**3GPP TSG-CT WG3 Meeting #108-eC3-201497**

**E-Meeting, 19th – 28th February 2020 *(revision of C3-201169)***

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **29.512** | **CR** | **0423** | **rev** | **1** | **Current version:** | **16.3.0** |  |
|  | | | | | | | | |
| *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)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | Report of EPS Fallback | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson, China Telecom, Huawei | | | | | | | | | |
| ***Source to TSG:*** | C3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | eIMS5G\_SBA | | | | |  | ***Date:*** | | | 2020-02-14 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-16 |
|  | *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 can be 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-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | SA2 agreed in [S2-2001341](https://www.3gpp.org/ftp/tsg_sa/WG2_Arch/TSGS2_136AH_Incheon/Docs/S2-2001341.zip) the support of a new Policy Control Request trigger, EPS Fallback, which is met when armed by the PCF and the SMF receives a PDU session modification response indicating that the establishment of the QoS Flow with 5QI=1 is rejected due to EPS Fallback. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Definition of:  - a new feature “EPSFallbackSupport”,  - a new PCRT “EPS\_FALLBACK”, which when met, reports the PCC rules that triggered the EPS fallback,  - a new value for the RequestedRuleDataType, “EPS\_FALLBACK”, and  - detailed service procedures in Annex B | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | EPS Fallback notification is not supported. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.6.3.6, 5.6.3.7, 5.8, A.2, B.3.3.x (new), B.3.4.x (new) | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | TS 23.503 CR 0384 | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | | This CR introduces a backward compatible feature in the OpenAPI file TS29512\_Npcf\_SMPolicyControl. | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**Additional discussion(if needed):**

**Proposed changes:**

\*\*\* 1st Change \*\*\*

#### 5.6.3.6 Enumeration: PolicyControlRequestTrigger

Table 5.6.3.6-1: Enumeration PolicyControlRequestTrigger

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| PLMN\_CH | PLMN Change. |  |
| RES\_MO\_RE | A request for resource modification has been received by the SMF. (NOTE) |  |
| AC\_TY\_CH | Access Type Change. |  |
| UE\_IP\_CH | UE IP address change. (NOTE) |  |
| 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. | UMC |
| APP\_STA | The start of application traffic has been detected. | ADC |
| APP\_STO | The stop of application traffic has been detected. | ADC |
| AN\_INFO | Access Network Information report. | NetLoc |
| CM\_SES\_FAIL | Credit management session failure. |  |
| PS\_DA\_OFF | The SMF reports when the 3GPP PS Data Off status changes. (NOTE) | 3GPP-PS-Data-Off |
| DEF\_QOS\_CH | Default QoS Change. (NOTE) |  |
| SE\_AMBR\_CH | Session AMBR Change. (NOTE) |  |
| QOS\_NOTIF | The SMF notify the PCF when receiving notification from RAN that QoS targets of the QoS Flow cannot be guaranteed or can be guaranteed. |  |
| NO\_CREDIT | Out of credit. |  |
| PRA\_CH | Change of UE presence in Presence Reporting Area. | PRA |
| 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 (i.e. Enforced PCC rule request defined in table 6.1.3.5.-1 of 3GPP TS 29.503 [6]). |  |
| RES\_RELEASE | Indicates that the SMF can inform the PCF of the outcome of the release of resources for those rules that require so. | RAN-NAS-Cause |
| SUCC\_RES\_ALLO | Indicates that the SMF shall inform the PCF of the successful resource allocation for those rules that requires so. |  |
| 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. (NOTE) Only applicable to the interworking scenario as defined in Annex B. |  |
| UE\_STATUS\_RESUME | Indicates that the UE’s status is resumed. Only applicable to the interworking scenario as defined in Annex B. | PolicyUpdateWhenUESuspends |
| UE\_TZ\_CH | UE Time Zone Change. |  |
| AUTH\_PROF\_CH | Indicates that the DN-AAA authorization profile index has changed. (NOTE) | DN-Authorization |
| TSN\_ETHER\_PORT | Manageable Ethernet port detected. | TimeSensitiveNetworking |
| TSN\_CONTAINER | Port management container detected. | TimeSensitiveNetworking |
| QOS\_MONITORING | Indicate that the SMF notifies the PCF of the QoS Monitoring information. | QosMonitoring |
| EPS\_FALLBACK | EPS Fallback report is enabled in the SMF. Only applicable to the interworking scenario as defined is Annex B. | EPSFallbackReport |
| NOTE: The SMF always reports to the PCF. | | |

The PCF may provision the values of policy control request trigger which are not always reported by the SMF as defined in subclause 4.2.6.4.

When the SMF detects the corresponding policy control request trigger(s), the SMF shall report the detected trigger(s) to the PCF as defined in subclause 4.2.4.1 with the additional information for different independent policy control request triggers as follows:

If the "PLMN\_CH" is provisioned, when the SMF detects a change of PLMN, the SMF shall include the "PLMN\_CH" within the "repPolicyCtrlReqTriggers" attribute and the current identifier of the serving network within the "servingNetwork" attribute.

When the SMF receives the resource modification request from the UE, the SMF shall include the "RES\_MO\_RE" within the "repPolicyCtrlReqTriggers" attribute and the information for requesting the PCC rule as defined in subclause 4.2.4.17.

If the "AC\_TY\_CH" is provisioned, when the SMF detects a change of access type, the SMF shall include the "AC\_TY\_CH" within the "repPolicyCtrlReqTriggers" attribute and the current access type within the "accessType" attribute. The RAT type encoded in the "ratType" attribute shall also be provided when applicable to the specific access type. Specific attributes for the EPC interworking case are described in Annex B.

When the SMF detects an IPv4 address and/or an IPv6 prefix is allocated or released, the SMF shall include the "UE\_IP\_CH" within the "repPolicyCtrlReqTriggers" attribute and new allocated UE Ipv4 address within the "ipv4Address" attribute and/or the UE Ipv6 prefix within the "ipv6AddressPrefix" attribute or the released UE Ipv4 address within the "relIpv4Address" attribute and/or the UE Ipv6 prefix within the "relIpv6AddressPrefix" attribute. If the "MultiIpv6AddrPrefix" feature is supported ,and if multiple allocated or released IPv6 prefixes are detected, the SMF shall include the new allocated UE Ipv6 prefixes within the "addIpv6AddrPrefixes" attribute and the released UE Ipv6 prefixes within the "addRelIpv6AddrPrefixes" attribute.

When the SMF detects a new UE MAC address or a used UE MAC address is not used any more, the SMF shall include the "UE\_MAC\_CH" within the "repPolicyCtrlReqTriggers" attribute and new detected UE MAC address within the "ueMac" attribute or the not used UE MAC address within the "relUeMac" attribute.

If the "AN\_CH\_COR" is provisioned, when the SMF is provisioned with the PCC rule as defined in subclause 4.2.6.5.1, the SMF shall notify the PCF of access network charging identifier associated with the PCC rules as defined in subclause 4.2.4.13.

If the "US\_RE" is provisioned, when the SMF receives the usage report from the UPF, the SMF shall notify the PCF of the accumulated usage as defined in subclause 4.2.4.10. Applicable to functionality introduced with the UMC feature as described in subclause 5.8.

If the "APP\_STA" is provisioned, when the SMF receives the application start report from the UPF, the SMF shall notify the PCF of the application start report as defined in subclause 4.2.4.6. Applicable to functionality introduced with the ADC feature as described in subclause 5.8.

If the "APP\_STO" is provisioned, when the SMF receives the application stop report from the UPF, the SMF shall notify the PCF of the application stop report as defined in subclause 4.2.4.6. Applicable to functionality introduced with the ADC feature as described in subclause 5.8.

If the "AN\_INFO" is provisioned, when the SMF receives the reported access network information from the access network, the SMF shall notify the PCF of the access network information as defined in subclause 4.2.4.9. Applicable to functionality introduced with the NetLoc feature as described in subclause 5.8.

If the "CM\_SES\_FAIL" is provisioned, when the SMF receives a detected transient/permanent failure from the CHF, the SMF shall include the "CM\_SES\_FAIL" within the "repPolicyCtrlReqTriggers" attribute. If the failure does not apply to all PCC Rules, the affected PCC Rules are indicated within the "ruleReports" attribute, with the "ruleStatus" attribute set to value ACTIVE and the "failureCode" attribute set to the corresponding value as reported by the CHF; otherwise if the failure applies to the session, the "creditManageStatus" shall be set to the corresponding value as reported by the CHF.

If the "PS\_DA\_OFF" is provisioned, when the SMF receives a change of 3GPP PS Data Off status from the UE, the SMF shall notify the PCF as defined in subclause 4.2.4.8. Applicable to functionality introduced with the 3GPP-PS-Data-Off feature as described in subclause 5.8.

When the SMF detects a change of subscribed default QoS, the SMF shall include the "DEF\_QOS\_CH" within the "repPolicyCtrlReqTriggers" attribute and the new subscribed default QoS within the "subsDefQos" attribute.

When the SMF detects a change of Session-AMBR, the SMF shall include the "SE\_AMBR\_CH" within the "repPolicyCtrlReqTriggers" attribute and the new Session-AMBR within the "subsSessAmbr" attribute.

If the "QOS\_NOTIF" is provisioned, when the SMF receives a notification from access network that QoS targets of the QoS Flow cannot be guaranteed or can be guaranteed again, the SMF shall send the notification as defined in subclause 4.2.4.20.

If the "NO\_CREDIT" is provisioned, when the SMF detects the credit for the PCC rule(s) is no longer available, the SMF shall include the "NO\_CREDIT" within the "repPolicyCtrlReqTriggers" attribute, the termination action the SMF applies to the PCC rules as instructed by the CHF within the "finUnitAct" attribute and the affected PCC rules within the "ruleReports" attribute.

If the "PRA\_CH" is provisioned, the SMF is provisioned the presence reporting area information as defined in subclause 4.2.6.5.6. When the SMF receives the presence reporting area information from the serving node, the SMF shall notify the PCF of the reported presence area information as defined in subclause 4.2.4.16. Applicable to functionality introduced with the PRA feature as described in subclause 5.8.

If the "SAREA\_CH" is provisioned, when the SMF detects a change of serving area (i.e. tracking area), the SMF shall include the "SAREA\_CH" within the "repPolicyCtrlReqTriggers" attribute and the current TAI within the "userLocationInfo" attribute in either the "eutraLocation" or "nrLocation", as applicable. Non-3GPP access user location is reported in the "n3gaLocation" attribute when applicable. The attributes used in case of EPC interworking are described in Annex B.

If the "SCNN\_CH" is provisioned, when the SMF detects a change of serving Network Function (i.e. the AMF, ePDG or S-GW), the SMF shall include the "SCNN\_CH" within the "repPolicyCtrlReqTriggers" attribute and the current serving Network Function in the "servNfId" attribute if available. When the serving Network Function is an AMF, the SMF shall include the AMF Network Function Instance Identifier within the "servNfInstId" attribute and the Globally Unique AMF Identifier within the "guami" attribute. The attributes included in case of EPC interworking are described in Annex B.

NOTE: In the home-routed roaming case, if the AMF change is unknown to the H-SMF, then the AMF change is not reported.

If the "RE\_TIMEOUT" is provisioned, the SMF is provisioned the revalidation time by the PCF. The SMF shall request the policy before the indicated the revalidation time as defined in subclause 4.2.4.13.

If the "RES\_RELEASE" is provisioned, when the SMF receives the request of PCC rule removal as defined in subclause 4.2.6.5.2, the SMF shall report the outcome of resource release as defined in subclause 4.2.4.12. Applicable to functionality introduced with the RAN-NAS-Cause feature as described in subclause 5.8.

When "SUCC\_RES\_ALLO" is provisioned and PCC rules are provisioned according to subclause 4.2.6.5.5, the SMF shall inform the PCF of the successful resource allocation as defined in subclause 4.2.4.14.

If the "RAT\_TY\_CH" is provisioned, when the SMF detects a change of the RAT type, the SMF shall include the "RAT\_TY\_CH" within the "repPolicyCtrlReqTriggers" attribute and the current RAT type within the "ratType" attribute.

If the "REF\_QOS\_IND\_CH" is provisioned, when the SMF receives a change of reflective QoS indication from the UE, the SMF shall include the "REF\_QOS\_IND\_CH" within the "repPolicyCtrlReqTriggers" attribute and the indication within the "refQosIndication" attribute.

When the SMF receives the number of supported packet filter for signalled QoS rules for the PDU session from the UE during the PDU Session Modification procedure after the first inter-system change from EPS to 5GS for a PDU Session established in EPS and transferred from EPS with N26 interface, the SMF shall include the "NUM\_OF\_PACKET\_FILTER" within the "repPolicyCtrlReqTriggers" attribute and the number of supported packet filter for signalled QoS rules within the "numOfPackFilter" attribute. Only applicable to the interworking scenario as defined in Annex B.

If the "UE\_STATUS\_RESUME" is provisioned, when the SMF detected the UE’s status is resumed from suspend state, the SMF shall inform the PCF of the UE status including the "UE\_STATUS\_RESUME" within "repPolicyCtrlReqTriggers" attribute. The PCF shall after this update the SMF with PCC Rules or session rules if necessary. Applicable to functionality introduced with the PolicyUpdateWhenUESuspends feature as described in subclause 5.8.

If the "UE\_TZ\_CH" is provisioned, when the SMF detects a change of the UE Time Zone, the SMF shall include the "UE\_TZ\_CH" within the "repPolicyCtrlReqTriggers" attribute and the current UE Time Zone within the "ueTimeZone" attribute.

If the "DN-Authorization" feature is supported, when the SMF detects a change of DN-AAA authorization profile index, the SMF shall include the "AUTH\_PROF\_CH" within the "repPolicyCtrlReqTriggers" attribute and the new DN-AAA authorization profile index within the "authProfIndex" attribute.

If the "TimeSensitiveNetworking" feature is supported and "TSN\_ETHER\_PORT" is provisioned and when the SMF detects a manageable Ethernet port, the SMF shall include the "TSN\_ETHER\_PORT" within the "repPolicyCtrlReqTriggers" attribute and the affected TSN bridge information within the "tsnBridgeInfo" attribute.

If the "TimeSensitiveNetworking" feature is supported and "TSN\_CONTAINER" is provisioned and when the SMF detects a Port Management Container, the SMF shall include the "TSN\_CONTAINER" within the "repPolicyCtrlReqTriggers" attribute and the Port Management Container(s), which are available, within the "tsnPortManContDstt" and the "tsnPortManContNwtt" attributes.

If the "QOS\_MONITORING" is provisioned, upon receiving the QoS Monitoring report from the UPF, the SMF shall send the QoS monitoring report to the PCF as defined in subclause 4.2.4.24.

If the "EPSFallbackReport" feature is supported and the "EPS\_FALLBACK" is provisioned and there is a PCC rule installed that required the reporting, when the SMF receives a PDU session modification response indicating the rejection of the establishment of the QoS flow with 5QI=1, the SMF shall notify the PCF of EPS fallback as defined in subclause B.3.4.x.

\*\*\* 2nd Change \*\*\*

#### 5.6.3.7 Enumeration: RequestedRuleDataType

Table 5.6.3.7-1: Enumeration RequestedRuleDataType

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| 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. (NOTE) |  |
| USER\_LOC\_INFO | Indicates that the requested access network info type is the UE's location. (NOTE) |  |
| 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. | EPSFallbackReport |
| NOTE: The requested rule data shall also be reported at QoS flow termination and PDU session termination. | | |

\*\*\* 3rd Change \*\*\*

## 5.8 Feature negotiation

The optional features in table 5.8-1 are defined for the Npcf\_SMPolicyControl API. They shall be negotiated using the extensibility mechanism defined in subclause 6.6 of 3GPP TS 29.500 [4].

Table 5.8-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
| 1 | TSC | This feature indicates support for traffic steering control in the (S)Gi-LAN or routing of the user traffic to a local Data Network identified by the DNAI per AF request. If the SMF supports this feature, the PCF shall behave as described in subclause 4.2.6.2.20. |
| 2 | ResShare | This feature indicates the support of service data flows that share resources. If the SMF supports this feature, the PCF shall behave as described in subclause 4.2.6.2.8. |
| 3 | 3GPP-PS-Data-Off | This feature indicates the support of 3GPP PS Data off status change reporting. |
| 4 | ADC | This feature indicates the support of application detection and control. |
| 5 | UMC | Indicates that the usage monitoring control is supported. |
| 6 | NetLoc | This feature indicates the support of the Access Network Information Reporting for 5GS. |
| 7 | RAN-NAS-Cause | This feature indicates the support for the detailed release cause code information from the access network. |
| 8 | ProvAFsignalFlow | This feature indicates support for the feature of IMS Restoration as described in subclause 4.2.3.17. If SMF supports this feature the PCF may provision AF signalling IP flow information. |
| 9 | PCSCF-Restoration-Enhancement | This feature indicates support of P-CSCF Restoration Enhancement. It is used for the SMF to indicate if it supports P-CSCF Restoration Enhancement. |
| 10 | PRA | This feature indicates the support of presence reporting area change reporting. |
| 11 | RuleVersioning | This feature indicates the support of PCC rule versioning as defined in subclause 4.2.6.7. |
| 12 | SponsoredConnectivity | This feature indicates support for sponsored data connectivity feature. If the SMF supports this feature, the PCF may authorize sponsored data connectivity to the subscriber. |
| 13 | RAN-Support-Info | This feature indicates the support of maximum packet loss rate value(s) for uplink and/or downlink voice service data flow(s). |
| 14 | PolicyUpdateWhenUESuspends | This feature indicates the support of report when the UE is suspended and then resumed from suspend state. Only applicable to the interworking scenario as defined in Annex B. |
| 15 | AccessTypeCondition | This feature indicates the support of access type conditioned authorized session AMBR as defined in subclause 4.2.6.3.2.4. |
| 16 | MultiIpv6AddrPrefix | This feature indicates the support of multiple Ipv6 address prefixes reporting. |
| 17 | SessionRuleErrorHandling | This feature indicates the support of session rule error handling. |
| 18 | DN-Authorization | This feature indicates the support of DN-AAA authorization data for policy control. |
| 19 | ATSSS | This feature indicates the support of the access traffic switching, steering and splitting functionality as defined in subclauses 4.2.6.2.17 and 4.2.6.3.4. |
| 20 | PendingTransaction | This feature indicates support for the race condition handling as defined in 3GPP TS 29.513 [7]. |
| 21 | URLLC | This feature indicates support of Ultra-Reliable Low-Latency Communication (URLLC) requirements, i.e. AF application relocation acknowledgement requirement and UE address(es) preservation. The TSC feature shall be supported in order to support this feature. |
| 22 | MacAddressRange | Indicates the support of a set of MAC addresses with a specific range in the traffic filter. |
| 23 | WWC | Indicates support of wireless and wireline convergence access as defined in annex C. |
| 24 | QosMonitoring | Indicates support of QoS monitoring as defined in subclause 4.2.6.2.18. |
| 25 | AuthorizationWithRequiredQoS | Indicates support of policy authorization for the AF session with required QoS as defined in subclause 4.2.3.22. |
| 26 | EnhancedBackgroundDataTransfer | Indicates the support of applying the Background Data Transfer Policy to a future PDU session. |
| 27 | AF\_Charging\_Identifier | Indicates the support of long character strings as charging identifiers. |
| 28 | PDUSessionRelCause | Indicates the support of PDU session release cause. |
| 29 | SamePcf | This feature indicates the support of same PCF selection for the parameter's combination. |
| 30 | ADCmultiRedirection | This feature indicates support for multiple redirection information in application detection and control. It requires the support of ADC feature. |
| 31 | RespBasedSessionRel | Indicates support of handling PDU session termination functionality as defined in subclause 4.2.4.22. |
| 32 | TimeSensitiveNetworking | Indicates that the 5G System is integrated within the external network as a TSN bridge. |
| 33 | EMDBV | This feature indicates the support of the ExtMaxDataBurstVol data type defined in 3GPP TS 29.571 [11]. The use of this data type is specified in subclause 4.2.2.1. |
| e1 | EPSFallbackReport | This feature indicates the support of the report of EPS Fallback as defined in subclauses B.3.3.x and B.3.4.x. |

\*\*\* 4th Change \*\*\*

# A.2 Npcf\_SMPolicyControl API

openapi: 3.0.0

info:

title: Npcf\_SMPolicyControl API

version: 1.1.1.alpha-4

description: |

Session Management Policy Control Service

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externalDocs:

description: 3GPP TS 29.512 V16.3.0; 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:

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

'204':

description: No Content, Notification was succesfull

'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 succesful

'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:

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'

'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:

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'

'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:

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

'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:

type: object

properties:

context:

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

policy:

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

required:

- context

- policy

SmPolicyContextData:

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'

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'

notificationUri:

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

accessType:

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

ratType:

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

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'

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'

required:

- supi

- pduSessionId

- pduSessionType

- dnn

- notificationUri

- sliceInfo

SmPolicyDecision:

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.

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.

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.

chgDecs:

type: object

additionalProperties:

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

minProperties: 1

description: Map of Charging data policy decisions.

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.

umDecs:

type: object

additionalProperties:

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

minProperties: 1

description: Map of Usage Monitoring data policy decisions.

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.

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.

nullable: true

revalidationTime:

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

offline:

type: boolean

description: Indicates the offline charging is applicable to the PDU session or PCC rule.

online:

type: boolean

description: Indicates the online charging is applicable to the PDU session or PCC rule.

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.

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'

SmPolicyNotification:

type: object

properties:

resourceUri:

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

smPolicyDecision:

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

PccRule:

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.

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 type 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 QoS Data 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 type decision type. It is the qmId described in subclause 5.6.2.40.

nullable: true

addrPreserInd:

type: boolean

nullable: true

required:

- pccRuleId

nullable: true

SessionRule:

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:

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'

required:

- qosId

nullable: true

ConditionData:

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:

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

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:

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.

online:

type: boolean

description: Indicates the online charging is applicable to the PCC rule.

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:

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:

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.

FlowInformation:

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:

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'

QosCharacteristics:

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:

type: object

properties:

primaryChfAddress:

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

secondaryChfAddress:

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

required:

- primaryChfAddress

- secondaryChfAddress

AccuUsageReport:

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:

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'

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'

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'

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.

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'

UpPathChgEvent:

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:

type: object

properties:

resourceUri:

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

cause:

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

required:

- resourceUri

- cause

AppDetectionInfo:

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:

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:

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:

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: Thooleanean 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:

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'

RuleReport:

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.

required:

- pccRuleIds

- ruleStatus

RanNasRelCause:

type: object

properties:

ngApCause:

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

5gMmCause:

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

5gSmCause:

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

UeInitiatedResourceRequest:

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:

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:

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:

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'

gfbrUl:

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

gfbrDl:

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

altQosParamId:

type: string

required:

- refPccRuleIds

- notifType

PartialSuccessReport:

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'

required:

- failureCause

AuthorizedDefaultQos:

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'

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.

extMaxDataBurstVol:

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

ErrorReport:

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.

SessionRuleReport:

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'

required:

- ruleIds

- ruleStatus

ServingNfIdentity:

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'

SteeringMode:

type: object

properties:

steerModeValue:

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

active:

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

standby:

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

3gLoad:

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

prioAcc:

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

required:

- steerModeValue

QosMonitoringData:

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

maxItems: 3

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..

repFreq:

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

repThreshDl:

type: integer

description: Unsigned integer identifying a period of time in units of miliiseconds for DL packet delay.

repThreshUl:

type: integer

description: Unsigned integer identifying a period of time in units of miliiseconds for UL packet delay.

repThreshRp:

type: integer

description: Unsigned integer identifying a period of time in units of miliiseconds for round trip packet delay.

waitTime:

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

repPeriod:

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

notifyUri:

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

notifyCorreId:

type: string

required:

- qmId

nullable: true

QosMonitoringReport:

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

dlDelays:

type: array

items:

type: integer

rttDelays:

type: array

items:

type: integer

required:

- refPccRuleIds

5GSmCause:

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

PacketFilterContent:

type: string

description: Defines a packet filter for an IP flow.Refer to subclause 5.3.54 of 3GPP TS 29.212 for encoding.

FlowDescription:

type: string

description: Defines a packet filter for an IP flow.Refer to subclause 5.4.2 of 3GPP TS 29.212 for encoding.

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:

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.

nullable: true

ReportingLevel:

anyOf:

- type: string

enum:

- SER\_ID\_LEVEL

- RAT\_GR\_LEVEL

- SPON\_CON\_LEVEL

- 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.

nullable: true

MeteringMethod:

anyOf:

- type: string

enum:

- DURATION

- VOLUME

- DURATION\_VOLUME

- EVENT

- 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.

nullable: true

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

- PRA\_CH

- SAREA\_CH

- SCNN\_CH

- RE\_TIMEOUT

- RES\_RELEASE

- SUCC\_RES\_ALLO

- RAT\_TY\_CH

- REF\_QOS\_IND\_CH

- NUM\_OF\_PACKET\_FILTER

- UE\_STATUS\_RESUME

- UE\_TZ\_CH

- AUTH\_PROF\_CH

- QOS\_MONITORING

- 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

- 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

- 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.

- 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.

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

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

- 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.

AfSigProtocol:

anyOf:

- type: string

enum:

- NO\_INFORMATION

- SIP

- 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.

nullable: true

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:

anyOf:

- type: string

enum:

- PCC\_RULE\_EVENT

- PCC\_QOS\_FLOW\_EVENT

- RULE\_PERMANENT\_ERROR

- RULE\_TEMPORARY\_ERROR

- type: string

CreditManagementStatus:

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

- UNSUCC\_QOS\_VAL

- UE\_STA\_SUSP

- 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: 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.

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

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

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:

anyOf:

- type: string

enum:

- ACTIVE\_STANDBY

- LOAD\_BALANCING

- SMALLEST\_DELAY

- PRIORITY\_BASED

- type: string

MulticastAccessControl:

anyOf:

- type: string

enum:

- ALLOWED

- NOT\_ALLOWED

- type: string

RequestedQosMonitoringParameter:

anyOf:

- type: string

enum:

- DOWNLINK

- UPLINK

- ROUND\_TRIP

- type: string

ReportingFrequency:

anyOf:

- type: string

enum:

- EVENT\_TRIGGERED

- PERIODIC

- SESSION\_RELEASE

- EVENT\_TRIGGERED\_AND\_SESSION\_RELEASE

- PERIODIC\_AND\_SESSION\_RELEASE

- type: string

SmPolicyAssociationReleaseCause:

anyOf:

- type: string

enum:

- UNSPECIFIED

- UE\_SUBSCRIPTION

- INSUFFICIENT\_RES

- VALIDATION\_CONDITION\_NOT\_MET

- type: string

PduSessionRelCause:

anyOf:

- type: string

enum:

- PS\_TO\_CS\_HO

- type: string

#

\*\*\* 5th Change \*\*\*

### B.3.3.x Request report of EPS Fallback

When the "EPSFallbackReport" feature is supported, if the AF requests the PCF to report the EPS fallback for voice media type as described in subclauses 4.2.2.x or 4.2.3.x of 3GPP TS 29.514 [17] or in subclause E.x1 of 3GPP TS 29.214 [18], the PCF shall perform the PCC rule provisioning procedure as defined in subclause 4.2.6.2.1 and additionally provide the request of EPS fallback report to the SMF as follows:

- it shall include the "lastReqRuleData" attribute to contain the "reqData" attribute with the value "EPS\_FALLBACK" and the "refPccRuleIds" attribute to contain the related installed/modified PCC rule identifier(s) with 5QI=1.

- it shall provide the "EPS\_FALLBACK" policy control request rigger within the "policyCtrlReqTriggers" attribute, if not provided before.

\*\*\* 6th Change \*\*\*

### B.3.4.x Report of EPS Fallback

When the "EPSFallbackReport" feature is supported, if the "PolicyCtrlReqTriggers" attribute with the value "EPS\_FALLBACK" has been provided to the SMF, the SMF shall notify to the PCF of EPS fallback when a PCC rule referred from the "lastReqRuleData" attribute required the EPS fallback report within the "reqData" attribute.

When the SMF received a PDU session modification response from the access network indicating the establishment of the QoS flow with 5QI=1 is rejected due to EPS fallback, the SMF shall within the SmPolicyUpdateContextData data structure include:

- the "EPS\_FALLBACK" value within the "repPolicyCtrlReqTriggers" attribute; and

- the affected PCC rules within the "pccRuleIds" attribute included in the "ruleReports" attribute, where the "ruleStatus" attribute is set to ACTIVE.

The PCF shall identify the AF session that requested the voice media type that triggered the EPS fallback and shall notify the AF as described in subclauses 4.2.5.x of 3GPP TS 29.514 [17] or in subclause E.x1 of 3GPP TS 29.214 [18].

\*\*\* End of Changes \*\*\*