Chapter 26

Dynamic Host Configuration Protocol (DHCP)

Introduction

This chapter describes the Dynamic Host Configuration Protocol (DHCP) support provided by the router, and how to configure the router to act as a DHCP or BOOTP server.

The Dynamic Host Configuration Protocol (DHCP) provides a method for passing configuration information to hosts on a TCP/IP network. DHCP is based on its predecessor Bootstrap Protocol (BOOTP), but adds automatic allocation of reusable network addresses and additional configuration options.

The Dynamic Host Configuration Protocol (DHCP)

The Dynamic Host Configuration Protocol (DHCP) is defined in RFC 1541 and provides a mechanism for passing configuration information to hosts on a TCP/IP network. DHCP is based on the Bootstrap Protocol (BOOTP) defined in RFC 1542, but adds automatic allocation of reusable network addresses and additional configuration options. DHCP is based on a client–server model, where the server is the host that allocates network addresses and initialisation parameters, and the client is the host that requests these parameters from the server.

DHCP supports three mechanisms for IP address allocation. In the *automatic allocation* mechanism, DHCP assigns a permanent IP address to a host. In the *dynamic allocation* mechanism, DHCP assigns an IP address to a host for a limited period of time, or until the host explicitly relinquishes the address. In the *manual allocation* mechanism, a host's IP address is assigned by the network administrator, and DHCP is used simply to convey the assigned address to
the host. A particular network will use one or more of these mechanisms, depending on the policies of the network administrator.

Dynamic allocation is the only one of the three mechanisms that allows automatic reuse of an address that is no longer needed by the host to which it was assigned. Dynamic allocation is particularly useful for assigning an address to a host that will be connected to the network only temporarily, or for sharing a limited pool of IP addresses among a group of hosts that do not need permanent IP addresses. Dynamic allocation may also be a good choice for assigning an IP address to a new host being permanently connected to a network where IP addresses are sufficiently scarce that it is important to reclaim them when old hosts are retired. Manual allocation allows DHCP to be used to eliminate the error-prone process of manually configuring hosts with IP addresses in environments where (for whatever reasons) it is desirable to manage IP address assignment outside of the DHCP mechanisms.

For dynamic allocation, DHCP assigns an IP address to a host for a limited period of time called the *lease time*. The minimum lease time is 3600 seconds. The maximum lease time is the largest unsigned 32-bit integer, called INFINITY in this implementation. If a lease time is set to INFINITY the mechanism changes to automatic allocation as the lease never expires.

This implementation uses the terms *policy* to refer to a predefined set of configuration information items, and the term *range* to refer to a list of consecutively numbered IP addresses.

This implementation supports both DHCP and its predecessor BOOTP, but this support must be explicitly enabled by a manager command. BOOTP requests can only be satisfied by policies with leases set to INFINITY, i.e. using the automatic allocation mechanism.

Configuration Example

The following example illustrates how to configure the router to act as a DHCP server in a small site. The site has a limited range of IP addresses and the users only use IP for short periods of time. The dynamic DHCP mechanism is the most appropriate for this situation. The router on the LAN will be configured to provide DHCP services to the PCs on the local LAN.
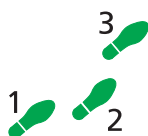
To configure DHCP:

1. **Enable the DHCP Server.**

   To enable DHCP use the command:

   ```
   ENABLE DHCP
   ```

2. **Create a policy.**

   A policy is created setting the base configuration information required by the client hosts, using the commands:

   ```
   CREATE DHCP POLICY=base LEASE=7200
   ADD DHCP POLICY=base SUBNET=255.255.255.0
   ADD DHCP POLICY=base ROUTER=192.168.1.1
   ADD DHCP POLICY=base DNSSERVER=192.168.1.254,
       192.168.1.253
   ```

3. **Create a range.**

   Create a range the defines the list of IP address to which the policy applies, using the command:

   ```
   CREATE DHCP RANGE=office POLICY=base IP=192.168.1.16
       NUMBER=32
   ```

4. **Test the configuration.**

   Check that DHCP is functioning correctly, using the commands:

   ```
   SHOW DHCP
   SHOW DHCP POLICY
   SHOW DHCP RANGE
   SHOW DHCP CLIENT
   ```

5. **Configure a printer.**

   To configure a printer with the MAC address of 00-00-0c-00-28-73 that only talks BOOTP, use the commands:

   ```
   ENABLE DHCP BOOTP
   CREATE DHCP POLICY=prnt LEASE=INFINITY INHERIT=base
   ADD DHCP RANGE=office POLICY=prnt IP=192.168.1.31
       ADDRESS=00-00-0c-00-28-73
   ```

Command Reference

This section describes the commands available on the router to configure and manage the Dynamic Host Configuration Protocol (DHCP) on the router.

DHCP requires the IP module to be enabled and configured correctly. See *Chapter 8, Internet Protocol (IP)* for detailed descriptions of the commands required to enable and configure IP.

See "*Conventions*" on page lxvii of *Preface* in the front of this manual for details of the conventions used to describe command syntax. See *Appendix A, Messages* for a complete list of messages and their meanings.

ADD DHCP POLICY

Syntax
```
ADD DHCP POLICY=name [ARPTIMEOUT=seconds]
    [BOOTFILESIZE=bootfilesize] [BROADCASTADDRESS=ipadd]
    [COOKIESERVER=ipadd,ipadd...]
    [DNSSERVER=ipadd,ipadd...] [DOMAINNAME=string]
    [ETHERENCAP={ON|OFF}] [EXTENSIONPATH=string]
    [FILE=string] [HOSTNAME=string]
    [IMPRESSSERVER=ipadd,ipadd...] [INTMTU=mtu]
    [IPFORWARDING={ENABLED|DISABLED}] [IPMTU=mtu]
    [IPPLATEAU=mtu,mtu...] [IPTIMEOUT=seconds] [IPTTL=ttl]
    [LOGSERVER=ipadd,ipadd...] [LPRSERVER=ipadd,ipadd...]
    [MASKDISCOVERY={ON|OFF}] [MASKSUPPLIER={ON|OFF}]
    [MERITDUMPFILE=string] [NAMESERVER=ipadd,ipadd...]
    [NBDDSERVERS=ipadd,ipadd...]
    [NBNAMESERVERS=ipadd,ipadd...] [NBNODETYPE={BNODE|
    PNODE|MNODE|HNODE}] [NBSCOPE=string] [NISDOMAIN=string]
    [NISERVERS=ipadd,ipadd...] [NTPSERVERS=ipadd,ipadd...]
    [POLICYFILTERING=ipadd,ipadd...]
    [RESOURCESERVER=ipadd,ipadd...] [ROOTPATH=string]
    [ROUTER=ipadd,ipadd...] [ROUTERDISCOVERY={ON|OFF}]
    [ROUTERSOLICIT=ipadd] [SERVER=ipadd]
    [SERVERNAME=server-name] [SOURCEROUTING={ENABLED|
    DISABLED}] [STATICROUTE=ipadd,ipadd...] [SUBLOCAL={ON|
    OFF}] [SUBNETMASK=ipadd] [SWAPSERVER=ipadd]
    [T1TIME=seconds] [T2TIME=seconds] [TCPGARBAGE={ON|OFF}]
    [TCPKEEPALIVE=seconds] [TCPTTL=ttl]
    [TIMEOFFSET=utc-offset] [TIMESERVER=ipadd,ipadd...]
    [TRAILERENCAP={ON|OFF}]
    [XDISPLAYSERVERS=ipadd,ipadd...]
    [XFONTSERVERS=ipadd,ipadd...]
```

where:

■ *name* is a character string, 1 to 15 characters in length. It may contain any printable character.

■ *seconds* is a time, time offset or timeout value in seconds.

■ *bootfilesize* is the length in 512-octet blocks of the default boot image for the client.

■ *ipadd* is an IP address in dotted decimal notation.

■ *string* is a character string, 1 to 99 characters in length. It may contain any printable character.

■ *mtu* is the maximum size datagram that the client should be prepared to reassemble. The minimum value is 576.

■ *ttl* is a number in the range 1 and 255.

■ *server-name* is a character string, 1 to 63 characters in length. It may contain any printable character.

■ *utc-offset* is a time offset in seconds from Coordinated Universal Time (UTC).

Description   This command adds an option to an existing DHCP policy. The POLICY parameter specifies the name of the policy to which the option is to be added.

The ARPTIMEOUT parameter specifies the timeout in seconds for ARP cache entries.

The BOOTFILESIZE parameter specifies the length in 512-octet blocks of the default boot image for the client.

The BROADCASTADDRESS parameter specifies the broadcast address in use on the client's subnet.

The COOKIESERVER parameter specifies a list of RFC 865 cookie servers available to the client. Servers should be listed in order of preference.

The DNSSERVER parameter specifies a list of Domain Name System (RFC 1035) name servers available to the client. Servers should be listed in order of preference.

The DOMAINNAME parameter specifies the domain name that client should use when resolving host names via the Domain Name System.

The ETHERENCAP parameter specifies whether or not the client should use Ethernet Version 2 (RFC 894) or IEEE 802.3 (RFC 1042) encapsulation if the interface is an Ethernet. A value of OFF indicates that the client should use RFC 894 encapsulation. A value of ON means that the client should use RFC 1042 encapsulation.

The EXTENSIONPATH parameter specifies a string to specify a file, retrievable via TFTP, which contains information which can be interpreted in the same way as the 64-octet vendor extension field within the BOOTP response.

The FILE parameter specifies the boot file name for the client.

The HOSTNAME parameter specifies the name of the client. The name may or may not be qualified with the local domain name. See RFC 1035 for character set restrictions.

The IMPRESSSERVER parameter specifies a list of Imagen Impress servers available to the client. Servers should be listed in order of preference.

The INTMTU parameter specifies the MTU to use on this interface. The MTU is specified as a 16-bit unsigned integer. The minimum legal value for the MTU is 68.

The IPFORWARDING parameter specifies whether or not the client should configure its IP layer for packet forwarding. A value of DISABLE will disable IP forwarding, and a value of ENABLE will enable IP forwarding.

The IPMTU parameter specifies the maximum size datagram that the client should be prepared to reassemble. The minimum value legal value is 576.

The IPPLATEAU parameter specifies a table of MTU sizes to use when performing Path MTU Discovery as defined in RFC 1191. The table is formatted as a list of 16-bit unsigned integers, ordered from smallest to largest. The minimum MTU value can not be smaller than 68.

The IPTIMEOUT parameter specifies the timeout (in seconds) to use when aging Path MTU values discovered by the mechanism defined in RFC 1191

The IPTTL parameter specifies the default time-to-live that the client should use on outgoing datagrams. The TTL is specified as an octet with a value between 1 and 255.

The LOGSERVER parameter specifies a list of MIT-LCS UDP log servers available to the client. Servers should be listed in order of preference.

The LPRSERVER parameter specifies a list of RFC 1179 line printer servers available to the client. Servers should be listed in order of preference.

The MASKDISCOVERY parameter specifies whether or not the client should perform subnet mask discovery using ICMP. A value of OFF indicates that the client should not perform mask discovery. A value of ON means that the client should perform mask discovery.

The MASKSUPPLIER parameter specifies whether or not the client should respond to subnet mask requests using ICMP. A value of OFF indicates that the client should not respond. A value of ON means that the client should respond.

The MERITDUMPFILE parameter specifies the path name of a file to which the client's core image should be dumped in the event the client crashes. The path name is formatted as a character string consisting of characters from the NVT ASCII character set.

The NAMESERVER parameter specifies a list of IEN116 name servers available to the client. Servers should be listed in order of preference.

The NBDDSERVERS parameter specifies a list of RFC 1001/1002 NetBIOS datagram distribution servers (NBDD) listed in order of preference.

The NBNAMESERVERS parameter specifies a list of RFC 1001/1002 NetBIOS name servers (NBNS) listed in order of preference.

The NBNODETYPE parameter specifies the NetBIOS node type which allows NetBIOS over TCP/IP clients to be configured as described in RFC 1001/1002.

The NBSCOPE parameter specifies the NetBIOS over TCP/IP scope parameter for the client as specified in RFC 1001/1002.

The NISDOMAIN parameter specifies the name of the client's NIS domain. The domain is formatted as a character string consisting of characters from the NVT ASCII character set.

The NISERVERS parameter specifies a list of IP addresses indicating NIS servers available to the client. Servers should be listed in order of preference.

The NTPSERVERS parameter specifies a list of IP addresses indicating NTP servers available to the client. Servers should be listed in order of preference.

The POLICYFILTERING parameter specifies policy filters for non-local source routing. The filters consist of a list of IP addresses and masks which specify destination/mask pairs with which to filter incoming source routes. Any source-routed datagram whose next hop address does not match one of the filters should be discarded by the client.

The RESOURCESERVER parameter specifies a list of RFC 887 Resource Location servers available to the client. Servers should be listed in order of preference.

The ROOTPATH parameter specifies the path name that contains the client's root disk. The path name is formatted as a character string consisting of characters from the NVT ASCII character set.

The ROUTER parameter specifies a list of IP addresses for routers on the client's subnet. Routers should be listed in order of preference.

The ROUTERDISCOVERY parameter specifies whether or not the client should solicit routers using the Router Discovery mechanism defined in RFC 1256. A value of OFF indicates that the client should not perform router discovery. A value of ON means that the client should perform router discovery.

The ROUTERSOLICIT parameter specifies the address to which the client should transmit router solicitation requests.

The SERVER parameter specifies the address of the server to use in the next step of the client's bootstrap process. As the router is not capable of providing an operating system executable this option allows the IP address of an appropriate TFTP server to be set.

The SERVERNAME parameter specifies the name of the server host. This is passed to the client.

The SOURCEROUTING parameter specifies whether or not the client should configure its IP layer to allow forwarding of datagrams with non-local source routes. A value of DISABLE will disallow forwarding of such datagrams, and a value of ENABLE will allow forwarding.

The STATICROUTE parameter specifies a list of static routes that the client should install in its routing cache. If multiple routes to the same destination are specified, they are listed in descending order of priority. The routes consist of a list of IP address pairs. The first address is the destination address, and the second address is the router for the destination. The default route (0.0.0.0) is an illegal destination for a static route.

The SUBLOCAL parameter specifies whether or not the client may assume that all subnets of the IP network to which the client is connected use the same MTU as the subnet of that network to which the client is directly connected. A value of ON indicates that all subnets share the same MTU. A value of OFF means that the client should assume that some subnets of the directly connected network may have smaller MTUs.

The SUBNETMASK parameter specifies the client's subnet mask as defined in RFC 950.

The SWAPSERVER parameter specifies the IP address of the client's swap server.

The T1TIME parameter specifies the time interval, in seconds, from address assignment until the client transitions to the RENEWING state.

The T2TIME parameter specifies the time interval, in seconds, from address assignment until the client transitions to the REBINDING state.

The TCPGARBAGE parameter specifies whether or not the client should send TCP keepalive messages with a octet of garbage for compatibility with older implementations. A value of OFF indicates that a garbage octet should not be sent. A value of ON indicates that a garbage octet should be sent.

The TCPKEEPALIVE parameter specifies the interval (in seconds) that the client TCP should wait before sending a keepalive message on a TCP connection. A value of zero indicates that the client should not generate keepalive messages on connections unless specifically requested by an application.

The TCPTTL parameter specifies the default time-to-live value that the client should use when sending TCP segments.

The TIMEOFFSET parameter specifies the offset of the client's subnet in seconds from Coordinated Universal Time (UTC).

The TIMESERVER parameter specifies a list of RFC 868 time servers available to the client. Servers should be listed in order of preference.

The TRAILERENCAP parameter specifies whether or not the client should negotiate the use of trailers (RFC 893) when using the ARP protocol. A value of OFF indicates that the client should not attempt to use trailers. A value of ON means that the client should attempt to use trailers.

The XDISPLAYSERVERS parameter specifies a list of IP addresses of systems that are running the X Window System Display Manager and are available to the client. Addresses should be listed in order of preference.

The XFONTSERVERS parameter specifies a list of X Window System Font servers available to the client. Servers should be listed in order of preference.

Examples   To create a policy called "base" with subnet mask, router and DNS server options, use the command:

```
ADD DHCP POLICY=BASE SUBNETMASK=255.255.255.0
    ROUTER=202.36.163.21
    DNSSERVER=192.168.100.50,192.168.100.33
```

See Also   CREATE DHCP POLICY
DELETE DHCP POLICY
DESTROY DHCP POLICY
SET DHCP POLICY
SHOW DHCP POLICY

ADD DHCP RANGE

Syntax   `ADD DHCP RANGE=name IP=ipadd ADDRESS=macadd [POLICY=name]`

where:

■ *name* is a character string, 1 to 15 characters in length. It may contain any printable character.

■ *ipadd* is an IP address in dotted decimal notation.

■ *macadd* is a hardware address of the form xx-xx-xx-xx-xx-xx, where xx is a two-digit hexadecimal number with leading zeros if necessary.

Description   This command adds a static entry to an existing DHCP range. The RANGE parameter specifies the name of an existing DHCP range.

The IP parameter specifies the IP address of the host to add to the range. The ADDRESS parameter defines the MAC address for the static host entry. The POLICY parameter specifies the name of a policy to give the host entry.

Examples   To add a static entry to the range "remote" for the device with MAC address 00-00-0c-00-28-73, use the command:

```
ADD DHCP RANGE=REMOTE IP=192.168.1.31
    ADDRESS=00-00-0c-00-28-73
```

See Also   CREATE DHCP RANGE
DELETE DHCP RANGE
DESTROY DHCP RANGE
SHOW DHCP RANGE

CREATE DHCP POLICY

Syntax   `CREATE DHCP POLICY=name LEASETIME={lease-time|INFINITY}`
`    [INHERIT=name]`

where:

■ *name* is a character string, 1 to 15 characters in length. It may contain any printable character.

■ *lease-time* is a time in seconds.

Description   This command creates a DHCP policy. Policies define the configuration information that will be given to the requesting IP host. The POLICY parameter specifies the name of the policy to create. This name is used in other commands to identify the policy.

The LEASETIME parameter specifies the time period for which the IP address will be leased to the requesting IP client. For BOOTP requests this must be set to INFINITY. If dynamic IP address allocation is not required then set LEASETIME to INFINITY. The minimum value for LEASETIME is 3600 seconds.

The INHERIT parameter specifies the name of an existing policy whose settings will be inherited by the new policy. This parameter allows the building of hierarchical policies and reduces the number of commands to create similar policies.

Examples   To create a DHCP policy called "base" with a default lease time of two hours, use the command:

```
CREATE DHCP POLICY=base LEASE=7200
```

See Also   ADD DHCP POLICY
DELETE DHCP POLICY
DESTROY DHCP POLICY
SET DHCP POLICY
SHOW DHCP POLICY

CREATE DHCP RANGE

Syntax   `CREATE DHCP RANGE=name POLICY=name IP=ipadd NUMBER=number [GATEWAY=ipadd]`

where:

■   *name* is a character string, 1 to 15 characters in length. It may contain any printable character.

■   *ipadd* is an IP address in dotted decimal notation.

■   *number* is a number in the range 1 to 255.

Description   This command creates a DHCP range. The server will reply try to fulfil BOOTP or DHCP requests from hosts with IP addresses in the defined ranges. The RANGE parameter specifies the name of the range to create.

The POLICY parameter specifies the name of a default policy to give the range. Individual host entries in the range can later be set to other defined policies.

The IP address parameter defines the IP address of the start of the range.

The NUMBER parameter defines how many host entries from the start IP address are to be included in the range.

The GATEWAY parameter specifies the IP address of a remote BOOTP relay agent. This parameter is needed if the range of IP addresses specified are not on a local interface.

Examples   To create a range called "office", which uses the policy "base", with 32 IP addresses starting at 192.168.1.16, use the command:

```
CREATE DHCP RANGE=office POLICY=base IP=192.168.1.16
    NUMBER=32
```

See Also   ADD DHCP RANGE
DELETE DHCP RANGE
DESTROY DHCP RANGE
SHOW DHCP RANGE

DELETE DHCP POLICY

Syntax   DELETE DHCP POLICY=*name*
             [ARPTIMEOUT] [BOOTFILESIZE] [BROADCASTADDRESS]
             [COOKIESERVER] [DNSSERVER] [DOMAINNAME] [ETHERENCAP]
             [EXTENSIONPATH] [FILE] [HOSTNAME] [IMPRESSSERVER]
             [INTMTU] [IPFORWARDING] [IPMTU] [IPPLATEAU] [IPTIMEOUT]
             [IPTTL] [LOGSERVER] [LPRSERVER] [MASKDISCOVERY]
             [MASKSUPPLIER] [MERITDUMPFILE] [NAMESERVER]
             [NBDDSERVERS] [NBNAMESERVERS] [NBNODETYPE] [NBSCOPE]
             [NISDOMAIN] [NISERVERS] [NTPSERVERS] [POLICYFILTERING]
             [RESOURCESERVER] [ROOTPATH] [ROUTER] [ROUTERDISCOVERY]
             [ROUTERSOLICIT] [SERVER] [SERVERNAME] [SOURCEROUTING]
             [STATICROUTE] [SUBLOCAL] [SUBNETMASK] [SWAPSERVER]
             [T1TIME] [T2TIME] [TCPGARBAGE] [TCPKEEPALIVE] [TCPTTL]
             [TIMEOFFSET] [TIMESERVER] [TRAILERENCAP]
             [XDISPLAYSERVERS] [XFONTSERVERS]

where:

■   *name* is a character string, 1 to 15 characters in length. It may contain any printable character.

Description   This command deletes an existing option from a DHCP policy. The POLICY parameter specifies the name of the policy from which the option is to be deleted.

The ARPTIMEOUT parameter specifies the timeout in seconds for ARP cache entries.

The BOOTFILESIZE parameter specifies the length in 512-octet blocks of the default boot image for the client.

The BROADCASTADDRESS parameter specifies the broadcast address in use on the client's subnet.

The COOKIESERVER parameter specifies a list of RFC 865 cookie servers available to the client. Servers should be listed in order of preference.

The DNSSERVER parameter specifies a list of Domain Name System (RFC 1035) name servers available to the client. Servers should be listed in order of preference.

The DOMAINNAME parameter specifies the domain name that client should use when resolving hostnames via the Domain Name System.

The ETHERENCAP parameter specifies whether or not the client should use Ethernet Version 2 (RFC 894) or IEEE 802.3 (RFC 1042) encapsulation if the interface is an Ethernet. A value of OFF indicates that the client should use RFC 894 encapsulation. A value of ON means that the client should use RFC 1042 encapsulation.

The EXTENSIONPATH parameter specifies a string to specify a file, retrievable via TFTP, which contains information which can be interpreted in the same way as the 64-octet vendor -extension field within the BOOTP response.

The FILE parameter specifies the boot file name for the client.

The HOSTNAME parameter specifies the name of the client. The name may or may not be qualified with the local domain name. See RFC 1035 for character set restrictions.

The IMPRESSSERVER parameter specifies a list of Imagen Impress servers available to the client. Servers should be listed in order of preference.

The INTMTU parameter specifies the MTU to use on this interface. The MTU is specified as a 16-bit unsigned integer. The minimum legal value for the MTU is 68.

The IPFORWARDING parameter specifies whether or not the client should configure its IP layer for packet forwarding. A value of DISABLE will disable IP forwarding, and a value of ENABLE will enable IP forwarding.

The IPMTU parameter specifies the maximum size datagram that the client should be prepared to reassemble. The minimum value legal value is 576.

The IPPLATEAU parameter specifies a table of MTU sizes to use when performing Path MTU Discovery as defined in RFC 1191. The table is formatted as a list of 16-bit unsigned integers, ordered from smallest to largest. The minimum MTU value can not be smaller than 68.

The IPTIMEOUT parameter specifies the timeout (in seconds) to use when aging Path MTU values discovered by the mechanism defined in RFC1191

The IPTTL parameter specifies the default time-to-live that the client should use on outgoing datagrams. The TTL is specified as an octet with a value between 1 and 255.

The LOGSERVER parameter specifies a list of MIT-LCS UDP log servers available to the client. Servers should be listed in order of preference.

The LPRSERVER parameter specifies a list of RFC 1179 line printer servers available to the client. Servers should be listed in order of preference.

The MASKDISCOVERY parameter specifies whether or not the client should perform subnet mask discovery using ICMP. A value of OFF indicates that the client should not perform mask discovery. A value of ON means that the client should perform mask discovery.

The MASKSUPPLIER parameter specifies whether or not the client should respond to subnet mask requests using ICMP. A value of OFF indicates that the client should not respond. A value of ON means that the client should respond.

The MERITDUMPFILE parameter specifies the path name of a file to which the client's core image should be dumped in the event the client crashes. The path name is formatted as a character string consisting of characters from the NVT ASCII character set.

The NAMESERVER parameter specifies a list of IEN116 name servers available to the client. Servers should be listed in order of preference.

The NBDDSERVERS parameter specifies a list of RFC 1001/1002 NetBIOS datagram distribution servers (NBDD) listed in order of preference.

The NBNAMESERVERS parameter specifies a list of RFC 1001/1002 NetBIOS name servers (NBNS) listed in order of preference.

The NBNODETYPE parameter specifies the NetBIOS node type which allows NetBIOS over TCP/IP clients to be configured as described in RFC 1001/1002.

The NBSCOPE parameter specifies the NetBIOS over TCP/IP scope parameter for the client as specified in RFC 1001/1002.

The NISDOMAIN parameter specifies the name of the client's NIS domain. The domain is formatted as a character string consisting of characters from the NVT ASCII character set.

The NISERVERS parameter specifies a list of IP addresses indicating NIS servers available to the client. Servers should be listed in order of preference.

The NTPSERVERS parameter specifies a list of IP addresses indicating NTP servers available to the client. Servers should be listed in order of preference.

The POLICYFILTERING parameter specifies policy filters for non-local source routing. The filters consist of a list of IP addresses and masks which specify destination/mask pairs with which to filter incoming source routes. Any source-routed datagram whose next hop address does not match one of the filters should be discarded by the client.

The RESOURCESERVER parameter specifies a list of RFC 887 Resource Location servers available to the client. Servers should be listed in order of preference.

The ROOTPATH parameter specifies the path name that contains the client's root disk. The path name is formatted as a character string consisting of characters from the NVT ASCII character set.

The ROUTER parameter specifies a list of IP addresses for routers on the client's subnet. Routers should be listed in order of preference.

The ROUTERDISCOVERY parameter specifies whether or not the client should solicit routers using the Router Discovery mechanism defined in RFC 1256. A value of OFF indicates that the client should not perform router discovery. A value of ON means that the client should perform router discovery.

The ROUTERSOLICIT parameter specifies the address to which the client should transmit router solicitation requests.

The SERVER parameter specifies the address of the server to use in the next step of the client's bootstrap process. As the router is not capable of providing an operating system executable this option allows the IP address of an appropriate TFTP server to be set.

The SERVERNAME parameter specifies the name of the server host. This is passed to the client.

The SOURCEROUTING parameter specifies whether or not the client should configure its IP layer to allow forwarding of datagrams with non-local source routes. A value of DISABLE will disallow forwarding of such datagrams, and a value of ENABLE will allow forwarding.

The STATICROUTE parameter specifies a list of static routes that the client should install in its routing cache. If multiple routes to the same destination are specified, they are listed in descending order of priority. The routes consist of a list of IP address pairs. The first address is the destination address, and the

second address is the router for the destination. The default route (0.0.0.0) is an illegal destination for a static route.

The SUBLOCAL parameter specifies whether or not the client may assume that all subnets of the IP network to which the client is connected use the same MTU as the subnet of that network to which the client is directly connected. A value of ON indicates that all subnets share the same MTU. A value of OFF means that the client should assume that some subnets of the directly connected network may have smaller MTUs.

The SUBNETMASK parameter specifies the client's subnet mask as defined in RFC 950.

The SWAPSERVER parameter specifies the IP address of the client's swap server.

The T1TIME parameter specifies the time interval, in seconds, from address assignment until the client transitions to the RENEWING state.

The T2TIME parameter specifies the time interval, in seconds, from address assignment until the client transitions to the REBINDING state.

The TCPGARBAGE parameter specifies whether or not the client should send TCP keepalive messages with a octet of garbage for compatibility with older implementations. A value of OFF indicates that a garbage octet should not be sent. A value of ON indicates that a garbage octet should be sent.

The TCPKEEPALIVE parameter specifies the interval (in seconds) that the client TCP should wait before sending a keepalive message on a TCP connection. A value of zero indicates that the client should not generate keepalive messages on connections unless specifically requested by an application.

The TCPTTL parameter specifies the default time-to-live value that the client should use when sending TCP segments.

The TIMEOFFSET parameter specifies the offset of the client's subnet in seconds from Coordinated Universal Time (UTC).

The TIMESERVER parameter specifies a list of RFC 868 time servers available to the client. Servers should be listed in order of preference.

The TRAILERENCAP parameter specifies whether or not the client should negotiate the use of trailers (RFC 893) when using the ARP protocol. A value of OFF indicates that the client should not attempt to use trailers. A value of ON means that the client should attempt to use trailers.

The XDISPLAYSERVERS parameter specifies a list of IP addresses of systems that are running the X Window System Display Manager and are available to the client. Addresses should be listed in order of preference.

The XFONTSERVERS parameter specifies a list of X Window System Font servers available to the client. Servers should be listed in order of preference.

Examples   To remove the LPRSERVER option from the policy "base", use the command:

```
DELETE DHCP POLICY=BASE LPRSERVER
```

See Also   ADD DHCP POLICY
CREATE DHCP POLICY
DESTROY DHCP POLICY
SET DHCP POLICY
SHOW DHCP POLICY

DELETE DHCP RANGE

Syntax   `DELETE DHCP RANGE=name IP=ipadd`

where:

■   *name* is a character string, 1 to 15 characters in length. It may contain any printable character.

■   *ipadd* is an IP address in dotted decimal notation.

Description   This command deletes an existing static host entry from a DHCP range. The IP host entry reverts to the default settings for the range.

The RANGE parameter specifies the name of the range. The IP address parameter specifies the host entry to return to the default range settings.

Examples   To delete the static entry 192.168.1.31 from the range "remote", use the command:

```
DELETE DHCP RANGE=REMOTE IP=192.168.1.31
```

See Also   ADD DHCP RANGE
CREATE DHCP RANGE
DESTROY DHCP RANGE
SHOW DHCP RANGE

DESTROY DHCP POLICY

Syntax   `DESTROY DHCP POLICY=name`

where:

■   *name* is a character string, 1 to 15 characters in length. It may contain any printable character.

Description   This command destroys an existing policy. The POLICY parameter specifies the name of the policy to destroy. If the policy is currently being used by any host entry, then an error message is displayed and the command fails.

Examples   To destroy policy "admin", use the command:

```
DESTROY DHCP POLICY=ADMIN
```

See Also   ADD DHCP POLICY
            CREATE DHCP POLICY
            DELETE DHCP POLICY
            SET DHCP POLICY
            SHOW DHCP POLICY

DESTROY DHCP RANGE

Syntax   `DESTROY DHCP RANGE=`*name*

where:

■   *name* is a character string, 1 to 15 characters in length. It may contain any printable character.

Description   This command destroys an existing DHCP range. The RANGE parameter specifies the name of the range to destroy.

Examples   To destroy the range "remote", use the command:

    `DESTROY DHCP RANGE=REMOTE`

See Also   ADD DHCP RANGE
            CREATE DHCP RANGE
            DELETE DHCP RANGE
            SHOW DHCP RANGE

DISABLE DHCP

Syntax   `DISABLE DHCP [BOOTP]`

Description   This command disables the DHCP module. All BOOTP or DHCP requests received while the module is disabled are ignored.

If the optional parameter BOOTP is specified then only the reception of BOOTP requests is disabled.

Examples   To disable BOOTP serving, use the command:

    `DISABLE DHCP BOOTP`

See Also   ENABLE DHCP
            SHOW DHCP

ENABLE DHCP

Syntax   `ENABLE DHCP [BOOTP]`

Description   This command enables the DHCP module. All BOOTP or DHCP requests received while the module is disabled are ignored.

              If the optional parameter BOOTP is specified then only the reception of BOOTP requests is enabled.

Examples   To enable the DHCP server, use the command:

                  `ENABLE DHCP`

See Also   DISABLE DHCP
              SHOW DHCP

SET DHCP POLICY

Syntax   `SET DHCP POLICY=name [ARPTIMEOUT=seconds]`
              `[BOOTFILESIZE=bootfilesize] [BROADCASTADDRESS=ipadd]`
              `[COOKIESERVER=ipadd,ipadd...]`
              `[DNSSERVER=ipadd,ipadd...] [DOMAINNAME=string]`
              `[ETHERENCAP={ON|OFF}] [EXTENSIONPATH=string]`
              `[FILE=string] [HOSTNAME=string]`
              `[IMPRESSSERVER=ipadd,ipadd...] [INTMTU=mtu]`
              `[IPFORWARDING={ENABLED|DISABLED}] [IPMTU=mtu]`
              `[IPPLATEAU=mtu,mtu...] [IPTIMEOUT=seconds] [IPTTL=ttl]`
              `[LOGSERVER=ipadd,ipadd...] [LPRSERVER=ipadd,ipadd...]`
              `[MASKDISCOVERY={ON|OFF}] [MASKSUPPLIER={ON|OFF}]`
              `[MERITDUMPFILE=string] [NAMESERVER=ipadd,ipadd...]`
              `[NBDDSERVERS=ipadd,ipadd...]`
              `[NBNAMESERVERS=ipadd,ipadd...] [NBNODETYPE={BNODE|`
              `PNODE|MNODE|HNODE}] [NBSCOPE=string] [NISDOMAIN=string]`
              `[NISERVERS=ipadd,ipadd...] [NTPSERVERS=ipadd,ipadd...]`
              `[POLICYFILTERING=ipadd,ipadd...]`
              `[RESOURCESERVER=ipadd,ipadd...] [ROOTPATH=string]`
              `[ROUTER=ipadd,ipadd...] [ROUTERDISCOVERY={ON|OFF}]`
              `[ROUTERSOLICIT=ipadd] [SERVER=ipadd]`
              `[SERVERNAME=server-name] [SOURCEROUTING={ENABLED|`
              `DISABLED}] [STATICROUTE=ipadd,ipadd...] [SUBLOCAL={ON|`
              `OFF}] [SUBNETMASK=ipadd] [SWAPSERVER=ipadd]`
              `[T1TIME=seconds] [T2TIME=seconds] [TCPGARBAGE={ON|OFF}]`
              `[TCPKEEPALIVE=seconds] [TCPTTL=ttl]`
              `[TIMEOFFSET=utc-offset] [TIMESERVER=ipadd,ipadd...]`
              `[TRAILERENCAP={ON|OFF}]`
              `[XDISPLAYSERVERS=ipadd,ipadd...]`
              `[XFONTSERVERS=ipadd,ipadd...]`

              where:

              ■ *name* is a character string, 1 to 15 characters in length. It may contain any printable character.

              ■ *seconds* is a time, time offset or timeout value in seconds.

- *bootfilesize* is the length in 512-octet blocks of the default boot image for the client.

- *ipadd* is an IP address in dotted decimal notation.

- *string* is a character string, 1 to 99 characters in length. It may contain any printable character.

- *mtu* is the maximum size datagram that the client should be prepared to reassemble. The minimum value is 576.

- *ttl* is a number in the range 1 and 255.

- *server-name* is a character string, 1 to 63 characters in length. It may contain any printable character.

- *utc-offset* is a time offset in seconds from Coordinated Universal Time (UTC).

Description   This command modifies an existing option in a DHCP policy. The POLICY parameter specifies the name of the policy containing the option to be modified.

The ARPTIMEOUT parameter specifies the timeout in seconds for ARP cache entries.

The BOOTFILESIZE parameter specifies the length in 512-octet blocks of the default boot image for the client.

The BROADCASTADDRESS parameter specifies the broadcast address in use on the client's subnet.

The COOKIESERVER parameter specifies a list of RFC 865 cookie servers available to the client. Servers should be listed in order of preference.

The DNSSERVER parameter specifies a list of Domain Name System (RFC 1035) name servers available to the client. Servers should be listed in order of preference.

The DOMAINNAME parameter specifies the domain name that client should use when resolving hostnames via the Domain Name System.

The ETHERENCAP parameter specifies whether or not the client should use Ethernet Version 2 (RFC 894) or IEEE 802.3 (RFC 1042) encapsulation if the interface is an Ethernet. A value of OFF indicates that the client should use RFC 894 encapsulation. A value of ON means that the client should use RFC 1042 encapsulation.

The EXTENSIONPATH parameter specifies a string to specify a file, retrievable via TFTP, which contains information which can be interpreted in the same way as the 64-octet vendor extension field within the BOOTP response.

The FILE parameter specifies the boot file name for the client.

The HOSTNAME parameter specifies the name of the client. The name may or may not be qualified with the local domain name. See RFC 1035 for character set restrictions.

The IMPRESSSERVER parameter specifies a list of Imagen Impress servers available to the client. Servers should be listed in order of preference.

The INTMTU parameter specifies the MTU to use on this interface. The MTU is specified as a 16-bit unsigned integer. The minimum legal value for the MTU is 68.

The IPFORWARDING parameter specifies whether or not the client should configure its IP layer for packet forwarding. A value of DISABLE will disable IP forwarding, and a value of ENABLE will enable IP forwarding.

The IPMTU parameter specifies the maximum size datagram that the client should be prepared to reassemble. The minimum value legal value is 576.

The IPPLATEAU parameter specifies a table of MTU sizes to use when performing Path MTU Discovery as defined in RFC 1191. The table is formatted as a list of 16-bit unsigned integers, ordered from smallest to largest. The minimum MTU value can not be smaller than 68.

The IPTIMEOUT parameter specifies the timeout (in seconds) to use when aging Path MTU values discovered by the mechanism defined in RFC1191

The IPTTL parameter specifies the default time-to-live that the client should use on outgoing datagrams. The TTL is specified as an octet with a value between 1 and 255.

The LOGSERVER parameter specifies a list of MIT-LCS UDP log servers available to the client. Servers should be listed in order of preference.

The LPRSERVER parameter specifies a list of RFC 1179 line printer servers available to the client. Servers should be listed in order of preference.

The MASKDISCOVERY parameter specifies whether or not the client should perform subnet mask discovery using ICMP. A value of OFF indicates that the client should not perform mask discovery. A value of ON means that the client should perform mask discovery.

The MASKSUPPLIER parameter specifies whether or not the client should respond to subnet mask requests using ICMP. A value of OFF indicates that the client should not respond. A value of ON means that the client should respond.

The MERITDUMPFILE parameter specifies the path name of a file to which the client's core image should be dumped in the event the client crashes. The path name is formatted as a character string consisting of characters from the NVT ASCII character set.

The NAMESERVER parameter specifies a list of IEN116 name servers available to the client. Servers should be listed in order of preference.

The NBDDSERVERS parameter specifies a list of RFC 1001/1002 NetBIOS datagram distribution servers (NBDD) listed in order of preference.

The NBNAMESERVERS parameter specifies a list of RFC 1001/1002 NetBIOS name servers (NBNS) listed in order of preference.

The NBNODETYPE parameter specifies the NetBIOS node type which allows NetBIOS over TCP/IP clients to be configured as described in RFC 1001/1002.

The NBSCOPE parameter specifies the NetBIOS over TCP/IP scope parameter for the client as specified in RFC 1001/1002.

The NISDOMAIN parameter specifies the name of the client's NIS domain. The domain is formatted as a character string consisting of characters from the NVT ASCII character set.

The NISERVERS parameter specifies a list of IP addresses indicating NIS servers available to the client. Servers should be listed in order of preference.

The NTPSERVERS parameter specifies a list of IP addresses indicating NTP servers available to the client. Servers should be listed in order of preference.

The POLICYFILTERING parameter specifies policy filters for non-local source routing. The filters consist of a list of IP addresses and masks which specify destination/mask pairs with which to filter incoming source routes. Any source-routed datagram whose next hop address does not match one of the filters should be discarded by the client.

The RESOURCESERVER parameter specifies a list of RFC 887 Resource Location servers available to the client. Servers should be listed in order of preference.

The ROOTPATH parameter specifies the path name that contains the client's root disk. The path name is formatted as a character string consisting of characters from the NVT ASCII character set.

The ROUTER parameter specifies a list of IP addresses for routers on the client's subnet. Routers should be listed in order of preference.

The ROUTERDISCOVERY parameter specifies whether or not the client should solicit routers using the Router Discovery mechanism defined in RFC 1256. A value of OFF indicates that the client should not perform router discovery. A value of ON means that the client should perform router discovery.

The ROUTERSOLICIT parameter specifies the address to which the client should transmit router solicitation requests.

The SERVER parameter specifies the address of the server to use in the next step of the client's bootstrap process. As the router is not capable of providing an operating system executable this option allows the IP address of an appropriate TFTP server to be set.

The SERVERNAME parameter specifies the name of the server host. This is passed to the client.

The SOURCEROUTING parameter specifies whether or not the client should configure its IP layer to allow forwarding of datagrams with non-local source routes. A value of DISABLE will disallow forwarding of such datagrams, and a value of ENABLE will allow forwarding.

The STATICROUTE parameter specifies a list of static routes that the client should install in its routing cache. If multiple routes to the same destination are specified, they are listed in descending order of priority. The routes consist of a list of IP address pairs. The first address is the destination address, and the second address is the router for the destination. The default route (0.0.0.0) is an illegal destination for a static route.

The SUBLOCAL parameter specifies whether or not the client may assume that all subnets of the IP network to which the client is connected use the same MTU as the subnet of that network to which the client is directly connected. A value of ON indicates that all subnets share the same MTU. A value of OFF

means that the client should assume that some subnets of the directly connected network may have smaller MTUs.

The SUBNETMASK parameter specifies the client's subnet mask as defined in RFC 950.

The SWAPSERVER parameter specifies the IP address of the client's swap server.

The T1TIME parameter specifies the time interval, in seconds, from address assignment until the client transitions to the RENEWING state.

The T2TIME parameter specifies the time interval, in seconds, from address assignment until the client transitions to the REBINDING state.

The TCPGARBAGE parameter specifies whether or not the client should send TCP keepalive messages with a octet of garbage for compatibility with older implementations. A value of OFF indicates that a garbage octet should not be sent. A value of ON indicates that a garbage octet should be sent.

The TCPKEEPALIVE parameter specifies the interval (in seconds) that the client TCP should wait before sending a keepalive message on a TCP connection. A value of zero indicates that the client should not generate keepalive messages on connections unless specifically requested by an application.

The TCPTTL parameter specifies the default time-to-live value that the client should use when sending TCP segments.

The TIMEOFFSET parameter specifies the offset of the client's subnet in seconds from Coordinated Universal Time (UTC).

The TIMESERVER parameter specifies a list of RFC 868 time servers available to the client. Servers should be listed in order of preference.

The TRAILERENCAP parameter specifies whether or not the client should negotiate the use of trailers (RFC 893) when using the ARP protocol. A value of OFF indicates that the client should not attempt to use trailers. A value of ON means that the client should attempt to use trailers.

The XDISPLAYSERVERS parameter specifies a list of IP addresses of systems that are running the X Window System Display Manager and are available to the client. Addresses should be listed in order of preference.

The XFONTSERVERS parameter specifies a list of X Window System Font servers available to the client. Servers should be listed in order of preference.

Examples   To change the DN server for policy "base", use the command:

```
SET DHCP POLICY=BASE DNSSERVER=192.168.100.51
```

See Also   ADD DHCP POLICY
CREATE DHCP POLICY
DELETE DHCP POLICY
DESTROY DHCP POLICY
SHOW DHCP POLICY

SHOW DHCP

Syntax   SHOW DHCP

Description   This command displays the state of the DHCP module (Figure 26-1 on page 26-22, Table 26-1 on page 26-22).

Figure 26-1: Example output from the SHOW DHCP command.

```
DHCP Server

  State .................. enabled
  BOOTP Status ........... enabled
  Policies ............... pol1
                          prnt
  Ranges ................. develop ( 202.36.163.6 - 202.36.163.22 )
                          remote ( 192.168.100.92 - 192.168.100.124 )
  In Messages ............ 3
  Out Messages ........... 3
  In DHCP Messages ....... 3
  Out DHCP Messages ...... 3
  In BOOTP Messages ...... 0
  Out BOOTP Messages ..... 0
```

Table 26-1: Parameters displayed in the output of the SHOW DHCP command.

Parameter	Meaning
State	The status of the DHCP server; one of "enabled" or "disabled".
BOOTP Status	The status of BOOTP serving; one of "enabled" or "disabled".
Policies	A list of the policies that have been defined.
Ranges	A list of the ranges that have been defined.
In Messages	The total number of DHCP or BOOTP messages received by the router.
Out Messages	The total number of DHCP or BOOTP messages transmitted by the router.
In DHCP Messages	The number of DHCP messages received by the router.
Out DHCP Messages	The number of DHCP messages transmitted by the router.
In BOOTP Messages	The number of BOOTP messages received by the router.
Out BOOTP Messages	The number of BOOTP messages transmitted by the router.

Examples   To display the current configuration of the DHCP server, use the command:

    SHOW DHCP

See Also   SHOW DHCP CLIENT
SHOW DHCP POLICY
SHOW DHCP RANGE

SHOW DHCP CLIENT

Syntax   SHOW DHCP CLIENT [RANGE=*name*]

Description   This command displays information about the currently defined range client entries (Figure 26-2 on page 26-23, Table 26-2 on page 26-24). If the RANGE parameter is specified then only the clients in the specified range are displayed.

Figure 26-2: Example output from the SHOW DHCP CLIENT command.

```
DHCP Client Entries

IP Address      ClientId                    State   Type   Expiry
------------------------------------------------------------------------
202.36.163.14   00-00-c0-00-00-01           unused  static never
202.36.163.15   00-00-c0-00-00-02           unused  static never
202.36.163.16   00-00-c0-00-00-03           unused  static never
202.36.163.17   00-00-c0-00-00-04           unused  static never
202.36.163.18   00-00-c0-00-00-05           unused  static never
202.36.163.19   00-00-c0-00-00-06           unused  static never
202.36.163.20   08-00-5a-a1-02-3f           inuse   auto   never
202.36.163.21   00-00-c0-c9-c6-7b           inuse   auto   never
202.36.163.22   08-00-09-0d-16-e7           inuse   auto   never
202.36.163.23                               unused  auto   never
202.36.163.24                               unused  auto   never
202.36.163.25                               unused  auto   never
202.36.163.26                               unused  auto   never
202.36.163.27                               unused  auto   never
202.36.163.28   00-40-10-02-e8-a3           inuse   auto   never


192.168.100.92  00-00-c0-c9-c6-21           inuse   dyn    19-Jun-1997 12:30:51
192.168.100.93                              unused  dyn
192.168.100.94                              unused  dyn
192.168.100.95                              unused  dyn
192.168.100.96                              unused  dyn
192.168.100.97                              unused  dyn
192.168.100.98                              unused  dyn
192.168.100.99                              unused  dyn
192.168.100.110                             unused  dyn
192.168.100.111                             unused  dyn
192.168.100.112                             unused  dyn
192.168.100.113                             unused  dyn
192.168.100.114                             unused  dyn
192.168.100.115                             reclaim dyn
192.168.100.116                             reclaim dyn
192.168.100.117                             reclaim dyn
192.168.100.118                             reclaim dyn
```

Table 26-2: Parameters displayed in the output of the SHOW DHCP CLIENT command.

Parameter	Meaning
IP Address	An IP address from the range of available IP addresses.
ClientId	The hardware address of the client, if any, that has been assigned the IP address.
State	The state of the IP address; one of "unused" (the IP address is not currently in use and is available for assignment), "inuse" (the IP address is currently assigned to a client) or "reclaim" (the IP address is currently being reclaimed).
Type	The type of allocation mechanism applied to the IP address; one of "static" (manual allocation), "auto" (automatic allocation) or "dyn" (dynamic allocation).
Expiry	The expiry date for dynamically allocated IP addresses.

Examples   To display information about the clients in the range "remote", use the command:

```
SHOW DHCP CLIENT RANGE=REMOTE
```

See Also   SHOW DHCP
SHOW DHCP POLICY
SHOW DHCP RANGE

SHOW DHCP POLICY

Syntax   SHOW DHCP POLICY[=*name*]

Description   This command displays information about the currently defined policies (Figure 26-3 on page 26-24, Table 26-3 on page 26-25). If a policy name is specified then only information about the specified policy is displayed.

Figure 26-3: Example output from the SHOW DHCP POLICY command.

```
DHCP Policies

Name: pol1
  Base Policy: none
  01 subnetmask ....... 255.255.255.0
  03 router ........... 202.36.163.21
  06 dnsserver ........ 192.168.100.50  192.168.100.33
  51 leasetime ........ 3600

Name: prnt
  Base Policy: pol1
  01 subnetmask ....... (pol1) 255.255.255.0
  03 router ........... (pol1) 202.36.163.21
  06 dnsserver ........ (pol1) 192.168.100.50  192.168.100.33
  51 leasetime ....... (prnt) infinity
```

Table 26-3: Parameters displayed in the output of the SHOW DHCP POLICY command.

Parameter	Meaning
Name	The name of the policy.
Base Policy	The base policy inherited by this policy.
options...	A list of the options configured for the policy. Each entry includes the DHCP option identifier, the parameter keyword and the current value(s) of the option.

Examples　To display information about the policy "base", use the command:

```
SHOW DHCP POLICY=BASE
```

See Also　SHOW DHCP
SHOW DHCP CLIENT
SHOW DHCP RANGE

SHOW DHCP RANGE

Syntax　SHOW DHCP RANGE[=*name*]

Description　This command displays information about the currently defined ranges (Figure 26-4 on page 26-25, Table 26-4 on page 26-26). If a range name is specified then only information about the specified range is displayed.

Figure 26-4: Example output from the SHOW DHCP RANGE command.

```
DHCP Ranges

Name: remote
  Start Address .............. 192.168.100.92
  End Address ................ 192.168.100.124
  Used Address(es) ........... 192.168.100.92    192.168.100.94    192.168.100.95
                              192.168.100.96
  Free Address(es) ........... 192.168.100.93    192.168.100.97    192.168.100.98
                              192.168.100.99    192.168.100.100   192.168.100.101
                              192.168.100.102
  Reclaiming Address(es) ..... 192.168.100.103   192.168.100.104   192.168.100.105
                              192.168.100.106   192.168.100.107   192.168.100.108
                              192.168.100.109   192.168.100.110   192.168.100.111
                              192.168.100.112   192.168.100.113   192.168.100.114
                              192.168.100.115   192.168.100.116   192.168.100.117
                              192.168.100.118   192.168.100.119   192.168.100.120
                              192.168.100.121   192.168.100.122   192.168.100.123
  In DHCP Messages ........... 0
  In Discover Messages ....... 0
  In Request Messages ........ 0
  In Decline Messages ........ 0
  In Release Messages ........ 0
  Out DHCP Messages .......... 0
  Out Offer Messages ......... 0
  Out Ack Messages ........... 0
  Out Nak Messages ........... 0
  In BOOTP Messages .......... 0
  Out BOOTP Messages ......... 0
```

Table 26-4: Parameters displayed in the output of the SHOW DHCP RANGE command.

Parameter	Meaning
Name	The name of the range.
Start Address	The first IP address in the range.
End Address	The last IP address in the range.
Used Address(es)	A list of the IP addresses currently assigned to clients.
Free Address(es)	A list of the IP addresses currently available for assignment.
Reclaiming Address(es)	A list of the IP addresses currently being reclaimed from clients.
In DHCP Messages	The total number of DHCP messages received for this range.
In Discover Messages	The number of DHCP discover messages received for this range.
In Request Messages	The number of DHCP request messages received for this range.
In Decline Messages	The number of DHCP decline messages received for this range.
In Release Messages	The number of DHCP release messages received for this range.
Out DHCP Messages	The total number of DHCP messages transmitted for this range.
Out Offer Messages	The number of DHCP offer messages transmitted for this range.
Out Ack Messages	The number of DHCP acknowledgment (ACK) messages transmitted for this range.
Out Nak Messages	The number of DHCP negative acknowledgement (NAK) messages transmitted for this range.
In BOOTP Messages	The number of BOOTP messages received for this range.
Out BOOTP Messages	The number of BOOTP messages transmitted for this range.

Examples   To display information about the range "remote", use the command:

```
SHOW DHCP RANGE=REMOTE
```

See Also   SHOW DHCP
SHOW DHCP CLIENT
SHOW DHCP POLICY