Ne'LBEU |CTUEf PPP
~~TCP/IP over~~TC PHP o/er PPP
IPX over PPP
SLIP
Network Access with RAS in Windows NT
~~Chapter 3 Networking Concepts for TCPnP~~
The RAS server provides a pool of IP addresses that are reserved for static configuration
during RAS installation. The IP addresses are automatically assigned to RAS clients using PPP
when they dial in. ~~If~~lf the administrator sets up the RAS server to use ~~astatic~~a static pool of addresses,
all clients dialing into a particular RAS server are assigned the same network ID as the RAS
server plus unique host ~~IDs~~lDs. (Of course, the network administrator must also ~~reserve~~reser\/e that
range of static addresses on the DHCP server, if present, to make sure that those addresses
are not assigned.)
RAS clients can connect to multiple TCP/~~IP~~lP networks that are logically joined (but physically
separate) networks sharing the same address space. When using multiple connections, the
(or third D814 -mn
PPP of s |P1
[flilfindcl/me NT3.1. mn
h@ r2M

RAS client can still use DNS and WINS for name ~~resolution~~resotution.
For complete details about RAS, see the ~~Windows~~Vwndows NT Server Remote Access Service manual.

Name Resolution for Windows Networking
Name Resolution with Host Files
For computers located on remote subnets where WINS is not used, the HOSTS and LMHOSTS files provide mappings for names to IP addresses. This is the name resolution
method used on ~~intemetworks~~internetworks before DNS and WINS were developed. The HOSTS file can be
used as a local DNS equivalent. The LMHOSTS file can be used as a local WINS equivalent.
Each of these files is also known as ~~ahost table~~a host fable. Sample versions of LMHOSTS and HOSTS
files are added to the
~~systemroot\SYSTEM32\DRIVERS~~lsysfemroofISYSTENl32\DRlVERS\ETC directory when you install
Microsoft ~~TCP~~TOP/IP. These files can be edited using any ASCII editor, such as Notepad or Edit,
which are part of Windows NT.
Microsoft TCP/IP can be configured to ~~search~~Search HOSTS, the local host table file, for mappings of
remote host names to IP addresses. The HOSTS file format is the same as the format for host

tables in the 4.3 Berkeley Software Distribution (BSD) UNIX /~~etc/hosts~~efc/hosfs file. For example, the

entry for a computer with an address of 192.102.73.6 and a host name of trey-~~research~~resear<:h .com

looks like this:

~~192.102.73.6 trey-research.com~~

Edit the sample HOSTS ~~file~~fiie that is created when you install TCP/IP to include remote host

names and their IP addresses for each computer with which you will communicate. This

sample file ~~also~~aiso explains the syntax of the HOSTS file.

The LMHOSTS file is a local text file that maps IP addresses to NetBIOS computer names for

Windows-networking computers that you will communicate with outside of the local subnet. For

example, the LMHOSTS table file entry for ~~acomputer~~a computer with an address of 192.45.36.5 and a

computer name of ~~Finance 1~~Financei looks like this:

~~192.45.36.5 financel~~

~~62 TCPnP~~

The LMHOSTS file is read when WINS or broadcast name resolution fails, and ~~resolved~~resoived

entries are stored in ~~asystem~~a system cache for later access.

When the computer uses the replicator service and does not use WINS, LMHOSTS entries are

required on import and export servers for any computers on different subnets participating in

the replication. LMHOSTS is also used for ~~small~~smail-scale networks that do not have servers. For

more information about the LMHOSTS file, see Chapter 6, "Setting Up LMHOSTS."

Networking Concepts for TCP/IP 150f17

192. 102.73.6 trey-research.com

192.45.36.5 Hnancel

Name Resolution for Windows Networking

Domain Name System Addressing

The Domain Name System (DNS) is ~~adistributed~~a distributed database providing a hierarchical naming

system for identifying hosts on the Internet. DNS was developed to solve the problems that

arose when the number of hosts on the Internet grew dramatically in the early ~~1980s.~~19803. The

specifications for DNS are defined in RFCs 1034 and 1035. Although DNS may seem similar to

WINS, there is a major difference: DNS requires static configuration for computer name-to-~~IP~~lP

address mapping, while WINS is fully dynamic and requires far less administration.

The DNS database is a tree structure called the domain name space, ~~where~~Where each domain

(node in the tree structure) is named and can contain subdomains. The domain name identifies

the domain's position in the database in relation to its parent domain, with a period (.)

separating each part of the names for the network nodes of the DNS domain. The root of the DNS database is managed by the Internet Network Information Center. The
top-level domains were assigned organizationally and by country. These domain names follow
the international standard ~~ISO~~ISG 3166. Two ~~letter~~ ~|etter and three-letter abbreviations are used for
countries, and various abbreviations are reserved for use by organizations, as shown in the
following ~~example.~~ eXamp!e.
DNS domain name abbreviation Type of organization
com
edu
gov
org
net
Commercial (for example, ~~microsoft.com)~~ microsoftcom)
~~edu~~ Educational (for example, mit.edu for Massachusetts Institute of Technology)
~~gov~~ Government (for example, nsf.gov for the National Science Foundation)
~~org~~ Noncommercial organizations (for example, ~~fidonet.org~~fidonetorg for ~~FidoNet~~
Fid0Nef)
~~net~~ Networking organizations (for example ~~nsf.net~~nsfnet for NSFNET)

~~Chapter 3 Networking Concepts for TCPnP~~
Each DNS domain is administered by different organizations, which usually break their
domains into subdomains and assign administration of the subdomains to other organizations.
Each domain has a unique name, and each of the subdomains have unique names within their
domains. The label for each network domain is a name of up to 63 characters. The ~~fully qualified~~fu//y
qua//Wed domain name (FQDN), which includes the names of all network domains leading back
to the root, is unique for each host on the Internet. ~~Aparticular~~A particular DNS name could be similar to
the following, for a commercial host:
accounting.trey.com
DNS uses a client-server model, where the DNS servers contain information about a portion of
the DNS database and make this information available to clients, called resolvers, that query
the name server across the network. DNS name ~~servers~~sen/ers are programs that store information
about parts of the domain name space called zones. The administrator for a domain sets up
name servers that contain the database files with all the resource records describing all hosts
in their zones. DNS resolvers are clients that are trying to use name servers to gain information
about the domain name space.

Windows NT ~~includes~~inciudes the DNS resolver functionality used by NetBIOS over TCP/IP and by
Windows Sockets connectivity applications such as ftp and telnet to query the name server
and interpret the responses.

The ~~key~~Key task for DNS is to present friendly names for users and then resolve those names to ~~IP~~
IP addresses, as required by the internetwork. Name resolution is provided through DNS by the
name servers, which interpret the information in a FQDN to find its specific address. ~~If~~lf a local
name server doesn't contain the data requested in a query, it sends back names and
addresses of other name servers that could contain the information. The resolver then queries
the other name servers until it finds the specific name and address it needs. This process is
made faster because name servers continuously cache the information learned about the
domain name space as the result of queries.
All the resolver software necessary for using DNS on the Internet is installed with Microsoft
TCP~~\~~/IP. To use DNS for TCP/IP name resolution, you specify options in the DNS Configuration
dialog box. For more information, see Chapter 2, ~~''Installing~~"lnstalling and Configuring Microsoft TCP/~~IP~~lP
and SNMP."
On computers with Windows NT Server 3.5, Windows NT Workstation 3.5, or Windows for
Workgroups 3.11 with Microsoft TCP/IP-32 installed, Windows Socket applications can use
either DNS or NetBIOS over TCP/IP for name resolution.
~~64 TCPnP~~
The following table compares DNS versus WINS name resolution.
~~WINS Versus DNS Name Resolution~~
~~Name provider capabilities   WINS   DNS~~
~~Provides scalable naming authority for large   Yes   Yes~~
~~intemetworks~~
~~Provides a dynamic, distributed naming authority   Yes   Not dynamic~~
~~for TCP/IP network names~~
Supports MX records for electronic ~~mail~~ mai! No   Yes
Supports recursion and referral for name resolution No   Yes
Provides hierarchical naming and resolution ~~No   Yes~~ scheme   No Yes
Includes DNS name server No   Yes
~~Includes~~includes DNS name resolution client Yes   Yes
DNS
Provides static name resolution Yes (optional)
Yes~~ (only)~~
~~Queries DNS servers   Yesl   Yes~~
~~Provides name server in operating system Yes No   Resolves NetBIOS compatible~~
~~names   Yes   No~~ 1
Provides a name resolution solution for large peer-~~Yes   No~~ based Yes

TCP~~+~~/IP networks (50,000+ systems)
~~Supports automatic name registration For WINS No~~
~~clients~~ only
~~Supports dynamic NetBIOS name registration and Yes No~~
~~resolution~~
~~Supports managing hosts configured via DHCP Yes No~~
Supports easy administration, including browsing ~~Yes No~~ and Yes
managing dynamic and static registrations
Yes (only)
Yes
No
No
No
No
No
No
No
No
No
No
No
No
1 Queries DNS servers via Windows Sockets applications or, for Windows networking
applications, via NetBIOS over TCP/IP (after using WINS first)
WINS Versus DNS Name Resolution
WINS
Provides scalable naming authority for large
internetworks
Yes Yes
Provides a dynamic, distributed naming authority for
TCP/iP network names
Yes
Name provider capabilities
Not dynamic
Queries DNS servers
Provides name server in operating system
Resolves NetBIOS-compatible names
Yes
Yes
Supports automatic name registration For WINS clients
Supports dynamic NetBIOS name registration and
resolution
Yes
Supports managing hosts configured via DHCP Yes
Centralizes management of the name database ~~Yes No~~
Defines server replication partners and policies ~~Yes No~~
Alleviates LMHOSTS management requirements
Yes ~~No~~
Yes
Yes
Reduces IP broadcast traffic in Windows-based
internetworks
Yes ~~No~~

intemetworks
I   Queries DNS servers via Windows Sockets applications or, for Windows
networking applications, via NetBIOS over TCP/IP (after using WINS first)
Chapter 3 Networking Concepts for TCPnP

SNMP
Simple Network Management Protocol (SNMP) is used by administrators to monitor and
control remote hosts and gateways on an internetwork. The Windows NT SNMP service allows
a Windows NT computer to be monitored remotely but does not include an application to
monitor other SNMP systems on the network.
Note
You must install the SNMP service to use the TCP/IP performance counters in Performance
Monitor, as described in Chapter X,8, "Using Performance Monitor with TCP/IP Services."
SNMP is a network management protocol widely used in TCP/IP networks. These kinds of
protocols are used to communicate between a management program run by an administrator
and the network management agent running on a host or gateway. These protocols define the
form and meaning of the messages exchanged, the representation of names and values in the
messages, and administrative relationships among hosts being managed. SNMP defines a set
of variables that the host must keep and specifies that all operations on the gateway are side
effects of getting, putting, or setting the data variables. Because different network--management
services are used for different types of devices or for different
network-management protocols,
each service has its own set of objects. The entire set of objects that any
servicesen/ice or protocol
uses is referred to as its management information base (MIB).
The Windows NT SNMP service includes MIB IIIl (based on RFC 1213) and LAN
Manager MIB II
H plus MIBsMlBs for DHCP and WINS servers, as described in Appendix A, "MIB
Object Types for
Windows NT." The SNMP service allows SNMP-based managers to perform standard SNMP
commands, such as reading the counters in the standard MIBsMll3s included with the service.
Windows NT SNMP has an extensible architecture, so it can be used to create custom
functionality on a Windows NT computer, such as starting and stopping specific services or
shutting down the system.
The SNMP service works with any computer running Windows NT and the TCP/IP protocol.
With the SNMP service, a Windows NT computer can report its current status to an SNMP

management system on a TCP/IP network. The service sends status information to a host in
two cases:
• 1 When a management system requests such information
• 1 When ~~asignificant~~a significant event occurs on the Windows NT computer
The SNMP service can handle requests from one or more hosts, and it can also report
network-management information to one or more hosts, in discrete blocks of data called traps.
The SNMP service uses the unique host names and IP addresses of devices to recognize the
host(s) to which it reports information and from which it receives requests.
When a network manager requests information about ~~adevice~~a device on the network, SNMP
management software can be used to determine object values that represent network status.
MIB objects represent various types of information about the device. For example, the
management station might request an object called SvStatOpen, which would be the total
number of files open on the Windows NT computer.
The SNMP service for Windows NT supports multiple MIBs through an agent Application
Programming Interface (API) extension interface. At SNMP service startup time, the SNMP
service loads ~~all~~ail of the extension-agent dynamic link libraries (DLLs) that are defined in the
Windows NT Registry. Two extension~~-~~-agent DLLs come with Windows NT~~;~~, others may be

developed and added by users.
~~CHAPTER 4~~

Installing and Configuring DHCP
Servers
~~ADynamic~~A Dynamic Host Configuration Protocol (DHCP) server is a Windows NT Server computer
running Microsoft TCP~~+~~/IP and the DHCP-compatible server software. DHCP is defined in
Requests for Comments (RFCs) 1533, 1534, 1541, and 1542.
This chapter describes how to install and manage servers to support DHCP in Windows NT
and also presents strategies for implementing DHCP. The following topics are included in this
chapter:
•
Overview of the DHCP client-server model

•
Installing DHCP servers and using DHCP Manager

•
Defining DHCP scopes

- Configuring DHCP options

- Administering DHCP clients

- Managing the DHCP database files

- Troubleshooting DHCP

- Advanced configuration parameters for DHCP

- Guidelines for setting local policies

- Planning a strategy for DHCP

Important ~~Ifyou~~

If you want to use a DHCP server to support subnetworks that span multiple routers, you may
need a firmware upgrade for your routers. Your routers must support RFCs ~~1533,~~1538, 1534, 1541,
and 1542.
To find out about DHCP-relay agent support, ~~contact~~Contact your router vendor. For more information,
refer to RFC1542.TXT available via anonymous FTP from ftp.~~internic~~internio.net:/rfc.
~~Overview of DHCP Clients and Servers~~
Chapter 4 1of33

Configuring DHCP servers for a network provides these benefits:
- ~~——~~
The administrator can centrally define global and subnet TCP/~~IP~~lP parameters for the entire ~~internetwork~~
internetvvork and define parameters for reserved clients.

- ~~——~~
" Client computers do not require manual TCP/IP configuration. When a client computer
moves between subnets, it is reconfigured for ~~TCPIIP~~TCP/IP automatically at system startup time.
DHCP uses a client-server model. The network administrator establishes one or more DHCP
servers that maintain TCP/IP configuration information to be provided to clients that make
requests.
The DHCP ~~server~~sewer database includes the following:
- ~~——~~
Valid configuration parameters for all clients on the ~~internetwork~~intemetwork.

- l Valid IP addresses maintained in a pool for assignment to clients, plus reserved addresses
for manual assignment.

- ' Duration of leases and other configuration parameters offered by the server. The lease
defines the length of time for which the assigned IP address can be used. ~~AWindows~~A Windows NT computer becomes a DHCP client if the Enable Automatic DHCP Configuration
option is checked in the Windows NT TCP/IP ~~Installation~~installation Options dialog box. When ~~aDHCP~~a DHCP
client computer is started, it communicates with a DHCP ~~server~~sen/er to receive the required TCP~~+~~/IP
configuration information~~.~~ This configuration information includes at least an ~~IP~~lP address and
submask plus the lease associated with the configuration.
Note
DHCP client software is part of ~~the~~tne Microsoft TCP/IP-32 for Windows for Workgroups software
and the Microsoft Network Client 2.0 software that are included on the Windows NT Server
compact disc. For information about installing this software, see the ~~Windows~~VW/vdows NT Server ~~Installation~~
/nsfallafion Guide.
For an overview of how DHCP works, see "Dynamic Host Configuration Protocol" in Chapter 3,
"Networking Concepts for TCP/IP."
Note
DHCP can be monitored using SNMP. For a list of DHCP MIB object types, see Appendix A,
"MIB Object Types for Windows NT."
. Installing and Configuring DHCP Servers
Overview of DHCP Clients and Servers
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You install a DHCP server as part of the process of installing Microsoft TCP/IP. These
instructions assume you have already installed the Windows NT Server operating system on
the computer.
Caution
Before installing a new DHCP server, check for other DHCP servers on the network to avoid
interfering with them.
You must be a member of the Administrators group for the computer you are installing or
administering as a DHCP server.
To install a DHCP ~~server~~sewer
1.   Start the Network option in Control Panel. When the Network Settings dialog box appears,
choose the Add Software button to display the Add Network Software dialog box.

2.   In the Network Software list box, select TCP~~I~~/IP ~~Protocol~~Protoco! And
~~Related~~Retated Components, and
then choose the Continue button.
3. ~~In~~in the Windows NT TCP/~~IP~~lP Installation Options dialog box, ~~check~~Check
the appropriate options
to be installed, including at least DHCP Server Service. Also check SNMP
~~Service~~Sen/ice if you
want to use Performance Monitor or SNMP to monitor DHCP.
4.   Choose the OK button. Windows NT Setup displays a message asking for
the full path to
the Windows NT Server distribution files. Provide the appropriate location,
and choose the
Continue button.
All necessary files are copied to your hard disk. When the Network Settings
dialog box
reappears after you finishing configuring TCP/IP, choose the OK button.
5.   Complete all the required procedures for manually configuring TCP/IP
as described in
"Configuring TCP/~~IP~~lP" in Chapter 2, "Installing and Configuring Microsoft
~~TCPliP~~TCP/IP and
SNMP.~~"~~'
~~If~~lf this DHCP server is multihomed (has multiple network adapters), you must
use the
Advanced Microsoft TCP~~IIP~~/lP Configuration dialog box to specify IP addresses
and other
information for each network adapter.
Also, ~~ifany~~if any adapter on the DHCP server is connected to a subnet that
you do not ~~want~~Want this
server to support, then you must disable the bindings to that subnet for the
particular
adapter~~.~~. To do this, choose the Network option in Control Panel, then choose
the Bindings
button in the Network Settings dialog box and disable the related binding.
Note
You cannot use DHCP to automatically configure ~~anew~~a new DHCP server, because
a
computer cannot be a DHCP ~~client~~ciient and server simultaneously.
All the appropriate TCP/IP and DHCP software is ready for use after you reboot
the computer.
Installing and Configuring DHCP Sewers
Installing DHCP Sewers
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The DHCP Client service is a Windows NT service running on a Windows NT
computer. The
supporting DHCP client software is automatically installed for computers
running Windows NT
Server or Windows NT Workstation when you install the basic operating system
software.
The Microsoft DHCP Server service starts automatically during system startup
if you have
installed ~~this~~tiwis service. You will probably want to pause the service while
you are configuring
scopes for the ~~ftrst~~first time.

~~.,.~~ To pause the DHCP ~~Server~~<u>Sewer</u> service at any Windows NT computer
1.   In Control Panel, choose the Services icon.
—Or—
In Server Manager, choose Services from the Computer menu.
2.   In the Services dialog box, select the Microsoft DHCP Server service.

~~3.~~
<u>3,</u> Choose the Pause button, and then choose the Close button.
You can also start, stop, and pause the DHCP service at the command prompt using the
commands net start dhcpserver or net stop dhcpserver or net pause dhcpserver.
~~Using DHCP Manager~~

<u>Sewer Scope DHCPOptions View Help</u>
<u>Paady</u>
<u>DHCP Sewers</u>
<u>Q 003</u>
<u>@1105</u>
<u>(9 01 5</u>
<u>(9 023</u>
<u>© 044</u>
<u>9 045</u>
<u>Router 11.1 03.-11.58, 11.1 05.0.1 11.1 01 .0</u>
<u>"ame §e│'Ve1$ ~ 1</u>
<u>Domam Name miclosofl.com</u>
<u>Default Tlme lo Irve 0x10</u>
<u>wms/NBNS Servers 11.105.87.98, 0.0.0.0</u>
<u>NelB│US over TCP/IP NBDD 0.0.0.0</u>
<u>(9127.u.n.1</u>
<u>' │ │ │ : `~ -'</u>
<u>[11.1l]3.U.U]Bldq3 H</u>
<u>Q [11.101.0.U]Bldq3Ad</u>
<u>Option Configuration</u>
The DHCP Manager icon is added to the Network Administration Tools group in Program
Manager when you set up a Windows NT Server computer to be a DHCP server. You must
use DHCP Manager to perform these basic tasks:
•
Create one or more DHCP scopes to begin providing DHCP services

•
~~Deftne~~<u>l Define</u> properties for the scope, ~~including~~<u>inciuding</u> the lease duration and IP address ranges to be
distributed to potential DHCP ~~clients~~<u>ciients</u> in the scope

•
~~Deftne~~<u>' Define</u> default values for options such as the default gateway, DNS server, or WINS server
to be assigned together with an IP address, or add any custom options
The procedures for completing these tasks are described in the following sections.
~~Chapter 4 Installing and Configuring DHCP Servers~~
————To start DHCP Manager

- ~~Double~~/lioubie-click the DHCP Manager icon in the Network Administration group in Program
Manager.
—Or—
At the command prompt, type start dhcpadmn and press ~~ENTER~~Enter.
DHCP Manager window shows the local computer the first time you start DHCP Manager.
Subsequently, the window shows ~~alist~~a list of the DHCP servers to which DHCP Manager has
connected, plus their scopes. ~~The~~Tne status bar reports the current DHCP Manager activities.
~~Select aserver or scope name   This list shows the DHCP options for the~~
~~to expand or contract the list of servers.   selected scope, and the icon~~
~~shows whether it is aglobal or scope option.~~
~~ame ervers   015 Domain Name   microsoft.com 023 Default Time to ve   Oxl~~
~~0 044 'WINS/NUNS Servers   11.1 05.67.98.~~
~~The icon shows whether Drag the spin bar to size the panes.~~
~~ascope is activated.~~
Important
When you are working with DHCP Manager, all computer names are DNS host names only,
such as accounting.trey.com. The NetBIOS computer names used in Windows networking
are not ~~allowed~~ailowed.
~~IJJ!.   ~~To connect to a DHCP server
Installing and Configuring DHCP Servers
Using DHCP Manager
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Enter the address of the DHCP server to add to
the list of sewers:
QHCP Server:
1 .
11.101.5.43
1.   From the Server menu~~,~~. choose the Add command.
~~Enter the address of the DHCP server to add to the list of serveJs:~~
~~.Q.HCP ServeJ:l,_11_.1_01_.5_.4_3_____.!~~
~~,..~~
2.   In the Add DHCP Server To Known Server List dialog box, type the DNS short name or IP
address for the DHCP server you want to connect to, and then choose the OK button~~.~~.
For example, type an address such as 11.1.26.30 or type a DNS name such as ~~corpOl.~~
corp01.trey.com in this box.
~~IJJ!.   F ~~To disconnect from a selected DHCP ~~server~~sewer
- From the Server menu, choose Remove, or press ~~DEL~~Del.

Installing and Configuring DHCP Servers sof as
Defining DHCP Scopes
A DHCP scope is an administrative grouping of computers running the DHCP Client service.
You will create a scope for each subnet on the network to ~~defme~~define parameters for that subnet.

Each scope has the following properties:

* ~~Aunique~~' A unique subnet mask used to determine the subnet related to a given IP address

* ~~Ascope~~l A scope name assigned by the administrator when the scope is created

* ' Lease duration values to be assigned to DHCP clients with dynamic addresses

IP Address Pool
Start Address.
End Address.
Subnet Mask.
Enclusron Flange.
Start Address.
End Address.
Lease Duration
O Unlrmrted
© Limrted To.
Name.
Comment.
Excluded Addresses
D_a 9[s] Hour[s] Minutes
1 U
Address 11.1 U1 .0.25 4,
>Y
101 5U 255
255 255 .U U
≥
< Flemove
3 4.
DI] "r. [ll] 'Ir
Bldg 3 Admin
UK Cancel Help

~~Chapter 4 Installing and Configuring DHCP Servers~~ Defining DHCP Scopes

Creating Scopes

You must use DHCP Manager to create, manage, or remove scopes.

To create a new DHCP scope

1. In the DHCP Servers list in the DHCP Manager window, select the ~~server for which~~sewer forwhich you want to create ~~ascope~~a scope.

2. From the Scope menu, choose Create.

~~E!! cluded Addresses:~~
~~.S.tart Address: 111 .101 .0 .1~~
~~Address 11.1 01.0.25~~
~~f.nd Address: 111 .1 01 .50 .2551~~
~~Subnet M_ask: 1255 .255 .0 .0 I~~
~~Exclusion Range:~~
~~S!art Address: . 1   ,IIRJWI~~

~~End Address: I II-   i"~~
~~_____~~
~~Lease Duration------------------------------,~~
~~0 Unlimited~~
~~®Limited To: [=:II D!!Y(s) -Hoyr(s) loo!lltlinytes~~
~~H_ame: !Bldg 3 Admin~~
~~CQmment:~~
~~_____~~

3.   To define the available range of IP addresses for this scope, type the beginning and ending
IP addresses for the range in the Start Address and End Address boxes.
The IP address range ~~will~~Will include the Start and End values.
Note
You must supply this information before this scope can be activated.
4.   In the Subnet Mask box, DHCP Manager proposes ~~asubnet~~a subnet mask, based on the IP
address of the Start and End addresses. Accept the proposed value, unless you know that ~~adifferent~~

Installing and Configuring DHCP Sewers 6of33

a different value is required.
5.   To define excluded addresses within the IP address pool range, use the Exclusion Range
controls, as follows:
~~1~~' Type the first IP address that is part of the excluded range in the Start Address box,
~~Type the first IP address that is part of the excluded range in the Start Address box,~~ and type the last number in the End Address box. Then choose the Add button.
Continue to define any other ~~excluded~~exciuded ranges in the same way.
~~1~~' To exclude a single IP address, type the number in the Start Address box. Leave the
End Address box empty and choose the Add button.
~~1~~l To remove an IP address or range from the excluded range, select it in the Excluded
Addresses box, and then choose the Remove button.
The excluded ranges should include all IP addresses that you assigned manually to other
DHCP servers, non-DHCP clients, diskless workstations, or RAS and PPP clients.
6.   To specify the lease duration for IP addresses in this scope, select Limited To. Then type
values defining the number of days, hours, and seconds for the length of the address lease.
~~Ifyou~~If you do not want IP address leases in this scope to expire, select the Unlimited option.
7.   In the Name box, type ~~ascope~~a scope name.
This is any name you want to use to describe this subnet. The name can include any
combination of letters, numbers, and hyphens. Blank spaces and underscore characters
are also allowed~~.~~. You cannot use Unicode characters.
8.   Optionally, in the Comment box, type any string to describe this scope, and then choose
the OK button.

Note
When you finish creating ~~ascope~~a scope, a message reminds you that the scope has not been
activated and allows you to choose Yes to activate the scope immediately. However, you
should not activate a new scope until you have defined the DHCP options to be configured for
this scope.
Now you can continue with the procedures described in "Configuring DHCP Option Types" and
"Administering DHCP Clients" later in this chapter. ~~Mter~~After you have configured the options for
this scope, you must activate it so that DHCP client computers on the related subnet can begin
using DHCP for dynamic TCP/~~IP~~1P configuration.
———————To activate a DHCP scope
•——'_From ~~the~~toe Scope menu, choose the Activate command to make this scope active.
The menu command name changes to Deactivate when ~~the~~tne selected scope is currently
active.

Defining DHCP Scopes
Changing Scope Properties
The subnet identifiers and address pool make up the properties of scopes. You can change the
properties of an existing scope. ~~IJJl>~~
To change the properties of a DHCP scope
1.   In the DHCP Servers list in the DHCP Manager window, select the scope for which you
want to change properties, and then from the Scope menu, choose Properties.
—Or—
~~In~~ln the DHCP Servers list, double-click the scope you want to change.
2.   In the Scope Properties dialog box, change any values for the IP address pool, lease
duration, or name and comment as described earlier in "Creating Scopes" or in online Help.
3.   Choose the OK button.
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Defining DHCP Scopes
Removing ~~aScope~~a Scope
When ~~asubnet~~a subnet is no longer in use, or any other time you ~~want~~went to remove an existing scope,
you can remove it using DHCP Manager. If any IP address in the scope is still leased or in use,
you must first deactivate the scope until all client leases expire or all client lease extension
requests are denied. ~~IJJl>~~
To remove a scope
1.   In the DHCP Servers list in the DHCP Manager window, select the scope you want to
remove.

2.   From the Scope menu, choose Deactivate. (This command name changes to Activate
when the scope is not active.)
The scope must remain deactivated until you are sure the scope is not in use.
3.   From the Scope menu, choose Delete.
The Delete command is not available for an active scope.

Installing and Configuring DHCP ~~Options~~ Servers 80f33

The configuration parameters that a DHCP server assigns to ~~aclient~~a client are defined as DHCP
options using DHCP Manager. Most options you will want to specify are predefined, based on
standard parameters defined in RFC 1542.
When you configure a DHCP scope, you can assign DHCP options to govern all configuration
parameters. You can also ~~defme~~define, edit, or delete DHCP options. These tasks are described in
the following sections.

Installing and Configuring DHCP Servers

Configuring DHCP Options

90f33

DK
UU2 Trme Offset Cancel
U04 Trme Server
UDB DNS Servers
UU? Log Servers
U08 Cookre Servers
U10 Impress Servers
011 Resource Localron Serve
+
Value >>>
< Flemove
H eip
Configuring DHCP Options
Assigning DHCP Configuration Options
Besides the IP addressing information, other DHCP configuration options to be passed to
DHCP clients must be configured for each scope. Options can be defined globally for all
scopes on the current server, specifically for a selected scope, or for individual DHCP clients
with reserved addresses.

•_____

l Active global options always apply unless overridden by scope options or DHCP client
settings.

•_____

l Active options for ~~ascope~~a scope apply to all computers in that scope, unless overridden for an
individual DHCP client.
The built-~~-~~~in options are described in "Predefined DHCP Client Configuration Options" later in

this chapter.
Note
Lease duration is ~~defmed~~defined for the scope in the Create Scope dialog box.
~~.,.~~To assign DHCP configuration options
1.   In the DHCP Servers list in the DHCP Manager window, select the scope you want to
configure.
2.   From the DHCP Options menu, choose the Global or Scope command, depending on
whether you want to define option settings for all scopes on the currently selected server or
the scope currently selected in the DHCP Manager window~~.,~~

~~DHtP Options: Global~~
~~0ptions lor: Server 11.1 01.196.191~~
~~!!nused Options: Active Options: 002 Time Offset 00.(Time Server == 005 Name~~
~~Servers 006 DNS Servers 009lPR Servers 007 log Servers 008 Cookie Servers 010~~
~~Impress Servers 011 Resource location S erv~~ U05 Name Servers
UU9 LPR Servers
Comment: Array of router addresses ordered by preference
~~Chapter 4 Installing and Configuring DHCP Servers n~~ H1
3.   In the Unused Options list in the DHCP Options dialog box, select the name of the DHCP
option that you want to apply, and then choose the Add button to move the name to the
Active Options ~~list~~list.
This list shows both predefined options and any custom options that you added.
For example, if you want to specify DNS servers for computers, select the option named
DNS Servers in the Unused Options list and choose the Add button.
Installing and Configuring DHCP Sewers 100f33
Options for: Serve! 11.1 U1 .1 36.1 91
Qnused Uptions: qctive Uptiuns:

~~Ifyou~~If you want to remove an active DHCP option, select its name in the Active Options box,
and then choose the Remove button.
4.   To define the value for an active option, select its name in the Active Options box, and
choose the Values button~~.,~~ Then choose ~~the~~tne Edit button, and edit the information in the
Current Value box, depending on the data type for the option, as follows:
~~1~~For an IP address, type the assigned address for the selected option
~~1~~l For a number, type an appropriate decimal or hexadecimal value for the option
~~1~~' For a string, type an appropriate ASCII string containing letters and numbers for the ~~option~~
opHon
For example, to specify the DNS name servers to be used by DHCP clients, select DNS
Servers in ~~the~~tne Active Options list. Then choose the Edit button and type a list of IP
addresses for DNS servers. The list should be in the order of preference.

For details about the Edit Array and Edit Address dialog boxes, see the online Help.

~~5.~~ 5, When you have completed all your changes, choose the OK button.

Tip ~~Ifyou~~

lf you are using DHCP to configure WINS clients, be sure to set options #44 WINS Servers

and #46 Node Type. These options will allow DHCP-configured computers to find and use the

WINS server automatically~~.~~ .,

Creating New DHCP Options

You can add custom parameters to be included with DHCP client configuration information.

You can also change values or other elements of the predefined DHCP options. The option

you add will appear in the list of available DHCP options in the DHCP Options dialog boxes for ~~defming~~

defining options globally, per scope, and per individual reserved DHCP client.

~~.,.~~ To add new DHCP options

1.   From the DHCP Options menu, choose Defaults.

2.   In the Option Class list in the DHCP Options: Default Values dialog box, select the class

for which you want to add new DHCP options, and then choose the New button. The option class can include the DHCP standard options or any custom options that you

add.

~~"'!' Add Option Type~~
~~Clan: Global~~
~~t!ame:~~
~~Data !l'pe:l-D.I'=le====:,   '1_·. DA[ra.l'~~
~~!dentifier:~~

3.   In the Name box of the Add Option Type dialog box, type a new option name.

~~Chapter 4 Installing and Configuring DHCP Servers~~

4.   From the Data Type list, select the data type for this option as described in the following

list. ~~If~~lf this ~~data~~date type represents ~~an~~en array, check the Array box.

Data type Meaning
Binary Value expressed as an array of bytes
Byte An 8-bit, unsigned integer
Encapsulated An array of unsigned bytes
IP address An IP address of ~~the~~tne form w.x.y.z
Long A 32~~-~~~bit, signed integer
Long integer A 32-bit, unsigned integer
String An ASCII text string

Word A 16-bit, unsigned integer
If you select the wrong data type, an error message ~~will~~Will appear or the value will be
truncated or converted to the required type.

5.   In the Identifier box, type a unique code number to be associated with this DHCP option.
This must be a number between 0 and 255.
6. ~~In~~In the Comment box, type ~~adescription~~a description of the DHCP option, and then choose the OK
button.
7.   In the DHCP Options: ~~Default Values dialog~~DefaultValues diaiog box, select the option, choose the Edit button,
and type the value to be configured by default for this DHCP option.
8.   Choose the OK button.
You can delete custom DHCP options, but you cannot delete any predefined DHCP options.
~~II>~~ To delete ~~acustom~~a custom DHCP option
1.   From the DHCP Options menu, choose Defaults.
2.   In the DHCP Options: Default Values dialog box, select the related class in the Option
Class list.
3.   In the Option Name list, select the option you want to delete, and then choose the Delete
button.

Upliorr Class:
_11plion Name:
Comment: Array of time sewer addresses, by preference
Value
IP Address
DHCP Standard Options
U05 Name Servers
11.1u1.8.1ns
11.1U1.5.158
11.101.12.14
Configuring DHCP Options
Changing DHCP Option Values
You can change the values for the ~~predefmed~~predefined and custom DHCP options for configuring
clients. For example, you could change the default values for these built-in options:
~~1~~' 3 = Router, to specify the IP addresses for the routers on the subnet
~~1~~l 6 = DNS Servers, to specify the IP addresses of the DNS name servers used at your site
~~1~~' 15 = Domain Name, to specify the DNS domain names to be used for host name resolution
~~.,.~~To change a DHCP option value
1.   From the DHCP Options menu, choose Defaults.
   ~~DHCP Options: Default Values~~
~~Option Class: IDHCP Standard Options~~
~~!!Ption Name: I005 Name Servers~~

2.   In the Option Class list in the DHCP Options: Default Values dialog box, select the option
class for which you want to change values.
3.   If you want to change the default value for an option, select the option you want to change
in the Option Name list, choose the Edit button, and then type a new value in the Value box.
Choosing the Edit button displays a special dialog box for editing strings, arrays of IP
address, or binary values. For information about using the special editing dialog boxes, see
the online Help for DHCP Manager.
4.   If you want to change basic elements of a custom option, select it in the Option Name list,
and then choose the Change button.
You can change the name, data type, identifier, and comment for ~~aDHCP~~a DHCP option, following
the procedures described earlier in "Creating New DHCP Options."
5. ~~When~~Wfwen you complete ~~all~~ali the ~~changes~~cuanges you want to make, choose the OK button.

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. .
Dptions ful: 11.1 05.45.87
_Llnused lflptions: gctive [lptions
Comment: Array of DNS servers, by preference
IP Address
l][l3 Flnuler
!I!"fl*.l£k-'l'-`19'§TI?3?':
U09 LPFI Sewers
U12 Host Name
U02 Time Offset
U04 Time Server
U05 Name Sewers
UU? Lug Servers
UU8 Cookie Servers
D10 Impress Servers
U11 Resource Location Serve
11.1n4.6?.54
Configuring DHCP Options
Defining ~~Options~~Gptions for Reservations
You can assign DHCP options and specify custom values for DHCP clients that use reserved ~~IP~~
lP addresses.
For ~~infonnation~~information about how to reserve IP configuration ~~infonnation~~information for DHCP clients, see
"Managing Client ~~Reservations~~Resen/ations" later in this chapter.
~~IJll>~~
To change DHCP options for ~~reservations~~resen/ations
1.   From the Scope menu, choose Active Leases.

2.   In the IP Address list of ~~the~~tne Active Leases dialog box, select the reserved address whose
options you want to change, and then choose the Options button.
The Options button is only ~~available~~avaliable for reserved addresses~~,~~, it is not available for DHCP
clients with dynamic addresses.

~~·   DHCP Options: Reservalion~~
~~Options lor: 11.105.45.67~~
~~,.•~~
~~!!nused Options: Active Options: 002 Time Offset 004 Time Server 0115 Name~~
~~Servers 007 Log Servers 008 Cookie Servers 010 Impress Servers 011 Resource~~
~~Location Serve~~
~~Comment: Array of DNS servers. by preference~~
~~IPAddreu 111.10<.67.5<~~
~~,__~~
~~I~~

3.   In the DHCP Options: Reservation dialog box, select an option name in the Unused
Options list, and then choose the Add button to move the name to the Active
Options list~~.~~.
If you want to remove a DHCP option that has been assigned to the scope, select its name
in the Active Options box, and then choose the Remove button.
4.   To change a value for an option selected in the Active Options list, choose the Value
button. Then choose the Edit button and ~~enter~~ENTER a new ~~value~~vaiue in the
Current ~~Value~~Vatue box~~.~~.
~~Predefined DHCP Client Configuration~~Installing and Configuring DHCP Servers
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Basic Options
The tables in this section describe the predefined options available for configuration of DHCP
clients. These options are defined in RFC 1533.
~~Basic Options~~
Code
0
255
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17

18
Option name
~~0~~ Pad
~~255~~ End
~~2~~ Time offset
~~3~~ Router ~~4~~
Time server ~~5~~
Name servers ~~6~~
DNS servers ~~7~~
Log ~~servers~~ sewers
~~8~~ Cookie servers ~~9~~
LPR servers ~~10~~
Impress servers ~~11~~
Resource location
servers ~~12~~
Host name
~~13~~ Boot file size
Merit dump file
Domain name
Swap server
Root path
Extensions path
Meaning
Causes subsequent fields to align on word
boundaries.
Indicates end of options in ~~the~~ tlwe DHCP packet.
Specifies the Universal Coordinated Time (~~UCI~~ UCT)
offset in seconds.
Specifies a list of IP addresses for routers on the
client's subnet. ~~1~~ 1
Specifies a list of IP addresses for time servers
available to the ~~client.1~~ c|ient.1
Specifies a list of IP addresses for name servers
available to the client. ~~1~~ 1
Specifies a list of IP addresses for DNS name
servers available to the client. ~~1~~ 1
Specifies a list of IP addresses for MIT_LCS User
Datagram Protocol (UDP) ~~log~~ !og servers available to ~~the~~ toe
client. ~~I~~ 1
Specifies a list of IP addresses for RFC 865 cookie
servers available to the client. ~~1~~ 1
Specifies a list of IP addresses for RFC 1179 ~~line~~
llne -printer servers available to the client. ~~1~~ 1
Specifies a list of IP addresses for ~~Imagen~~ lmagen Impress
servers available to the client. ~~1~~ 1
Specifies ~~alist~~ a list of RFC 887 Resource Location
servers available to the client. ~~1~~ 1
Specifies the host name of up to 63 characters for
the client. The name must start with a letter, end with
a letter or digit, and have as interior characters only
letters, numbers, and hyphens. The name can be
qualified with the local DNS domain name.
Specifies the size of the default boot image file for
the client ~~,~~ . in 512-octet blocks.

1 List is specified in order of preference.

Basic Options (continuetf)

Code   Option name   Meaning

14   Merit dump file   Specifies the ASCII path name of a file where the client's core image is dumped if acrasha crash occurs.

15   Domain name   Specifies the DNS domain name the client should use for DNS host name resolution.

16   Swap server   Specifies the IP address of the client's swap server.

17   Root path   Specifies the ASCII path name for the client's root disk.

Specifies a Hle retrievabie via TFTP containing

Installing and Configuring DHCP Sewers

Configuring DHCP Options

Predefined DHCP Client Configuration Options

18
1
Extensions path   Specifies a file retrievable via TFfPTFTP containing information interpreted the same as the vendor ~extension fieldfietd in the BOOTP response, except the file length is unconstrained and references to Tag 18 in the file are ignored.

I List is specified in order of preference.

The following table lists IP layer parameters on apera per-host basis.

IP Layer Parameters per Host

Code
19
20
21
22
23
24
25
Option name   Meaning

19 IP layer forwarding

Nonlocal source
routing
Policy filter masks
Max DG
reassembly size
Default time-to-live
Path MTU aging
timeout
Path MTU plateau
table
Meaning

Enables or disables forwarding of IP packet for this client. 1 enables forwarding, 0 disables it.

20   Nonlocal source   Enables or disables forwarding of datagrams with non routing local

nonlocal source routes. 1 enables forwarding; 0 disables it.

~~21 Policy filter masks~~ Specifies policy filters that consist of ~~alist~~a list of pairs of ~~IP~~
lP addresses and masks specifying destination/mask
pairs for filtering nonlocal source routes. Any source
routed datagram whose next-hop address does not
match a filter will be discarded by the client.
~~22   MaxDG~~ Specifies the maximum size datagram that the client
can ~~reassembly size~~ reassemble. The minimum value is 576.
~~23 Default time to~~ Specifies the default time-to-live (~~TIL~~TTL) that the
client ~~live~~
uses on outgoing datagrams. The value for the octet
is a number between 1 and 255.
~~24 Path MTU aging~~ Specifies the timeout in seconds for aging Path ~~timeout~~
Maximum Transmission Unit (MTU) values
(discovered by the mechanism defined in RFC 1191).
~~25 Path MTU plateau~~ Specifies a table of MTU sizes to use when
performing ~~table~~ Path MTU Discovered as defined in RFC
1191. The table is sorted by size from smallest to
largest. The minimum MTU value is 68.
The following table lists IP parameters on a per-interface basis. These
options affect the
operation of the IP layer on a per-interface basis. ~~Aclient~~A client can issue
multiple requests, one per
interface, to configure interfaces with their specific parameters.
IP Parameters per Interface
Code
26
27
28
29
30
Option name
~~26~~ MTU option
~~27 All~~AH subnets are local
~~28~~ Broadcast address
~~29~~ Perform mask
discovery
~~30~~ Mask supplier
~~31 Perform router discovery~~
~~32 Router solicitation address~~
~~33 Static route~~
Meaning
Specifies the MTU discovery size for this interface.
The minimum MTU value is 68.
Specifies ~~whether~~wnether the client assumes that all subnets
of the client's internetwork use the same MTU as the
local subnet where the client is connected. 1
indicates that all subnets share the same MTU~~,~~. 0
indicates that the client should assume some subnets
may ~~have~~bave smaller MTUs.
Specifies the broadcast address used on the ~~client~~<:|ient's
subnet.
Specifies whether the client should use Internet
Control Message Protocol (ICMP) for subnet mask

discovery. 1 indicates the client should perform mask
discovery; 0 indicates the client should not.
Specifies whether the client should respond to
subnet mask requests using ICMP. 1 indicates the

33 Static route

subnet mask requests using ICMP. 1 indicates the
client should respond, 0 indicates the client should
not respond.
Specifies whether the client should solicit routers
using the router discovery method in RFC 1256. 1
indicates that the client should perform router
discovery, 0 indicates that the client should not use it.
Specifies the IP address to which the client submits
router solicitation requests.
Specifies a list of IP address pairs that indicate the
static routes the client should install in its routing
cache. Any multiple routes to the same destination
are listed in descending order or priority. The routes
are destination/router address pairs. (The default
route of 0.0.0.0 is an illegal destination for ~~astatic~~ a static
route.)
~~Chapter 4 Installing and Configuring DHCP Servers~~
The following table lists link layer parameters per interface. These options
affect the operation
of the data link layer on a per-interface basis.
Link Layer Parameters per Interface
Code Option name Meaning
~~34 Trailer encapsulation~~ Specifies whether the client should negotiate use
of
trailers (RFC 983) when using the ARP protocol. 1
indicates the client should attempt to use trailer, 0
indicates the client should not use trailers.
~~35 ARP cache timeout~~ Specifies the timeout in seconds for ARP cache
entries.
~~36 Ethernet encapsulation~~ Specifies whether the client should use Ethernet
v. 2
(RFC 894) or IEEE 802.3 (RFC 1042) encapsulation
if the interface is Ethernet. 1 indicates that the client
should use RFC 1042 encapsulation; 0 indicates the
client should use RFC 894 encapsulation.
The following table shows TCP parameters. These options affect the operation
of the TCP
layer on a per-interface basis.
TCP Parameters
Code Option name ~~Meaning~~
37 Default time-to-live
38 Keepalive interval
39 Keepalive garbage
Meaning
Specifies the default ~~TIL~~TTL the client should use when ~~live~~
sending TCP segments. The minimum value of the
octet is 1.
~~38 Keepalive interval~~ Specifies the interval in seconds the client TCP

should wait before sending a keepalive message on
a TCP connection. ~~Avalue~~A value of 0 indicates that the
client should not send keepalive messages on
connections unless specifically requested by an
application.
~~39 Keepalive garbage~~ Specifies whether the client should send TCP
keepalive messages with an octet of garbage data for
compatibility with older implementations. 1 indicates
that a garbage octet should be sent; 0 indicates that
it should not be sent.
The following table shows application layer parameters. These miscellaneous
options are used
to configure applications and services.
Application Layer Parameters per
Code Option name Meaning
31 Perform router
discovery
32 Router solicitation
address
34 Trailer
encapsulation
35 ARP cache timeout
36 Ethernet
encapsuiation

40
4 1
42
1
NIS domain name
NIS servers
NTP servers
Specifies the name of the Network ~~Information~~information
Service (NIS) domain as an ASCII string. ~~41 NIS servers~~
Specifies a list of IP addresses for NIS servers
available to ~~the~~tlle client.~~1 42 NTP servers~~1
Specifies a list of IP addresses for Network Time
Protocol (NTP) ~~servers~~sewers available to the ~~client.1~~c|ient.1
~~I~~List is specified in order of preference.
The following options are for vendor-specific information.
Vendor-Specific Information
Code ~~Option name Meaning~~
43
Option name
Vendor specific info
Meaning
Binary information used by clients and servers to
~~info~~ exchange vendor-specific information~~.~~ Servers not
equipped to interpret ~~the~~tne information ignore it. Clients
that don't receive the information attempt to operate
without it.
K DHCP:options:NetB|OS over TCP/IPK
NetBIOS over TCP/~~IP~~IPZDHCP optionsNetB|OS over TCPIIP
Code ~~Option name Meaning~~

44 ~~WINS/NBNS Specifies alist of IP addresses for NetBIOS name servers servers (NBNS).l~~

45 ~~NetBIOS over Specifies alist of IP addresses for NetBIOS datagram TCP/IPNBDD distribution servers (NBDD).l~~

46
47
48
49
1
Option name
WINS/NBNS
servers
NetBIOS over
TCP/IP NBDD
WINS/N BT node
type
NetBIOS scope ID
X Window system
font
X Window system
display
Parameters:DHCP options:NetBIOS over TCP/IPK
Meaning
Specifies a list of IP addresses for NetBIOS name
servers (NBNS).1
Specifies a list of IP addresses for NetBIOS
datagram distribution sewers (NBDD).1
~~46 WINS/NBT node~~Allows configurable NetBIOS over ~~TCPJIP~~TCP/IP clients to ~~type~~
be configured as described in RFC 1001~~:~~/1002,
where 1=b-node, 2=p-node, 4=m-node, and
8=h-node.
~~Chapter 4 Installing and Configuring DHCP Servers~~
~~NetBIOS over TCP/IP (continued) Code Option name Meaning 47 NetBIOS scope ID~~
Specifies as a string that is the NetBIOS over ~~TCP/IP~~
TCPHP Scope ID for the client, as specified in RFC
1001/~~1002. 48 XWindow system~~1 002.
Specifies a list of IP addresses for ~~XWindow~~X Window font ~~font~~
servers available to the ~~client.! 49 XWindow system~~c|ient.1
Specifies a list of IP addresses for ~~XWindow~~X Window
System ~~display~~Display Manager servers available to the
client.~~!~~1
~~I~~List is specified in order of preference.
DHCP Extensions
Code
58
59
Option name ~~Meaning~~
~~58~~Renewal (~~Tl~~T1) time
value
Rebinding (T2) time
value
Meaning
Specifies the time in seconds from address
assignment ~~value~~ until the client enters the renewing state.

~~59 Rebinding (T2)~~ Specifies the time in seconds from address assignment ~~time value~~ until the client enters the rebinding state.

~~Administering DHCP Clients~~
After you have established the scope and defined the range of available and excluded ~~IP~~lP
addresses, DHCP-enabled clients can begin using the service for automatic TCP/IP
configuration.
You can use DHCP Manager to manage individual client leases, including creating and
managing reservations for clients.
Tip
You can use the ipconfig utility to troubleshoot the IP configuration on computers that use
DHCP, as described in Chapter 11, "Utilities Reference." You can also use ipconfig on
TCP/IP-32 ~~clients~~ciients on Windows for Workgroups 3.11 computers and on computers running
Microsoft Network Client version 2.0 for MS-DOS.
Installing and Configuring DHCP Servers
Administering DHCP Clients
150f33

Clrent
I I I
wmw *rf 1"i*I*" Ill
8 1 1 .201 _1 2.201 [JimP3] Reservation
Sort Order
© Sort leases by LP Address
O Sort leases by Name
Show Heservalluns Dnly
I UK
Cancel
Help
Properties. Delete
Managing Client Leases
The lease for the IP address assigned by a DHCP server has an expiration date, which the
client must renew if it is going to continue to use that address. You can view the lease duration
and other ~~infonnation~~information for specific DHCP clients, and you can add options and change settings
for reserved DHCP clients.
~~———~~To view client lease ~~infonnation~~information
1.   In the DHCP Servers list in the DHCP Manager window, select the scope ~~for which~~forvvhich you
want to view or change client information.
2.   From the Scope menu, choose Active Leases.

~~– Active Leases [11.201.0.0]~~
~~Client~~
~~.;;! 11.201.0.1 (ANNIEP2) ·· Resetvation~~

~~1}, 11.201.12.201 (JimP3) ··Reservation~~
~~Sort Order   ,~~
~~@ Sort leases by lP Address~~
~~D Show ftesetvalions Only 0 Sort leases by fiame~~
3.   In the Active Leases dialog box, select the computer whose lease you want to view in the
IP Address list, and then choose the Properties button.
~~If~~lf you want to view only clients that use reserved IP addresses, check the Show
Reservations Only box.
4.   In the Client Properties dialog box, you can view the unique identifier and other client ~~infonnation~~
information, including the lease expiration date.
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Administering DHCP Clients
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~~!PAddren:~~
.~~Y.nique ldentifrer: 12340897(32~~ 4/ 3/ 4/ /. /><4. ~
~~-=========:~~
E 8.1 xi 49 ..
_l,l_nique Identifier:
Client ~~f!.ame: W4NIEP2~~ liamez
~~,::::;==========------,~~
~~Clienl.!;.omment INet achin llliiChine~~
Client Qomment:
~~lease~~Lease Expires: ~~1994109/16~~193430931 B 20:53
1.0
2340897432
IANNIEPZ
Net admin machine
Note
You can only edit the name, unique ID, and comment, or choose the Options button in the
Client Properties dialog box for clients with reserved IP addresses.
For information about the Options button in this dialog box, see "Defining Options for
Reservations" earlier in this chapter.
You can cancel the DHCP configuration information for a DHCP client that is no longer using
an ~~IP~~lP address or for all clients in the scope. This ~~has~~nas the same effect as if the client's lease
expired-the next time that client computer starts, it must enter the ~~rebinding~~reblnding state and obtain
new TCP/IP ~~configuration~~Configuration information from a DHCP server.
Important
Delete only entries for clients that are no longer using the assigned DHCP configuration.
Deleting an active client could result in duplicate IP addresses on the network, because deleted
addresses ~~will~~Will be assigned to new active clients.
You can use ipconfig /release at the command prompt for ~~aDHCP~~a DHCP client computer to delete
an active client entry and safely free its IP address for reuse.

— To cancel ~~aclient~~a client's DHCP configuration
1.   Make sure the client is not using the assigned IP address.
2. ~~In~~In the IP Client list of the Active Leases dialog box, select the client you want to cancel,
and then choose the Delete button.
11

105.41
U8UU2b2b33U8
HIKEHAS1
édd Close 5.819
Administering DHCP Clients
Managing Client Reservations
You can reserve a specific IP address for ~~aclient~~a ciient. Typically, you will need to reserve addresses
in the following cases:
•

l For domain controllers ~~ifthe~~if the network also uses LMHOSTS files that define IP addresses
for domain ~~controllers~~oontroilers

•

' For clients that use IP addresses assigned using another method for TCP/IP configuration

•

l For assignment by RAS servers to non-DHCP clients

•

l For DNS servers
~~Ifmultiple~~If multiple DHCP servers are distributing addresses in the same scope, the client reservations
on each DHCP server should be identical. Otherwise, the DHCP reserved client will receive
different IP addresses, depending on the responding server.
Important
The IP address and static name specified in WINS take precedence over the IP address
assigned by the DHCP server. For such clients, create client reservations with the IP address
that is defined in the WINS database.
~~.,..~~To add a reservation for a client
~~1.   From the Scope menu, choose Add Reservations.~~
~~··) Add Reserved Clients~~
~~!PAddJess: ,, .105.41 .25 1~~
IP Address:
~~!!nique~~Qnique Identifier: ~~I08002b2b3308~~
~~;=::=========~~
~~Client fiame: IMIKEMASl~~
~~:============   ,~~

~~Client!;_ommenl:~~