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650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - APE 7112B
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Version x.y.z

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- x the first digit:
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In the present document, modal verbs have the following meanings:

- | | |
|------------------|---|
| shall | indicates a mandatory requirement to do something |
| shall not | indicates an interdiction (prohibition) to do something |

The constructions "shall" and "shall not" are confined to the context of normative provisions, and do not appear in Technical Reports.

The constructions "must" and "must not" are not used as substitutes for "shall" and "shall not". Their use is avoided insofar as possible, and they are not used in a normative context except in a direct citation from an external, referenced, non-3GPP document, or so as to maintain continuity of style when extending or modifying the provisions of such a referenced document.

- | | |
|-------------------|--|
| should | indicates a recommendation to do something |
| should not | indicates a recommendation not to do something |
| may | indicates permission to do something |
| need not | indicates permission not to do something |

The construction "may not" is ambiguous and is not used in normative elements. The unambiguous constructions "might not" or "shall not" are used instead, depending upon the meaning intended.

- | | |
|---------------|--|
| can | indicates that something is possible |
| cannot | indicates that something is impossible |

The constructions "can" and "cannot" are not substitutes for "may" and "need not".

- | | |
|-----------------|--|
| will | indicates that something is certain or expected to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document |
| will not | indicates that something is certain or expected not to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document |
| might | indicates a likelihood that something will happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document |

might not indicates a likelihood that something will not happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

In addition:

is (or any other verb in the indicative mood) indicates a statement of fact

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1 Scope

The present document specifies the stage 3 protocol and data model for the Nnrf Service Based Interface. It provides stage 3 protocol definitions and message flows, and specifies the API for each service offered by the NRF.

The 5G System stage 2 architecture and procedures are specified in 3GPP TS 23.501 [2] and 3GPP TS 23.502 [3].

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

2 References

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

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- [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".
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3 Definitions 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].

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].

5GC	5G Core Network
CEF	Charging Enablement Function
CHF	Charging Function
IPUPS	Inter-PLMN User Plane Security
NF	Network Function
NRF	NF Repository Function
NWDAF	Network Data Analytics Function
PFD	Packet Flow Description
SNPN	Stand-alone Non-Public Network
TNGF	Trusted Non-3GPP Gateway Function
TWIF	Trusted WLAN Interworking Function
W-AGF	Wireline Access Gateway Function

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;
- 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. 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).

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

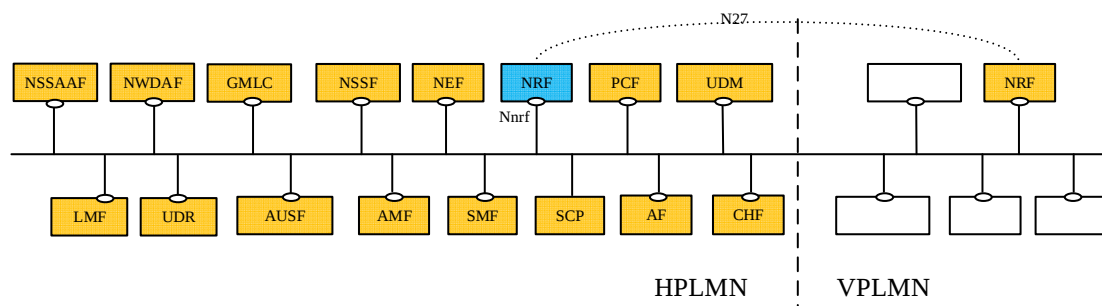


Figure 4-1: 5G System architecture

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 scenario:

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

5 Services Offered by the NRF

5.1 Introduction

The NRF offers to other NFs the following services:

- Nnrf_NFManagement
- Nnrf_NFDiscovery
- Nnrf_AccessToken (OAuth2 Authorization)
- Nnrf_Bootstrapping

Table 5.1-1 summarizes the corresponding APIs defined for this specification.

Table 5.1-1: API Descriptions

Service Name	Clause	Description	OpenAPI Specification File	apiName	Annex
Nnrf_NFManagement	6.1	NRF NFManagement Service	TS29510_Nnrf_NFManagement.yaml	nnrf-nfm	A.2
Nnrf_NFDiscovery	6.2	NRF NFDiscovery Service	TS29510_Nnrf_NFDiscovery.yaml	nnrf-disc	A.3
Nnrf_AccessToken	6.3	NRF OAuth2 Authorization	TS29510_Nnrf_AccessToken.yaml		A.4
Nnrf_Bootstrapping	6.4	NRF Bootstrapping	TS29510_Nnrf_Bootstrapping.yaml		A.5

NRF provides services also in the following SNPN scenario:

- In an SNPN where roaming is not supported, which corresponds to the NRF services in the same PLMN, see 3GPP TS 23.502 [3], clause 5.2.7.2 and 5.2.7.3.

5.2 Nnrf_NFManagement Service

5.2.1 Service Description

The Nnrf_NFManagement service allows an NF or an SCP Instance in the serving PLMN to register, update or deregister its profile in the NRF.

The Nnrf_NFManagement service also allows an NRF Instance to register, update or deregister its profile in another NRF in the same PLMN.

NOTE: Alternatively, other means such as OA&M can also be used to register, update or deregister NRF profile in another NRF.

It also allows an NF or an SCP to subscribe to be notified of registration, deregistration and profile changes of NF Instances, along with their potential NF services. It also enables an SCP to subscribe to be notified of registration, deregistration and profile changes of other SCP instances.