**3GPP TSG-CT WG4 Meeting #110-eC4-223320**

**E-Meeting, 12th – 20th May 2022 Revision of C4-223021**

|  |
| --- |
| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **29.510** | **CR** | **0715** | **rev** | **1** | **Current version:** | **17.5.0** |  |
|  |
| *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:***  | MBSF/MB-STF profiles in NRF |
|  |  |
| ***Source to WG:*** | Samsung |
| ***Source to TSG:*** | CT4 |
|  |  |
| ***Work item code:*** | 5MBS |  | ***Date:*** | 2022-05-17 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-17 |
|  | *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 canbe 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-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
|  |  |
| ***Reason for change:*** | This CR adds MBSF/MBSTF NF-Services and NF-Types in NRF |
| ***a*** |  |
| ***Summary of change:*** | Update NFType and ServiceName parameters |
|  |  |
| ***Consequences if not approved:*** | MBSF/MBSTF profiles cannot be discovered via NRF |
|  |  |
| ***Clauses affected:*** | 6.1.6.3.3, 6.1.6.3.11, A.2 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** | This CR introduces backward compatible new feature to the following OpenAPI files:- TS29510\_Nnrf\_NFManagement.yaml- TS29510\_Nnrf\_NFDiscovery.yaml |
|  |  |
| ***This CR's revision history:*** | Rev1: Added changes to Clause 4, NFDiscovery API as affected API |

\* \* \* \* First Change \* \* \* \*

# 4 Overview

The Network Function (NF) Repository Function (NRF) is the network entity in the 5G Core Network (5GC) supporting the following functionality:

- Maintains the NF profile of available NF instances and their supported services;

- Maintains the SCP profile of available SCP instances;

- Maintains the SEPP profile of available SEPP instances;

- Allows other NF or SCP instances to subscribe to, and get notified about, the registration in NRF of new NF instances of a given type or of SEPP instances. It also allows SCP instances to subscribe to, and get notified about, the registration in NRF of new SCP instances;

- Supports service discovery function. It receives NF Discovery Requests from NF or SCP instances, and provides the information of the available NF instances fulfilling certain criteria (e.g., supporting a given service);

- Support SCP discovery function. It receives NF Discovery Requests for SCP profiles from other SCP instances, and provides the information of the available SCP instances fulfilling certain criteria (e.g., serving a given NF set);

- Support SEPP discovery function. It receives NF Discovery Requests for SEPP profiles from other NF or SCP instances, and provides the information of the available SEPP instances fulfilling certain criteria (e.g. supporting connectivity with a remote PLMN).

Figures 4-1 shows the reference architecture for the 5GC, with focus on the NRF:



Figure 4-1: 5G System architecture

Figure 4-1 illustrates PLMN level scenarios, but this architecture is also applicable to the SNPN scenarios, as explained below.

For the sake of clarity, the NRF is never depicted in reference point representation figures, given that the NRF interacts with every other NF in the 5GC. As an exception, in the roaming case, the reference point between the vNRF and the hNRF is named as N27. The reference point name of N27 is used only for representation purposes, but its functionality is included in the services offered by the Nnrf Service-Based Interface.

In the case of SNPN, the NRF provides services e.g. in the following scenarios:

- For a SNPN for which roaming is not supported (see 3GPP TS 23.501 [2], clause 5.30.2.0);

- For the case of UE access to SNPN using credentials from Credentials Holder (see 3GPP TS 23.501 [2], clause 5.30.2.9);

- For the case of Onboarding of UEs for SNPNs (see 3GPP TS 23.501 [2], clause 5.30.2.10).

\* \* \* \* Next Change \* \* \* \*

6.1.6.3.3 Enumeration: NFType

The enumeration NFType represents the different types of Network Functions or Network Entities that can be found in the 5GC.

**Table 6.1.6.3.3-1: Enumeration NFType**

|  |  |
| --- | --- |
| **Enumeration value** | **Description** |
| "NRF" | Network Function: NRF |
| "UDM" | Network Function: UDM |
| "AMF" | Network Function: AMF |
| "SMF" | Network Function: SMF |
| "AUSF" | Network Function: AUSF |
| "NEF" | Network Function: NEF |
| "PCF" | Network Function: PCF |
| "SMSF" | Network Function: SMSF |
| "NSSF" | Network Function: NSSF |
| "UDR" | Network Function: UDR |
| "LMF" | Network Function: LMF |
| "GMLC" | Network Function: GMLC |
| "5G\_EIR" | Network Function: 5G-EIR |
| "SEPP" | Network Entity: SEPP |
| "UPF" | Network Function: UPF |
| "N3IWF" | Network Function and Entity: N3IWF |
| "AF" | Network Function: AF |
| "UDSF" | Network Function: UDSF |
| "BSF" | Network Function: BSF |
| "CHF" | Network Function: CHF |
| "NWDAF" | Network Function: NWDAF |
| "PCSCF" | Network Function: P-CSCF |
| "CBCF" | Network Function: CBCF |
| "UCMF" | Network Function: UCMF |
| "HSS" | Network Function: HSS |
| "SOR\_AF" | Network Function: SOR-AF |
| "SPAF" | Network Function: SP-AF |
| "MME" | Network Function: MME |
| "SCSAS" | Network Function: SCS/AS |
| "SCEF" | Network Function: SCEF |
| "SCP" | Network Entity: SCP |
| "NSSAAF" | Network Function: NSSAAF |
| "ICSCF" | Network Function: I-CSCF |
| "SCSCF" | Network Function: S-CSCF |
| "DRA" | Network Function: DRA |
| "IMS\_AS" | Network Function: IMS-AS |
| "AANF" | Network Function: AAnF |
| "5G\_DDNMF" | Network Function: 5G DDNMF |
| "NSACF" | Network Function: NSACF |
| "MFAF" | Network Function: MFAF |
| "EASDF" | Network Function: EASDF |
| "DCCF" | Network Function: DCCF |
| "MB-SMF" | Network Function: MB-SMF |
| "TSCTSF" | Network Function: TSCTSF |
| "ADRF" | Network Function: ADRF |
| "GBA\_BSF" | Network Function: GBA BSF |
| "CEF" | Network Function: CEF |
| "MB-UPF" | Network Function: MB-UPF |
| "NSWOF" | Network Function: NSWOF |
| "MBSF" | Network Function: MBSF |
| "MBSTF" | Network Function: MBSTF |

\* \* \* \* Next Change \* \* \* \*

##### 6.1.6.3.11 Enumeration: ServiceName

Table 6.1.6.3.11-1: Enumeration ServiceName

|  |  |
| --- | --- |
| Enumeration value | Description |
| "nnrf-nfm" | Nnrf\_NFManagement Service offered by the NRF |
| "nnrf-disc" | Nnrf\_NFDiscovery Service offered by the NRF |
| "nnrf-oauth2" | Nnrf\_AccessToken Service offered by the NRF  |
| "nudm-sdm" | Nudm\_SubscriberDataManagement Service offered by the UDM |
| "nudm-uecm" | Nudm\_UEContextManagement Service offered by the UDM |
| "nudm-ueau" | Nudm\_UEAuthentication Service offered by the UDM |
| "nudm-ee" | Nudm\_EventExposure Service offered by the UDM |
| "nudm-pp" | Nudm\_ParameterProvision Service offered by the UDM |
| "nudm-niddau" | Nudm\_NIDDAuthorization Service offered by the UDM |
| "nudm-mt" | Nudm\_MT Service offered by the UDM |
| "nudm-ssau" | Nudm\_ServiceSpecificAuthorization Service offered by the UDM |
| "namf-comm" | Namf\_Communication Service offered by the AMF |
| "namf-evts" | Namf\_EventExposure Service offered by the AMF |
| "namf-mt" | Namf\_MT Service offered by the AMF |
| "namf-loc" | Namf\_Location Service offered by the AMF |
| "namf-mbs-comm" | Namf\_MBSCommunication Service offered by AMF |
| "namf-mbs-bc" | Namf\_MBSBroadcast Service offered by AMF |
| "nsmf-pdusession" | Nsmf\_PDUSession Service offered by the SMF |
| "nsmf-event-exposure" | Nsmf\_EventExposure Service offered by the SMF |
| "nsmf-nidd" | Nsmf\_NIDD Service offered by the SMF |
| "nausf-auth" | Nausf\_UEAuthentication Service offered by the AUSF |
| "nausf-sorprotection" | Nausf\_SoRProtection Service offered by the AUSF |
| "nausf-upuprotection" | Nausf\_UPUProtection Service offered by the AUSF |
| "nnef-pfdmanagement" | Nnef\_PFDManagement offered by the NEF |
| "nnef-smcontext" | Nnef\_SMContext Service offered by the NEF |
| "nnef-eventexposure" | Nnef\_EventExposure Service offered by the NEF |
| "nnef-eas-deployment-info" | Nnef\_EASDeployment InfoService offered by the NEF. This is the southbound part of the API (e.g. the service operations used by the SMF) |
| "3gpp-cp-parameter-provisioning" | Nnef\_ParameterProvision Service offered by the NEF |
| "3gpp-device-triggering" | Nnef\_Trigger Service offered by the NEF |
| "3gpp-bdt" | Nnef\_BDTPNegotiation Service offered by the NEF |
| "3gpp-traffic-influence" | Nnef\_TrafficInfluence Service offered by the NEF |
| "3gpp-chargeable-party" | Nnef\_ChargeableParty Service offered by the NEF |
| "3gpp-as-session-with-qos" | Nnef\_AFsessionWithQoS Service offered by the NEF |
| "3gpp-msisdn-less-mo-sms" | Nnef\_MSISDN-less\_MO\_SMS Service offered by the NEF |
| "3gpp-service-parameter" | Nnef\_ServiceParameter Service offered by the NEF |
| "3gpp-monitoring-event" | Nnef\_APISupportCapability Service offered by the NEF |
| "3gpp-nidd-configuration-trigger" | Nnef\_NIDDConfiguration Service offered by the NEF |
| "3gpp-nidd" | Nnef\_NIDD Service offered by the NEF |
| "3gpp-analyticsexposure" | Nnef\_AnalyticsExposure Service offered by the NEF |
| "3gpp-racs-parameter-provisioning" | Nnef\_UCMFProvisioning Service offered by the NEF |
| "3gpp-ecr-control" | Nnef\_ECRestriction Service offered by the NEF |
| "3gpp-applying-bdt-policy" | Nnef\_ApplyPolicy Service offered by the NEF |
| "3gpp-mo-lcs-notify" | Nnef\_Location Service offered by the NEF |
| "3gpp-time-sync" | Nnef\_TimeSynchronization Service offered by the NEF |
| "3gpp-am-influence" | Nnef\_AMInfluence Service offered by the NEF |
| "3gpp-am-policyauthorization" | Nnef\_AMPolicyAuthorization |
| "3gpp-akma" | Nnef\_AKMA Service offered by the NEF |
| "3gpp-eas-deployment" | Nnef\_EASDeployment Service offered by the NEF. This is the northbound part (e.g. the service operations used by the AF). |
| "3gpp-iptvconfiguration" | Nnef\_IPTV\_configuration Service offered by the NEF |
| "3gpp-mbs-tmgi" | Nnef\_MBSTMGI Service offered by the NEF |
| "3gpp-mbs-session" | Nnef\_MBSSession Service offered by the NEF |
| "3gpp-authentication" | Nnef\_Authentication Service offered by the NEF |
| "npcf-am-policy-control" | Npcf\_AMPolicyControl Service offered by the PCF |
| "npcf-smpolicycontrol" | Npcf\_SMPolicyControl Service offered by the PCF |
| "npcf-policyauthorization" | Npcf\_PolicyAuthorization Service offered by the PCF |
| "npcf-bdtpolicycontrol" | Npcf\_BDTPolicyControl Service offered by the PCF |
| "npcf-eventexposure" | Npcf\_EventExposure Service offered by the PCF |
| "npcf-ue-policy-control" | Npcf\_UEPolicyControl Service offered by the PCF |
| "npcf-am-policyauthorization" | Npcf\_AM\_PolicyAuthorization Service offered by the PCF |
| "nsmsf-sms" | Nsmsf\_SMService Service offered by the SMSF |
| "nnssf-nsselection" | Nnssf\_NSSelection Service offered by the NSSF |
| "nnssf-nssaiavailability" | Nnssf\_NSSAIAvailability Service offered by the NSSF |
| "nudr-dr" | Nudr\_DataRepository Service offered by the UDR |
| "nudr-group-id-map" | Nudr\_GroupIDmap Service offered by the UDR |
| "nlmf-loc" | Nlmf\_Location Service offered by the LMF |
| "n5g-eir-eic" | N5g-eir\_EquipmentIdentityCheck Service offered by the 5G-EIR |
| "nbsf-management" | Nbsf\_Management Service offered by the BSF |
| "nchf-spendinglimitcontrol" | Nchf\_SpendingLimitControl Service offered by the CHF |
| "nchf-convergedcharging" | Nchf\_Converged\_Charging Service offered by the CHF |
| "nchf-offlineonlycharging" | Nchf\_OfflineOnlyCharging Service offered by the CHF |
| "nnwdaf-eventssubscription" | Nnwdaf\_EventsSubscription Service offered by the NWDAF |
| "nnwdaf-analyticsinfo" | Nnwdaf\_AnalyticsInfo Service offered by the NWDAF |
| "nnwdaf-datamanagement" | Nnwdaf\_DataManagement Service offered by the NWDAF |
| "nnwdaf-mlmodelprovision" | Nnwdaf\_MLModelProvision Service offered by the NWDAF |
| "ngmlc-loc" | Ngmlc\_Location Service offered by GMLC |
| "nucmf-provisioning" | Nucmf\_Provisioning Service offered by UCMF |
| "nucmf-uecapabilitymanagement" | Nucmf\_UECapabilityManagement Service offered by UCMF |
| "nhss-sdm" | Nhss\_SubscriberDataManagement Service offered by the HSS |
| "nhss-uecm" | Nhss\_UEContextManagement Service offered by the HSS |
| "nhss-ueau" | Nhss\_UEAuthentication Service offered by the HSS |
| "nhss-ee" | Nhss\_EventExposure Service offered by the HSS |
| "nhss-ims-sdm" | Nhss\_imsSubscriberDataManagement Service offered by the HSS |
| "nhss-ims-uecm" | Nhss\_imsUEContextManagement Service offered by the HSS |
| "nhss-ims-ueau" | Nhss\_imsUEAuthentication Service offered by the HSS |
| "nhss-gba-sdm" | Nhss\_gbaSubscriberDataManagement Service offered by the HSS |
| "nhss-gba-ueau" | Nhss\_gbaUEAuthentication Service offered by the HSS |
| "nsepp-telescopic" | Nsepp\_Telescopic\_FQDN\_Mapping Service offered by the SEPP |
| "nsoraf-sor" | Nsoraf\_SteeringOfRoaming Service offered by the SOR-AF |
| "nspaf-secured-packed" | Nspaf\_SecuredPacket Service offered by the SP-AF |
| "nudsf-dr" | Nudsf Data Repository service offered by the UDSF. |
| "nudsf-timer" | Nudsf Timer service offered by the UDSF |
| "nnssaaf-nssaa" | Nnssaaf\_NSSAA service offered by the NSSAAF. |
| "nnssaaf-aiw" | Nnssaaf\_AIW service offered by the NSSAAF. |
| "naanf-akma" | Naanf\_AKMA service offered by the AAnF. |
| "n5gddnmf-discovery" | N5g-ddnmf\_Discovery service offered by 5G DDNMF |
| "nmfaf-3dadm" | Nmfaf 3daDataManagement service offered by the MFAF. |
| "nmfaf-3cadm" | Nmfaf 3caDataManagement service offered by the MFAF. |
| "neasdf-dnscontext" | Neasdf\_DNSContext service offered by the EASDF |
| "neasdf-baselinednspattern" | Neasdf\_BaselineDNSPattern service offered by the EASDF |
| "ndccf-dm" | Ndccf\_DataManagement service offered by the DCCF. |
| "ndccf-cm" | Ndccf\_ContextManagement service offered by the DCCF. |
| "nnsacf-nsac" | Nnsacf\_NSAC service offered by the NSACF. |
| "nnsacf-slice-ee" | Nnsacf\_SliceEventExposure service offered by the NSACF. |
| "nmbsmf-tmgi" | Nmbsmf TMGI service offered by the MB-SMF |
| "nmbsmf-mbssession" | Nmbsmf MBSSession service offered by the MB-SMF |
| "nadrf-dm" | Nadrf\_DataManagement service offered by the ADRF. |
| "nbsp-gba" | Nbsp\_GBA service offered by the GBA BSF. |
| "ntsctsf-time-sync" | Ntsctsf\_TimeSynchronization service offered by the TSCTSF |
| "ntsctsf-qos-tscai" | Ntsctsf\_QoSandTSCAssistance service offered by the TSCTSF |
| "nmbsf-mbsuserserv" | Nmbsf\_MBSUserService service offered by the MBSF |
| "nmbsf-mbsuserdataing" | Nmbsf\_MBSUserDataIngestSession service offered by the MBSF |
| "nmbstf-distsession" | Nmbstf\_MBSDistributionSession service offered by the MBSTF |
| NOTE: The services defined in this table are those defined by 3GPP NFs in 5GC; however, in order to support custom services offered by standard and custom NFs, the NRF shall also accept the registration of NF Services with other service names. |

\* \* \* \* Next Change \* \* \* \*

A.2 Nnrf\_NFManagement API

openapi: 3.0.0

info:

 version: '1.2.0-alpha.6'

 title: 'NRF NFManagement Service'

 description: |

 NRF NFManagement Service.

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externalDocs:

 description: 3GPP TS 29.510 V17.5.0; 5G System; Network Function Repository Services; Stage 3

 url: 'https://www.3gpp.org/ftp/Specs/archive/29\_series/29.510/'

servers:

 - url: '{apiRoot}/nnrf-nfm/v1'

 variables:

 apiRoot:

 default: https://example.com

 description: apiRoot as defined in clause 4.4 of 3GPP TS 29.501

security:

 - {}

 - oAuth2ClientCredentials:

 - nnrf-nfm

…

…

[skipped for clarity]

 NFType:

 description: NF types known to NRF

 anyOf:

 - type: string

 enum:

 - NRF

 - UDM

 - AMF

 - SMF

 - AUSF

 - NEF

 - PCF

 - SMSF

 - NSSF

 - UDR

 - LMF

 - GMLC

 - 5G\_EIR

 - SEPP

 - UPF

 - N3IWF

 - AF

 - UDSF

 - BSF

 - CHF

 - NWDAF

 - PCSCF

 - CBCF

 - HSS

 - UCMF

 - SOR\_AF

 - SPAF

 - MME

 - SCSAS

 - SCEF

 - SCP

 - NSSAAF

 - ICSCF

 - SCSCF

 - DRA

 - IMS\_AS

 - AANF

 - 5G\_DDNMF

 - NSACF

 - MFAF

 - EASDF

 - DCCF

 - MB-SMF

 - TSCTSF

 - ADRF

 - GBA\_BSF

 - CEF

 - MB-UPF

 - NSWOF

 - MBSF

 - MBSTF

 - type: string

…

…

[skipped for clarity]

 ServiceName:

 description: Service names known to NRF

 anyOf:

 - type: string

 enum:

 - nnrf-nfm

 - nnrf-disc

 - nnrf-oauth2

 - nudm-sdm

 - nudm-uecm

 - nudm-ueau

 - nudm-ee

 - nudm-pp

 - nudm-niddau

 - nudm-mt

 - nudm-ssau

 - namf-comm

 - namf-evts

 - namf-mt

 - namf-loc

 - namf-mbs-comm

 - namf-mbs-bc

 - nsmf-pdusession

 - nsmf-event-exposure

 - nsmf-nidd

 - nausf-auth

 - nausf-sorprotection

 - nausf-upuprotection

 - nnef-pfdmanagement

 - nnef-smcontext

 - nnef-eventexposure

 - nnef-eas-deployment-info

 - 3gpp-cp-parameter-provisioning

 - 3gpp-device-triggering

 - 3gpp-bdt

 - 3gpp-traffic-influence

 - 3gpp-chargeable-party

 - 3gpp-as-session-with-qos

 - 3gpp-msisdn-less-mo-sms

 - 3gpp-service-parameter

 - 3gpp-monitoring-event

 - 3gpp-nidd-configuration-trigger

 - 3gpp-nidd

 - 3gpp-analyticsexposure

 - 3gpp-racs-parameter-provisioning

 - 3gpp-ecr-control

 - 3gpp-applying-bdt-policy

 - 3gpp-mo-lcs-notify

 - 3gpp-time-sync

 - 3gpp-am-influence

 - 3gpp-am-policyauthorization

 - 3gpp-akma

 - 3gpp-eas-deployment

 - 3gpp-iptvconfiguration

 - 3gpp-mbs-tmgi

 - 3gpp-mbs-session

 - 3gpp-authentication

 - npcf-am-policy-control

 - npcf-smpolicycontrol

 - npcf-policyauthorization

 - npcf-bdtpolicycontrol

 - npcf-eventexposure

 - npcf-ue-policy-control

 - npcf-am-policyauthorization

 - nsmsf-sms

 - nnssf-nsselection

 - nnssf-nssaiavailability

 - nudr-dr

 - nudr-group-id-map

 - nlmf-loc

 - n5g-eir-eic

 - nbsf-management

 - nchf-spendinglimitcontrol

 - nchf-convergedcharging

 - nchf-offlineonlycharging

 - nnwdaf-eventssubscription

 - nnwdaf-analyticsinfo

 - nnwdaf-datamanagement

 - nnwdaf-mlmodelprovision

 - ngmlc-loc

 - nucmf-provisioning

 - nucmf-uecapabilitymanagement

 - nhss-sdm

 - nhss-uecm

 - nhss-ueau

 - nhss-ee

 - nhss-ims-sdm

 - nhss-ims-uecm

 - nhss-ims-ueau

 - nhss-gba-sdm

 - nhss-gba-ueau

 - nsepp-telescopic

 - nsoraf-sor

 - nspaf-secured-packet

 - nudsf-dr

 - nudsf-timer

 - nnssaaf-nssaa

 - nnssaaf-aiw

 - naanf-akma

 - n5gddnmf-discovery

 - nmfaf-3dadm

 - nmfaf-3cadm

 - neasdf-dnscontext

 - neasdf-baselinednspattern

 - ndccf-dm

 - ndccf-cm

 - nnsacf-nsac

 - nnsacf-slice-ee

 - nmbsmf-tmgi

 - nmbsmf-mbssession

 - nadrf-dm

 - nbsp-gba

 - ntsctsf-time-sync

 - ntsctsf-qos-tscai

 - nmbsf-mbsuserserv

 - nmbsf-mbsuserdataing

 - nmbstf-distsession

 - type: string

…

…

[skipped for clarity]

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