

IPv6 PDU Sessions

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Feature Summary and Revision History

Summary Data

Table 1: Summary Data

Applicable Product(s) or Functional Area	SMF
Applicable Platform(s)	SMI
Feature Default Setting	Enabled – Always-on
Related Changes in this Release	Not Applicable
Related Documentation	Not Applicable

Revision History

Table 2: Revision History

Revision Details	Release
Added permissible range values for the following commands in ICMPv6 Profile configuration options. • **mtu** • **reachable-time** • **retrans-timer**	2021.02.1
First introduced.	Pre-2020.02.0

Feature Description

SMF supports ICMPv6 Router Solicit and Advertisement to comply to IPv6 Stateless Auto-configuration.

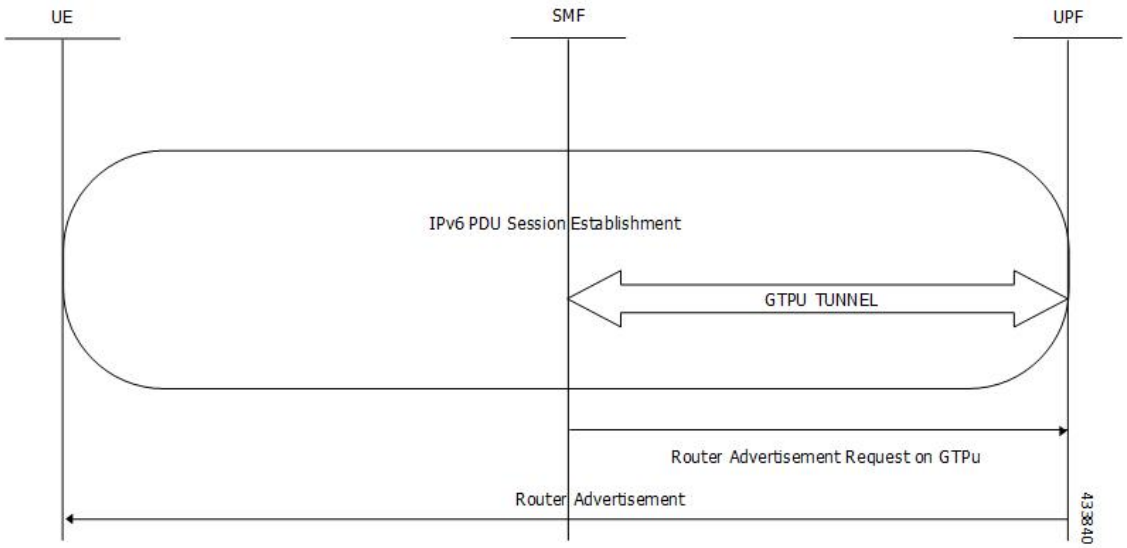
Router Advertisement supports the following ICMPv6 options:

- Prefix Information—Sends the allocated UE IPv6 prefix.
- MTU—Takes the MTU size from the configuration. Default is 1500.
- Source Link Layer Address—Takes the value from the configured local virtual MAC.

Unsolicited Router Advertisement

The SMF sends unsolicited router advertisement on successful PDU Session Establishment to share the allocated IPv6 prefix to UE. RA message is sent over the GTPU tunnel, which is created between SMF and UPF during the session establishment procedure. SMF also installs PDRs and FARs on the UPF to enable routing for RS and RA messages.

Figure 1: Router Advertisement Message Processing Call Flow

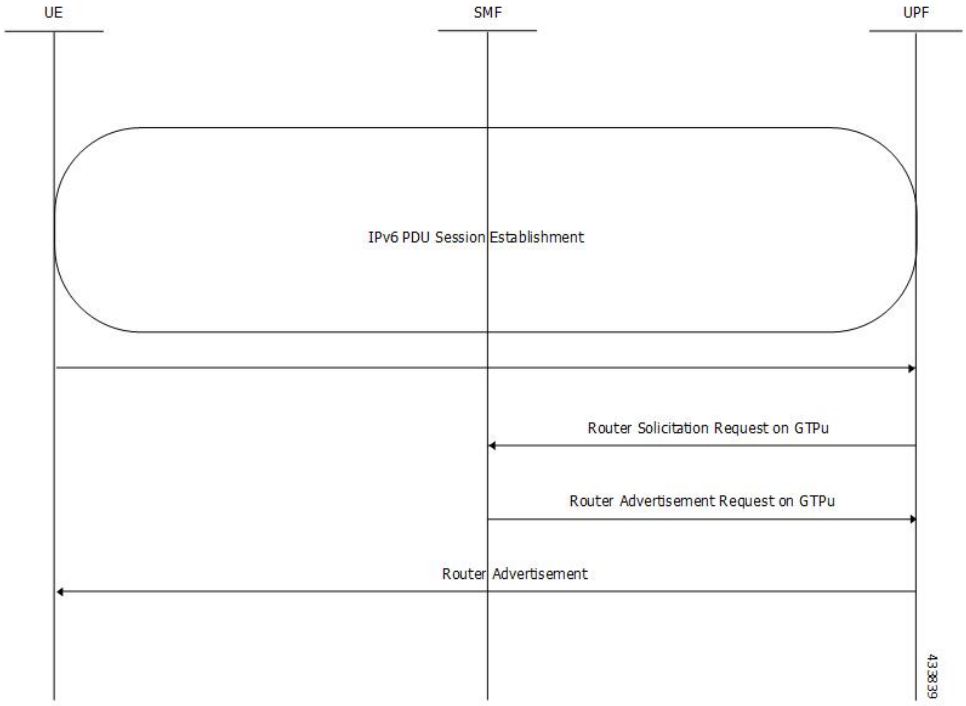


Note The UPF cannot generate or send the unsolicited router advertisement to the UE as the IPv6 prefix allocation is performed by SMF.

Solicited Router Advertisement

To get the allocated IPv6 prefix, UE sends a router solicit message. Upon receiving the router solicit message, SMF sends the router advertisement message containing the allocated UE IPv6 prefix towards UE.

Figure 2: Router Solicitation and Advertisement Message Processing Call Flow



Configuring Router Solicit and Router Advertisement

This section describes how to configure the Router Solicit and Router Advertisement feature.

Configuring the Router Solicit and Router Advertisement feature involves the following:

- Configuring Router Advertisement Parameters, on page 3
- Configuring Virtual MAC Address, on page 4
- Associating the ICMPv6 Profile with SMF Service Profile, on page 5

Configuring Router Advertisement Parameters

To configure the Router Advertisement parameters, use the following sample configuration:

```
config
  profile icmpv6 icmpv6profile_name
    options { hop-limit hop_limit | mtu mtu_size | reachable-time reachable_time
 | retrans-timer retrans_timer | router-lifetime router_lifetime | virtual-mac
 virtual_mac }
     ra trigger handover { false | true }
     end
```

NOTES:

- **profile icmpv6** *icmpv6profile_name*: Specify the ICMPv6 profile name. *icmpv6profile_name* must be an alphanumeric string.
- **options { hop-limit** *hop_limit* **| mtu** *mtu_size* **| reachable-time** *reachable_time* **| retrans-timer** *retrans_timer* **| router-lifetime** *router_lifetime* **| virtual-mac** *virtual_mac* **}**: Configure the ICMPv6 options.
  - **hop-limit** *hop_limit*: Configure the hop limit. *hop_limit* must be an integer in the range of 0–255. Default: 255.
  - **mtu** *mtu_size*: Configure the MTU size. Default: 1500.

    mtu_size must be an integer in the range of 1280-1500.
  - **reachable-time** *reachable_time*: Configure the reachable time in milliseconds. Default: 0.

    reachable_time must be an integer in the range of 0-3600.
  - **retrans-timer** *retrans_timer*: Configure the retransmission timer in milliseconds. Default: 0.

    retrans_timer must be an integer in the range of 0-4294968.
  - **router-lifetime** *router_lifetime*: Configure the router lifetime in seconds. *router_lifetime* must be an integer in the range of 0–65535. Default: 65535.
  - **virtual-mac** *virtual_mac*: Configure the local virtual MAC address.
- **ra trigger handover { false | true }**: Configure the trigger to send router advertisements for Wi-Fi handovers.

Verifying the Configuration

Use the **show running-config profile icmpv6** command to verify the Router Advertisement configuration.

The following configuration is an example output of the command:

```
[unknown] smf(config)# show running-config profile icmpv6
profile icmpv6 icmpprf1
 options hop-limit 255
 options mtu   1500
 options reachable-time 0
 options retrans-timer 0
 options router-lifetime 65535
 options virtual-mac b6:6d:57:45:45:45
 ra trigger handover true
exit
```

Configuring Virtual MAC Address

To configure the remote virtual MAC address in the DNN profile, use the following sample configuration:

```
config
  profile dnn dnnprofile_name
    virtual-mac mac_address
    exit
```

NOTES:

- **profile dnn** *dnnprofile_name*: Specify the DNN profile name. *dnnprofile_name* must be an alphanumeric string.
- **virtual-mac** *mac_address*: Specify the remote virtual MAC address used to generate interface ID for UE. *mac_address* must be a string in the MAC address pattern.

In release 2021.01 and later, the SMF generates unique 64-bit interface ID which is non-EUI-64 format by using SBI VIP address and CommonId of the subscriber.

That is, IPv6 interface ID = VIP-IP (4 bytes) + CommonId (4 bytes)

By default, **virtual-mac** CLI command is now disabled under DNN configuration.

Table 3: Interface ID for Different Messages

Call Model	PDU Session Establishment Accept	Create Session Response
5G	N11-SBI-VIP+CommonID	—
4G	—	GTP-VIP+CommonID
WiFi	—	GTP-VIP+CommonID
5G->4G	—	—(N26 HO - there are NAS contents during handover)
4G->5G	— (N26 HO - there are NAS contents during handover)	—
4G->WiFi	—	GTP-VIP+CommonID (Same as 4G)
WiFi->4G	—	GTP-VIP+CommonID (Same as 4G)
5G->WiFi	—	N11-SBI-VIP+CommonID (Same as 5G)
WiFi->5G	GTP-VIP+CommonID (Same as WiFi)	—

Associating the ICMPv6 Profile with SMF Service Profile

To associate the ICMPv6 profile with the SMF service profile, use the following sample configuration:

```
config
  profile smf smfprofile_name
    service name svc_name
      icmpv6-profile icmpv6profile_name
      exit
```

NOTES:

- **profile smf** *smfprofile_name*: Specify the SMF service profile name. *smfprofile_name* must be an alphanumeric string.

- **service name** *svc_name*: Specify the name of the SMF network function service. *svc_name* must be an alphanumeric string.
- **icmpv6-profile** *icmpv6profile_name*: Specify the load profile name to associate with the SMF service profile. *icmpv6profile_name* must be an alphanumeric string.