Oracle® Communications

Policy Control Function Cloud Native User's Guide

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Introduction

This document provides information on how to use the Policy Control Function and configure the services.

Overview

The Oracle Communications Policy Management solution is enhanced to add Policy Control Function that extends the functionality of PCRF as part of 5G core network. The Policy Control Function is a functional element for policy control decision and flows based charging control functionalities. The PCF provides the following functions:

- Policy rules for application and service data flow detection, gating, QoS, and flow based charging to the SMF.
- Access and Mobility Management related policies to the AMF.

Acronyms

Table 1-1 provides information about the acronyms used in the document.

Table 1-1   Acronyms

Acronym	Definition
5GC	5G Core Network
5GS	5G System
5G-AN	5G Access Network
5G-EIR	5G-Equipment Identity Register
5G-GUTI	5G Globally Unique Temporary Identifier
5G-S-TMSI	5G S-Temporary Mobile Subscription Identifier
5QI	5G QoS Identifier
AF	Application Function
AMF	Access and Mobility Management Function
AS	Access Stratum
AUSF	Authentication Server Function
BSF	Binding Support Function
CAPIF	Common API Framework for 3GPP northbound APIs
CP	Control Plane
DL	Downlink
DN	Data Network
DNAI	DN Access Identifier
DNN	Data Network Name
DRX	Discontinuous Reception

Table 1-1 (Cont.) Acronyms

Acronym	Definition
ePDG	evolved Packet Data Gateway
EBI	EPS Bearer Identity
FAR	Forwarding Action Rule
FQDN	Fully Qualified Domain Name
GFBR	Guaranteed Flow Bit Rate
GMLC	Gateway Mobile Location Centre
GPSI	Generic Public Subscription Identifier
GUAMI	Globally Unique AMF Identifier
HR	Home Routed (roaming)
LADN	Local Area Data Network
LBO	Local Break Out (roaming)
LMF	Location Management Function
LRF	Location Retrieval Function
MCX	Mission Critical Service
MDBV	Maximum Data Burst Volume
MFBR	Maximum Flow Bit Rate
MICO	Mobile Initiated Connection Only
MPS	Multimedia Priority Service
N3IWF	Non-3GPP InterWorking Function
NAI	Network Access Identifier
NEF	Network Exposure Function
NF	Network Function
NGAP	Next Generation Application Protocol
NR	New Radio
NRF	Network Repository Function
NSI ID	Network Slice Instance Identifier
NSSAI	Network Slice Selection Assistance Information
NSSF	Network Slice Selection Function
NSSP	Network Slice Selection Policy
NWDAF	Network Data Analytics Function
PCF	Policy Control Function
PDR	Packet Detection Rule
PEI	Permanent Equipment Identifier
PER	Packet Error Rate
PFD	Packet Flow Description
PPD	Paging Policy Differentiation
PPF	Paging Proceed Flag
PPI	Paging Policy Indicator
PSA	PDU Session Anchor
QFI	QoS Flow Identifier
QoE	Quality of Experience
(R)AN	(Radio) Access Network
RQA	Reflective QoS Attribute

Table 1-1 (Cont.) Acronyms

Acronym	Definition
RQI	Reflective QoS Indication
SA NR	Standalone New Radio
SBA	Service Based Architecture
SBI	Service Based Interface
SD	Slice Differentiator
SEAF	Security Anchor Functionality
SEPP	Security Edge Protection Proxy
SMF	Session Management Function
SMSF	Short Message Service Function
S-NSSAI	Single Network Slice Selection Assistance Information
SSC	Session and Service Continuity
SSCMSP	Session and Service Continuity Mode Selection Policy
SST	Slice/Service Type
SUCI	Subscription Concealed Identifier
SUPI	Subscription Permanent Identifier
TNL	Transport Network Layer
TNLA	Transport Network Layer Association
TSP	Traffic Steering Policy
UDM	Unified Data Management
UDR	Unified Data Repository
UDSF	Unstructured Data Storage Function
UL	Uplink
UL CL	Uplink Classifier
UPF	User Plane Function
URSP	UE Route Selection Policy
VID	VLAN Identifier
VLAN	Virtual Local Area Network

References

User can refer to the following documents for information.

- Oracle Communications Policy Control Function Cloud Native User's Guide.

2

Policy Control Function Architecture

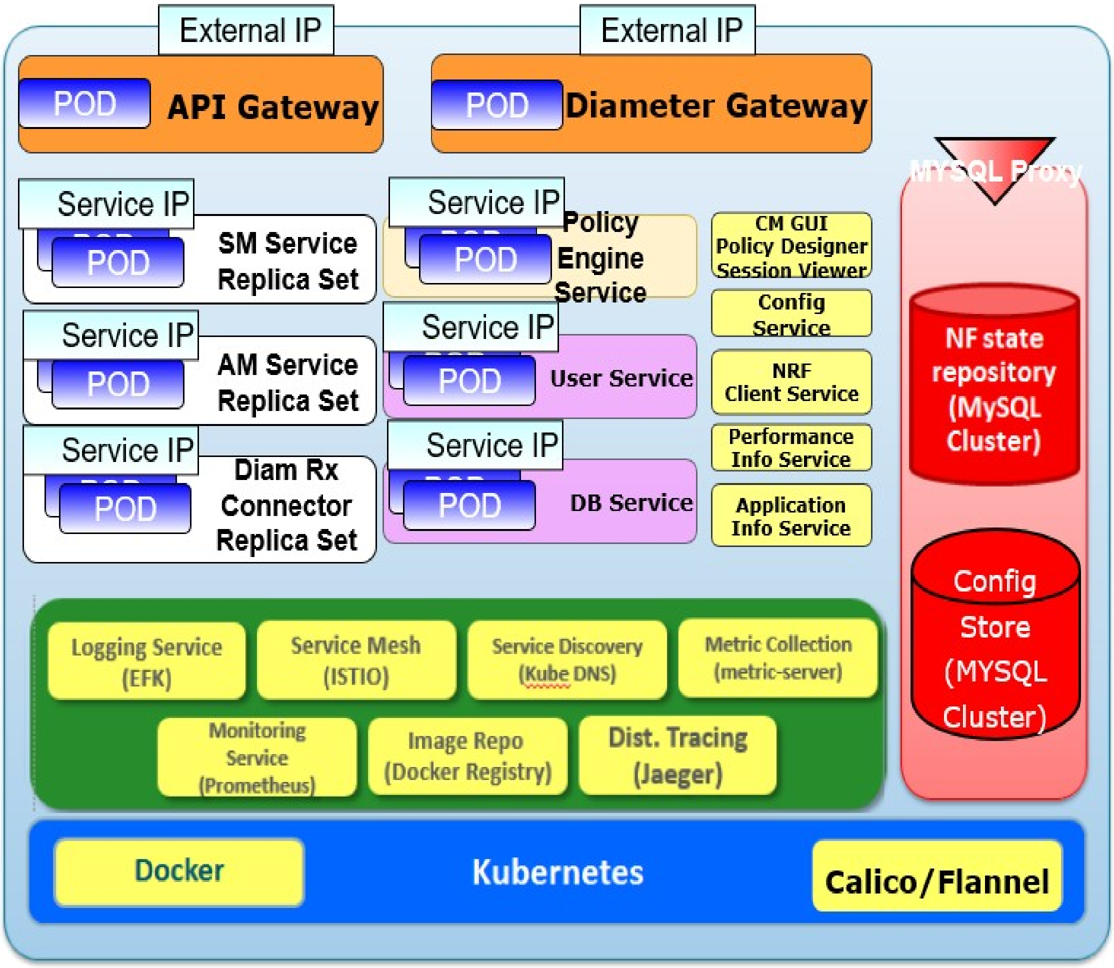
The Oracle Communications Policy Management solution is enhanced to add Policy Control Function that extends the functionality of PCRF as part of 5G core network. The Policy Control Function is a functional element for policy control decision and flows based charging control functionalities.

The PCF provides the following functions:

- Policy rules for application and service data flow detection, gating, QoS, and flow based charging to the SMF.
- Access and Mobility Management related policies to the AMF.
- Micro-services based Cloud-Native Architecture
- Policy Design Evolution to support modular and flexible Domain Driven Policy design
- Compliant with 3GPP Release 15 specifications
- Product supports Session Management, Access management and Authorization policy control services
- Flexible, user friendly Policy Design Framework for rapid policy use case deployments
- Pluggable Data Sources to ingest input from a variety of data sources (UDR, LDAP, Analytics, etc.)
- Support of different Deployment Options - PLMN level, slice shared and slice specific

The Oracle Communications Policy Control Function is built as a cloud-native application composed of a collection of microservices running in a cloud-native environment. It separates processing/business logic and state concerns following the corresponding logical grouping of microservices/components:

Figure 2-1 PCF Architecture



- **Connectivity**: Components interfacing with external entities. This is where an API gateway is utilized to interface with external traffic to the PCF. These are stateless sets of components.
- **Business logic**: Application layer running the PCRF/PCF business logic, policy engine and various services that can be enabled based on deployment needs. These are stateless sets of components.
- **Data Management**: Data layer responsible for storing various types of persistent data. The PCF is built to be able to plug in different types of backend data layers that could be internal or external.

3

About Policy Design Experience

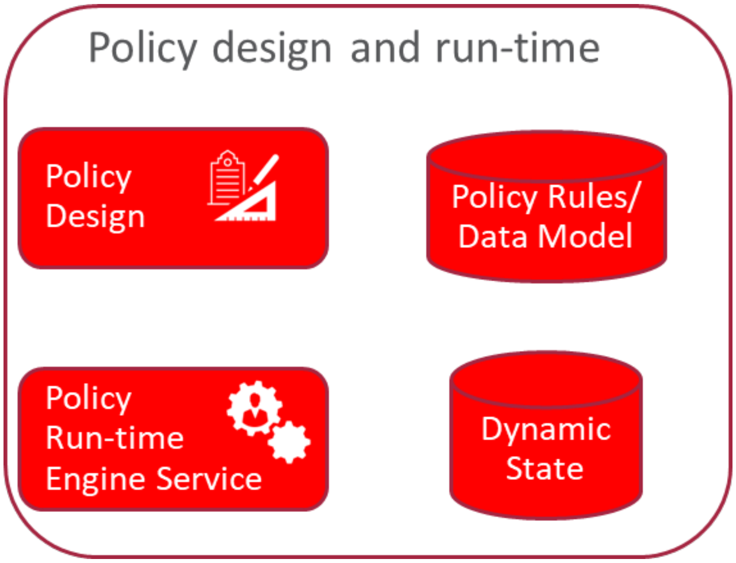
Policy design experience allows an operator to craft and deploy, from scratch, operator policies in production in very less time. 5G brings the policy design experience to the next level by providing flexibility, extensibility, modularization, and assurance to the operator to rapidly, yet confidently deploy new operator policies and enable use cases more faster.

The Policy Control Function packages its micro-services into containers and leverages Kubernetes' constructs and abstractions such as Pods, ReplicaSets, and services so it can enable Kubernetes to manage and orchestrate the PCF. It also leverages Istio as a service mesh (including Envoy proxies as sidecars) for the internal communication amongst the various micro-services. The Oracle PCF integrates with a variety of common services for data collection, analysis, and visualization services for operational aspects like logs, metrics, and traces. The Oracle 5GC PCF comprises artifacts like Helm charts that encapsulate lifecycle instructions and resource dependencies for all member components.

The Oracle PCF is flexible to run in various cloud-native environments. The Policy Control Function can be configured to leverage common services provided by the cloud-native environment and/or provide its own set if certain common services aren't provided by the underlying environment.

The following figure highlights the various components used by the policy design and run-time:

Figure 3-1 Policy Design Experience



Design

- Modular and flexible domain driven policy design

- Modules encompasses data model, triggers, conditions and actions
- Modules can be designed via a GUI (very intuitive, can be used by anyone) and allows any language supported by JVM for advances cases if needed (e.g. Java, Groovy, etc)
- Pre-packaged modules provided by Oracle
- Modules can be extended or built by operators

Run-time

- Run-time engine service to expose APIs
- Run-time engine service to be stateless and independently scalable
- Newly designed policies or policy updates can be rolled out in an incremental fashion (e.g. to a specific set of policy run-time engines) to enable canary releases and ensure updates are working as expected before being rolled out globally

Debugging and testing

- Debugging policy logic capability as a complementary tool to the design experience
- Automated testing framework to enable regression and validation of policy logic and modules before deployment

4

About Policy Control Function Services

About Session Management Service

PCF extends SM Policy service over the N7 interface for session management. Session management in 5G network is service equivalent to Gx interface in traditional EPC core.

Session management supports the following:

- PCC rule authorization
- QoS enforcement
- Subscriber-specific policy enforcement

For configuring session management service, see Configuring Session Management Service.

Configuring Session Management Service

You can edit and refresh the session management service.

Table 4-1 Session Management Service Fields

Field	Description
System	
Log level	Indicates the log level of PCF SM Service. **Default Value**: WARN **Type**: String **Expert Cfg**: FALSE
Component Tracing	Determines if component tracing is enabled. Component tracing is used to evaluate system process latency in detail level. **Default Value**:FALSE **Type**: Boolean **Expert Cfg**: TRUE
Server Root URL	This is PCF SM Service API Root URI. It is part of PCF SM Service URI:{apiRoot}/npcf-smpolicycontrol/v1/sm-policies. This value is auto injected at service deployment. User can also configure this manually. **Default Value**:N/A **Type**: String **Expert Cfg**: TRUE

Table 4-1 (Cont.) Session Management Service Fields

Field	Description
FQDN	This is the PCF FQDN used by the PCF to register Binding data to BSF. AF may use this FQDN to communicate with PCF on N5 reference point. **Default Value**: pcf-smservice.pcfn **Type**: String **Expert Cfg**: TRUE
Diameter Realm	This is the PCF diameter realm used by the PCF to register Binding data to BSF. Diameter based AF may use this diameter realm to communicate with PCF on Rx reference point. **Default Value**: pcf-smservice.svc **Type**: String **Expert Cfg**: TRUE
Diameter Identity	This is the PCF diameter identity used by the PCF to register Binding data to BSF. Diameter based AF may use this diameter identity to communicate with PCF on Rx reference point. **Default Value**: pcf-smservice **Type**: String **Expert Cfg**: TRUE
snssai	This is the PCF SNSSAI used by the PCF to register Binding data to BSF. AF/BSF may use this SNSSAI to discover proper PCF. **Format**: sst,sd. **Default Value**: 0,000000 **Type**: String **Expert Cfg**: TRUE
Enable Metrics	This determines if system metrics is enabled. This will take priority on global metrics config. **Default Value**: TRUE **Type**: Boolean **Expert Cfg**: FALSE
User	
Validate User	Determines if user validate is enabled. HTTP 400 with cause **USER_UNKNOWN** returns, if this is enabled and user not found in UDR. **Default Value**: FALSE **Type**: Boolean **Expert Cfg**: FALSE
Query User	Determines if user query from UDR is enabled. **Default Value**: TRUE **Type**: Boolean **Expert Cfg**: TRUE

Table 4-1   (Cont.) Session Management Service Fields

Field	Description
Query User on Update	Determines if user query from UDR on update is enabled. **Default Value**: FALSE **Type**: Boolean **Expert Cfg**: TRUE
Query User on Delete	Determines if user query from UDR on delete is enabled. **Default Value**: FALSE **Type**: Boolean **Expert Cfg**: TRUE
Query User on Reauth	Determines if user query from UDR on reuath is enabled. **Default Value**: FALSE **Type**: Boolean **Expert Cfg**: TRUE
Subscribe to Notify	Determines if subscribe to nofity about subscriber data change is enabled. **Default Value**: TRUE **Type**: Boolean **Expert Cfg**: FALSE
Policy	
Evaluate	This determines if policy evaluate is enabled. **Default Value**: TRUE **Type**: Boolean **Expert Cfg**: FALSE
Policy control Request Trigger	
Default Policy Control Request Triggers	This is the default Policy Control Request Trigger(s) to install on PDU session at SM Policy Association Establishment. This is a comma split string. **Default Value**: PLMN_CH,UE_IP_CH,DEF_QOS_CH,AC_TY_CH **Type**: String **Expert Cfg**: FALSE
Binding Operation	This determines if binding operation (register and deregister) to the BSF is enabled. **Default Value**: TRUE **Type**: Boolean **Expert Cfg**: FALSE
Binding Use Local Configuredbsf(is it BSF) Always	Whether to use local configured BSF without discovering. **Default Value**: FALSE **Type**: Boolean **Expert Cfg**: FALSE

Table 4-1 (Cont.) Session Management Service Fields

Field	Description
Binding User Local Configured BSF When Not Discovered	Whether to use local configured (if having) BSF when not discovered or discover failed. **Default Value**: TRUE **Type**: Boolean **Expert Cfg**: FALSE
Use HTTP2	Determines if using http/2 to communicate with BSF. Otherwise use http/1.1. **Default Value**: TRUE **Type**: Boolean **Expert Cfg**: TRUE
QoS	
Qos Data Id Prefix	This is the prefix of qos data id used by PCF to generate qos data id. For example, prefix is "qosdata_", the generated qos data id is qosdata_0, chgdata_1, etc. **Default Value**: qosdata_ **Type**: String **Expert Cfg**: TRUE
update Default Pcf Rule With Auth Def Qos	This determines whether to update Qos of default PccRule with the authDefQos of session rule **Default Value**: TRUE **Type**: Boolean **Expert Cfg**: TRUE
Install Default Qos If Not Requested	This determines whether to install default Qos to the PDU session if UE not requested **Default Value**: TRUE **Type**: Boolean **Expert Cfg**: TRUE
Default Qos 5qi	This is the 5Qi of default Qos which will be applied if no default Qos is requested by UE **Default Value**: 9 **Type**: Integer **Expert Cfg**: TRUE
Default Qos Arp Preempt Cap	This is the ARP PreemptionCapability of default Qos which will be applied if no default Qos is requested by UE **Default Value**: MAY_PREEMPT **Type**: String **Expert Cfg**: TRUE
Default Qos Arp Preempt Vuln	This is the ARP PreemptionVulnerability of default Qos which will be applied if no default Qos is requested by UE **Default Value**: NOT_PREEMPTABLE **Type**: String **Expert Cfg**: TRUE

Table 4-1 (Cont.) Session Management Service Fields

Field	Description
Default Qos Arp Priority Level	This is the ARP Priority Level of default Qos which will be applied if no default Qos is requested by UE **Default Value**: 1 **Type**: Integer **Expert Cfg**: TRUE
Rule	
Install Default Pcc Rule	This determine whether and how to install default pcc rule for a PDU session • ALWAYS • IF_NO_PROVISIONED_RULE: Only if no other provisioned rule is configured • IF_NO_RULE: Only if no other rule (predefined or provisioned) is configured/installed • NEVER **Default Value**: IF_NO_RULE **Type**: String **Expert Cfg**: TRUE
Rule Id Prefix	This is the prefix of rule id of the pcc rule or session rule auto generated by PCF. for example, prefix is "0_", the generated rule id is 0_0, 0_1, etc. **Default Value**: 0_ **Type**: String **Expert Cfg**: TRUE
Default Pcc Rule 5qi	This is the 5Qi of default pcc rule. **Default Value**: 9 **Type**: Integer **Expert Cfg**: FALSE
Default Pcc Rule Precedence	This is the precedence of default pcc rule. **Default Value**: 3000 **Type**: Integer **Expert Cfg**: FALSE
Default Pcc Rule Arp Preempt Cap	This is the ARP PreemptionCapability of qos of default PCC rule. • NOT_PREEMPT • MAY_PREEMPT **Default Value**: NOT_PREEMPT **Type**: String **Expert Cfg**: FALSE
Default Pcc Rule Arp Preempt Vuln	This is the ARP PreemptionVulnerability of qos of default pcc rule • NOT_PREEMPTABLE • PREEMPTABLE **Default Value**: PREEMPTABLE **Type**: String **Expert Cfg**: FALSE

Table 4-1 (Cont.) Session Management Service Fields

Field	Description
App Rule Precedence Min	This value defines the minimum value for precedence of a PCC rule as authorized by the establishment of an application flow by the AF. If multiple rules are applied to the same packet flow or UE resource (i.e., overlapping rules) a rule with lower precedence value takes the priority over a rule with higher precedence value. The value of -1 is used to not set the precedence of a rule (NOT RECOMMENDED). **Default Value**: 400 **Type**: Integer **Expert Cfg**: TRUE
App Rule Precedence Max	This value defines the maximum value for precedence of a PCC rule as authorized by the establishment of an application flow by the AF. If multiple rules are applied to the same packet flow or UE resource (i.e., overlapping rules) a rule with lower precedence value takes the priority over a rule with higher precedence value. The value of -1 is used to not set the precedence of a rule (NOT RECOMMENDED). **Default Value**: 899 **Type**: Integer **Expert Cfg**: TRUE
Default Pcc Rule Arp Priority Level	This is the ARP Priority Level of qos of default pcc rule The range is 1 to 15. Values are ordered in decreasing order of priority, for example, with 1 as the highest priority and 15 as the lowest priority. **Default Value**: 15 **Type**: Integer **Expert Cfg**: FALSE
Switch Flow In To Out Enabled	This determines whether to switch "in" to "out" in flow description. The src and desc will be switched as well. For example, if enabled, "permit in ip from 2800:a00:cc01:c056:1c00:de10:c481:f193/128 to 2800:a00:800:7::1:3b/128 36004" will be changed to "permit out ip from 2800:a00:800:7::1:3b/128 36004 to 2800:a00:cc01:c056:1c00:de10:c481:f193/128" **Default Value**: FALSE **Type**: Boolean **Expert Cfg**: TRUE
Charging	
Charging Data Id Prefix	This is the prefix of chg data id used by PCF to generate chg data id. For example, prefix is "chgdata_", the generated chg data id is chgdata_0, chgdata_1, etc. **Default Value**: chgdata_ **Type**: String **Expert Cfg**: TRUE

Table 4-1 (Cont.) Session Management Service Fields

Field	Description
Traffic Control	
Traffic Control Id Prefix	This is the prefix of traffic control data id used by PCF to generate tc data id. For example, prefix is "tcdata_", the generated tc data id is tcdata_0, tcdata_1, etc. **Default Value**: tcdata_ **Type**: String **Expert Cfg**: TRUE

About Access and Mobility Service

Access and Mobility Policy Control Service in PCF is responsible for handling interaction with AMF to privide policy rules including:

Policy Type	Destination	Sub Policy Type
Access control and mobility management related policy	to AMF	SAR (Service Area Restriction)
	to AMF	RFSP (Rat Frequency Selection Priori

AM Policy Association establishes, modifies, and terminates the session initiated by AMF and PCF.

Configuring Access and Mobility Service

You can edit and refresh the access and mobility service.

Table 4-2 Access and Mobility Service Fields

Field	Description
System	
Log level	Indicates the log level of PCF AM Service. **Default Value**: WARN **Type**: String
Log Level	
Use Policy Service	If selected, uses the policy service. Component tracing is used to evaluate system process latency in detail level. **Default Value**:TRUE **Type**: Boolean
Use User Service	If selected uses the user service **Default Value**:TRUE **Type**: String
Is Subscribe	Indicates whether service is subscribed. **Default Value**: TRUE **Type**: String

Table 4-2 (Cont.) Access and Mobility Service Fields

Field	Description
Enable Http2 Client	Enables http2 client **Default Value**: TRUE **Type**: String
App	
Default Service Area Restriction	Determines the service area restriction.
Default Rfsp	Indicates the default Rfsp value.
Default Triggers	Indicates the default triggers.

5 Configuring Policy Control Function

This section provides the information for configuring policy control function for various services.

Configuring NRF Client Service

User can configure nrfclient service by configuring the resources in their repository.

Table 5-1 provides the list of resources for configuring the nrf client service.

Table 5-1 NRF Client Services Resources

Resource	Resource URI	HTTP Method or Custom Operation	Description
nf-instances (Store)	{apiRoot}/nnrf-nfm/v1/nf-instances	GET	Read a collection of NF Instances.
nf-instance (Document)	{apiRoot}/nnrf-nfm/v1/nf-instances/{nfInstanceID}	GET	Read the profile of a given NF Instance.
		PUT	Register in NRF a new NF Instance, or replace the profile of an existing NF Instance, by providing an NF profile.
		PATCH	Modify the NF profile of an existing NF Instance.
		DELETE	Deregister from NRF a given NF Instance.
subscriptions (Collection)	{apiRoot}/nnrf-nfm/v1/subscriptions	POST	Creates a new subscription in NRF to newly registered NF Instances.
subscription (Document)	{apiRoot}/nnrf-nfm/v1/subscriptions/{subscriptionID}	DELETE	Deletes an existing subscription from NRF.
Notification Callback	{nfStatusNotificationUri}	POST	Notify about newly created NF Instances, or about changes of the profile of a given NF Instance.

Configuring Session Rule Service

You can create and manage session rules from the Session Rule Management screen. The page provides information about the existing session rules. You can create or refresh the session rules from this page.

> **Note:**
>
> Only administrators can create session rules.

1. From the navigation menu, under **Configurations**, click **Session Rule**. The Session Rule Management screen appears.
2. Click **Create**. The create session page appears.
3. In the **ID** field, enter the session ID details.
4. In the **Name** field, enter the name for the session.
5. (Optional) In the **Description** field, enter the information about the session rule.
6. In **Authorized Session AMBR** section, enter the following:
   a. In the **Up Link Bandwidth** field, enter the bandwidth details.
   b. In the **Down Link Bandwidth** field, enter the bandwidth details. The bandwidth can be entered in bps, Kbps, Mbps, Gbps, and Tbps.
7. Click **Save** to create the session rule or click **Cancel**. If you have clicked **Save**, a new session rule is created.
8. Click **Edit** to edit the details of session rule.
9. Click **Delete** to delete the session rule.

Managing Session Rule Profile

You can create and manage session rule profiles from Session Rule Profile Management screen. The page provides information about the existing session rule profiles. You can create or refresh the session rule profiles from this page.

> **Note:**
>
> Only administrators can create a session rule profile.

To create a session rule profile:

1. From the navigation menu, under Configurations, click **Session Rule Profile**.
   The Session Rule Profile Management screen appears.
2. Click **Create**.
   The create session page appears.
3. In the **ID** field, enter the session ID details.
4. In the **Name** field, enter the name for the session.
5. (Optional) In the **Description** field, enter the information about the session rule.
6. In **Authorized Session AMBR** section, enter the following:
   a. In the **Up Link Bandwidth** field, enter the bandwidth details.
   b. In the **Down Link Bandwidth** field, enter the bandwidth details.
   The bandwidth can be entered in bps, Kbps, Mbps, Gbps, and Tbps.

7. Click **Save** to create the session rule profile or click **Cancel**. If you have clicked **Save**, a new session rule profile is created.
8. Click **Edit** to edit the details of session rule.
9. Click **Delete** to delete the session rule.

Managing Service Area Restriction

You can create and manage service restrictions from Service Area Restriction Management screen. The page provides information about the existing service restrictions. You can create or refresh the session rule profiles from this page.

> **Note:**
>
> Only administrators can create a session rule profile.

To create a session rule profile:

1. From the navigation menu, under **Configurations**, click **Service Area Restriction**.
   The Service Area Restriction Management screen appears.
2. Click **Create**.
   The create session page appears.
3. In the **ID** field, enter the session ID details.
4. In the **Name** field, enter the name for the session.
5. (Optional) In the **Description** field, enter the information about the session rule.
6. In **Restriction Type** drop-down, select the restriction type. The available types are:
   a. - ALLOWED_AREAS
      - NOT_ALLOWED_AREAS
7. In **Areas** section, click **Create**.
   The Create screen appears.
   a. In the **Tacs** field, enter the Tac details.
   b. In the **Area Codes** field, enter the area code.
   c. Click **Save** to create the area or click **Cancel**. The area is created. You can create multiple areas.
8. Click **Save** to create the session rule profile or click **Cancel**. If you have clicked **Save**, a new session rule profile is created.
9. Click **Edit** to edit the details of session rule.
10. Click **Delete** to delete the session rule.

Managing Authorized Default Qos

You can create and manage QoS from Authorized Default Qos Management screen. The page provides information about the existing QoS. You can create or refresh the QoS profiles from this page.

> **Note:**
>
> Only administrators can create QoS.

To create a QoS:

1. From the navigation menu, under **Configurations**, click **QoS Information**.
   The Authorized Default Qos Management screen appears.
2. Click **Create**. The create QoS page appears.
3. The **ID** field, enter the session ID details.
4. In the **Name** field, enter the name for the QoS.
5. (Optional) In the **Description** field, enter the information about the session rule.
6. In **Default 5G QoS Identifier** field, enter a number between 0 to 255.
7. In the **Priority Level** field, enter a number between o and 127.
8. In the **Average Window** field, enter the window information
9. In **Max DataBurstVol** field, enter the details.
10. In the **arp** section, do the following:
    1. In the **Priority Level** field, enter a number between o and 15.
    2. From **Preemption Capacity** drop-down, select one of the following:
       - NOT_PREEMPT
       - MAY_PREEMPT
    3. From **Preemption Vulnerability** drop-down, select one of the following:
       - NOT_PREEMPTABLE
       - PREEMPTABLE
11. Click **Save** to create the session rule profile or click **Cancel**. If you have clicked **Save**, a new session rule profile is created.

Managing PCC Rule

You can create and manage PCC rules from PCC Rules Management screen. The page provides information about the existing PCC Rules. You can create or refresh the PCC rules from this page.

> **Note:**
>
> Only administrators can create PCC rules.

To create a PCC rule:

1. From the navigation menu, under **Configurations**, click PCC Rule. The PCC Rule Management screen appears.
2. Click **Create**. The create PCC Rule page appears.

3. The **PCC Rule** field is not editable.
4. In the **Name** field, enter the name for the QoS.
5. (Optional) In the **Description** field, enter the information about the session rule.
6. In **Type** drop-down, select the type of PCC rule. The available PCC rules are:
   - Predefined PCC Rule
   - Dynamic PCC Rule
7. (Optional) If selected predefined PCC Rule in step 6, click **Save** to create PCC Rule or click **Cancel** to discard changes.
8. (Optional) If selected dynamic PCC Rule in step 6, perform the following:
   a. In **Flow Infos** section, select the existing flow info or create a new one by clicking **Create** and filling in the detail as mentioned in the Table 5-2.
9. In the **APP ID** field,
10. In the **Content Version** field,
11. In the **Precedence** field,
12. In the AF Signalling Protocol drop-down, select one of the following options:
    - NO_INFORMATION
    - SIP
13. In the **Application Relocation** field,
14. In the **QoS Data** field,
15. In the **Traffic Control Data** field,
16. In the **Charging Data** field,
17. In the **Usage Monitoring Data** field,
18. In the **Condition Data** field,
19. Click **Save** to create PCC Rule or click **Cancel** to discard changes.

Table 5-2 Flow Info Fields

Field	Description
Name	Indicates the name for the flow
PAck Filt ID	An identifier of packet filter.
Packet Filter Usage	The packet shall be sent to the UE. The default value "FALSE" shall apply, if the attribute is not present and has not been supplied previously.
Tos Traffic Class	Contains the Ipv4 Type-of-Service and mask field or the Ipv6 Traffic-Class field and mask field.
SPI	The security parameter index of the IPSec packet.
Flow Label	The Ipv6 flow label header field.
Flow Direction	Indicates the flow direction. Select from the following options: • DOWNLINK • UPLINK • BIDIRECTIONAL • UNSPECIFIED

Table 5-2 (Cont.) Flow Info Fields

Field	Description
Flow Description	Indicates the details about flow. Enter a description for the flow.
Ethernet Flow Description	
Dset Mac Address	A string indicating MAC address. Enter a valid MAC address. For example, 3D-F2-C9-A6-B3-4F
Ethernet Type	Indicates the ethernet.
Flow Description	Indicates the details about flow. Enter a description for the flow.
Flow Direction	Indicates the flow direction. Select from the following options: • DOWNLINK • UPLINK • BIDIRECTIONAL • UNSPECIFIED
Source Mac Address	Enter a MAC Address. For example, 3D-F2-C9-A6-B3-4F
VLAN Tags	Indicates the VLAN tags.
Save	Click to create a Flow.
Cancel	Click to discard changes.

Managing PCC Rule Profile

You can manage, view, import, export and create the PCC rule profiles from PCC Rule Profile screen.

> **Note:**
>
> Only administrators can create PCC rules.

To create a PCC rule profile:

1. From the navigation menu, under **Configurations**, click **PCC Rule Profile**.

   The PCC Rule Profile Management screen appears.

2. Click **Import** and drag the files or click to upload the files from your local machine.

   The supported formats are application/json files.

3. Click **Export All** to export the PCC Rule profiles.
4. Click **Create**.

   The create PCC Rule page appears.

5. Follow the instructions in the Managing PCC Rule.

Managing QoS Data

You can manage, view, import, export and create the QoS Data from QoS Data Management screen.

> **Note:**
>
> Only administrators can create QoS data.

To create a QoS Data:

1. From the navigation menu, under **Configurations**, click **QoS Data**.
   The QoS Data Management screen appears.
2. Click **Import** and drag the files or click to upload the files from your local machine.
   The supported formats are application/json files.
3. Click **Export All** to export the QoS Data.
4. Click **Create** and fill the details as mentioned in the below table o create QoS Data.

Field	Description
QoS Id	Univocally identifies the QoS control policy data within a PDU session.
Name	The name of the Qos Data
Description	The description of the Qos Data
Default 5G QoS Identifier	Identifier for the authorized QoS parameters for the service data flow. It shall be included when the QoS data decision is initially provisioned and "defQosFlowIndication" is not included or is included and set to false.
Maximum Bit Rate UL	Indicates the max bandwidth in uplink.
Maximum Bit Rate DL	Indicates the max bandwidth in downlink.
Guaranteed Bit Rate UL	Indicates the guaranteed bandwidth in uplink.
Guaranteed Bit Rate DL	Indicates the guaranteed bandwidth in downlink.
ARP	
Priority Level	Defines the relative importance of a resource request.
Preemption Capacity	Defines whether a service data flow may get resources that were already assigned to another service data flow with a lower priority level.
Preemption Vulnerability	Defines whether a service data flow may lose the resources assigned to it in order to admit a service data flow with higher priority level.
QoS Notification Control	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. Default value is "FALSE", if not present and has not been supplied previously.

Field	Description
Reflective QoS	Indicates whether the QoS information is reflective for the corresponding service data flow. Default value is "FALSE", if not present and has not been supplied previously.
Sharing Key UI	Indicates, by containing the same value, what PCC rules may share resource in uplink direction.
Sharing Key DI	Indicates, by containing the same value, what PCC rules may share resource in downlink direction.
Priority Level	Defines the relative importance of a resource request.
Averaging Window	Represents the duration over which the guaranteed and maximum bitrate shall be calculated (NOTE).
Maximum Data Burst Volume	Denotes the largest amount of data that is required to be transferred within a period of 5G-AN PDB (NOTE).
Maximum Packet Loss Rate DI	Indicates the downlink maximum rate for lost packets that can be tolerated for the service data flow.
Maximum Packet Loss Rate DI	Indicates the downlink maximum rate for lost packets that can be tolerated for the service data flow.
Maximum Packet Loss Rate UI	Indicates the uplink maximum rate for lost packets that can be tolerated for the service data flow.
Default QoS Flow Indication	Indicates that the dynamic PCC rule shall always have its binding with the QoS Flow associated with the default QoS rule. Default value is "FALSE", if not present and has not been supplied previously.
Save	Click to create qos data record.
Cancel	Click to cancel the changes.

Managing Charging Data

You can manage, view, import, export and create the Charging Data from Charging Data Management screen.

> **Note:**
>
> Only administrators can create Charging data

To access a Charging Data:

1. From the navigation menu, under **Configurations**, click **Charging Data**.
   The Charging Data Management screen appears.
2. Click **Import** and drag the files or click to upload the files from your local machine.
   The supported formats are application/json files.

3. Click **Export All** to export the charging data.
4. Click **Create** and fill the details as mentioned in the below table o create Charging Data.

Field	Description
Chg Id	Univocally identifies the charging control policy data within a PDU session.
Name	The name of the Charging Data
Description	The description of the Charging Data
Metering Method	The following options are available • DURATION • VOLUME • DURATION_VOLUME • EVENT Defines what parameters shall be metered for offline charging. If the attribute is not present but it has been supplied previously, the previous information remains valid. If the attribute is not present and it has not been supplied previously or the attribute has been supplied previously but the attribute is set to NULL, the metering method pre-configured at the SMF is applicable as default metering method.
Offline	Indicates the offline charging is applicable to the PDU session or PCC rule. The default value "FALSE" shall apply, if the attribute is not present and has not been supplied previously. (NOTE)
Online	Indicates the online charging is applicable to the PDU session or PCC rule. The default value "FALSE" shall apply, if the attribute is not present and has not been supplied previously. (NOTE)
Rating Group	The charging key for the PCC rule used for rating purposes.
Reporting Level	The following options are available: • SER_ID_LEVEL • RAT_GR_LEVEL • SPON_CON_LEVEL Defines on what level the SMF reports the usage for the related PCC rule. If the attribute is not present but it has been supplied previously, the previous information remains valid. If the attribute is not present and it has not been supplied previously or the attribute has been supplied previously but it is set to NULL, the reporting level pre-configured at the SMF is applicable as default reporting level.
Service Id	Indicates the identifier of the service or service component the service data flow in a PCC rule relates to.
Sponsor Id	Indicates the sponsor identity.
App Sv Prov Id	Indicates the application service provider identity.

Field	Description
Af Charging Identifier	Indicates the identifier of the service or service component the service data flow in a PCC rule relates to.
Save	Click to create charging data record.
Cancel	Click to cancel the changes.

Managing Usage Monitoring Data

You can manage, view, import, export and create the Usage Monitoring Data from Usage Monitoring Data Management screen.

> **Note:**
>
> Only administrators can create usage monitoring data.

To create a usage monitoring data:

1. From the navigation menu, under **Configurations**, click **Usage Monitoring Data**. The Usage Monitoring Data Management screen appears.
2. Click **Import** and drag the files or click to upload the files from your local machine. The supported formats are application/json files.
3. Click **Export All** to export the Usage Monitoring Data.
4. Click **Create** and fill the details as mentioned in the below table o create Usage Monitoring Data.

Field	Description
Um Id	Univocally identifies the usage monitoring policy data within a PDU session.
Name	The name of the UsageMonitoring Data
Description	The description of the UsageMonitoring Data
Volume Threshold	Indicates the total volume threshold.
Volume Threshold Uplink	Indicates a volume threshold in uplink.
Volume Threshold Downlink	Indicates a volume threshold in downlink.
Time Threshold	Indicates a time threshold.
Monitoring Time	Indicates the time at which the UP function is expected to reapply the next thresholds (e.g. nextVolThreshold)
Next vol Threshold Uplink	Indicates a volume threshold in uplink after the Monitoring Time.
Next Vol Threshold Downlink	Indicates al volume threshold in downlink after the Monitoring Time.
NExt Time Threshold	Indicates a time threshold after the Monitoring.
Inactivity Time	Defines the period of time after which the time measurement shall stop, if no packets are received.

Field	Description
ex Usage PccRule Ids	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.
Save	Click to create usage monitoring data record.
Cancel	Click to cancel the changes.

Managing Traffic Control Data

You can manage, view, import, export and create the traffic control data from the Traffic Control Data Management screen.

To create traffic conditional data:

1. From the navigation menu, under **Configurations**, click **Traffic Control Data**.
   The Traffic Control Data Management screen appears.
2. Click **Import** and drag the files or click to upload the files from your local machine.
   The supported formats are application/json files.
3. Click **Export All** to export the Traffic Control Data.
4. Click **Create** and fill the details as mentioned in the below table to create the Traffic Control Data.

Field	Description
Tc Id	Univocally identifies the traffic control policy data within a PDU session.
Name	The name of the Traffic Control policy data
Description	The description of the Traffic Control policy data
Flow Status	The following options are available: • ENABLED-UPLINK • ENABLED-DOWNLINK • ENABLEd • DISABLED • REMOVED Enum determining what action to perform on traffic. Possible values are: [enable, disable, enable_uplink, enable_downlink] . The default value "ENABLED" shall apply, if the attribute is not present and has not been supplied previously.
Redirect Information	
Redirect Enabled	Indicates the redirect is enable
Redirect Access Type	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.
Redirect Server Address	Indicates the address of the redirect server.
Mute Notification	Indicates whether application's start or stop notification is to be muted. The default value "FALSE" shall apply, if the attribute is not present and has not been supplied previously.

Field	Description
Traffic Steering Pol Id DL	Reference to a pre-configured traffic steering policy for downlink traffic at the SMF.
Traffic Steering Pol Id UI	Reference to a pre-configured traffic steering policy for uplink traffic at the SMF.
Route To Locs	
Dnai	Identifies the location of the application.
Route Information	Includes the traffic routing information.
IPV4 Addr	Ipv4 address of the tunnel end point in the data network.
Ipv6 Addr	Ipv6 address of the tunnel end point in the data network.
Port number	UDP port number of the tunnel end point in the data network.
Route Profile Id	Identifies the routing profile Id.
Up Path Chg Event	
Notification Uri	
Notification Correlation Id	It is used to set the value of Notification Correlation ID in the notification sent by the SMF.
Dnai Change Type	The following options are available: • EARLY • EARLY_LATE • LATE Possible values are - EARLY: Early notification of UP path reconfiguration. - EARLY_LATE: Early and late notification of UP path reconfiguration. This value shall only be present in the subscription to the DNAI change event. - LATE: Late notification of UP path reconfiguration. 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.
Save	Click to create traffic control data record.
Cancel	Click to cancel the changes.

Managing Condition Data

You can manage, view, import, export and create the Condition Data from Condition Data Management screen.

> **Note:**
>
> Only administrators can create condition data

To create a condition Data:

1. From the navigation menu, under **Configurations**, click **Condition Data**.
   The Condition Data Management screen appears.
2. Click **Import** and drag the files or click to upload the files from your local machine.

The supported formats are application/json files.

3. Click **Export All** to export the Condition Data.
4. Click **Create** and fill the details as mentioned in the below table o create Condition Data.

Field	Description
Cond Id	Uniquely identifies the condition data within a PDU session.
Name	The name of the Condition Data policy data
Description	The description of the Condition Data policy data
Activation Time	The time when the decision data shall be activated.
Deactivation Time	The time when the decision data shall be deactivated.
Save	Click to create condition data record.
Cancel	Click to cancel the changes.

Viewing Sessions

To view the sessions:

1. From the navigation menu, click **Session Viewer**.
   The Session Viewer page appears.
2. From the **Session Type** drop-down menu, select the session type whose sessions you want to view. The available options are:
   - SM Policy Association
   - AM Policy Association
3. In the **Policy Association ID** field, enter the session ID number.
4. Click **Query**.

Configuring Match List

User can create and manage match list from Match List Management screen. The page provides information about the existing match lists. You can import, export, create or refresh the match list from this page.
To create a match list:

1. From the navigation menu, under **Common Configurations**, click **Match List**.
   The Match List Management screen appears.
2. Click **Create**.
   The create match list page appears.
3. In the **ID** field, enter the match ID details.
4. In the **Name** field, enter the name for match list.
5. (Optional) In the **Description** field, enter the information about the match list.
6. In the Item drop-down, select one of the following:

- String
- Wildcard String

7. Click **Save** to create the match list or click **Cancel**. If you have clicked **Save**, a new match list is created.
8. Click **Edit** to edit the details of match list.
9. Click **Delete** to delete the match list.

6
Managing Policy

You can create and manage Policy projects.

Managing Policy Projects

User can create, edit and delete project from this page.

Creating Policy Project

To create a policy project:

- Click **Create**.
- In the **Name** field, enter the name for the project.
- In the **Description** field, enter the description for the project.
- In the **Service Type**, select the service.
- Click **Save** to create the project.

Deleting Policy Project

To delete a policy project, select the project, and click **Delete**. Confirm the deletion.

7

Administering Policy Control Function

This section provides information for performing system administration.

As an administrator user can perform the following:

- Managing Users
- Managing Roles
- Managing Data Model
- Managing Dynamic Configuration Menu Demo

Managing Users

The Manage Users page gives information about the users, their roles and their permissions. You can import, export, and create users, edit, and delete users from this page.

To create a user:

1. From the Home page, navigate to **System Administration**, and click **User Management**. The User Manage page appears.
2. Click **Create**. The Create User page appears.
3. In the **User Name** field, enter the username.
4. In the **Password** field, enter the password.
5. In the **Confirm Password** field, enter the password provided in te step 4.
6. Click **Save** to create user or click **Cancel** to discard the changes.

You can import bulk users by clicking **Import** and uploading the appropriate file with user information.

Managing Roles

User can view and create new roles from this page.

To create roles:

1. From the Home page, navigate to **System Administration**, and click **Role Manage**. The Role Manage page appears.
2. Click **New Role**.
   The Create New Role page appears.
3. In the **Role Name** field, enter the name for the role
4. In the **Privileges** field, select the privileges for the role.

5. Click **Save** to create the role or click **Cancel**.

   A new role will be created.

Managing Data Model

The Data model page provides the details of existing data model services. You can create new services.

To create a data model service:

1. From the Home page, navigate to **System Administration**, click **Data Model** and then click **Create**.
   The create data model service appears.
2. In the **Name** field, enter the name for the service.
3. In the **Label Nam**e field, enter the label name.
4. In the **Description** field, enter the description of the service.
5. From the **Type** drop-down, select the type of service. The available options are:
   - enum
   - Object
6. Do one of the following:
   - If you have selected **Enum** in step 6, in the Enum section, perform the following:
     a. Click **Create**.
     b. In the **Name** field, enter the name of the Enum
     c. In the **Value** field, enter a value.
     d. Click **Save** to create Enum or click **Cancel** to discard the changes.
   - If you have selected **Object** in step 6, in the Fields section, perform the following:
     a. Click **Create**.
     b. In the **Name** field, enter the name of the Field.
     c. In the **Description** field, enter the description of the service.
     d. In the **Label Nam**e field, enter the label name.
     e. From the **Type** drop-down, select the type of service. The available options are:
        - Primitive
        - Object
        - Array
     f. Based on the above selection, the description field appears. Fill the details accordingly.
        - **Primitive Type**: Select the primitive type from the drop-down list. Available options are:
          - String
          - Number
          - Boolean

- **Object Type**: Select the object type from the drop-down list.
- **Item Type**: Select the type from **Type** drop-down list and the object type from the **Object Type** drop-down list.

g. Click **Save** to create the field or click **Cancel** to discard the changes.

7. Click **Save** to create the data model service or click **Cancel** to discard the changes.

You can also import and export the data.

Managing Dynamic Configuration Menu Demo

The Dynamic Configuration Menu Demo page allows you to manage dynamic configuration.
You can import, export, and create new configurations.
To create a Dynamic Configuration Menu Demo service:

1. From the Home page, navigate to **System Administration**, click **Dynamic Configuration Menu Demo** and then click **Create**.
   The Create Dynamic Configuration page appears.
2. In the **Name** field, enter the name for the service.
3. In the **Label Name** field, enter the label name.
4. In the **Topic** field, enter the topic details.
5. From the **Parent Menu** drop-down list, select one of the following
   - Services
   - Configurations
6. Turn on/off **Auto Generate ID**.
7. In the **Description** field, enter the description of the service.
8. From the **Data Model** drop-down, select the type of service.
9. Click **Save** to create the field or click **Cancel** to discard the changes.