**3GPP TSG-CT3 Meeting #119-e *C3-216047***

**Online, , 11th Nov 2021 - 19th Nov 2021**

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| --- |
| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **29.512** | **CR** | **0862** | **rev** | **-** | **Current version:** | **17.4.0** |  |
|  |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

|  |
| --- |
|  |
| ***Title:***  | Adding EAS IP replacement information in PCC rules |
|  |  |
| ***Source to WG:*** | Nokia, Nokia Shanghai Bell |
| ***Source to TSG:*** | C3 |
|  |  |
| ***Work item code:*** | eEDGE\_5GC |  | ***Date:*** | 2021-11-03 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-17 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
|  |  |
| ***Reason for change:*** | As specified in 23.501 5.6.7, 23.502 4.3.6.3, 23.503 6.3.1, 23.548 6.3.3.2, the AF can provide EAS (Edge Application Server) IP replacement information for the case of EAS relocation either in initial traffic influence requests (using Nnef\_TrafficInfluence\_Create/Update if untrusted or Npcf\_PolicyAuthorization\_Create/Update if trusted), which the PCF can include in the PCC rules that are provisioned to the SMF using the SM Policy Control service. |
|  |  |
| ***Summary of change:*** | Added EAS IP replacement information in the PCC rules provisioned with the SM Policy Control service.Extended the respective procedure descriptions and the OpenAPI accordingly.Added also the EAS abbreviation. |
|  |  |
| ***Consequences if not approved:*** |  Stage 2 requirements not fulfilled. |
|  |  |
| ***Clauses affected:*** | 3.2, 4.1.4.2.1, 4.1.4.4.2, 4.2.6.2.6.2, 5.6.1, 5.6.2.10, A.2 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** | This CR introduces a backwards compatible feature in the Npcf\_SMPolicyControl OpenAPI |
|  |  |
| ***This CR's revision history:*** |  |

\* \* \* \* First change \* \* \* \*

## 3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

ADC Application Detection and Control

5G-RG 5G Residential Gateway

AF Application Function

AMF Access and Mobility Management Function

API Application Programming Interface

ATSSS Access Traffic Steering, Switching, Splitting

ATSSS-LL ATSSS Low-Layer

BBF Broadband Forum

CHEM Coverage and Handoff Enhancements using Multimedia error robustness feature

CHF Charging Function

DDD Downlink Data Delivery

DDN Downlink Data Notification

DN-AAA Data Network Authentication, Authorization and Accounting

DNN Data Network Name

DS-TT Device-side TSN translator

DTS Data Transport Service

EAS Edge Application Server

ePDG evolved Packet Data Gateway

FN-RG Fixed Network Residential Gateway

GEO Geosynchronous Orbit

GFBR Guaranteed Flow Bit Rate

GUAMI Globally Unique AMF Identifier

HFC Hybrid Fiber Coax

HTTP Hypertext Transfer Protocol

LEO Low Earth Orbit

MA Multi-Access

MEO Medium Earth Orbit

MPTCP Multi-Path TCP Protocol

NAS Non-Access-Stratum

NEF Network Exposure Function

NF Network Function

NID Network Identifier

NRF Network Repository Function

NW-TT Network-side TSN translator

PCC Policy and Charging Control

PCF Policy Control Function

PFD Packet Flow Description

PFDF Packet Flow Description Function

PMIC Port Management Information Container

PSAP Public Safety Answering Point

QoS Quality of Service

RTT Round-Trip Time

SDF Service Data Flow

SMF Session Management Function

SNPN Stand-alone Non-Public Network

S-NSSAI Single Network Slice Selection Assistance Information

SUPL Secure User Plane for Location

TNAN Trusted Non-3GPP Access Network

TWAN Trusted WLAN Access Network

TSC Time Sensitive Communication

TSCAI Time Sensitive Communication Assistance Information

TSCTSF Time Sensitive Communication and Time Synchronization Function

TSN Time Sensitive Networking

TSN GM TSN Grand Master

UDM Unified Data Management

UDR Unified Data Repository

UE User Equipment

UMIC User plane node Management Information Container

URLLC Ultra Reliable Low Latency Communication

W-5GAN Wireline 5G Access Network

W-5GBAN Wireline BBF Access Network

W-5GCAN Wireline 5G Cable Access Network

W-AGF Wireline Access Gateway Function

\* \* \* \* Next change \* \* \* \*

##### 4.1.4.2.1 PCC rules definition

A PCC rule is a set of information elements enabling the detection of a service data flow and providing parameters for policy control and/or charging control. There are two different types of PCC rules as defined in 3GPP TS 23.503 [6]:

- Dynamic PCC rules: PCC rules that are dynamically provisioned by the PCF to the SMF. These PCC rules may be either predefined or dynamically generated in the PCF. Dynamic PCC rules can be installed, modified and removed at any time.

- Predefined PCC rules: PCC rules that are preconfigured in the SMF. Predefined PCC rules can be activated or deactivated by the PCF at any time. Predefined PCC rules within the PCF may be grouped allowing the PCF to dynamically activate a set of PCC rules.

Additionally, predefined PCC rules may be grouped within the SMF as predefined PCC rule bases which allow the PCF to dynamically activate these sets of rules. In this case, the PCC rule identifier is used to hold the predefined PCC rule base identifier.

NOTE 1: When the SMF interacts with the PCF for a PCC rule base, the PCF has no way of knowing which individual PCC rule of the PCC rule base caused the interaction. If such knowledge is required for specific PCC rules, then these PCC rules need to be implemented either as dynamic PCC rules or as predefined PCC rules that are not grouped in a PCC rule base. The SMF decision logic for interacting (or not) with the PCF about an event related to a PCC rule base is up to implementation and depends on the specific issue that triggered this interaction.

NOTE 2: The operator can define a predefined PCC rule, to be activated by the SMF. Such a predefined rule is not explicitly known in the PCF.

A PCC rule consists of:

Table 4.1.4.2.1-1: PCC rule information elements

|  |  |  |
| --- | --- | --- |
| Information name | Description | Category |
| Rule identifier | Uniquely identifies the PCC rule, within a PDU Session.It is used between PCF and SMF for referencing PCC rules. | Mandatory |
|  | Service data flow detection |  |
|  Precedence | Determines the order, in which the service data flow templates are applied at service data flow detection, enforcement and charging. | Mandatory |
| Service Data Flow Template | For IP PDU traffic: Either a list of service data flow filters or an application identifier that references the corresponding application detection filter for the detection of the service data flow.For Ethernet PDU traffic: Combination of traffic patterns of the Ethernet PDU traffic. | Mandatory |
| Mute for notification | Defines whether application's start or stop notification is to be muted. | Optional |
|  | Charging |  |
| Charging key | The charging system (CHF) uses the charging key to determine the tariff to apply to the service data flow. | Optional |
| Service identifier | The identity of the service or service component the service data flow in a rule relates to. | Optional |
| Sponsor Identifier | An identifier, provided from the AF, which identifies the Sponsor, used for sponsored flows to correlate measurements from different users for accounting purposes. | Optional |
| Application Service Provider Identifier | An identifier, provided from the AF, which identifies the Application Service Provider, used for sponsored flows to correlate measurements from different users for accounting purposes. | Optional |
| Charging method | Indicates the required charging method for the PCC rule.Values: online or offline or none. | Optional |
| Service Data flow handling while requesting credit | Indicates whether the service data flow is allowed to start while the SMF is waiting for the response to the credit request.Only applicable for charging method online. | Optional |
| Measurement method | Indicates whether the service data flow data volume, duration, combined volume/duration or event shall be measured.This is applicable to reporting, if the charging method is online or offline.Note: Event based charging is only applicable to predefined PCC rules and PCC rules used for application detection filter (i.e. with an application identifier). | Optional |
| Application Function Record Information | An identifier, provided from the AF, correlating the measurement for the Charging key/Service identifier values in this PCC rule with application level reports. | Optional |
| Service identifier level reporting | Indicates that separate usage reports shall be generated for this Service identifier.Values: mandated or not required. | Optional |
|  | Policy control |  |
| 5QI | Identifier of the authorized QoS parameters for the service data flow. | Mandatory |
| ARP | The Allocation and Retention Priority for the service data flow consisting of the priority level, the pre-emption capability and the pre-emption vulnerability. | Mandatory |
| Gate status | The gate status indicates whether the service data flow, detected by the service data flow template, may pass (Gate is open) or shall be discarded (Gate is closed). | Optional |
| QoS Notification Control (QNC) | Indicates whether notifications are requested from 3GPP NG-RAN when the GFBR can no longer (or again) be guaranteed for a QoS Flow during the lifetime of the QoS Flow. | Optional |
| Reflective QoS Control | Indicates to apply reflective QoS for the SDF. | Optional |
| MBR (UL/DL) | The uplink/downlink maximum bitrate authorized for the service data flow. | Optional |
| GBR (UL/DL) | The uplink/downlink guaranteed bitrate authorized for the service data flow. | Optional |
| UL sharing indication | Indicates resource sharing in uplink direction with service data flows having the same value in their PCC rule. | Optional |
| DL sharing indication | Indicates resource sharing in downlink direction with service data flows having the same value in their PCC rule. | Optional |
| Redirect | Redirect state of the service data flow (enabled/disabled). | Optional |
| Redirect Destination | Controlled Address to which the service data flow is redirected when redirect is enabled. | Optional |
| Bind to default QoS Flow | Indicates that the dynamic PCC rule shall always have its binding with the default QoS Flow. | Optional |
| Priority Level | Indicates a priority in scheduling resources among QoS Flows. | Optional |
| Averaging Window  | Represents the duration over which the guaranteed and maximum bitrate shall be calculated. | Optional |
| Maximum Data Burst Volume | Denotes the largest amount of data that is required to be transferred within a period of 5G-AN PDB. | Optional |
| Disable UE notifications at changes related to Alternative QoS Profiles | Indicates to disable QoS flow parameters signalling to the UE when the SMF is notified by the NG-RAN of changes in the fulfilled QoS situation. The fulfilled situation is either the QoS profile or an Alternative QoS Profile. | Optional |
|  | Access Network Information Reporting |  |
| User Location Required | The UE location(s) (e.g. the serving cell of the UE) is to be reported. When the corresponding QoS flow is deactivated, and if available, information on when the UE was last known to be in that location is also to be reported. | Optional |
| UE Timezone Required | The time zone of the UE is to be reported. | Optional |
|  | Usage Monitoring Control |  |
| Monitoring key | The PCF uses the monitoring key to group services that share a common allowed usage. | Optional |
|  | N6-LAN Traffic Steering Enforcement Control |  |
| Traffic steering policy identifier(s) | Reference to a pre-configured traffic steering policy at the SMF. | Optional |
|  | AF influenced Traffic Steering Enforcement Control |  |
| Data Network Access Identifier | Identifier of the target Data Network Access. | Optional |
| Per DNAI: Traffic steering policy identifier | Reference to a pre-configured traffic steering policy at the SMF. | Optional |
| Per DNAI: N6 traffic routing information | Describes the information necessary for traffic steering to the DNAI. | Optional |
| Information on AF subscription to UP path changes events | Indicates whether a notification in case of UP path change is requested, as well as the destination(s) for where to provide the notification. | Optional |
| Indication of UE IP address preservation | Indicates UE IP address should be preserved. | Optional |
| Indication of traffic correlation | Indicates that the target PDU Sessions should be correlated via a common DNAI in the user plane.  | Optional |
| Information on User Plane Latency requirements | Indicates the user plane latency requirements. | Optional |
| EAS IP replacement information | Contains EAS IP replacement information (i.e. IP addresses and port numbers of source and target EAS). | Optional |
|  | RAN support information |  |
| UL Maximum Packet Loss Rate | The maximum rate for lost packets that can be tolerated in the uplink direction for the service data flow. | Optional |
| DL Maximum Packet Loss Rate | The maximum rate for lost packets that can be tolerated in the downlink direction for the service data flow. | Optional |
|  | MA PDU Session Control |  |
| Application descriptors | Identifies the application traffic to apply the Steering functionality and the Steering mode. | Optional |
| Steering Functionality | Indicates the applicable traffic steering functionality. | Optional |
| Steering mode (UL/DL) | Indicates the UL and/or DL traffic distribution rules between the 3GPP and Non-3GPP accesses together with associated parameters (when applicable) for the traffic matching the service data flow. | Optional |
| Charging for Non-3GPP access | Indicates parameters used for charging packets carried via Non-3GPP access for a MA PDU Session. The same set of parameters as for the Charging information above applies. If a parameter is not included here, the value provided in the Charging information above applies. | Optional |
| Usage Monitoring for Non-3GPP access | Indicates parameters used to monitor usage of the packets carried via Non-3GPP access for a MA PDU Session. The same set of parameters as for the Usage Monitoring information above applies. If a parameter is not included here, the value provided in the Usage Monitoring information above applies. | Optional |
|  | IPTV (NOTE 1) |  |
| IP Multicast traffic control information | Indicates whether the service data flow, corresponding to the service data flow template, is allowed or not allowed. | Optional |
|  | QoS Monitoring for URLLC |  |
| QoS parameter(s) to be measured | UL packet delay, DL packet delay or round trip packet delay. | Optional |
| Reporting frequency | Defines the frequency for the reporting, such as event triggered, periodic, or when the PDU Session is released. | Optional |
| Target of reporting | Defines the target of the QoS Monitoring reports, it can be either the PCF and/or the AF, decided by the PCF. | Optional |
| Indication of direct event notification | Indicates that the QoS Monitoring event shall be reported by the UPF directly to the AF or Local NEF indicated by the Target of reporting.  | Optional |
|  | Alternative QoS Parameter Sets (NOTE 2) |  |
| Packet Delay Budget | Indicates the packet delay budget in this Alternative QoS Parameter Set. | Optional |
| Packet Error Rate | Indicates the packet error rate in this Alternative QoS Parameter Set. | Optional |
| GBR (UL/DL) | The uplink/downlink guaranteed bitrate authorized for the service data flow in this Alternative QoS Parameter Set. | Optional |
|  | **TSCAI Input container** |  |
| Burst Arrival Time | Indicates the burst arrival time in reference to TSN GM for TSN or external GM for non-TSN applications at ingress port. | Optional |
| Periodicity | The time period (in reference to TSN GM for TSN or external GM for non-TSN applications) between start of two bursts. | Optional |
| Flow Direction | Direction of the flow. | Optional |
| Survival Time | It refers to the time period an application can survive without any burst. It is expressed in reference to the TSN GM for TSN and external GM for non-TSN applications. | Optional |
| Time Domain | Indicate the (g)PTP domain the (TSN)AF is located in. | Optional |
| NOTE 1: Only applicable to the 5G-RG connecting to the 5GC via NG-RAN as defined in Annex C.NOTE 2: Only applicable for GBR service data flow with QoS Notification Control enabled.NOTE 3: The parameter "Bind to QoS Flow associated with the default QoS rule and apply PCC rule parameters" defined in table 6.3.1 of 3GPP TS 23.503 [6] is implemented as follows: a default QoS with a GBR type or delay critical GBR type 5QI and a PCC rule bound to the default QoS flow are provisioned as defined in subclause 4.2.6.2.1.NOTE 4: The parameter "Indication of exclusion from session level monitoring" defined in table 6.3.1 of 3GPP TS 23.503 [6] is implemented as follows: a PCC rule identifier is included within the "exUsagePccRuleIds" attribute of the UsageMonitoringData instance of PDU session level usage monitoring to indicate that the service data flow shall be excluded from PDU Session usage monitoring as defined in subclause 4.2.6.5.3. |

The above information is organized into a set of decision data objects as defined in subclause 4.1.4.4. The exact encoding of PCC rules is defined in subclause 5.6.2.6.

\* \* \* \* Next change \* \* \* \*

##### 4.1.4.4.2 Traffic control data definition

Traffic control data defines how traffic data flows associated with a rule are treated (e.g. blocked, redirected). The traffic control data encoding table is defined in subclause 5.6.2.10.

Traffic control data shall include:

- Traffic Control Data ID.

Traffic control data may include:

- Flow status;

- Redirect Information;

- Mute Notification;

- Traffic Steering Policy ID UL;

- Traffic Steering Policy ID DL;

- Routing requirements;

- UP path change event subscription from the AF;

- Information on User Plane Latency requirements;

- EAS IP replacement information;

- Indication of traffic correlation;

- Access Traffic Steering Functionality;

- Access Traffic Steering Mode DL;

- Access Traffic Steering Mode UL; and

- Multicast Access Control.

\* \* \* \* Next change \* \* \* \*

###### 4.2.6.2.6.2 Steering the traffic to a local access of the data network

This procedure is only applicable in non-roaming and visited access (i.e. LBO) scenarios.

The PCF shall determine if the ongoing PDU Session is impacted by the routing of traffic to a local access to a data network as follows:

- If the AF request includes the individual IP address/ prefix allocated to a UE or the UE MAC address, the PCF shall store the received traffic routing information and perform session binding as defined in subclause 6.2 of 3GPP TS 29.513 [7] to determine the impacted PDU session.

- Otherwise, the PCF fetches from the UDR, as defined in 3GPP TS 29.519 [15], the traffic routing data information applicable for a UE, any UE or an Internal Group Id (if received in the SMF request).

Then the PCF authorizes the request for influencing SMF routing decisions. For the impacted PDU Session that corresponds to the AF request, the PCF shall take into account, if available, the local routing indication stored in the policy data subscription information in the UDR, as defined in 3GPP TS 29.519 [15], to determine whether it is allowed to generate PCC rules with traffic routing information. When allowed, the PCC rules are generated based on the AF request as follows:

- When the request is for influencing SMF routing decisions, based on traffic routing information, operator's policy, etc., the PCF determines the traffic steering policy. The traffic steering policy indicates, for each DNAI, a traffic steering policy identifier configured in the SMF and/or if the N6 routing information associated to the application is explicitly provided by the AF, the N6 routing information (as provided by the AF). The traffic steering policy identifier is derived by the PCF from the routing profile Id provided by the AF and is related to the mechanism enabling traffic steering to the DN. Then:

- The PCF shall include within each PccRule data structure the necessary information to identify the concerned traffic within either the "flowInfos" attribute or the "appId" attribute, and include within the TrafficControlData data type that the PCC rule refers to a list of locations that the traffic shall be routed to in the "routeToLocs" attribute, and, if the "EnEDGE" feature is supported, the information on User Plane Latency requirements within the "upLatReq" attribute and the EAS IP replacement information within the "easIpReplaceInfos" attribute.

- Within each RouteToLocation instance, the PCF shall include a DNAI in the "dnai" attribute to indicate the location of the application towards which the traffic routing is applied, and a traffic steering policy identifier in the "routeProfId" attribute or the explicit routing information in the "routeInfo" attribute.

- Within the UserPlaneLatencyRequirements data structure, the PCF may include the maximum allowed user plane latency within the "maxAllowedUpLat" attribute and/or user plane latency preference within the "upLatPrefer" attribute;

- If the AF provides both a routing profile Id and N6 routing information for a DNAI, the PCF shall include two RouteToLocation instances with the same DNAI within the "dnai" attribute and a traffic steering policy identifier within the "routeProfId" attribute in one instance and explicit routing information within the "routeInfo" attribute in the other instance.

NOTE 1: The N6 traffic routing requirements are related to the mechanism enabling traffic steering in the local access to the DN. The routing profile ID refers to a pre-agreed policy between the AF and the 5GC. This policy may refer to different steering policy identifier(s) sent to the SMF and e.g. based on time of the day, etc.

NOTE 2: Per DNAI, a Traffic steering policy identifier and/or N6 traffic routing information can be provided. If the pre-configured traffic steering policy (that is referenced by the traffic steering policy identifier) contains information that is overlapping with the N6 traffic routing information, the N6 traffic routing information shall take precedence.

NOTE 3: In this release of the specification, either a traffic steering policy identifier for UL or a traffic steering policy identifier for DL can be defined per DNAI.

- When the request is for subscribing to UP path change events of the PDU session, the PCF shall include the information on AF subscription to UP path change events within the PCC rule(s) to request the SMF to create a subscription to such notifications for the AF. In order to do so, the PCF shall include within each PccRule data structure the necessary information to identify the concerned traffic within either the "flowInfos" attribute or the "appId" attribute, and include within the Traffic Control Data decision that the PCC rule refers to the information on AF subscription to events within the "upPathChgEvent" attribute. Within this "upPathChgEvent" attribute, the PCF shall include the "dnaiChgType" attribute to indicate the type of notification (i.e. early notification, late notification or both), the notification URI within the "notificationUri" attribute, the notification correlation Id within the "notifCorreId" attribute, and if the URLLC feature is supported, an indication of AF acknowledgement to be expected within the "afAckInd" attribute. In order to enable the AF to identify the AF request to which the notification corresponds when the AF receives a UP path change notification from the SMF, as defined in subclause 4.2.2.2 of 3GPP TS 29.508 [12], the PCF shall set the values of the "notificationUri" attribute and "notifCorreId" attribute respectively as follows:

- If the PCF fetches the traffic routing data information from the UDR, the PCF shall set the value of the "notificationUri" attribute to the value of the "upPathChgNotifUri" attribute of the TrafficInfluData data structure and set the value of the "notifCorreId" attribute to the value of the "upPathChgNotifiCorreId" attribute of the TrafficInfluData data structure as defined in 3GPP TS 29.519 [15].

- If the PCF receives the traffic routing data information from the AF via N5 interface, the PCF shall set the values of the "notificationUri" attribute and the "notifCorreId" attribute according to the "upPathChgSub" attribute within the AfRoutingRequirement data structure as defined in 3GPP TS 29.514 [17].

- If the AF request includes an indication that application relocation is not possible, the PCF shall include within the PccRule data instance(s) the necessary information to identify the traffic within either the "flowInfos" attribute or the "appId" attribute and the "appReloc" attribute set to true. In this case, the SMF shall ensure that for the traffic related with the concerned application, no DNAI change takes place once selected initially for this application.

- If the URLLC feature is supported and the AF request includes an indication that the UE IP address preservation should be considered, the PCF shall include within the concerned PccRule data instance(s) the "addrPreserInd" attribute set to true.

- If the AF request includes an indication that the PDU session should be correlated via a common DNAI for a given traffic, the PCF shall include within the TrafficControlData data instance provisioned for one or more PCC rule(s), the "traffCorreInd" attribute set to true.

The PCF shall provide the PCC rule(s) as defined in subclause 4.2.6.2.1.

If the temporal validity condition is received, the PCF shall evaluate the temporal validity condition of the AF request and inform the SMF to install or remove the corresponding PCC rule(s) according to the evaluation result. When policies specific to the PDU Session and policies general to multiple PDU Sessions exist, the PCF gives precedence to the PDU Session specific policies over the general policies.

If the spatial validity condition is received, the PCF considers the latest known UE location to determine the PCC rules provided to the SMF. In order to do that, the PCF shall request the SMF to report the notifications about change of UE location in an area of interest (i.e. Presence Reporting Area) as defined in subclauses 4.2.2.13 or 4.2.3.19. The subscribed area of interest may be the same as the one provided in spatial validity condition, or may be a subset of the spatial validity condition (e.g. a list of TAs) based on the latest known UE location. When the SMF detects that the UE entered the area of interest subscribed by the PCF, the SMF notifies the PCF and the PCF provides to the SMF the PCC rule(s) described above. When the SMF becomes aware that the UE left the area subscribed by the PCF, the SMF notifies the PCF and the PCF may remove or provide updated PCC rule(s) to the SMF.

When the PCC rules are installed, the SMF may, based on local policies, take the information in the PCC rule(s) into account to:

- if the PDU Session is of IP type and the "addrPreserInd" attribute is included and set to true in the PCC rule(s), the SMF should preserve the UE IP address and, if necessary, not reselect the related PSA UPF for the traffic identified in the PCC rule once the PSA UPF is selected; otherwise, the SMF (re)selects UPF(s) as it might be required for PDU Sessions.

- activate mechanisms for traffic multi-homing or enforcement of an UL Classifier (UL CL).

- inform the AF of the (re)selection of the UP path (change of DNAI).

- if the "traffCorreInd" attribute set to true is included in the TrafficControlData data type referenced by a set of PCC rules, based on SMF implementation and local configuration, the SMF should select a common DNAI from the list of DNAI included in the "routeToLocs" attribute for the identified traffic of the PDU session.

- if the "maxAllowedUpLat" attribute is received, SMF may use this value to decide whether edge relocation is needed to ensure that the user plane latency does not exceed the value and whether to relocate the PSA UPF to satisfy the user plane latency; if the "upLatPrefer" attribute is received, the SMF may decide to (re-)select the PSA UPF based on the preference.

- if the "easIpReplaceInfos" attribute is received, the SMF may instruct the local PSA UPF with the EAS IP address replacement using "Outer Header Creation" as defined in 3GPP TS 29.244 [13] subclause 8.2.56 and "Outer Header Removal" as defined in 3GPP TS 29.244 [13] subclause 8.2.64.

If routing of traffic to a local access to a data network policy provided in the "routeToLocs" attribute is invalid, unknown or not applicable, or the enforcement of the steering of the traffic to the indicated DNAI failed, the SMF shall return a PCC Rule Error Report, as specified in subclauses 4.2.3.16 and 4.2.4.15, and set the "failureCode" attribute to "DNAI\_STEERING\_ERROR".

\* \* \* \* Next change \* \* \* \*

### 5.6.1 General

This subclause specifies the application data model supported by the API.

The Npcf\_SMPolicyControl API allows the NF service consumer to retrieve the session management related policy from the PCF as defined in 3GPP TS 23.503 [6].

Table 5.6.1-1 specifies the data types defined for the Npcf\_SMPolicyControl service based interface protocol.

Table 5.6.1-1: Npcf\_SMPolicyControl specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Section defined | Description | Applicability |
| 5GSmCause | 5.6.3.2 | Indicates the 5GSM cause code value. | RAN-NAS-Cause |
| AdditionalAccessInfo | 5.6.2.43 | Indicates the combination of additional Access Type and RAT Type for MA PDU session | ATSSS |
| AccNetChargingAddress | 5.6.2.35 | Identifies the address of the network node performing charging and used for charging applications. |  |
| AccNetChId | 5.6.2.23 | Contains the access network charging identifier for the PCC rule(s) or whole PDU session. |  |
| AccuUsageReport | 5.6.2.18 | Contains the accumulated usage report information. | UMC |
| AfSigProtocol | 5.6.3.10 | Indicates the protocol used for signalling between the UE and the AF. | ProvAFsignalFlow |
| AppDetectionInfo | 5.6.2.22 | Contains the detected application's traffic information. | ADC |
| ApplicationDescriptor | 5.6.3.2 | Defines the Application Descriptor for an ATSSS rule. | ATSSS |
| AtsssCapability | 5.6.3.26 | Contains the ATSSS capability supported for the MA PDU Session. | ATSSS |
| AuthorizedDefaultQos | 5.6.2.34 | Authorized Default QoS. |  |
| BridgeManagementContainer | 5.6.2.47 | Contains the UMIC. | TimeSensitiveNetworking |
| ChargingData | 5.6.2.11 | Contains charging related parameters. |  |
| ChargingInformation | 5.6.2.17 | Contains the addresses, and if available, the instance ID and set ID, of the charging functions. |  |
| ConditionData | 5.6.2.9 | Contains conditions for applicability of a rule. |  |
| CreditManagementStatus | 5.6.3.16 | Indicates the reason of the credit management session failure. |  |
| DownlinkDataNotificationControl | 5.6.2.48 | Contains the downlink data notification control information. | DDNEventPolicyControl |
| DownlinkDataNotificationControlRm | 5.6.2.49 | This data type is defined in the same way as the "DownlinkDataNotificationControl" data type, but with the OpenAPI "nullable: true" property. | DDNEventPolicyControl2 |
| EpsRanNasRelCause | 5.6.3.2 | Indicates the RAN or NAS release cause code information in 3GPP-EPS access type or indicates the TWAN or untrusted WLAN release cause code information in Non-3GPP-EPS access type. | RAN-NAS-Cause |
| ErrorReport | 5.6.2.36 | Contains the rule reports. |  |
| FailureCause | 5.6.3.14 | Indicates the cause of the failure in a Partial Success Report. |  |
| FailureCode | 5.6.3.9 | Indicates the reason of the PCC rule failure. |  |
| FlowDescription | 5.6.3.2 | Defines a packet filter for an IP flow. |  |
| FlowDirection | 5.6.3.3 | Indicates the direction of the service data flow. |  |
| FlowDirectionRm | 5.6.3.15 | This data type is defined in the same way as the "FlowDirection" data type, but allows null value. |  |
| FlowInformation | 5.6.2.14 | Contains the flow information. |  |
| IpMulticastAddressInfo | 5.6.2.46 | Contains the IP multicast addressing information | WWC |
| MaPduIndication | 5.6.3.25 | Contains the MA PDU session indication, i.e., MA PDU Request or MA PDU Network-Upgrade Allowed. | ATSSS |
| MeteringMethod | 5.6.3.5 | Indicates the metering method. |  |
| MulticastAccessControl | 5.6.3.20 | Indicates whether the service data flow, corresponding to the service data flow template, is allowed or not allowed. | WWC |
| NetLocAccessSupport | 5.6.3.27 | Indicates the access network support of the report of the requested access network information. | NetLoc |
| NotificationControlIndication | 5.6.3.29 | Indicates the notification of DDD Status is requested and/or notification of DDN Failure is requested. | DDNEventPolicyControl |
| PacketFilterContent | 5.6.3.2 | Defines a packet filter for an IP flow. |  |
| PacketFilterInfo | 5.6.2.30 | Contains the information from a single packet filter sent from the NF service consumer to the PCF. |  |
| PartialSuccessReport | 5.6.2.33 | Includes the information reported by the NF service consumer when some of the PCC rules and/or session rules are not successfully installed/activated. |  |
| PccRule | 5.6.2.6 | Contains the PCC rule information. |  |
| PduSessionRelCause | 5.6.3.24 | Contains the NF service consumer PDU Session release cause.  | PDUSessionRelCause,ImmediateTermination |
| PolicyControlRequestTrigger | 5.6.3.6 | Contains the policy control request trigger(s). |  |
| PolicyDecisionFailureCode | 5.6.3.28 | Indicates the type of the failed policy decision and/or condition data. | PolicyDecisionErrorHandling |
| PortManagementContainer | 5.6.2.45 | Contains the port management information container for a port. | TimeSensitiveNetworking |
| QosCharacteristics | 5.6.2.16 | Contains QoS characteristics for a non-standardized or non-configured 5QI. |  |
| QosData | 5.6.2.8 | Contains the QoS parameters. |  |
| QosFlowUsage | 5.6.3.13 | Indicates a QoS flow usage information. |  |
| QosMonitoringData | 5.6.2.40 | Contains QoS monitoring related control information. | QosMonitoring |
| QosMonitoringReport | 5.6.2.42 | Contains QoS monitoring reporting information. | QosMonitoring |
| QosNotificationControlInfo | 5.6.2.32 | Contains the QoS Notification Control Information. |  |
| RanNasRelCause | 5.6.2.28 | Contains the RAN/NAS release cause. | RAN-NAS-Cause |
| RedirectAddressType | 5.6.3.12 | Indicates the redirect address type. | ADC |
| RedirectInformation | 5.6.2.13 | Contains the redirect information. | ADC |
| ReportingFrequency | 5.6.3.22 | Indicates the frequency for the reporting | QosMonitoring |
| ReportingLevel | 5.6.3.4 | Indicates the reporting level. |  |
| RequestedQos | 5.6.2.31 | Contains the QoS information requested by the UE. |  |
| RequestedQosMonitoringParameter | 5.6.3.21 | Indicates the requested QoS monitoring parameters to be measured. | QosMonitoring |
| RequestedRuleData | 5.6.2.24 | Contains rule data requested by the PCF to receive information associated with PCC rules.  |  |
| RequestedRuleDataType | 5.6.3.7 | Contains the type of rule data requested by the PCF. |  |
| RequestedUsageData | 5.6.2.25 | Contains usage data requested by the PCF requesting usage reports for the corresponding usage monitoring data instances.  | UMC |
| RuleOperation | 5.6.3.11 | Indicates a UE initiated resource operation that causes a request for PCC rules. |  |
| RuleReport | 5.6.2.27 | Reports the status of PCC. |  |
| RuleStatus | 5.6.3.8 | Indicates the status of PCC or session rule. |  |
| SatelliteBackhaulCategory | 5.6.3.30 | Indicates the satellite backhaul category or non-satellite backhaul. | SatBackhaulCategoryChg |
| ServingNfIdenty | 5.6.2.38 | Contains the serving Network Function identity. |  |
| SessionRule | 5.6.2.7 | Contains session level policy information. |  |
| SessionRuleFailureCode | 5.6.3.17 | Indicates the reason of the session rule failure. | SessionRuleErrorHandling |
| SessionRuleReport | 5.6.2.37 | Reports the status of session rule. | SessionRuleErrorHandling |
| SgsnAddress | 5.6.2.50 | Contains the serving SGSN address. | 2G3GIWK |
| SmPolicyAssociationReleaseCause | 5.6.3.23 | Represents the cause why the PCF requests the termination of the SM policy association. |  |
| SmPolicyControl | 5.6.2.2 | Contains the parameters to request the SM policies and the SM policies authorized by the PCF. |  |
| SmPolicyContextData | 5.6.2.3 | Contains the parameters to create individual SM policy resource. |  |
| SmPolicyDecision | 5.6.2.4 | Contains the SM policies authorized by the PCF. |  |
| SmPolicyNotification | 5.6.2.5 | Contains the update of the SM policies. |  |
| SmPolicyDeleteData | 5.6.2.15 | Contains the parameters to be sent to the PCF when the individual SM policy is deleted. |  |
| SmPolicyUpdateContextData | 5.6.2.19 | Contains the met policy control request trigger(s) and corresponding new value(s) or the error report of the policy enforcement. |  |
| SteeringFunctionality | 5.6.3.18 | Indicates functionality to support traffic steering, switching and splitting determined by the PCF. | ATSSS |
| SteeringMode | 5.6.2.39 | Contains the steering mode value and parameters determined by the PCF. | ATSSS |
| SteerModeIndicator | 5.6.3.31 | Contains Autonomous load-balance indicator or UE-assistance indicator. | EnATSSS |
| SteerModeValue | 5.6.3.19 | Indicates the steering mode value determined by the PCF. | ATSSS |
| TerminationNotification | 5.6.2.21 | Termination Notification. |  |
| ThresholdValue | 5.6.2.52 | Contains the threshold value(s) for RTT and/or Packet Loss Rate. | EnATSSS |
| TrafficControlData | 5.6.2.10 | Contains parameters determining how flows associated with a PCCRule are treated (blocked, redirected, etc). |  |
| TsnBridgeInfo | 5.6.2.41 | Contains parameters that describe and identify the TSC user plane node. | TimeSensitiveNetworking,TimeSensitiveCommunication |
| TsnPortNumber | 5.6.3.2 | Contains a port number. | TimeSensitiveNetworking |
| UeCampingRep | 5.6.2.26 | Contains the current applicable values corresponding to the policy control request triggers. |  |
| UeInitiatedResourceRequest | 5.6.2.29 | Indicates a UE requests specific QoS handling for selected SDF. |  |
| UpPathChgEvent | 5.6.2.20 | Contains the UP path change event subscription from the AF. | TSC |
| UsageMonitoringData | 5.6.2.12 | Contains usage monitoring related control information. | UMC |
| UserPlaneLatencyRequirements | 5.6.2.51 | The user plane latency requirements. | EnEDGE |

Table 5.6.1-2 specifies data types re-used by the Npcf\_SMPolicyControl service based interface protocol from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the Npcf\_SMPolicyControl service based interface.

Table 5.6.1-2: Npcf\_SMPolicyControl re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| 5GMmCause | 3GPP TS 29.571 [11] | Contains the cause value of 5GMM protocol. | RAN-NAS-Cause |
| 5Qi | 3GPP TS 29.571 [11] | Unsigned integer representing a 5G QoS Identifier (see subclause 5.7.2.1 of 3GPP TS 23.501 [2]), within the range 0 to 255. |  |
| 5QiPriorityLevel | 3GPP TS 29.571 [11] | Unsigned integer indicating the 5QI Priority Level (see subclauses 5.7.3.3 and 5.7.4 of 3GPP TS 23.501 [2]), within the range 1 to 127.Values are ordered in decreasing order of priority, i.e. with 1 as the highest priority and 127 as the lowest priority. |  |
| 5QiPriorityLevelRm | 3GPP TS 29.571 [11] | This data type is defined in the same way as the "5QiPriorityLevel" data type, but with the OpenAPI "nullable: true" property. |  |
| AccessType | 3GPP TS 29.571 [11] | The identification of the type of access network. |  |
| AccessTypeRm | 3GPP TS 29.571 [11] | This data type is defined in the same way as the "AccessType" data type, but with the OpenAPI "nullable: true" property. | ATSSS |
| Ambr | 3GPP TS 29.571 [11] | Session AMBR. |  |
| AnGwAddress | 3GPP TS 29.514 [17] | Carries the control plane address of the access network gateway. (NOTE 1) |  |
| ApplicationChargingId | 3GPP TS 29.571 [11] | Application provided charging identifier allowing correlation of charging information. | AF\_Charging\_Identifier |
| Arp | 3GPP TS 29.571 [11] | ARP. |  |
| AverWindow | 3GPP TS 29.571 [11] | Averaging Window. |  |
| AverWindowRm | 3GPP TS 29.571 [11] | This data type is defined in the same way as the "AverWindow" data type, but with the OpenAPI "nullable: true" property. |  |
| Bytes | 3GPP TS 29.571 [11] | String with format "byte". | TimeSensitiveNetworking |
| BitRate | 3GPP TS 29.571 [11] | String representing a bit rate that shall be formatted as follows:pattern: "^\d+(\.\d+)? (bps|Kbps|Mbps|Gbps|Tbps)$"Examples: "125 Mbps", "0.125 Gbps", "125000 Kbps". |  |
| BitRateRm | 3GPP TS 29.571 [11] | This data type is defined in the same way as the "BitRate" data type, but with the OpenAPI "nullable: true" property. |  |
| ChargingId | 3GPP TS 29.571 [11] | Charging identifier allowing correlation of charging information. |  |
| ContentVersion | 3GPP TS 29.514 [17] | Indicates the content version of a PCC rule. It uniquely identifies a version of the PCC rule as defined in subclause 4.2.6.2.14. | RuleVersioning |
| DateTime | 3GPP TS 29.571 [11] | String with format "date-time" as defined in OpenAPI Specification [10]. |  |
| DateTimeRm | 3GPP TS 29.571 [11] | This data type is defined in the same way as the "DateTime" data type, but with the OpenAPI "nullable: true" property. |  |
| DddTrafficDescriptor | 3GPP TS 29.571 [11] | Traffic Descriptor | DDNEventPolicyControl |
| DlDataDeliveryStatus | 3GPP TS 29.571 [11] | Downlink data delivery status. | DDNEventPolicyControl |
| DnaiChangeType | 3GPP TS 29.571 [11] | Describes the types of DNAI change. |  |
| Dnn | 3GPP TS 29.571 [11] | The DNN the user is connected to. |  |
| DnnSelectionMode | 3GPP TS 29.502 [22] | DNN selection mode. | DNNSelectionMode |
| DurationSec | 3GPP TS 29.571 [11] | Identifies a period of time in units of seconds. |  |
| DurationSecRm | 3GPP TS 29.571 [11] | This data type is defined in the same way as the "DurationSec" data type, but with the OpenAPI "nullable: true" property. |  |
| EasIpReplacementInfo | 3GPP TS 29.571 [11] | Contains EAS IP replacement information for a Source and a Target EAS. | EnEDGE |
| EthFlowDescription | 3GPP TS 29.514 [17] | Defines a packet filter for an Ethernet flow. (NOTE 2) |  |
| ExtMaxDataBurstVol | 3GPP TS 29.571 [11] | Maximum Data Burst Volume. | EMDBV |
| ExtMaxDataBurstVolRm | 3GPP TS 29.571 [11] | This data type is defined in the same way as the "ExtMaxDataBurstVol" data type, but with the OpenAPI "nullable: true" property. | EMDBV |
| FinalUnitAction | 3GPP TS 32.291 [19] | Indicates the action to be taken when the user's account cannot cover the service cost. |  |
| FlowStatus | 3GPP TS 29.514 [17] | Describes whether the IP flow(s) are enabled or disabled. The value "REMOVED" is not applicable to Npcf\_SMPolicyControl service. |  |
| Gpsi | 3GPP TS 29.571 [11] | Identifies a GPSI. |  |
| GroupId | 3GPP TS 29.571 [11] | Identifies a group of internal globally unique ID. |  |
| Guami | 3GPP TS 29.571 [11] | Globally Unique AMF Identifier. |  |
| InvalidParam | 3GPP TS 29.571 [11] | Invalid Parameters for the reported failed policy decisions | ExtPolicyDecisionErrorHandling |
| IpIndex | 3GPP TS 29.519 [15] | Information that identifies which IP pool or external server is used to allocate the IP address. |  |
| Ipv4Addr | 3GPP TS 29.571 [11]  | Identifies an Ipv4 address. |  |
| Ipv4AddrMask | 3GPP TS 29.571 [11] | String identifying an IPv4 address mask. |  |
| Ipv6Addr | 3GPP TS 29.571 [11] | Identifies an IPv6 address. |  |
| Ipv6Prefix | 3GPP TS 29.571 [11] | The Ipv6 prefix allocated for the user. |  |
| MacAddr48 | 3GPP TS 29.571 [11] | MAC Address. |  |
| MaxDataBurstVol | 3GPP TS 29.571 [11] | Maximum Data Burst Volume. |  |
| MaxDataBurstVolRm | 3GPP TS 29.571 [11] | This data type is defined in the same way as the "MaxDataBurstVol" data type, but with the OpenAPI "nullable: true" property. |  |
| NfInstanceId | 3GPP TS 29.571 [11] | The NF instance identifier. |  |
| NfSetId | 3GPP TS 29.571 [11] | The NF set identifier. |  |
| NgApCause | 3GPP TS 29.571 [11] | Contains the cause value of NgAP protocol. | RAN-NAS-Cause |
| NullValue | 3GPP TS 29.571 [11] | JSON's null value, used as an explicit value of an enumeration. |  |
| PacketDelBudget | 3GPP TS 29.571 [11] | Packet Delay Budget. |  |
| PacketErrRate | 3GPP TS 29.571 [11] | Packet Error Rate. |  |
| PacketLossRateRm | 3GPP TS 29.571 [11] | This data type is defined in the same way as the "PacketLossRate" data type, but with the OpenAPI "nullable: true" property. |  |
| PduSessionId | 3GPP TS 29.571 [11] | The identification of the PDU session. |  |
| PduSessionType | 3GPP TS 29.571 [11] | Indicate the type of a PDU session. |  |
| Pei | 3GPP TS 29.571 [11] | The Identification of a Permanent Equipment. |  |
| PlmnIdNid | 3GPP TS 29.571 [11] | The identification of the Network: The PLMN Identifier (the mobile country code and the mobile network code) or the SNPN Identifier (the PLMN Identifier and the NID). |  |
| PresenceInfo  | 3GPP TS 29.571 [11] | Contains the information which describes a Presence Reporting Area. | PRA |
| PresenceInfoRm | 3GPP TS 29.571 [11] | This data type is defined in the same way as the "PresenceInfo" data type, but with the OpenAPI "nullable: true" property. | PRA |
| ProblemDetails | 3GPP TS 29.571 [11] | Contains a detailed information about an error. |  |
| QosNotifType | 3GPP TS 29.514 [17] | Indicates whether the GBR targets for the indicated SDFs are "NOT\_GUARANTEED" or "GUARANTEED" again. |  |
| QosResourceType | 3GPP TS 29.571 [11] | Indicates whether the resource type is GBR, delay critical GBR, or non-GBR. |  |
| RatingGroup | 3GPP TS 29.571 [11] | Identifier of a rating group. |  |
| RatType | 3GPP TS 29.571 [11] | The identification of the RAT type. |  |
| RedirectResponse | 3GPP TS 29.571 [11] | Contains redirection related information. | ES3XX |
| RouteToLocation | 3GPP TS 29.571 [11] | A traffic routes to applications location. | TSC |
| ServiceId | 3GPP TS 29.571 [11] | Identifier of a service. |  |
| Snssai | 3GPP TS 29.571 [11] | Identifies the S-NSSAI. |  |
| SubscribedDefaultQos | 3GPP TS 29.571 [11] | Subscribed Default QoS. |  |
| Supi | 3GPP TS 29.571 [11] | The identification of the user (i.e. IMSI, NAI). |  |
| SupportedFeatures | 3GPP TS 29.571 [11] | Used to negotiate the applicability of the optional features defined in table 5.8-1. |  |
| TraceData | 3GPP TS 29.571 [11] |  |  |
| TimeZone | 3GPP TS 29.571 [11] | Contains the user time zone information. |  |
| TscaiInputContainer | 3GPP TS 29.514 [17] | TSCAI Input information. | TimeSensitiveNetworking |
| Uinteger | 3GPP TS 29.571 [11] | Unsigned Integer. | TimeSensitiveNetworking |
| UintegerRm | 3GPP TS 29.571 [11] | This data type is defined in the same way as the "Uinteger" data type, but with the OpenAPI "nullable: true" property. | EnATSSS |
| Uint64 | 3GPP TS 29.571 [11] | Unsigned 64-bit integers. | TimeSensitiveNetworking |
| Uri | 3GPP TS 29.571 [11] | URI. |  |
| UserLocation | 3GPP TS 29.571 [11] | Contains the user location(s). |  |
| Volume | 3GPP TS 29.122 [32] | Unsigned integer identifying a volume in units of bytes. |  |
| VolumeRm | 3GPP TS 29.122 [32] | This data type is defined in the same way as the "Volume" data type, but with the OpenAPI "nullable: true" property. |  |
| VplmnQos | 3GPP TS 29.502 [22] | QoS constraints in the VPLMN. | VPLMN-QoS-Control |
| NOTE 1: "AnGwAddr" data structure is only applicable to the 5GS and EPC/E-UTRAN interworking scenario as defined in Annex B.NOTE 2: In order to support a set of MAC addresses with a specific range in the traffic filter, feature MacAddressRange as specified in subclause 5.8 shall be supported. |

\* \* \* \* Next change \* \* \* \*

#### 5.6.2.10 Type TrafficControlData

Table 5.6.2.10-1: Definition of type TrafficControlData

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| tcId | string | M | 1 | Univocally identifies the traffic control policy data within a PDU session. |  |
| flowStatus | FlowStatus | O | 0..1 | Enum determining what action to perform on traffic. Possible values are: [enable, disable, enable\_uplink, enable\_downlink]. The default value "ENABLED" shall apply, if the attribute is not present and has not been supplied previously. |  |
| redirectInfo | RedirectInformation | O | 0..1 | It indicates whether the detected application traffic should be redirected to another controlled address. | ADC |
| addRedirectInfo | array(RedirectInformation) | O | 1..N | Additional redirection information.Each element indicates whether the detected application traffic should be redirected to another controlled address. | ADCmultiRedirection |
| muteNotif | boolean | O | 0..1 | Indicates whether application's start or stop notifications are to be muted. The default value "FALSE" shall apply, if the attribute is not present and has not been supplied previously. | ADC |
| trafficSteeringPolIdDl(NOTE 1) | string | O | 0..1 | Reference to a pre-configured traffic steering policy for downlink traffic at the SMF. | TSC |
| trafficSteeringPolIdUl(NOTE 1) | string | O | 0..1 | Reference to a pre-configured traffic steering policy for uplink traffic at the SMF. | TSC |
| routeToLocs(NOTE 1) | array(RouteToLocation) | O | 1..N | A list of location(s) to which the traffic shall be routed for the AF request. | TSC |
| upLatReq | UserPlaneLatencyRequirements | O | 0..1 | Contains the user plane latency requirements. | EnEDGE |
| easIpReplaceInfos | array(EasIpReplacementInfo) | O | 1..N | Contains EAS IP replacement information. | EnEDGE |
| traffCorreInd | boolean | O | 0..1 | Indication of traffic correlation. If it is included and set to "true", traffic should be correlated; The default value "false" applies, if the attribute is not present and has not been supplied previously. (NOTE 2) |  |
| upPathChgEvent | UpPathChgEvent | O | 0..1 | Contains the information about the AF subscription to UP path change events. | TSC |
| steerFun | SteeringFunctionality | O | 0..1 | Indicates the applicable traffic steering functionality. | ATSSS |
| steerModeDl | SteeringMode | O | 0..1 | Determines the traffic distribution rule across 3GPP and Non-3GPP accesses to apply for downlink traffic. | ATSSS |
| steerModeUl | SteeringMode | O | 0..1 | Determines the traffic distribution rule across 3GPP and Non-3GPP accesses to apply for uplink traffic. | ATSSS |
| mulAccCtrl | MulticastAccessControl | O | 0..1 | Indicates whether the service data flow, corresponding to the service data flow template, is allowed or not allowed. The default value "NOT\_ALLOWED" applies, if the attribute is not present and has not been supplied previously. | WWC |
| NOTE 1: Traffic steering policy identifier(s) (i.e. "trafficSteeringPolIdDl" attribute and/or "trafficSteeringPolIdUl” attribute) and N6 traffic routing requirements (i.e. "routeToLocs" attribute) are mutually exclusive.NOTE 2: The TSC feature shall be supported in order to support this attribute. |

\* \* \* \* Next change \* \* \* \*

# A.2 Npcf\_SMPolicyControl API

openapi: 3.0.0

info:

 title: Npcf\_SMPolicyControl API

 version: 1.2.0-alpha.4

 description: |

 Session Management Policy Control Service

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externalDocs:

 description: 3GPP TS 29.512 V17.4.0; 5G System; Session Management Policy Control Service.

 url: 'http://www.3gpp.org/ftp/Specs/archive/29\_series/29.512/'

security:

 - {}

 - oAuth2ClientCredentials:

 - npcf-smpolicycontrol

servers:

 - url: '{apiRoot}/npcf-smpolicycontrol/v1'

 variables:

 apiRoot:

 default: https://example.com

 description: apiRoot as defined in subclause 4.4 of 3GPP TS 29.501

paths:

 /sm-policies:

 post:

 summary: Create a new Individual SM Policy

 operationId: CreateSMPolicy

 tags:

 - SM Policies (Collection)

 requestBody:

 required: true

 content:

 application/json:

 schema:

 $ref: '#/components/schemas/SmPolicyContextData'

 responses:

 '201':

 description: Created

 content:

 application/json:

 schema:

 $ref: '#/components/schemas/SmPolicyDecision'

 headers:

 Location:

 description: 'Contains the URI of the newly created resource'

 required: true

 schema:

 type: string

 '308':

 description: Permanent Redirect

 headers:

 Location:

 description: 'Contains the URI of the PCF within the existing PCF binding information stored in the BSF for the same UE ID, S-NSSAI and DNN combination '

 required: true

 schema:

 type: string

 '400':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

 '404':

 description: Not Found

 '411':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/411'

 '413':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/413'

 '415':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '503':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29571\_CommonData.yaml#/components/responses/default'

 callbacks:

 SmPolicyUpdateNotification:

 '{$request.body#/notificationUri}/update':

 post:

 requestBody:

 required: true

 content:

 application/json:

 schema:

 $ref: '#/components/schemas/SmPolicyNotification'

 responses:

 '200':

 description: OK. The current applicable values corresponding to the policy control request trigger is reported

 content:

 application/json:

 schema:

 oneOf:

 - $ref: '#/components/schemas/UeCampingRep'

 - type: array

 items:

 $ref: '#/components/schemas/PartialSuccessReport'

 minItems: 1

 - type: array

 items:

 $ref: '#/components/schemas/PolicyDecisionFailureCode'

 minItems: 1

 '204':

 description: No Content, Notification was succesfull

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

 description: Bad Request.

 content:

 application/json:

 schema:

 $ref: '#/components/schemas/ErrorReport'

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/404'

 '411':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/411'

 '413':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/413'

 '415':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '503':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29571\_CommonData.yaml#/components/responses/default'

 SmPolicyControlTerminationRequestNotification:

 '{$request.body#/notificationUri}/terminate':

 post:

 requestBody:

 required: true

 content:

 application/json:

 schema:

 $ref: '#/components/schemas/TerminationNotification'

 responses:

 '204':

 description: No Content, Notification was successful

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/404'

 '411':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/411'

 '413':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/413'

 '415':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '503':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29571\_CommonData.yaml#/components/responses/default'

 /sm-policies/{smPolicyId}:

 get:

 summary: Read an Individual SM Policy

 operationId: GetSMPolicy

 tags:

 - Individual SM Policy (Document)

 parameters:

 - name: smPolicyId

 in: path

 description: Identifier of a policy association

 required: true

 schema:

 type: string

 responses:

 '200':

 description: OK. Resource representation is returned

 content:

 application/json:

 schema:

 $ref: '#/components/schemas/SmPolicyControl'

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/404'

 '406':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/406'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '503':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29571\_CommonData.yaml#/components/responses/default'

 /sm-policies/{smPolicyId}/update:

 post:

 summary: Update an existing Individual SM Policy

 operationId: UpdateSMPolicy

 tags:

 - Individual SM Policy (Document)

 requestBody:

 required: true

 content:

 application/json:

 schema:

 $ref: '#/components/schemas/SmPolicyUpdateContextData'

 parameters:

 - name: smPolicyId

 in: path

 description: Identifier of a policy association

 required: true

 schema:

 type: string

 responses:

 '200':

 description: OK. Updated policies are returned

 content:

 application/json:

 schema:

 $ref: '#/components/schemas/SmPolicyDecision'

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/404'

 '411':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/411'

 '413':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/413'

 '415':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '503':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29571\_CommonData.yaml#/components/responses/default'

 /sm-policies/{smPolicyId}/delete:

 post:

 summary: Delete an existing Individual SM Policy

 operationId: DeleteSMPolicy

 tags:

 - Individual SM Policy (Document)

 requestBody:

 required: true

 content:

 application/json:

 schema:

 $ref: '#/components/schemas/SmPolicyDeleteData'

 parameters:

 - name: smPolicyId

 in: path

 description: Identifier of a policy association

 required: true

 schema:

 type: string

 responses:

 '204':

 description: No content

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/404'

 '411':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/411'

 '413':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/413'

 '415':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '503':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29571\_CommonData.yaml#/components/responses/default'

components:

 securitySchemes:

 oAuth2ClientCredentials:

 type: oauth2

 flows:

 clientCredentials:

 tokenUrl: '{nrfApiRoot}/oauth2/token'

 scopes:

 npcf-smpolicycontrol: Access to the Npcf\_SMPolicyControl API

 schemas:

 SmPolicyControl:

 description: Contains the parameters used to request the SM policies and the SM policies authorized by the PCF.

 type: object

 properties:

 context:

 $ref: '#/components/schemas/SmPolicyContextData'

 policy:

 $ref: '#/components/schemas/SmPolicyDecision'

 required:

 - context

 - policy

 SmPolicyContextData:

 description: Contains the parameters used to create an Individual SM policy resource.

 type: object

 properties:

 accNetChId:

 $ref: '#/components/schemas/AccNetChId'

 chargEntityAddr:

 $ref: '#/components/schemas/AccNetChargingAddress'

 gpsi:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Gpsi'

 supi:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Supi'

 invalidSupi:

 type: boolean

 description: When this attribute is included and set to true, it indicates that the supi attribute contains an invalid value.This attribute shall be present if the SUPI is not available in the SMF or the SUPI is unauthenticated. When present it shall be set to true for an invalid SUPI and false (default) for a valid SUPI.

 interGrpIds:

 type: array

 items:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/GroupId'

 minItems: 1

 pduSessionId:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/PduSessionId'

 pduSessionType:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/PduSessionType'

 chargingcharacteristics:

 type: string

 dnn:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Dnn'

 dnnSelMode:

 $ref: 'TS29502\_Nsmf\_PDUSession.yaml#/components/schemas/DnnSelectionMode'

 notificationUri:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'

 accessType:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/AccessType'

 ratType:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/RatType'

 addAccessInfo:

 $ref: '#/components/schemas/AdditionalAccessInfo'

 servingNetwork:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/PlmnIdNid'

 userLocationInfo:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/UserLocation'

 ueTimeZone:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/TimeZone'

 pei:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Pei'

 ipv4Address:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv4Addr'

 ipv6AddressPrefix:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv6Prefix'

 ipDomain:

 type: string

 description: Indicates the IPv4 address domain

 subsSessAmbr:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ambr'

 authProfIndex:

 type: string

 description: Indicates the DN-AAA authorization profile index

 subsDefQos:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/SubscribedDefaultQos'

 vplmnQos:

 $ref: 'TS29502\_Nsmf\_PDUSession.yaml#/components/schemas/VplmnQos'

 numOfPackFilter:

 type: integer

 description: Contains the number of supported packet filter for signalled QoS rules.

 online:

 type: boolean

 description: If it is included and set to true, the online charging is applied to the PDU session.

 offline:

 type: boolean

 description: If it is included and set to true, the offline charging is applied to the PDU session.

 3gppPsDataOffStatus:

 type: boolean

 description: If it is included and set to true, the 3GPP PS Data Off is activated by the UE.

 refQosIndication:

 type: boolean

 description: If it is included and set to true, the reflective QoS is supported by the UE.

 traceReq:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/TraceData'

 sliceInfo:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Snssai'

 qosFlowUsage:

 $ref: '#/components/schemas/QosFlowUsage'

 servNfId:

 $ref: '#/components/schemas/ServingNfIdentity'

 suppFeat:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

 smfId:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/NfInstanceId'

 recoveryTime:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/DateTime'

 maPduInd:

 $ref: '#/components/schemas/MaPduIndication'

 atsssCapab:

 $ref: '#/components/schemas/AtsssCapability'

 ipv4FrameRouteList:

 type: array

 items:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv4AddrMask'

 minItems: 1

 ipv6FrameRouteList:

 type: array

 items:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv6Prefix'

 minItems: 1

 satBackhaulCategory:

 $ref: '#/components/schemas/SatelliteBackhaulCategory'

 required:

 - supi

 - pduSessionId

 - pduSessionType

 - dnn

 - notificationUri

 - sliceInfo

 SmPolicyDecision:

 description: Contains the SM policies authorized by the PCF.

 type: object

 properties:

 sessRules:

 type: object

 additionalProperties:

 $ref: '#/components/schemas/SessionRule'

 minProperties: 1

 description: A map of Sessionrules with the content being the SessionRule as described in subclause 5.6.2.7. The key used in this map for each entry is the sessRuleId attribute of the corresponding SessionRule.

 pccRules:

 type: object

 additionalProperties:

 $ref: '#/components/schemas/PccRule'

 minProperties: 1

 description: A map of PCC rules with the content being the PCCRule as described in subclause 5.6.2.6. The key used in this map for each entry is the pccRuleId attribute of the corresponding PccRule.

 nullable: true

 pcscfRestIndication:

 type: boolean

 description: If it is included and set to true, it indicates the P-CSCF Restoration is requested.

 qosDecs:

 type: object

 additionalProperties:

 $ref: '#/components/schemas/QosData'

 minProperties: 1

 description: Map of QoS data policy decisions. The key used in this map for each entry is the qosId attribute of the corresponding QosData.

 chgDecs:

 type: object

 additionalProperties:

 $ref: '#/components/schemas/ChargingData'

 minProperties: 1

 description: Map of Charging data policy decisions. The key used in this map for each entry is the chgId attribute of the corresponding ChargingData.

 nullable: true

 chargingInfo:

 $ref: '#/components/schemas/ChargingInformation'

 traffContDecs:

 type: object

 additionalProperties:

 $ref: '#/components/schemas/TrafficControlData'

 minProperties: 1

 description: Map of Traffic Control data policy decisions. The key used in this map for each entry is the tcId attribute of the corresponding TrafficControlData.

 umDecs:

 type: object

 additionalProperties:

 $ref: '#/components/schemas/UsageMonitoringData'

 minProperties: 1

 description: Map of Usage Monitoring data policy decisions. The key used in this map for each entry is the umId attribute of the corresponding UsageMonitoringData.

 nullable: true

 qosChars:

 type: object

 additionalProperties:

 $ref: '#/components/schemas/QosCharacteristics'

 minProperties: 1

 description: Map of QoS characteristics for non standard 5QIs. This map uses the 5QI values as keys.

 qosMonDecs:

 type: object

 additionalProperties:

 $ref: '#/components/schemas/QosMonitoringData'

 minProperties: 1

 description: Map of QoS Monitoring data policy decisions. The key used in this map for each entry is the qmId attribute of the corresponding QosMonitoringData.

 nullable: true

 reflectiveQoSTimer:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/DurationSec'

 conds:

 type: object

 additionalProperties:

 $ref: '#/components/schemas/ConditionData'

 minProperties: 1

 description: A map of condition data with the content being as described in subclause 5.6.2.9. The key used in this map for each entry is the condId attribute of the corresponding ConditionData.

 nullable: true

 revalidationTime:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/DateTime'

 offline:

 type: boolean

 description: Indicates the offline charging is applicable to the PDU session when it is included and set to true.

 online:

 type: boolean

 description: Indicates the online charging is applicable to the PDU session when it is included and set to true.

 offlineChOnly:

 type: boolean

 default: false

 description: Indicates that the online charging method shall never be used for any PCC rule activated during the lifetime of the PDU session.

 policyCtrlReqTriggers:

 type: array

 items:

 $ref: '#/components/schemas/PolicyControlRequestTrigger'

 minItems: 1

 description: Defines the policy control request triggers subscribed by the PCF.

 nullable: true

 lastReqRuleData:

 type: array

 items:

 $ref: '#/components/schemas/RequestedRuleData'

 minItems: 1

 description: Defines the last list of rule control data requested by the PCF.

 lastReqUsageData:

 $ref: '#/components/schemas/RequestedUsageData'

 praInfos:

 type: object

 additionalProperties:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/PresenceInfoRm'

 minProperties: 1

 description: Map of PRA information. The praId attribute within the PresenceInfo data type is the key of the map.

 nullable: true

 ipv4Index:

 $ref: 'TS29519\_Policy\_Data.yaml#/components/schemas/IpIndex'

 ipv6Index:

 $ref: 'TS29519\_Policy\_Data.yaml#/components/schemas/IpIndex'

 qosFlowUsage:

 $ref: '#/components/schemas/QosFlowUsage'

 relCause:

 $ref: '#/components/schemas/SmPolicyAssociationReleaseCause'

 suppFeat:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

 tsnBridgeManCont:

 $ref: '#/components/schemas/BridgeManagementContainer'

 tsnPortManContDstt:

 $ref: '#/components/schemas/PortManagementContainer'

 tsnPortManContNwtts:

 type: array

 items:

 $ref: '#/components/schemas/PortManagementContainer'

 minItems: 1

 redSessIndication:

 type: boolean

 description: Indicates whether the PDU session is a redundant PDU session. If absent it means the PDU session is not a redundant PDU session.

 SmPolicyNotification:

 description: Represents a notification on the update of the SM policies.

 type: object

 properties:

 resourceUri:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'

 smPolicyDecision:

 $ref: '#/components/schemas/SmPolicyDecision'

 PccRule:

 description: Contains a PCC rule information.

 type: object

 properties:

 flowInfos:

 type: array

 items:

 $ref: '#/components/schemas/FlowInformation'

 minItems: 1

 description: An array of IP flow packet filter information.

 appId:

 type: string

 description: A reference to the application detection filter configured at the UPF.

 appDescriptor:

 $ref: '#/components/schemas/ApplicationDescriptor'

 contVer:

 $ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/ContentVersion'

 pccRuleId:

 type: string

 description: Univocally identifies the PCC rule within a PDU session.

 precedence:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uinteger'

 afSigProtocol:

 $ref: '#/components/schemas/AfSigProtocol'

 appReloc:

 type: boolean

 description: Indication of application relocation possibility.

 refQosData:

 type: array

 items:

 type: string

 minItems: 1

 maxItems: 1

 description: A reference to the QosData policy decision type. It is the qosId described in subclause 5.6.2.8.

 refAltQosParams:

 type: array

 items:

 type: string

 minItems: 1

 description: A Reference to the QosData policy decision type for the Alternative QoS parameter sets of the service data flow.

 refTcData:

 type: array

 items:

 type: string

 minItems: 1

 maxItems: 1

 description: A reference to the TrafficControlData policy decision type. It is the tcId described in subclause 5.6.2.10.

 refChgData:

 type: array

 items:

 type: string

 minItems: 1

 maxItems: 1

 description: A reference to the ChargingData policy decision type. It is the chgId described in subclause 5.6.2.11.

 nullable: true

 refChgN3gData:

 type: array

 items:

 type: string

 minItems: 1

 maxItems: 1

 description: A reference to the ChargingData policy decision type only applicable to Non-3GPP access if "ATSSS" feature is supported. It is the chgId described in subclause 5.6.2.11.

 nullable: true

 refUmData:

 type: array

 items:

 type: string

 minItems: 1

 maxItems: 1

 description: A reference to UsageMonitoringData policy decision type. It is the umId described in subclause 5.6.2.12.

 nullable: true

 refUmN3gData:

 type: array

 items:

 type: string

 minItems: 1

 maxItems: 1

 description: A reference to UsageMonitoringData policy decision type only applicable to Non-3GPP access if "ATSSS" feature is supported. It is the umId described in subclause 5.6.2.12.

 nullable: true

 refCondData:

 type: string

 description: A reference to the condition data. It is the condId described in subclause 5.6.2.9.

 nullable: true

 refQosMon:

 type: array

 items:

 type: string

 minItems: 1

 maxItems: 1

 description: A reference to the QosMonitoringData policy decision type. It is the qmId described in subclause 5.6.2.40.

 nullable: true

 addrPreserInd:

 type: boolean

 nullable: true

 tscaiInputDl:

 $ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/TscaiInputContainer'

 tscaiInputUl:

 $ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/TscaiInputContainer'

 tscaiTimeDom:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uinteger'

 ddNotifCtrl:

 $ref: '#/components/schemas/DownlinkDataNotificationControl'

 ddNotifCtrl2:

 $ref: '#/components/schemas/DownlinkDataNotificationControlRm'

 disUeNotif:

 type: boolean

 nullable: true

 required:

 - pccRuleId

 nullable: true

 SessionRule:

 description: Contains session level policy information.

 type: object

 properties:

 authSessAmbr:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ambr'

 authDefQos:

 $ref: '#/components/schemas/AuthorizedDefaultQos'

 sessRuleId:

 type: string

 description: Univocally identifies the session rule within a PDU session.

 refUmData:

 type: string

 description: A reference to UsageMonitoringData policy decision type. It is the umId described in subclause 5.6.2.12.

 nullable: true

 refUmN3gData:

 type: string

 description: A reference to UsageMonitoringData policy decision type to apply for Non-3GPP access. It is the umId described in subclause 5.6.2.12.

 nullable: true

 refCondData:

 type: string

 description: A reference to the condition data. It is the condId described in subclause 5.6.2.9.

 nullable: true

 required:

 - sessRuleId

 nullable: true

 QosData:

 description: Contains the QoS parameters.

 type: object

 properties:

 qosId:

 type: string

 description: Univocally identifies the QoS control policy data within a PDU session.

 5qi:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/5Qi'

 maxbrUl:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRateRm'

 maxbrDl:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRateRm'

 gbrUl:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRateRm'

 gbrDl:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRateRm'

 arp:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Arp'

 qnc:

 type: boolean

 description: Indicates whether notifications are requested from 3GPP NG-RAN when the GFBR can no longer (or again) be guaranteed for a QoS Flow during the lifetime of the QoS Flow.

 priorityLevel:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/5QiPriorityLevelRm'

 averWindow:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/AverWindowRm'

 maxDataBurstVol:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/MaxDataBurstVolRm'

 reflectiveQos:

 type: boolean

 description: Indicates whether the QoS information is reflective for the corresponding service data flow.

 sharingKeyDl:

 type: string

 description: Indicates, by containing the same value, what PCC rules may share resource in downlink direction.

 sharingKeyUl:

 type: string

 description: Indicates, by containing the same value, what PCC rules may share resource in uplink direction.

 maxPacketLossRateDl:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/PacketLossRateRm'

 maxPacketLossRateUl:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/PacketLossRateRm'

 defQosFlowIndication:

 type: boolean

 description: Indicates that the dynamic PCC rule shall always have its binding with the QoS Flow associated with the default QoS rule

 extMaxDataBurstVol:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/ExtMaxDataBurstVolRm'

 packetDelayBudget:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/PacketDelBudget'

 packetErrorRate:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/PacketErrRate'

 required:

 - qosId

 nullable: true

 ConditionData:

 description: Contains conditions of applicability for a rule.

 type: object

 properties:

 condId:

 type: string

 description: Uniquely identifies the condition data within a PDU session.

 activationTime:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/DateTimeRm'

 deactivationTime:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/DateTimeRm'

 accessType:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/AccessType'

 ratType:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/RatType'

 required:

 - condId

 nullable: true

 TrafficControlData:

 description: Contains parameters determining how flows associated with a PCC Rule are treated (e.g. blocked, redirected, etc).

 type: object

 properties:

 tcId:

 type: string

 description: Univocally identifies the traffic control policy data within a PDU session.

 flowStatus:

 $ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/FlowStatus'

 redirectInfo:

 $ref: '#/components/schemas/RedirectInformation'

 addRedirectInfo:

 type: array

 items:

 $ref: '#/components/schemas/RedirectInformation'

 minItems: 1

 muteNotif:

 type: boolean

 description: Indicates whether applicat'on's start or stop notification is to be muted.

 trafficSteeringPolIdDl:

 type: string

 description: Reference to a pre-configured traffic steering policy for downlink traffic at the SMF.

 nullable: true

 trafficSteeringPolIdUl:

 type: string

 description: Reference to a pre-configured traffic steering policy for uplink traffic at the SMF.

 nullable: true

 routeToLocs:

 type: array

 items:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/RouteToLocation'

 minItems: 1

 description: A list of location which the traffic shall be routed to for the AF request

 nullable: true

 upLatReq:

 $ref: '#/components/schemas/UserPlaneLatencyRequirements'

 easIpReplaceInfos:

 type: array

 items:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/EasIpReplacementInfo'

 minItems: 1

 description: Contains EAS IP replacement information.

 nullable: true

 traffCorreInd:

 type: boolean

 upPathChgEvent:

 $ref: '#/components/schemas/UpPathChgEvent'

 steerFun:

 $ref: '#/components/schemas/SteeringFunctionality'

 steerModeDl:

 $ref: '#/components/schemas/SteeringMode'

 steerModeUl:

 $ref: '#/components/schemas/SteeringMode'

 mulAccCtrl:

 $ref: '#/components/schemas/MulticastAccessControl'

 required:

 - tcId

 nullable: true

 ChargingData:

 description: Contains charging related parameters.

 type: object

 properties:

 chgId:

 type: string

 description: Univocally identifies the charging control policy data within a PDU session.

 meteringMethod:

 $ref: '#/components/schemas/MeteringMethod'

 offline:

 type: boolean

 description: Indicates the offline charging is applicable to the PCC rule when it is included and set to true.

 online:

 type: boolean

 description: Indicates the online charging is applicable to the PCC rule when it is included and set to true.

 sdfHandl:

 type: boolean

 description: Indicates whether the service data flow is allowed to start while the SMF is waiting for the response to the credit request.

 ratingGroup:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/RatingGroup'

 reportingLevel:

 $ref: '#/components/schemas/ReportingLevel'

 serviceId:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/ServiceId'

 sponsorId:

 type: string

 description: Indicates the sponsor identity.

 appSvcProvId:

 type: string

 description: Indicates the application service provider identity.

 afChargingIdentifier:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/ChargingId'

 afChargId:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/ApplicationChargingId'

 required:

 - chgId

 nullable: true

 UsageMonitoringData:

 description: Contains usage monitoring related control information.

 type: object

 properties:

 umId:

 type: string

 description: Univocally identifies the usage monitoring policy data within a PDU session.

 volumeThreshold:

 $ref: 'TS29122\_CommonData.yaml#/components/schemas/VolumeRm'

 volumeThresholdUplink:

 $ref: 'TS29122\_CommonData.yaml#/components/schemas/VolumeRm'

 volumeThresholdDownlink:

 $ref: 'TS29122\_CommonData.yaml#/components/schemas/VolumeRm'

 timeThreshold:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/DurationSecRm'

 monitoringTime:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/DateTimeRm'

 nextVolThreshold:

 $ref: 'TS29122\_CommonData.yaml#/components/schemas/VolumeRm'

 nextVolThresholdUplink:

 $ref: 'TS29122\_CommonData.yaml#/components/schemas/VolumeRm'

 nextVolThresholdDownlink:

 $ref: 'TS29122\_CommonData.yaml#/components/schemas/VolumeRm'

 nextTimeThreshold:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/DurationSecRm'

 inactivityTime:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/DurationSecRm'

 exUsagePccRuleIds:

 type: array

 items:

 type: string

 minItems: 1

 description: Contains the PCC rule identifier(s) which corresponding service data flow(s) shall be excluded from PDU Session usage monitoring. It is only included in the UsageMonitoringData instance for session level usage monitoring.

 nullable: true

 required:

 - umId

 nullable: true

 RedirectInformation:

 description: Contains the redirect information.

 type: object

 properties:

 redirectEnabled:

 type: boolean

 description: Indicates the redirect is enable.

 redirectAddressType:

 $ref: '#/components/schemas/RedirectAddressType'

 redirectServerAddress:

 type: string

 description: Indicates the address of the redirect server. If "redirectAddressType" attribute indicates the IPV4\_ADDR, the encoding is the same as the Ipv4Addr data type defined in 3GPP TS 29.571.If "redirectAddressType" attribute indicates the IPV6\_ADDR, the encoding is the same as the Ipv6Addr data type defined in 3GPP TS 29.571.If "redirectAddressType" attribute indicates the URL or SIP\_URI, the encoding is the same as the Uri data type defined in 3GPP TS 29.571.

 FlowInformation:

 description: Contains the flow information.

 type: object

 properties:

 flowDescription:

 $ref: '#/components/schemas/FlowDescription'

 ethFlowDescription:

 $ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/EthFlowDescription'

 packFiltId:

 type: string

 description: An identifier of packet filter.

 packetFilterUsage:

 type: boolean

 description: The packet shall be sent to the UE.

 tosTrafficClass:

 type: string

 description: Contains the Ipv4 Type-of-Service and mask field or the Ipv6 Traffic-Class field and mask field.

 nullable: true

 spi:

 type: string

 description: the security parameter index of the IPSec packet.

 nullable: true

 flowLabel:

 type: string

 description: the Ipv6 flow label header field.

 nullable: true

 flowDirection:

 $ref: '#/components/schemas/FlowDirectionRm'

 SmPolicyDeleteData:

 description: Contains the parameters to be sent to the PCF when an individual SM policy is deleted.

 type: object

 properties:

 userLocationInfo:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/UserLocation'

 ueTimeZone:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/TimeZone'

 servingNetwork:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/PlmnIdNid'

 userLocationInfoTime:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/DateTime'

 ranNasRelCauses:

 type: array

 items:

 $ref: '#/components/schemas/RanNasRelCause'

 minItems: 1

 description: Contains the RAN and/or NAS release cause.

 accuUsageReports:

 type: array

 items:

 $ref: '#/components/schemas/AccuUsageReport'

 minItems: 1

 description: Contains the usage report

 pduSessRelCause:

 $ref: '#/components/schemas/PduSessionRelCause'

 qosMonReports:

 type: array

 items:

 $ref: '#/components/schemas/QosMonitoringReport'

 minItems: 1

 QosCharacteristics:

 description: Contains QoS characteristics for a non-standardized or a non-configured 5QI.

 type: object

 properties:

 5qi:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/5Qi'

 resourceType:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/QosResourceType'

 priorityLevel:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/5QiPriorityLevel'

 packetDelayBudget:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/PacketDelBudget'

 packetErrorRate:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/PacketErrRate'

 averagingWindow:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/AverWindow'

 maxDataBurstVol:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/MaxDataBurstVol'

 extMaxDataBurstVol:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/ExtMaxDataBurstVol'

 required:

 - 5qi

 - resourceType

 - priorityLevel

 - packetDelayBudget

 - packetErrorRate

 ChargingInformation:

 description: Contains the addresses of the charging functions.

 type: object

 properties:

 primaryChfAddress:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'

 secondaryChfAddress:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'

 primaryChfSetId:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/NfSetId'

 primaryChfInstanceId:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/NfInstanceId'

 secondaryChfSetId:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/NfSetId'

 secondaryChfInstanceId:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/NfInstanceId'

 required:

 - primaryChfAddress

 AccuUsageReport:

 description: Contains the accumulated usage report information.

 type: object

 properties:

 refUmIds:

 type: string

 description: An id referencing UsageMonitoringData objects associated with this usage report.

 volUsage:

 $ref: 'TS29122\_CommonData.yaml#/components/schemas/Volume'

 volUsageUplink:

 $ref: 'TS29122\_CommonData.yaml#/components/schemas/Volume'

 volUsageDownlink:

 $ref: 'TS29122\_CommonData.yaml#/components/schemas/Volume'

 timeUsage:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/DurationSec'

 nextVolUsage:

 $ref: 'TS29122\_CommonData.yaml#/components/schemas/Volume'

 nextVolUsageUplink:

 $ref: 'TS29122\_CommonData.yaml#/components/schemas/Volume'

 nextVolUsageDownlink:

 $ref: 'TS29122\_CommonData.yaml#/components/schemas/Volume'

 nextTimeUsage:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/DurationSec'

 required:

 - refUmIds

 SmPolicyUpdateContextData:

 description: Contains the policy control request trigger(s) that were met and the corresponding new value(s) or the error report of the policy enforcement.

 type: object

 properties:

 repPolicyCtrlReqTriggers:

 type: array

 items:

 $ref: '#/components/schemas/PolicyControlRequestTrigger'

 minItems: 1

 description: The policy control reqeust trigges which are met.

 accNetChIds:

 type: array

 items:

 $ref: '#/components/schemas/AccNetChId'

 minItems: 1

 description: Indicates the access network charging identifier for the PCC rule(s) or whole PDU session.

 accessType:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/AccessType'

 ratType:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/RatType'

 addAccessInfo:

 $ref: '#/components/schemas/AdditionalAccessInfo'

 relAccessInfo:

 $ref: '#/components/schemas/AdditionalAccessInfo'

 servingNetwork:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/PlmnIdNid'

 userLocationInfo:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/UserLocation'

 ueTimeZone:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/TimeZone'

 relIpv4Address:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv4Addr'

 ipv4Address:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv4Addr'

 ipDomain:

 type: string

 description: Indicates the IPv4 address domain

 ipv6AddressPrefix:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv6Prefix'

 relIpv6AddressPrefix:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv6Prefix'

 addIpv6AddrPrefixes:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv6Prefix'

 addRelIpv6AddrPrefixes:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv6Prefix'

 relUeMac:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/MacAddr48'

 ueMac:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/MacAddr48'

 subsSessAmbr:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ambr'

 authProfIndex:

 type: string

 description: Indicates the DN-AAA authorization profile index

 subsDefQos:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/SubscribedDefaultQos'

 vplmnQos:

 $ref: 'TS29502\_Nsmf\_PDUSession.yaml#/components/schemas/VplmnQos'

 numOfPackFilter:

 type: integer

 description: Contains the number of supported packet filter for signalled QoS rules.

 accuUsageReports:

 type: array

 items:

 $ref: '#/components/schemas/AccuUsageReport'

 minItems: 1

 description: Contains the usage report

 3gppPsDataOffStatus:

 type: boolean

 description: If it is included and set to true, the 3GPP PS Data Off is activated by the UE.

 appDetectionInfos:

 type: array

 items:

 $ref: '#/components/schemas/AppDetectionInfo'

 minItems: 1

 description: Report the start/stop of the application traffic and detected SDF descriptions if applicable.

 ruleReports:

 type: array

 items:

 $ref: '#/components/schemas/RuleReport'

 minItems: 1

 description: Used to report the PCC rule failure.

 sessRuleReports:

 type: array

 items:

 $ref: '#/components/schemas/SessionRuleReport'

 minItems: 1

 description: Used to report the session rule failure.

 qncReports:

 type: array

 items:

 $ref: '#/components/schemas/QosNotificationControlInfo'

 minItems: 1

 description: QoS Notification Control information.

 qosMonReports:

 type: array

 items:

 $ref: '#/components/schemas/QosMonitoringReport'

 minItems: 1

 userLocationInfoTime:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/DateTime'

 repPraInfos:

 type: object

 additionalProperties:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/PresenceInfo'

 minProperties: 1

 description: Reports the changes of presence reporting area. The praId attribute within the PresenceInfo data type is the key of the map.

 ueInitResReq:

 $ref: '#/components/schemas/UeInitiatedResourceRequest'

 refQosIndication:

 type: boolean

 description: If it is included and set to true, the reflective QoS is supported by the UE. If it is included and set to false, the reflective QoS is revoked by the UE.

 qosFlowUsage:

 $ref: '#/components/schemas/QosFlowUsage'

 creditManageStatus:

 $ref: '#/components/schemas/CreditManagementStatus'

 servNfId:

 $ref: '#/components/schemas/ServingNfIdentity'

 traceReq:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/TraceData'

 maPduInd:

 $ref: '#/components/schemas/MaPduIndication'

 atsssCapab:

 $ref: '#/components/schemas/AtsssCapability'

 tsnBridgeInfo:

 $ref: '#/components/schemas/TsnBridgeInfo'

 tsnBridgeManCont:

 $ref: '#/components/schemas/BridgeManagementContainer'

 tsnPortManContDstt:

 $ref: '#/components/schemas/PortManagementContainer'

 tsnPortManContNwtts:

 type: array

 items:

 $ref: '#/components/schemas/PortManagementContainer'

 minItems: 1

 mulAddrInfos:

 type: array

 items:

 $ref: '#/components/schemas/IpMulticastAddressInfo'

 minItems: 1

 policyDecFailureReports:

 type: array

 items:

 $ref: '#/components/schemas/PolicyDecisionFailureCode'

 minItems: 1

 description: Contains the type(s) of failed policy decision and/or condition data.

 invalidPolicyDecs:

 type: array

 items:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/InvalidParam'

 minItems: 1

 description: Indicates the invalid parameters for the reported type(s) of the failed policy decision and/or condition data.

 trafficDescriptors:

 type: array

 items:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/DddTrafficDescriptor'

 minItems: 1

 pccRuleId:

 type: string

 description: Contains the identifier of the PCC rule which is used for traffic detection of event.

 typesOfNotif:

 type: array

 items:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/DlDataDeliveryStatus'

 minItems: 1

 interGrpIds:

 type: array

 items:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/GroupId'

 minItems: 1

 UpPathChgEvent:

 description: Contains the UP path change event subscription from the AF.

 type: object

 properties:

 notificationUri:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'

 notifCorreId:

 type: string

 description: It is used to set the value of Notification Correlation ID in the notification sent by the SMF.

 dnaiChgType:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/DnaiChangeType'

 afAckInd:

 type: boolean

 required:

 - notificationUri

 - notifCorreId

 - dnaiChgType

 nullable: true

 TerminationNotification:

 description: Represents a Termination Notification.

 type: object

 properties:

 resourceUri:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'

 cause:

 $ref: '#/components/schemas/SmPolicyAssociationReleaseCause'

 required:

 - resourceUri

 - cause

 AppDetectionInfo:

 description: Contains the detected application's traffic information.

 type: object

 properties:

 appId:

 type: string

 description: A reference to the application detection filter configured at the UPF

 instanceId:

 type: string

 description: Identifier sent by the SMF in order to allow correlation of application Start and Stop events to the specific service data flow description, if service data flow descriptions are deducible.

 sdfDescriptions:

 type: array

 items:

 $ref: '#/components/schemas/FlowInformation'

 minItems: 1

 description: Contains the detected service data flow descriptions if they are deducible.

 required:

 - appId

 AccNetChId:

 description: Contains the access network charging identifier for the PCC rule(s) or for the whole PDU session.

 type: object

 properties:

 accNetChaIdValue:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/ChargingId'

 refPccRuleIds:

 type: array

 items:

 type: string

 minItems: 1

 description: Contains the identifier of the PCC rule(s) associated to the provided Access Network Charging Identifier.

 sessionChScope:

 type: boolean

 description: When it is included and set to true, indicates the Access Network Charging Identifier applies to the whole PDU Session

 required:

 - accNetChaIdValue

 AccNetChargingAddress:

 description: Describes the network entity within the access network performing charging

 type: object

 anyOf:

 - required: [anChargIpv4Addr]

 - required: [anChargIpv6Addr]

 properties:

 anChargIpv4Addr:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv4Addr'

 anChargIpv6Addr:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv6Addr'

 RequestedRuleData:

 description: Contains rule data requested by the PCF to receive information associated with PCC rule(s).

 type: object

 properties:

 refPccRuleIds:

 type: array

 items:

 type: string

 minItems: 1

 description: An array of PCC rule id references to the PCC rules associated with the control data.

 reqData:

 type: array

 items:

 $ref: '#/components/schemas/RequestedRuleDataType'

 minItems: 1

 description: Array of requested rule data type elements indicating what type of rule data is requested for the corresponding referenced PCC rules.

 required:

 - refPccRuleIds

 - reqData

 RequestedUsageData:

 description: Contains usage data requested by the PCF requesting usage reports for the corresponding usage monitoring data instances.

 type: object

 properties:

 refUmIds:

 type: array

 items:

 type: string

 minItems: 1

 description: An array of usage monitoring data id references to the usage monitoring data instances for which the PCF is requesting a usage report. This attribute shall only be provided when allUmIds is not set to true.

 allUmIds:

 type: boolean

 description: This boolean indicates whether requested usage data applies to all usage monitoring data instances. When it's not included, it means requested usage data shall only apply to the usage monitoring data instances referenced by the refUmIds attribute.

 UeCampingRep:

 description: Contains the current applicable values corresponding to the policy control request triggers.

 type: object

 properties:

 accessType:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/AccessType'

 ratType:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/RatType'

 servNfId:

 $ref: '#/components/schemas/ServingNfIdentity'

 servingNetwork:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/PlmnIdNid'

 userLocationInfo:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/UserLocation'

 ueTimeZone:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/TimeZone'

 netLocAccSupp:

 $ref: '#/components/schemas/NetLocAccessSupport'

 RuleReport:

 description: Reports the status of PCC.

 type: object

 properties:

 pccRuleIds:

 type: array

 items:

 type: string

 minItems: 1

 description: Contains the identifier of the affected PCC rule(s).

 ruleStatus:

 $ref: '#/components/schemas/RuleStatus'

 contVers:

 type: array

 items:

 $ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/ContentVersion'

 minItems: 1

 description: Indicates the version of a PCC rule.

 failureCode:

 $ref: '#/components/schemas/FailureCode'

 finUnitAct:

 $ref: 'TS32291\_Nchf\_ConvergedCharging.yaml#/components/schemas/FinalUnitAction'

 ranNasRelCauses:

 type: array

 items:

 $ref: '#/components/schemas/RanNasRelCause'

 minItems: 1

 description: indicates the RAN or NAS release cause code information.

 altQosParamId:

 type: string

 required:

 - pccRuleIds

 - ruleStatus

 RanNasRelCause:

 description: Contains the RAN/NAS release cause.

 type: object

 properties:

 ngApCause:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/NgApCause'

 5gMmCause:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/5GMmCause'

 5gSmCause:

 $ref: '#/components/schemas/5GSmCause'

 epsCause:

 $ref: '#/components/schemas/EpsRanNasRelCause'

 UeInitiatedResourceRequest:

 description: Indicates that a UE requests specific QoS handling for the selected SDF.

 type: object

 properties:

 pccRuleId:

 type: string

 ruleOp:

 $ref: '#/components/schemas/RuleOperation'

 precedence:

 type: integer

 packFiltInfo:

 type: array

 items:

 $ref: '#/components/schemas/PacketFilterInfo'

 minItems: 1

 reqQos:

 $ref: '#/components/schemas/RequestedQos'

 required:

 - ruleOp

 - packFiltInfo

 PacketFilterInfo:

 description: Contains the information from a single packet filter sent from the SMF to the PCF.

 type: object

 properties:

 packFiltId:

 type: string

 description: An identifier of packet filter.

 packFiltCont:

 $ref: '#/components/schemas/PacketFilterContent'

 tosTrafficClass:

 type: string

 description: Contains the Ipv4 Type-of-Service and mask field or the Ipv6 Traffic-Class field and mask field.

 spi:

 type: string

 description: The security parameter index of the IPSec packet.

 flowLabel:

 type: string

 description: The Ipv6 flow label header field.

 flowDirection:

 $ref: '#/components/schemas/FlowDirection'

 RequestedQos:

 description: Contains the QoS information requested by the UE.

 type: object

 properties:

 5qi:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/5Qi'

 gbrUl:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'

 gbrDl:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'

 required:

 - 5qi

 QosNotificationControlInfo:

 description: Contains the QoS Notification Control Information.

 type: object

 properties:

 refPccRuleIds:

 type: array

 items:

 type: string

 minItems: 1

 description: An array of PCC rule id references to the PCC rules associated with the QoS notification control info.

 notifType:

 $ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/QosNotifType'

 contVer:

 $ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/ContentVersion'

 altQosParamId:

 type: string

 required:

 - refPccRuleIds

 - notifType

 PartialSuccessReport:

 description: Includes the information reported by the SMF when some of the PCC rules and/or session rules are not successfully installed/activated.

 type: object

 properties:

 failureCause:

 $ref: '#/components/schemas/FailureCause'

 ruleReports:

 type: array

 items:

 $ref: '#/components/schemas/RuleReport'

 minItems: 1

 description: Information about the PCC rules provisioned by the PCF not successfully installed/activated.

 sessRuleReports:

 type: array

 items:

 $ref: '#/components/schemas/SessionRuleReport'

 minItems: 1

 description: Information about the session rules provisioned by the PCF not successfully installed.

 ueCampingRep:

 $ref: '#/components/schemas/UeCampingRep'

 policyDecFailureReports:

 type: array

 items:

 $ref: '#/components/schemas/PolicyDecisionFailureCode'

 minItems: 1

 description: Contains the type(s) of failed policy decision and/or condition data.

 invalidPolicyDecs:

 type: array

 items:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/InvalidParam'

 minItems: 1

 description: Indicates the invalid parameters for the reported type(s) of the failed policy decision and/or condition data.

 required:

 - failureCause

 AuthorizedDefaultQos:

 description: Represents the Authorized Default QoS.

 type: object

 properties:

 5qi:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/5Qi'

 arp:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Arp'

 priorityLevel:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/5QiPriorityLevelRm'

 averWindow:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/AverWindowRm'

 maxDataBurstVol:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/MaxDataBurstVolRm'

 maxbrUl:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRateRm'

 maxbrDl:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRateRm'

 gbrUl:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRateRm'

 gbrDl:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRateRm'

 extMaxDataBurstVol:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/ExtMaxDataBurstVolRm'

 ErrorReport:

 description: Contains the rule error reports.

 type: object

 properties:

 error:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/ProblemDetails'

 ruleReports:

 type: array

 items:

 $ref: '#/components/schemas/RuleReport'

 minItems: 1

 description: Used to report the PCC rule failure.

 sessRuleReports:

 type: array

 items:

 $ref: '#/components/schemas/SessionRuleReport'

 minItems: 1

 description: Used to report the session rule failure.

 polDecFailureReports:

 type: array

 items:

 $ref: '#/components/schemas/PolicyDecisionFailureCode'

 minItems: 1

 description: Used to report failure of the policy decision and/or condition data.

 invalidPolicyDecs:

 type: array

 items:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/InvalidParam'

 minItems: 1

 description: Indicates the invalid parameters for the reported type(s) of the failed policy decision and/or condition data.

 SessionRuleReport:

 description: Represents reporting of the status of a session rule.

 type: object

 properties:

 ruleIds:

 type: array

 items:

 type: string

 minItems: 1

 description: Contains the identifier of the affected session rule(s).

 ruleStatus:

 $ref: '#/components/schemas/RuleStatus'

 sessRuleFailureCode:

 $ref: '#/components/schemas/SessionRuleFailureCode'

 policyDecFailureReports:

 type: array

 items:

 $ref: '#/components/schemas/PolicyDecisionFailureCode'

 minItems: 1

 description: Contains the type(s) of failed policy decision and/or condition data.

 required:

 - ruleIds

 - ruleStatus

 ServingNfIdentity:

 description: Contains the serving Network Function identity.

 type: object

 properties:

 servNfInstId:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/NfInstanceId'

 guami:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Guami'

 anGwAddr:

 $ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/AnGwAddress'

 sgsnAddr:

 $ref: '#/components/schemas/SgsnAddress'

 SteeringMode:

 description: Contains the steering mode value and parameters determined by the PCF.

 type: object

 properties:

 steerModeValue:

 $ref: '#/components/schemas/SteerModeValue'

 active:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/AccessType'

 standby:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/AccessTypeRm'

 3gLoad:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uinteger'

 prioAcc:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/AccessType'

 thresValue:

 $ref: '#/components/schemas/ThresholdValue'

 steerModeInd:

 $ref: '#/components/schemas/SteerModeIndicator'

 required:

 - steerModeValue

 AdditionalAccessInfo:

 description: Indicates the combination of additional Access Type and RAT Type for a MA PDU session.

 type: object

 properties:

 accessType:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/AccessType'

 ratType:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/RatType'

 required:

 - accessType

 QosMonitoringData:

 description: Contains QoS monitoring related control information.

 type: object

 properties:

 qmId:

 type: string

 description: Univocally identifies the QoS monitoring policy data within a PDU session.

 reqQosMonParams:

 type: array

 items:

 $ref: '#/components/schemas/RequestedQosMonitoringParameter'

 minItems: 1

 description: indicates the UL packet delay, DL packet delay and/or round trip packet delay between the UE and the UPF is to be monitored when the QoS Monitoring for URLLC is enabled for the service data flow.

 repFreqs:

 type: array

 items:

 $ref: '#/components/schemas/ReportingFrequency'

 minItems: 1

 repThreshDl:

 type: integer

 description: Indicates the period of time in units of miliiseconds for DL packet delay.

 nullable: true

 repThreshUl:

 type: integer

 description: Indicates the period of time in units of miliiseconds for UL packet delay.

 nullable: true

 repThreshRp:

 type: integer

 description: Indicates the period of time in units of miliiseconds for round trip packet delay.

 nullable: true

 waitTime:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/DurationSecRm'

 repPeriod:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/DurationSecRm'

 notifyUri:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/UriRm'

 notifyCorreId:

 type: string

 nullable: true

 directNotifInd:

 type: boolean

 description: Indicates that the direct event notification sent by UPF to the Local NEF or AF is requested if it is included and set to true.

 required:

 - qmId

 - reqQosMonParams

 - repFreqs

 nullable: true

 QosMonitoringReport:

 description: Contains reporting information on QoS monitoring.

 type: object

 properties:

 refPccRuleIds:

 type: array

 items:

 type: string

 minItems: 1

 description: An array of PCC rule id references to the PCC rules associated with the QoS monitoring report.

 ulDelays:

 type: array

 items:

 type: integer

 minItems: 1

 dlDelays:

 type: array

 items:

 type: integer

 minItems: 1

 rtDelays:

 type: array

 items:

 type: integer

 minItems: 1

 required:

 - refPccRuleIds

#

 TsnBridgeInfo:

 description: Contains parameters that describe and identify the TSC user plane node.

 type: object

 properties:

 bridgeId:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint64'

 dsttAddr:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/MacAddr48'

 dsttIpv4Addr:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv4Addr'

 dsttIpv6Addr:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv6Addr'

 dsttPortNum:

 $ref: '#/components/schemas/TsnPortNumber'

 dsttResidTime:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uinteger'

#

 PortManagementContainer:

 description: Contains the port management information container for a port.

 type: object

 properties:

 portManCont:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Bytes'

 portNum:

 $ref: '#/components/schemas/TsnPortNumber'

 required:

 - portManCont

 - portNum

 BridgeManagementContainer:

 description: Contains the UMIC.

 type: object

 properties:

 bridgeManCont:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Bytes'

 required:

 - bridgeManCont

 IpMulticastAddressInfo:

 description: Contains the IP multicast addressing information.

 type: object

 properties:

 srcIpv4Addr:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv4Addr'

 ipv4MulAddr:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv4Addr'

 srcIpv6Addr:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv6Addr'

 ipv6MulAddr:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv6Addr'

 DownlinkDataNotificationControl:

 description: Contains the downlink data notification control information.

 type: object

 properties:

 notifCtrlInds:

 type: array

 items:

 $ref: '#/components/schemas/NotificationControlIndication'

 minItems: 1

 typesOfNotif:

 type: array

 items:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/DlDataDeliveryStatus'

 minItems: 1

 DownlinkDataNotificationControlRm:

 description: This data type is defined in the same way as the DownlinkDataNotificationControl data type, but with the nullable:true property.

 type: object

 properties:

 notifCtrlInds:

 type: array

 items:

 $ref: '#/components/schemas/NotificationControlIndication'

 minItems: 1

 nullable: true

 typesOfNotif:

 type: array

 items:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/DlDataDeliveryStatus'

 minItems: 1

 nullable: true

 nullable: true

 UserPlaneLatencyRequirements:

 description: Contains the user plane latency requirements.

 type: object

 properties:

 maxAllowedUpLat:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/DurationSecRm'

 upLatPrefer:

 type: integer

 nullable: true

 nullable: true

 ThresholdValue:

 description: Indicates the threshold value(s) for RTT and/or Packet Loss Rate.

 type: object

 properties:

 rttThres:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/UintegerRm'

 plrThres:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/PacketLossRateRm'

 nullable: true

 5GSmCause:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uinteger'

 EpsRanNasRelCause:

 type: string

 description: Defines the EPS RAN/NAS release cause.

 PacketFilterContent:

 type: string

 description: Defines a packet filter for an IP flow.

 FlowDescription:

 type: string

 description: Defines a packet filter for an IP flow.

 TsnPortNumber:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uinteger'

 ApplicationDescriptor:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Bytes'

 FlowDirection:

 anyOf:

 - type: string

 enum:

 - DOWNLINK

 - UPLINK

 - BIDIRECTIONAL

 - UNSPECIFIED

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

 - DOWNLINK: The corresponding filter applies for traffic to the UE.

 - UPLINK: The corresponding filter applies for traffic from the UE.

 - BIDIRECTIONAL: The corresponding filter applies for traffic both to and from the UE.

 - UNSPECIFIED: The corresponding filter applies for traffic to the UE (downlink), but has no specific direction declared. The service data flow detection shall apply the filter for uplink traffic as if the filter was bidirectional. The PCF shall not use the value UNSPECIFIED in filters created by the network in NW-initiated procedures. The PCF shall only include the value UNSPECIFIED in filters in UE-initiated procedures if the same value is received from the SMF.

 FlowDirectionRm:

 description: This data type is defined in the same way as the "FlowDirection" data type, with the only difference that it allows null value.

 anyOf:

 - $ref: '#/components/schemas/FlowDirection'

 - $ref: 'TS29571\_CommonData.yaml#/components/schemas/NullValue'

 ReportingLevel:

 anyOf:

 - type: string

 enum:

 - SER\_ID\_LEVEL

 - RAT\_GR\_LEVEL

 - SPON\_CON\_LEVEL

 - $ref: 'TS29571\_CommonData.yaml#/components/schemas/NullValue'

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

 - SER\_ID\_LEVEL: Indicates that the usage shall be reported on service id and rating group combination level.

 - RAT\_GR\_LEVEL: Indicates that the usage shall be reported on rating group level.

 - SPON\_CON\_LEVEL: Indicates that the usage shall be reported on sponsor identity and rating group combination level.

 MeteringMethod:

 anyOf:

 - type: string

 enum:

 - DURATION

 - VOLUME

 - DURATION\_VOLUME

 - EVENT

 - $ref: 'TS29571\_CommonData.yaml#/components/schemas/NullValue'

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

 - DURATION: Indicates that the duration of the service data flow traffic shall be metered.

 - VOLUME: Indicates that volume of the service data flow traffic shall be metered.

 - DURATION\_VOLUME: Indicates that the duration and the volume of the service data flow traffic shall be metered.

 - EVENT: Indicates that events of the service data flow traffic shall be metered.

 PolicyControlRequestTrigger:

 anyOf:

 - type: string

 enum:

 - PLMN\_CH

 - RES\_MO\_RE

 - AC\_TY\_CH

 - UE\_IP\_CH

 - UE\_MAC\_CH

 - AN\_CH\_COR

 - US\_RE

 - APP\_STA

 - APP\_STO

 - AN\_INFO

 - CM\_SES\_FAIL

 - PS\_DA\_OFF

 - DEF\_QOS\_CH

 - SE\_AMBR\_CH

 - QOS\_NOTIF

 - NO\_CREDIT

 - REALLO\_OF\_CREDIT

 - PRA\_CH

 - SAREA\_CH

 - SCNN\_CH

 - RE\_TIMEOUT

 - RES\_RELEASE

 - SUCC\_RES\_ALLO

 - RAI\_CH

 - RAT\_TY\_CH

 - REF\_QOS\_IND\_CH

 - NUM\_OF\_PACKET\_FILTER

 - UE\_STATUS\_RESUME

 - UE\_TZ\_CH

 - AUTH\_PROF\_CH

 - QOS\_MONITORING

 - SCELL\_CH

 - USER\_LOCATION\_CH

 - EPS\_FALLBACK

 - MA\_PDU

 - TSN\_BRIDGE\_INFO

 - 5G\_RG\_JOIN

 - 5G\_RG\_LEAVE

 - DDN\_FAILURE

 - DDN\_DELIVERY\_STATUS

 - GROUP\_ID\_LIST\_CHG

 - DDN\_FAILURE\_CANCELLATION

 - DDN\_DELIVERY\_STATUS\_CANCELLATION

 - VPLMN\_QOS\_CH

 - SUCC\_QOS\_UPDATE

 - SAT\_CATEGORY\_CHG

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

 - PLMN\_CH: PLMN Change

 - RES\_MO\_RE: A request for resource modification has been received by the SMF. The SMF always reports to the PCF.

 - AC\_TY\_CH: Access Type Change

 - UE\_IP\_CH: UE IP address change. The SMF always reports to the PCF.

 - UE\_MAC\_CH: A new UE MAC address is detected or a used UE MAC address is inactive for a specific period

 - AN\_CH\_COR: Access Network Charging Correlation Information

 - US\_RE: The PDU Session or the Monitoring key specific resources consumed by a UE either reached the threshold or needs to be reported for other reasons.

 - APP\_STA: The start of application traffic has been detected.

 - APP\_STO: The stop of application traffic has been detected.

 - AN\_INFO: Access Network Information report

 - CM\_SES\_FAIL: Credit management session failure

 - PS\_DA\_OFF: The SMF reports when the 3GPP PS Data Off status changes. The SMF always reports to the PCF.

 - DEF\_QOS\_CH: Default QoS Change. The SMF always reports to the PCF.

 - SE\_AMBR\_CH: Session AMBR Change. The SMF always reports to the PCF.

 - QOS\_NOTIF: The SMF notify the PCF when receiving notification from RAN that QoS targets of the QoS Flow cannot be guranteed or gurateed again.

 - NO\_CREDIT: Out of credit

 - REALLO\_OF\_CREDIT: Reallocation of credit

 - PRA\_CH: Change of UE presence in Presence Reporting Area

 - SAREA\_CH: Location Change with respect to the Serving Area

 - SCNN\_CH: Location Change with respect to the Serving CN node

 - RE\_TIMEOUT: Indicates the SMF generated the request because there has been a PCC revalidation timeout

 - RES\_RELEASE: Indicate that the SMF can inform the PCF of the outcome of the release of resources for those rules that require so.

 - SUCC\_RES\_ALLO: Indicates that the requested rule data is the successful resource allocation.

 - RAI\_CH: Location Change with respect to the RAI of GERAN and UTRAN.

 - RAT\_TY\_CH: RAT Type Change.

 - REF\_QOS\_IND\_CH: Reflective QoS indication Change

 - NUM\_OF\_PACKET\_FILTER: Indicates that the SMF shall report the number of supported packet filter for signalled QoS rules

 - UE\_STATUS\_RESUME: Indicates that the UE’s status is resumed.

 - UE\_TZ\_CH: UE Time Zone Change

 - AUTH\_PROF\_CH: The DN-AAA authorization profile index has changed

 - QOS\_MONITORING: Indicate that the SMF notifies the PCF of the QoS Monitoring information.

 - SCELL\_CH: Location Change with respect to the Serving Cell.

 - USER\_LOCATION\_CH: Indicate that user location has been changed, applicable to serving area change and serving cell change.

 - EPS\_FALLBACK: EPS Fallback report is enabled in the SMF.

 - MA\_PDU: UE Indicates that the SMF notifies the PCF of the MA PDU session request

 - TSN\_BRIDGE\_INFO: TSC user plane node information available

 - 5G\_RG\_JOIN: The 5G-RG has joined to an IP Multicast Group.

 - 5G\_RG\_LEAVE: The 5G-RG has left an IP Multicast Group.

 - DDN\_FAILURE: Event subscription for DDN Failure event received.

 - DDN\_DELIVERY\_STATUS: Event subscription for DDN Delivery Status received.

 - GROUP\_ID\_LIST\_CHG: UE Internal Group Identifier(s) has changed: the SMF reports that UDM provided list of group Ids has changed.

 - DDN\_FAILURE\_CANCELLATION: The event subscription for DDN Failure event is cancelled.

 - DDN\_DELIVERY\_STATUS\_CANCELLATION: The event subscription for DDD STATUS is cancelled.

 - VPLMN\_QOS\_CH: Change of the QoS supported in the VPLMN.

 - SUCC\_QOS\_UPDATE: Indicates that the requested MPS Action is successful.

 - SAT\_CATEGORY\_CHG: Indicates that the SMF has detected a change between different satellite backhaul categories, or between a satellite backhaul and a non-satellite backhaul.

 RequestedRuleDataType:

 anyOf:

 - type: string

 enum:

 - CH\_ID

 - MS\_TIME\_ZONE

 - USER\_LOC\_INFO

 - RES\_RELEASE

 - SUCC\_RES\_ALLO

 - EPS\_FALLBACK

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

 - CH\_ID: Indicates that the requested rule data is the charging identifier.

 - MS\_TIME\_ZONE: Indicates that the requested access network info type is the UE's timezone.

 - USER\_LOC\_INFO: Indicates that the requested access network info type is the UE's location.

 - RES\_RELEASE: Indicates that the requested rule data is the result of the release of resource.

 - SUCC\_RES\_ALLO: Indicates that the requested rule data is the successful resource allocation.

 - EPS\_FALLBACK: Indicates that the requested rule data is the report of QoS flow rejection due to EPS fallback.

 RuleStatus:

 anyOf:

 - type: string

 enum:

 - ACTIVE

 - INACTIVE

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

 - ACTIVE: Indicates that the PCC rule(s) are successfully installed (for those provisioned from PCF) or activated (for those pre-defined in SMF), or the session rule(s) are successfully installed

 - INACTIVE: Indicates that the PCC rule(s) are removed (for those provisioned from PCF) or inactive (for those pre-defined in SMF) or the session rule(s) are removed.

 FailureCode:

 anyOf:

 - type: string

 enum:

 - UNK\_RULE\_ID

 - RA\_GR\_ERR

 - SER\_ID\_ERR

 - NF\_MAL

 - RES\_LIM

 - MAX\_NR\_QoS\_FLOW

 - MISS\_FLOW\_INFO

 - RES\_ALLO\_FAIL

 - UNSUCC\_QOS\_VAL

 - INCOR\_FLOW\_INFO

 - PS\_TO\_CS\_HAN

 - APP\_ID\_ERR

 - NO\_QOS\_FLOW\_BOUND

 - FILTER\_RES

 - MISS\_REDI\_SER\_ADDR

 - CM\_END\_USER\_SER\_DENIED

 - CM\_CREDIT\_CON\_NOT\_APP

 - CM\_AUTH\_REJ

 - CM\_USER\_UNK

 - CM\_RAT\_FAILED

 - UE\_STA\_SUSP

 - UNKNOWN\_REF\_ID

 - INCORRECT\_COND\_DATA

 - REF\_ID\_COLLISION

 - TRAFFIC\_STEERING\_ERROR

 - DNAI\_STEERING\_ERROR

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

 - UNK\_RULE\_ID: Indicates that the pre-provisioned PCC rule could not be successfully activated because the PCC rule identifier is unknown to the SMF.

 - RA\_GR\_ERR: Indicate that the PCC rule could not be successfully installed or enforced because the Rating Group specified within the Charging Data policy decision which the PCC rule refers to is unknown or, invalid.

 - SER\_ID\_ERR: Indicate that the PCC rule could not be successfully installed or enforced because the Service Identifier specified within the Charging Data policy decision which the PCC rule refers to is invalid, unknown, or not applicable to the service being charged.

 - NF\_MAL: Indicate that the PCC rule could not be successfully installed (for those provisioned from the PCF) or activated (for those pre-defined in SMF) or enforced (for those already successfully installed) due to SMF/UPF malfunction.

 - RES\_LIM: Indicate that the PCC rule could not be successfully installed (for those provisioned from PCF) or activated (for those pre-defined in SMF) or enforced (for those already successfully installed) due to a limitation of resources at the SMF/UPF.

 - MAX\_NR\_QoS\_FLOW: Indicate that the PCC rule could not be successfully installed (for those provisioned from PCF) or activated (for those pre-defined in SMF) or enforced (for those already successfully installed) due to the fact that the maximum number of QoS flows has been reached for the PDU session.

 - MISS\_FLOW\_INFO: Indicate that the PCC rule could not be successfully installed or enforced because neither the "flowInfos" attribute nor the "appId" attribute is specified within the PccRule data structure by the PCF during the first install request of the PCC rule.

 - RES\_ALLO\_FAIL: Indicate that the PCC rule could not be successfully installed or maintained since the QoS flow establishment/modification failed, or the QoS flow was released.

 - UNSUCC\_QOS\_VAL: indicate that the QoS validation has failed or when Guaranteed Bandwidth > Max-Requested-Bandwidth.

 - INCOR\_FLOW\_INFO: Indicate that the PCC rule could not be successfully installed or modified at the SMF because the provided flow information is not supported by the network (e.g. the provided IP address(es) or Ipv6 prefix(es) do not correspond to an IP version applicable for the PDU session).

 - PS\_TO\_CS\_HAN: Indicate that the PCC rule could not be maintained because of PS to CS handover.

 - APP\_ID\_ERR: Indicate that the rule could not be successfully installed or enforced because the Application Identifier is invalid, unknown, or not applicable to the application required for detection.

 - NO\_QOS\_FLOW\_BOUND: Indicate that there is no QoS flow which the SMF can bind the PCC rule(s) to.

 - FILTER\_RES: Indicate that the Flow Information within the "flowInfos" attribute cannot be handled by the SMF because any of the restrictions defined in subclause 5.4.2 of 3GPP TS 29.212 was not met.

 - MISS\_REDI\_SER\_ADDR: Indicate that the PCC rule could not be successfully installed or enforced at the SMF because there is no valid Redirect Server Address within the Traffic Control Data policy decision which the PCC rule refers to provided by the PCF and no preconfigured redirection address for this PCC rule at the SMF.

 - CM\_END\_USER\_SER\_DENIED: Indicate that the charging system denied the service request due to service restrictions (e.g. terminate rating group) or limitations related to the end-user, for example the end-user's account could not cover the requested service.

 - CM\_CREDIT\_CON\_NOT\_APP: Indicate that the charging system determined that the service can be granted to the end user but no further credit control is needed for the service (e.g. service is free of charge or is treated for offline charging).

 - CM\_AUTH\_REJ: Indicate that the charging system denied the service request in order to terminate the service for which credit is requested.

 - CM\_USER\_UNK: Indicate that the specified end user could not be found in the charging system.

 - CM\_RAT\_FAILED: Indicate that the charging system cannot rate the service request due to insufficient rating input, incorrect AVP combination or due to an attribute or an attribute value that is not recognized or supported in the rating.

 - UE\_STA\_SUSP: Indicates that the UE is in suspend state.

 - UNKNOWN\_REF\_ID: Indicates that the PCC rule could not be successfully installed/modified because the referenced identifier to a Policy Decision Data or to a Condition Data is unknown to the SMF.

 - INCORRECT\_COND\_DATA: Indicates that the PCC rule could not be successfully installed/modified because the referenced Condition data are incorrect.

 - REF\_ID\_COLLISION: Indicates that PCC rule could not be successfully installed/modified because the same Policy Decision is referenced by a session rule (e.g. the session rule and the PCC rule refer to the same Usage Monitoring decision data).

 - TRAFFIC\_STEERING\_ERROR: Indicates that enforcement of the steering of traffic to the N6-LAN or 5G-LAN failed; or the dynamic PCC rule could not be successfully installed or modified at the NF service consumer because there are invalid traffic steering policy identifier(s) within the provided Traffic Control Data policy decision to which the PCC rule refers.

 - DNAI\_STEERING\_ERROR: Indicates that the enforcement of the steering of traffic to the indicated DNAI failed; or the dynamic PCC rule could not be successfully installed or modified at the NF service consumer because there is invalid route information for a DNAI(s) (e.g. routing profile id is not configured) within the provided Traffic Control Data policy decision to which the PCC rule refers.

 AfSigProtocol:

 anyOf:

 - type: string

 enum:

 - NO\_INFORMATION

 - SIP

 - $ref: 'TS29571\_CommonData.yaml#/components/schemas/NullValue'

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

 - NO\_INFORMATION: Indicate that no information about the AF signalling protocol is being provided.

 - SIP: Indicate that the signalling protocol is Session Initiation Protocol.

 RuleOperation:

 anyOf:

 - type: string

 enum:

 - CREATE\_PCC\_RULE

 - DELETE\_PCC\_RULE

 - MODIFY\_PCC\_RULE\_AND\_ADD\_PACKET\_FILTERS

 - MODIFY\_ PCC\_RULE\_AND\_REPLACE\_PACKET\_FILTERS

 - MODIFY\_ PCC\_RULE\_AND\_DELETE\_PACKET\_FILTERS

 - MODIFY\_PCC\_RULE\_WITHOUT\_MODIFY\_PACKET\_FILTERS

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

 - CREATE\_PCC\_RULE: Indicates to create a new PCC rule to reserve the resource requested by the UE.

 - DELETE\_PCC\_RULE: Indicates to delete a PCC rule corresponding to reserve the resource requested by the UE.

 - MODIFY\_PCC\_RULE\_AND\_ADD\_PACKET\_FILTERS: Indicates to modify the PCC rule by adding new packet filter(s).

 - MODIFY\_ PCC\_RULE\_AND\_REPLACE\_PACKET\_FILTERS: Indicates to modify the PCC rule by replacing the existing packet filter(s).

 - MODIFY\_ PCC\_RULE\_AND\_DELETE\_PACKET\_FILTERS: Indicates to modify the PCC rule by deleting the existing packet filter(s).

 - MODIFY\_PCC\_RULE\_WITHOUT\_MODIFY\_PACKET\_FILTERS: Indicates to modify the PCC rule by modifying the QoS of the PCC rule.

 RedirectAddressType:

 anyOf:

 - type: string

 enum:

 - IPV4\_ADDR

 - IPV6\_ADDR

 - URL

 - SIP\_URI

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

 - IPV4\_ADDR: Indicates that the address type is in the form of "dotted-decimal" IPv4 address.

 - IPV6\_ADDR: Indicates that the address type is in the form of IPv6 address.

 - URL: Indicates that the address type is in the form of Uniform Resource Locator.

 - SIP\_URI: Indicates that the address type is in the form of SIP Uniform Resource Identifier.

 QosFlowUsage:

 anyOf:

 - type: string

 enum:

 - GENERAL

 - IMS\_SIG

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

 - GENERAL: Indicate no specific QoS flow usage information is available.

 - IMS\_SIG: Indicate that the QoS flow is used for IMS signalling only.

 FailureCause:

 description: Indicates the cause of the failure in a Partial Success Report.

 anyOf:

 - type: string

 enum:

 - PCC\_RULE\_EVENT

 - PCC\_QOS\_FLOW\_EVENT

 - RULE\_PERMANENT\_ERROR

 - RULE\_TEMPORARY\_ERROR

 - POL\_DEC\_ERROR

 - type: string

 CreditManagementStatus:

 description: Indicates the reason of the credit management session failure.

 anyOf:

 - type: string

 enum:

 - END\_USER\_SER\_DENIED

 - CREDIT\_CTRL\_NOT\_APP

 - AUTH\_REJECTED

 - USER\_UNKNOWN

 - RATING\_FAILED

 - type: string

 SessionRuleFailureCode:

 anyOf:

 - type: string

 enum:

 - NF\_MAL

 - RES\_LIM

 - SESSION\_RESOURCE\_ALLOCATION\_FAILURE

 - UNSUCC\_QOS\_VAL

 - INCORRECT\_UM

 - UE\_STA\_SUSP

 - UNKNOWN\_REF\_ID

 - INCORRECT\_COND\_DATA

 - REF\_ID\_COLLISION

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

 - NF\_MAL: Indicates that the PCC rule could not be successfully installed (for those provisioned from the PCF) or activated (for those pre-defined in SMF) or enforced (for those already successfully installed) due to SMF/UPF malfunction.

 - RES\_LIM: Indicates that the PCC rule could not be successfully installed (for those provisioned from PCF) or activated (for those pre-defined in SMF) or enforced (for those already successfully installed) due to a limitation of resources at the SMF/UPF.

 - SESSION\_RESOURCE\_ALLOCATION\_FAILURE: Indicates the session rule could not be successfully enforced due to failure during the allocation of resources for the PDU session in the UE, RAN or AMF.

 - UNSUCC\_QOS\_VAL: indicates that the QoS validation has failed.

 - INCORRECT\_UM: The usage monitoring data of the enforced session rule is not the same for all the provisioned session rule(s).

 - UE\_STA\_SUSP: Indicates that the UE is in suspend state.

 - UNKNOWN\_REF\_ID: Indicates that the session rule could not be successfully installed/modified because the referenced identifier to a Policy Decision Data or to a Condition Data is unknown to the SMF.

 - INCORRECT\_COND\_DATA: Indicates that the session rule could not be successfully installed/modified because the referenced Condition data are incorrect.

 - REF\_ID\_COLLISION: Indicates that the session rule could not be successfully installed/modified because the same Policy Decision is referenced by a PCC rule (e.g. the session rule and the PCC rule refer to the same Usage Monitoring decision data).

 SteeringFunctionality:

 anyOf:

 - type: string

 enum:

 - MPTCP

 - ATSSS\_LL

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

 - MPTCP: Indicates that PCF authorizes the MPTCP functionality to support traffic steering, switching and splitting.

 - ATSSS\_LL: Indicates that PCF authorizes the ATSSS-LL functionality to support traffic steering, switching and splitting.

 SteerModeValue:

 description: Indicates the steering mode value determined by the PCF.

 anyOf:

 - type: string

 enum:

 - ACTIVE\_STANDBY

 - LOAD\_BALANCING

 - SMALLEST\_DELAY

 - PRIORITY\_BASED

 - type: string

 MulticastAccessControl:

 description: Indicates whether the service data flow, corresponding to the service data flow template, is allowed or not allowed.

 anyOf:

 - type: string

 enum:

 - ALLOWED

 - NOT\_ALLOWED

 - type: string

 RequestedQosMonitoringParameter:

 description: Indicates the requested QoS monitoring parameters to be measured.

 anyOf:

 - type: string

 enum:

 - DOWNLINK

 - UPLINK

 - ROUND\_TRIP

 - type: string

 ReportingFrequency:

 description: Indicates the frequency for the reporting.

 anyOf:

 - type: string

 enum:

 - EVENT\_TRIGGERED

 - PERIODIC

 - SESSION\_RELEASE

 - type: string

 SgsnAddress:

 description: describes the address of the SGSN

 type: object

 anyOf:

 - required: [sgsnIpv4Addr]

 - required: [sgsnIpv6Addr]

 properties:

 sgsnIpv4Addr:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv4Addr'

 sgsnIpv6Addr:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv6Addr'

 SmPolicyAssociationReleaseCause:

 description: Represents the cause due to which the PCF requests the termination of the SM policy association.

 anyOf:

 - type: string

 enum:

 - UNSPECIFIED

 - UE\_SUBSCRIPTION

 - INSUFFICIENT\_RES

 - VALIDATION\_CONDITION\_NOT\_MET

 - type: string

 PduSessionRelCause:

 description: Contains the SMF PDU Session release cause.

 anyOf:

 - type: string

 enum:

 - PS\_TO\_CS\_HO

 - RULE\_ERROR

 - type: string

 MaPduIndication:

 description: Contains the MA PDU session indication, i.e., MA PDU Request or MA PDU Network-Upgrade Allowed.

 anyOf:

 - type: string

 enum:

 - MA\_PDU\_REQUEST

 - MA\_PDU\_NETWORK\_UPGRADE\_ALLOWED

 - type: string

 AtsssCapability:

 description: Contains the ATSSS capability supported for the MA PDU Session.

 anyOf:

 - type: string

 enum:

 - MPTCP\_ATSSS\_LL\_WITH\_ASMODE\_UL

 - MPTCP\_ATSSS\_LL\_WITH\_EXSDMODE\_DL\_ASMODE\_UL

 - MPTCP\_ATSSS\_LL\_WITH\_ASMODE\_DLUL

 - ATSSS\_LL

 - MPTCP\_ATSSS\_LL

 - type: string

#

 NetLocAccessSupport:

 anyOf:

 - type: string

 enum:

 - ANR\_NOT\_SUPPORTED

 - TZR\_NOT\_SUPPORTED

 - LOC\_NOT\_SUPPORTED

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

 - ANR\_NOT\_SUPPORTED: Indicates that the access network does not support the report of access network information.

 - TZR\_NOT\_SUPPORTED: Indicates that the access network does not support the report of UE time zone.

 - LOC\_NOT\_SUPPORTED: Indicates that the access network does not support the report of UE Location (or PLMN Id).

 PolicyDecisionFailureCode:

 description: Indicates the type of the failed policy decision and/or condition data.

 anyOf:

 - type: string

 enum:

 - TRA\_CTRL\_DECS\_ERR

 - QOS\_DECS\_ERR

 - CHG\_DECS\_ERR

 - USA\_MON\_DECS\_ERR

 - QOS\_MON\_DECS\_ERR

 - CON\_DATA\_ERR

 - POLICY\_PARAM\_ERR

 - type: string

#

 NotificationControlIndication:

 description: Indicates that the notification of DDD Status is requested and/or that the notification of DDN Failure is requested.

 anyOf:

 - type: string

 enum:

 - DDN\_FAILURE

 - DDD\_STATUS

 - type: string

#

 SatelliteBackhaulCategory:

 description: Indicates the type of satellite backhaul category or non-satellite backhaul for the PDU session.

 anyOf:

 - type: string

 enum:

 - GEO

 - MEO

 - LEO

 - OTHER\_SAT

 - NON\_SATELLITE

 - type: string

 SteerModeIndicator:

 description: Contains Autonomous load-balance indicator or UE-assistance indicator.

 anyOf:

 - type: string

 enum:

 - AUTO\_LOAD\_BALANCE

 - UE\_ASSISTANCE

 - type: string

#

\* \* \* \* End of changes \* \* \* \*