

UDR Interface

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Feature Summary and Revision History

Summary Data

Table 1: Summary Data

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

Revision History

Table 2: Revision History

Revision Details	Release
Enhancement introduced. Introduced changes related to the Nudr_DataRepository service.	2020.02.0
First introduced.	2020.01.0

Feature Description

The PCF interfaces with the User Data Repository (UDR) to receive subscriber-related policies for User Equipment (UE) attach and session establishment. When a UE attaches to the network, AMF requires AM policies of the subscriber from PCF for the UE. Similarly, when a UE makes a PDU Session, SMF requires policy rules from PCF. Subscriber attributes are stored in the UDR. PCF communicates with UDR to receive these attributes which are used in the evaluation of policies.

PCF invokes the Nudr_DataRepository service to retrieve the AM and SM Policy attributes. PCF carries out the discovery of UDR URL through the Nnrf_NFDiscovery service which is NRF service.

API Details

Description	API URI	Request Parameters	Response Parameters
Retrieves the access and mobility policy data for a subscriber.	{apiRoot}/nudr-dr/v1/policy-data/ues/{ueId}/am-data	Path and Query	200 Ok AmPolicyData
Retrieves the session management policy data for a subscriber.	{apiRoot}/nudr-dr/v1/policy-data/ues/{ueId}/sm-data	Path and Query	200 Ok SmPolicyData

Important The UE Id in the API represents the SUPI or GPSI.

Parameter Details

PCF supports the following parameters:

AMPolicy Query Parameters

Table 3: AMPolicy Query Parameters

Parameter Name	Parameter Type	Description
ueId	Path	SUPI or GPSI

AmPolicyData

Table 4: AmPolicyData

Parameter Name	Parameter Type	Description
ueId	Path	SUPI or GPSI
AmPolicyData	-	List of category identifiers associated with the subscriber.

SmPolicy Query Parameters

Table 5: SmPolicy Query Parameters

Parameter Name	Parameter Type	Description
ueId	Path	SUPI or GPSI
Snssai	Query	Identifies single network slice selection assistance information.
Dnn	Query	Identifies a Data Network Name.
Fields	Query	Attributes to be received.

SmPolicyData

Before configuring the SmPolicyData parameters, make sure that in the Policy Builder the policy subscriber AVP field has the following keys:

- allowedServices
- subscCats

Table 6: smPolicySnssaiData Object

Parameter Name	Description
smPolicySnssaiData	The Session Management Policy data per S-NSSAI for all the SNSSAIs of the subscriber. The key of the map is the S-NSSAI. **Note** The SmPolicySnssaiData parameter contains the Snssai and SmPolicyDnnData objects.

Table 7: Snssai Object

Parameter Name	Description
Snssai	Identifies a single network slice selection assistance information.

Table 8: SmPolicyDnnData objects

Parameter Name	Description
Dnn	Identifies the Data Network Name.
allowedServices	List of subscriber’s allowed service identifiers.
subscCats	List of categories associated with the subscriber.
gbrUl	Maximum aggregate UL bitrate that is provided across all GBR QoS Flows in the DNN.

Parameter Name	Description
gbrDl	Maximum aggregate DL bitrate that is provided across all GBR QoS Flows in the DNN.
adcSupport	Indicates whether application detection and control that is enabled for a subscriber.
subscSpendinglimits	Indicates whether PCF must enforce policies that are based on subscriber spending limits.
ipv4Index	Information that identifies which IP pool or external server that is used to allocate the IPv4 address.
ipv6Index	Information that identifies which IP pool or external server that is used to allocate the IPv6 address.
Offline	Indicates that the offline charging is applicable to the PDU session.
Online	Indicates that the online charging is applicable to the PDU session.
chfInfo	Address of the charging function.
usageMonDataLimits	Contains a list of usage monitoring profiles that are associated with the subscriber. The monitoring key that is used as the key in the map.
usageMonData	Contains the remaining allowed usage data that are associated with the subscriber. The monitoring key that is used as the key in the map.
mpsPriority	Indicates subscription to the MPS priority service. Priority applies to all traffic on the PDU Session.
imsSignallingprio	Indicates subscription to the IMS signaling priority service. Priority only applies to IMS signaling traffic.
mpsPrioritylevel	Relative priority level for the multimedia priority services.
smPolicySnssaiData	The Session Management Policy data per S-NSSAI for all the SNSSAIs of the subscriber. The key of the map is the S-NSSAI.



Note The PCF does not support the UDR-N36 response data fields such as umDataLimits and umData.

How it Works

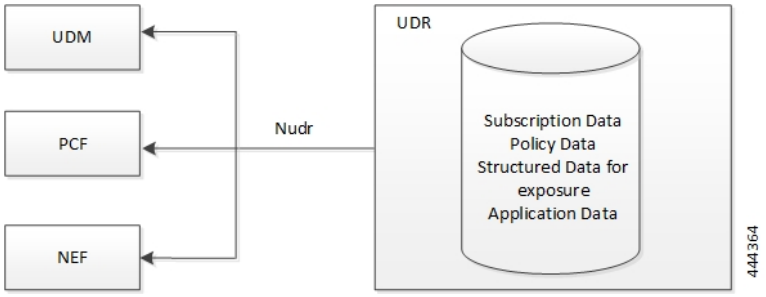
This section describes how this feature works.

The User Data Repository (UDR) provisions PCF to retrieve the data stored in the UDR through the Nudr_DataRepository service. The service is also responsible for enabling the NF to subscribe and unsubscribe to the data change notifications from UDR. In particular to PCF, the Nudr_DataRepository service provides the following retrieve services to access policy control-related subscription information and application-specific information that is stored in the UDR:

- Subscription to notifications from the UDR on changes in the policy control-related subscription information.
- Subscription to the UDR for the AF requests targeting a DNN and S-NSSAI or a group of UEs (roaming UEs for LBO case) that are identified by an Internal Group Identifier.
- Subscription to notifications from the UDR on the update of AF requests targeting a DNN and S-NSSAI or a group of UEs (roaming UEs for LBO case) identified by an Internal Group Identifier.

The N36 reference point is defined for the interactions between PCF and UDR in the following reference point representation.

Figure 1: N36 Reference Point



Call Flows

This section describes the key call flows for this feature.

AM Policy Subscription Call Flow

This section describes the AM Policy Subscription call flow .

Figure 2: AM Policy Subscription Call Flow

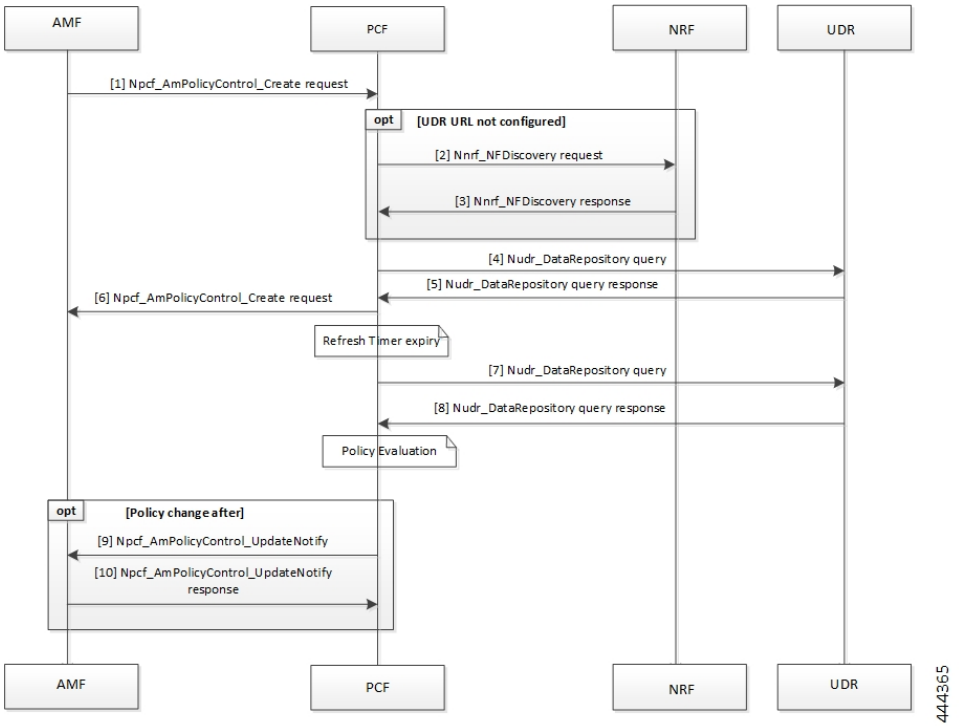


Table 9: AM Policy Subscription Call Flow Description

Step	Description
1	The AMF sends a Npcf_AmPolicyControl_Create request to the PCF.
2	If the UDR URL is not configured, the PCF sends the Nnrf_NFDiscovery request is sent to NRF.
3	In response, the NRF sends the Nnrf_NFDiscovery results to the PCF.
4	The PCF sends the Nudr_DataRespository query to the UDR.
5	In response, the UDR sends the repository details to the PCF.
6	The PCF sends the Npcf_AmPolicyControl_Create request to the AMF.
7	The PCF sends the Nudr_DataRepository query to the UDR.
8	The UDR responds to PCF with the repository information.
9	After PCF evaluates the response, if the policy has modified, then the PCF sends the Npcf_AmPolicyControl_UpdateNotify request to the AMF.
10	The AMF sends the Update Notification as a response to the PCF.

SM Policy Subscription Call Flow

This section describes the SM Policy Subscription call flow.

Figure 3: SM Policy Subscription Call Flow

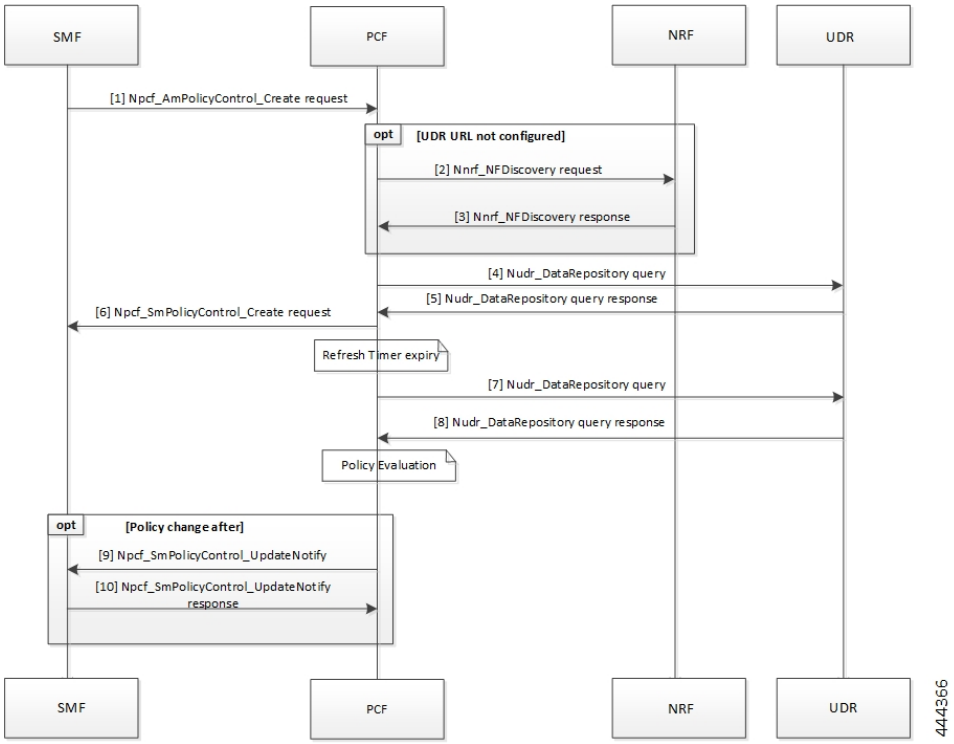


Table 10: SM Policy Subscription Call Flow Description

Step	Description
1	The SMF sends a Npcf_SmPolicyControl_Create request to the PCF.
2	If the UDR URL is not configured, the PCF sends the Nnrf_NFDiscovery request to NRF.
3	In response, the NRF sends the Nnrf_NFDiscovery results to the PCF.
4	The PCF sends the Nudr_DataRespository query to the UDR.
5	In response, the UDR sends the repository details to the PCF.
6	The PCF sends the Npcf_SmPolicyControl_Create request to the SMF.
7	The PCF sends the Nudr_DataRepository query to the UDR.
8	The UDR responds to PCF with the repository information.
9	After PCF evaluates the response, if the policy has modified, then the PCF sends the Npcf_SmPolicyControl_UpdateNotify request to the SMF.
10	The SMF sends the Update Notification as a response to the PCF.

Configuring the UDR Base URL

This section describes how to configure the UDR base URL discovery.

You must configure the UDR base URL for discovering profiles. The base URL aids in navigating to the mapped UDR. In the absence of the UDR base URL, the NRF's base URL is queried for the UDR base URL on the discovered profiles.

To configure the UDR base URL, use the following configuration in the Policy Ops Center console:

```
config
  nrfDiscovery
    nfType
      locality
        client client_name
        geoServer server_name
        preferredServer server_name
      nrfDiscoveryGroup
        subscriptionEnabled [ true | false ]
        subscriptionExtension extension_count
        type nf_type
        end
```

NOTES:

- **nrfDiscovery**—Enters the NRF discovery configuration mode.
- **locality**—Enters the locality configuration mode. The PCF REST endpoint considers the locality configuration.
- **client** *client_locality*—Specify the client locality of used by the NRF endpoint.
- **geoServer** *server_name*—Specify the geo redundant site of the preferred locality.
- **preferredServer** *preferred_locality* —Specify the server that is configured as the preferred server. Preferred locality takes precedence over the geo locality while using the service of the discovered NF (UDR).
- **nrfDiscoveryGroup**—Enters the NRF discovery group configuration.
- **subscriptionEnabled [true | false]** —Configures the subscription capability.
- **subscriptionExtension** *extension_count*—Specify the count for which the subscription can be extented.
- **type** *nf_type*—Specify the NF type. For this configuration, it should be UDR.

Standards Compliance

This feature complies with the following standards specifications:

- *3GPP TS 23.501 "System Architecture for the 5G System "*
- *3GPP TS 23.502 "Procedures for the 5G System (5GS)"*

- *3GPP TS 23.503 "Policy and charging control framework for the 5G System (5GS)"*
- *3GPP TS 29.508 "Session Management Event Exposure Service"*
- *3GPP TS 29.512 "Session Management Policy Control Service"*
- *3GPP TS 29.513 "Policy and Charging Control signalling flows and QoS parameter mapping"*
- *3GPP TS 29.519 V15.4.0 "Usage of the Unified Data Repository Service for Policy Data, Application Data and Structured Data for Exposure"*

Filtering the Profile Data

PCF queries the subscriber attributes that are mapped in additional profiles from UDR for the N7 interface. Based on the UDR response, the attributes that are returned are mapped to the subscriber attribute. The allowed services that are returned can be mapped to the services associated with the subscriber.

For information on how to configure the additional profile data, see Setting Up Additional Profile Data.

In Policy Builder, you can access the following filters under **Domain > Additional Profile Data > Filter**:

- SUPI
- GPSI