

NF Set and NF Service Set

Table 1: Feature History

Feature Name	Release Information	Description
NF Set and NF Service Set	2023.04	PCF supports the configuration of NF Set and NF Service Set feature by using the `Set ID` attribute in `service-registration` CLI commands. **Default Setting**: Disabled – Configuration required to enable

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Feature Summary and Revision History

Summary Data

Table 2: 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 3: Revision History

Revision Details	Release
First introduced.	2023.04.0

Feature Description

Policy Control Function (PCF) implements the NF Set and NF Service Set in compliance to the 3GPP Release 17 specifications.

NF Set and NF Service Set supports the following functionalities:

- NF Set and Service Set for the services produced by PCF (smpolicycontrol(N7), ampolicycontrol(N15) and policyauthorization(N5).
- PCF register and update of NRF, UDR and CHF call-back services.
- NF Set and Service Set support for UDR and CHF.

How it Works

This section describes how NF Set and NF Service feature works.

NF Register

Constructing NF Set ID and NF Service Set ID

PCF constructs the NF Set ID and NF Service Set ID in the following formats.

Following is the format for NF Set Identifier:

```
set<Set ID>.<nftype>set.5gc.mnc<MNC>.mcc<MCC> for a NF Set in a PLMN
 or
set<Set ID>.<nftype>set.5gc.nid<NID>.mnc<MNC>.mcc<MCC> for a NF Set in a SNPN
```

Following is the format for NF Service Set Identifier:

```
set<Set ID>.sn<Service Name>.nfi<NF Instance ID>.5gc.mnc<MNC>.mcc<MCC> for a NF Service Set
 in a PLMN
or
set<Set ID>.sn<Service Name>.nfi<NF Instance ID>.5gc.nid<NID>.mnc<MNC>.mcc<MCC> for a NF
Service Set
in a SNPN
```

Ops Center Configuration for Populating Set ID Part of NF Set ID

To configure this feature, use the following configuration:

```
config
   service-registration profile nf-set set-id <value>
   end
```

NOTES:

- **service-registration**—Enters the service registration configuration mode.
- **profile**—Enters the profile configuration mode.

Following is an example:

```
service-registration profile locality pcf01
service-registration profile capacity 20
service-registration profile priority 10
service-registration profile nf-status REGISTERED
service-registration profile plmn-list 100 010
service-registration profile nf-set set-id  <value>
service-registration profile snssais
1 sd ABCDEF
```

Ops Center Configuration for Notification Services

Added the following options for notification services:

- chfNotificationService
- udrNotificationService
- nrfNotificationService

To configure this feature, use the following configuration:

```
config
service-registration services chfNotificationService
service-name <value>
nf-service-set service-set-id <value>
end
```

NOTES:

- **service-registration**—Enters the service registration configuration mode.
- **services**—Enters the services configuration mode.

Following is an example:

```
service-registration services chfNotificationService
service-name <value>
nf-service-set service-set-id <value>
```

Note Configure only the Set ID part of NF Service Set ID using the CLI and other attributes can be derived.

NRF Register and NRF Update

PCF registers or updates to NRF using the `Nnrf_NFManagement_NFRegister` API by passing following additional attributes to support the NF Set and NF Service Set:

- NFProfile
  - nfSetIdList
- NFService
  - nfServiceSetIdList

NF Service Discovery

Ops Center CLI changes in Profile for NF Set ID and NF Service Set ID

Added the following attributes for configuration:

- NF Set ID - **nf-set-id-list**
- NF Service Set ID - **nf-service-set-id**

To configure this feature, use the following syntax:

```
config
   profile nf-pair nf-type nf-set-id-list
   end
```

```
config
   profile nf-client nf-type nf-set-id-list
   end
```

Following is an example:

```
profile nf-pair nf-type CHF
 nrf-discovery-group    nrf-discovery-group
 subscription-enabled   true
 subscription-extension 3
 locality client  pcf01
 locality preferred-server loc1
 locality geo-server loc2
 nf-set-id-list set-id chfset1 mcc 111 mnc 12
 exit
 nf-service-set-id-list service-set-id chfservice nf-instance-id
54804518-4191-46b3-955c-ac631f953ed8 mcc 111 mnc 12
 exit
exit

profile nf-client nf-type chf
 chf-profile chfprofile
  locality SW
   priority 10000
   service name type nchf-spendinglimitcontrol
    nf-service-set-id-list [service-set-id list]
    endpoint-profile chfprofile
     capacity   10
     priority   30
     uri-scheme http
     version
      uri-version v1
      exit
     exit
     nf-set-id-list set-id chfset1 mcc 111 mnc 11
     exit
```

```
    nf-service-set-id-list service-set-id spendlimit1 nf-instance-id 54804518-4191-46b3-
  955c-ac631f953ed8 mcc 111 mnc 11
    exit
    endpoint-name ep1
     primary ip-address ipv4 10.191.26.65
     primary ip-address port 1090
     secondary ip-address ipv4 10.191.153.129
     secondary ip-address port 1090
    exit
    endpoint-name ep2
     primary ip-address ipv4 10.191.26.64
     primary ip-address port 1090
     secondary ip-address ipv4 10.191.153.128
     secondary ip-address port 1090
    exit
   exit
  exit
 exit
exit
```

Note PCF uses the Set ID and Service Set ID values from the CLI and use them for NF set aware Discovery and Retry.

NF Set Aware Discovery

If the NF Set ID or NF Service Set ID is available in the client profile, the PCF requests to NRF using the `Nnrf_NFDiscovery_request` API by passing the following additional query params to select the NF services based on the NF Set ID or NF Service Set ID:

- - target-nf-set-id
- - target-nf-service-set-id

NF Set Aware Retry and Re-selection

NF selection retry and re-selection are done first within the same NF Service Set and then within the same NF Set.

Bulk Statistics Support

Added the following KPIs for NF Selection based on the SetID and Service SetID:

- **outgoing_request_total_nfset**

  {[illegible]}
  1.0

- **outgoing_request_time_nfset**

  {[illegible]}
  1.000907281

- **outbound_request_failure_unable**{[illegible]}
  2.0

- [illegible]
  1.0