



UCC 5G UPF - Release Change Reference

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Features and Changes Quick Reference

Features / Behavior Changes	Release Introduced / Modified
Additional TCP Fields , on page 3	2021.01.0
APN ACL Support , on page 3	2021.01.0
Bandwidth Policy Configuration Limits , on page 4	2021.01.0
Bulkstatistics for UPF , on page 4	2021.01.0
Converged Datapath , on page 4	2021.01.0
DNS Attribute in EDRs , on page 4	2021.01.0

Features / Behavior Changes	Release Introduced / Modified
Flow-level Policing, on page 5	2021.01.0
Heartbeat Support for N4 Interface, on page 5	2021.01.0
L7 PCC Rules, on page 5	2021.01.0
Multiple N4 Interface, on page 6	2021.01.0
N:M Redundancy, on page 6	2021.01.0
N4 Library Update, on page 6	2021.01.0
Overlapping IP Pools, on page 7	2021.01.0
Redundancy Configuration Manager and SMI Cluster Manager, on page 7	2021.01.0
Smart Licensing, on page 7	2021.01.0
UPF Qualification with CNDP, on page 8	2021.01.1

Feature Defaults Quick Reference

The following table indicates what features are enabled or disabled by default.

Feature	Default
Additional TCP Fields	Disabled - Configuration Required
APN ACL Support	Disabled - Configuration Required
Bandwidth Policy Configuration Limits	Enabled - Always-on
Bulk Statistics Support	Enabled - Always-on
Converged Datapath	Enabled - Always-on
DNS Attribute in EDRs	Disabled - Configuration Required
Flow-level Policing	Disabled - Configuration Required
Heartbeat Support for N4/Sx Interface	Disabled - Configuration Required
L7 PCC Rules	Enabled - Always-on
Multiple N4 Interface	Disabled - Configuration Required
N:M Redundancy	Disabled - Configuration Required
N4 Library Update	Enabled - Always-on
Overlapping IP Pool	Enabled - Always-on

Feature	Default
Redundancy Configuration Manager with SMI Cluster Manager	Disabled - Configuration Required
Smart Licensing	Disabled - License Required
UPF Qualification with CNDP	Disabled - Configuration Required

Additional TCP Fields

Feature Description

TCP Fast Open

TCP Fast Open (TFO) is an extension to speed up the opening of successive TCP connections between two endpoints. It works by using a TFO cookie (a TCP option), which is a cryptographic cookie stored on the client and set upon the initial connection with the server. When the client reconnects, it sends the initial SYN packet along with the TFO cookie data to authenticate itself. If successful, the server starts sending data to the client even before the reception of the final ACK packet of the three-way handshake. Due to this, the difference between following packets are recorded to calculate and record time difference between control packets of TCP flow in EDR:

- SYN and SYN-ACK packet
- SYN-ACK and ACK packet

For more details, refer the *DPI and Inline Services* chapter in the *UCC 5G UPF Configuration and Administration Guide*.

APN ACL Support

Feature Description

IP Access Lists, commonly known as Access Control Lists (ACLs), control the flow of packets into and out of the system. The configuration is per-context basis and consists of "rules" (ACL rules) or filters that control the action applicable for packets that match the filter criteria. Once configured, an ACL can be applied to an individual subscriber. Separate ACLs can be created for IPv4 and IPv6 access routes.

The following are the two main aspects of ACLs:

- Rule(s)
- Rule Order

With this release, a configurable mechanism is introduced to apply traffic classification and policy enforcement on selective subscriber sessions.

For more details, refer the *APN ACL Support* chapter in the *UCC 5G UPF Configuration and Administration Guide*.

Bandwidth Policy Configuration Limits

Feature Description

With this release, the maximum number of configurable groups per bandwidth policy is increased.

For details, refer the *Dynamic and Static PCC Rules* chapter in the *UCC 5G UPF Configuration and Administration Guide*.

Bulkstatistics for UPF

Feature Description

Bulk statistics is a collection of software features and framework that collects and exports the important performance and health-related statistics of the packet core node to an external node.

For details, refer the *Bulk Statistics Support* chapter in the *UCC 5G UPF Configuration and Administration Guide*.

Converged Datapath

Feature Description

The Converged Datapath feature allows interconnection of the same UEs session at UPF instance with SGW-C/cnSGW and Session Management Function (SMF)/Inter-Working Function (IWF) to build converged/collapsed datapath and achieve higher throughput.

For details, refer the *Converged Datapath* chapter in the *UCC 5G UPF Configuration and Administration Guide*.

DNS Attribute in EDRs

Feature Description

Event Data Records (EDRs) are usage records with support to configure content information, format, and generation of triggers by the system administrative user. When a flow is terminated, the UPF generates EDRs with detail information of the terminated flow.

With this release, DNS attributes are introduced in EDRs. For more details, refer the *DPI and Inline Services* chapter of the *UCC 5G UPF Configuration and Administration Guide*.

Flow-level Policing

Feature Description

The policer configuration uses inputs from the Session Manager. The inputs are received either from PCF as AMBR or from flow-level QoS information. The values received from the PCF is always accepted for session-level AMBR policing. However, the flow-level policing is prioritized, if available, and AMBR policing is applied sequentially. That is to say, the policer engine applies the hierarchical policing—first the flow-level/rule bandwidth limiting and then the session-level bandwidth limiting.

For more details, refer the *Dynamic and Static PCC Rules* chapter in the *UCC 5G UPF Configuration and Administration Guide*.

Heartbeat Support for N4 Interface

Feature Description

In accordance with 3GPP TS 29.244, support has been added for node-level Heartbeat procedures between the Session Management Function (SMF) and User Plane Function (UPF) over N4/Sx interface.

The Heartbeat procedure contains the following two messages:

- Heartbeat Request
- Heartbeat Response

For more details, refer the *Heartbeat Support for N4/Sx Interface* chapter in the *UCC 5G UPF Configuration and Administration Guide*.

L7 PCC Rules

Feature Description

One of the key product capability of Cisco 5G-UPF is integrated Deep Packet Inspection (DPI) based services. DPI is the examination of layer 7 (L7) which contains Uniform Resource Identifier (URI) information. In some cases, layer 3 (L3) and layer 4 (L4) analyzers that identify a trigger condition are insufficient for billing purposes. So, layer 7 (L7) examination is used. DPI performs packet inspection beyond L4 inspection and is typically deployed for detection of URI information at L7.

The following L7 protocols are supported as part of DPI:

- DNS
- FTP
- HTTP

- HTTPS
- RTP/RTSP
- SIP

For more details, refer the *DPI and Inline Services* chapter in the *UCC 5G UPF Configuration and Administration Guide*.

Multiple N4 Interface

Feature Description

The Multiple N4 Interface feature enables a single UPF to establish multiple N4 interfaces with as many SMFs. Integration of multiple SMFs with a single UPF results in optimal usage of resources.

For details, refer the *Multiple N4 Interface* chapter in the *UCC 5G UPF Configuration and Administration Guide*.

N:M Redundancy

Feature Description

The Redundancy Configuration Manager (RCM) is a Cisco proprietary node/network function (NF) that provides redundancy of StarOS-based UP/UPFs. The RCM provides N:M redundancy of UP/UPFs wherein “N” is number of Active UP/UPFs and is less than 10, and “M” is the number of Standby UP/UPF in the redundancy group.

For details, contact your Cisco Account representative.

N4 Library Update

Feature Description

In compliance with 3GPP TS 29.244, the UPF supports the following IEs:

- Averaging Window
- Paging Policy Indicator (PPI)
- Outer Header

For more details, refer the *N4 Interface Compliance with 3GPP Specification* chapter in the *UCC 5G UPF Configuration and Administration Guide*.

Overlapping IP Pools

Feature Description

Overlapping pools share and use a range of IP addresses. Overlapping pools can either be of type STATIC or PRIVATE. No public pools can be configured as overlapping pools. Each overlapping pool is part of different VRF (routing domain) and pool-group. Since an APN can use only one pool-group, overlapping pools are part of different APN as well.

For details, refer the *Virtual Routing and Forwarding* chapter in the *UCC 5G UPF Configuration and Administration Guide*.

Redundancy Configuration Manager and SMI Cluster Manager

Feature Description

The Subscriber Microservices Infrastructure (SMI) Kubernetes (K8s) Cluster Manager allows you to deploy 5G Network Functions (NFs) which are developed based on SMI. SMI Cluster Manager (SMI CM) can also deploy UPF that is based on StarOS image.

For details, contact your Cisco Account representative.

Smart Licensing

Feature Description

Ultra Cloud Core 5G User Plane Function (UPF) supports Smart Licensing. Smart Licensing is a cloud-based approach to licensing that simplifies the purchase, deployment, and management of Cisco software assets. Entitlements are purchased through your Cisco account via Cisco Commerce Workspace (CCW) and immediately deposited into your Virtual Account for usage. This eliminates the need to install license files on every device. Products that are smart-enabled, communicate directly to Cisco to report consumption. A single location is available to customers to manage Cisco software licenses—the Cisco Smart Software Manager (CSSM). License ownership and consumption are readily available to help make better purchase decision based on consumption or business need.

For more details, refer the *Smart Licensing* chapter in the *UCC 5G UPF Configuration and Administration Guide*.

UPF Qualification with CNDP

Feature Description

This UPF release is qualified with OSP and CNDP (SMI Cluster Manager).

For more information, contact your Cisco Account representative.