

Dynamic Rules and Table-Driven Charging Rules

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Feature Summary and Revision History

Summary Data

Table 1: Summary Data

Applicable Product(s) or Functional Area	PCF
Applicable Platform(s)	SMI
Feature Default Setting	Enabled – Configuration required to disable
Related Documentation	Not Applicable

Revision History

Table 2: Revision History

Revision Details	Release
First introduced.	Pre 2020.01.0

Feature Description

PCF supports the provisioning of the following dynamic and table-driven charging rules.

- Table-driven dynamic PCC rules in PCF
- N7 session retrievers:
    - SUPI

- GPSI
- DNN
- PLMN ID
- N7 Access Type
- N7 Cell Global Identifier
- N7 DNN
- N7 GPSI
- N7 IMEI TAC
- N7 MCC (SUPI Based)
- N7 MNC (SUPI Based)
- N7 Permanent Equipment Identifier
- N7 RAT Type
- N7 Serving Network
- N7 SliceInformation
- N7 SUPI
- N7 Tracking Area Identifier

Standards Compliance

This feature complies with the following standards specifications:

- *3GPP TS 29.512 V15.1.0 (2018-09) "Session Management Policy Control Service"*
- *3GPP TS 29.571 V15.1.0 (2018-09) "Common Data Types for Service Based Interfaces"*

Restrictions

The values configured for the maxbrUl, maxbrDl, gbrUl, and gbrDL attributes under QosData and TableDrivenQosDecision service configuration objects as well as any other attribute configured in Policy Builder that corresponds to an attribute defined as having the BitRate data type must match the format that is described in *3GPP TS 29.571, Table 5.5.2-1: Simple Data Types*.

Use the following pattern in Policy Builder to validate the format:

'^\d+(\.\d+)? (bps|Kbps|Mbps|Gbps|Tbps)$'

Configuration Support for Dynamic and Table-Driven Charging Rules

This section describes how to configure the dynamic and table-driven charging rules using the following services:

- TableDrivenQosDecision
- TableDrivenDynamicPccRule

TableDrivenQosDecision

The TableDrivenQosDecision service configuration object provides a way for the different refQosData values that are encountered while adding the PCC rules to be expanded to actual QosData objects.

The different refQosData are added to a bucket, the duplicates (if any) are eliminated, and the QosData objects are added for all the PCC rules that are added or updated. The addition happens even if a PCC rule having the same refQosData value is removed. A one-time CRD lookup is executed for each QosData object using a refQosData as a key value.

Note

- Do not use the QosData service configuration object and TableDrivenQosDecision service configuration object in the same policy if there are overlapping QoS references.
- Since the actual QoS attributes are stored in a CRD table, it is assumed they do not change over time. However, if the values change in the CRD, the new values are going to be pushed next time when the policy gets evaluated. Changing the values in the CRD does not automatically trigger a policy update.

Before setting the service parameters, ensure that you create a use case template and add a service for this configuration. For details, see Configuring the Use Case Template and Adding a Service.

The following table describes the TableDrivenQosDecision service parameters.

Table 3: TableDrivenQosDecision Parameters

Parameter	Description
Priority	The priority assigned for this service configuration object (among similar service configuration objects) is used for policy evaluation by the Policy Engine. Higher the value, higher is its priority. Default: 0
Search Table	CRD table that is queried for the PCC rule data.
Search Column	Primary key column in the table configured under the Search Table field. **Note** The search value corresponding to this column is passed in the code and not exposed.

Parameter	Description
QoS Id Source	Primary key value for the column configured under Search Column.
5qi Source	Additional primary key column-value pairs in the table configured under the Search Table field.
Maxbr Ul Source	Maxbr Ul column in the table that is configured under the Search Table field corresponding to the maxbrUl attribute. The values that are allowed for this attribute are specified in *3GPP TS 29.571*, *Table 5.5.2-1: Simple Data Types*. **Note** The values that are provided for this attribute must match the specific format. See the Restrictions, on page 2 section for more details.
Maxbr Dl Source	Maxbr Dl column in the table that is configured under the Search Table field corresponding to the maxbrDl attribute. The values that are permitted for this attribute are specified in *3GPP TS 29.571*, *Table 5.5.2-1: Simple Data Types*. **Note** The values that are provided for this attribute must match the specific format. Refer the *Restrictions* section for more details.
Gbr Ul Source	Gbr Ul column in the table that is configured under the Search Table field corresponding to the gbrUl attribute. The values that are allowed for this attribute are specified in *3GPP TS 29.571*, *Table 5.5.2-1: Simple Data Types*. **Note** The values that are provided for this attribute must match the specific format. Refer the *Restrictions* section for more details.
Gbr Dl Source	Gbr Dl column in the table configured under the Search Table field corresponding to the gbrDl attribute. The values that are allowed for this attribute are specified in *3GPP TS 29.571*, *Table 5.5.2-1: Simple Data Types*. **Note** The values that are provided for this attribute must match the specific format. Refer the *Restrictions* section for more details.
Priority Level Source	Priority Level Source column in the table configured under the Search Table field corresponding to priorityLevel attribute.
Preempt Cap Source	Preempt the Cap Source column in the table configured under Search Table field corresponding to the preemptCap attribute. The values that are allowed for this attribute are specified in *3GPP TS 29.571*, section *5.5.3.1 Enumeration: PreemptionCapability*.
Preempt Vuln Source	Preempt the Vuln Source column in the table that is configured under the Search Table field corresponding to the preemptVuln attribute. The values that are allowed for this attribute are specified in *3GPP TS 29.571*, section *5.5.3.2 Enumeration: PreemptionVulnerability*.
Qnc Source	Indicates whether the notifications are requested from the 3GPP NG-RAN when the GFBR can no longer (or again) be guaranteed for a QoS Flow during the lifetime of the QoS Flow.

Parameter	Description
Authorized Qos Priority Level	Indicates a priority in scheduling the resources among the QoS Flows.
Aver Window Source	Indicates the duration over which the guaranteed and maximum bitrate is calculated.
Max Data Burst Vol Source	Indicates the largest amount of data that is required to be transferred within a period of 5G-AN PDB.
Reflective QoS Source	Indicates applying reflective QoS for the SDF.
Sharing Key DI Source	Indicates resource sharing in downlink direction with the service data flows having the same value in their PCC rule.
Sharing Key UI Source	Indicates resource sharing in an uplink direction with the service data flows having the same value in their PCC rule.
Max Packet Loss Rate DI Source	The maximum rate for lost packets that can be tolerated in the downlink direction for the service data flow.
Max Packet Loss Rate UI Source	The maximum rate for lost packets that can be tolerated in the uplink direction for the service data flow.
Def QoS Flow Indication Source	Indicates that the dynamic PCC rule shall always have its binding with the default QoS Flow.

TableDrivenDynamicPccRule

This section describes the parameters for the TableDrivenDynamicPccRule configuration.

TableDrivenDynamicPccRule service configuration object provides a mapping between the PCC rule attributes and the CRD table that backs the service. A one-to-many relation is supported between the service configuration object and the PCC rules.

Before setting the service parameters, ensure that you create a use case template and add a service for this configuration. For details, see Configuring the Use Case Template and Adding a Service.

The following table describes the TableDrivenDynamicPCCRule service parameters.

Table 4: TableDrivenDynamicPCCRule Parameters

Parameter	Description
Priority	The priority assigned for this service configuration object (among similar service configuration objects) is used for policy evaluation by the Policy Engine. Higher the value, higher is its priority. Default: 0
Search Table	The CRD table that is to be queried for the PCC rule data.
Search Column	Primary key column in the table configured under the Search Table field.

Parameter	Description
Search Value	Primary key value for the column configured under Search Column.
Input List (List)	Additional primary key column-value pairs in the table configured under the Search Table field.
PCC Rule Id Source	PCC Rule Id column in the table that is configured under the Search Table field corresponding to the pccRuleId attribute.
Precedence Source	Precedence column in the table that is configured under the Search Table field corresponding to the precedence attribute.
App Id Source	App Id column in the table that is configured under the Search Table field corresponding to the appId attribute.
QoS Id Source	QoS Id column in the table configured under the Search Table field corresponding to refQosData attribute. Per *3GPP TS 29.512 v15.1.0*, refQosData can be an array of string objects. To accommodate multiple string values in the CRD, the following convention is used: • The different refQosData objects are separated by ",". • Any blank characters before and after the actual data is dropped.
Chg Id Source	The value must be bound to the Chg Id column in the STG. The value in the STG column must be of Type Text.

Parameter	Description
Flow Information Source	Flow Information column in the table configured under the Search Table field corresponding to flowInfos attribute. Per *3GPP TS 29.512 v15.1.0*, flowInfos can be an array of FlowInformation objects. To accommodate multiple FlowInformation values in the CRD, the following convention is used: • The different FlowInformation objects are separated by ",". • The different attributes within each FlowInformation object are separated by ";". • ethFlowDescription attribute within FlowInformation is not currently supported. • The expected format for each FlowInformation attribute is as follows: `flowDescription;packetFilterUsage;tosTrafficClass;spi;flowLabel;flowDirection`. • If any of the FlowInformation is missing, leave the corresponding placeholder empty while preserving the format (for example tosTrafficClass and spi are missing: flowDescription;packetFilterUsage;;;flowLabel;flowDirection) • Any blank characters before and after the actual data is dropped. • The values that are allowed for flowDirection attribute are the ones that are specified in *3GPP TS 29.512*, section *5.6.3.3 Enumeration: FlowDirection*.