Ultra Cloud Core 5G User Plane Function, Release 2023.01 - Release Change Reference

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About this Guide

Note Control and User Plane Separation (CUPS) represents a significant architectural change in the way StarOS-based products are deployed in the 3G, 4G, and 5G networks. This document provides information on the features and functionality specifically supported by this 5G UPF product deployed in a 5G network. It should not be assumed that features and functionality that have been previously supported in legacy or non-CUPS products are supported by this product. References to any legacy or non-CUPS products or features are for informational purposes only. Furthermore, it should not be assumed that any constructs (including, but not limited to, commands, statistics, attributes, MIB objects, alarms, logs, services) referenced in this document imply functional parity with legacy or non-CUPS products. Please contact your Cisco Account or Support representative for any questions about parity between this product and any legacy or non-CUPS products.

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This preface describes the *5G User Plane Function Guide*, how it is organized and its document conventions.

This guide describes the Cisco User Plane Function (UPF) and includes infrastructure and interfaces, feature descriptions, specification compliance, session flows, configuration instructions, and CLI commands for monitoring and troubleshooting the system.

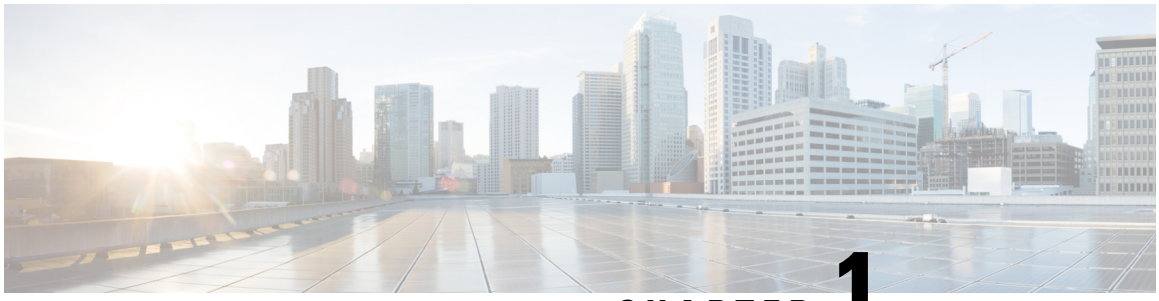
• Conventions Used, on page v

Conventions Used

The following tables describe the conventions used throughout this documentation.

Notice Type	Description
Information Note	Provides information about important features or instructions.
Caution	Alerts you of potential damage to a program, device, or system.
Warning	Alerts you of potential personal injury or fatality. May also alert you of potential electrical hazards.

Typeface Conventions	Description
Text represented as a `screen display`	This typeface represents displays that appear on your terminal screen, for example: `Login:`
Text represented as **commands**	This typeface represents commands that you enter, for example: **show ip access-list** This document always gives the full form of a command in lowercase letters. Commands are not case sensitive.
Text represented as a **command** *variable*	This typeface represents a variable that is part of a command, for example: **show card** *slot_number* *slot_number* is a variable representing the desired chassis slot number.
Text represented as menu or sub-menu names	This typeface represents menus and sub-menus that you access within a software application, for example: Click the **File** menu, then click **New**



CHAPTER 1

UCC 5G UPF - Release Change Reference

- Features and Behavior Changes Quick Reference, on page 1
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Features and Behavior Changes Quick Reference

The following table indicates the default values of features and behavior changes in this release.

Features/ Behavior Changes	Default	Release Introduced/ Modified
Display FAR, URR, and PDR Count Received over N4 Interface—CSCvz59790, on page 2	Enabled – Always-on	2023.01.0
DNS Server Readdressing, on page 3	Disabled – Configuration Required	2023.01.0
Fastpath Stream Statistics, on page 4	Disabled – Configuration Required	2023.01.0
Granularity of Packet Drop Statistics, on page 5	Disabled – Configuration Required	2023.01.0
Mismatched ToS Marked Byte Count for UL and DL Packets—CSCwa22261, on page 6	Disabled – Configuration Required	2023.01.0 2022.04.0
MPLS Support on N6 Interface, on page 7	Disabled – Configuration Required	2023.01.0

Features/ Behavior Changes	Default	Release Introduced/ Modified
QoS Group of Ruledefs Support, on page 8	Disabled – Configuration Required	2023.01.0
URR Volume Quota Calculation—CSCwd61752, on page 7	Disabled – Configuration Required	2023.01.0

Display FAR, URR, and PDR Count Received over N4 Interface—CSCvz59790

Feature Summary and Revision History

Summary Data

Applicable Product(s) or Functional Area	5G-UPF
Applicable Platform(s)	VPC-SI
Feature Default Setting	Enabled – Always-on
Related Changes in this Release	Not Applicable
Related Documentation	UCC 5G UPF Configuration and Administration Guide

Revision History

Revision Details	Release
The **show user-plane-service statistics all** command has been enhanced to display PFCP IEs received in Sx Establishment or Modification messages over N4 interface.	2023.01 2021.02.2
PDN Update procedure is introduced in this release.	2021.02.0
First introduced.	2020.02.0

Feature Changes

Previous Behavior: The **show user-plane-service statistics all** CLI command does not display the PFCP IEs received in Sx Establishment or Sx Modification messages.

New Behavior: The **show user-plane-service statistics all** CLI command is enhanced to display the PFCP IEs such as FAR, URR, and PDRs received over N4 interface in Sx Establishment and Sx Modification messages.

Impact on customer: The enhanced output helps with improving debuggability.

DNS Server Readdressing

Feature Summary and Revision History

Summary Data

Table 1: Summary Data

Applicable Product (s) or Functional Area	5G-UPF
Applicable Platforms	VPC-SI
Feature Default Setting	Disabled – Configuration Required
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
First introduced.	2023.01.0

Feature Description

Whenever you use an unauthorized DNS server, you can modify the request to readdress the DNS IPs to use authorized servers. A ruledef determines if a packet belongs to a DNS query. It also determines if the DNS query belongs to a set of authorized DNS servers. If the DNS query does not belong to the authorized DNS servers, the flow action picks up DNS servers from the readdress server list.

You can configure the readdress-server-list command under active-charging service. When the flow matches a ruledef, you can configure the flow action to use the servers from readdress-server-list.

For more information, refer to the UCC 5G UPF Configuration and Administration Guide > Deep Packet Inspection and Inline Services chapter.

Fastpath Stream Statistics

Feature Summary and Revision History

Summary Data

Table 3: Summary Data

Applicable Product (s) or Functional Area	5G-UPF
Applicable Platforms	VPC-SI
Feature Default Setting	Disabled – Configuration Required
Related Changes in this Release	Not Applicable
Related Documentation	*UCC 5G UPF Configuration and Administration Guide*

Revision History

Table 4: Revision History

Revision Details	Release
First introduced.	2023.01.0

Feature Description

The UPF datapath is managed by the session manager and VPP (fastpath) components. The session manager information is collected using StarOS CLIs whereas VPP information is collected using VPPCTL.

The **show subscribers user-plane-only callid** *callid_value* **flows flow-id** *flow_value* and **show subscribers user-plane-only callid** *callid_value* **flows full** commands are enhanced to display per flow VPP related information. The new statistics enhance the correlation of information from both components.

For more information, refer to the UCC 5G UPF Configuration and Administration Guide > UPF Troubleshooting Information chapter.

Granularity of Packet Drop Statistics

Feature Summary and Revision History

Summary Data

Table 5: Summary Data

Applicable Product (s) or Functional Area	5G-UPF
Applicable Platforms	VPC-SI
Feature Default Setting	Disabled – Configuration Required
Related Changes in this Release	Not Applicable
Related Documentation	*UCC 5G UPF Configuration and Administration Guide*

Revision History

Table 6: Revision History

Revision Details	Release
First introduced.	2023.01.0

Feature Description

UPF supports granularity of packet drop statistics at session-level and instance-level. The granular-level information eases the debuggability of issues.

Whenever a packet is dropped, the respective cause along with the number of packets dropped are pegged at instance and session levels. This release introduces two CLI commands, **show subscribers user-plane-only callid** *callid_value* **drop-statistics** and **show user-plane-service statistics drop-counter** that provide specific drop reasons and the corresponding drop counters. These commands support the SxA, SxB, SxAB, and N4 interfaces.

For more information, refer to the UCC 5G UPF Configuration and Administration Guide > UPF Troubleshooting Information chapter.

Mismatched ToS Marked Byte Count for UL and DL Packets—CSCwa22261

Behavior Change Summary and Revision History

Summary Data

Table 7: Summary Data

Applicable Product (s) or Functional Area	5G-UPF
Applicable Platforms	VPC-SI
Feature Default Setting	Disabled – Configuration Required
Related Changes in this Release	Not Applicable
Related Documentation	Not Applicable

Revision History

Table 8: Revision History

Revision Details	Release
Provided updated output for **show subscribers user-plane-only full all** and **show user-plane-service statistics qos-group sessmgr all** CLI commands.	2023.01.0 2022.04.0
First introduced.	2021.02.0

Behavior Change

Previous Behaviour: Both ToS marked Packets counter and Byte counter were available in IPv6 Traffic with DSCP Marking.

New Behaviour: Now, only the ToS marked Packets counter is available in IPv6 Traffic with DSCP Marking.

For more information, refer to the UCC 5G UPF Configuration and Administration Guide > DSCP Markings For Collapse Calls chapter.

URR Volume Quota Calculation—CSCwd61752

Behavior Change Summary and Revision History

Summary Data

Table 9: Summary Data

Applicable Product (s) or Functional Area	5G-UPF
Applicable Platforms	VPC-SI
Feature Default Setting	Disabled – Configuration Required
Related Changes in this Release	Not Applicable
Related Documentation	Not Applicable

Revision History

Table 10: Revision History

Revision Details	Release
First introduced.	2023.01.0

Behavior Change

Previous Behavior: UPF recalculated the URR volume quota values as per the usage after UP recovery.

New Behavior: The volume quota values provided by OCS must be the same after UP recovery.

MPLS Support on N6 Interface

Feature Summary and Revision History

Summary Data

Table 11: Summary Data

Applicable Product (s) or Functional Area	5G-UPF
Applicable Platforms	VPC-SI
Feature Default Setting	Disabled – Configuration Required

Related Changes in this Release	Not Applicable
Related Documentation	*UCC 5G UPF Configuration and Administration Guide*

Revision History

Revision Details	Release
Added MPLS support over the N6 interface.	2023.01.0
First introduced.	2022.04.0

Feature Description

In UPF, the boxer supports MPLS to switch MPLS traffic using VPP as the data plane forwarder.

This feature supports MPLS on the N6 interface for 5G deployments. The VPP MPLS stack configuration supports the forwarding information base (FIB) table with the FTN (FEC To NHLFE), and incoming label map (ILM) tables.

For more information, refer to the UCC 5G UPF Configuration and Administration Guide > MPLS Support on UPF chapter.

QoS Group of Ruledefs Support

Feature Summary and Revision History

Summary Data

Table 12: Summary Data

Applicable Product (s) or Functional Area	5G-UPF
Applicable Platforms	VPC-SI
Feature Default Setting	Disabled – Configuration Required
Related Changes in this Release	Not Applicable
Related Documentation	*UCC 5G UPF Configuration and Administration Guide*

Revision History

Revision Details	Release
First introduced.	2023.01.0

Feature Description

The QoS Group of Ruledefs feature helps in enforcing fair usage policy (FUP) per subscriber. QoS Group of Ruledefs is also referred to as QGR or SGQ.

The QGR feature sets different QoS parameters for different subscribers for a named QGR, thereby ensuring fair usage policing for a subscriber. The QGR feature performs flow status and bandwidth limiting under the charging-action configuration. UPF applies the static configuration for QGR using RCM.

For more information, refer to the QoS Group of Ruledefs Support chapter.