

# **Nexthop Forwarding Support IPv4/v6 Address**

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## **Revision History**



Note

Revision history details are not provided for features introduced before release 21.24.

Revision Details	Release
First introduced	Pre 21.24

## **Feature Description**

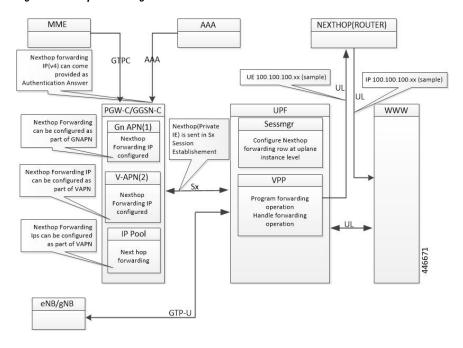
In uplink direction at CUPS UPF, UE IP and the GI IP might be in a different subnet and the routing path is defined to allow the uplink packet forward accordingly.

### **How It Works**

### **Architecture**

The following illustration provides EGCI-based P-GW UP Selection Solution overview.

Figure 1: Nexthop Forwarding



### **Configuration Priority**

Configuration	Priority
AAA (Only IPv4)	1
APN (Gn/VAPN)	2
IP Pool	3

### **Configuration Use Cases**

Case	IP Type	AAA	APN	IP Pool	Nexthop IP Selection	
Nexthop supplied Only in AA message	IPv4	209.165.200.225	Not configured	Not configured	Nexthop Address Selected from AAA:	
over AAA	IPv6	Not supported	Not configured	Not configured	IPv4: 209.165.200.225 IPv6: NA	
Nexthop that is supplied in AA	IPv4	209.165200.225	209.165.201.1	50.50.50.50	Nexthop Address is selected from AAA:	
message over AAA + IPv4 configured in APN and IP Pool	IPv46 Not supported		Not configured	Not configured	IPv4: 209.165.200.225 IPv6: NA	

Case	IP Type	AAA	APN	IP Pool	Nexthop IP Selection		
IPv4 and IPv6 configured in APN only	IPv4	Not configured	209.165.201.1	Not configured	Nexthop Address is selected from APN: IPv4:		
	IPv6	Not supported	9001::3	Not configured	209.165.200.225 IPv6: 9001::3		
IPv4 and IPv6 configured in IP Pool only	IPv4	Not configured	Not configured 50.50.50.50.		Nexthop Address is selected from IP Pool:		
Olly	IPv6	Not configured	Not configured	5002::5	209.165.200.225 IPv6 : 5002::5		
IPv4 available over	IPv4	209.165.200.225	209.165.201.1	50.50.50.50	Nexthop IPv4 is selected from AAA: 209.165.200.225 Nexthop IPv6 selected from APN: 9001::3		
AAA + IPv4 and IPv6 configure on APN and IP Pool	IPv6	Not Supported	9001::3	5002::5			
IPv4 available over	IPv4	209.165.200.225	Not configured	50.50.50.50	Nexthop IPv4 is selected from AAA:		
AAA + IPv4 and IPv6 configure on IP Pool	IPv6	Not Supported	Not configured	5002::5	209.165.200.225 Nexthop IPv6 selected from IP Pool: 5002::5		
IPv4 available over	IPv4	209.165.200.225	209.165.201.1	Not configured	Nexthop IPv4 is selected from AAA:		
AAA + IPv4 and IPv6 configure on APN.	IPv6	Not Supported	9001::3	Not configured	209.165.200.225 Nexthop IPv6 selected from APN: 9001::3		

### Interface

Following Private IEs are introduced in SX Session Establishment message.

3 8	PFCP _IE_ NEXT HOP		Sx Session PFCP_IE_NEXTHOP Establish ment Request										Private IE: CUPS: nexthop forward		
				ing support-											
		Octets	7 6 5 4 2 2 1									IPv4 /IPv6			
		1 to 2		I	Type =	= 238 (	decim	al)				address			
		3 to 4			L	ength	= n								
		5 to 10		P	FCP_IF	E_NEX	КТНО	P_ID	)			-			
		11-14		P	FCP_II	E_NEX	XTHO	P_IP	)						
2 3 9	PFCP _IE_ NEXIHOI _ID			PFCP_	IE_NE		P_ID			creatile of Session Se	nside CP CTHOP	Private IE: CUPS: nexthop forwarding support- IPv4 /IPv6 address			
		Octets	IE												
		1 to 2		Type = 239 (decimal) NEX of S						XTHOP x					
		3 to 4			Ler	ngth =	5				sion blishment uest				
		5 to	5 to												

10

2 4 0	PFCP_IE_ NEXTHOP _IP		PFCP_IE_NEXTHOP_IP  Bits									Private
		Octoba	7	6	5	4	3	2	1		NEXTHOP	IE:
		Octets	/	0	3	4	3	2	1		of Sx Session	CUPS:
		1 to 2		Type = 240 (decimal)								nexthop forwarding
		3 to 4		Length = n  spare V4 V6								support- IPv4/
		5										IPv6 address
		m to m+3	IPv4 Address									
		p to p+15	IPv6 Address									

## **Configuring Nexthop Forwarding Support IPv4/IPv6 Address**

## **Configuring Nexthop Forwarding at APN Configuration Mode**

Use the following CLI commands to configure Nexthop Forwarding at APN.

```
configure
  context context_name
    apn apn_name
       nexthop-forwarding-address { ipv4v6_address | ipv4_address | ipv6_address}
}
    no nexthop-forwarding-address
    end
```

#### NOTES:

- no: Disables Nexthop forwarding address configuration.
- **nexthop-forwarding-address** { *ipv4v6\_address | ipv4\_address | ipv6\_address* }: Configures the Nexthop forwarding address for this APN.
  - *ipv4\_address* Configures IPv4 address.
  - *ipv6\_address* Configures IPv6 address (supports colon-separated hexadecimal notation).

## **Configuring Nexthop Forwarding at IP Pool**

Use the following CLI commands to configure Nexthop Forwarding at APN.

```
configure
  context context name
```

```
[ no ] ip pool ipv4-public nexthop-forwarding-address ipv4_address [ no ] ip pool ipv6-public nexthop-forwarding-address ipv6_address end
```

#### NOTES:

- no: Disables Nexthop forwarding address configuration.
- **nexthop-forwarding-address** *ipv4\_address | ipv6\_address*: Configures the IPv4 address Nexthop forwarding address for this pool.
- **nexthop-forwarding-address** *ipv6\_address*: Configures the IPv6 address Nexthop forwarding address for this pool.

### **Configuring Nexthop Forwarding Through AAA**

Nexthop Forwarding Address can be configured through AAA. This option allows us to configure externally. Configuring Nexthop Forwarding externally:

```
RADIUS AUTHENTICATION
Access-Accept
Subscriber-Nexthop-Address
```

## **Monitoring and Troubleshooting**

This section provides information about CLI commands available for monitoring and troubleshooting the feature.

### **Show Commands and Outputs**

This section provides information about show commands and their outputs in support of this feature.

#### show apn name <apn\_name>

The output of this show command is enhanced to include the following fields introduced in support of this feature.

• nexthop gateway addr: Displays the configured Nexthop gateway address.

#### show subscriber user-plane-only full all

The output of this show command is enhanced to include the following fields introduced in support of this feature.

• Next Hop Ip Address - Displays the configured Nexthop IP address.