



CHAPTER 12

Configuring Dynamic Addressing on the GGSN

This chapter describes how to configure dynamic IP addressing on the gateway GRPS support node (GGSN).



Note

The tasks in this chapter apply to IPv4 PDP contexts only. For information on IPv6 addressing, see [Chapter 4, “Configuring IPv6 PDP Support on the GGSN.”](#)

For a complete description of the GGSN commands in this chapter, refer to the *Cisco GGSN Command Reference*

- [Overview of Dynamic IP Addressing on the GGSN, page 12-1](#)
 - [Configuring DHCP on the GGSN, page 12-2](#)
 - [Configuring MS Addressing via Local Pools on the GGSN, page 12-10](#)
 - [Configuring MS Addressing via RADIUS, page 12-12](#)
 - [Configuring IP Overlapping Address Pools, page 12-12](#)
 - [Configuring the NBNS and DNS Address for an APN, page 12-16](#)

Overview of Dynamic IP Addressing on the GGSN

-
-
-
- **peer default ip address dhcp**
- **aaa authorization network *method_list***

Be sure that users are configured on the RADIUS server using the complete username@domain format.

Specify the `peer default ip address dhcp` command at the PPP Virtual Template interface.

For more information about configuring RADIUS services on the GGSN, see the “[Configuring Security on the GGSN](#)” chapter in this book.

Local pool IP address allocation

Be sure to configure a local pool using the `ip local pool` command.

Specify the `ip local pool` command on the GGSN.

Specify the `ip local pool` *pool-name*



On the Cisco IOS 7600 platform, dynamic address allocation using the DHCP or RADIUS server methods requires that the DHCP or RADIUS server be Layer 3 routeable from the supervisor engine.

Configuring DHCP on the GGSN

You can use local DHCP services within the Cisco IOS software, or you can configure the GGSN to use an external DHCP server such as the Cisco Network Registrar (CNR). For information about configuring internal DHCP services in the Cisco IOS software, refer to the *Cisco IOS Configuration Fundamentals Configuration Guide*.

```

gprs default dhcp-server
    dhcp-server
gprs default ip-address-pool
    ip-address-pool
dhcp-proxy-client
    dhcp-server

```

, page 12-8

Configuration Example, page 12-8

Configuring DHCP Server Communication Globally

	Command	Purpose
Step 1	Router(config)# ip address-pool { dhcp-proxy-client local }	<p>—Specifies the router or instance of Cisco IOS software as the proxy-client between a third-party DHCP server and peers connecting to the router or IOS instance.</p> <p>—Specifies the local address pool named “default”.</p> <p>There is no default option for the command. If you configure a local address pool using the keyword, you can also configure the optional commands in Step 4 and Step 5.</p>
Step 2	ip dhcp-server <i>ip-address</i> <i>name</i>	

Step 3	<pre>ip dhcp excluded address low-address [high-address]</pre>	<p><i>low-address</i></p> <p><i>high-address</i></p>
Step 4		
Step 5	<pre>Router(config-dhcp)# network network-number mask /prefix-length</pre>	<p>length must be preceded by a forward slash (/).</p>

Guide Cisco IOS IP Command References

Cisco IOS IP Configuration
Cisco IOS Dial Technologies Command Reference

Configuring DHCP at the GGSN Global Configuration Level

onfiguration level. When you configure DHCP at the GGSN configuration level, you can configure DHCP server communication for all access points or for a specific access point.

Configuring DHCP at the GGSN configuration level includes the following tasks:

- [Configuring a Loopback Interface, page 12-4](#) (Required)
- [Specifying a DHCP Server for All Access Points, page 12-5](#) (Optional)
- [Specifying a DHCP Server for a Particular Access Point, page 12-6](#) (Optional)

Configuring a Loopback Interface

Command	Purpose
Step 1 <code>interface loopback interface-number</code>	<i>interface-number</i>
	<i>ip-address</i> <i>mask</i> <i>ip-address</i>

Specifying a DHCP Server for All Access Points

```
gprs default ip-address-pool
dhcp-proxy-client radius-client disable
```

disable

```
Router(config-access-point)#  
{          |          |          pool-name  
|          }
```

```
Router(config-access-point)#  
{ip-address} [ip-address] [ ]
```

```
Router(config-access-point)#  
ip-address
```



To optimize local DHCP services on the GGSN, use the following commands, beginning in global configuration mode:

Router(config)# ip dhcp ping packets 0	
Router(config)# ip dhcp ping timeout 100	

Configuration Example

-
-

```
aa new-model
!
aaa group server radius abc
 server 10.2.3.4
 server 10.6.7.8
!
aaa authentication ppp abc group abc
aaa authorization network abc group abc
aaa accounting network abc start-stop group abc
!
ip cef
!
ip vrf vpn3
 rd 300:3
!
interface Loopback1
 ip address 10.30.30.30 255.255.255.255
!
interface Loopback2
```

```

interface FastEthernet0/0
 ip vrf forwarding vpn3
 ip address 10.50.0.1 255.255.0.0
 duplex half
!
interface FastEthernet1/0
 ip address 10.70.0.1 255.255.0.0
 duplex half
!
interface loopback 1
 ip address 10.8.0.1 255.255.255.0
!
interface Virtual-Template1
 ip unnumber loopback 1
 encapsulation gtp
 gprs access-point-list gprs
!
ip route 10.10.0.1 255.255.255.255 Virtual-Template1
ip route vrf vpn3 10.100.0.5 255.255.255.0 fa0/0 10.50.0.2
ip route 10.200.0.5 255.255.255.0 fa1/0 10.70.0.2
!
no ip http server
!
gprs access-point-list gprs
 access-point 1
  access-point-name gprs.pdn.com
  ip-address-pool dhcp-proxy-client
  dhcp-server 10.200.0.5
  dhcp-gateway-address 10.30.30.30
  network-request-activation
  exit
!
 access-point 2
  access-point-name gprs.pdn2.com
  access-mode non-transparent
  ip-address-pool dhcp-proxy-client
  dhcp-server 10.100.0.5 10.100.0.6 vrf
  dhcp-gateway-address 10.27.27.27
  aaa-group authentication abc
  vrf vpn3
  exit
!
gprs default ip-address-pool dhcp-proxy-client
!
radius-server host 10.2.3.4 auth-port 1645 acct-port 1646 non-standard
radius-server host 10.6.7.8 auth-port 1645 acct-port 1646 non-standard
radius-server key ggsntel

```

Configuring MS Addressing via Local Pools on the GGSN

Hold Back Timer

first-in first-out [FIFO] queue. Therefore, all other elements will have a great recycle delay than the first element.)

When an address assignment is blocked because an IP address is held for some time, a count of blocked address assignments that is maintained for the local pool is incremented.



The hold back timer feature does not support IPv6 local pools.

To configure a local IP address pool, use the following command in global configuration mode:

	Configures a local pool of IP addresses to be used when a remote peer connects to a point-to-point interface, where: <ul style="list-style-type: none">—Default local address pool is used if no other pool is named.—Name of a specific local address pool.—Lowest IP address in the pool.—(Optional) Highest IP address in the pool. If this value is omitted, only the low-ip-address IP address argument is included in the local pool.—(Optional) The time, in seconds, addresses should be held before making them available for reassignment.

To assign a local pool to an access-point, use the following command in access-point configuration mode:

	(Optional) Specifies that a local pool provides the IP address.



Using VRF at the access point, you can configure APNs that use the same IP address pool (overlapping addresses).

For more information on configuring VPN access via VRF from an access point, see the [“VPN Access Using VRF Configuration Task Lists”](#) section on page 8-13.

] command in privileged EXEC

mode:

Pool	Begin	End	Free	In use	Blocked
poola	10.8.8.1	10.8.8.5	5	0	0

Router #show ip local pool poolA

Pool	Begin	End	Free	In use	Blocked
poola	10.8.8.1	10.8.8.5	5	0	0

Available addresses:

10.8.8.1
 10.8.8.2
 10.8.8.3
 10.8.8.4
 10.8.8.5

Inuse addresses:

None

Held addresses: Time Remaining

None

```
!
ip local pool local_pool1 128.1.0.1 128.1.255.254
```

```
ip-address-pool local local_pool1
```

Configuring MS Addressing via RADIUS

Cisco IOS Security Configuration Guide

Configuring IP Overlapping Address Pools

	Command	Purpose
Step 1	<p>Example:</p> <pre>GGSN(config)# ip local pool testpool 10.2.2.1 10.2.2.10 group testgroup cache-size 10000</pre>	
	<pre>Router(config)# [] []</pre> <p>GGSN(config)#</p>	

Configuration Examples

-
-
-

Defining Local Address Pooling as the Global Default

```
ip address-pool local ip local pool default 192.169.15.15 192.68.15.16
```

Configuring Multiple Ranges of IP Addresses into One Pool Example

Configuring IP Overlapping Address Pools on a GGSN on the Cisco 7600 Platform with Supervisor II / MSFC2 Example

```
description GRE Tunnel 1
rd 100:1
!
ip vrf vpn2
description GRE Tunnel 3
rd 101:1

description GPRS GTP V-TEMPLATE IP ADDRESS
ip address 9.9.9.72 255.255.255.0
!
interface Tunnel1
description VRF-GRE to PDN 7500(13) Fa0/1

ip address 50.50.52.72 255.255.255.0
tunnel source 150.1.1.72
tunnel destination 165.2.1.13
!
interface Tunnel2
description VRF-GRE to PDN PDN x(12) Fa3/0

ip address 80.80.82.72 255.255.255.0
tunnel source 150.1.1.72
tunnel destination 167.2.1.12
!
interface GigabitEthernet0/0.1
description Gi
encapsulation dot1Q 100
```

```
ip address 10.1.2.72 255.255.255.0
!
interface Virtual-Templat1
description GTP v-access
ip unnumbered Loopback100
encapsulation gtp
gprs access-point-list gprs
!
router ospf 10
network 10.1.2.0 0.0.0.255 area 10
network 150.1.0.0 0.0.255.255 area 10
!

gprs access-point-list gprs
access-point 1
access-point-name apn.vrf1.com
access-mode non-transparent
aaa-group authentication ipdbfms

!
access-point 2
access-point-name apn.vrf2.com
access-mode non-transparent
aaa-group authentication ipdbfms

!

interface FastEthernet9/5
no ip address
switchport
switchport access vlan 167
no cdp enable
!
interface FastEthernet9/10
no ip address
switchport
switchport access vlan 165
no cdp enable
!
interface Vlan165
ip address 165.1.1.1 255.255.0.0
!
interface Vlan167
ip address 167.1.1.1 255.255.0.0
!
! provides route to tunnel endpoints on GGSNs
router ospf 10
network 10.1.2.0 0.0.0.255 area 10
!
! routes to tunnel endpoints on PDN
!
ip route 165.2.0.0 255.255.0.0 165.1.1.13
ip route 167.2.0.0 255.255.0.0 167.1.1.12
```

Configuring the NBNS and DNS Address for an APN

1.

2.

3.

4.



nbns primary

no

nbns primary

secondary

dns primary

no

dns primary

secondary

