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Contents

Intellectual Property Rights	2
Legal Notice	2
Modal verbs terminology.....	2
Foreword.....	8
1 Scope	9
2 References	9
3 Definitions, symbols and abbreviations	10
3.1 Definitions	10
3.2 Abbreviations	11
4 Npcf_SMPolicyControl Service.....	11
4.1 Service Description	11
4.1.1 Overview	11
4.1.2 Service Architecture	11
4.1.3 Network Functions.....	12
4.1.3.1 Policy Control Function (PCF)	12
4.1.3.2 NF Service Consumers.....	12
4.1.4 Rules	13
4.1.4.1 General	13
4.1.4.2 PCC rules	13
4.1.4.2.1 PCC rules definition	13
4.1.4.2.2 PCC rules operation.....	16
4.1.4.3 Session rule	16
4.1.4.3.1 Session rules definition.....	16
4.1.4.3.2 Session rules operation.....	17
4.1.4.4 Policy Decision types.....	17
4.1.4.4.1 General	17
4.1.4.4.2 Traffic control data definition.....	17
4.1.4.4.3 QoS data definition.....	17
4.1.4.4.4 Charging data definition.....	18
4.1.4.4.5 UsageMonitoring data definition.....	19
4.1.5 Policy control request trigger	19
4.1.6 Requested rule data.....	19
4.1.7 Requested usage data.....	20
4.1.8 Condition data.....	20
4.2 Service Operations	20
4.2.1 Introduction.....	20
4.2.2 Npcf_SMPolicyControl_Create Service Operation	20
4.2.2.1 General	20
4.2.2.2 SM Policy Association establishment	21
4.2.2.3 Provisioning of charging related information for PDU session	23
4.2.2.3.1 Provisioning of Charging Addresses	23
4.2.2.3.2 Provisioning of Default Charging Method	24
4.2.2.4 Provisioning of revalidation time.....	24
4.2.2.5 Policy provisioning and enforcement of authorized AMBR per PDU session.....	24
4.2.2.6 Policy provisioning and enforcement of authorized default QoS.....	24
4.2.2.7 Provisioning of PCC rule for Application Detection and Control.....	24
4.2.2.8 3GPP PS Data Off Support	25
4.2.2.9 IMS Emergency Session Support.....	25
4.2.2.10 Request Usage Monitoring Control.....	25
4.2.2.11 Access Network Charging Identifier report	25
4.2.2.12 Request for the successful resource allocation notification.....	26
4.2.2.13 Request of Presence Reporting Area Change Report.....	26
4.2.2.14 Provisioning of IP Index Information	26
4.2.2.15 Negotiation of the QoS flow for IMS signalling	26

4.2.2.16	PCF resource cleanup.....	26
4.2.3	Npcf_SMPolicyControl_UpdateNotify Service Operation.....	26
4.2.3.1	General.....	26
4.2.3.2	SM Policy Association Update request.....	27
4.2.3.3	SM Policy Association termination request.....	28
4.2.3.4	Provisioning of revalidation time.....	29
4.2.3.5	Policy provisioning and enforcement of authorized AMBR per PDU session.....	29
4.2.3.6	Policy provisioning and enforcement of authorized default QoS.....	29
4.2.3.7	Provisioning of PCC rule for Application Detection and Control.....	29
4.2.3.8	3GPP PS Data Off Support.....	30
4.2.3.9	IMS Emergency Session Support.....	30
4.2.3.9.1	Provisioning of PCC rule.....	30
4.2.3.9.2	Removal of PCC Rules for Emergency Services.....	30
4.2.3.10	Request of Access Network Information.....	31
4.2.3.11	Request Usage Monitoring Control.....	31
4.2.3.12	Ipv6 Multi-homing support.....	31
4.2.3.13	Request for the result of PCC rule removal.....	31
4.2.3.14	Access Network Charging Identifier request.....	31
4.2.3.15	Request for the successful resource allocation notification.....	31
4.2.3.16	PCC Rule Error Report.....	31
4.2.3.17	IMS Restoration Support.....	32
4.2.3.18	P-CSCF Restoration Enhancement Support.....	32
4.2.3.19	Request of Presence Reporting Area Change Report.....	32
4.2.3.20	Session Rule Error Report.....	32
4.2.4	Npcf_SMPolicyControl_Update Service Operation.....	33
4.2.4.1	General.....	33
4.2.4.2	Requesting the update of the Session Management related policies.....	34
4.2.4.3	Request the policy based on revalidation time.....	35
4.2.4.4	Policy provisioning and enforcement of authorized AMBR per PDU session.....	36
4.2.4.5	Policy provisioning and enforcement of authorized default QoS.....	36
4.2.4.6	Application detection information reporting.....	36
4.2.4.7	Indication of QoS Flow Termination Implications.....	36
4.2.4.8	3GPP PS Data Off Support.....	37
4.2.4.9	Request and Report of Access Network Information.....	38
4.2.4.10	Request Usage Monitoring Control and Reporting Accumulated Usage.....	38
4.2.4.11	Ipv6 Multi-homing support.....	39
4.2.4.12	Request and report for the result of PCC rule removal.....	39
4.2.4.13	Access Network Charging Identifier request and report.....	39
4.2.4.14	Request and report for the successful resource allocation notification.....	40
4.2.4.15	PCC Rule Error Report.....	40
4.2.4.16	Presence Reporting Area Information Report.....	41
4.2.4.17	UE initiates a resource modification support.....	41
4.2.4.18	Trace Control.....	43
4.2.4.19	Negotiation of the QoS flow for IMS signalling.....	43
4.2.4.20	Notification about Service Data Flow QoS target enforcement.....	43
4.2.4.21	Session Rule Error Report.....	43
4.2.5	Npcf_SMPolicyControl_Delete Service Operation.....	44
4.2.5.1	General.....	44
4.2.5.2	SM Policy Association termination.....	44
4.2.5.3	Report Accumulated Usage.....	45
4.2.5.4	Report Access Network Information.....	45
4.2.6	Provisioning and Enforcement of Policy Decisions.....	45
4.2.6.1	General.....	45
4.2.6.2	PCC Rules.....	47
4.2.6.2.1	Overview.....	47
4.2.6.2.2	Gate function.....	48
4.2.6.2.3	Policy enforcement for authorized QoS per PCC Rule.....	48
4.2.6.2.4	Redirect function.....	48
4.2.6.2.5	Usage Monitoring Control.....	49
4.2.6.2.6	Traffic Steering Control support.....	49
4.2.6.2.6.1	Steering the traffic in the N6-LAN.....	49
4.2.6.2.6.2	Steering the traffic to a local access of the data network.....	49

4.2.6.2.7	Conditioned PCC rule.....	51
4.2.6.2.8	PCC rule for resource sharing	52
4.2.6.2.9	Resource reservation for services sharing priority.....	52
4.2.6.2.10	PCC rule bound to the default QoS flow	54
4.2.6.2.11	PCC rule for Application Detection and Control.....	54
4.2.6.2.12	Provisioning of PCC Rules for Multimedia Priority Services	54
4.2.6.2.12.1	General.....	54
4.2.6.2.12.2	Invocation/Revocation of Priority PDU connectivity services	55
4.2.6.2.12.3	Invocation/Revocation of IMS Multimedia Priority Services.....	56
4.2.6.2.13	Sponsored Data Connectivity	56
4.2.6.2.14	Support for PCC rule versioning	57
4.2.6.2.15	Background data transfer support.....	57
4.2.6.2.16	Number of supported packet filter for signalled QoS rule limitation support	57
4.2.6.3	Session Rules	58
4.2.6.3.1	Overview	58
4.2.6.3.2	Conditioned Session rule	58
4.2.6.3.2.1	General.....	58
4.2.6.3.2.2	Time conditioned authorized session AMBR	59
4.2.6.3.2.3	Time conditioned authorized default QoS	59
4.2.6.3.3	Provisioning of authorized default QoS	59
4.2.6.4	Policy control request triggers.....	60
4.2.6.5	Encoding of the request of information reporting	60
4.2.6.5.1	Request of Access Network Charging Identifier	60
4.2.6.5.2	RAN NAS Cause Support	60
4.2.6.5.3	Provisioning of the Usage Monitoring Control Policy	61
4.2.6.5.4	Request for Access Network Information	62
4.2.6.5.5	Request for the successful resource allocation notification	62
4.2.6.5.6	Provisioning of Presence Reporting Area Information	62
4.2.6.5.7	Policy provisioning and enforcement of reflective QoS	63
4.2.6.6	Authorized QoS.....	64
4.2.6.6.1	General	64
4.2.6.6.2	Policy provisioning and enforcement of authorized QoS per service data flow.....	65
4.2.6.6.3	Policy provisioning and enforcement of authorized explicitly signalled QoS Characteristics	66
5	Npcf_SMPolicyControl Service API	66
5.1	Introduction	66
5.2	Usage of HTTP.....	66
5.2.1	General.....	66
5.2.2	HTTP standard headers.....	67
5.2.2.1	General	67
5.2.2.2	Content type	67
5.2.3	HTTP custom headers.....	67
5.2.3.1	General	67
5.3	Resources	67
5.3.1	Resource Structure.....	67
5.3.2	Resource: SM Policies.....	68
5.3.2.1	Description	68
5.3.2.2	Resource definition	68
5.3.2.3	Resource Standard Methods.....	68
5.3.2.3.1	POST	68
5.3.2.4	Resource Custom Operations	69
5.3.3	Resource: Individual SM Policy	69
5.3.3.1	Description	69
5.3.3.2	Resource definition	69
5.3.3.3	Resource Standard Methods.....	69
5.3.3.3.1	GET	69
5.3.3.4	Resource Custom Operations	70
5.3.3.4.1	Overview	70
5.3.3.4.2	Operation: delete	70
5.3.3.4.2.1	Description.....	70
5.3.3.4.2.2	Operation Definition	70
5.3.3.4.3	Operation: update	70

5.3.3.4.3.1	Description.....	70
5.3.3.4.3.2	Operation Definition	70
5.4	Custom Operations without associated resources.....	71
5.5	Notifications	71
5.5.1	General.....	71
5.5.2	Policy Update Notification	71
5.5.2.1	Description	71
5.5.2.2	Operation Definition	71
5.5.3	Request for termination of the policy association.....	72
5.5.3.1	Description	72
5.5.3.2	Operation Definition	72
5.6	Data Model.....	72
5.6.1	General.....	72
5.6.2	Structured data types.....	78
5.6.2.1	Introduction.....	78
5.6.2.2	Type SmPolicyControl.....	79
5.6.2.3	Type SmPolicyContextData.....	80
5.6.2.4	Type SmPolicyDecision.....	83
5.6.2.5	Type SmPolicyNotification.....	85
5.6.2.6	Type PccRule	86
5.6.2.7	Type SessionRule.....	88
5.6.2.8	Type QosData	89
5.6.2.9	Type ConditionData	90
5.6.2.10	Type TrafficControlData.....	90
5.6.2.11	Type ChargingData	91
5.6.2.12	Type UsageMonitoringData	93
5.6.2.13	Type RedirectInformation	93
5.6.2.14	Type FlowInformation	94
5.6.2.15	Type SmPolicyDeleteData	94
5.6.2.16	Type QosCharacteristics	95
5.6.2.17	Type ChargingInformation.....	95
5.6.2.18	Type AccuUsageReport	96
5.6.2.19	Type SmPolicyUpdateContextData	97
5.6.2.20	Type UpPathChgEvent.....	99
5.6.2.21	Type TerminationNotification.....	99
5.6.2.22	Type AppDetectionInfo	99
5.6.2.23	Type AccNetChId	100
5.6.2.24	Type RequestedRuleData.....	100
5.6.2.25	Type RequestedUsageData	100
5.6.2.26	Type UeCampingRep.....	101
5.6.2.27	Type RuleReport	101
5.6.2.28	Type RanNasRelCause.....	101
5.6.2.29	Type UeInitiatedResourceRequest.....	102
5.6.2.30	Type PacketFilterInfo.....	102
5.6.2.31	Type RequestedQos	102
5.6.2.32	Type QosNotificationControlInfo	103
5.6.2.33	Type PartialSuccessReport.....	103
5.6.2.34	Type AuthorizedDefaultQos	104
5.6.2.35	Type AccNetChargingAddress	104
5.6.2.36	Type ErrorReport	105
5.6.2.37	Type SessionRuleReport.....	105
5.6.2.38	Type ServingNfIdentity	105
5.6.3	Simple data types and enumerations.....	105
5.6.3.1	Introduction.....	105
5.6.3.2	Simple data types	105
5.6.3.3	Enumeration: FlowDirection.....	106
5.6.3.4	Enumeration: ReportingLevel.....	106
5.6.3.5	Enumeration: MeteringMethod.....	106
5.6.3.6	Enumeration: PolicyControlRequestTrigger.....	107
5.6.3.7	Enumeration: RequestedRuleDataType	110
5.6.3.8	Enumeration: RuleStatus.....	110
5.6.3.9	Enumeration: FailureCode	111

5.6.3.10	Enumeration: AfSigProtocol	113
5.6.3.11	Enumeration: RuleOperation	113
5.6.3.12	Enumeration: RedirectAddressType	113
5.6.3.13	Enumeration: QosFlowUsage	114
5.6.3.14	Enumeration: FailureCause	114
5.6.3.15	Enumeration: FlowDirectionRm	114
5.6.3.16	Enumeration: CreditManagementStatus	115
5.6.3.17	Enumeration: SessionRuleFailureCode	115
5.7	Error handling	115
5.7.1	General	115
5.7.2	Protocol Errors	115
5.7.3	Application Errors	115
5.8	Feature negotiation	117
5.9	Security	118
Annex A (normative): OpenAPI specification		119
A.1	General	119
A.2	Npcf_SMPolicyControl API	119
Annex B (normative): 5GC and EPC interworking scenario support		142
B.1	Scope	142
B.2	Npcf_SMPolicyControl Service	142
B.2.1	Service Description	142
B.2.1.1	Overview	142
B.2.1.2	Service Architecture	142
B.3	Service Operation	143
B.3.1	Introduction	143
B.3.2	Npcf_SMPolicyControl_Create Service Operation	143
B.3.2.0	General	143
B.3.2.1	UE Location related information	144
B.3.2.2	Access Type related information	144
B.3.3	Npcf_SMPolicyControl_UpdateNotify Service Operation	144
B.3.3.0	General	144
B.3.3.1	Policy Update When UE suspends	144
B.3.4	Npcf_SMPolicyControl_Update Service Operation	145
B.3.4.0	General	145
B.3.4.1	Number of Supported Packet Filters Report	145
B.3.4.2	Policy Update When UE suspends	145
B.3.4.2.1	Policy Update Error Report	145
B.3.4.2.2	UE State Change Report	146
B.3.4.3	UE Location related information	146
B.3.4.4	Presence Reporting Area Information Report	146
B.3.4.5	Access Type related information	147
B.3.5	Npcf_SMPolicyControl_Delete Service Operation	147
B.3.5.1	General	147
B.3.6	Provisioning and Enforcement of Policy Decisions	147
B.3.6.1	QoS mapping performed by the SMF+PGW-C	147
B.3.6.2	Provisioning of Presence Reporting Area Information	148
Annex C (informative): Change history		149
History	159

Foreword

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1 Scope

The present document provides the stage 3 specification of the Session Management Policy Control Service of 5G system. The stage 2 definition and related procedures of the Session Management Policy Control Service are contained in 3GPP TS 23.502 [3] and 3GPP TS 23.503 [6]. The 5G System Architecture is defined in 3GPP TS 23.501 [2].

Stage 3 call flows are provided in 3GPP TS 29.513 [7].

The Technical Realization of the Service Based Architecture and the Principles and Guidelines for Services Definition of the 5G System are specified in 3GPP TS 29.500 [4] and 3GPP TS 29.501 [5].

The Policy Control Function with session related policies provides the Session Management Policy Control Service to the NF consumers (i.e. Session Management Function).

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [2] 3GPP TS 23.501: "System Architecture for the 5G System; Stage 2".
- [3] 3GPP TS 23.502: "Procedures for the 5G System; Stage 2".
- [4] 3GPP TS 29.500: "5G System; Technical Realization of Service Based Architecture; Stage 3".
- [5] 3GPP TS 29.501: "5G System; Principles and Guidelines for Services Definition; Stage 3".
- [6] 3GPP TS 23.503: "Policy and Charging Control Framework for the 5G System; Stage 2".
- [7] 3GPP TS 29.513: "5G System; Policy and Charging Control signalling flows and QoS parameter mapping; Stage 3".
- [8] IETF RFC 7540: "Hypertext Transfer Protocol Version 2 (HTTP/2)".
- [9] IETF RFC 8259: "The JavaScript Object Notation (JSON) Data Interchange Format".
- [10] OpenAPI: "OpenAPI 3.0.0 Specification", <https://github.com/OAI/OpenAPI-Specification/blob/master/versions/3.0.0.md>.
- [11] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces; Stage 3".
- [12] 3GPP TS 29.508: "5G System; Session Management Event Exposure Service; Stage 3".
- [13] 3GPP TS 29.244: "Interface between the Control Plane and the User Plane of EPC Nodes".
- [14] Void.
- [15] 3GPP TS 29.519: "5G System; Usage of the Unified Data Repository service for Policy Control Data, Application Data and Structured Data for Exposure; Stage 3".
- [16] 3GPP TS 23.228: "IP multimedia subsystem; Stage 2".
- [17] 3GPP TS 29.514: "5G System; Policy Authorization Service; Stage 3".

- [18] 3GPP TS 29.214: "Policy and Charging Control over Rx reference point 5".
- [19] 3GPP TS 32.291: "5G System; Charging service; Stage 3".
- [20] 3GPP TS 24.501: "Non-Access-Stratum (NAS) protocol for 5G System (5GS); Stage 3".
- [21] 3GPP TS 23.380: "IMS Restoration Procedures".
- [22] 3GPP TS 29.502: "5G System; Session Management Services; Stage 3".
- [23] 3GPP TS 29.212: "Policy and Charging Control (PCC); Reference points".
- [24] 3GPP TS 32.422: "Telecommunication management; Subscriber and equipment trace; Trace control and configuration management".
- [25] 3GPP TS 29.507: "5G System; Access and Mobility Policy Control Service; Stage 3".
- [26] 3GPP TS 23.060: "General Packet Radio Service (GPRS); Service description; Stage 2".
- [27] 3GPP TS 33.501: "Security architecture and procedures for 5G system".
- [28] IETF RFC 6749: "The OAuth 2.0 Authorization Framework".
- [29] 3GPP TS 29.510: "Network Function Repository Services; Stage 3".
- [30] 3GPP TS 32.290: "5G system; Services, operations and procedures of charging using Service Based Interface (SBI)".
- [31] IETF RFC 7807: "Problem Details for HTTP APIs".
- [32] 3GPP TS 29.122: "T8 reference point for Northbound APIs".
- [33] 3GPP TS 23.527: "5G System; Restoration Procedures".
- [34] 3GPP TS 29.503: "5G System; Unified Data Management Services; Stage 3".
- [35] 3GPP TS 32.255: "Charging management; 5G data connectivity domain charging; stage 2".
- [36] 3GPP TS 29.518: "5G System; Access and Mobility Management Services; Stage 3".
- [37] 3GPP TS 29.274: "3GPP Evolved Packet System (EPS); Evolved General Packet Radio Service (GPRS) Tunnelling Protocol for Control plane (GTPv2-C); Stage 3".
- [38] 3GPP TR 21.900: "Technical Specification Group working methods".

3 Definitions, symbols and abbreviations

3.1 Definitions

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

For the purposes of the present document, the following terms and definitions given in 3GPP TS 23.501 [2], subclause 3.1 apply:

5G QoS Identifier

PCC rule

PDU Session

Service Data Flow

Service Data Flow Filter**Service Data Flow Template**

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].

AF	Application Function
AMF	Access and Mobility Management Function
API	Application Programming Interface
CHF	Charging Function
DNN	Data Network Name
ePDG	evolved Packet Data Gateway
GFBR	Guaranteed Flow Bit Rate
GUAMI	Globally Unique AMF Identifier
HTTP	Hypertext Transfer Protocol
NEF	Network Exposure Function
NF	Network Function
NRF	Network Repository Function
PCC	Policy and Charging Control
PCF	Policy Control Function
PSAP	Public Safety Answering Point
QoS	Quality of Service
SDF	Service Data Flow
SMF	Session Management Function
S-NSSAI	Single Network Slice Selection Assistance Information
UDM	Unified Data Management
UDR	Unified Data Repository
UE	User Equipment

4 Npcf_SMPolicyControl Service

4.1 Service Description

4.1.1 Overview

The Session Management Policy Control Service performs provisioning, update and removal of session related policies and PCC rules by the Policy Control Function (PCF) to the NF service consumer (i.e. SMF). The Session Management Policy Control Service can be used for charging control, policy control and/or application detection and control. Session Management Policy Control Service applies to the cases where the SMF interacts with the PCF in the non-roaming scenario, the V-SMF interacts with the V-PCF in the local breakout roaming scenario and the H-SMF interacts with the H-PCF in the home-routed scenario.

4.1.2 Service Architecture

The Session Management Policy Control Service is provided by the PCF to the consumer and shown in the SBI representation model in figure 4.1.2-1 and in the reference point representation model in figure 4.1.2-2. The overall Policy and Charging Control related 5G architecture is depicted in 3GPP TS 29.513 [7].

The only known NF Service Consumer is the SMF.

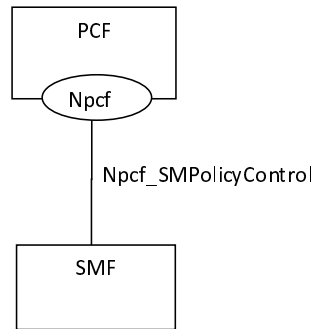


Figure 4.1.2-1: Reference Architecture for the Npcf_SMPolicyControl Service; SBI representation



Figure 4.1.2-2: Reference Architecture for the Npcf_SMPolicyControl Service; reference point representation

NOTE: The SMF represents the V-SMF and the PCF represents the V-PCF in the local breakout scenario. The SMF represents the H-SMF and the PCF represents the H-PCF in the home routed scenario.

4.1.3 Network Functions

4.1.3.1 Policy Control Function (PCF)

The PCF is responsible for policy control decisions and flow based charging control functionalities. The PCF provides the following:

- policies for application and service data flow detection, gating, QoS, flow based charging, traffic steering control, usage monitoring control, access network information report and RAN support information to the SMF.

The policy decisions made by the PCF may be based on one or more of the following:

- Information obtained from the AF, e.g. the session, media and subscriber related information;
- Information obtained from the UDR;
- Information obtained from the AMF, e.g. UE related and access related information;
- Information obtained from the SMF;
- Information obtained from the NWDAF;
- Information obtained from the NEF;
- information from CHF; and
- PCF pre-configured policy context.

4.1.3.2 NF Service Consumers

The SMF is responsible for the enforcement of session management related policy decisions from the PCF, related to service flow detection, QoS, charging, gating, traffic usage reporting and traffic steering