

Emulate HTTPD Log

By default, the server emulates the log file format used by many HTTP servers. Accept the default of on or select off to turn this feature off.

No. of Logfile Rotations

Specifies the number of log file rotations the server performs upon receipt of a signal from an application such as the `rotlog` program. With the default of 10, the software creates log files with extensions from 0 through 9. Set this property to 0 to turn off log file rotation. See “Managing Proxy Cache Service Log Files” on page 133 for a description of `rotlog`.

Log Directory

You do not have the option to change the default log-storage directory, `/var/opt/SUNWcache/cachelogs`, in the current release.

Web Server Accelerator Options

▼ To View or Modify Web Server Accelerator Options

1. **Click Web Server Accelerator Options in the Advanced Proxy Cache Configuration page. The page shown in Figure 4-11 is displayed.**

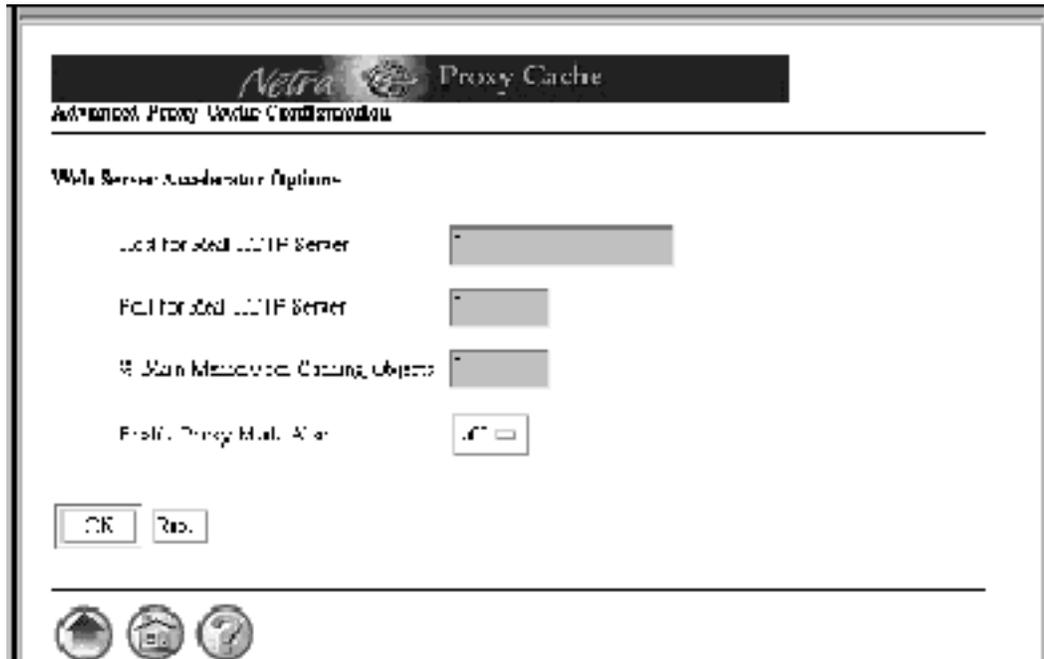


Figure 4-11 Web Server Accelerator Options Page

2. Under the **Web Server Accelerator Options** heading, enter or accept values for the following properties:

Host for Real HTTP Server

The Netra Proxy Cache Server can act as a front end for an HTTP server. This function is sometimes referred to as an *HTTP accelerator*. This feature can be useful under the following conditions:

- If the Netra Proxy Cache Server is more powerful or more highly available than the HTTP server.
- If the HTTP server is connected to a slow network, while clients have relatively fast connectivity to the Netra Proxy Cache Server. The Netra Proxy Cache Server hides the effects of the slow link.
- If the HTTP server is vulnerable to attack. The Netra Proxy Cache intercepts all requests. Also, you can set up an access list to limit the effect of an attack

A potential disadvantage of this feature is that the HTTP server does not have available the source IP address of clients.

Enter the fully-qualified hostname of the server for which the Netra Proxy Cache Server is acting as a front end.

Port for Real HTTP Server

The HTTP port on the server for which the Netra Proxy Cache Server is acting as a front end. (See preceding property.)

% Main Memory for Caching Objects

Percentage of memory used for keeping a number of web objects. If you are using the Netra Proxy Cache Server as a front end for an HTTP server, it is recommended you use a value of 12.5 (percent).

Enable Proxy Mode Also

This property determines whether a Netra Proxy Cache Server is acting as a front end, caching only the URLs of the HTTP server being “accelerated” or caches URLs from all web servers. Accept the default value of off or select on to enable caching of URLs from all servers.

External Program Options

▼ To View or Modify External Program Options

1. **Click External Program Options in the Advanced Proxy Cache Configuration page. The page shown in Figure 4-12 is displayed.**

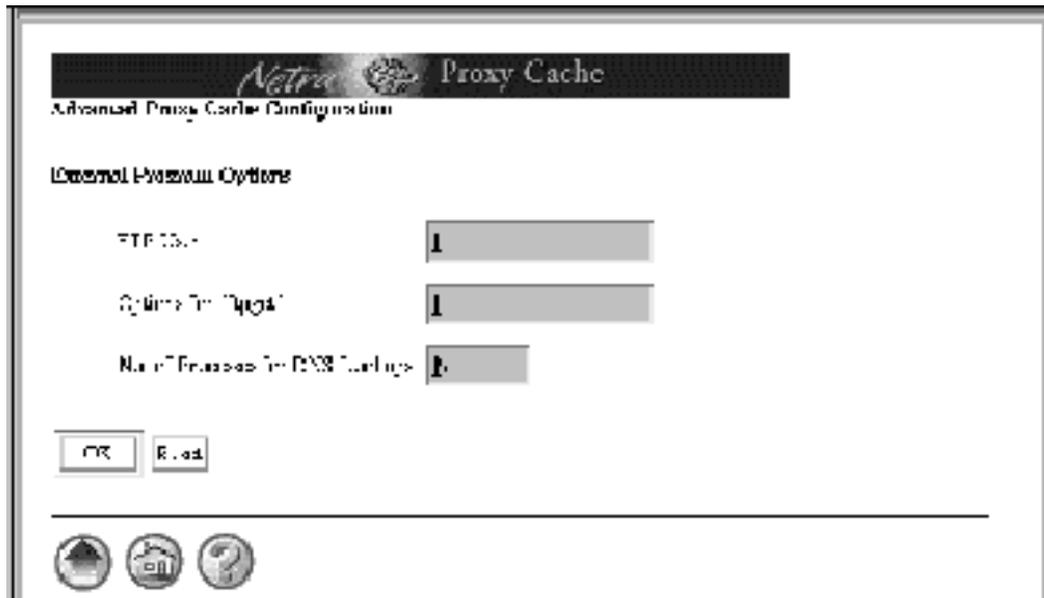


Figure 4-12 External Program Options Page

2. Under the **External Program Options** heading, enter or accept values for the following properties:

FTP User

The string supplied as the login password for anonymous ftp. This enables you to supply an informative address, if you want.

Options for 'ftpget'

The arguments supplied to the ftpget command. The ftpget command retrieves FTP data for the cache. HTTP and Gopher protocol support are built into the proxy cache software. To view a list of valid ftpget arguments, invoke /opt/SUNWcache/lib/ftpget, with no arguments.

No. of Processes for DNS Lookups

Number of processes spawned by the Netra Proxy Cache Server to service DNS name lookups. This number indicates the maximum number of concurrent DNS lookups. On heavily loaded caches, you might want to increase the this value from a default of 5 to 10. The maximum is 32.

Advanced Array Configuration

- “Viewing and Modifying Advanced Array Configuration Properties” on page 57
- “Networks” on page 59
- “Proxy Cache” on page 60
- “DNS” on page 61

This chapter explains how to perform advanced array configuration. The chapter assumes you have completed configuration of your Netra Proxy Cache Array, as described in the *Netra Proxy Cache Array Configuration Guide*. Consult that document for a description of *service network*, *control network*, *multicast address*, and other array-related concepts.

Viewing and Modifying Advanced Array Configuration Properties

You view or modify advanced array configuration properties in the Advanced Array Configuration page. You reach this page through the Proxy Cache Administration page. See Chapter 3, “[Proxy Cache Administration](#),” for instructions on loading this page.

▼ To View or Modify Advanced Array Configuration Properties

1. **In the Proxy Cache Administration page, click Advanced Array Configuration.**
The Advanced Array Configuration page, shown in Figure 5-1, is displayed.

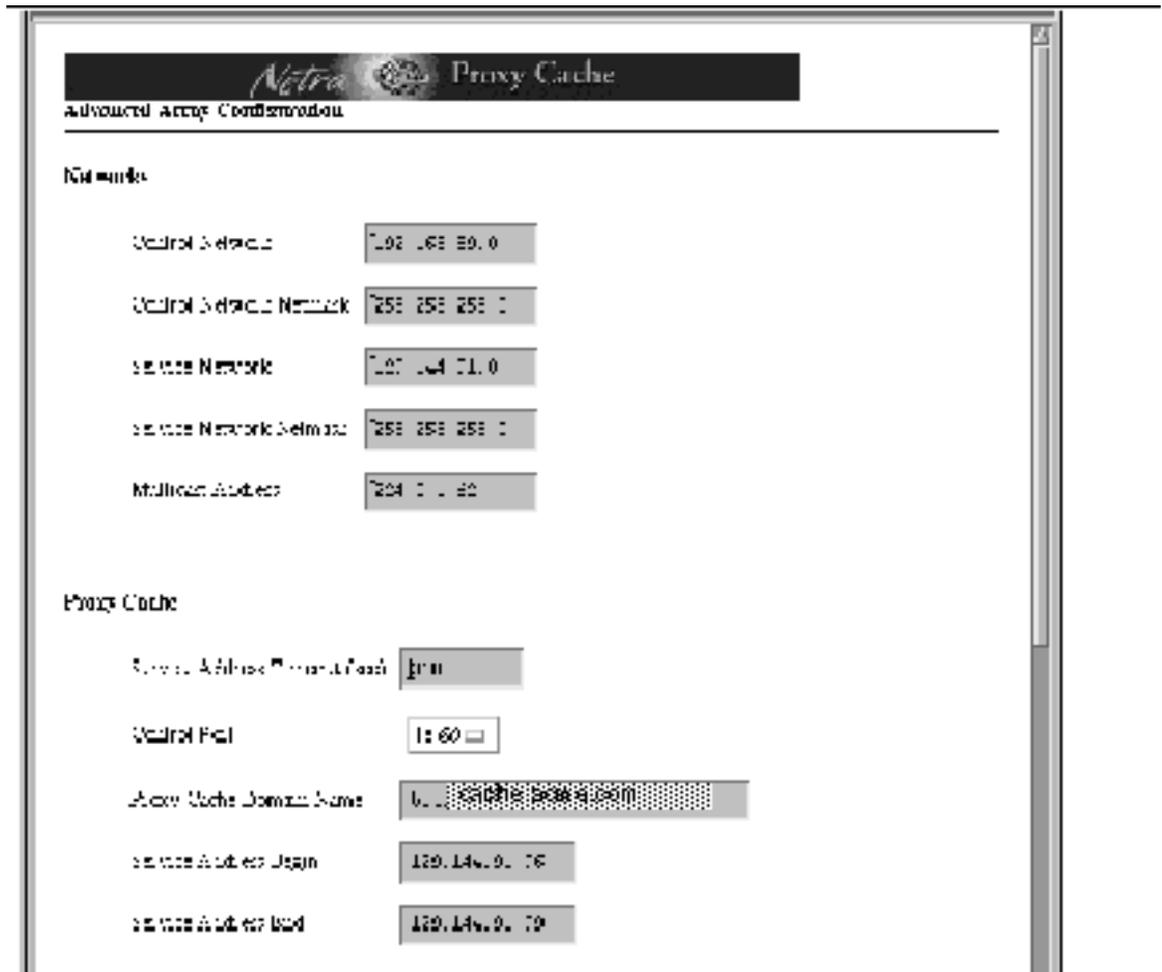


Figure 5-1 Advanced Array Configuration Page (Top)

2. In the page shown in Figure 5-1, view or make changes to the value of a property.

Most properties have editable fields. Two have pulldown menus.

3. At the bottom of the category page, click OK.

A page is displayed indicating the success or failure of your change. If a change fails, the page is redisplayed with the error indicated. Correct the error and click OK again. With some errors a new page, containing an error message, is displayed. If this occurs, click the Back button on your browser to return to the category page.

If you click Reset, the values for the properties on the page revert to what they were when you first loaded the page.

4. **After a successful change, click the up-arrow icon to return to the Proxy Cache Administration page.**

Alternatively, you can click the home icon to return to the Netra Main Administration page.

5. **If you make *any* changes to advanced array properties, you must use the Install Configuration function to install the changes on all machines in the array. You access this function by clicking the Install Configuration link in the Proxy Cache Administration page.**

See the *Netra Proxy Cache Array Configuration Guide* for instructions on the use of the Install Configuration function.

The remainder of this chapter is a description of the advanced array properties.

Networks

▼ To View or Modify Advanced Array Configuration Properties (Networks Category)

1. **Under the Networks heading (see Figure 5-1), enter or accept the values for the following properties:**

Control Network

The subnet number of the control network, expressed in dotted-decimal notation. The host portion of the address is expressed in one or more zeroes. We suggest the use of one subnet from 10.0.0.0 or 192.168.89.0, ideally one not used by anyone else in your organization. Keep in mind that the control network is a private network, distinct from the network over which a Netra Proxy Cache server interacts with clients. No packets are forwarded between control and service networks. Such traffic would be disruptive of array operation.

Netmask

The netmask of the control network. It is recommended you use 255.255.255.0.

Service Network

The subnet number of the service network, expressed in dotted-decimal notation. Express the host portion of the address in one or more zeroes. The service network is the network over which the Netra Proxy Cache server interacts with clients. This address is the subnet portion of the IP address you assigned to given Netra Proxy Cache server. An example of a valid Class B subnet address is 129.144.0.0; a Class C example is 195.144.168.0.

Netmask

The netmask of the service network. An example of a netmask for a network that subnets Class B addresses is 255.255.255.0.

Multicast Address

The multicast address used by array software to send heartbeat messages over the control network to all members of the array. The Internet Authority for Network Addresses (IANA) has assigned the multicast address 224.0.1.62 to the Netra Proxy Cache server product. It is recommended that you use this address. If the default address is already in use, you need to select another multicast address. It is suggested that you use `snoop (1M)` to ensure that an address you choose is not already in use.

Note - If you have more than one Netra Proxy Cache array on the same subnet, use different multicast addresses for the different arrays. The array software uses the service network for a redundant multicast. Using different multicast addresses to distinguish arrays is less prone to conflict than is using the same multicast address with different port numbers. (See the Control Port property, below.)

Proxy Cache

▼ To View or Modify Advanced Array Configuration Properties (Proxy Cache Category)

1. Under the **Networks** heading (see Figure 5-1), enter or accept the values for the following properties:

Service Address Timeout (sec)

A Netra Proxy Cache array maintains a proxy cache service at a given service address in the event of host failure(s). However, if the original owner of a service address has not reclaimed its address after some extended period (604800 seconds, or 7 days, by default), the Netra Proxy Cache software assumes that the proxy cache

service will no longer be offered at that address and removes the address from the list of service addresses in the Netra Proxy Cache array. The default value cited above is probably appropriate for most installations.

Control Port

The port number the array software uses for multicast messages associated with the proxy cache service. The software uses the combination of the multicast address (mentioned above) and a port number for listening for multicast messages. By default, the software uses a port number of 1860, which has been registered with the IANA for use with the Netra Proxy Cache product. You can select port numbers other than 1860 from the pulldown menu. However, only 1860 has been registered with the IANA.

Service Address Begin and Service Address End (optional)

The array software enables you to specify a range of service addresses that are disabled at startup. Service addresses are then assigned to hosts through normal array activity. By disabling addresses at startup, the Netra Proxy Cache Array starts with a clean slate and prevents the possibility of an incorrect address assignment that might linger following abnormal termination of one or more hosts in the array. Use of this feature requires that your service addresses are in a consecutive range; for example, 129.144.102.1, 129.144.102.2, and 129.144.102.3.

DNS

▼ To View or Modify Advanced Array Configuration Properties (DNS Category)

1. **Scroll down the Advanced Array Configuration page, so that the DNS properties come into view, as shown in Figure 5-2.**

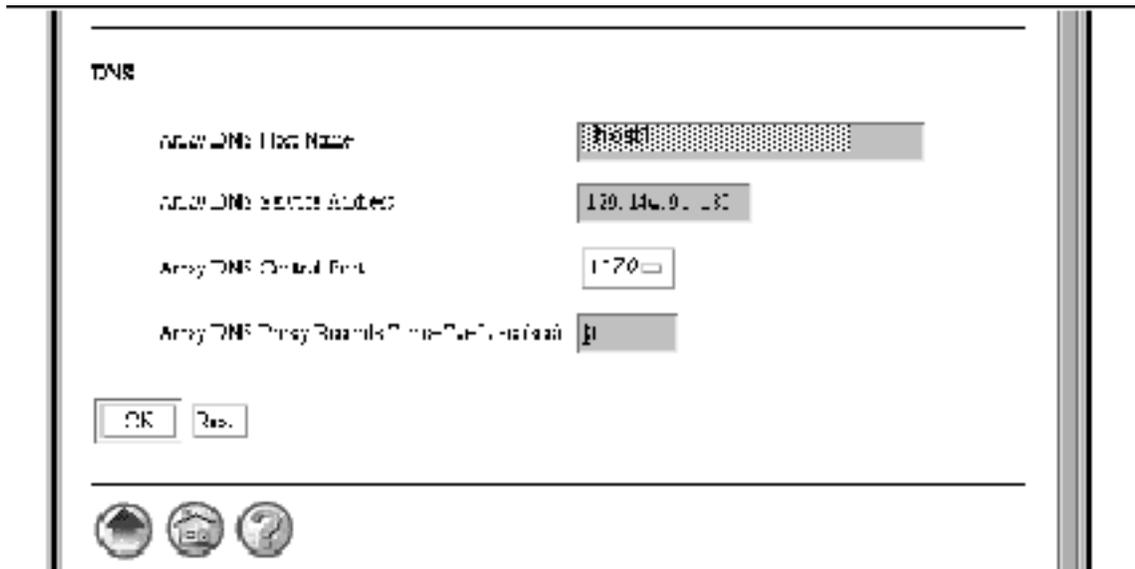


Figure 5-2 Advanced Array Configuration Page (DNS Properties)

2. Under the DNS heading, enter or accept values for the following properties:

Array DNS Host Name

The host in the array that will act as DNS server for the subdomain formed by the array. The choice of which machine is arbitrary. It is strongly recommended that you use your administrative host as DNS primary host. For the DNS, all of the other hosts in the array act as hot spares for the machine you specify here.

Array DNS Service Address

The service address of the DNS on the DNS primary host. This address must have the same subnet number as a host's IP address (that is, the address associated with a machine's hostname), and its proxy cache service address.

Array DNS Control Port

The port number the array software uses for multicast messages associated with the DNS. See description of Control Port property, above. The default port number, 1870, is registered with the IANA.

Array DNS Proxy Records Time-To-Live (sec)

By default, the array DNS host records host entries with a TTL of 30 seconds. This value is appropriate if the DNS server that clients use to resolve the name of proxy cache subdomain uses round-robin (the recommended configuration). If this DNS

server does not use round-robin, the default value of 30 seconds will diminish the effectiveness of the load balancing within the array. In such a case, we recommend a low TTL such as 3 seconds.

Advanced Array Member Configuration

This chapter explains how to perform advanced array member configuration. The chapter assumes you have completed configuration of your Netra Proxy Cache Array, as described in the *Netra Proxy Cache Array Configuration Guide*.

You view or modify advanced array member configuration properties in the Advanced Array Configuration page. You reach this page through the Proxy Cache Administration page. See Chapter 3, " for instructions on loading this page.

The advanced array member configuration pages differ from the basic array member configuration page in the following ways:

- The basic page enables you to add an array member; the advanced pages do not.
- The advanced pages enable you to delete a member from the array; the basic page does not.

Advanced Array Member Configuration Page

The advanced array member configuration page enables you to change the host address, control address, and service address for any member of the array. The page also enables you to remove a host from an array.

▼ To View or Modify Advanced Array Member Configuration Properties

1. In the Proxy Cache Administration page, click **Advanced Array Configuration**.
The Advanced Array Configuration page, shown in Figure 6-1, is displayed.



Figure 6-1 Advanced Array Member Configuration Page (All Array Members)

2. In the page shown in Figure 6-1, click the host name or the icon for the host you want to modify or remove from the array.
A page such as that shown in Figure 6-2 is displayed.

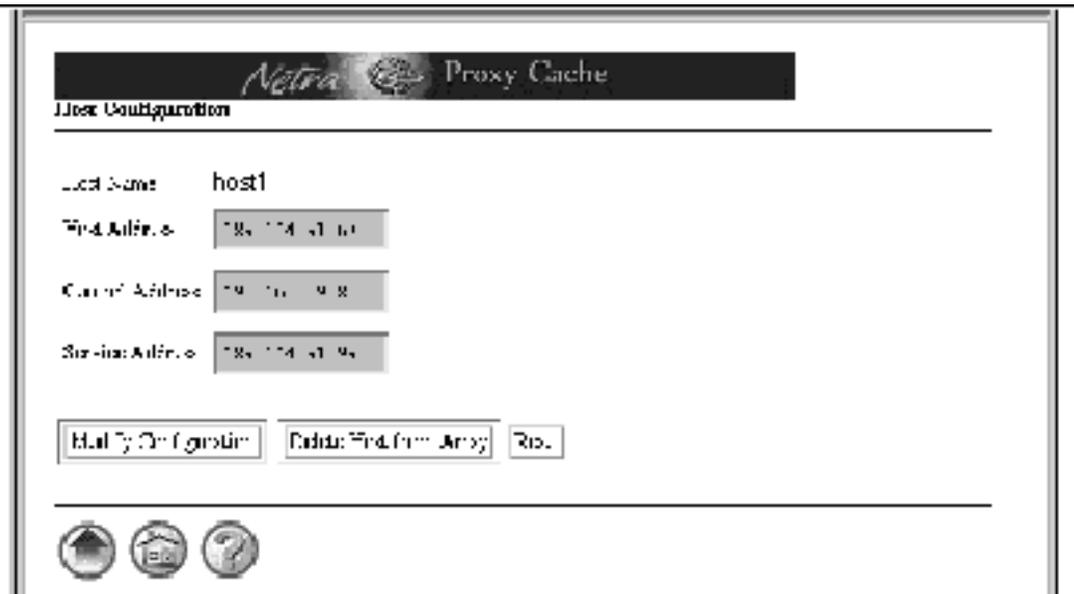


Figure 6-2 Advanced Array Member Configuration (Individual Member)

3. **Make any changes you want to the addresses listed and click Modify Configuration, or click Delete Host from Array to remove the host.**

The host, control, and service addresses are described in the *Netra Proxy Cache Array Configuration Guide*.

If you made a modification, a page is displayed indicating the success or failure of your change. If a change fails, the page is redisplayed with the error indicated. Correct the error and click OK again. With some errors a new page, containing an error message, is displayed. If this occurs, click the Back button on your browser to return to the category page.

If you clicked Delete Host from Array, a page asking you for confirmation is displayed. Click OK to confirm removal of the host from the array, or click the up-arrow or home icon to change pages.

The confirmation page reminds you that, in addition to removing the host from the array, you must shut down the proxy cache service on the host being removed.

If you click Reset, the values for the properties on the page revert to what they were when you first loaded the page.

4. **After a successful change or deletion, click the up-arrow icon to return to the Proxy Cache Administration page.**

Alternatively, you can click the home icon to return to the Netra Main Administration page.

5. If you make *any* changes to advanced array members properties, you must use the **Install Configuration** function to install the changes on the machine(s) whose configuration was changed. You access this function by clicking the **Install Configuration** link in the **Proxy Cache Administration** page.

See the *Netra Proxy Cache Array Configuration Guide* for instructions on the use of the Install Configuration function.

SNMP Configuration

This chapter explains how to perform SNMP configuration for the proxy cache service and array software that are part of the Netra Proxy Cache product. The chapter assumes you have completed configuration of your Netra Proxy Cache Array, as described in the *Netra Proxy Cache Array Configuration Guide*.

The SNMP Configuration page enables you to change defaults associated with the SNMP agents shipped with the Netra Proxy Cache product. The Netra Proxy Cache software's support for SNMP enables you to use a SNMP-conformant management platform to monitor your Netra Proxy Cache Array or Server.

See Chapter 16," for a description of the MIBs shipped with the Netra Proxy Cache product.

Viewing and Modifying SNMP Properties

You view or modify SNMP configuration properties in the SNMP Configuration page. You reach this page through the Proxy Cache Administration page. See Chapter 3," for instructions on loading this page.

▼ To Configure SNMP Properties

1. **In the Proxy Cache Administration page, click the SNMP Configuration link.**
The SNMP Configuration page is displayed, as shown in Figure 7-1.

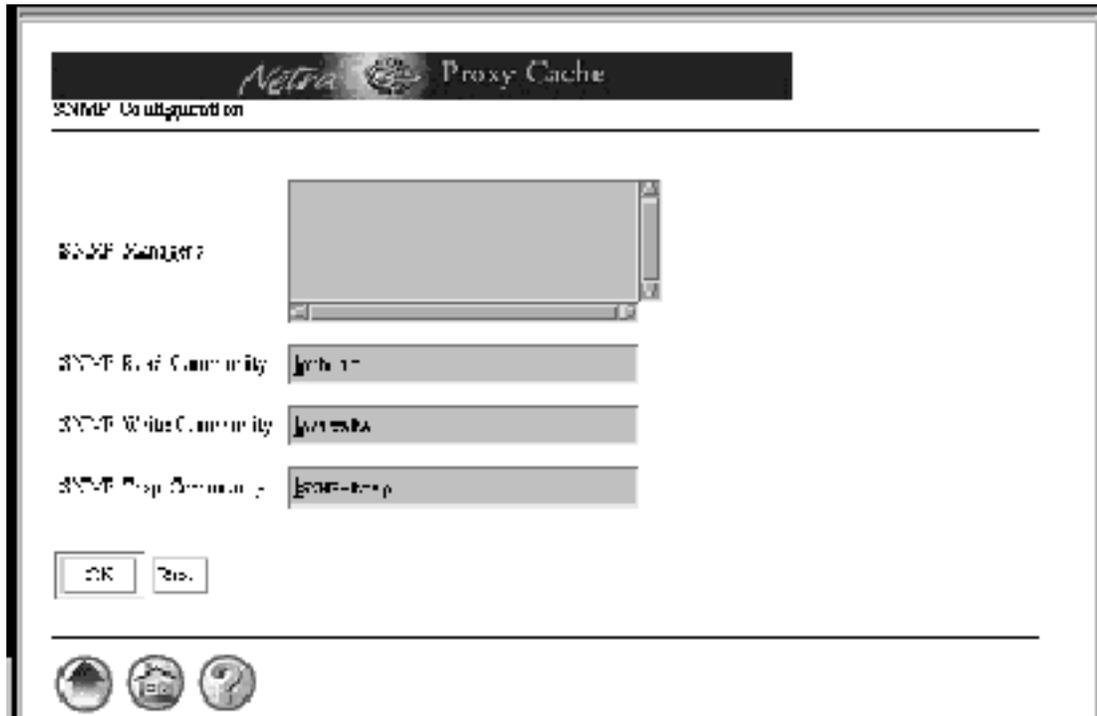


Figure 7-1 SNMP Configuration Page

2. In the SNMP Configuration Page, add the hostname(s) of machines that are to receive SNMP traps.

In the current release host names can not contain a . (period) and, therefore, cannot contain a domain name.

3. Enter values or accept defaults for the following fields:

- SNMP Read Community
- SNMP Write Community
- SNMP Trap Community

4. Click OK.

A page is displayed indicating the success or failure of your change. If a change fails, the page is redisplayed with the error indicated. Correct the error and click OK again. With some errors a new page, containing an error message, is displayed. If this occurs, click the Back button on your browser to return to the SNMP Configuration page.

Local Area Network Administration

- “Local Area Network Requirements” on page 71
- “LAN Procedures” on page 72

This chapter describes how to configure the local area network (LAN) interfaces on the Netra Proxy Cache Server using the Local Area Network module.

Local Area Network Requirements

A network interface consists of three elements:

- Network Port

The network port provides the physical link between machines that comprise a network. Ports can be built into the Netra server, or they can be provided by PCI cards in the server. The Netra server supports Fast Ethernet 100 BASE-T (hme).

- Network Protocol

The network protocol defines the communication that travels over the network. The Netra server supports the TCP/IP network protocols. The TCP/IP protocol suite supports the definition of multiple interfaces for a network hardware port and network protocol.

- Interface Definition

The interface definition is the configuration information that is specific to the Netra server. For example, the Netra server requires host addresses for TCP/IP interfaces.

LAN Procedures

The Netra server cannot be administered from a remote client without first defining the network interface.

Note - It is strongly recommended that you not make any changes to the service network (hme0) or control network (hme1) interfaces. If you do make changes to these interfaces, make them in the Proxy Cache Administration page. Such changes are reflected in the Local Area Network Administration page. If you make any changes to the service network (hme0) or control network (hme1) interfaces in the LAN Administration page, you must make corresponding changes to your array and array member configuration in the Proxy Cache Administration page.

Adding a Network Interface

▼ To Add a Network Interface

1. Choose Network Connection Administration: Local Area Network.

The Local Area Network Administration page is displayed with a list of network interface hardware to configure.

2. Choose Add a TCP/IP Interface.

An administration page for the TCP/IP interface is displayed.

3. Type the information in the form using Table 8-1.

TABLE 8-1 Information Required to Add an Interface

Host Address/	The host address or host name for the network interface.
Host Name	This address should not be on the same network as any other configured interface. Example: 129.144.79.5 The host name is valid if it has been entered in the local name service. See Chapter 9," for more information.
Netmask	The netmask address that determines the network with which the host address is associated. Example: 255.255.255.0

Modify a Network Interface

▼ To Modify a Network Interface

1. Choose Network Connection Administration: Local Area Network.

The Local Area Network Administration page is displayed with a list of network interfaces to configure.

2. Choose Modify a TCP/IP Interface.

An administration page is displayed with existing configuration information for the chosen interface.

3. Make the changes in the form using Table 8-1.

Delete a Network Interface

▼ To Delete a Network Interface

1. Choose Network Connection Administration: Local Area Network.

The Local Area Network Administration page is displayed with a list of network interfaces to delete.

2. Choose Delete for the interface to be removed; then confirm the operation.

Note - If you remove the interface by which your browser is connected to the server, you can longer perform administrative procedures. If the server has other network interfaces through which you can use your browser to connect to the server, you can use such an interface to continue administration of the machine. If there are no remaining interfaces, you lose the ability to connect using a browser and have to rely on a serial connection, as described in Appendix A of the *Netra Proxy Cache Server Configuration Guide* or *Netra Proxy Cache Array Configuration Guide*.

Name Service Administration

- “Name Services Used by the Netra Proxy Cache Server” on page 76
- “Domain Name Service Background” on page 76
- “Options for Resolving Names” on page 77
- “Name Service Procedures” on page 78

Note - This chapter discusses the alternatives available for the resolution of the name of the Netra Proxy Cache Server or Array. This name service resolution is independent of the activity of the Domain Name Service (DNS) within a Netra Proxy Cache Array.

The Netra Proxy Cache Server uses a name service whenever a URL is processed: the host name part of a URL is mapped to its address.

Every machine on a network, including the Internet, must have a unique identifier to distinguish itself from other machines on the network. Thus, every machine is given a *host address*. A host address has the form 129.144.79.5, where each of the four numbers separated by periods can be in the range of 0 to 255. Each machine is also given a *host name* that is associated with its host address. Users generally use a host name, such as `stimp.comedy.tv.net`, to access a specific machine on a given network.

The process by which a host name is translated to its host address is called *name resolution*. It is usually performed by a *name service*.

Name Services Used by the Netra Proxy Cache Server

The Netra Proxy Cache Server can use three types of name services:

- DNS: Translation is provided by a DNS server
- Local name service: Translation is done locally (by looking up the name in a file)
- Network Information Service (NIS): Translation is done by an NIS server (running on another host)

The Netra Proxy Cache Server can use any or all of the name services at the same time. If more than one name service is used, they are interrogated in the following order: local name service, NIS, DNS. For example, suppose the Netra server is configured to use the local name service and DNS. When a name service query is made, the server attempts name resolution by looking up the host name in the local database first. If the host name is found, the server returns the host address. If not, the query is passed to the DNS server. If the DNS server resolves the query, it returns the information, otherwise it returns “not found.”

Domain Name Service Background

DNS gives different groups responsibility for subsets of names. Each subset or level is called a domain. At the top level of the DNS hierarchy are a small number of large domains, such as `com` (for commercial organizations). Individual organizations set up their own domains within these domains (`sun.com`, `oracle.com`, `stanford.edu`). Domains, in turn, can have subdomains. Contact your ISP for a domain name, which they can register for a fee.

The host name of a system, together with its full domain specification, makes up a complete DNS name. For example, Figure 9-1 shows such a DNS name: `ren.comedy.tv.net`. The machine `ren` is a node residing in the subdomain `comedy` within the domain `tv`, which is in the domain `net`.

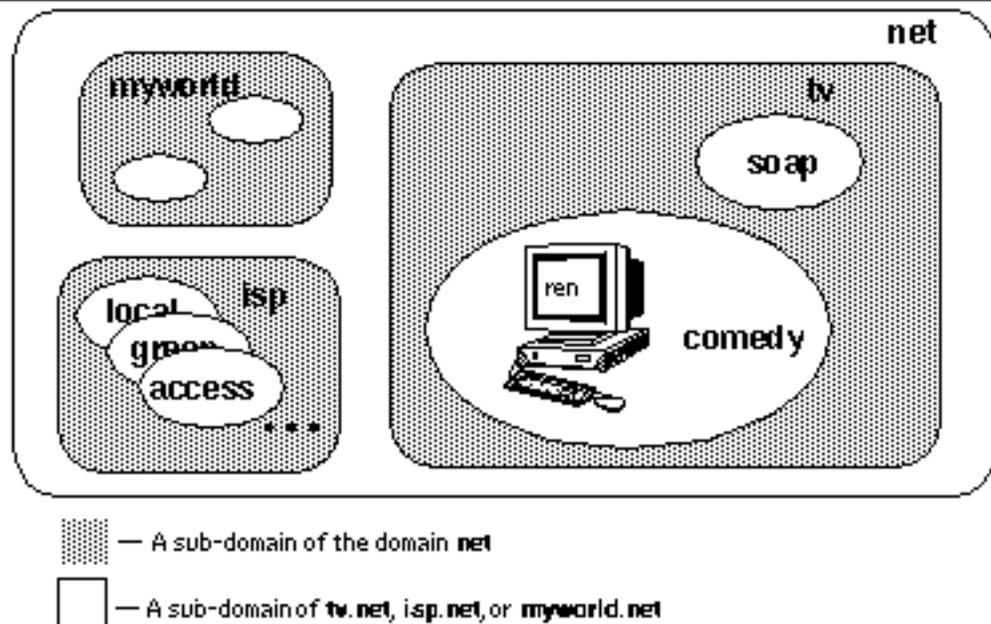


Figure 9-1 Example of DNS Domains

Every domain has two or more systems that keep a database of DNS names for that domain. These systems also contain the DNS names of the subdomains, unless this responsibility is delegated to systems in the subdomain. Thus, there are several systems that contain the database for the domain `net`. In that database, there is a delegation entry pointing to a system that keeps the database for `tv`. The DNS database for `tv` contains entries for delegating the domains `soap` and `comedy`. The database for `comedy` contains the host address for `ren`.

The DNS system of resolving names is strictly hierarchical. Using the previous example, the system that acts as the DNS server for the domain `tv` translates a host name to a host address only if that host name exists directly within the domain. All other host names are forwarded to the appropriate sub-domain for resolution. (Thus, the name `ren.comedy.tv.net` is forwarded from `tv`'s DNS server to the DNS server for the subdomain `tv` for resolution.

Options for Resolving Names

Using DNS to Resolve Names

To enable the use of DNS to resolve host names, the IP addresses of on or more DNS servers must be provided to the Netra Proxy Cache Server.

Local Name Service

The Netra Proxy Cache Server can use a local name service to resolve host names. In this case, the Netra server contains a list of host-name-to-host-address mappings for its own use. Unlike hostname/address pairs in a DNS database, the mappings specified by the local name service are only available to applications running on the Netra server. Information entered in the local database is automatically available to programs running locally.

Network Information Service

NIS provides name services and other information, such as users on the network, for a local network. If there is a NIS server on the network, use the Netra Name Service module to configure the Netra server to use NIS. This means that it uses NIS to resolve host names, host addresses and host aliases.

Name Service Procedures

DNS Administration

▼ To Configure the Netra Server to Use DNS

1. **Choose Network Services Administration: Name Service DNS (Domain Name System) Configure DNS Resolver.**

The DNS Administration page is displayed.

2. **Type the information in the form using Table 9-1.**

TABLE 9-1 DNS Client Information

DNS Domain Name	The DNS domain that is used to resolve partially qualified host names. Usually, this is the local domain name. Example: comedy.tv.net
Name Server 1	The host address of the DNS server that is tried first for all DNS queries. Example: 129.144.79.5
Name Server 2 (optional)	The host address of the DNS server to use, if the first name server is unreachable. Example: 129.144.79.6
Name Server 3 (optional)	The host address of the DNS server to use, if the first two name servers are unreachable. Example: 129.144.102.6

▼ To Modify DNS Resolver Configuration

1. **Choose Network Services Administration: Name Service DNS (Domain Name System) Modify DNS resolver.**
The DNS Administration page is displayed.
2. **Make the changes in the form using Table 9-1.**

▼ To Delete A DNS Configuration

1. **Choose Network Services Administration: Name Service DNS (Domain Name System) Delete DNS resolver.**
The Delete DNS Administration page is displayed.
2. **Click OK to confirm the operation.**

Local Name Server Administration

▼ To Configure the Netra Server to Use a Local Name Server

1. **Choose Network Services Administration: Name Service Local Name Service.**
The Local Name Service Administration page is displayed.
2. **Type the information in the form using Table 9-2.**

TABLE 9-2 Host Name and Address

Host Addresses/ Host Names/ Aliases	The host addresses and corresponding host names and aliases. The host names may be partially or fully qualified to be compatible with other name services. However, this database only resolves host names that have an exact match in the database. Example: <i>stimp</i> y only matches <i>stimp</i> y, not <i>stimp</i> y.comedy.tv.net. Maximum 2000 records.
---	---

NIS Administration

▼ To Configure the Netra Server to Use NIS to Resolve Names

1. **Choose Network Services Administration: Name Service NIS (Network Information Name Service).**
The NIS Administration page is displayed.
2. **Type the information in the form using Table 9-3.**

TABLE 9-3 NIS Domain Name

NIS Domain Name	The NIS domain in which the Netra server resides.
-----------------	---

▼ To Modify or Unconfigure an NIS Domain Name

Note - The Modify and Unconfigure options are only displayed when the Netra server is configured as an NIS client.

1. **Choose Network Service Administration: Name Service NIS (Network Information Name Service).**
2. **Choose one of the following:**
 - To modify an NIS domain name, choose Modify, type a new NIS domain name, and confirm the operation.
 - To unconfigure an NIS domain name, choose Unconfigure NIS, and confirm the operation. The Netra server no longer uses NIS to resolve host names, and the NIS domain name is ignored.

Note - You must reboot the server if you make changes to your NIS configuration.

Routing Administration

- “Netra System Router Alternatives” on page 83
- “Routing Procedures” on page 84

This chapter describes how to configure the Netra Proxy Cache Server as a router.

Note - You cannot configure a host in a Netra Proxy Cache Array as a router in its standard configuration, in which the second network interface (`hme1`) is reserved for the use of the control network. To enable support for routing, you must add an additional network interface to the server. If you do this, you must take care that no packets are forwarded over the control network interface.

Routing is the mechanism by which systems on different networks can communicate with each other. Each network usually has at least one system called a router. A *router* is a system that is connected to multiple networks; it maintains information that defines routes between host systems and networks.

Netra System Router Alternatives

With the addition of one or more network interfaces, the Netra system can be configured as one of the following:

- A dynamic router
- A static router
- Not a router (the default)

Dynamic Router

A *dynamic router* relies on information broadcast from other routers to update its routes and reflect changes in the network topology. It also broadcasts this information to other dynamic routers.

Dynamic routers are typically required when systems act as gateways between networks or within large networks where route information is constantly changing. The Netra server supports the following dynamic routing protocols:

- The Xerox NS Routing Information Protocol (RIP)
- The Internet Control Message Protocol (ICMP) router discovery protocol

If client host systems are required to use the dynamic router, they must either run programs that can communicate using these protocols or they must specify the dynamic router as a default router.

Static Router

A *static router* relies on the manual addition of routes. Routing information is not exchanged with other routers.

Static routers are typically used in very stable, simple networks.

If machines on the LAN require a static router, it must be specified as a default router.

Not a Router

A non-gateway system need not be a router in networks that already have dynamic routers. The Netra server listens for dynamic routers to broadcast route information using the RIP and the ICMP router discovery protocols.

Routing Procedures

Static Router

▼ To Configure the Netra System as a Static Router

1. **Choose Network Connection Administration: Routing > Configure static router.**
The Static Router Administration page is displayed.

2. Type the information in the form using Table 10-1.

TABLE 10-1 Information Required for Static Routing

Default Router Host Address	Host address of the default router for the network.
Destination Network/Host Address	Network/Host address to which information is routed.
Router Host Address	Host address of the router used for accessing the destination address.
Hop Count	A value of 0 or greater. 0 means the Netra server is the router; a value greater than 0 means that another system is the router.

▼ To Modify a Static Router

1. Choose Network Connection Administration: Routing Modify static router.
2. Make the changes in the form using Table 10-1.

Note - In certain Solaris versions, there is a complication for setting the destination address of a subnetwork with a trailing non-zero digit. To construct a network gateway on a non-zero subnetwork, the `/etc/init.d/inetinit` file must be manually edited to contain the information in the following form:

```
route add net 194.125.10.32 194.125.10.2 1 -netmask 255.255.255.224
```

The addresses shown above are for example only.

Dynamic Router

▼ To Configure the Netra System as a Dynamic Router

1. **Choose Network Connection Administration: RoutingConfigure dynamic router.**
The Dynamic Router Administration page is displayed.
2. **Type the information in the form using Table 10-2.**

TABLE 10-2 Information Required for Dynamic Routing

Destination Network/ Host Address	Network/Host address to which information is routed.
Gateway Host Address	Host address of the gateway used for accessing the destination address. If the router is unreachable when this form is configured then it is not used for routing until dynamic routing is reconfigured or the Netra system is restarted.
Hop Count	A value of 0 or greater. 0 means the Netra server is the router; a value greater than 0 means that another system is the router.
Status	Active or Passive. Gateways marked active are removed from the routing information if they become inaccessible. Gateways marked passive are part of the routing information until explicitly removed. Routes to passive gateways are also not broadcast to the other systems on the network.
Dynamic Routing Information over Point-to-Point Links?	Enables or disables RIP over PPP links. Choices: Yes or No

▼ To Modify a Dynamic Router

1. **Choose Network Connection Administration: Routing > Modify dynamic router.**
2. **Make the changes in the form using Table 10-2.**

Not a Router

▼ To Configure the Netra System as Not a Router

Note - Once the Netra server is already configured as “not a router,” this option is not displayed.

1. **Choose Network Connection Administration: Routing > Turn off routing; then confirm the operation.**

By default, the Netra Proxy Cache Server is not a router.

Administration Web Server

- “Setting the Administration Password” on page 89
- “Controlling Host Access” on page 90

The Administration Web Server serves the administration pages through which the Netra administration modules are configured. To protect the Netra Proxy Cache Server from unauthorized users, access to the Web server is protected through a password (obligatory), and an access list (optional). If an access list is specified, connections from machines that are not on the list are refused. Connections from machines on the list are permitted access, provided the user knows the password.

The account name for the Administration Web Server is `setup`. When you click the Administration link the Netra Welcome page, you are prompted for user name (`setup`) and password.

The Administration Web Server module enables the user to change the password and edit the access list.

Setting the Administration Password

▼ To Set the Administration Password

1. **Choose Security Administration: Administration Web Server Change Administration Password.**

The Administration Password page is displayed.

2. Type the information in the form using Table 11-1.

TABLE 11-1 Information Required for Changing Administration Password

Current Administration Password	The existing administration password. The administration password for an unconfigured Netra system is <code>setup</code> . A password can be a combination of any characters.
New Administration Password	A new password that is used to access the Netra server. The password is not echoed as it is typed. If the existing password is changed, the browser has to be reauthenticated using the new password.
Re-enter New Administration Password	A repetition of the new administration password. Because the password is not echoed as it is typed, it is verified by typing it a second time.

3.

Controlling Host Access

▼ To Control Host Access

1. **Choose Security Administration: Administration Web Server Modify Host Access Control.**

The Host Access Administration page is displayed.

2. **Choose one of the following:**

- All hosts are allowed access.
- Specified host and network addresses are allowed access.

Type the address of the hosts or networks (one per line) that are permitted access to the administration modules.

Root Password Administration

- “Superuser Account” on page 93
- “Setting the Root Password” on page 93

This chapter describes how to configure the superuser (root) password on a Netra Proxy Cache Server.

Superuser Account

On UNIX systems there is a privileged account for the superuser who unlike normal users, has access to all files and commands. The user name of this account is “root”, and it is used for system administration tasks that are not available to normal users. The Root Password module enables the user to change the password for the superuser.

Setting the Root Password

▼ To Set the Root Password

1. **Choose Security Administration: Root Password.**

The Root Password Administration page is displayed.

2. Type the information in the form using Table 12-1.

TABLE 12-1 Information Required for Root Password

Current Root Password	The existing root password for the Netra server. When the Netra server is unconfigured, there is no root password, so leave this field empty.
New Root Password	The root password for the Netra server.
Re-enter New Root Password	A repetition of the password used to access the Netra server. Because the password is not echoed as it is typed the first time, the user is required to verify it by typing it a second time.

3.

Note - By default, you can login as root only on the system console, which requires you have a serial connection to the server.

Netra System Administration

- “Audio” on page 95
- “Host Name” on page 96
- “Solaris Log Files” on page 97
- “Restart and Shutdown” on page 98
- “Save and Restore Configuration” on page 99
- “System Administrator Alias” on page 102
- “System Defaults” on page 102

This chapter describes the system administration modules accessible through the Netra Main Administration page.

Audio

Use the Audio module to adjust the volume for configuration messages and audio files that are played through the Netra system speaker.

The volume level is tested by playing a sample sound when the level is set.

▼ To Adjust the Audio Volume

1. **Choose System Administration: Audio.**
The Audio Administration page, showing the current volume, is displayed.
2. **Set the volume using Table 13-1.**

TABLE 13-1 Audio Settings

Audio Volume	An integer between 0 and 99, inclusive, where 0 = no sound 99 = maximum volume
Output Port	The destination of the audio output. Choose built-in speaker, line out, or headphone jack.
Play Sample Sound	Plays a sound at the chosen volume on the Netra system speaker. Choices: Yes, No

Host Name

Use the Host Name module to change the name of the Netra server.

▼ To Change the Host Name

- 1. Choose System Administration: Host Name.**
The Host Name Administration page is displayed.
- 2. Type the Netra server name. See Table 13-2.**

TABLE 13-2 Host Name

Host Name	The name by which the Netra server is known.
-----------	--

- 3. Restart the Netra server so that the new name is used.**

Note - If you change the host name of a host in a Netra Proxy Cache Array, you must also modify the array member configuration for that host. See Chapter 6, for instructions.

Solaris Log Files

Note - The log files described below are different from the proxy cache log files described in Chapter 17.”

Log files should be viewed and cleared periodically. The Log Files module gives access to the following:

- *Mail log*: Contains mail debug information
- *Message log*: Contains status on generic Solaris™ modules
- *Netra log*: Contains information posted by Netra administration modules (such as error conditions)
- *Super User Login log*: Records who logs in to the server as root
- *Administration Web Server Error log*: Records the times that the Administration Web Server was unable to deliver a page
- *Administration Web Server Access log*: Records all requests to the Administration Web Server

▼ To View or Clear Log Files

1. **Choose System Administration: Log Files.**
The Log Administration page is displayed.
2. **Choose one of the following options:**

- To look at a log file, Choose View.
- To remove a log file, Choose Clear; then confirm the operation.

Restart and Shutdown

Use the Restart and Shutdown module to restart or shutdown the Netra server.

If the Netra server is used by normal users, always try to notify them in advance if the system is to be shut down or restarted. All users that are logged in when the process is initiated receive messages on their terminals informing them that the system is about to be shutdown. If it is known that users are currently logged in on the server, it is best to specify a reasonable delay to give them time to close applications and log out.

▼ To Restart or Shut Down the System

1. Choose System Administration: Restart and Shutdown.

The Restart and Shutdown Administration page is displayed.

2. Type the information in the form using Table 13-3.

TABLE 13-3 Shutdown Information

Operation	Shutdown shuts down the Netra server. Shutdown and Power off shuts down and powers off the Netra server. Restart shuts down and then starts up the Netra server. Choice: Shutdown, Shutdown and Power off, or Restart.
Check for new devices during restart?	If "Yes" is chosen, the operating system regenerates the list of devices attached to the Netra server upon start-up. Select yes if adding or removing a tape drive, CD-ROM drive, external hard disk, or network interface hardware to the server. Choice: Yes or No.
Delay (in minutes)	The time, in minutes, after which the Netra server shuts down or restarts. Users who are logged on receive broadcast messages during the countdown that the system is about to shut down. Use 0 for immediate restart or shutdown.

3. Click the OK button to confirm the operation.

Save and Restore Configuration

The Save and Restore Configuration module enables:

- Saving a record of the current configuration of the Netra server to a diskette or to a file.
- Restoring the Netra server to a previous configuration using data which was saved to either media.

It is recommended that the system configuration be saved whenever it is changed. Doing so enables a return to this configuration state should it become necessary.

Save and Restore Options

The following options are available:

- *Eject diskette*: This option ejects a diskette from the drive.

- *Save configuration to diskette*: This option saves the current system configuration to the diskette in the drive. If an unformatted diskette is inserted, it is formatted as part of the save process.
- *Save configuration to file system*: This option saves the current system configuration to a file on the hard disk.
- *Restore configuration from diskette*: Either all or selected configurations on the diskette are restored to the Netra system.
- *Restore configuration from file system*: Either all or selected configurations on the hard disk are restored to the Netra system.

The Eject Diskette and Save Configuration to diskette options are only displayed on the form if there is a diskette in the drive. The Restore configuration from diskette option is only displayed if there is a diskette in the drive which contains valid Netra configuration information. The option Restore configuration from file system is only displayed if a Netra configuration state has previously been saved to a file on the hard disk.

After saving or restoring the system configuration to or from a diskette, the diskette is ejected at the end of the operation.

Note - Only saving to diskette removes the reminder to save your configuration, displayed on the Main Administration page.

Save and Restore Procedures

▼ To Eject a Diskette

1. **Choose System Administration: Save and Restore Configuration > Eject diskette.**

The Eject Diskette Administration page is displayed, indicating that the diskette has been ejected.

▼ To Save the System Configuration

1. **If saving the configuration to diskette, insert the diskette into the drive; otherwise proceed to Step 1 on page 95.**

Make sure the diskette is not write protected.

2. **Choose System Administration: Save and Restore Configuration.**

The Save And Restore Configuration Administration page is displayed.

3. **Choose either Save configuration to diskette or Save configuration to file system; then confirm the operation.**

▼ To Restore the System Configuration

1. **If restoring the configuration from a diskette, insert a diskette into the drive; otherwise proceed to Step 1 on page 95.**
2. **Choose System Administration: Save and Restore Configuration.**
The Save And Restore Configuration Administration page is displayed.
3. **Choose either Restore configuration from diskette or Restore configuration from file system.**
The Restore Configuration Administration page is displayed.
4. **Make the entries in the form using Table 13-4.**

TABLE 13-4 Restoring System Configuration

Restore entire configuration	Restores all configurations from the diskette/disk.
Restore selected configurations	Restores only the selected configurations from the diskette/disk. If this option is chosen, at least one configuration must also be chosen; if any configuration is chosen, this option must also be chosen.

Note - It is strongly recommended that you restore only your entire configuration.

System Administrator Alias

Use the System Administrator Alias module to create and maintain a list of people who receive mail addressed to the root user. Each recipient on the list must be a valid email address.

▼ To Set Up an Administrator Alias

1. **Choose System Administration: System Administrator Alias.**
The System Administrator Alias Administration page is displayed.
2. **Type the mail addresses of the alias members. See Table 13-5.**

TABLE 13-5 Alias Members

Alias Members	A list of users, one per line, who receive mail sent to root.
---------------	---

System Defaults

Use the System Defaults module to change the time zone of the Netra server.

Note - If the time zone or locale is changed, restart the Netra server so that the new information takes effect.

▼ To Set System Defaults

1. **Choose System Administration: System Defaults.**
The System Defaults page is displayed with the current time zone and locale.

There are lists from which time zone and locale are chosen. The current time zone and locale are highlighted.

2. Modify the information in the form using Table 13-6.

TABLE 13-6 Timezone Information

Default System Time Zone	The default time zone used by the Netra server.
Default System Locale	The default locale used by the Netra server.

Performing Administrative Tasks for the Proxy Cache Service and Array

- “Modifying Your Configuration” on page 105
- “Backing Up Your Configuration” on page 106
- “Restoring Your Configuration” on page 106
- “Adding and Removing Hosts” on page 107
- “Moving an Array” on page 108

This chapter describes additional configuration procedures not described in the *Netra Proxy Cache Array Configuration Guide* or the *Netra Proxy Cache Server Configuration Guide*.

The starting point for most performing most proxy cache- and array-related tasks is the Proxy Cache Administration page. See Chapter 3,” for instructions on bringing up this page.

Modifying Your Configuration

Use of the “basic” links in the Proxy Cache Administration page to modify your Netra Proxy Cache Server or Array configuration is the same as it is for first-time configuration, and is described in the *Netra Proxy Cache Array Configuration Guide* and the *Netra Proxy Cache Server Configuration Guide*.

Advanced configuration is described in Chapter 4 for the proxy cache service and Chapter 5 for array properties.

When making changes to proxy cache service or array properties, the significant points to keep in mind are:

- For a server, if you make any changes to the proxy cache service properties, you must install those changes before they take effect.
- For an array, if you make any changes to the proxy cache service or array properties, you must install those changes on all hosts in the array (including the administrative host).
- If you make any changes to an array member configuration, you must install the changes on the modified host.

You install changes using the Install Configuration link in the Proxy Cache Administration page.

Backing Up Your Configuration

You can backup your server or array configuration by using the Save/Restore link in the Netra Main Administration page. See Chapter 3 of the *Netra Proxy Cache Array Configuration Guide* or *Netra Proxy Cache Server Configuration Guide* for a detailed procedure.

Restoring Your Configuration

Assuming you have backed up your configuration to diskette (see preceding section), you can restore that configuration, to an individual server or to all of the hosts in your array. Use the Save/Restore link in the Netra Main Administration page.

If you suffer a complete failure, such as the loss of the hard disk from which you boot, follow the procedure in Appendix A.”

▼ To Restore a Proxy Cache Configuration

1. **Insert your backup diskette in the diskette drive of the host being restored.**
2. **In the Netra Main Administration page, click Save/Restore.**
3. **In the Save/Restore page, click Restore configuration from diskette.**

Adding and Removing Hosts

To add or remove a Netra Proxy Cache Server to or from your Netra Proxy Cache Array, use the following procedures.

▼ To Add a Host

1. **Connect the new host to the service and control networks.**
2. **Perform initial host configuration on the new host.**
See *Netra Proxy Cache Array Configuration Guide* for detailed instructions.
3. **Connect to the administrative host and perform basic array member configuration for the new host.**
Use the addresses chosen in Step 1 on page 106.
4. **Use the Install Configuration link to copy your array configuration to new the host.**

▼ To Remove a Host

1. **Using the Advanced array member configuration link in the Proxy Cache Administration page, remove the host from the array.**
See Chapter 6," for detailed instructions on removing an array member.
1. **In the Proxy Cache Administration page on the host to be removed, click Unconfigure proxy cache service.**

You can perform the preceding steps in either order.

1. **After performing the preceding steps, disconnect the machine from the service and control networks.**

Note that the service address originally associated with the removed host will remain available to existing clients for the duration specified in the service timeout property. See "Proxy Cache" on page 60 for a description of this property.

Moving an Array

You can move an array from one subnet to another. This means that all host addresses, proxy cache service addresses, and the DNS service address change. You can continue to use the same control addresses, both subnet and host. You can use any machine as your administrative host.

▼ To Move an Array

1. If you use a name service, register the new host addresses in the name service.
2. In the Proxy Cache Administration page on each host in the array, click **Unconfigure Proxy Cache**.
3. In the Netra Main Administration page on each host in the array, click on **Restart and Shutdown**, then click on **Shutdown** in the **Restart and Shutdown Administration** page.
4. Disconnect the array hosts from the service and control networks.
5. Connect the array hosts to the new subnet and reconnect the hosts to the control network.
6. Perform the TTY method for network interface configuration, as described in Section 2.3.1 of the *Netra Proxy Cache Array Configuration Guide*, on each host in the array.
7. Using a browser to connect to your administrative host, in the Netra Main Administration, change your host name (if the name is changing) and make any other required changes, such as name service configuration or time zone selection.
If any changes require a reboot, the Netra Main Administration page reminds you of this requirement. Use the Restart and Shutdown link to reboot your server.
8. In the Proxy Cache Administration page, complete proxy cache service and array configuration, as described in Chapter 3 of the aforementioned *Configuration Guide*.

Monitoring a Netra Proxy Cache Array and Proxy Cache Service

- “Proxy Cache and Array Monitoring Pages” on page 109
- “Array Status” on page 110
- “Host Status” on page 114
- “Proxy Cache Array Monitoring” on page 117
- “Proxy Cache Monitoring for Host” on page 119

This chapter explains how to monitor a Netra Proxy Cache Array through the Netra Administration web pages. You can also monitor the array through an SNMP-conformant management platform. This support is described in Chapter 16.”

Proxy Cache and Array Monitoring Pages

▼ To Invoke the Array Status Monitor or Proxy Cache Monitoring

You monitor a Netra Proxy Cache Array through links available in the Proxy Cache Administration page. See Chapter 3,” for instructions on loading this page.

1. In the Proxy Cache Administration page, click **Array Status**, to monitor the Netra Proxy Cache Array, or **Proxy Cache Monitoring**, to view statistics related to the operation of the proxy cache service.

Array Status

When you click the Array Status link in the Proxy Cache Administration page, a page such as that shown in Figure 15-1 is displayed.

Array Status

Host names are links to individual host status pages.
 Thu Nov 11 08:02:27 PST 1999

Proxy Cache Service Group

Host Name	Host Addr	Preferred Addr	Queue Size	OK	Failed	Capacity	Service Addr	State
host1	128.144.51.30	128.144.51.30	0	yes	0	24000	128.144.51.30	online
host2	128.144.51.31	128.144.51.31	0	yes	0	24000	128.144.51.31	online
host3	128.144.51.32	128.144.51.32	0	yes	0	24000	128.144.51.32	online

DNS Service Group

Host Name	Host Addr	Preferred Addr	Queue Size	OK	Failed	Capacity	Service Addr	State
host1	128.144.51.30	128.144.51.100	0	yes	0	0	128.144.51.100	online
host2	128.144.51.31	0.0.0.0	0	yes	0	0	none	up
host3	128.144.51.32	0.0.0.0	0	yes	0	0	none	up

DNS Zone

netb230ca118.org.com.mull		
128.144.51.31	128.144.51.32	128.144.51.33

Refresh every minutes

Figure 15-1 Array Status Page

The Proxy Cache Service Group and DNS Service Group tables have a row for each host in the array. If a host is down, the row for that host flashes and displays in red. In the flashing row is displayed the cause of the host being absent from the array or a message “status unknown.”

When you load the Array Status page, a snapshot of current array activity is displayed. If you want periodic updates, specify a number of minutes in the “Refresh” field at the bottom of the page. Click Reset to return the refresh value to 0.

Note - In some browsers, when you use the refresh feature, the display of the Array Status page becomes disrupted, as if pages are overlaying one another, after about 40 updates. This is a characteristic of the browser software. No display disruption occurs with Netscape Navigator 4.04, as well as with other browsers. (Netscape and Netscape Navigator are trademarks of Netscape Communications Corporation.)

The tables in the Array Status page are described as follows:

Proxy Cache Service Group

Displays characteristics of all of the hosts in a Netra Proxy Cache Array that are, collectively, providing a single proxy cache service.

DNS Service Group

Refers to the DNS that is internal to the Netra Proxy Cache Array. One host in the array provides a DNS for the array, with the remaining hosts acting as hot spares. In Figure 15-1 and in your own Array Status page, note that only one host has a service address (the *Service Addr* column) and, when all hosts are up, only one host has a non-zero preferred address. A preferred address of 0.0.0.0 indicates a host's role as a hot spare.

DNS Zone

The subdomain formed by the array. The array DNS rotates proxy cache service addresses in round-robin fashion. Thus, the name of your array is resolved to a different proxy cache service address upon each resolve operation.

The headings in the Proxy Cache Service Group and DNS Service Group tables are described as follows:

Host Name

The host name associated with the array member and, also, associated with the host address (see next item). The Host Name entry is a link to a Host Status page, described below.

Note - In the current release, for a host name link to work, the host name must be resolveable by the name service(s) configured on the server.

Host Addr

The IP address of the array member. That is, the address associated with the host name. Unlike the preferred address (see next item) and the service address, the host address remains fixed to a host.

Preferred Addr

The service address assigned to a host when the host first joined the array. This address might move to a different host in the array if the original owner fails. However, the address remains the preferred address of the original owner. When a

host fails, you will note that its preferred address moves to a different host. The inheriting host will have two (or more) addresses in the `Service Addr` column: its own preferred address, plus the service address of the failed host. If a preferred address that has moved does not return to its original owner within a certain, configurable span of time (call the *service timeout*), that service address is removed from the service group. See “Proxy Cache” on page 60 for a description of the service timeout property.

A preferred address of `0.0.0.0` (as in the DNS Service Group table) indicates that a host is a hot spare. For the proxy cache service, an array member has its own service address and stands ready to inherit another host’s service address, if needed. For the DNS, only the array DNS server has its own service address; the remaining members can inherit the service address, but do not offer one of their own. If the array DNS server fails, you will note that its preferred address moves to another array member, where it shows up in the inheriting member’s `Service Addr` column. At that point, no host displays a preferred address for the DNS.

Quiesced

Indicates whether the array member is quiesced or not. In the quiesced state, a host can service existing clients, but cannot acquire any service addresses. Also, a quiesced host is excluded from the array’s DNS zone, so that it cannot acquire any new clients.

OK

Indicates whether any of a host’s test objects has returned an OK or a not-OK (that is, failed) status. The test objects running on a host are displayed in the Host Status page, accessible by clicking on the host name (in the `Host Name` column).

Load and Capacity

Divide the load by the capacity to arrive at a percentage that indicates the resources consumed on a host. This percentage is significant to array software that monitors the load on individual array members. When a host exceeds a high water mark for load, the host is removed from the array DNS zone and is thus not available to new clients. An overloaded host returns to availability when its load falls beneath a low water mark.

Service Addr

The address associated with an instance of the proxy cache service. Upon startup of a host, a service address is associated with a given array member (for which it is the preferred address). Upon host failure, a service address moves to a different host, as distinguished from a host address, which remains fixed to a host. A given host might have two or more service addresses, indicating that other hosts in the array have failed and that those addresses have been inherited by the host with multiple service addresses.

State

The *state* of a service address. A service address can be in one of four states: unserved, acquiring, online, and releasing. The array software acts on a service address in only the unserved and online states. An online address is one that

identifies a service for a requesting client. Only online addresses are included in the array's DNS zone. An unserved address is one that is not being served by any array member; such an address is not displayed in the monitoring page. Acquiring and releasing are intermediate states between unserved and online.

If a host is down (indicated by a flashing, red row), examine the remaining array members to see which member has acquired the down host's service address. Note the preferred address of the acquiring host. Then, note the service address that is not the acquiring host's preferred address. This address is the preferred address of the down host, failed over to the acquiring host.

Host Status

A host status page presents information on a given host within the array.

▼ To Load the Host Status Page

1. **In the Array Status page (see Figure 15-1) click on the host name of the host whose status you want to check.**

You can click the host name in either the Proxy Cache Service Group or DNS Service Group tables.

Note - In the current release, for a host name link to work, the host name must be resolveable by the name service(s) configured on the server.

After clicking a host name, a page such as that shown in Figure 15-2 is displayed.

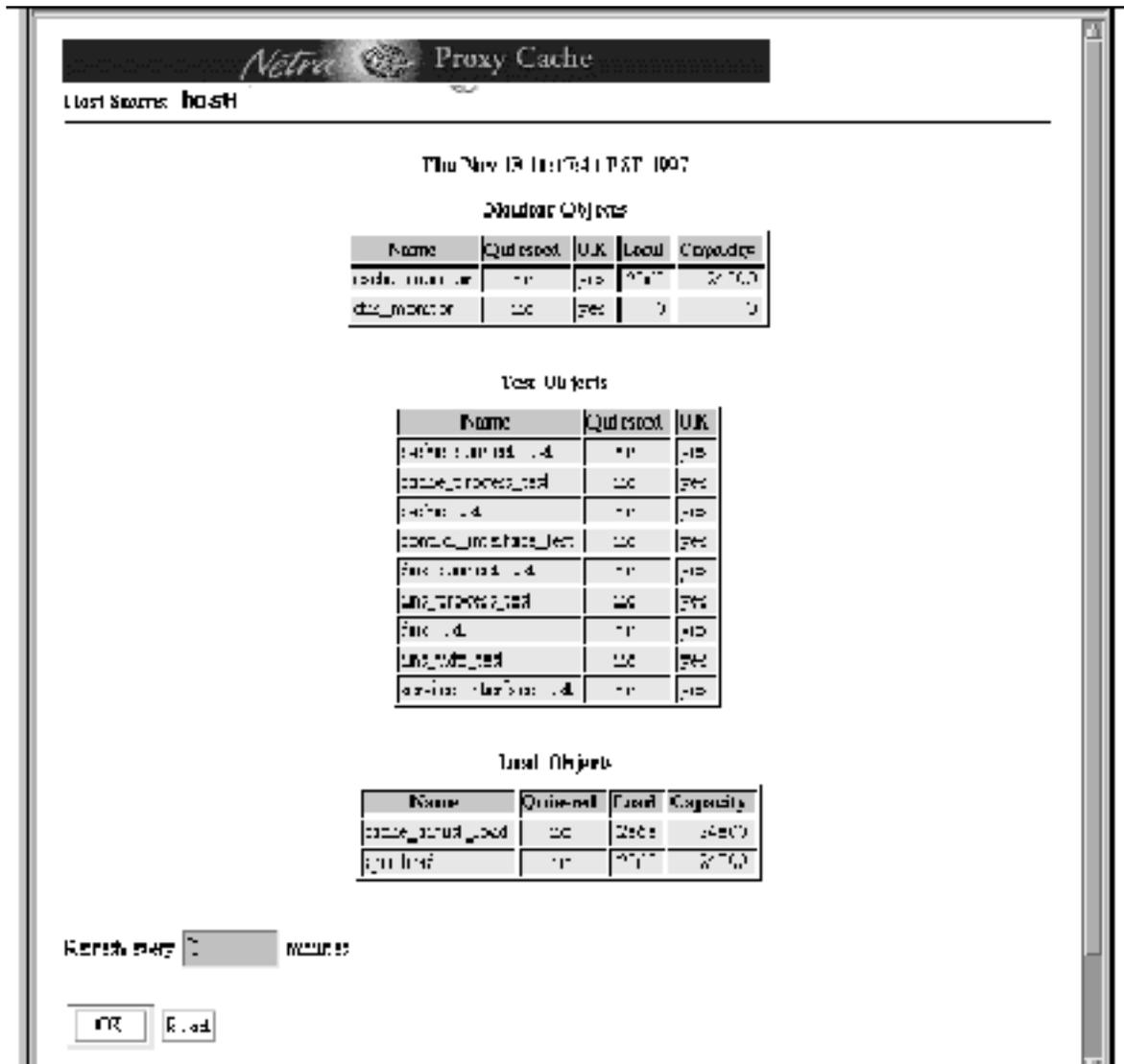


Figure 15-2 Host Status Page

When you load the Host Status page, a snapshot of current host activity is displayed. If you want periodic updates, specify a number of minutes in the “Refresh” field at the bottom of the page. Click Reset to return the refresh value to 0.

The tables in the Host Status page are described as follows:

Monitor Objects

Monitor objects identify the array software that provides a given service. The object `cache_monitor` controls the array software for the proxy cache service. The object `dns_monitor` controls the array software for the array's DNS.

A quiesced monitor object does not acquire new service addresses and withdraws its preferred service address from the array's DNS zone. Thus, a host could service an existing client but not acquire a new one. You use the `scalrcontrol (1)` utility, described in a man page, to quiesce a monitor object.

Test Objects

A test object is a software object that runs on a host to test a specific component of that host, such as the integrity of an interface or the existence of a process. A test object returns OK (yes) or not-OK (no) for the object it tests. There is a man page for each type of test object, in `/opt/SUNWscalr/man/man5`. A failure return from a test object can result in the failure of the service (as represented by the monitor object) on a host. That service on that host is considered to have failed and the array software moves the service address(es) associated with the failed service to the least-loaded host in the array.

A quiesced test object reports its last value prior to quiescence. You use the `scalrcontrol (1)` utility, described in a man page, to quiesce a test object.

Note that test objects run periodically, for example, every 10 minutes. This means that a test object will not detect a corrected condition till the next time it runs, so that, in the Host Status page, a test object displays "not OK" till the next time the test object code is run.

Load Objects

A load object returns a load and capacity for the component whose usage it measures. There is a man page for each load object, in `/opt/SUNWscalr/man/man5`. If load divided by capacity is a percentage that exceeds the high water mark set for the proxy cache service, the array software removes the service address(es) associated with the overloaded host from the array's DNS zone, thus making the overloaded host inaccessible to new clients.

A quiesced load object reports its last value prior to quiescence. You use the `scalrcontrol (1)` utility, described in a man page, to quiesce a load object.

See "Test and Load Objects" on page 155 for further discussion of test and load objects and the relationship of those objects to monitor objects. See "Netra Proxy Cache Man Pages" on page 147 for instructions on accessing Netra Proxy Cache man pages. If you have a serial connection to your server, you can view the properties related to the test and load objects in `/etc/opt/SUNWscalr/scalrd.conf`.

Proxy Cache Array Monitoring

The Proxy Cache Array Monitoring page presents status of and statistics for the proxy cache service provided by the array.

▼ To Load the Proxy Cache Array Monitoring Page

1. In the Proxy Cache Administration page, click Proxy Cache Monitoring.

A page such as that shown in Figure 15-3 is displayed.

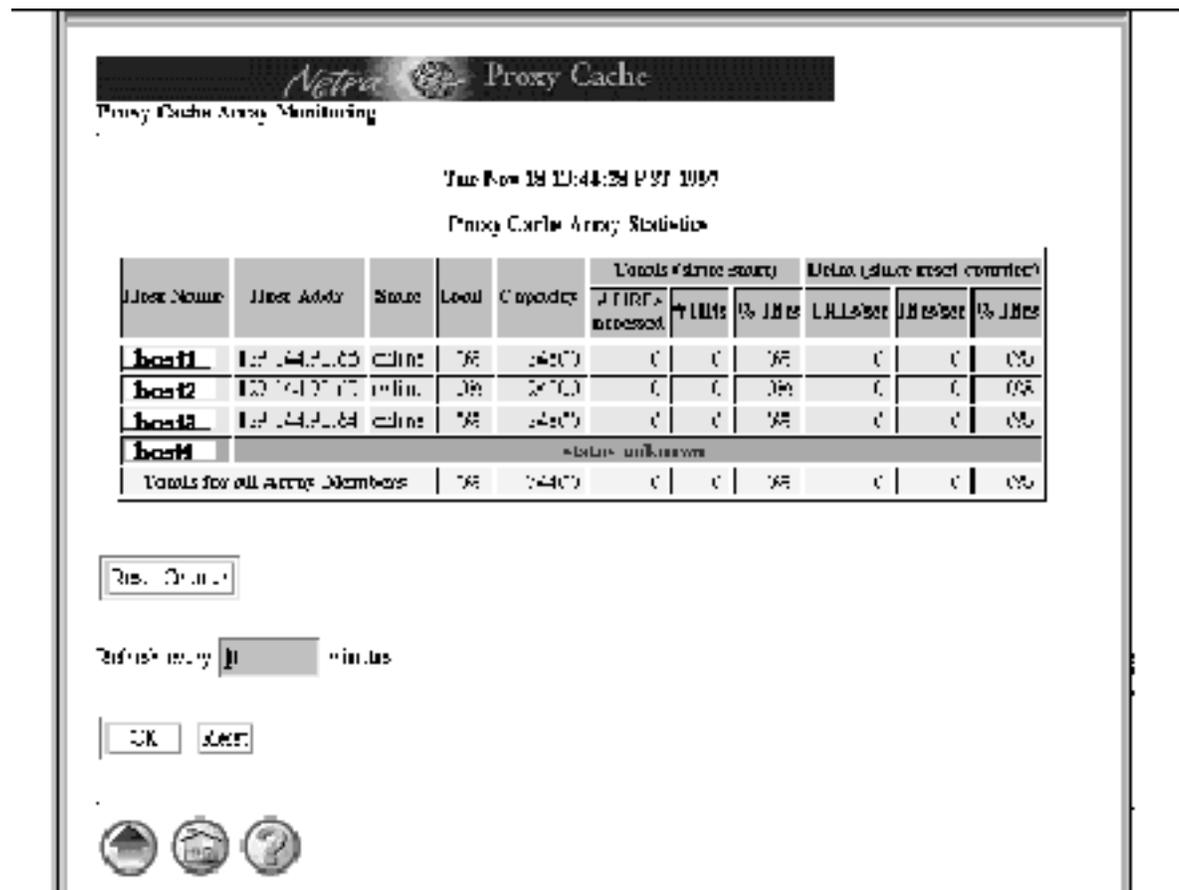


Figure 15-3 Proxy Cache Array Monitoring Page

When you load the Proxy Cache Array Monitoring page, a snapshot of current array activity is displayed. If you want periodic updates, specify a number of minutes in the "Refresh" field at the bottom of the page. Click Reset (next to OK) to return the refresh value to 0.

Click Reset Counter to return the URLs/sec and Hits/sec numbers in the Delta column, to zero.

The Proxy Cache Array Statistics table has a row for each host in the array. If a host is down, the row for that host flashes and displays in red. In the flashing row is displayed the cause of the host being absent from the array or a message "status unknown."

The Proxy Cache Array Monitoring page has a single table, Proxy Cache Array Statistics. The fields in this table are as follows:

Host Name

The host name associated with the array member and, also, associated with the host address (see next item). The Host Name entry is a link to a Proxy Cache Monitoring for Host page, described below.

Note - In the current release, for a host name link to work, the host name must be resolvable by the name service(s) configured on the server.

Host Addr

The IP address of the array member. That is, the address associated with the host name.

State

The state of the service address associated with the proxy cache service on a host.

Load and Capacity

Divide the load by the capacity to arrive at a percentage that indicates the resources consumed on a host.

Under the *Totals (since start)* heading:

URLs accessed

The number of requests for URLs fielded by the Netra Proxy Cache server.

Hits

The number of URL requests for which the Netra Proxy Cache server was able to return an object from its own cache or the cache of another array member.

% Hits

The number of hits divided by the number of URLs accessed. This number tells you the extent to which the Netra Proxy Cache server is able to respond to URL requests from local caches.

Under the *Delta (since reset counter)* heading:

URLs/sec

The rate at which URL requests are being fielded by the Netra Proxy Cache Server, since the reset counter was last set to zero.

Hits/sec

The rate at which the Netra Proxy Cache Server was able to find requested objects in a local cache, since the reset counter was last set to zero.

% Hits

The number of hits divided by the number of URLs accessed, since the reset counter was last set to zero.

The row Totals for all Array Members gives the same types of statistics as described above, for all array members. This row gives you a picture of the proxy cache performance of the entire array.

Proxy Cache Monitoring for Host

A Proxy Cache Monitoring for host page presents proxy cache statistics for a given host within the array.

▼ To Load the Proxy Cache Monitoring for Host Page

1. In the Proxy Cache Array Monitoring page (see Figure 15-3) click on the host name of the host whose statistics you want to check.

Note - In the current release, for a host name link to work, the host name must be resolveable by the name service(s) configured on the server.

After clicking a host name, a page such as that shown in Figure 15-4 is displayed.

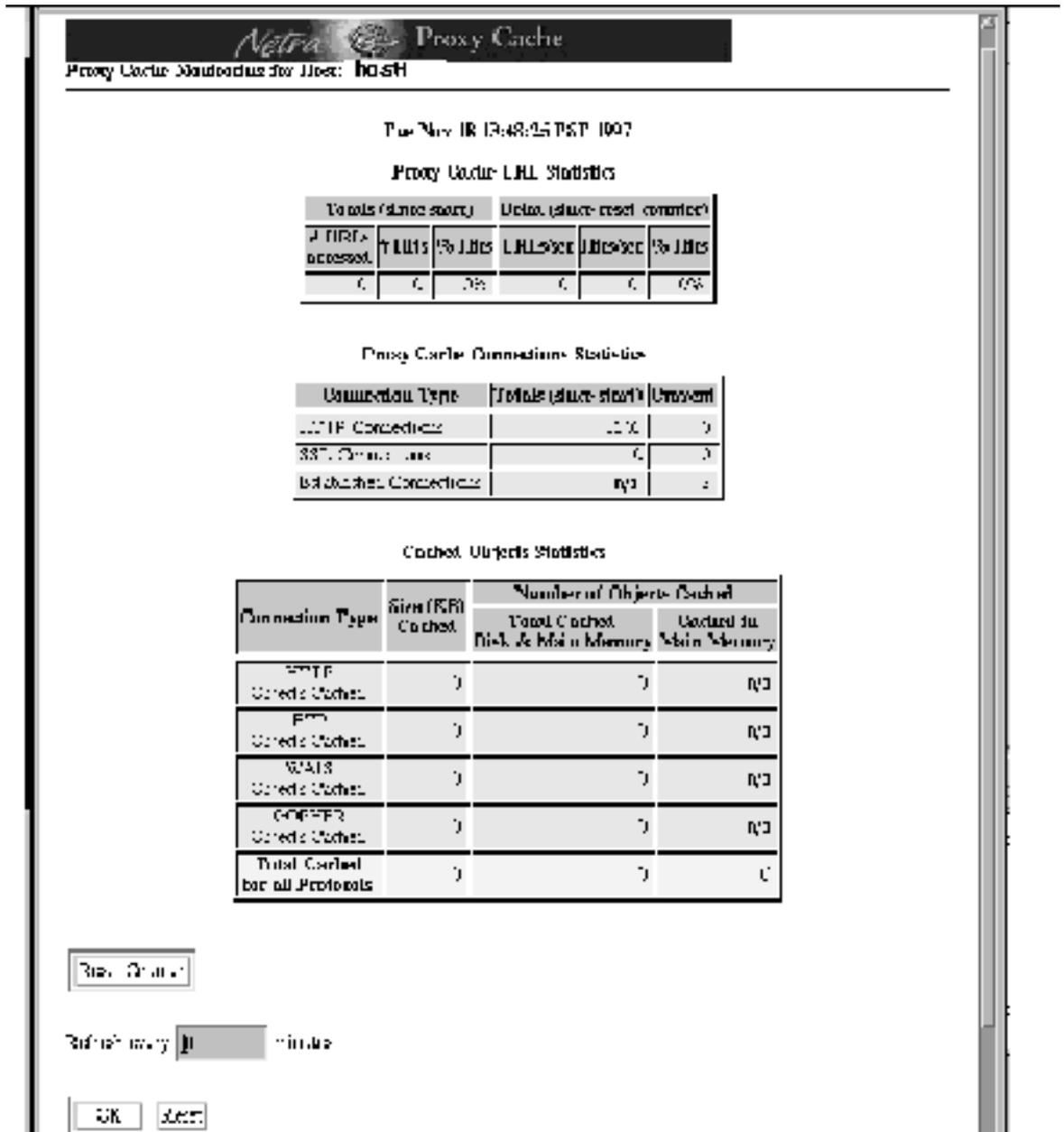


Figure 15-4 Proxy Cache Monitoring for Host Page

When you load the Proxy Cache Monitoring for Host page, a snapshot of current proxy cache statistics is displayed. If you want periodic updates, specify a number of minutes in the “Refresh” field at the bottom of the page. Click Reset to return the refresh value to 0.

The tables in the Proxy Cache Monitoring for Host page are described as follows:

Proxy Cache URL Statistics

Provides statistics on the rate of URL requests and the extent to which requests are serviced from the local cache.

Proxy Cache Connection Statistics

Provides statistics on HTTP and SSL connections.

Cached Object Statistics

Provides statistics on the number of objects cached, for each type of object.

The headings in the just-mentioned tables are described as follows:

In the Proxy Cache URL Statistics table:

Under *Totals (since start)*:

URLs accessed

The number of requests for a URL fielded by the Netra Proxy Cache server.

Hits

The number of URL requests for which the Netra Proxy Cache server was able to return an object from its own cache.

% Hits

The number of hits divided by the number of URLs accessed. This is number tells you the extent to which the Netra Proxy Cache server is able to respond to URL requests from the local cache.

Under *Delta (since reset counter)*:

URLs/sec

The rate at which URL requests are being fielded by the Netra Proxy Cache server, since the reset counter was last set to zero.

Hits/sec

The rate at which the Netra Proxy Cache server was able to find requested objects in a local cache, since the reset counter was last set to zero.

% Hits

URLs accessed divided by the number of hits, since the reset counter was last set to zero.

In the Proxy Cache Connections Statistics table:

Connection Type

Has rows for HTTP and SSL connections and for established connections.

Totals (since start)

The total number of connections for each connection type, HTTP and SSL, since the last reboot of the host.

Current

The number of current connections for each connection type, HTTP and SSL, and the number of current established connections.

In the Cached Object Statistics table:

Connection Type

HTTP, FTP, WAIS, or Gopher.

Size (KB) Cached

The size of all objects cached for a given object type.

Under *Number of Objects Cached*:

Total Cached Disk & Main Memory

In effect, total number of objects cached on host, for a given object type.

Cached in Main Memory

Number of objects cached in main memory. Only small objects are cached in main memory, as distinguished from disk.

Netra Proxy Cache Array MIBs and Traps

- “Netra Proxy Cache Software MIB Definitions” on page 124
- “Array MIB Definitions” on page 126
- “Traps” on page 129

This chapter defines the variables in the Management Information Bases (MIBs), shipped with the Netra Proxy Cache product. These MIBs enable you to use an SNMP-conformant management platform, such as Solstice Domain Manager, to monitor your Netra Proxy Cache Server.

The following MIBs are shipped with the Netra Proxy Cache product;

- one for the Netra Proxy Cache (proxy cache) software (`proxycache.mib`)
- one for the array software (`scalrd.mib`)
- the standard Sun MIB (`sun.mib`)
- the SNMP master agent for Solstice Enterprise Agents (`snmpdx.mib`)

These MIBs are stored in `/var/snmp/mib`. Only the first two MIBs are described in this chapter.

A MIB contains attributes that collectively describe a network-accessible object. The `proxy/cache` MIB describes the `proxy/cache` server; the array MIB describes the software that joins a set of Netra Proxy Cache servers to provide a single proxy cache server instance.

MIB attributes are categorized by groups and tables.

Netra Proxy Cache Software MIB Definitions

Table 16-1 lists the groups and tables in the `inpgcache.mib` file.

TABLE 16-1 Netra Proxy Cache Software MIB Definitions

Group or Table	
Attribute Name	Description
<code>proxyConfGroup</code>	
<code>proxyDescription</code>	Proxy server description
<code>proxyLocation</code>	Full pathname of server software
<code>proxyPort</code>	Port number on which the server is listening
<code>proxyMethods</code>	Methods supported by the server (GET, PUT, POST, and others)
<code>proxyProtocol</code>	HTTP version number
<code>proxyVersion</code>	Server software version number
<code>proxyContact</code>	Contact person for server
<code>proxyHang</code>	Server response status: 1—response received; 0—no response
proxyCacheGroup	
<code>cacheMemEntry</code>	Number of entries in main memory
<code>cacheSwapEntry</code>	Number of entries on disk
proxyClientStatGroup	
<code>currentConnections</code>	Number of current client-established connections

TABLE 16-1 Netra Proxy Cache Software MIB Definitions (continued)

Group or Table	
Attribute Name	Description
idleConnections	Number of current client idle connections
currentSSLConnections	Number of current client-established SSL connections
totalSSLConnections	Number of total (cumulative) client SSL connections
httpConnectionRate	Client HTTP connection rate (connections per second)
httpRequestRate	Client ICP request rate (requests per second)
icpRequestRate	Client ICP request rate (requests per second)
keepaliveRequested	Number of requested keep-alives
keepaliveOffered	Number of offered keep-alives
keepaliveUsed	Number of used keep-alives
protoTable	
protoName	Protocol name
protoObjCount	Object count
protoSpaceUsage	Space usage (KB)
protoAccess	Total number of accesses (hits + misses)
protoHits	Number of cache hits
protoHitRatio	Hit percentage (hits/total access)

Array MIB Definitions

Table 16-2 lists the groups and tables in the `scalrd.mib` file.

TABLE 16-2 Array MIB Definitions

Group or Table	
Attribute Name	Description
infoGroup	
infoRev	Revision number of daemon software.
infoDebug	Debug level.
trapGroup	
trapServiceName	Service group name.
trapTestName	Test object name.
trapServiceAddr	Service address.
serviceTable	
serviceName	Service group name.
serviceOk	Status of service on host. True means test passed.
serviceQuiesce	Whether service is quiesced on host. When a service is quiesced, the host cannot acquire any service addresses. However, it can release service addresses. The host's preferred service address will not be advertised by the DNS server.
servicePort	Port associated with service monitor. Used to communicate the status of a service.
serviceHostId	Host identifier within the service group.

TABLE 16-2 Array MIB Definitions (continued)

Group or Table	
Attribute Name	Description
serviceControlAddrs	List of control IP addresses.
serviceBroadcastAddr	Broadcast IP address.
serviceInterface	Service network interface.
serviceAddr	Service IP address.
serviceAddrBegin	Start of range of service addresses. Service monitor disables all service addresses in this range upon startup and termination.
serviceAddrEnd	End of range of service addresses. Service monitor disables all service addresses in this range upon startup and termination.
serviceAddrTimeout	Service address timeout. After the host owning a service address has failed, the period during which a service address continues to be served. Timing out of a service address enables the deinstallation of hosts and service addresses.
serviceControlInterval	Interval between the detection of a condition and the decision to act upon that condition.
serviceTransmitInterval	Interval between transmission of heartbeat messages. Should be smaller than <code>serviceHostTimeout</code> (below) and <code>serviceControlInterval</code> .
serviceArpInterval	ARP interval. Interval between initiating ARP broadcasts to update service group members' tables.
serviceHostTimeout	Host timeout. A period of inactivity beyond which a host is considered unavailable.
serviceTestObjects	Comma-separated list of test objects.
serviceLoadObjects	Comma-separated list of load objects.
serviceDnsUpdateInterval	Minimum time between DNS zone modifications done for load-balancing.

TABLE 16-2 Array MIB Definitions (continued)

Group or Table	
Attribute Name	Description
serviceDnsMaxUtilization	Load based on which the array daemon removes a host from a service group from a DNS zone and returns a host to the zone when the host's load decreases. The daemon computes high and low thresholds based on the number specified in this variable.
serviceDnsUtilizationDelta	Value added and subtracted to serviceDnsMaxUtilization to determine high- and low-water marks for a service/host.
serviceDnsUtilizationScale	Scaling factor for computing utilization.
serviceDnsMinServers	The array daemon does not allow fewer hosts than this number to be available, even if some number of hosts are overloaded.
serviceDnsAllServersWhenLoaded	When all hosts are overloaded, the array daemon can keep all service addresses available.
serviceAddrTable	
serviceAddrServiceName	Service group name.
serviceAddrServiceAddr	Service address of a host in a given service group.
serviceAddrExpire	Time remaining before expiring service address.
hostServingTable	
hostServingServiceName	Service group name.
hostServingHostId	Hostid of host serving a given service address.
hostServingControlAddr	Control address of host serving a given service address.
hostServingServiceAddr	Service address being served by a given control address.
hostServingOk	Indicates whether service address is associated with a control address that passes the service test.

TABLE 16-2 Array MIB Definitions *(continued)*

Group or Table	
Attribute Name	Description
hostServingQuiesce	Indicates whether a serving host is quiesced.
hostServingState	State of a service address on a serving host—acquiring, releasing, or online.
hostServingLoad	Load reported by a host for a service.
hostServingCapacity	Capacity reported by a host for a service.
testTable	
testName	Name of a test object.
testResult	Result of a test: 0 for fail and 1 for pass.
testQuiesce	Indicates whether test is quiesced.
loadTable	
loadName	Name of a load object.
loadValue	Value that indicates a host's load.
loadCapacity	Value that specifies a host's capacity.
loadQuiesce	Indicates whether test is quiesced.

Traps

SNMP provides for traps. A trap enables you to be notified of a specified event on (usually) a remote machine. You must use an SNMP-conformant management platform, such as Solstice Domain Manager, to be able to receive notice of a trap.

Table 16-3 lists the traps supported by the array software.

TABLE 16-3 Array Traps

Trap Name	Description
<code>testFailedTrap</code>	Indicates that a test has failed.
<code>serviceTestFailedTrap</code>	Indicates that a service test has failed.
<code>serviceReleaseTrap</code>	Indicates that a service address will be released.
<code>serviceAcquireTrap</code>	Indicates that a service address will be acquired.
<code>serviceCannotAssignTrap</code>	Indicates that a service address cannot be assigned, most likely because all hosts have a failed test object or are quiesced.
<code>serviceReleaseFailedTrap</code>	Indicates a failure when a host attempted to release a service address.
<code>serviceAcquireFailedTrap</code>	Indicates a failure when a host attempted to acquire a service address.

The proxy cache software supports a single trap, `serverNoResponse`. This trap occurs when the proxy cache service terminates on a Netra Proxy Cache Server.

Monitoring Proxy Cache Log Files

- “Loading the Proxy Cache Log Administration Page” on page 131
- “Managing Proxy Cache Service Log Files” on page 133

This chapter explains how to view and manage the proxy cache service log files. These log files are distinct from the log files accessed through the Log Files link on the Main Administration page. The log files described in this chapter relate only to the activity of the proxy cache service on a Netra Proxy Cache Server.

You view through the Proxy Cache Log Administration page. You reach this page through the Proxy Cache Administration page. See Chapter 3,” for instructions on loading this page.

Loading the Proxy Cache Log Administration Page

▼ To Load the Proxy Cache Log Administration Page

1. **In the Proxy Cache Administration page, click Log Files.**
The page shown in Figure 17-1 is displayed.

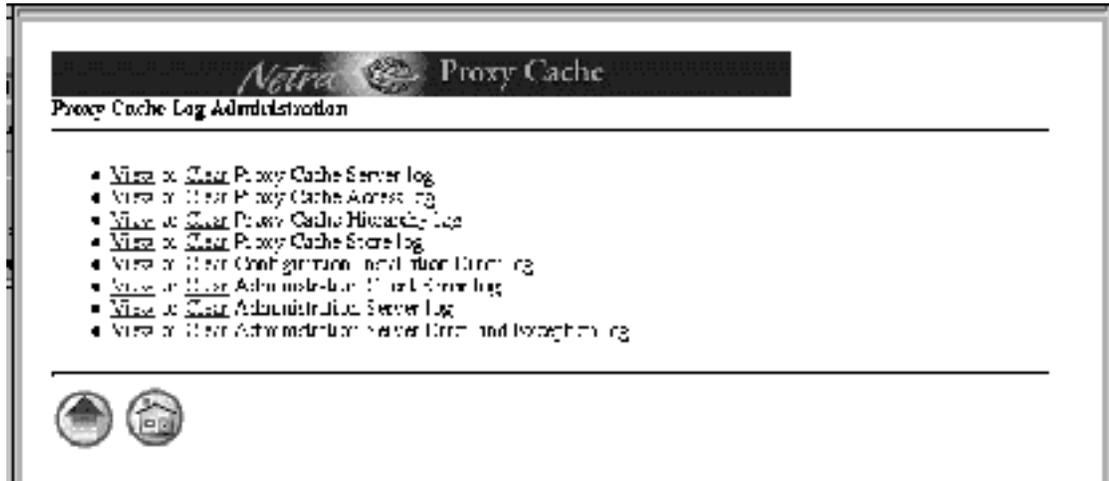


Figure 17-1 Proxy Cache Log Administration Page

For each type of log file listed in Figure 17-1, you can view or clear the log file. If you choose to clear a log file, you are prompted to confirm the operation. Click OK to confirm.

Note - Clearing a log file truncates the log file.

The log file types are described as follows:

Proxy Cache Server log

Lists status messages related to the activity of the proxy cache service. By default, this log is turned on.

Proxy Cache Access log

Lists records of all client accesses to the Netra Proxy Cache Server. By default, this log is turned on.

Proxy Cache Hierarchy log

Contains information about which parent or sibling satisfied each request. By default, this log is turned off.

Proxy Cache Store log

A log of items stored in and removed from the cache, with type (protocol), size, and timestamp. By default, this log is turned off.

Configuration Installation Error log

A log of errors that occur when you perform an Install Configuration operation, as described in the *Netra Proxy Cache Array Configuration Guide*.

Administration Client Error log

A log of errors that occur when the `cgi-bin` programs run from the administration web pages. This log can be useful when you encounter an unexpected and inexplicable failure when interacting with the web pages.

Administration Server log

A log of the daemon that maintains the configuration database that is, typically, propagated to the hosts in an array.

Administration Server Error and Exception log

Records the `stdout` and `stderr` of the daemon referred to in the preceding item. Of use primarily to trained technical personnel.

In the list above, for the proxy cache service, note that server and access logging is enabled and that hierarchy and store logging is disabled. To enable hierarchy and store logging, you must edit the file `proxycache.conf`, stored in `/etc/opt/SUNWoam/config/proxy`. In this file, if you want to enable, for example, both types of logging, you must uncomment the lines for `cache_hierarchy_log` and `cache_store_log`. In these lines, replace the word `none` with the location of the proxy cache service log files. The edited lines display as follows:

```
cache_store_log /var/opt/SUNWcache/cachelogs/store.log
cache_hierarchy_log /var/opt/SUNWcache/cachelogs/hierarchy.log
```

Following any changes to `proxycache.conf`, you must use the Install Configuration link, described in Chapter 3 of the *Netra Proxy Cache Server Configuration Guide* or the *Netra Proxy Cache Array Configuration Guide*, to make the changes take effect.

Managing Proxy Cache Service Log Files

The Netra Proxy Cache product is shipped with a command-line program, `rotlog`, that enables you to rotate and back up proxy cache service log files. These files correspond to the following types referred to in the Proxy Cache Log Administration page:

- Proxy Cache Server log (log type: `cache`)
- Proxy Cache Access log (log type: `access`)
- Proxy Cache Hierarchy log (log type: `hierarchy`)
- Proxy Cache Store log (log type: `store`)

For each type specified in the preceding list, the `rotlog` command can perform the following functions:

- Rotate the log files, so that the current log file `<type>.log` becomes `<type>.log.0`, `<type>.log.0` becomes `<type>.log.1`, `<type>.log.1` becomes `<type>.log.2`, and so on. The highest-numbered (and oldest) file, `<type>.log.9`, is overwritten by `<type>.log.8`. (You can change the number of log files in the rotation. See “Log File Options” on page 52.)
- Copy log files to a remote server, using FTP. Local log files are deleted following a successful file transfer.

By default on a Netra Proxy Cache Server, `rotlog` is run by `cron`, using the following entry:

```
25 4,12,20 * * * /opt/SUNWcache/sbin/rotlog -M all -S 100
```

The effect of this `cron` job is that `rotlog` rotates all types of logs (the default) at 4:25 AM, 12:25 PM, and 8:25 PM, daily, enforcing a minimum available amount of space of 100 MB (`-S 100`) for all types of logs (`-M all`). If the `rotlog` command encounters less space than specified in an `-S` option, it deletes log files, starting with the oldest, until the specified amount of space is reached. Using the `-M` option, you can establish minimum space thresholds for one or more log types (including all log types).

The `-M` option (specifying log types for which to set minimum space thresholds) is always used in conjunction with the `-S` option (which sets the minimum space threshold).

You might specify a `cron` job to use `rotlog` to copy logs to a remote file server. For example:

```
15 2 * * * /opt/SUNWcache/sbin/rotlog -F cache -d /pub/logs -h hepa -u anonymous
```

At 2:15 AM, daily, the preceding command copies logs of type `cache` (`-F cache`) to the directory `/pub/logs` (`-d /pub/logs`) on the server `hepa` (`-h hepa`), using the user id, for ftp purposes, of `anonymous` (`-u anonymous`). Following the successful copy operation, `rotlog` deletes the local log files that were copied.

On a remote host, `rotlog` renames a copied file to the following form:

```
<type>.log.YYYYMMDD
```

where `<type>` is one of `access`, `cache`, `store`, or `hierarchy`, `YYYY` is the current year, `MM` the current month, and `DD` the current day.

If there are multiple local files of the same type (for example, `access.log.0` and `access.log.1`), `rotlog` appends an integer extension to the remote file name, starting with `.1` for the oldest file and incrementing with each successive file of the

same type. Continuing with our example, `access.log.0` and `access.log.1` are renamed as follows:

TABLE 17-1 Local and Remote Log File Names

Local Name	Remote Name
<code>access.log.0</code>	<code>access.log.19980202.2</code>
<code>access.log.1</code>	<code>access.log.19980202.1</code>

Note that `access.log.1`, the local file, is the older of the two files.

In a `rotlog` command, you can use the `-x` option to change the format of the file extension of a copied, using the format specifications listed in the `strftime (3C)` man page. Use of `-x` can prevent the overwriting of copied files when you copy log files more than once a day. For example, you can modify the preceding `cron` job as follows:

```
15 2,12 * * * /opt/SUNWcache/sbin/rotlog -F cache -d /pub/logs \  
-h hepa -u anonymous -x %Y%m%d%H%M
```

This example is the same as the preceding, except:

- The copy operation occurs twice a day, at 2:15 AM and 12:15 PM.
- To copied files, `rotlog` appends a file extension of the form:

```
YYYYMMDDHHMM
```

The addition of hours and minutes to the default file extension prevents the overwriting of copied files.

See the `rotlog (1M)` man page for a description of all of the `rotlog` options.

Adding a SCSI Disk

A Netra Proxy Cache Server is equipped with two internal 4.2 GB SCSI hard disks. Depending on the hit rate experienced by your server, the size of cached objects, and client usage patterns, adding disk space can improve the performance of your server. Such an improvement would be manifested in reduced response time for users and decreased network traffic between the proxy server and its parents.

For this procedure, you need to have a serial connection to the Netra Proxy Cache Server. See Appendix A of the *Netra Proxy Cache Server Configuration Guide* or *Netra Proxy Cache Array Configuration Guide* for instructions on connecting a serial terminal to your server.

Adding a SCSI Disk

In the procedure specified below, for purposes of example, we assume the following:

- You are adding a six-disk MultiPack enclosure to the existing SCSI controller (controller 0, or c0).
- You will use all of the space on all of the disks in the enclosure for caching.
- You will use slice (partition) 0 for all of the available space on a disk.
- The disks in the MultiPack enclosure are formatted at the factory.

▼ To Add a SCSI Disk

1. **Set the address switch on the back of the MultiPack enclosure to 9-14.**

The two internal disks are `c0t0` and `c0t1`. For controller 0, you can use target numbers other than 0, 1, and 6, which is used by the CD-ROM drive.

2. Halt your machine.

In the Netra Proxy Cache Main Administration page, click Restart and Shutdown. In the Restart and Shutdown Administration page, click the Shutdown and power off operation and leave the check box for “Check for new devices upon restart” set to Yes. Click OK.

3. Ensure that the server is powered off (after about 90 seconds).

The green indicator light on the front of your Netra Proxy Cache Server is off when the machine is powered off.

4. Connect the MultiPack enclosure to the SCSI port on the back of the server.

See the *Netra Proxy Cache 30 Hardware Installation Guide* for instructions.

5. Power up the enclosure.

6. Power up the Netra Proxy Cache Server and log in as root.

7. Invoke `format`:

```
# format
```

8. In the available-disk menu, select 2, for the first available disk after the two internal disks.

In this menu, there are eight disks, 0 and 1 for the internal disks and 2 through 7 for the disks in the MultiPack enclosure.

9. If the disk is new, asked whether to label the disk. Enter `y` to label the disk now.

10. In the `format` menu, enter `p` for partition.

11. In the partition menu, enter `m`, to modify a partition table.

12. In response to the Select partitioning base menu, enter the number to select “modify the current partition table.”

The current partition table is displayed.

13. In the displayed partition table make a note of the number of cylinders for slice (partition) 2.

14. Press Return to indicate that, yes, you want to create a new partition table.

15. Press **Return** to accept the default partition number (for example, 6) for the free hog partition.
16. Enter the number of cylinders noted in Step 1 on page 137 for the size of partition 0.
For example, 4101c, to indicate 4101 cylinders.
17. Except for the partition number for the free hog partition, enter a size of 0 for the remaining partitions. For the free hog partition, press **Return** to accept the default.
After making or accepting an entry for each partition, the partition table is displayed.
18. Press **Return** to OK the current partition table or enter **n** to make changes.
19. After confirming your partition table, you are prompted to enter a table name. Enter a name enclosed in quotes.
For example, "added_cache1", for the first disk in a MultiPack enclosure.
20. If the disk is not a new disk, you are asked whether you are ready to label the disk. Enter **y** to label the disk.
21. Enter **q** at the `partition>` prompt.
22. Enter **disk** at the `format>` prompt, to return to the available-disk menu.
23. Repeat Step 8 on page 138 through Step 21 on page 139 for each disk in the MultiPack enclosure.
For Step 1 on page 137, enter the number that corresponds to the disk whose partition map you are modifying.
24. After you modify the partition map for the last disk in your MultiPack enclosure, enter **q** at the `format>` prompt (see Step 1 on page 137), to exit `format`.
25. For each disk in the MultiPack enclosure, enter a `newfs` command of the following form:

```
# newfs /dev/rdisk/c0t<num>d0s0
```


where `<num>` is, in succession, 9, 10, 11, 12, 13, and 14.
Each instance of the `newfs` command takes a few minutes.
26. Edit `/etc/vfstab` to add the new partitions.

The original vfstab contains:

```
# cat /etc/vfstab.orig
#device      device      mount      FS      fsck      mount      mount
#to mount    to fsck     point      type    pass     at boot   options
#
#/dev/dsk/c1d0s2 /dev/rdisk/c1d0s2 /usr      ufs     1        yes      -
fd          -          /dev/fd fd      -        no       -
/proc      -          /proc  proc    -        no       -
/dev/dsk/c0t0d0s1 -          -        swap    -        no       -
/dev/dsk/c0t1d0s1 -          -        swap    -        no       -
/dev/dsk/c0t0d0s0 /dev/rdisk/c0t0d0s0 /          ufs     1        no       -
/dev/dsk/c0t1d0s0 /dev/rdisk/c0t1d0s0 /var      ufs     1        no       -
/dev/dsk/c0t0d0s6 /dev/rdisk/c0t0d0s6 /var/opt/SUNWcache/cache1
this line continued from previous line ufs     2        yes      -
/dev/dsk/c0t1d0s6 /dev/rdisk/c0t1d0s6 /var/opt/SUNWcache/cache2
this line continued from previous line ufs     2        yes      -
swap       -          /tmp    tmpfs   -        yes     -
```

Using the disks in our example MultiPack enclosure, add lines such as the following to vfstab:

```
# The following disks were added to extend the cache
/dev/dsk/c0t9d0s0 /dev/rdisk/c0t9d0s0 /var/opt/SUNWcache/cache3
this line continued from previous line ufs     2        yes      -
/dev/dsk/c0t10d0s0 /dev/rdisk/c0t10d0s0 /var/opt/SUNWcache/cache4
this line continued from previous line ufs     2        yes      -
/dev/dsk/c0t11d0s0 /dev/rdisk/c0t11d0s0 /var/opt/SUNWcache/cache5
this line continued from previous line ufs     2        yes      -
/dev/dsk/c0t12d0s0 /dev/rdisk/c0t12d0s0 /var/opt/SUNWcache/cache6
this line continued from previous line ufs     2        yes      -
/dev/dsk/c0t13d0s0 /dev/rdisk/c0t13d0s0 /var/opt/SUNWcache/cache7
this line continued from previous line ufs     2        yes      -
/dev/dsk/c0t14d0s0 /dev/rdisk/c0t14d0s0 /var/opt/SUNWcache/cache8
this line continued from previous line ufs     2        yes      -
```

Note that the mount points, `/var/opt/SUNWcache/cache<num>`, are present in the Netra Proxy Cache software distribution.

27. Reboot.

In the Netra Proxy Cache Main Administration page, click Restart and Shutdown. In the Restart and Shutdown Administration page, click the Restart operation and leave the check box for “Check for new devices upon restart” set to Yes. Click OK.

Upon rebooting, in the console window, you receive output such as the following:

```
Disk configuration has changed.
New filesystem detected: /var/opt/SUNWcache/cache3
New filesystem detected: /var/opt/SUNWcache/cache4
New filesystem detected: /var/opt/SUNWcache/cache5
New filesystem detected: /var/opt/SUNWcache/cache6
New filesystem detected: /var/opt/SUNWcache/cache7
New filesystem detected: /var/opt/SUNWcache/cache8
Disk configuration has changed.
Reconfiguring the cache. Please wait.
This operation should take no more than 5 minutes.
Current time is: Fri Dec 5 11:06:04 PST 1997
```

```
0          1          2          3          4          5 (min)
-----
The cache has been reconfigured.
                                     DONE

oamserver in stop state
The system is ready.

<host name> console login:
```

At this point, the proxy cache service can begin to use the additional disks for caching web objects.

Troubleshooting and Technical Information

- “Installation of Proxy Cache and Array Configuration Fails” on page 143
- “Processes Associated with Netra Proxy Cache” on page 145
- “Netra Proxy Cache Man Pages” on page 147
- “Running the Netra Proxy Cache Array in an NIS-only Environment” on page 147
- “Proxy Cache and Array Packages” on page 148
- “Default Disk Partitions” on page 150
- “Multiple Arrays on the Same Subnet” on page 151
- “System Administrator and Proxy Webmaster Aliases” on page 152
- “Parent, Siblings, and the ICP” on page 152
- “Control Interface Down” on page 153
- “Proxy Cache Connect Timeout and Parent Failover” on page 153
- “Rules for Pattern Matching for TTL Selection Property” on page 154
- “Test and Load Objects” on page 155

Installation of Proxy Cache and Array Configuration Fails

If installation fails for one or more hosts, note the reason in the page that reports the failure. The following conditions must be in effect for successful installation:

- Each array member must be running and must be configured, as described in the *Netra Proxy Cache Array Configuration Guide*.
- All host and service addresses must be unique and must have the same subnet number.
- One host in the array must be configured as a DNS server for the array and must have a unique DNS service address with the same subnet number as the host and proxy cache service addresses.
- All control addresses must be unique and must have the same subnet number.
- If you configured a local name service (not recommended), you might have made a mistake so that, for example, on one or more hosts, the loopback interface is configured with the host address.

There are other, relatively remote possibilities, such as the update process being dead on a given array member. You could probably correct such an obscure problem by rebooting the affected host.

In the event of installation failure, consult the error logs.

▼ To View Installation Error Logs

1. Click the home icon to load the Main Administration page.
2. Click Proxy Cache Service to load the Proxy Cache Administration page.
3. Under the Monitoring heading, click Log Files.
4. In the Proxy Cache Log Administration page, click View for the Administration Client Error log or the Configuration Installation Error log.

In addition to the error logs, a useful troubleshooting tool, if you have a serial connection to a Netra Proxy Cache Server, is `ifconfig`. On an array member, correct `ifconfig` output is as follows:

```
# ifconfig -a
lo0: flags=<num><UP,LOOPBACK,RUNNING,MULTICAST> mtu 8232
    inet 127.0.0.1 netmask ff000000

hme0: flags=<num><UP,BROADCAST,NOTRAILERS,RUNNING,MULTICAST> mtu 1500
    inet <host address> netmask <service net netmast> broadcast <service net number>.255
    ether <ethernet address>

hme0:1: flags=<num><UP,BROADCAST,NOTRAILERS,RUNNING,MULTICAST,PRIVATE> mtu 1500
    inet <proxy cache service address> netmask <service net netmast> broadcast <service net number>.255
```

The following entry (hme0:2:) is present only on the array DNS server:

```
hme0:2: flags=<num><UP,BROADCAST,NOTRAILERS,RUNNING,MULTICAST,PRIVATE> mtu 1500
```

```
inet <DNS service address> netmask <service net netmast> broadcast <service net number>.255
hme1: flags=<num><UP,BROADCAST,NOTRAILERS,RUNNING,MULTICAST> mtu 1500
inet <control net address> netmask <control net netmast> broadcast <service net number>.255
    ether <ethernet address>
```

In the preceding output, note that spacing is altered for readability. Also, the broadcast addresses show examples of Class C broadcast addresses. Your own broadcast address might differ, depending on the netmask you use on your service and control networks.

Regarding `ifconfig` output, if a host cannot provide a service (proxy cache or DNS), the `hme0:<num>` entry will not be present for that service. On the other hand, a host might have additional `hme0:<num>` entries, indicating that it has acquired additional service addresses, from other array members.

Processes Associated with Netra Proxy Cache

Most of the processes listed below are present on a Netra Proxy Cache Server as well as on the hosts in a Netra Proxy Cache Array.

OAM Server Process (runs only on administrative host):

```
java -cp ./oamserver.zip -noasynccg -Djava.rmi.server.hostname=<admin host>\ -Djava.rmi
```

HTTP Daemon (runs on all hosts, not just administrative host):

```
/opt/netra/SUNWnetra/bin/httpd -f /etc/opt/netra/SUNWnetra/conf/httpd.conf
```

Update daemon (runs on all hosts):

```
/opt/SUNWoam/lib/oampushd -s -d /tmp/oampushd -e /opt/SUNWoam/lib/oamutil -p 12
```

DNS server (runs only on array DNS server):

```
/usr/sbin/in.named -b named.boot
```

DNS name lookup process (used by proxy cache service for DNS name lookups):

```
(dnsserver) -t
```

By default there are five of the preceding type of process. You can increase this number to 32.

Proxy cache service SNMP agent (runs on all hosts in an array):

```
proxycachesnmpd
```

Array software SNMP Agent (runs on all hosts in array):

```
scalrsnmpd
```

FTP get process used by proxy cache service (all hosts in array):

```
/opt/SUNWcache/lib/ftpget -S 39388
```

Proxy cache process (all hosts in array):

```
/opt/SUNWcache/sbin/proxycache -P /var/opt/SUNWcache/proxycache.pid
```

Solstice DMI-to-SNMP translator (all hosts in array):

```
/usr/lib/dmi/snmpXdmid -s <host name>
```

Array software daemon (all hosts in array):

```
/opt/SUNWscalr/lib/scalrd -f /etc/opt/SUNWscalr/scalrd.conf -p \  
/var/opt/SUNWscalr
```

SNMP master agent (all hosts in array):

```
/usr/lib/snmp/snmpdx -y -c /etc/snmp/conf
```

Netra Proxy Cache Man Pages

The Netra Proxy Cache Array and Server products have man pages available. To access these pages add the paths shown below to your `MANPATH`.

For Netra Proxy Cache Server:

```
/opt/SUNWcache/man  
/opt/SUNWoam/man
```

For Netra Proxy Cache Array, add the preceding paths, plus:

```
/opt/SUNWscalr/man
```

To add to your `MANPATH`, add lines such as those shown below to your shell startup file.

For a C-shell, in your `$HOME/.cshrc` file enter:

```
setenv MANPATH ${MANPATH}:/opt/SUNWscalr/man:/opt/SUNWcache/man:\  
/opt/SUNWoam/man
```

For a Bourne or Korn shell, in your `$HOME/.profile` file enter:

```
MANPATH=${MANPATH}:/opt/SUNWscalr/man:/opt/SUNWcache/man:/opt/SUNWoam/man  
export MANPATH
```

Running the Netra Proxy Cache Array in an NIS-only Environment

Load Distribution in an NIS-only Environment

Load distribution in a Netra Proxy Cache Array is optimum in an environment where resolution of the name of proxy cache service provided by the array occurs on a continual basis. This occurs in a network where the name service acknowledges the time-to-live (TTL) of the name-to-address entries made available by the array DNS. Examples of such a name service are the DNS (using `bind` v. 4.9.3 or later) or NIS, as shipped with Solaris 2.6.

In an environment where name resolution is static or occurs infrequently (such as with pre-Solaris 2.6 NIS), you might be able to use browser facilities, such as the Proxy Access Control (PAC) file, to force name service lookups on an ongoing basis.

Resolving the Name of the Proxy Cache Service

For an NIS-only environment, the following are two alternatives for resolving the name of the proxy cache service provided by a Netra Proxy Cache Array. Other alternatives are available.

- Configure the NIS server to forward unresolved queries to a DNS server that delegates the proxy cache's zone to the array. Set the Array DNS Proxy Records Time-To-Live property in the Advanced array configuration page, described in "DNS" on page 61, to a low value, such as 3 seconds.
- Assign an NIS service name for each service address in the array. By doing this, you achieve failover functionality. However, the DNS configuration on the array becomes redundant.
- The browser's PAC file might have a facility for name resolution.

Proxy Cache and Array Packages

A Netra Proxy Cache Array and Server products are shipped with the packages listed below installed. Unless otherwise indicated, packages are installed on both the array and server versions of the product.

TABLE 19-1 Product Packages

Package Name	Description
SUNWcache	Proxy cache server software
SUNWcaoam	Proxy cache user interface and configuration database software (Netra Proxy Cache Server only)
SUNWcasnm	SNMP agent for proxy cache software
SUNWjvjit	Java JIT compiler
SUNWjvrt	Java Virtual Machine run-time environment; includes Java, appletviewer, and classes zip file

TABLE 19-1 Product Packages *(continued)*

Package Name	Description
SUNWmibii	Solstice Enterprise Agents SNMP daemon
SUNWnsA	Netra HTML forms for configuring name systems (DNS, NIS client, local)
SUNWntr	Netra-required library functions, boot scripts and HTTP daemon
SUNWntrA	Netra HTML forms for configuring common Solaris and Netra functionality
SUNWntrpP	Netra images and HTML forms for the proxy cache product
SUNWoam	Proxy cache plus array configuration files
SUNWprxyA	Netra HTML forms for configuring proxy cache
SUNWsacom	Solstice Enterprise Agents files for root file system
SUNWsadmi	Solstice Enterprise Agents Desktop Management Interface
SUNWsasdk	Solstice Enterprise Agents Software Developer Kit
SUNWsasnm	Solstice Enterprise Agents Simple Network Management Protocol
SUNWscalr	Array daemon and supporting binaries
SUNWscapp	Appliance setup
SUNWSCOAM	Array software configuration files (Netra Proxy Cache Array only)
SUNWscsml	Array software service monitor license (Netra Proxy Cache Array only)
SUNWscsnm	Array daemon SNMP agent

Default Disk Partitions

Table 19-2 lists the disk partitions on the two internal drives of a Netra Proxy Cache Server. You cannot change the disk partitioning without affecting the operation of the server.

If you experience a disk failure, the procedure described in Appendix A, "automatically re-creates the partitions specified in Table 19-2."

TABLE 19-2 Disk Partitions for Netra Proxy Cache Server

File System/Mount Point	Disk/Slice	Size
/	c0t0d0s0	600 MB
/var (including proxy cache service logs)	c0t1d0s0	600 MB
swap	c0t0d0s1	128 MB
swap	c0t1d0s1	128 MB
overlap	c0t0d0s2	4092 MB
overlap	c0t1d0s2	4092 MB
/var/opt/SUNWcache/cache1	c0t0d0s6	3044 MB (or rest of disk, whatever that number might be)
/var/opt/SUNWcache/cache2	c0t1d0s6	3044 MB (or rest of disk, whatever that number might be)

The disk layout for the Netra Proxy Cache Server is illustrated in Figure 19-1.

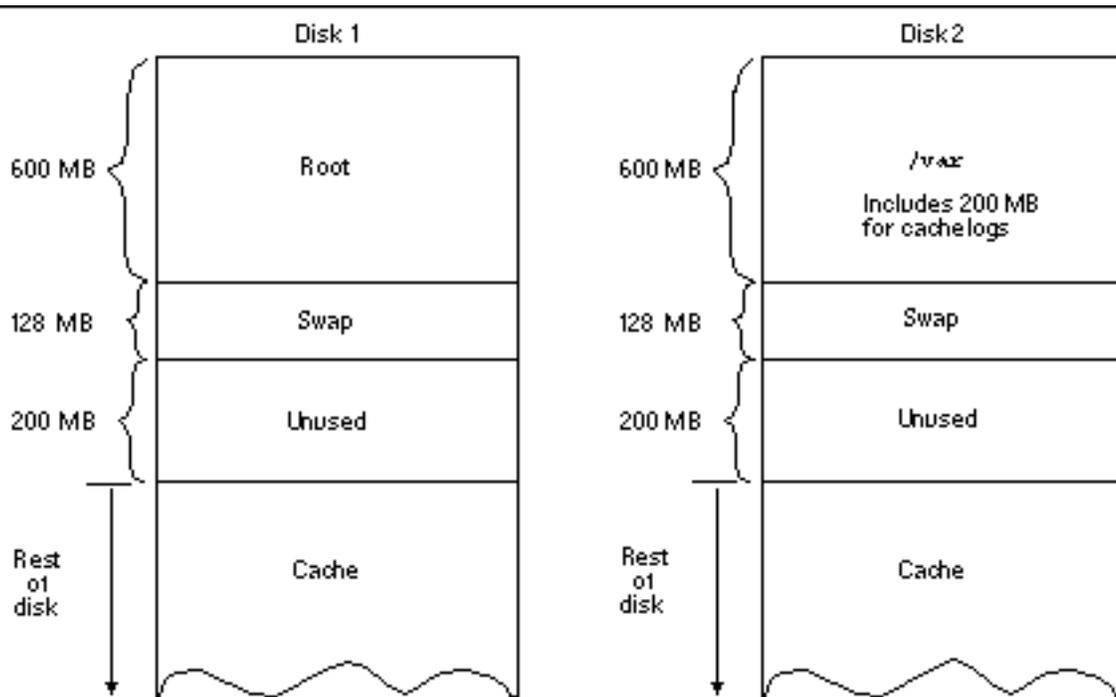


Figure 19-1 Disk Partitioning

Multiple Arrays on the Same Subnet

The Netra Proxy Cache Array software multicasts load and heartbeat information over the control network. It also performs a redundant multicast of the same data over the service interface. This raises the possibility of overlapping addresses if you have more than one array on a given subnet.

If you have more than one array on a subnet, it is recommended you use different multicast addresses and not just different port numbers to distinguish each array. See the description of the multicast address property in “Networks” on page 59. You can use `snoop (1M)` to ensure uniqueness of a multicast address within your network.

System Administrator and Proxy Webmaster Aliases

Netra Proxy Cache software enables you to establish email recipients for mail that is addressed to `root@<netra host name>` or `Postmaster@<netra host name>`. When entering email addresses, make sure you specify addresses in a form compatible with your `sendmail` configuration. For example, if your mail system expects an address of a form `<login>@<nis domain name>`, mail sent to `<login>@<host name>` is undeliverable.

See “System Administrator Alias” on page 102 for a description of the system administrator alias and “Primary Configuration” on page 29 for a description of the proxy webmaster alias.

Parent, Siblings, and the ICP

In the absence of siblings, upon a miss (an object not in its local cache) a proxy cache server issues a HTTP request for the object to its parents or to the origin web server.

In an environment in which the Inter Cache Protocol (ICP) is supported (as it is in the Netra Proxy Cache Server), upon a miss, a proxy cache server asks all of its parents and siblings if any of them has the requested object. If no parent or sibling responds within a certain period, the proxy cache server forwards the request to one its parents.

Note that a parent might be called upon to be responsible for returning the object to a requesting server. A request to a sibling never goes beyond that sibling; that is, a sibling only checks its local cache and does not forward a request.

You can specify the use of certain parents (or siblings) for certain domains, through the use of the Query Parent Cache for Domains property, described in “Proxy Cascade” on page 32.

The following example illustrates the use of ordering in the parent/sibling table and the Query Parent Cache for Domains property. Assume the following table:

```
host1 ICP-capable parent
host2 non-ICP-capable parent
host3 ICP-capable parent
host4 sibling
```

Assume further the Query Parent Cache for Domains property is defined as follows:

```
host1 .edu
host2 .com
host3 .com
host4 .com
```

Your server receives a request containing the domain `acme.eng.com`. The following sequence occurs:

1. Your server contacts `host3` and `host4`. It does not contact `host2` because that host is not ICP-capable; `host1` is not contacted because you configured it to handle the `.edu` domain.
2. Both `host3` and `host4` return ICP misses
3. Your server fetches the URL from `host2` because it is the first parent in the parent/sibling table that matches the `.com` domain.

Control Interface Down

In the Host Status page (see “Host Status” on page 114), if the control interface test displays as not OK, it indicates one of the following:

- The host being monitored has an incorrect control network number or an incorrect netmask for the control network.
- The preceding is true for other array members.

A possible, but less likely, alternative is that the control interface hardware is not working correctly.

Proxy Cache Connect Timeout and Parent Failover

The Netra Proxy Cache Server supports parent failover, in which, if the server’s parent fails, the server switches to the next parent on its list. (See “Proxy Cascade” on page 32 for a description of the table of parent and sibling proxies.) Failover occurs if the Netra Proxy Cache Server’s TCP connect call fails, not if the proxy cache service’s connect timeout (2 minutes, by default) is exceeded. (See “Timeouts” on page 50 for a description of the Timeout for Server Connections property.)

A TCP connect call might fail because the operating system’s timeout (3 minutes, by default) is exceeded or from some other cause. If the proxy cache service’s timeout is

shorter than the operating system's (as is true for the default case), the connect attempt is terminated before an error is returned, with the result that parent failover does not occur.

If your server experiences frequent connection timeouts when attempting to connect to a parent, you can set the proxy cache service's connect timeout to be at least 10 seconds greater than the operating system's TCP connect timeout. Alternatively, (if you have a serial connection to your server) you can reduce the operating system's timeout. To change the operating system's timeout, use the `ndd` command, which takes arguments in milliseconds. For example:

```
# ndd -set /dev/tcp tcp_ip_abort_cinterval 30000
```

The preceding command sets the TCP connect timeout to 30 seconds. To view the current TCP connect timeout, enter:

```
# ndd /dev/tcp tcp_ip_abort_cinterval
```

Rules for Pattern Matching for TTL Selection Property

Listed below are the rules for pattern matching used for the *<reg expression>* component of the TTL Selection Based on URL property, described in "URL Policy" on page 42. These rules are taken from Section 3C of the Solaris `regex` man page.

1. If subexpression *i* in a regular expression is not contained within another subexpression, and it participated in the match several times, then the byte offsets in `pmatch[i]` will delimit the last such match.
2. If subexpression *i* is not contained within another subexpression, and it did not participate in an otherwise successful match, the byte offsets in `pmatch[i]` will be -1. A subexpression does not participate in the match when:
 - `*` or `\{ \}` appears immediately after the subexpression in a basic regular expression, or `*`, `?`, or `{ }` appears immediately after the subexpression in an extended regular expression, and the subexpression did not match (matched zero times)

or

- `|` is used in an extended regular expression to select this subexpression or another, and the other subexpression matched.
1. If subexpression *i* is contained within another subexpression *j*, and *i* is not contained within any other subexpression that is contained within *j*, and a match

- of subexpression `j` is reported in `pmatch[j]`, then the match or non-match of subexpression `i` reported in `pmatch[i]` will be as described in 1. and 2. above, but within the substring reported in `pmatch[j]` rather than the whole string.
2. If subexpression `i` is contained in subexpression `j`, and the byte offsets in `pmatch[j]` are `-1`, then the pointers in `pmatch[i]` also will be `-1`.
 3. If subexpression `i` matched a zero-length string, then both byte offsets in `pmatch[i]` will be the byte offset of the character or `NULL` terminator immediately following the zero-length string.

Test and Load Objects

Test and load objects are pieces of software that run in the context of the Netra Proxy Cache array daemon, communicating the health of a service/host instantiation to the monitor object (`cache_monitor` or `dns_monitor`) in that daemon. The monitor object is responsible for monitoring a service on a given array host.

The format of the values returned by test and load objects are:

- From a test object, a monitor object expects a boolean value, indicating, for example, whether an interface is up or whether a service is available.
- From a load object, a monitor object expects two integers, one for current load, the other for current capacity.

The return values for test and load objects can be applied to a wide variety of resources. For example, a memory-intensive service might call for a load object to measure the availability of swap space.

In the current release of the Netra Proxy Cache product, all array members have the same set of test and load objects. These objects are selected for their appropriateness for a proxy cache service and an array DNS.

The array daemon configuration file, `scalrd.conf`, contains parameter settings for each test and load object. The file `scalrd.conf` is stored in `/etc/opt/SUNWscalr`. If you have a serial connection to an array host, you can use the `scalrcontrol (1)` utility, stored in `/opt/SUNWscalr/bin`, to obtain the output from the test and load objects.

There is a man page for each test object type, in `/opt/SUNWscalr/man/man5`. These man pages describe the parameters for each test object instance below. There is also a man page for `scalrcontrol`, in `/opt/SUNWscalr/man/man1`.

In the following object descriptions, parameters are taken from `scalrd.conf`. Values for these parameters are the default values.

Test Objects

The test objects listed below are shipped with the Netra Proxy Cache product. Their output is displayed in the Host Status page that you invoke from the Array Status page.

`cache_connect_test`

An object of type `ConnectTest` (5). Tests the TCP port used by the proxy cache service (8080). Also tests the service address(es) and control address used by the proxy cache service. The test object instance is configured to test persistent TCP connections. The parameters for this test object are as follows:

```
ConnectTest cache_connect_test
port=8080
check_addr=0.0.0.0
interval=10
retries=3
retry_interval=2
reset_min_interval=60
monitor_object=cache_monitor
max_connect=99999999
check_control=true
persistent_connection=true
connection_test_object=cache_http_test
```

`cache_process_test`

An object of type `ProcessTest` (5). Tests for the presence of the process associated with the proxy cache service. The parameters for this test object are as follows:

```
ProcessTest cache_process_test
process_id_script="/etc/init.d/scalr.cache getpid"
interval=2
retries=3
retry_interval=2
reset_min_interval=60
```

`cache_test`

An object of type `AndTest` (5). Combines the outputs from `cache_connect_test`, `cache_process_test`, and `service_interface_test`. Reports failure to the monitor object (`cache_monitor`) if any of these “child” test objects returns failure. The parameters for this test object are as follows:

```
AndTest cache_test
test_objects=cache_connect_test,cache_process_test
reset_script="/etc/init.d/scalr.cache restart"
reset_min_interval=60
monitor_object=cache_monitor
```

control_interface_test

An object of type `PingTest` (5). Tests the integrity of the control interface. The parameters for this test object are as follows:

```
PingTest control_interface_test
ping_addr=192.168.89.255
min_replies=1
exclude_same_host=true
interval=600
ping_timeout=5
retries=3
retry_interval=2
```

dns_connect_test

An object of type `ConnectTest` (5). Tests the TCP port used by the array DNS (53). Also tests the service address(es) and control address used by the DNS. The parameters for this test object are as follows:

```
ConnectTest dns_connect_test
port=53
check_addr=0.0.0.0
interval=10
retries=3
retry_interval=2
reset_min_interval=60
monitor_object=dns_monitor
max_connect=99999999
check_control=true
persistent_connection=false
```

dns_process_test

An object of type `ProcessTest` (5). Tests for the presence of the process associated with the array DNS. The parameters for this test object are as follows:

```
ProcessTest dns_process_test
process_id_script="/opt/SUNWscalr/scripts/dns.getpid"
interval=2
retries=3
retry_interval=2
reset_min_interval=60
```

dns_test

An object of type `AndTest` (5). Combines the outputs from `dns_connect_test`, `dns_udp_test`, `dns_process_test`, and `service_interface_test`. Reports failure to the monitor object (`dns_monitor`) if any of these “child” test objects returns failure. The parameters for this test object are as follows:

```
AndTest dns_test
test_objects=dns_connect_test,dns_process_test,dns_udp_test
reset_script="/opt/SUNWscalr/scripts/dns.reset"
reset_min_interval=30
monitor_object=dns_monitor
```

dns_udp_test

An object of type `DNSTest` (5). Tests the ability of the array DNS to resolve the name of a domain. By default the name `localhost` is used. The parameters for this test object are as follows:

```
DNSTest dns_udp_test
domain_name=localhost
port=53
check_addr=0.0.0.0
interval=10
timeout=5
retries=3
retry_interval=2
reset_min_interval=60
monitor_object=dns_monitor
max_check=99999999
check_control=true
```

service_interface_test

An object of type `PingTest` (5). Tests the integrity of the service interface used by a monitor object. The parameters for this test object are as follows:

```
PingTest service_interface_test
ping_addr=129.144.91.255
min_replies=1
exclude_same_host=true
interval=60
ping_timeout=5
retries=3
retry_interval=2
```

Load Objects

The load objects listed below are shipped with the Netra Proxy Cache product. Their output is displayed in the Host Status page that you invoke from the Array Status page.

There is a man page for each load object type, in `/opt/SUNWscalr/man/man5`. These man pages describe the parameters for each load object instance below.

cache_adjust_load

An object of type `AdjustLoad` (5). Adjusts the output from the `cpu_load` object to account for special conditions, such as startup and shutdown. The parameters for this load object are as follows:

```
AdjustLoad cache_adjust_load
interval=10
adjust_load_file=/tmp/.proxyload.adjust
max_adjust=100
load_object=cpu_load
```

cpu_load

An object of type `CPULoad` (5). Returns the CPU utilization on a host. The parameters for this test object are as follows:

```
CPULoad cpu_load
interval=30
divide_by_cpus=false
divide_by_cpu_clocks=false
```

Relationships Among Objects

The relationship among monitor, test, and load objects is illustrated in Figure 19-2.

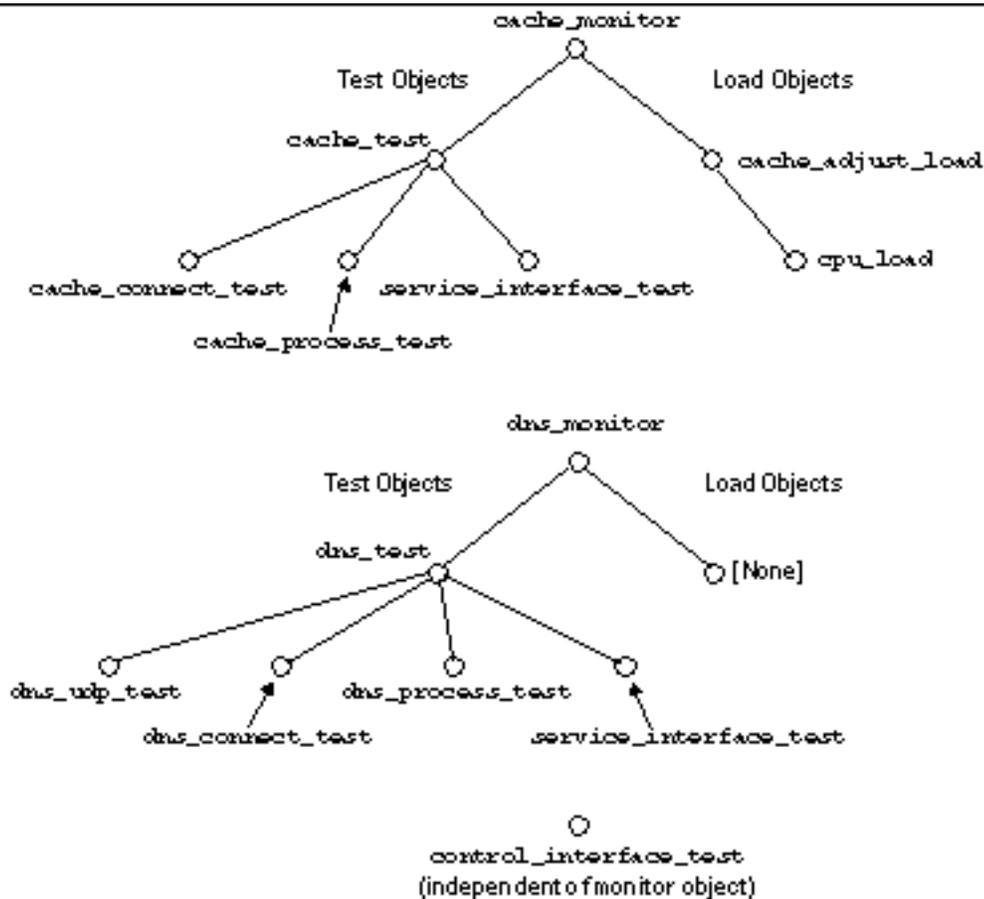


Figure 19-2 Relationships Among Objects

The significance of the relationships illustrated in Figure 19-2 is as follows:

- For test objects, a failure of a lowest-level object (indicated by a not-OK status in the Host Status page) causes the parent object (`cache_test` and `dns_test`, both of type `AndTest`) to fail. The failure of such a parent object, in turn, causes the monitor object return failure status. This failure is also reflected in the Host Status page. When a service on a host fails, the monitor object removes the service address associated with that service from the array's DNS zone and moves the service address to the least loaded host in the array.
- For load objects, the lowest-level object (`cpu_load`) returns its load and capacity figures to its parent (`cache_adjust_load`, of type `AdjustLoad`). Using our example, the `cache_adjust_load` object performs any adjustments required and returns "final" load and capacity figures to the monitor object, `cache_monitor`. The monitor object compares figures obtained from `cache_adjust_load` to high- and low-water marks that it maintains for the service and takes action if one

of these thresholds is crossed. If a monitor object determines that a service is overloaded, it removes its service address from the array's DNS zone. If the monitor object determines that a formerly overloaded service is now in its normal range, it reintroduces the service address for that service in the DNS zone.

System Recovery

This chapter specifies the procedure for recovery should the hard disk from which you boot fail. You need the Netra Proxy Cache recovery CD to complete the recovery procedure. This CD is shipped with the Netra Proxy Cache product.

Note - A nearly indispensable aid to the recovery of a Netra Proxy Cache Server is the backup diskette you were instructed to create in the *Netra Proxy Cache Array Configuration Guide*. If you do not have such a diskette, you can still recover, but you must repeat some of the configuration steps described in the *Netra Proxy Cache Array Configuration Guide*.

Solaris and Netra Proxy Cache Restoration

The installation program on the recovery CD performs the following steps:

- Installs the Solaris operating environment
- Formats your hard disks and installs the partition map appropriate for a Netra Proxy Cache Server
- Installs the Netra Proxy Cache product packages

▼ To Restore the Solaris Operating Environment and Netra Proxy Cache Packages

1. Replace the hard disk, following the procedure specified in the *Netra Proxy Cache Server Service Manual*.
2. Ensure that you have a terminal connected to your Netra Proxy Cache Server, as described in Appendix A of the *Netra Proxy Cache Array Configuration Guide* or *Netra Proxy Cache Server Configuration Guide*.
3. With your Netra Proxy Cache Server connected to both service and control networks, power up your server.
4. Insert the Netra Proxy Cache recovery CD in the server's CD drive.
5. Send the RS232 break signal to obtain the `ok` prompt.

For `tip` use:

```
<return>~#
```

For telnet, use `Ctrl-]`. For other programs, use the appropriate break signal.

6. At the `ok` prompt, enter:

```
ok boot cdrom
```

The Solaris boot process starts. The following prompt is displayed:

```
Please confirm that you want to reinstall Netra Proxy Cache 1.0.  
This will ERASE ALL EXISTING DATA on the system.
```

```
Answer yes, no or quit: y
```

7. Enter `y` to the preceding prompt.

The entire process takes about an hour. The process completes when the server returns to the `ok` prompt.

▼ To Restore the Netra Proxy Cache Configuration Properties

If you have a backup diskette:

1. **Insert your backup diskette in the drive of the Netra Proxy Cache Server.**

2. **At the `ok` prompt, enter:**

```
ok boot
```

Restoration is complete.

If you do not have a backup diskette:

1. **At the `ok` prompt, enter:**

```
ok boot
```

2. **Perform initial configuration as described in the *Netra Proxy Cache Server Configuration Guide* or the *Netra Proxy Cache Array Configuration Guide*.**

3. **Load the Proxy Cache Administration page.**

The procedure for loading this page is described in Chapter 3.”

4. **Perform proxy cache service configuration, if the server’s default values are not appropriate for your use.**

If your machine is part of an array, you can install the proxy cache, array, and array member configuration from your administrative host or another array member that is running the proxy cache administration server.

5. **Click the Install Configuration link.**

In the Install Configuration page, select the host you are restoring and click Install Selected Hosts.

See the *Netra Proxy Cache Array Configuration Guide* or *Netra Proxy Cache Server Configuration Guide* for details on the Install Configuration feature.

Advanced Proxy Cache Configuration Examples

- “Domains Inside Firewall and Local Domains Inside the Firewall” on page 167
- “Limiting Access to the Server” on page 169

Domains Inside Firewall and Local Domains Inside the Firewall

See “Proxy Cascade” on page 32 for a description of the properties described in this section.

If you have a hierarchy of proxy cache servers, you can make use of the Netra Proxy Cache software’s “local domain” features, illustrated in Figure B-1.

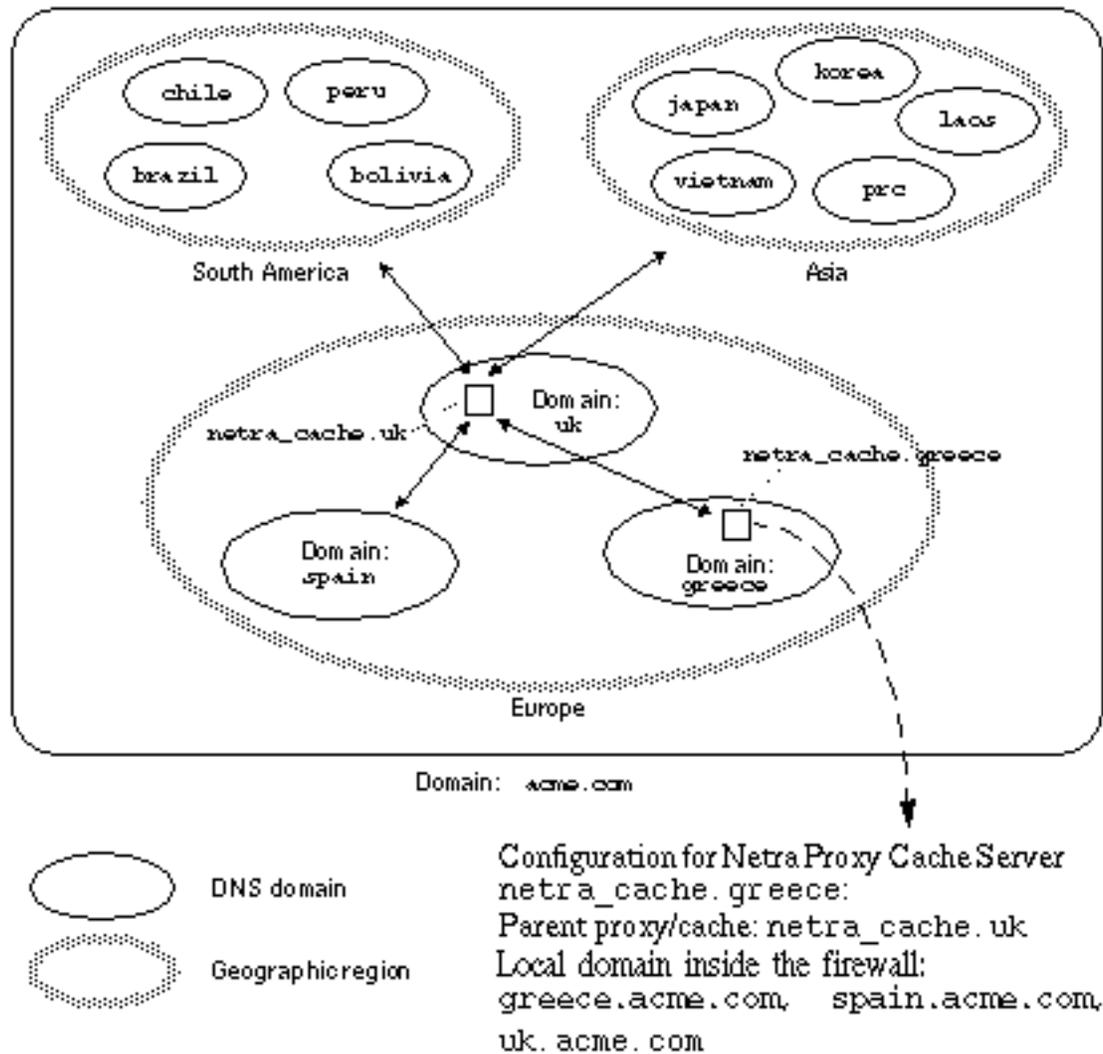


Figure B-1 Example of Use of Local Domain Property

In Figure B-1, the effect of the configuration options for the machine `netra_cache.greece` is that, in general, HTTP requests containing `acme.com` are retrieved from the parent, `netra_cache.uk`. However, requests for the local domain, `greece`, are retrieved directly from the local web server.

Limiting Access to the Server

See “Access Control” on page 43 for a description of the properties you use to limit access to the Netra Proxy Cache Server.

To limit access to the server, you define a filter in the Access List Definition property, then specify one or more filters for the following properties:

- Client Access Control
- Access to Cache via ICP
- ACLs for Cache Host
- URL Redirection

When you specify multiple entries for any of the preceding properties, list the lines in the order from the most exclusive (smallest set) toward the most inclusive (largest set). In processing multiple entries, the proxy cache service evaluates entries from top to bottom, stopping at the first entry that matches a URL request.

When you specify multiple access lists for a given property, those lists are ANDed.

Limiting by Source Address

The following are example access lists:

```
Under Access List Definition:
eng src 129.144.118.0/255.255.255.0
sales src 129.144.130.0/255.255.255.0
division src 129.144.0.0/255.255.0.0
```

The preceding access lists might be used as follows:

```
Under Client Access Control:
allow eng sales
deny division
```

The preceding entries specify that machines on the subnets 129.144.118.0 and 129.144.130.0 are allowed HTTP access to the Netra Proxy Cache Server, while machines in the `division` list are excluded.

You might want to restrict Inter Cache Protocol (ICP) access to a server to only those machines. This is illustrated in the following example:

Under Access List Definition:

```
arrayhosts src 129.144.107.1/255.255.255.255 129.144.107.2/255.255.255.255 \  
129.144.107.3/255.255.255.255 127.0.0.1/255.255.255.255  
all src 0.0.0.0/0.0.0.0
```

The list `arrayhosts` includes the host addresses of all machines in a Netra Proxy Cache Array. The list might be used as follows:

Under Access to Cache via ICP:

```
allow arrayhosts  
deny all
```

The preceding entries specify that only the array machines are allowed ICP access to the Netra Proxy Cache Server, while all other machines are excluded.

Limiting by Time

The following are example access lists:

Under Access List Definition:

```
nights time M-F 17:01-07:59  
weekends time A-S 00:00-24:00  
worktime time M-F 08:00-1700
```

The preceding access lists might be used as follows:

Under Client Access Control:

```
deny nights weekends  
allow worktime
```

Note that `A` is the abbreviation for Saturday and `S` for Sunday.

Limiting by Domain in Request

The following are example access lists:

Under Access List Definition:

```
poets domain .poetry .rhyme  
sports domain .espn .cnnsi  
cooks domain .culinary .gourmet
```

The preceding access lists might be used as follows:

Under Client Access Control:
deny poets sports cooks

You might want to allow users access to the cache for non-work-hours web access. The following example uses time-based access lists defined in the preceding subsection.

Under Client Access Control:
deny worktime poets sports cooks
allow nights weekends poets sports cooks

Redirecting Requests

The following are example access lists:

Under Access List Definition:
politics domain .rightwing .leftwing
pop_culture domain .disney .twarner

The preceding access lists might be used as follows:

Under URL Redirection:
politics : HOST www.vatican.net PATH /index.html
pop_culture : HOST lcweb.loc.gov PATH /homepage/lchp.html

The effect of the preceding lines is that URL requests that match the `politics` filter are redirected to `http://www.vatican.net/index.html`. Requests that match `pop_culture` are redirected to `http://lcweb.loc.gov/homepage/lchp.html`.

Security Issues

This appendix describes security issues related to the activity of a Netra Proxy Cache Array.

Update Daemon

The Netra Proxy Cache Array software uses an update daemon that enables a Netra Proxy Cache host to receive configuration updates from the administrative host. By default, this daemon, `/opt/SUNWoam/lib/oampushd`, enables updates from any host that knows its port number and is on the same subnet as the Netra Proxy Cache machine.

To disable updates on a given host, use the `oamcontrol` command, as follows:

```
# /opt/SUNWscalr/bin/oamcontrol disable_updates
```

To re-enable updates, use the `enable_updates` option to `oamcontrol`. See the `oamcontrol (1)` man page for all of the arguments to that command.

Glossary

Understanding of the following terms is useful in understanding the Netra Proxy Cache Array product. Italicized terms in definitions are defined elsewhere in the glossary.

- administrative host** One host in a Netra Proxy Cache Array on which you perform administrative functions and from which you propagate configuration data to all members of the array. It is recommended that the administrative host also act as DNS server for the array.
- acquire message** A *control message*, sent by a *service group* leader, requesting that a service group member acquire a *service address*. A leader sends an acquire message when a member first joins the service group, when the new member first obtains its service address. A leader also sends an acquire message when a member host/service fails and the leader needs to reassign an *orphaned service address*.
- acquire script** Script that is executed upon the acquisition of a *service address*, invoked in response to an *acquire message*. For successful execution, a *monitor object* needs to supply to an acquire script the service address being acquired and the name of the interface associated with that service.
- acquiring** One of four *address states* of a service address. Acquiring is an intermediate state, between *unserved* and *online*. A *service group leader* acts on service address in only the unserved and online states. The acquiring state allows a service to perform initialization tasks; because the service is acquiring and not unserved, the leader will not reassign the initializing service's address to another host.
- address states** A *service address* can be in one of four states: *unserved*, *acquiring*, *online*, and *releasing*. A *service group leader* acts on service address in only the unserved and online states. Acquiring and releasing are intermediate states between unserved and online.

cache	A store of information used for repeated fast access. With respect to web pages, a cache is a repository of URLs that lies between clients (browsers) and origin web servers. Design issues for caches involve which pages to store, for how long. Caches are useful when the ratio of <i>hits</i> to <i>misses</i> is at least 30% (approximately). This threshold varies according to the types of objects being cached and the expense and bandwidth of the links between the cache and the origin web server. For example, a hit rate of 20% might be cost effective if the hits are for very large objects. Similarly, if the links between the cache and origin web server are very expensive, even a low hit rate might prove cost effective. Another important design issue is how expensive a miss is. For example, if a cache were of such size that an exhaustive search is a resource-intensive activity, it might be more cost effective not to have the cache.
control address	IP address of a control interface. Each <i>control interface</i> has a control address.
control interface	The <i>monitor object's</i> network interface to the <i>control network</i> . The monitor object transmits and receive <i>information messages</i> over a control interface.
control message	A <i>release message</i> or an <i>acquire message</i> multicast over a <i>service group's control network</i> .
control network	A logical network over which <i>service group</i> members exchange <i>information messages</i> . A control network is distinguished from a <i>service network</i> . It might be an IP subnet distinct from or the same as the IP subnet used for the service network.
failover	The sequence of steps initiated by a service's <i>monitor object</i> when a host/service failure is detected. The result of these steps is that the <i>service address</i> associated with one host/service instantiation is moved to a different host.
hit	The finding of a requested URL in a cache, obviating the need to request the object from a <i>parent</i> or an origin web server. A hit is distinguished from a <i>miss</i> .
HTTPS	An advanced form of <i>SSL tunneling</i> supported by popular web browsers.
information message	A message multicast at a regular interval over a <i>service group's control network</i> . Each member of a service group multicasts an information message and listens for information messages sent by

other members. An information message is, in itself, a heartbeat and, in addition, communicates the load and capacity of host/service instantiations and the *address states* of *service addresses* in the group.

Inter Cache Protocol (ICP)	A lightweight protocol used by a proxy cache server to inquire of its siblings and ICP-capable parents as to whether they have a <i>web object</i> . The ICP contains a metric (response time) that enables a requestor to choose among multiple caches.
leader	See <i>service group leader</i> .
load object	A script or program that measures the load and capacity of a host resource. A load object returns two integers, indicating current load and current capacity. A load object can be shared by multiple <i>monitor objects</i> . A given monitor object can obtain data from multiple load objects. See <i>test object</i> .
miss	The failure to find a requested URL in a cache, requiring further activity on the part of the cache server. This activity might include any or all of sending ICP requests to parents and siblings, sending requests to parents, and sending a request to an origin web server. A miss is distinguished from a <i>hit</i> . To a large degree, the success of a web cache depends on the expense associated with a miss.
monitor object	A service-specific module that is incorporated into the array daemon. A monitor object manages the <i>service addresses</i> assigned to a service. It performs <i>failover</i> , where necessary, and can address load-balancing by modifying a <i>service group DNS zone</i> . A monitor object is associated with one or more <i>load objects</i> and <i>test objects</i> .
neighbor	Refers to <i>parents</i> and <i>siblings</i> of a proxy cache server.
online	One of four <i>address states</i> of a service address. An online address is one that identifies a service that can perform work for a requesting client. In a service group where DNS is employed, only online addresses are included in the group's DNS zone. A <i>service group leader</i> acts on service address in only the <i>unreserved</i> and online states.
orphaned service address	A service address not assigned to its <i>preferred host</i> . If the preferred host of a service address fails and releases its service address (that is, its <i>preferred service address</i>) that address is considered orphaned. It remains orphaned until such time as it is reassigned to its preferred host or the expiration of the <i>service timeout</i> , whichever occurs first.

parent	An proxy cache server that is responsible for returning a requested object if a child server cannot retrieve the object from its own cache. The parent attempts to locate the requested object in its own cache. If it cannot, it requests the object from its parents and <i>siblings</i> , or, in the absence of parents and siblings, from the origin web server. A parent might be <i>ICP</i> -capable, in which case it receives <i>ICP</i> queries for objects along with a proxy cache server's siblings.
persistent connections	A feature of HTTP 1.1, as implemented by popular web browsers, wherein multiple, different HTTP requests can be carried on the same TCP connection. Sometimes referred to as "HTTP keepalive".
preferred host of a service address	The host that is originally assigned a service group address. This becomes the host's <i>preferred service address</i> . In response to host and service failures, a service address might get moved from its preferred host. However, whenever conditions permit, array activities return a service address to its preferred host.
preferred service address	The service address associated with a service on a host when that host becomes a member of a <i>service group</i> . If there is a host or service failure on the host that "owns" a preferred service address, the releases that address, at which point the address becomes an <i>orphaned service address</i> , subject reassignment to a host other than its original owner. At such time as the original owner returns to health, it reacquires its preferred service address.
quiesced host	A host that can release, but cannot acquire <i>service addresses</i> ; it cannot acquire its own <i>preferred service address</i> . A quiesced host is in a state between failed and available. As with a failed host, the service addresses of a quiesced host are not included in the <i>service group DNS zone</i> . Unlike a failed host, a quiesced host can continue to serve its current service addresses. A host is quiesced via the array daemon's <i>SNMP</i> interface or through a command-line interface. The quiesced state enables a system administrator to address resource problems on a host without removing the host from the <i>service group</i> .
release message	A <i>control message</i> , sent by a <i>service group leader</i> , requesting that a <i>service group</i> member release a <i>service address</i> . A leader sends a release message to a member that has been serving a previously orphaned <i>preferred service address</i> when the original owner of that preferred service address is ready to resume ownership. A release message invokes a release script on the host releasing the service address.

release script	A script invoked in response to a <i>release message</i> . A release script releases the resources associated with a service. For successful execution, a <i>monitor object</i> needs to supply to a release script the service address being released and the name of the interface associated with that service.
releasing	One of four <i>address states</i> of a <i>service address</i> . Releasing is an intermediate state, between <i>unserved</i> and <i>online</i> . A <i>service group leader</i> acts on service address in only the unserved and online states. The releasing state allows a service to perform cleanup tasks; because the service is releasing and not yet unserved, the leader will not reassign the initializing service's address to another host before cleanup is complete.
service address	The address at which a <i>service group</i> provides a network service to clients. A set of service addresses is the essential entity managed by the <i>monitor objects</i> in a service group.
service group	A set of hosts that, collectively, provide a network service to clients. Members of a service group run an array daemon that multicasts heartbeat messages. If a service or host in the group fails, the address associated with that service/host is transferred to another member of the group.
service group DNS zone	The DNS name space containing all hostname-to-IP address mappings in a <i>service group</i> . The monitor object can modify the contents of a DNS zone, depending on the vitality of the service group members.
service group leader	The entity within a <i>service group</i> that assigns <i>preferred service addresses</i> to member hosts and assigns <i>orphaned service addresses</i> to hosts capable of acquiring them. Election of the leader occurs automatically as a result of the exchange of <i>information messages</i> among service group members. A group always has only one leader. The role of leader moves to a different member upon failure of the leader host. The leader role might move to a different host upon addition or removal of a member host to or from the service group, depending on the result of the election algorithm.
service interface	The interface through which a host provides a service to clients. A service interface is identified by a <i>service address</i> .
service network	The IP subnet over which a service group provides a service to clients. See <i>control network</i> .

service timeout	The maximum length of time a service address can be orphaned (see <i>orphaned service address</i>). Beyond this period, the service group leader deinstalls the service address from the service group.
sibling	A proxy cache server that has a peer relationship with another proxy cache server. If a proxy cache server receives a request for an object that it cannot fulfill, it checks its <i>parents</i> and siblings to see whether they have the object. A sibling server checks only its local cache and no further. A parent checks its own cache and, if the object is not there, attempts to retrieve the object from its parent or from an origin web server.
Secure Sockets Layer (SSL) tunneling	Involves opening a direct socket between the client (browser) and a target web server for secure communication. A tunneled connection might pass through one or more proxy cache servers.
test object	A script or program that tests the functionality of a host resource. A test object might return, for a example, a boolean, indicating whether a <i>control interface</i> can transmit and receive. Test objects return data to monitor objects. A test object can be shared by multiple monitor objects. A given monitor object can obtain data from multiple test objects. See <i>load object</i> .
unserved	One of four <i>address states</i> of a <i>service address</i> . An unserved address is one that is not being served by any <i>service group</i> member. Under certain conditions, a <i>service group leader</i> attempts to assign an unserved address to a host that has the largest amount of excess capacity (determined by capacity minus the load, as returned by a host's <i>load object</i>). A service group leader acts on service addresses in only the unserved and <i>online</i> states.
web object	A web page, audio or video clip, graphic file, or other object that can be provided by a web server to a client (most often a browser) using the HyperText Transfer Protocol. A proxy cache server caches web objects, although not all proxy cache servers can cache all types of web objects.

Index
