

N4 Interface Configuration

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Feature Summary and Revision History

Summary Data

Table 1: Summary Data

Applicable Product(s) or Functional Area	5G-UPF
Applicable Platform(s)	VPC-SI SMI
Feature Default Setting	Enabled (configuration required to disable)
Related Changes in this Release	Not Applicable
Related Documentation	*UCC 5G UPF Configuration and Administration Guide*

Revision History

Table 2: Revision History

Revision Details	Release
New IEs are supported in UPF in compliance with 3GPP TS 29.244.	2021.01.0
First introduced.	2020.02.0

Feature Description

This chapter provides the configuration information to identify a peer node to be an N4 interface, and the configuration to modify N4 parameters in an Sx-Service.

Uniformity in compression at N4 and Sx interfaces

This feature introduces a peer-level handshake mechanism during the PFCP Association Setup procedure. This allows the UPF and the Control Plane (CP) to negotiate compression capabilities, enabling the UPF to send compressed or uncompressed messages on a per-peer basis.

In deployments where a User Plane Function (UPF) is shared between a Converged Core (cnSGW/SMF) and a legacy Control and User Plane Separation (CUPS) core, call rejections may occur if Sx compression is enabled on the UPF. This is because converged core nodes do not currently support compressed PFCP messages.

How it works

The feature relies on an exchange of Information Elements (IEs) during the PFCP Association Setup procedure:

1. UPF Capability: The UPF sends the Operator configurable UPF capability IE (Type 359, as defined in 3GPP TS 29.244) in the Association Setup Request.
2. CP Capability: The CP (SMF/cnSGW) responds with a proprietary Operator configurable CP capability IE (Type 32769, Enterprise ID 9) in the Association Setup Response.
3. Capability Logic:
   - If the CP reports "0", the UPF sends uncompressed messages to that peer.
   - If the CP reports "1" or the IE is absent (backward compatibility), the UPF sends compressed messages, provided the local CLI is configured to allow it.

Per-Peer compression logic

The UPF determines whether to compress outgoing PFCP messages based on the following logic:

Local CLI config	Peer capability (IE 32769)	UPF compression
Disabled	Not Sent / 0 / 1	Disabled
Not Configured	Not Sent / 1	Enabled
Not Configured	0	Disabled
Enabled	Not Sent / 1	Enabled
Enabled	0	Disabled

Configuration

To enable or disable Sx protocol compression on the UPF, use the following CLI commands:

```
configure
          context <context_name>
```

```
sx-service <service_name>
  [no] sx-protocol compression
   end
```



Note The `sx-protocol compression` CLI controls outgoing message compression only. The compression flag (IE 359/IE 32769) indicates the node's capability to receive compressed messages. Runtime configuration changes take effect immediately without requiring an Association Update.

Verification

To verify the exchanged compression capability for a specific peer, use the following command:

```
show sx peers full address <peer-ip>
```

Sample Output:

```
Peer IP      : 21.21.21.101
Sx Service Id: 1
Group Name   : default
...
Compression  : Enabled
```

Configuring N4 Interface

This section describes the following configurations:

- Identifying N4 Interface
- Adding N4-type and Modification of N4 Parameters in Sx Service

Identifying an N4 Interface

Use the following configuration to identify if a peer node is an N4 interface type.

```
configure
   control-plane-group group_name
      peer-node-id [ ipv4-address ipv4_address | ipv6-address ipv6_address ]
interface n4
      end
```

NOTES:

- To enable the **n4 interface** CLI command, you need the **require upf** CLI command on the UPF, which depends on the UPF license.
- **[ipv4-address** *ipv4_address* **| ipv6-address** *ipv6_address* **]** :

  ipv4-address *ipv4_address*: Specifies the IPv4 address of the peer node.

  ipv6-address *ipv6_address*: Specifies the IPv6 address of the peer node.
- **interface n4**: Identifies the N4 interface.

Modification of N4-type Parameters in an Sx Service

Use the following configuration to modify N4-type parameters in an Sx Service.

```
configure
   context context_name
      sx-service service_name
         n4 [ max-retransmissions max_retransmission_value |
retransmission-timeout-ms timeout_value ]
         end
```

NOTES:

- **n4**: Allows modifications to N4 parameters.
- **[max-retransmissions***max_retransmission_value* **| retransmission-timeout-ms** *timeout_value***]**:

  max-retransmissions *max_retransmission_value* Configures maximum retries for Sx control packets. *max_retransmission_value* must be an integer in the range of 0 to 15. The default value is 4.

  retransmission-timeout-ms: Configures the control packet retransmission timeout in Sx in milliseconds. *timeout_value* must be an integer in the range of 1000 to 20000 milliseconds. The timeout value must be configured in steps of 100; for example: 1000, 1100, 1200, and so on. The default value is 5000 milliseconds.

Statistics

This section provides information on show commands and their output available in support of this feature.

show control-plane-group

The output of this command displays the following fields for this feature:

- Interface Type – This field indicates if the peer interface is N4. It is not displayed for non-N4 interfaces.

show sx-service all

The output of this command displays the following fields for this feature:

- N4
  - N4 Retransmission Timeout
  - N4 Maximum Request Retransmission

show subscribers user-plane-only all

The output of this command displays the following fields for this feature:

- Interface
  - N4

show user-plane-service statistics all

The output of this command displays the following fields for this feature:

- N4 interface-type PDNs
  - Active
  - Setup
  - Released

show subscribers user-plane-only seid number pdr all

The output of this command displays the following fields for this feature:

- Associated-QFIs

show subscribers user-plane-only callid number pdr full all

The output of this command displays the following fields for this feature:

- QoS Flow Identifier

show subscribers user-plane-only callid number pdr full all