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| 3GPP TS 29.511 V18.2.0 (2023-12) | |
| Technical Specification | |
| 3rd Generation Partnership Project;  Technical Specification Group Core Network and Terminals;  5G System;  Equipment Identity Register Services;  Stage 3  (Release 18) | |
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# Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

x the first digit:

1 presented to TSG for information;

2 presented to TSG for approval;

3 or greater indicates TSG approved document under change control.

y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the document.

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

**is not** (or any other negative verb in the indicative mood) indicates a statement of fact

The constructions "is" and "is not" do not indicate requirements.

# 1 Scope

The present document describes the stage 3 protocol and data model for the N5g-eir Service Based Interface between the 5G-EIR and its consumers over which the service to check the equipment identity as described in 3GPP TS 23.501 [2] is performed. It provides the stage 3 protocol definitions and message flows, and specifies the API for each service offered by the 5G-EIR.

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.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[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".

[5] 3GPP TS 29.501: "5G System; Principles and Guidelines for Services Definition; Stage 3".

[6] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces; Stage 3".

[7] IETF RFC 9113: "HTTP/2".

[8] OpenAPI Initiative, "OpenAPI Specification Version 3.0.0", <https://spec.openapis.org/oas/v3.0.0>.[9] IETF RFC 8259: "The JavaScript Object Notation (JSON) Data Interchange Format".

[10] IETF RFC 9457: "Problem Details for HTTP APIs".

[11] 3GPP TS 33.501: "Security Architecture and Procedures for 5G System".

[12] IETF RFC 6749: "The OAuth 2.0 Authorization Framework".

[13] 3GPP TS 29.510: "5G System; Network Function Repository Services; Stage 3".

[14] 3GPP TR 21.900: "Technical Specification Group working methods".

[15] 3GPP TS 29.524: "5G System; Cause codes mapping between 5GC interfaces; Stage 3".

# 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].

**N5g-eir:** Service-based interface exhibited by 5G-EIR

## 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].

5G-EIR 5G-Equipment Identity Register

EIR Equipment Identity Register

PEI Permanent Equipment Identifier

# 4 Overview

## 4.1 Introduction

N5g-eir is a Service-based interface exhibited by 5G-EIR (5G-Equipment Identity Register) which is an optional network function that supports the following functionality:

- Check the status of Equipment's identity (e.g. to check that it has not been prohibited listed).

The reference point N17 (see Fig 4-1 below) shows the interaction between the 5G-Equipment Identity Register 5G-EIR and the AMF (Access and Mobility Management Function) enabling the check of the status of the mobile equipment identity.



Figure 4-1: Reference Model – N5g-eir

During any procedure establishing a signalling connection with the UE the network may optionally perform an ME identity check with 5G-EIR via the N5g-eir\_Equipment Identity Check Service exhibited by 5G-EIR.

# 5 Services offered by the 5G-EIR NF

## 5.1 Introduction

The following NF service is offered by the N5g-eir to check the ME whether it is prohibited listed or not:

- N5g-eir\_EquipmentIdentityCheck

Table 5.1-1: NF Services provided by 5G-EIR

| Service Name | Description | Consumer |
| --- | --- | --- |
| N5g-eir\_EquipmentIdentityCheck | This service offered by the 5G-EIR allows the consumer to check the Permanent Equipment Identifier (PEI) and check whether the PEI is in the prohibited list or not. | AMF |

The N5g-eir\_Equipment Identity Check service is specified in 3GPP TS 23.502 [3], clause 4.2.2.2.2

Table 5.1-2 summarizes the corresponding APIs defined for this specification.

Table 5.1-2: API Descriptions

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Service Name** | **Clause** | **Description** | **OpenAPI Specification File** | **apiName** | **Annex** |
| N5g-eir\_EquipmentIdentityCheck | 6.1 | 5G-EIR Equipment Identity Check Service | TS29511\_N5g-eir\_EquipmentIdentityCheck.yaml | n5g-eir-eic | A.2 |

The N5g-eir\_Equipment Identity Check service is specified in 3GPP TS 23.502 [3], clause 4.2.2.2.2

## 5.2 N5g-eir\_EquipmentIdentityCheck Service

### 5.2.1 Service Description

The N5g-eir\_Equipment Identity Check service is provided by the 5G-EIR to check the Permanent Equipment Identifier (PEI) whether it is in the prohibited list or not. The service can be consumed by AMF which initiates ME identity check by invoking the N5g-eirEquipmentIdentityCheckGet service operation (see clause 5.2.4.2. of 3GPP TS 23.502 [3]).

During the initial registration the Permanent Equipment Identifier is obtained from the UE. The AMF operator may check the PEI with an EIR.

### 5.2.2 Service Operations

#### 5.2.2.1 Introduction

#### 5.2.2.2 CheckEquipmentIdentity

##### 5.2.2.2.1 General

The CheckEquipmentIdentity operation shall be used to check the PEI and determine whether the subscriber is allowed to use the equipment, in the following procedures:

- ME Identity check procedure (see clause 4.7 of 3GPP TS 23.502 [3]);

##### 5.2.2.2.2 Procedure using CheckEquipmentIdentity Operation

The NF Service Consumer (e.g. AMF) shall check the PEI by using the HTTP GET method as shown in Figure 5.2.2.2.2-1.



Figure 5.2.2.2.2-1: PEI status check by the NF Service Consumer

1. The NF Service Consumer (e.g. AMF) sends a GET request to the resource representing the PEI equipment Status. It shall include the PEI as a query parameter and, optionally, the SUPI and/or GPSI may also be included.

2a. On success, "200 OK" with the message body containing the equipment status of the PEI.

2b. If the PEI is not known, "404 Not Found" with the message body containing a ProblemDetails object, with the "details" attribute set to "ERROR\_EQUIPMENT\_UNKNOWN". When receiving the response from the 5G-EIR, the NF Service Consumer (e.g. AMF) shall check the equipment Status and the detailed problem. Dependent upon the result, the NF Service Consume will decide its subsequent actions (e.g. sending a Registration Reject if the 5G-EIR indicates that the PEI is unknown or prohibited listed).

The definition of the equipment-status resource is specified in clause 6.1.3.

# 6 API Definitions

## 6.1 N5g-eir\_EquipmentIdentityCheck Service API

### 6.1.1 API URI

The N5g-eir\_EquipmentIdentityCheck Service shall use the N5g-eir\_EquipmentIdentityCheck API.

The API URI of the N5g-eir\_EquipmentIdentityCheck API shall be:

**{apiRoot}/<apiName>/<apiVersion>**

The request URI used in HTTP request from the NF service consumer towards the NF service producer shall have the structure defined in subclause 4.4.1 of 3GPP TS 29.501 [5], i.e.:

**{apiRoot}/<apiName>/<apiVersion>/<apiSpecificResourceUriPart>**

with the following components:

- The {apiRoot} shall be set as described in 3GPP TS 29.501 [5].

- The <apiName>shall be "n5g-eir-eic".

- The <apiVersion> shall be "v1".

- The <apiSpecificResourceUriPart> shall be set as described in subclause 6.1.3.

### 6.1.2 Usage of HTTP

#### 6.1.2.1 General

HTTP/2, as defined in IETF RFC 9113 [7], shall be used as specified in clause 5 of 3GPP TS 29.500 [4].

HTTP/2 shall be transported as specified in clause 5.3 of 3GPP TS 29.500 [4].

HTTP messages and bodies for the N5g-eir\_EquipmentIdentityCheck Service shall comply with the OpenAPI [8] specification contained in Annex A.

#### 6.1.2.2 HTTP standard headers

##### 6.1.2.2.1 General

The usage of HTTP standard headers shall be supported as specified in clause 5.2.2 of 3GPP TS 29.500 [4].

##### 6.1.2.2.2 Content type

The following content types shall be supported:

- JSON, as defined in IETF RFC 8259 [9]. The use of the JSON format shall be signalled by the content type "application/json". See also clause 5.4 of 3GPP TS 29.500 [4].

- The Problem Details JSON Object (IETF RFC 9457 [10]. The use of the Problem Details JSON object in a HTTP response body shall be signalled by the content type "application/problem+json".

#### 6.1.2.3 HTTP custom headers

##### 6.1.2.3.1 General

In this release of this specification, no custom headers specific to the N5g-eir\_EquipmentIdentityCheck Service are defined. For 3GPP specific HTTP custom headers used across all service based interfaces, see clause 5.2.3 of 3GPP TS 29.500 [4].

### 6.1.3 Resources

#### 6.1.3.1 Overview



Figure 6.1.3.1-1: Resource URI structure of the n5g-eir-eic API

Table 6.1.3.1-1 provides an overview of the resources and applicable HTTP methods.

Table 6.1.3.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | HTTP method or custom operation | Description |
| equipmentStatus | /equipment-status | GET | Retrieve the equipment status of the PEI |

#### 6.1.3.2 Resource: equipmentStatus

##### 6.1.3.2.1 Description

This resource represents the equipmentStatus for a PEI.

##### 6.1.3.2.2 Resource Definition

Resource URI: {apiRoot}/n5g-eir-eic/<apiVersion>/equipment-status

This resource shall support the resource URI variables defined in table 6.1.3.2.2-1.

Table 6.1.3.2.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 6.1.1 |

##### 6.1.3.2.3 Resource Standard Methods

###### 6.1.3.2.3.1 GET

This method shall support the URI query parameters specified in table 6.1.3.2.3.1-1.

Table 6.1.3.2.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| pei | Pei | M | 1 | The PEI of the UE shall be included for equipment identify checking |
| supi | Supi | O | 0..1 | The SUPI of the UE |
| gpsi | Gpsi | O | 0..1 | The GPSI of the UE |
| supported-features | SupportedFeatures | C | 0..1 | This IE shall be present if at least one optional feature defined in clause 6.1.6 is supported. |

This method shall support the request data structures specified in table 6.1.3.2.3.1-2 and the response data structures and response codes specified in table 6.1.3.2.3.1-3.

Table 6.1.3.2.3.1-2: Data structures supported by the GET Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.1.3.2.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| EirResponseData | M | 1 | 200 OK | Upon success, a response body containing the Equipment Status shall be returned |
| RedirectResponse | O | 0..1 | 307 Temporary Redirect | Temporary redirection. The response shall include a Location header field containing a different URI, or the same URI if this is a redirection triggered by an SCP to the same target resource via another SCP. In the former case, the URI shall be an alternative URI of the resource located on an alternative service instance within the same 5G-EIR or 5G-EIR (service) set. (NOTE 2) |
| RedirectResponse | O | 0..1 | 308 Permanent Redirect | Permanent redirection. The response shall include a Location header field containing a different URI, or the same URI if this is a redirection triggered by an SCP to the same target resource via another SCP. In the former case, the URI shall be an alternative URI of the resource located on an alternative service instance within the same 5G-EIR or 5G-EIR (service) set. (NOTE 2) |
| ProblemDetails | O | 0..1 | 404 Not Found | The equipment identify checking has failed.  The "cause" attribute may be used to indicate one of the following application errors:  - ERROR\_EQUIPMENT\_UNKNOWN  See table 6.1.5.3-1 for the description of this error. |
| NOTE : The mandatory HTTP error status codes for the GET method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [4] other than those specified in the table above also apply, with a ProblemDetails data type when needed (see clause 5.2.7 of 3GPP TS 29.500 [4]).  NOTE 2: RedirectResponses may be inserted by an SCP, see clause 6.10.9.1 of 3GPP TS 29.500 [4]. | | | | |

Table 6.1.3.2.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located on an alternative service instance within the same 5G-EIR or 5G-EIR (service) set.  Or the same URI, if a request is redirected to the same target resource via a different SCP. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target NF (service) instance ID towards which the request is redirected |

Table 6.1.3.2.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located on an alternative service instance within the same 5G-EIR or 5G-EIR (service) set.  Or the same URI, if a request is redirected to the same target resource via a different SCP. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target NF (service) instance ID towards which the request is redirected |

### 6.1.4 Data Model

#### 6.1.4.1 General

This clause specifies the application data model supported by the API.

Table 6.1.4.1-1 specifies the data types defined for the n5g-eir-eic service based interface protocol.

Table 6.1.4.1-1: n5g-eir-eic specific Data Types

|  |  |  |
| --- | --- | --- |
| Data type | Clause defined | Description |
| EirResponseData | 6.1.4.2.2 |  |
| EquipmentStatus | 6.1.4.3.3 | Equipment status of the PEI, this data type is string. |

Table 6.1.6.1-2 specifies data types re-used by the N<NF> service based interface protocol from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the N<NF> service based interface.

Table 6.1.4.1-2: 5g-eir-eic re-used Data Types

|  |  |  |
| --- | --- | --- |
| Data type | Reference | Comments |
| Pei | 3GPP TS 29.571[6] | Data type representing the PEI of the UE. |
| Supi | 3GPP TS 29.571 [6] | Data type representing the SUPI of the subscriber.  pattern: See pattern of type Supi in 3GPP TS 29.571 [6] |
| ProblemDetails | 3GPP TS 29.571 [6] | Common data type for error responses |
| Gpsi | 3GPP TS 29.571 [6] | Data type representing the GPSI of the subscriber. |
| SupportedFeatures | 3GPP TS 29.571 [6] | Supported Features |
| RedirectResponse | 3GPP TS 29.571 [6] | Response body of the redirect response message. |

#### 6.1.4.2 Structured data types

##### 6.1.4.2.1 Introduction

This clause defines the structures to be used in resource representations.

##### 6.1.4.2.2 Type: EirResponseData

Table 6.1.4.2.2-1: Definition of type EirResponseData

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description |
| status | EquipmentStatus | M | 1 | Status of the UE |

#### 6.1.4.3 Simple data types and enumerations

##### 6.1.4.3.1 Introduction

This clause defines simple data types and enumerations that can be referenced from data structures defined in the previous clauses.

##### 6.1.4.3.2 Simple data types

The simple data types defined in table 6.1.4.3.2-1 shall be supported.

Table 6.1.4.3.2-1: Simple data types

|  |  |  |
| --- | --- | --- |
| Type Name | Type Definition | Description |
|  | <one simple data type, e.g. boolean, integer, null, number, string> |  |

##### 6.1.4.3.3 Enumeration: EquipmentStatus

Table 6.1.4.3.3-1: Enumeration EquipmentStatus

|  |  |
| --- | --- |
| Enumeration value | Description |
| "WHITELISTED" | Indicates the PEI is permitted whitelisted |
| "BLACKLISTED" | Indicates the PEI is prohibited listed |
| "GREYLISTED" | Indicates the PEI is tracking listed |

### 6.1.5 Error Handling

#### 6.1.5.1 General

HTTP error handling shall be supported as specified in clause 5.2.4 of 3GPP TS 29.500 [4].

The Cause codes mapping performed by AMF between the following HTTP responses returned by the EIR services to the AMF and the 5GMM related values is specified in clause 4.5.2 of 3GPP TS 29.524 [15].

#### 6.1.5.2 Protocol Errors

Protocol Error Handling shall be supported as specified in clause 5.2.7 of 3GPP TS 29.500 [4].

#### 6.1.5.3 Application Errors

The common application errors defined in the Table 5.2.7.2-1 in 3GPP TS 29.500 [4] may also be used for the N5g-eir\_EquipmentIdentityCheck service, and the following application errors listed in Table 6.1.5.3-1 are specific for the N5g-eir\_EquipmentIdentityCheck service.

Table 6.1.5.3-1: Application errors

|  |  |  |
| --- | --- | --- |
| Application Error | HTTP status code | Description |
| ERROR\_EQUIPMENT\_UNKNOWN | 404 Not Found | Indicate the mobile equipment is not known in the EIR. |

### 6.1.6 Feature Negotiation

The optional features in table 6.1.6-1 are defined for the N5g-eir\_EquipmentIdentityCheck API. They shall be negotiated using the extensibility mechanism defined in clause 6.6 of 3GPP TS 29.500 [4].

Table 6.1.6-1: Supported Features

|  |  |  |  |
| --- | --- | --- | --- |
| Feature number | Feature Name | M/O | Description |
| 1 | ES3XX | M | Extended Support of HTTP 307/308 redirection  An NF Service Consumer (e.g. AMF) that supports this feature shall support handling of HTTP 307/308 redirection for any service operation of the EquipmentIdentityCheck service. An NF Service Consumer that does not support this feature does only support HTTP redirection as specified for 3GPP Release 15. |

### 6.1.7 Security

#### 6.1.7.1 General

The security mechanisms for service based interfaces are specified in clause 13 of 3GPP TS 33.501 [11] and in clause 6.7.3 of 3GPP TS 29.500 [4]. The access to the N5g-eir\_EquipmentIdentityCheck API may be authorized by means of the OAuth2 protocol (see IETF RFC 6749 [12]), based on local configuration, using the "Client Credentials" authorization grant, where the NRF (see 3GPP TS 29.510 [13]) plays the role of the authorization server.

The N5g-eir\_EquipmentIdentityCheck API defines scopes for OAuth2 authorization as specified in 3GPP TS 33.501 [11]; it defines a single scope consisting on the name of the service (i.e., "n5g-eir-eic"), and it does not define any additional scopes at resource or operation level.

Security Protection Edge Proxy (SEPP), as specified in 3GPP TS 33.501 [11], shall be used between service based interfaces across PLMNs. The NFs in a PLMN shall use the SEPP as a HTTP/2 proxy for the HTTP/2 messages that carry ":authority" pseudo header with a uri-host formatted as specified in clause 6.1.4.3 of 3GPP TS 29.500 [4]

#### 6.1.7.2 Transport Layer Security Protection of Messages

As specified in clause 13.1 of 3GPP TS 33.501 [11], TLS shall be used for the security protection of messages at the transport layer for the N5g-eir service based interface if network security is not provided by other means.

The protocol stack for the N5g-eir service based interface is shown on Figure 6.1.7.2-1.



Figure 6.1.7.2-1: SBI Protocol Stack

The N5g-eir service based interface uses HTTP/2 protocol (see clause 5.2) with JSON (see clause 5.4) as the application layer serialization protocol. For the security protection at the transport layer, 5G-EIR NF shall support TLS and TLS shall be used within a PLMN if network security is not provided by other means, as specified in 3GPP TS 33.501 [11].

#### 6.1.7.3 Authorization of 5G-EIR NF Service Access

As specified in clause 13.4.1 of 3GPP TS 33.501 [11] OAuth 2.0 (see IETF RFC 6749 [12]) may be used for authorization of N5g-eir\_EquipmentIdentityCheck service access. The 5G-EIR NF and the NRF (as defined in 3GPP TS 29.510 [13]) shall support the OAuth 2.0 authorization framework with "Client Credentials" grant type as specified in clause 4.4 of IETF RFC 6749 [12]. The NRF shall act as the Authorization Server providing the access tokens to the NF service consumers to access the service provided by the 5G-EIR. If the 5G-EIR NF receives an OAuth 2.0 authorization token in the "Authorization" HTTP request header field, the N5g-eir\_EquipmentIdentityCheck service shall validate the access token, its expiry and its access scope before allowing access to the requested resource, as specified in clause 7 of IETF RFC 6749 [12].

### 6.1.8 HTTP redirection

An HTTP request may be redirected to a different 5G-EIR service instance, within the same 5G-EIR or a different 5G-EIR of an 5G-EIR set, e.g. when an 5G-EIR service instance is part of an 5G-EIR (service) set or when using indirect communications (see 3GPP TS 29.500 [4]). See also the ES3XX feature in clause 6.1.6.

An SCP that reselects a different 5G-EIR producer instance will return the NF Instance ID of the new 5G-EIR producer instance in the 3gpp-Sbi-Producer-Id header, as specified in clause 6.10.3.4 of 3GPP TS 29.500 [4].

If an 5G-EIR within an 5G-EIR set redirects a service request to a different 5G-EIR of the set using an 307 Temporary Redirect or 308 Permanent Redirect status code, the identity of the new 5G-EIR towards which the service request is redirected shall be indicated in the 3gpp-Sbi-Target-Nf-Id header of the 307 Temporary Redirect or 308 Permanent Redirect response as specified in clause 6.10.9.1 of 3GPP TS 29.500 [4].

Annex A (normative):  
OpenAPI specification

# A.1 General

This Annex specifies the formal definition of the N5g-eir\_EquipmentIdentityCheck Service API. It consists of an OpenAPI 3.0.0 specification, in YAML format.

This Annex takes precedence when being discrepant to other parts of the specification with respect to the encoding of information elements and methods within the API(s).

NOTE : The semantics and procedures, as well as conditions, e.g. for the applicability and allowed combinations of attributes or values, not expressed in the OpenAPI definitions but defined in other parts of the specification also apply.

Informative copies of the OpenAPI specification files contained in this 3GPP Technical Specification are available on a Git-based repository that uses the GitLab software version control system (see 3GPP TS 29.501 [5] clause 5.3.1 and 3GPP TR 21.900 [14] clause 5B).

# A.2 N5g-eir\_EquipmentIdentityCheck Service API

openapi: 3.0.0

info:

version: '1.3.0-alpha.1'

title: '5G-EIR Equipment Identity Check'

description: |

5G-EIR Equipment Identity Check Service.

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externalDocs:

description: 3GPP TS 29.511 V18.0.0; 5G System; Equipment Identity Register Services; Stage 3

url: 'https://www.3gpp.org/ftp/Specs/archive/29\_series/29.511/'

servers:

- url: '{apiRoot}/n5g-eir-eic/v1'

variables:

apiRoot:

default: https://example.com

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

security:

- {}

- oAuth2ClientCredentials:

- n5g-eir-eic

paths:

/equipment-status:

get:

summary: Retrieves the status of the UE

operationId: GetEquipmentStatus

tags:

- Equipment Status (Document)

parameters:

- name: pei

in: query

description: PEI of the UE

required: true

schema:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Pei'

- name: supi

in: query

description: SUPI of the UE

required: false

schema:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Supi'

- name: gpsi

in: query

description: GPSI of the UE

required: false

schema:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Gpsi'

- name: supported-features

in: query

description: supported features of the NF consumer

schema:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

responses:

'200':

description: Expected response to a valid request

content:

application/json:

schema:

$ref: '#/components/schemas/EirResponseData'

'307':

$ref: 'TS29571\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29571\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29571\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29571\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29571\_CommonData.yaml#/components/responses/403'

'404':

description: PEI Not Found

content:

application/problem+json:

schema:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/ProblemDetails'

'406':

$ref: 'TS29571\_CommonData.yaml#/components/responses/406'

'414':

$ref: 'TS29571\_CommonData.yaml#/components/responses/414'

'429':

$ref: 'TS29571\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29571\_CommonData.yaml#/components/responses/500'

'502':

$ref: 'TS29571\_CommonData.yaml#/components/responses/502'

'503':

$ref: 'TS29571\_CommonData.yaml#/components/responses/503'

default:

description: Unexpected error

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{nrfApiRoot}/oauth2/token'

scopes:

n5g-eir-eic: Access to the N5g-eir\_EquipmentIdentityCheck API

schemas:

EirResponseData:

description: Represents equipment status data provided in an EIR response message.

type: object

required:

- status

properties:

status:

$ref: '#/components/schemas/EquipmentStatus'

EquipmentStatus:

description: Represents equipment status of the PEI. This data type is a string.

type: string

enum:

- WHITELISTED # PERMITTED

- BLACKLISTED # PROHIBITED

- GREYLISTED # TRACKING

Annex B (informative):  
Change history

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Change history** | | | | | | | |
| **Date** | **Meeting** | **TDoc** | **CR** | **Rev** | **Cat** | **Subject/Comment** | **New version** |
| 2017-10 | CT4#80 | C4-175323 |  |  |  | Initial Draft. | 0.1.0 |
| 2017-10 | CT4#80 | C4-175396 |  |  |  | At CT4#80 approved pCRs C4-175323, C4-175324, C4-175325, C4-175326 incorporated. | 0.2.0 |
| 2017-12 | CT4#81 | C4-176439 |  |  |  | At CT4#81 approved pCRs C4-176428, C4-176429 incorporated | 0.3.0 |
| 2018-03 | CT4#83 | C4-182436 |  |  |  | At CT4#83 approved pCRs C4-182368, C4-182369, C4-182384 incorporated. | 0.4.0 |
| 2018-03 | CT#79 | CP-180032 |  |  |  | Presented for information | 1.0.0 |
| 2018-05 | CT4#85 | C4-184627 |  |  |  | At CT4#85 approved pCRs C4-184475, C4-184476, C4-184628 incorporated. | 1.1.0 |
| 2018-06 | CT#80 | CP-181106 |  |  |  | Presented for approval | 2.0.0 |
| 2018-06 | CT#80 |  |  |  |  | Approved in CT#80. | 15.0.0 |
| 2018-09 | CT#81 | CP-182061 | 0001 | - | F | Error Handling | 15.1.0 |
| 2018-09 | CT#81 | CP-182061 | 0002 | - | F | Description of Structured data types | 15.1.0 |
| 2018-09 | CT#81 | CP-182061 | 0003 | - | F | Update of Resource Figure | 15.1.0 |
| 2018-09 | CT#81 | CP-182061 | 0004 | - | F | API Version Number Update | 15.1.0 |
| 2018-12 | CT#82 | CP-183178 | 0005 | 2 | F | 5G-EIR OpenAPI Updates | 15.2.0 |
| 2018-12 | CT#82 | CP-183019 | 0007 | - | F | APIRoot Clarification | 15.2.0 |
| 2018-12 | CT#82 | CP-183019 | 0008 | - | F | Common Status codes | 15.2.0 |
| 2018-12 | CT#82 | CP-183019 | 0009 | 1 | F | API Version Update | 15.2.0 |
| 2018-12 | CT#82 | CP-183198 | 00010 | 1 | F | Correction of "externalDocs" for N5g-eir\_EquipmentIdentityCheck Service | 15.2.0 |
| 2019-03 | CT#83 | CP-190024 | 0012 | 1 | F | GPSI | 15.3.0 |
| 2019-03 | CT#83 | CP-190024 | 0014 | 1 | F | Reuse of data types in EIR OpenAPI | 15.3.0 |
| 2019-03 | CT#83 | CP-190024 | 0015 | - | F | API Version Update | 15.3.0 |
| 2019-06 | CT#84 | CP-191035 | 0017 | 2 | F | Storage of OpenAPI specification files | 15.4.0 |
| 2019-06 | CT#84 | CP-191035 | 0018 | - | F | Copyright Note in YAML file | 15.4.0 |
| 2019-06 | CT#84 | CP-191035 | 0019 | - | F | Wrong formatting in OpenAPI annex | 15.4.0 |
| 2019-06 | CT#84 | CP-191035 | 0020 | - | F | 3GPP TS 29.511 API version update | 15.4.0 |
| 2019-11 | CT#84 | CP-193036 | 0022 | 1 | F | Add reference to TS 29.524 | 16.0.0 |
| 2019-12 | CT#84 | CP-193121 | 0024 | - | F | ExternalDocs field and API version change in the OpenAPI | 16.0.0 |
| 2020-03 | CT#87e | CP-200039 | 0025 | 2 | F | Add Corresponding API descriptions in clause 5.1 | 16.1.0 |
| 2020-03 | CT#87e | CP-200039 | 0028 | 2 | D | Editorial corrections | 16.1.0 |
| 2020-03 | CT#87e | CP-200020 | 0029 | 1 | B | Optionality of ProblemDetails | 16.1.0 |
| 2020-03 | CT#87e | CP-200035 | 0030 | - | B | SUPI pattern | 16.1.0 |
| 2020-04 | CT#88e | CP-201064 | 0032 | 1 | F | Datatype column in Resource URI variables Table | 16.2.0 |
| 2020-06 | CT#88e | CP-201034 | 0033 | - | B | Storage of YAML files | 16.2.0 |
| 2020-06 | CT#88e | CP-201332 | 0034 | 1 | F | API Version and ExternalDoc Version Update | 16.2.0 |
| 2020-12 | CT#90e | CP-203035 | 0036 | - | F | Storage of YAML files in 3GPP Forge | 16.3.0 |
| 2021-03 | CT#91e | CP-210037 | 0038 |  | F | HTTP 3xx redirection | 16.4.0 |
| 2021-03 | CT#91e | CP-210054 | 0041 |  | F | 29.511 Rel-16 API version and External doc update | 16.4.0 |
| 2021-03 | CT#91e | CP-210026 | 0037 |  | D | Use of inclusive terminology | 17.0.0 |
| 2021-03 | CT#91e | CP-210034 | 0039 |  | F | OpenAPI Reference | 17.0.0 |
| 2021-03 | CT#91e | CP-210029 | 0040 |  | F | 29.511 Rel-17 API version and External doc update | 17.0.0 |
| 2021-06 | CT#91e | CP-211028 | 0042 |  | F | backward compatible correction | 17.1.0 |
| 2021-06 | CT#92e | CP-211059 | 0044 | 2 | F | backward compatible correction | 17.1.0 |
| 2021-06 | CT#92e | CP-211050 | 0045 | - | F | 29.511 Rel-17 API version and External doc update | 17.1.0 |
| 2021-09 | CT#93e | CP-212060 | 0048 |  | A | 3xx description correction for SCP | 17.2.0 |
| 2022-06 | CT#96 | CP-221027 | 0051 |  | F | Correction of typos in description fields | 17.3.0 |
| 2022-06 | CT#96 | CP-221304 | 0053 |  | F | 29.511 Rel17 API version and External doc update | 17.3.0 |
| 2022-12 | CT#98e | CP-223027 | 0055 | 1 | F | Missing Mandatory Status Codes in OpenAPI | 18.0.0 |
| 2022-12 | CT#98e | CP-223033 | 0056 |  | F | 29.511 Rel18 API version and External doc update | 18.0.0 |
| 2023-09 | CT#101 | CP-232058 | 0057 | 1 | F | Major API version | 18.1.0 |
| 2023-12 | CT#102 | CP-233028 | 0058 |  | F | Update and replace obsoleted HTTP RFCs | 18.2.0 |
| 2023-12 | CT#102 | CP-233031 | 0059 |  | F | Replacing obsoleted HTTP RFC 7807 with 9457 | 18.2.0 |