UCC 5G PCF API Reference, Release 2025.02

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Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
http://www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 527-0883

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About this Guide

Note The documentation set for this product strives to use bias-free language. For purposes of this documentation set, bias-free is defined as language that does not imply discrimination based on age, disability, gender, racial identity, ethnic identity, sexual orientation, socioeconomic status, and intersectionality. While any existing biased terms are being substituted, exceptions may be present in the documentation due to language that is hardcoded in the user interfaces of the product software, language used based on RFP documentation, or language that is used by a referenced third-party product.

This preface describes the *Ultra Cloud Core 5G Policy Control Function API Reference*, the document conventions, and the customer support details.

- Conventions Used, on page vii
- Contacting Customer Support, on page viii

Conventions Used

The following tables describe the conventions used throughout this documentation.

Notice Type	Description
Information Note	Provides information about important features or instructions.
Caution	Alerts you of potential damage to a program, device, or system.
Warning	Alerts you of potential personal injury or fatality. May also alert you of potential electrical hazards.

Typeface Conventions	Description
Text represented as a `screen display`	This typeface represents displays that appear on your terminal screen, for example: `Login:`

Typeface Conventions	Description
Text represented as **commands**	This typeface represents commands that you enter, for example: **show ip access-list** This document always gives the full form of a command in lowercase letters. Commands are not case sensitive.
Text represented as a **command** *variable*	This typeface represents a variable that is part of a command, for example: **show card** *slot_number* *slot_number* is a variable representing the applicable chassis slot number.
Text represented as menu or sub-menu names	This typeface represents menus and sub-menus that you access within a software application, for example: Click the **File** menu, then click **New**

Contacting Customer Support

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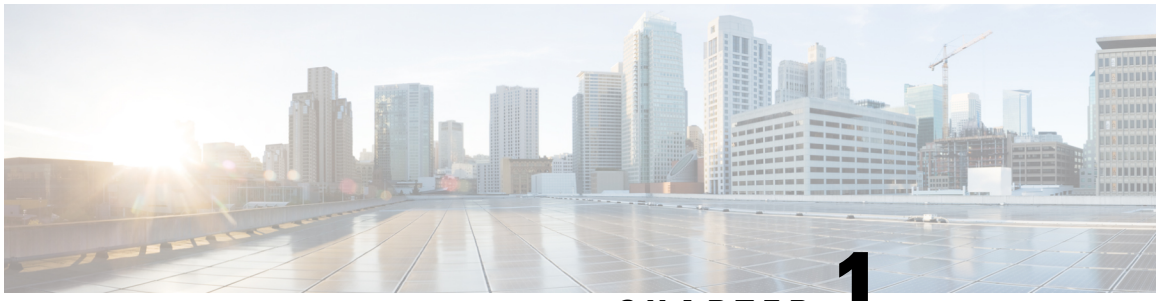


CHAPTER 1

Npcf_AMPolicyControl

The PCF uses the Npcf_AMPolicyControl API to communicate with the Access and Mobility Management Function (AMF) over the N15 Interface.

- OpenAPI, on page 1
- Info, on page 1
- Servers, on page 1
- Security, on page 2
- Paths, on page 2
- Components, on page 7

OpenAPI

OpenAPI Version: 3.0.0

Info

```
Description: Access and Mobility Policy Control Service API
Version: "1.0.0"
Title: Npcf_AMPolicyControl
```

Servers

```
URL: '{apiRoot}/npcf-am-policy-control/v1'
Variables:
  API Root:
    Default: https://example.com
    Description: apiRoot as defined in subclause subclause 4.4 of 3GPP TS 29.501
```

Security

```
- {}
- oAuth2ClientCredentials:
  - npcf-am-policy-control
```

Paths

/policies

```
  Method: Post
    Request Body:
      Required/Optional: true
      Content:
        Application/JSON:
          Schema:
            Reference: '#/components/schemas/PolicyAssociationRequest'

    Responses:
      '201':
        Description: Created
        Content:
          Application/JSON:
            Schema:
              Reference: '#/components/schemas/PolicyAssociation'
        Headers:
          Location:
            description: 'Contains the URI of the newly created resource,
according to the structure': {apiRoot}/npcf-am-policy-control/v1/policies/{polAssoId}'

            Required/Optional: true
            Schema:
              Type: string
      '400':
        Reference: 'TS29571_CommonData.yaml#/components/responses/400'
      '401':
        Reference: 'TS29571_CommonData.yaml#/components/responses/401'
      '403':
        Reference: 'TS29571_CommonData.yaml#/components/responses/403'
      '404':
        Reference: 'TS29571_CommonData.yaml#/components/responses/404'
      '411':
        Reference: 'TS29571_CommonData.yaml#/components/responses/411'
      '413':
        Reference: 'TS29571_CommonData.yaml#/components/responses/413'
      '415':
        Reference: 'TS29571_CommonData.yaml#/components/responses/415'
```

```
    '429':
      Reference: 'TS29571_CommonData.yaml#/components/responses/429'
    '500':
      Reference: 'TS29571_CommonData.yaml#/components/responses/500'
    '503':
      Reference: 'TS29571_CommonData.yaml#/components/responses/503'
    Default:
      Reference: 'TS29571_CommonData.yaml#/components/responses/default'
Callbacks:
  policyUpdateNotification:
    '{$request.body#/notificationUri}/update':
      Method: Post
        Request Body:
          Required/Optional: true
          Content:
            Application/JSON:
              Schema:
                Reference: '#/components/schemas/PolicyUpdate'

        Responses:
          '204':
            Description: No Content, Notification was succesfull
          '307':
            Description: temporary redirect
          '400':
            Reference: 'TS29571_CommonData.yaml#/components/responses/400'
          '401':
            Reference: 'TS29571_CommonData.yaml#/components/responses/401'
          '403':
            Reference: 'TS29571_CommonData.yaml#/components/responses/403'
          '404':
            Reference: 'TS29571_CommonData.yaml#/components/responses/404'
          '411':
            Reference: 'TS29571_CommonData.yaml#/components/responses/411'
          '413':
            Reference: 'TS29571_CommonData.yaml#/components/responses/413'
          '415':
            Reference: 'TS29571_CommonData.yaml#/components/responses/415'
          '429':
            Reference: 'TS29571_CommonData.yaml#/components/responses/429'
          '500':
            Reference: 'TS29571_CommonData.yaml#/components/responses/500'
          '503':
            Reference: 'TS29571_CommonData.yaml#/components/responses/503'
          Default:
            Reference: 'TS29571_CommonData.yaml#/components/responses/default'
  policyAssocitionTerminationRequestNotification:
    '{$request.body#/notificationUri}/terminate':
      Method: Post
        Request Body:
          Required/Optional: true
          Content:
```

```
      Application/JSON:
        Schema:
          Reference: '#/components/schemas/TerminationNotification'

    Responses:
      '204':
        Description: No Content, Notification was succesfull
      '307':
        Description: temporary redirect
      '400':
        Reference: 'TS29571_CommonData.yaml#/components/responses/400'
      '401':
        Reference: 'TS29571_CommonData.yaml#/components/responses/401'
      '403':
        Reference: 'TS29571_CommonData.yaml#/components/responses/403'
      '404':
        Reference: 'TS29571_CommonData.yaml#/components/responses/404'
      '411':
        Reference: 'TS29571_CommonData.yaml#/components/responses/411'
      '413':
        Reference: 'TS29571_CommonData.yaml#/components/responses/413'
      '415':
        Reference: 'TS29571_CommonData.yaml#/components/responses/415'
      '429':
        Reference: 'TS29571_CommonData.yaml#/components/responses/429'
      '500':
        Reference: 'TS29571_CommonData.yaml#/components/responses/500'
      '503':
        Reference: 'TS29571_CommonData.yaml#/components/responses/503'
      Default:
        Reference: 'TS29571_CommonData.yaml#/components/responses/default'
```

/policies/{polAssoId}

```
  get:

    Parameters:
      - Name: polAssoId
        In: path
        Description: Identifier of a policy association
        Required/Optional: true
        Schema:
          Type: string

    Responses:
      '200':
        Description: OK. Resource representation is returned
        Content:
          Application/JSON:
            Schema:
              Reference: '#/components/schemas/PolicyAssociation'
```

```
    '400':
      Reference: 'TS29571_CommonData.yaml#/components/responses/400'
    '401':
      Reference: 'TS29571_CommonData.yaml#/components/responses/401'
    '403':
      Reference: 'TS29571_CommonData.yaml#/components/responses/403'
    '404':
      Reference: 'TS29571_CommonData.yaml#/components/responses/404'
    '406':
      Reference: 'TS29571_CommonData.yaml#/components/responses/406'
    '429':
      Reference: 'TS29571_CommonData.yaml#/components/responses/429'
    '500':
      Reference: 'TS29571_CommonData.yaml#/components/responses/500'
    '503':
      Reference: 'TS29571_CommonData.yaml#/components/responses/503'
    Default:
      Reference: 'TS29571_CommonData.yaml#/components/responses/default'
delete:

  Parameters:
    - Name: polAssoId
      In: path
      Description: Identifier of a policy association
      Required/Optional: true
      Schema:
        Type: string

  Responses:
    '204':
      Description: No Content. Resource was succesfully deleted
    '400':
      Reference: 'TS29571_CommonData.yaml#/components/responses/400'
    '401':
      Reference: 'TS29571_CommonData.yaml#/components/responses/401'
    '403':
      Reference: 'TS29571_CommonData.yaml#/components/responses/403'
    '404':
      Reference: 'TS29571_CommonData.yaml#/components/responses/404'
    '429':
      Reference: 'TS29571_CommonData.yaml#/components/responses/429'
    '500':
      Reference: 'TS29571_CommonData.yaml#/components/responses/500'
    '503':
      Reference: 'TS29571_CommonData.yaml#/components/responses/503'
    Default:
      Reference: 'TS29571_CommonData.yaml#/components/responses/default'
```

/policies/{polAssoId}/update

```
Method: Post
  Request Body:
    Required/Optional: true
    Content:
      Application/JSON:
        Schema:
          Reference: '#/components/schemas/PolicyAssociationUpdateRequest'

  Parameters:
    - Name: polAssoId
      In: path
      Description: Identifier of a policy association
      Required/Optional: true
      Schema:
        Type: string

  Responses:
    '200':
      Description: OK. Updated policies are returned
      Content:
        Application/JSON:
          Schema:
            Reference: '#/components/schemas/PolicyUpdate'
    '400':
      Reference: 'TS29571_CommonData.yaml#/components/responses/400'
    '401':
      Reference: 'TS29571_CommonData.yaml#/components/responses/401'
    '403':
      Reference: 'TS29571_CommonData.yaml#/components/responses/403'
    '404':
      Reference: 'TS29571_CommonData.yaml#/components/responses/404'
    '411':
      Reference: 'TS29571_CommonData.yaml#/components/responses/411'
    '413':
      Reference: 'TS29571_CommonData.yaml#/components/responses/413'
    '415':
      Reference: 'TS29571_CommonData.yaml#/components/responses/415'
    '429':
      Reference: 'TS29571_CommonData.yaml#/components/responses/429'
    '500':
      Reference: 'TS29571_CommonData.yaml#/components/responses/500'
    '503':
      Reference: 'TS29571_CommonData.yaml#/components/responses/503'
    Default:
      Reference: 'TS29571_CommonData.yaml#/components/responses/default'
```

Components

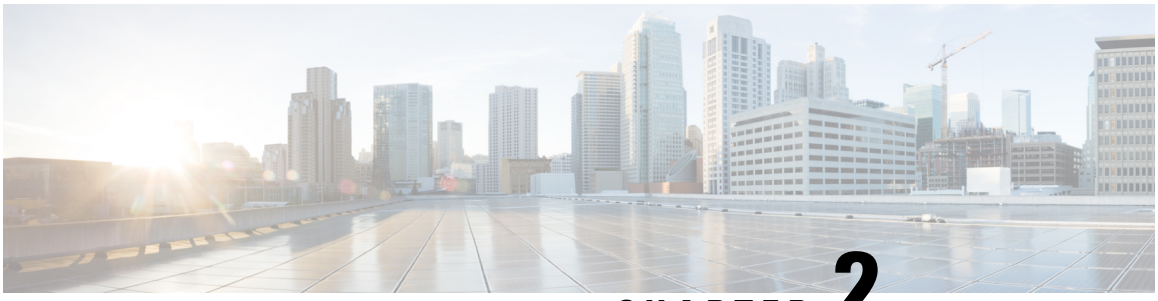
```
securitySchemes:
  oAuth2ClientCredentials:
    Type: oauth2
    Flows:
      clientCredentials:
        tokenUrl: '{nrfApiRoot}/oauth2/token'
        scopes:
          npcf-am-policy-control: Access to the Npcf_AMPolicyControl API

schemas:
  PolicyAssociation:
    Type: object
    Properties:
      request:
        Reference: '#/components/schemas/PolicyAssociationRequest'
      triggers:
        Type: array
        Items:
          Reference: '#/components/schemas/RequestTrigger'
        minItems: 1
        Description: Request Triggers that the PCF subscribes. Only values "LOC_CH" and
 "PRA_CH" are permitted.
      servAreaRes:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/ServiceAreaRestriction'
      rfsp:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/RfspIndex'
      pras:
        Type: object
        additionalProperties:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/PresenceInfo'
        minProperties: 1
      suppFeat:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
    Required:
      - suppFeat
  PolicyAssociationRequest:
    Type: object
    Properties:
      notificationUri:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Uri'
      altNotifIpv4Addrs:
        Type: array
        Items:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
        minItems: 1
        Description: Alternate or backup IPv4 Address(es) where to send Notifications.
      altNotifIpv6Addrs:
```

```
        Type: array
        Items:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Addr'
        minItems: 1
        Description: Alternate or backup IPv6 Address(es) where to send Notifications.
      supi:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Supi'
      gpsi:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
      accessType:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/AccessType'
      pei:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Pei'
      userLoc:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/UserLocation'
      timeZone:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/TimeZone'
      servingPlmn:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/NetworkId'
      ratType:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/RatType'
      groupIds:
        Type: array
        Items:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/GroupId'
        minItems: 1
      servAreaRes:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/ServiceAreaRestriction'
      rfsp:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/RfspIndex'
      guami:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Guami'
      serviveName:
        Type: string
       Description: If the NF service consumer is an AMF, it should provide the name of
 a service produced by the AMF that makes use of information received within the
Npcf_AMPolicyControl_UpdateNotify service operation.
      traceReq:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/TraceData'
      suppFeat:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
    Required:
      - notificationUri
      - suppFeat
      - supi
  PolicyAssociationUpdateRequest:
    Type: object
    Properties:
      notificationUri:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Uri'
      altNotifIpv4Addrs:
        Type: array
```

```
      Items:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
      minItems: 1
      Description: Alternate or backup IPv4 Address(es) where to send Notifications.
    altNotifIpv6Addrs:
      Type: array
      Items:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Addr'
      minItems: 1
      Description: Alternate or backup IPv6 Address(es) where to send Notifications.
    triggers:
      Type: array
      Items:
        Reference: '#/components/schemas/RequestTrigger'
      minItems: 1
      Description: Request Triggers that the NF service consumer observes.
    servAreaRes:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/ServiceAreaRestriction'
    rfsp:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/RfspIndex'
    praStatuses:
      Type: object
      additionalProperties:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/PresenceInfo'
      minProperties: 1
      Description: Map of PRA status information.
    userLoc:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/UserLocation'
    traceReq:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/TraceData'
 PolicyUpdate:
  Type: object
  Properties:
    resourceUri:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/Uri'
    triggers:
      Type: array
      Items:
        Reference: '#/components/schemas/RequestTrigger'
      minItems: 1
      nullable: true
      Description: Request Triggers that the PCF subscribes. Only values "LOC_CH" and
"PRA_CH" are permitted.
    servAreaRes:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/ServiceAreaRestriction'
    rfsp:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/RfspIndex'
    pras:
      Type: object
      additionalProperties:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/PresenceInfoRm'
      Description: Map of PRA information.
```

```
      minProperties: 1
      nullable: true
    Required:
      - resourceUri
  TerminationNotification:
    Type: object
    Properties:
      resourceUri:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Uri'
      cause:
        Reference: '#/components/schemas/PolicyAssociationReleaseCause'
    Required:
      - resourceUri
      - cause
  RequestTrigger:
    anyOf:
    - type: string
      enum:
        - LOC_CH
        - PRA_CH
        - SERV_AREA_CH
        - RFSP_CH
    - type: string
      Description:
        This string provides forward-compatibility with future
        extensions to the enumeration but is not used to encode
        content defined in the present version of this API.
    Description:
      Possible values are
      - LOC_CH: Location change (tracking area). The tracking area of the UE has changed.
     - PRA_CH: Change of UE presence in PRA. The UE is entering/leaving a Presence Reporting
 Area.
      - SERV_AREA_CH: Service Area Restriction change. The UDM notifies the AMF that the
subscribed service area restriction information has changed.
     - RFSP_CH: RFSP index change. The UDM notifies the AMF that the subscribed RFSP index
 has changed.
  PolicyAssociationReleaseCause:
    anyOf:
    - type: string
      enum:
        - UNSPECIFIED
        - UE_SUBSCRIPTION
        - INSUFFICIENT_RES
    - type: string
      Description:
        This string provides forward-compatibility with future
        extensions to the enumeration but is not used to encode
        content defined in the present version of this API.
    Description:
      Possible values are
      - UNSPECIFIED: This value is used for unspecified reasons.
      - UE_SUBSCRIPTION: This value is used to indicate that the session needs to be
terminated because the subscription of UE has changed (e.g. was removed).
      - INSUFFICIENT_RES: This value is used to indicate that the server is overloaded and
 needs to abort the session.
```



CHAPTER 2

Nnrf_NFDiscovery

The Network Repository Function authorizes an NF client to perform the discovery operation using the Nnrf_NFDiscovery service to detect an NF.

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- Servers, on page 11
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- Paths, on page 12
- /searches/{searchId}:, on page 25
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- Components, on page 27
- External Docs, on page 35

OpenAPI

OpenAPI Version: 3.0.0

Info

```
Version: '1.1.4'
Title: 'NRF NFDiscovery Service'
Description: 'NRF NFDiscovery  Service'
```

Servers

```
URL: '{apiRoot}/nnrf-disc/v1'
Variables:
  API Root:
    Default: https://example.com

    Description: apiRoot as defined in clause subclause 4.4 of 3GPP TS 29.501
```

Security

```
- {}
- oAuth2ClientCredentials:
    - nnrf-disc
```

Paths

/nf-instances

```
get:
  Summary: Search a collection of NF Instances
  Operation ID: SearchNFInstances

  Tags:
    - NF Instances (Store)

  Parameters:
    #- Name: Accept-Encoding
    #  in: header
    #  description: Accept-Encoding, described in IETF RFC 7231
     #  schema:
    #    type: string
    - Name: target-nf-type
      In: query
      Description: Type of the target NF
      Required/Optional: true
      Schema:
        Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/NFType'
    - Name: requester-nf-type
      In: query
      Description: Type of the requester NF
      Required/Optional: true
      Schema:
        Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/NFType'
      #- name: requester-nf-instance-id
      #  in: query
      #  description: NfInstanceId of the requester NF
      #  schema:
      #    $ref: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
    - Name: service-names
      In: query
      Description: Name of the service offered by the NF
      Schema:
        Type: array
        Items:
      #    $ref: 'TS29571_CommonData.yaml#/components/schemas/ServiceName'
```

```
      Min Items: 1

      Unique Items: False


    Style: form
    Explode: false
  - Name: requester-nf-instance-fqdn
    In: query
    Description: FQDN of the requester NF
    Schema:
      Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/Fqdn'
  - Name: target-plmn-list
    In: query
    Description: Id of the PLMN where the target NF is located
    Content:
      Application/JSON:
        Schema:
          Type: array
          Items:
            Reference: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
          Min Items: 1
  - Name: requester-plmn-list
    In: query
   Description: Id of the PLMN where the NF issuing the Discovery request is located

    Content:
      Application/JSON:
        Schema:
          Type: array
          Items:
            Reference: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
          Min Items: 1
  - Name: target-nf-instance-id
    In: query
    Description: Identity of the NF instance being discovered
    Schema:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
  - Name: target-nf-fqdn
    In: query
    Description: FQDN of the NF instance being discovered
    Schema:
      Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/Fqdn'
  - Name: hnrf-uri
    In: query
    Description: Uri of the home NRF
    Schema:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/Uri'
  - Name: snssais
    In: query
    Description: Slice info of the target NF
    Content:
```

```
          Application/JSON:
            Schema:
              Type: array
              Items:
                Reference: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
              Min Items: 1
        - Name: plmn-specific-snssai-list
          In: query
          Description: PLMN specific Slice info of the target NF
          Content:
            Application/JSON:
              Schema:
                Type: array
                Items:
                Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/PlmnSnssai'

                Min Items: 1
        #- Name: requester-plmn-specific-snssai-list
          # In: query
          # Description: PLMN-specific slice info of the NF issuing the Discovery request

          # Content:
            # Application/JSON:
              # Schema:
                # Type: array
                # Items:
                  # Reference:
'TS29510_Nnrf_NFManagement.yaml#/components/schemas/PlmnSnssai'
                # Min Items: 1
        - Name: dnn
          In: query
          Description: Dnn supported by the BSF, SMF or UPF
          Schema:
            Reference: 'TS29571_CommonData.yaml#/components/schemas/Dnn'
        - Name: nsi-list
          In: query
          Description: NSI IDs that are served by the services being discovered
          Schema:
            Type: array
            Items:
              Type: string
            Min Items: 1
          Style: form
          Explode: false
        - Name: smf-serving-area
          In: query
          Schema:
            Type: string
        - Name: tai
          In: query
          Description: Tracking Area Identity
          Content:
```

```
    Application/JSON:
      Schema:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Tai'
- Name: amf-region-id
  In: query
  Description: AMF Region Identity
  Schema:
    Type: string
- Name: amf-set-id
  In: query
  Description: AMF Set Identity
  Schema:
    Type: string
- Name: guami
  In: query
  Description: Guami used to search for an appropriate AMF
  Content:
    Application/JSON:
  Schema:
    Reference: 'TS29571_CommonData.yaml#/components/schemas/Guami'
- Name: supi
  In: query
  Description: SUPI of the user
  Schema:
    Reference: 'TS29571_CommonData.yaml#/components/schemas/Supi'
- Name: ue-ipv4-address
  In: query
  Description: IPv4 address of the UE
  Schema:
    Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
- Name: ip-domain
  In: query
  Description: IP domain of the UE, which supported by BSF
  Schema:
    Type: string
- Name: ue-ipv6-prefix
  In: query
  Description: IPv6 prefix of the UE
  Schema:
    Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Prefix'
- Name: pgw-ind
  In: query
  Description: Combined PGW-C and SMF or a standalone SMF
  Schema:
    Type: boolean
- Name: pgw
  In: query
  Description: PGW FQDN of a combined PGW-C and SMF
  Schema:
    Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/Fqdn'
- Name: gpsi
```

```
  In: query
  Description: GPSI of the user
  Schema:
    Reference: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
- Name: external-group-identity
  In: query
  Description: external group identifier of the user
  Schema:
    # Reference: 'TS29503_Nudm_SDM.yaml#/components/schemas/ExtGroupId'
# - Name: internal-group-identity
  # In: query
  # Description: internal group identifier of the user
  # Schema:
    # Reference: 'TS29571_CommonData.yaml#/components/schemas/GroupId'
# - Name: pfd-data
  # In: query
  # Description: pfd-data
  # Content:
    # Application/JSON:
  # Schema:
    # Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/PfdData'
- Name: data-set
  In: query
  Description: data set supported by the NF
  Schema:
    Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/DataSetId'
- Name: routing-indicator
  In: query
  Description: routing indicator in SUCI
  Schema:
    Type: string
    pattern: '^[0-9]{1,4}$'
- Name: group-id-list
  In: query
  Description: Group IDs of the NFs being discovered
  Schema:
    Type: array
    Items:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/NfGroupId'
    Min Items: 1
  Style: form
  Explode: false
- Name: dnai-list
  In: query
  Description: Data network access identifiers of the NFs being discovered
  Schema:
    Type: array
    Items:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/Dnai'
    Min Items: 1
  Style: form
```

```
        Explode: false
      - Name: pdu-session-types
        In: query
        Description: list of PDU Session Type required to be supported by the target NF
        Schema:
          Type: array
          Items:
            Reference: 'TS29571_CommonData.yaml#/components/schemas/PduSessionType'
          Min Items: 1
        Style: form
        Explode: false
      #- Name:  event-id-list
        # In: query
        # Description: Analytics event(s) requested to be supported by the
Nnwdaf_AnalyticsInfo service
        # Schema:
          # Type: array
          # Items:
           # Reference: 'TS29520_Nnwdaf_AnalyticsInfo.yaml#/components/schemas/EventId'

          # Min Items: 1
        # Style: form
        # Explode: false
      #- Name:  nwdaf-event-list
        # In: query
        # Description: Analytics event(s) requested to be supported by the
Nnwdaf_EventsSubscription service.
        # Schema:
          # Type: array
          # Items:
            # Reference:
'TS29520_Nnwdaf_EventsSubscription.yaml#/components/schemas/NwdafEvent'
          # Min Items: 1
        # Style: form
        # Explode: false
      - Name: supported-features
        In: query
        Description: Features required to be supported by the target NF
        Schema:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
      - Name: upf-iwk-eps-ind
        In: query
        Description: UPF supporting interworking with EPS or not
        Schema:
          Type: boolean
      - Name: chf-supported-plmn
        In: query
        Description: PLMN ID supported by a CHF
        Content:
          Application/JSON:
            Schema:
              Reference: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
```

```
    - Name: preferred-locality
      In: query
      Description: preferred target NF location
      Schema:
        Type: string
    - Name: access-type
      In: query
      Description: AccessType supported by the target NF
      Schema:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/AccessType'
    - Name: limit
      In: query
      Description: Maximum number of NFProfiles to return in the response
      required: false
      Schema:
        Type: integer
        minimum: 1
        Reference: 'TS29571_CommonData.yaml#/components/schemas/AccessType'
    - Name: required-features
      In: query
      Description: Features required to be supported by the target NF
      Schema:
        Type: array
        Items:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
        Min Items: 1
      Style: form
      Explode: false
    - Name: complex-query
      In: query
      Description: the complex query condition expression
      Content:
        Application/JSON:
      Schema:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/ComplexQuery'
    - Name: max-payload-size
      In: query
      Description: Maximum payload size of the response expressed in kilo octets
      required: false
      Schema:
        Type: integer
        maximum: 2000
        default: 124
    #- Name: max-payload-size-ext
      # In: query
     # Description: Extended query for maximum payload size of the response expressed
in kilo octets
      # required: false
      # Schema:
        # Type: integer
        # default: 124
    #- Name: ATSSS Capability
```

```
  # Content:
    # Application/JSON:
  # Schema:
    # Reference: 'TS29571_CommonData.yaml#/components/schemas/AtsssCapability'
#- Name: upf-ue-ip-addr-ind
  # In: query
  # Description: UPF supporting allocating UE IP addresses/prefixes
  # Schema:
    # Type: boolean
#- Name: client-type
  # In: query
  # Description: Requested client type served by the NF
  # Content:
    # Application/JSON:
  # Schema:
   # Reference: 'TS29572_Nlmf_Location.yaml#/components/schemas/ExternalClientType'

#- Name: lmf-id
  # In: query
  # Description: LMF identification to be discovered
  # Content:
    # Application/JSON:
  # Schema:
   # Reference: 'TS29572_Nlmf_Location.yaml#/components/schemas/LMFIdentification'

#- Name: an-node-type
  # In: query
  # Description: Requested AN node type served by the NF
  # Content:
    # Application/JSON:
  # Schema:
    # Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/AnNodeType'
#- Name: rat-type
  # In: query
  # Description: Requested AN node type served by the NF
  # Content:
    # Application/JSON:
  # Schema:
    # Reference: 'TS29571_CommonData.yaml#/components/schemas/RatType'
#- Name: preferred-tai
  # In: query
  # Description: preferred Tracking Area Identity
  # Content:
    # Application/JSON:
  # Schema:
    # Reference: 'TS29571_CommonData.yaml#/components/schemas/Tai'
#- Name: preferred-nf-instances
  # In: query
  # Description: preferred NF Instances
  # Schema:
    # Type: array
    # Reference: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
```

```
        # Min Items: 1
      # Style: form
      # Explode: false
    - Name: If-None-Match
      In: header
      Description: Validator for conditional requests, as described in IETF RFC 7232,
3.2
      Schema:
        Type: string
    #- Name: target-snpn
      # In: query
      Description: Target SNPN Identity
      # Content:
        # Application/JSON:
      Schema:
        # Reference: 'TS29571_CommonData.yaml#/components/schemas/PlmnIdNid'
    #- Name: requester-snpn-list
      # In: query
      Description: SNPN ID(s) of the NF instance issuing the Discovery request
      # Content:
        # Application/JSON:
      # Schema:
        # Type: array
        # Items:
        # Reference: 'TS29571_CommonData.yaml#/components/schemas/PlmnIdNid'
        # Min Items: 1
    #- Name: af-ee-data
      # In: query
      # Description: NEF exposured by the AF
      # Content:
        # Application/JSON:
      # Schema:
        # Reference:
'TS29510_Nnrf_NFManagement.yaml#/components/schemas/AfEventExposureData'
    #- Name: w-agf-info
      # In: query
      Description: UPF collocated with W-AGF
      # Content:
        # Application/JSON:
      # Schema:
        # Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/WAgfInfo'
    #- Name: tngf-info
      # In: query
      # Description: UPF collocated with TNGF
      # Content:
        # Application/JSON:
      # Schema:
        # Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/TngfInfo'
    #- Name: twif-info
      # In: query
      # Description: UPF collocated with TWIF
      # Content:
```

```
        # Application/JSON:
       Schema:
         Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/TwifInfo'
     #- Name: target-nf-set-id
       # In: query
       Description: Target NF Set ID
       Schema:
         Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/TwifInfo'
     #- Name: target-nf-service-set-id
       # In: query
       # Description: Target NF Service Set ID
       # Schema:
         Reference: 'TS29571_CommonData.yaml#/components/schemas/NfServiceSetId'
     #- Name: nef-id
       # In: query
       # Description: NEF ID
       # Schema:
         Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/NefId'
     #- Name: notification-type
       # In: query
       # Description: Notification Type
       # Schema:
        Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/NotificationType'

     #- Name: n1-msg-class
       # In: query
       #  Description: N1 Message Class
       # Schema:
        Reference: 'TS29518_Namf_Communication.yaml#/components/schemas/N1MessageClass'

     #- Name: n2-info-class
       # In: query
       # Description: N2 Information Class
       # Schema:
         # Reference:
'TS29518_Namf_Communication.yaml#/components/schemas/N2InformationClass'
     #- Name: serving-scope
       # In: query
       # Description: areas that can be served by the target NF
       # Schema:
         # Type: array
         # Items:
         # Type: string
         # Min Items: 1
       # Style: form
       # Explode: false
     #- Name: imsi
       # In: query
       # Description: IMSI of the requester UE to search for an appropriate NF (e.g.
HSS)
       # Schema:
         # Type: string
```

```
      #- Name: ims-private-identity
        # In: query
        # Description: IMPI of the requester UE to search for a target HSS
        # Schema:
          # Type: string
      #- Name: ims-public-identity
        # In: query
        # Description: IMS Public Identity of the requester UE to search for a target
HSS
        # Schema:
          # Type: string
      #- Name: msisdn
        # In: query
        # Description: MSISDN of the requester UE to search for a target HSS
        # Schema:
          # Type: string
      #- Name: preferred-api-versions
        # In: query
        # Description: Preferred API version of the services to be discovered
        # Content:
          # Application/JSON:
        # Schema:
          # Type: object
          # additionalProperties:
          #   Type: string
          # minProperties: 1
      #- Name: v2x-support-ind
        # In: query
        # Description: PCF supports V2X
        # Schema:
        #   Type: boolean
      #- Name: redundant-gtpu
        # In: query
        # Description: UPF supports redundant gtp-u to be discovered
        # Schema:
        #   Type: boolean
      #- Name: ipups
        # In: query
        # Description: UPF which is configured for IPUPS functionality to be discovered

        # Schema:
        #   Type: boolean
      #- Name: scp-domain-list
        # In: query
        # Description: SCP domains the target SCP belongs to
        # Schema:
        #   Type: array
        #   Items:
          #   Type: string
          # Min Items: 1
        # Style: form
        # Explode: false
```

```
      #- Name: scp-domain-list
        # In: query
        # Description: SCP domains the target SCP belongs to        # Schema:
        # Schema:
        # Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/Fqdn'
      #- Name: ipv4-addr
        # In: query
        # Description: IPv4 address reachable through the SCP
        # Schema:
            # Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
      #- Name: ipv6-prefix
        # In: query
        # Description: IPv6 prefix reachable through the SCP
        # Schema:
            # Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Prefix'
      #- Name: served-nf-set-id
        # In: query
        # Description: NF Set ID served by the SCP
        # Schema:
            # Reference: 'TS29571_CommonData.yaml#/components/schemas/NfSetId'
      #- Name: remote-plmn-id
        # In: query
        # Description: Id of the PLMN reachable through the SCP
        # Content:
          # Application/JSON:
        # Schema:
            # Reference: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
      #- Name: data-forwarding
        # In: query
        # Description: UPF Instance(s) configured for data forwarding are requested
        # Schema:
        #   Type: boolean
      #- Name: preferred-full-plmn
        # In: query
        # Description: NF Instance(s) serving the full PLMN are preferred
        # Schema:
        #   Type: boolean
      #- Name: requester-features
        # In: query
        # Description: Features supported by the NF Service Consumer that is invoking
the Nnrf_NFDiscovery service
        # Schema:
           # Reference: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'

      #- Name: realm-id
        # In: query
        # Description: realm-id to search for an appropriate UDSF
        # Schema:
        #   Type: string
      #- Name: storage-id
        # In: query
        # Description: storage-id to search for an appropriate UDSF
```

```
        # Schema:
        #   Type: string
      #- Name: vsmf-support-ind
        # In: query
        # Description: storage-id to search for an appropriate UDSF
        # Schema:
        #   Type: boolean

    Responses:
      '200':
        Description: Expected response to a valid request
        Content:
          Application/JSON:
            Schema:
              Reference: '#/components/schemas/SearchResult'
        Links:
          search:
            operationId: RetrieveStoredSearch
            parameters:
              searchId: $response.body#/searchId
            Description:
                        The 'searchId' parameter returned in the response can be used as
the 'searchId' parameter in the GET request to '/searches/{searchId}'
          completeSearch:
            operationId: RetrieveCompleteSearch
            parameters:
              searchId: $response.body#/searchId
            Description:
                        The 'searchId' parameter returned in the response can be used as
the 'searchId' parameter in the GET request to '/searches/{searchId}/complete'
        Headers:
          Cache-Control:
            Description: Cache-Control containing max-age, described in IETF RFC 7234,
5.2
            Schema:
              Type: string
          ETag:
            Description: Entity Tag containing a strong validator, described in IETF RFC
 7232, 2.3
            Schema:
              Type: string
          Content-Encoding:
            Description: Entity Tag containing a strong validator, described in IETF RFC
 7232, 2.3
            Schema:
              Type: string
      '307':
        Description: Temporary Redirect
        Content:
          Application/JSON:
            Schema:
              Reference: '#/components/schemas/SearchResult'
        Headers:
```

```
        Location:
         Description: 'The URI pointing to the resource located on the redirect target
NRF'
          required: true
          schema:
           Type: string
      '308':
       Description: Permanent Redirect
       Content:
         Application/JSON:
          Schema:
            Reference: 'TS29571_CommonData.yaml#/components/schemas/RedirectResponse'
       Headers:
         Location:
          Description: 'The URI pointing to the resource located on the redirect target
NRF'
          required: true
          schema:
           Type: string
      '400':
       Reference: 'TS29571_CommonData.yaml#/components/responses/400'
      '403':
       Reference: 'TS29571_CommonData.yaml#/components/responses/403'
      '404':
       Reference: 'TS29571_CommonData.yaml#/components/responses/404'
      '411':
       Reference: 'TS29571_CommonData.yaml#/components/responses/411'
      '413':
       Reference: 'TS29571_CommonData.yaml#/components/responses/413'
      '415':
       Reference: 'TS29571_CommonData.yaml#/components/responses/415'
      '500':
       Reference: 'TS29571_CommonData.yaml#/components/responses/500'
      '501':
       Reference: 'TS29571_CommonData.yaml#/components/responses/501'
      '503':
       Reference: 'TS29571_CommonData.yaml#/components/responses/503'
      Default:
       Reference: 'TS29571_CommonData.yaml#/components/responses/default'
```

/searches/{searchId}:

```
    get:
    operationId: RetrieveStoredSearch
    tags:
     - Stored Search (Document)
    parameters:
      - $ref: '#/components/parameters/searchId'
      - name: Accept-Encoding
        in: header
```

```
        description: Accept-Encoding, described in IETF RFC 7231
        schema:
          type: string
      responses:
        '200':
          $ref: '#/components/responses/200'
        '307':
          description: Temporary Redirect
          content:
            application/json:
              schema:
                $ref: 'TS29571_CommonData.yaml#/components/schemas/RedirectResponse'
          headers:
            Location:
              description: 'The URI pointing to the resource located on the redirect
target NRF'
              required: true
              schema:
                type: string
        '308':
          description: Permanent Redirect
          content:
            application/json:
              schema:
                $ref: 'TS29571_CommonData.yaml#/components/schemas/RedirectResponse'
          headers:
            Location:
              description: 'The URI pointing to the resource located on the redirect
target NRF'
              required: true
              schema:
                type: string
```

/searches/{searchId}/complete:

```
    get:
      operationId: RetrieveCompleteSearch
      tags:
        - Complete Stored Search (Document)
      parameters:
        - $ref: '#/components/parameters/searchId'
        - name: Accept-Encoding
          in: header
          description: Accept-Encoding, described in IETF RFC 7231
          schema:
            type: string
      responses:
        '200':
          $ref: '#/components/responses/200'
        '307':
```

```
          description: Temporary Redirect
          content:
            application/json:
              schema:
                $ref: 'TS29571_CommonData.yaml#/components/schemas/RedirectResponse'
          headers:
            Location:
              description: 'The URI pointing to the resource located on the redirect
target NRF'
              required: true
              schema:
                type: string
        '308':
          description: Permanent Redirect
          content:
            application/json:
              schema:
                $ref: 'TS29571_CommonData.yaml#/components/schemas/RedirectResponse'
          headers:
            Location:
              description: 'The URI pointing to the resource located on the redirect
target NRF'
              required: true
              schema:
                type: string
```

Components

```
securitySchemes:
  oAuth2ClientCredentials:
    Type: oauth2
    Flows:
      clientCredentials:
        tokenUrl: '/oauth2/token'
        scopes:
          nnrf-disc: Access to the Nnrf_NFDiscovery API
  parameters:
    searchId:
      name: searchId
      in: path
      description: Id of a stored search
      required: true
      schema:
        type: string
  responses:
    '200':
      description: Expected response to a valid request
      content:
        application/json:
```

```
          schema:
            $ref: '#/components/schemas/StoredSearchResult'
        headers:
          Cache-Control:
           description: Cache-Control containing max-age, described in IETF RFC 7234, 5.2

          schema:
            type: string
          ETag:
            description: Entity Tag containing a strong validator, described in IETF RFC
7232, 2.3
            schema:
              type: string
          Content-Encoding:
            description: Content-Encoding, described in IETF RFC 7231
            schema:
              type: string

schemas:
  SearchResult:
      description: Contains the list of NF Profiles returned in a Discovery response
    Type: object
    Required:
      - nfInstances
    Properties:
      validityPeriod:
        Type: integer
      nfInstances:
        Type: array
        Items:
          Reference: '#/components/schemas/NFProfile'
        searchId:
          type: string
        numNfInstComplete:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
        preferredSearch:
          Reference: '#/components/schemas/PreferredSearch'
        nrfSupportedFeatures:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
    StoredSearchResult:
      description: Contains a complete search result (i.e. a number of discovered NF
Instances), stored by NRF as a consequence of a prior search result
      type: object
      required:
        - nfInstances
      properties:
        nfInstances:
          type: array
          items:
            Reference: '#/components/schemas/NFProfile'
      description: Information of an NF Instance discovered by the NRF
  NFProfile:
    Type: object
```

```
Required:
  - nfInstanceId
  - nfType
  - nfStatus
Properties:
  nfInstanceId:
    Reference: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
    nfInstanceName:
      type: string
  nfType:
    Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/NFType'
  nfStatus:
    Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/NFStatus'
  plmnList:
    Type: array
    Items:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
    minItems: 1
  sNssais:
    Type: array
    Items:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
      Reference: 'TS29571_CommonData.yaml#/components/schemas/ExtSnssai'
    minItems: 1
  nsiList:
    Type: array
    Items:
      Type: string
    minItems: 1
  fqdn:
    Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/Fqdn'
  ipv4Addresses:
    Type: array
    Items:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
    minItems: 1
  ipv6Addresses:
    Type: array
    Items:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Addr'
    minItems: 1
  capacity:
    Type: integer
    Minimum: 0
    Maximum: 65535
  load:
    Type: integer
    Minimum: 0
    Maximum: 100
  locality:
    Type: string
  priority:
```

```
      Type: integer
      Minimum: 0
      Maximum: 65535
    udrInfo:
      Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/UdrInfo'
      udrInfoList:
        type: object
        additionalProperties:
          Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/UdrInfo'
        minProperties: 1
    udmInfo:
      Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/UdmInfo'
      udmInfoList:
        type: object
        additionalProperties:
          Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/UdmInfo'
        minProperties: 1
    ausfInfo:
      Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/AusfInfo'
      ausfInfoList:
        type: object
        additionalProperties:
          Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/AusfInfo'
        minProperties: 1
    amfInfo:
      Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/AmfInfo'
      amfInfoList:
        type: object
        additionalProperties:
          Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/AmfInfo'
        minProperties: 1
    smfInfo:
      Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/SmfInfo'
      smfInfoList:
        type: object
        additionalProperties:
          Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/smfInfo'
        minProperties: 1
    upfInfo:
      Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/UpfInfo'
      upfInfoList:
        type: object
        additionalProperties:
          Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/upfInfo'
        minProperties: 1
    pcfInfo:
      Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/PcfInfo'
      pcffInfoList:
        type: object
        additionalProperties:
          Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/pcfInfo'
```

```
    minProperties: 1
bsfInfo:
  Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/bsfInfo'
  bsfInfoList:
    type: object
    additionalProperties:
      Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/bsfInfo'
    minProperties: 1
chfInfo:
  Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/ChfInfo'
  chfInfoList:
    type: object
    additionalProperties:
      Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/chfInfo'
    minProperties: 1
udsInfo:
  Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/udsInfo'
  udsInfoList:
    type: object
    additionalProperties:
      Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/udsInfo'
    minProperties: 1
nwdafInfo:
  Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/nwdafInfo'
nefInfo:
  Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/nefInfo'
  pcscfInfoList:
    type: object
    additionalProperties:
      Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/pcscfInfo'
    minProperties: 1
  hssInfoList:
    type: object
    additionalProperties:
      Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/hssInfo'
    minProperties: 1
customInfo:
  Type: object
recoveryTime:
  Reference: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
nfServicePersistence:
  Type: boolean
  Default: false
nfServices:
    deprecated: true
  Type: array
  Items:
    Reference: '#/components/schemas/NFService'
  minItems: 1
    deprecated: true
  nfServiceList:
```

```
            type: object
            additionalProperties:
              Reference: '#/components/schemas/NFService'
            minProperties: 1
          defaultNotificationSubscriptions:
            type: array
            items:
              Reference:
'TS29510_Nnrf_NFManagement.yaml#/components/schemas/DefaultNotificationSubscription'
        lmfInfo:
          Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/lmfInfo'
        gmlcInfo:
          Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/gmlcInfo'
          snpnList:
            type: array
            items:
              Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/PlmnIdNid'
            minItems: 1
          nfSetIdList:
            type: array
            items:
              Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/NfSetId'
            minItems: 1
          servingScope:
            type: array
            items:
              type: string
            minItems: 1
          lcHSupportInd:
            type: boolean
            default: false
          olcHSupportInd:
            type: boolean
            default: false
          nfSetRecoveryTimeList:
            type: object
            additionalProperties:
              Reference: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
            minProperties: 1
          serviceSetRecoveryTimeList:
            type: object
            additionalProperties:
              Reference: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
            minProperties: 1
          scpDomains:
            type: array
            items:
              type: string
            minItems: 1
          scpInfo:
            Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/ScpInfo'
    NFService:
```

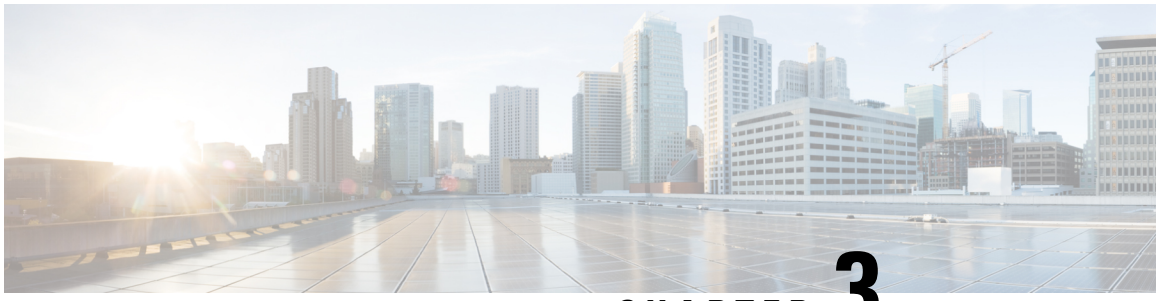
```
    description: Information of a given NF Service Instance; it is part of the NFProfile
 of an NF Instance discovered by the NRF
   Type: object
   Required:
     - serviceInstanceId
     - serviceName
     - versions
     - scheme
     - nfServiceStatus
   Properties:
     serviceInstanceId:
       Type: string
     serviceName:
       Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/ServiceName'
     versions:
       Type: array
       Items:
        Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/NFServiceVersion'

       minItems: 1
     scheme:
       Reference: 'TS29571_CommonData.yaml#/components/schemas/UriScheme'
     nfServiceStatus:
       Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/NFServiceStatus'
     fqdn:
       Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/Fqdn'
     ipEndPoints:
       Type: array
       Items:
         Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/IpEndPoint'
       minItems: 1
     apiPrefix:
       Type: string
     defaultNotificationSubscriptions:
       Type: array
       Items:
         Reference:
'TS29510_Nnrf_NFManagement.yaml#/components/schemas/DefaultNotificationSubscription'
       minItems: 1
     capacity:
       Type: integer
       Minimum: 0
       Maximum: 65535
     load:
       Type: integer
       Minimum: 0
       Maximum: 100
       loadTimeStamp:
         Reference: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
     priority:
       Type: integer
       Minimum: 0
       Maximum: 65535
```

```
      recoveryTime:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      chfServiceInfo:
        Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/ChfServiceInfo'
      supportedFeatures:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
        nfServiceSetIdList:
          type: array
          items:
            Reference: 'TS29571_CommonData.yaml#/components/schemas/NfServiceSetId'
          minItems: 1
        sNssais:
          type: array
          items:
            Reference: 'TS29571_CommonData.yaml#/components/schemas/ExtSnssai'
          minItems: 1
        perPlmnSnssaiList:
          type: array
          items:
            Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/PlmnSnssai'
          minItems: 1
        vendorId:
          Reference: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/VendorId'
        supportedVendorSpecificFeatures:
          type: object
          additionalProperties:
            type: array
            items:
              Reference:
'TS29510_Nnrf_NFManagement.yaml#/components/schemas/VendorSpecificFeature'
            minItems: 1
          minProperties: 1
externalDocs:
  description: 3GPP TS 29.510 V15.3.0; 5G System; Network Function Repository Services;
 Stage 3
  url: 'http://www.3gpp.org/ftp/Specs/archive/29_series/29.510/'
      oauth2Required:
        type: boolean
      allowedOperationsPerNfType:
        type: object
        additionalProperties:
          type: array
          items:
            type: string
          minItems: 1
        minProperties: 1
      allowedOperationsPerNfInstance:
        type: object
        additionalProperties:
          type: array
          items:
            type: string
```

```
          minItems: 1
        minProperties: 1
    PreferredSearch:
      description: Contains information on whether the returned NFProfiles match the
preferred query parameters
      type: object
      properties:
        preferredTaiMatchInd:
          type: boolean
          default: false
        preferredFullPlmnMatchInd:
          type: boolean
          default: false
        preferredApiVersionsMatchInd:
          type: boolean
        otherApiVersionsInd:
          type: boolean
        preferredLocalityMatchInd:
          type: boolean
          default: false
        otherLocalityInd:
          type: boolean
          default: false
```

External Docs

```
Description: 3GPP TS 29.510 V15.2.0; 5G System; Network Function Repository Services;
Stage 3
URL: 'http://www.3gpp.org/ftp/Specs/archive/29_series/29.510/'
```



CHAPTER 3

Nnrf_NFManagement

The Network Repository Function uses the Nnrf_NFManagement service to manage the create, update, and delete an NF.

- OpenAPI, on page 37
- Info, on page 37
- Servers, on page 37
- Security, on page 38
- Paths, on page 38
- Components, on page 55
- External Docs, on page 95

OpenAPI

OpenAPI Version: 3.0.0

Info

```
Version: '1.0.2'
Version: '1.1.4'
Title: 'NRF NFManagement Service'
Description: 'NRF NFManagement Service'
```

Servers

```
URL: '{apiRoot}/nnrf-nfm/v1'
Variables:
  API Root:
    Default: https://example.com
    Description: apiRoot as defined in subclause subclause 4.4 of 3GPP TS 29.501
    Description: apiRoot as defined in subclause clause 4.4 of 3GPP TS 29.501
```

Security

```
- {}
- oAuth2ClientCredentials:
    - nnrf-nfm
```

Paths

/nf-instances

```
  get:
    Summary: Retrieves a collection of NF Instances
    Operation ID: GetNFInstances

    Tags:
      - NF Instances (Store)

    Parameters:
      - Name: nf-type
        In: query
        Description: Type of NF
        Required/Optional: false
        Schema:
          Reference: '#/components/schemas/NFType'
      - Name: limit
        In: query
        Description: How many items to return at one time
        Required/Optional: false
        Schema:
          Type: integer

    Responses:
      '200':
        Description: Expected response to a valid request
        Content:
          application/3gppHal+json:
            Schema:
              Type: object
              Properties:
                _links:
                  Type: object
                 Description: 'List of the URI of NF instances. It has two members whose
 names are item and self. The item one contains an array of URIs.'
                  additionalProperties:
                    Reference:
'TS29571_CommonData.yaml#/components/schemas/LinksValueSchema'
              minProperties: 1
```

```
        '307':
          description: Temporary Redirect
          content:
            application/json:
              schema:
               Reference: 'TS29571_CommonData.yaml#/components/schemas/RedirectResponse'

          headers:
            Location:
              description: 'The URI pointing to the resource located on the redirect
target NRF'
              required: true
              schema:
                type: string
        '308':
          description: Permanent Redirect
          content:
            application/json:
              schema:
               Reference: 'TS29571_CommonData.yaml#/components/schemas/RedirectResponse'

          headers:
            Location:
              description: 'The URI pointing to the resource located on the redirect
target NRF'
              required: true
              schema:
                type: string
      '400':
        Reference: 'TS29571_CommonData.yaml#/components/responses/400'
      '403':
        Reference: 'TS29571_CommonData.yaml#/components/responses/403'
      '404':
        Reference: 'TS29571_CommonData.yaml#/components/responses/404'
      '411':
        Reference: 'TS29571_CommonData.yaml#/components/responses/411'
      '413':
        Reference: 'TS29571_CommonData.yaml#/components/responses/413'
      '415':
        Reference: 'TS29571_CommonData.yaml#/components/responses/415'
      '500':
        Reference: 'TS29571_CommonData.yaml#/components/responses/500'
      '501':
        Reference: 'TS29571_CommonData.yaml#/components/responses/501'
      '503':
        Reference: 'TS29571_CommonData.yaml#/components/responses/503'
      Default:
        Reference: 'TS29571_CommonData.yaml#/components/responses/default'
  options:
      summary: Discover communication options supported by NRF for NF Instances
      operationId: OptionsNFInstances
      tags:
```

```
    - NF Instances (Store)
  responses:
    '200':
      description: OK
      content:
        application/json:
          schema:
            Reference: '#/components/schemas/OptionsResponse'
       headers:
        Accept-Encoding:
          description: Accept-Encoding, described in IETF RFC 7694
          schema:
            type: string
    '204':
      headers:
      description: No Content
        Accept-Encoding:
          description: Accept-Encoding, described in IETF RFC 7694
          schema:
            type: string
    '307':
      description: Temporary Redirect
      content:
        application/json:
          schema:
           Reference: 'TS29571_CommonData.yaml#/components/schemas/RedirectResponse'

      headers:
        Location:
          description: 'The URI pointing to the resource located on the redirect
target NRF'
          required: true
          schema:
            type: string
    '308':
      description: Permanent Redirect
      content:
        application/json:
          schema:
           Reference: 'TS29571_CommonData.yaml#/components/schemas/RedirectResponse'

      headers:
        Location:
          description: 'The URI pointing to the resource located on the redirect
target NRF'
          required: true
          schema:
            type: string
  '400':
    Reference: 'TS29571_CommonData.yaml#/components/responses/400'
  '403':
    Reference: 'TS29571_CommonData.yaml#/components/responses/403'
```

```
    '404':
      Reference: 'TS29571_CommonData.yaml#/components/responses/404'
    '411':
      Reference: 'TS29571_CommonData.yaml#/components/responses/411'
    '413':
      Reference: 'TS29571_CommonData.yaml#/components/responses/413'
    '415':
      Reference: 'TS29571_CommonData.yaml#/components/responses/415'
    '500':
      Reference: 'TS29571_CommonData.yaml#/components/responses/500'
    '501':
      Reference: 'TS29571_CommonData.yaml#/components/responses/501'
    '503':
      Reference: 'TS29571_CommonData.yaml#/components/responses/503'
    Default:
      Reference: 'TS29571_CommonData.yaml#/components/responses/default'
```

/nf-instances/{nfInstanceID}

```
  get:
    Summary: Read the profile of a given NF Instance
    Operation ID: GetNFInstance

    Tags:
      - NF Instance ID (Document)

    Parameters:
      - Name: nfInstanceID
        In: path
        Description: Unique ID of the NF Instance
        Required/Optional: true
        Schema:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
        - name: requester-features
          in: query
          description: Features supported by the NF Service Consumer
          schema:
            Reference: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'

    Responses:
      '200':
        Description: Expected response to a valid request
          headers:
            ETag:
              description: Entity Tag containing a strong validator, described in IETF
RFC 7232, 2.3
              schema:
                type: string
        Content:
          Application/JSON:
            Schema:
```

```
            Reference: '#/components/schemas/NFProfile'
        '307':
          description: Temporary Redirect
          content:
            application/json:
              schema:
               Reference: 'TS29571_CommonData.yaml#/components/schemas/RedirectResponse'

          headers:
            Location:
              description: 'The URI pointing to the resource located on the redirect
target NRF'
              required: true
              schema:
                type: string
        '308':
          description: Permanent Redirect
          content:
            application/json:
              schema:
               Reference: 'TS29571_CommonData.yaml#/components/schemas/RedirectResponse'

          headers:
            Location:
              description: 'The URI pointing to the resource located on the redirect
target NRF'
              required: true
              schema:
                type: string
      '400':
        Reference: 'TS29571_CommonData.yaml#/components/responses/400'
      '403':
        Reference: 'TS29571_CommonData.yaml#/components/responses/403'
      '404':
        Reference: 'TS29571_CommonData.yaml#/components/responses/404'
      '411':
        Reference: 'TS29571_CommonData.yaml#/components/responses/411'
      '413':
        Reference: 'TS29571_CommonData.yaml#/components/responses/413'
      '415':
        Reference: 'TS29571_CommonData.yaml#/components/responses/415'
      '500':
        Reference: 'TS29571_CommonData.yaml#/components/responses/500'
      '501':
        Reference: 'TS29571_CommonData.yaml#/components/responses/501'
      '503':
        Reference: 'TS29571_CommonData.yaml#/components/responses/503'
      Default:
        Reference: 'TS29571_CommonData.yaml#/components/responses/default'
  put:
    Summary: Register a new NF Instance
    Operation ID: RegisterNFInstance
```

```
    Tags:
      - NF Instance ID (Document)

    Parameters:
      - Name: nfInstanceID
        In: path
        Required/Optional: true
        Description: Unique ID of the NF Instance to register
        Schema:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
      - Name: Content-Encoding
        In: header
        Required/Optional: true
        Description: Content-Encoding, described in IETF RFC 7231
        Schema:
          type: string
        #- name: Accept-Encoding
        #  in: header
        #  description: Accept-Encoding, described in IETF RFC 7231
        #  schema:
        #    type: string
    Request Body:
      Content:
        Application/JSON:
          Schema:
            Reference: '#/components/schemas/NFProfile'
      Required/Optional: true

    Responses:
      '200':
        Description: OK (Profile Replacement)
        Content:
          Application/JSON:
            Schema:
              Reference: '#/components/schemas/NFProfile'
            Content-Encoding:
              description: Content-Encoding, described in IETF RFC 7231
              schema:
                type: string
            ETag:
              description: Entity Tag containing a strong validator, described in IETF
RFC 7232, 2.3
              schema:
                type: string
      '201':
        Description: Expected response to a valid request
        Content:
          Application/JSON:
            Schema:
              Reference: '#/components/schemas/NFProfile'
        Headers:
```

```
        Location:
          description: 'Contains the URI of the newly created resource,
according to the structure': {apiRoot}/nnrf-nfm/v1/nf-instances/{nfInstanceId}'
          Required/Optional: true
          Schema:
            Type: string
          Accept-Encoding:
            description: Accept-Encoding, described in IETF RFC 7694
          Schema:
            Type: string
          Content-Encoding:
            description: Content-Encoding, described in IETF RFC 7231
            schema:
              type: string
          ETag:
            description: Entity Tag containing a strong validator, described in IETF
RFC 7232, 2.3
            schema:
              type: string
      '307':
        description: Temporary Redirect
        content:
          application/json:
            schema:
             Reference: 'TS29571_CommonData.yaml#/components/schemas/RedirectResponse'

        headers:
          Location:
            description: 'The URI pointing to the resource located on the redirect
target NRF'
            required: true
            schema:
              type: string
      '308':
        description: Permanent Redirect
        content:
          application/json:
            schema:
             Reference: 'TS29571_CommonData.yaml#/components/schemas/RedirectResponse'

        headers:
          Location:
            description: 'The URI pointing to the resource located on the redirect
target NRF'
            required: true
            schema:
              type: string
    '400':
      Reference: 'TS29571_CommonData.yaml#/components/responses/400'
    '403':
      Reference: 'TS29571_CommonData.yaml#/components/responses/403'
    '404':
```

```
        Reference: 'TS29571_CommonData.yaml#/components/responses/404'
      '411':
        Reference: 'TS29571_CommonData.yaml#/components/responses/411'
      '413':
        Reference: 'TS29571_CommonData.yaml#/components/responses/413'
      '415':
        Reference: 'TS29571_CommonData.yaml#/components/responses/415'
      '500':
        Reference: 'TS29571_CommonData.yaml#/components/responses/500'
      '501':
        Reference: 'TS29571_CommonData.yaml#/components/responses/501'
      '503':
        Reference: 'TS29571_CommonData.yaml#/components/responses/503'
      Default:
        Reference: 'TS29571_CommonData.yaml#/components/responses/default'
  patch:
    Summary: Update NF Instance profile
    Operation ID: UpdateNFInstance

    Tags:
      - NF Instance ID (Document)

    Parameters:
      - Name: nfInstanceID
        In: path
        Required/Optional: true
        Description: Unique ID of the NF Instance to update
        Schema:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
        #- name: Content-Encoding
        #  in: header
        #  description: Content-Encoding, described in IETF RFC 7231
        #  schema:
        #    type: string
        #- name: Accept-Encoding
        #  in: header
        #  description: Accept-Encoding, described in IETF RFC 7231
        #  schema:
        #    type: string
        #- name: If-Match
        #  in: header
        #  description: Validator for conditional requests, as described in IETF RFC
7232, 3.2
        #  schema:
        #    type: string
    Request Body:
      Content:
        application/json-patch+json:
          Schema:
            Type: array
            Items:
              Reference: 'TS29571_CommonData.yaml#/components/schemas/PatchItem'
```

```
          Min Items: 1
        Required/Optional: true

      Responses:
        '200':
          Description: Expected response to a valid request
          Content:
            Application/JSON:
              Schema:
                Reference: '#/components/schemas/NFProfile'
              headers:
                Accept-Encoding:
                  description: Accept-Encoding, described in IETF RFC 7694
                Schema:
                   type: string
                ETag:
                  description: Entity Tag containing a strong validator, described in IETF
RFC 7232, 2.3
                  schema:
                    type: string
                Content-Encoding:
                  description: Content-Encoding, described in IETF RFC 7231
                  schema:
                    type: string

        '204':
          Description: Expected response with empty body
            headers:
              Accept-Encoding:
                description: Accept-Encoding, described in IETF RFC 7694
                schema:
                  type: string
          '307':
            description: Temporary Redirect
            content:
              application/json:
                schema:
                 Reference: 'TS29571_CommonData.yaml#/components/schemas/RedirectResponse'

            headers:
              Location:
                description: 'The URI pointing to the resource located on the redirect
target NRF'
                required: true
                schema:
                  type: string
          '308':
            description: Permanent Redirect
            content:
              application/json:
                schema:
                 Reference: 'TS29571_CommonData.yaml#/components/schemas/RedirectResponse'
```

```
        headers:
          Location:
            description: 'The URI pointing to the resource located on the redirect
target NRF'
            required: true
            schema:
              type: string
      '400':
        Reference: 'TS29571_CommonData.yaml#/components/responses/400'
      '403':
        Reference: 'TS29571_CommonData.yaml#/components/responses/403'
      '404':
        Reference: 'TS29571_CommonData.yaml#/components/responses/404'
      '409':
        Reference: 'TS29571_CommonData.yaml#/components/responses/409'
      '411':
        Reference: 'TS29571_CommonData.yaml#/components/responses/411'
      '412':
        Reference: 'TS29571_CommonData.yaml#/components/responses/412'
      '413':
        Reference: 'TS29571_CommonData.yaml#/components/responses/413'
      '415':
        Reference: 'TS29571_CommonData.yaml#/components/responses/415'
      '500':
        Reference: 'TS29571_CommonData.yaml#/components/responses/500'
      '501':
        Reference: 'TS29571_CommonData.yaml#/components/responses/501'
      '503':
        Reference: 'TS29571_CommonData.yaml#/components/responses/503'
      Default:
        Reference: 'TS29571_CommonData.yaml#/components/responses/default'
  delete:
    Summary: Deregisters a given NF Instance
    Operation ID: DeregisterNFInstance

    Tags:
      - NF Instance ID (Document)

    Parameters:
      - Name: nfInstanceID
        In: path
        Required/Optional: true
        Description: Unique ID of the NF Instance to deregister
        Schema:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'

    Responses:
      '204':
        Description: Expected response to a successful deregistration
        '307':
          description: Temporary Redirect
          content:
```

```
            application/json:
              schema:
               Reference: 'TS29571_CommonData.yaml#/components/schemas/RedirectResponse'

          headers:
            Location:
              description: 'The URI pointing to the resource located on the redirect
target NRF'
              required: true
              schema:
                type: string
        '308':
          description: Permanent Redirect
          content:
            application/json:
              schema:
               Reference: 'TS29571_CommonData.yaml#/components/schemas/RedirectResponse'

          headers:
            Location:
              description: 'The URI pointing to the resource located on the redirect
target NRF'
              required: true
              schema:
                type: string
      '400':
        Reference: 'TS29571_CommonData.yaml#/components/responses/400'
      '401':
        Reference: 'TS29571_CommonData.yaml#/components/responses/401'
      '403':
        Reference: 'TS29571_CommonData.yaml#/components/responses/403'
      '404':
        Reference: 'TS29571_CommonData.yaml#/components/responses/404'
      '411':
        Reference: 'TS29571_CommonData.yaml#/components/responses/411'
      '429':
        Reference: 'TS29571_CommonData.yaml#/components/responses/429'
      '500':
        Reference: 'TS29571_CommonData.yaml#/components/responses/500'
      '501':
        Reference: 'TS29571_CommonData.yaml#/components/responses/501'
      '503':
        Reference: 'TS29571_CommonData.yaml#/components/responses/503'
```

/subscriptions

```
  Method: Post
    Summary: Create a new subscription
    Operation ID: CreateSubscription

    Tags:
```

```
      - Subscriptions (Collection)
      parameters:
        - name: Content-Encoding
          in: header
          description: Content-Encoding, described in IETF RFC 7231
          schema:
            type: string
        - name: Accept-Encoding
          in: header
          description: Accept-Encoding, described in IETF RFC 7231
          schema:
            type: string
    Request Body:
      Content:
        Application/JSON:
          Schema:
            Reference: '#/components/schemas/SubscriptionData'
      Required/Optional: true

    Responses:
      '201':
        Description: Expected response to a valid request
        Content:
          Application/JSON:
            Schema:
              Reference: '#/components/schemas/SubscriptionData'
        Headers:
          Location:
            description: 'Contains the URI of the newly created resource,
according to the structure: {apiRoot}/nnrf-nfm/v1/subscriptions/{subscriptionId}'
      '307':
        description: Temporary Redirect
        content:
          application/json:
            schema:
              Reference: 'TS29571_CommonData.yaml#/components/schemas/RedirectResponse'

        headers:
          Location:
            description: 'The URI pointing to the resource located on the redirect
target NRF'
            required: true
            schema:
              type: string
      '308':
        description: Permanent Redirect
        content:
          application/json:
            schema:
              Reference: 'TS29571_CommonData.yaml#/components/schemas/RedirectResponse'

        headers:
          Location:
```

```
            description: 'The URI pointing to the resource located on the redirect
target NRF'
            required: true
            schema:
              type: string
      '400':
        Reference: 'TS29571_CommonData.yaml#/components/responses/400'
      '403':
        Reference: 'TS29571_CommonData.yaml#/components/responses/403'
      '404':
        Reference: 'TS29571_CommonData.yaml#/components/responses/404'
      '411':
        Reference: 'TS29571_CommonData.yaml#/components/responses/411'
      '413':
        Reference: 'TS29571_CommonData.yaml#/components/responses/413'
      '415':
        Reference: 'TS29571_CommonData.yaml#/components/responses/415'
      '500':
        Reference: 'TS29571_CommonData.yaml#/components/responses/500'
      '501':
        Reference: 'TS29571_CommonData.yaml#/components/responses/501'
      '503':
        Reference: 'TS29571_CommonData.yaml#/components/responses/503'
      Default:
        Reference: 'TS29571_CommonData.yaml#/components/responses/default'
    Callbacks:
      onNFStatusEvent:
        '{$request.body#/nfStatusNotificationUri}':
          Post:
              parameters:
                - name: Content-Encoding
                  in: header
                  description: Content-Encoding, described in IETF RFC 7231
                  schema:
                    type: string
              Request Body:
                Description: Notification Payload
                Content:
                  Application/JSON:
                    Schema:
                      Reference: '#/components/schemas/NotificationData'

              Responses:
                '204':
                  Description: Expected response to a successful callback processing
                    headers:
                      Accept-Encoding:
                        description: Accept-Encoding, described in IETF RFC 7694
                        schema:
                          type: string
          '307':
            description: Temporary Redirect
```

```
          content:
            application/json:
              schema:
               Reference: 'TS29571_CommonData.yaml#/components/schemas/RedirectResponse'

          headers:
            Location:
              description: 'The URI pointing to the resource located on the redirect
target NRF'
              required: true
              schema:
                type: string
        '308':
          description: Permanent Redirect
          content:
            application/json:
              schema:
               Reference: 'TS29571_CommonData.yaml#/components/schemas/RedirectResponse'

          headers:
            Location:
              description: 'The URI pointing to the resource located on the redirect
target NRF'
              required: true
              schema:
                type: string
              '400':
                Reference: 'TS29571_CommonData.yaml#/components/responses/400'
              '403':
                Reference: 'TS29571_CommonData.yaml#/components/responses/403'
              '404':
                Reference: 'TS29571_CommonData.yaml#/components/responses/404'
              '411':
                Reference: 'TS29571_CommonData.yaml#/components/responses/411'
              '413':
                Reference: 'TS29571_CommonData.yaml#/components/responses/413'
              '415':
                Reference: 'TS29571_CommonData.yaml#/components/responses/415'
              '500':
                Reference: 'TS29571_CommonData.yaml#/components/responses/500'
              '501':
                Reference: 'TS29571_CommonData.yaml#/components/responses/501'
              '503':
                Reference: 'TS29571_CommonData.yaml#/components/responses/503'
              Default:
                Reference: 'TS29571_CommonData.yaml#/components/responses/default'
```

/subscriptions/{subscriptionID}

```
  patch:
    Summary: Updates a subscription
```

```
Operation ID: UpdateSubscription

Tags:
  - Subscription ID (Document)

Parameters:
  - Name: subscriptionID
    In: path
    Required/Optional: true
    Description: Unique ID of the subscription to update
    Schema:
      Type: string
      pattern: '^([0-9]{5,6}-)?[^-]+$'
    - name: Content-Encoding
      in: header
      description: Content-Encoding, described in IETF RFC 7231
      schema:
        type: string
    - name: Accept-Encoding
      in: header
      description: Accept-Encoding, described in IETF RFC 7231
      schema:
        type: string
Request Body:
  Content:
    application/json-patch+json:
      Schema:
        Type: array
        Items:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/PatchItem'
  Required/Optional: true

Responses:
  '200':
    Description: Expected response to a valid request
    Content:
      Application/JSON:
        Schema:
          Reference: '#/components/schemas/SubscriptionData'
      headers:
        Accept-Encoding:
          description: Accept-Encoding, described in IETF RFC 7694
          schema:
            type: string
        Content-Encoding:
          description: Content-Encoding, described in IETF RFC 7231
          schema:
            type: string
  '204':
    Description: No Content
      headers:
        Accept-Encoding:
```

```
            description: Accept-Encoding, described in IETF RFC 7694
            schema:
              type: string
        '307':
          description: Temporary Redirect
          content:
            application/json:
              schema:
               Reference: 'TS29571_CommonData.yaml#/components/schemas/RedirectResponse'

          headers:
            Location:
              description: 'The URI pointing to the resource located on the redirect
target NRF'
              required: true
              schema:
                type: string
        '308':
          description: Permanent Redirect
          content:
            application/json:
              schema:
               Reference: 'TS29571_CommonData.yaml#/components/schemas/RedirectResponse'

          headers:
            Location:
              description: 'The URI pointing to the resource located on the redirect
target NRF'
              required: true
              schema:
                type: string
      '400':
        Reference: 'TS29571_CommonData.yaml#/components/responses/400'
      '403':
        Reference: 'TS29571_CommonData.yaml#/components/responses/403'
      '404':
        Reference: 'TS29571_CommonData.yaml#/components/responses/404'
      '411':
        Reference: 'TS29571_CommonData.yaml#/components/responses/411'
      '413':
        Reference: 'TS29571_CommonData.yaml#/components/responses/413'
      '415':
        Reference: 'TS29571_CommonData.yaml#/components/responses/415'
      '500':
        Reference: 'TS29571_CommonData.yaml#/components/responses/500'
      '501':
        Reference: 'TS29571_CommonData.yaml#/components/responses/501'
      '503':
        Reference: 'TS29571_CommonData.yaml#/components/responses/503'
      Default:
        Reference: 'TS29571_CommonData.yaml#/components/responses/default'
  delete:
```

```
    Summary: Deletes a subscription
    Operation ID: RemoveSubscription

    Tags:
      - Subscription ID (Document)

    Parameters:
      - Name: subscriptionID
        In: path
        Required/Optional: true
        Description: Unique ID of the subscription to remove
        Schema:
          Type: string
          pattern: '^([0-9]{5,6}-)?[^-]+$'

    Responses:
      '204':
        Description: Expected response to a successful subscription removal
        '307':
          description: Temporary Redirect
          content:
            application/json:
              schema:
               Reference: 'TS29571_CommonData.yaml#/components/schemas/RedirectResponse'

          headers:
            Location:
              description: 'The URI pointing to the resource located on the redirect
target NRF'
              required: true
              schema:
                type: string
       '308':
          description: Permanent Redirect
          content:
            application/json:
              schema:
               Reference: 'TS29571_CommonData.yaml#/components/schemas/RedirectResponse'

          headers:
            Location:
              description: 'The URI pointing to the resource located on the redirect
target NRF'
              required: true
              schema:
                type: string
      '400':
        Reference: 'TS29571_CommonData.yaml#/components/responses/400'
      '403':
        Reference: 'TS29571_CommonData.yaml#/components/responses/403'
      '404':
        Reference: 'TS29571_CommonData.yaml#/components/responses/404'
      '411':
```

```
      Reference: 'TS29571_CommonData.yaml#/components/responses/411'
    '413':
      Reference: 'TS29571_CommonData.yaml#/components/responses/413'
    '415':
      Reference: 'TS29571_CommonData.yaml#/components/responses/415'
    '500':
      Reference: 'TS29571_CommonData.yaml#/components/responses/500'
    '501':
      Reference: 'TS29571_CommonData.yaml#/components/responses/501'
    '503':
      Reference: 'TS29571_CommonData.yaml#/components/responses/503'
    Default:
      Reference: 'TS29571_CommonData.yaml#/components/responses/default'
```

Components

```
securitySchemes:
  oAuth2ClientCredentials:
    Type: oauth2
    Flows:
      clientCredentials:
        tokenUrl: '/oauth2/token'
        scopes:
          nnrf-nfm: Access to the Nnrf_NFManagement API

schemas:
  NFProfile:
      description: Information of an NF Instance registered in the NRF
    Type: object
    Required:
      - nfInstanceId
      - nfType
      - nfStatus
    anyOf:
      - required: [ fqdn ]
      - required: [ ipv4Addresses ]
      - required: [ ipv6Addresses ]
    Properties:
      nfInstanceId:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
        nfInstanceName:
          type: string
      nfType:
        Reference: '#/components/schemas/NFType'
      nfStatus:
        Reference: '#/components/schemas/NFStatus'
      heartBeatTimer:
        Type: integer
      plmnList:
        Type: array
```

```
    Items:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
    minItems: 1
    snpnList:
      type: array
      items:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/PlmnIdNid'
    minItems: 1
  sNssais:
    Type: array
    Items:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
    minItems: 1
  nsiList:
    Type: array
    Items:
      Type: string
    minItems: 1
  fqdn:
    Reference: '#/components/schemas/Fqdn'
  interPlmnFqdn:
    Reference: '#/components/schemas/Fqdn'
  ipv4Addresses:
    Type: array
    Items:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
    minItems: 1
  ipv6Addresses:
    Type: array
    Items:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Addr'
    minItems: 1
  allowedPlmns:
    Type: array
    Items:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
    minItems: 1
    allowedSnpns:
    Type: array
    Items:
       Reference: 'TS29571_CommonData.yaml#/components/schemas/PlmnIdNid'
    minItems: 1
  allowedNfTypes:
    Type: array
    Items:
      Reference: '#/components/schemas/NFType'
    minItems: 1
  allowedNfDomains:
    Type: array
    Items:
      Type: string
```

```
  minItems: 1
allowedNssais:
  Type: array
  Items:
    Reference: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
  minItems: 1
priority:
  Type: integer
  Minimum: 0
  Maximum: 65535
capacity:
  Type: integer
  Minimum: 0
  Maximum: 65535
load:
  Type: integer
  Minimum: 0
  Maximum: 100
  loadTimeStamp:
    # Reference: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
    format: date-time
    type: string
locality:
  Type: string
udrInfo:
  Reference: '#/components/schemas/UdrInfo'
  udrInfoList:
    type: object
    additionalProperties:
      Reference: '#/components/schemas/UdrInfo'
    minProperties: 1
udmInfo:
  Reference: '#/components/schemas/UdmInfo'
  udmInfoList:
    type: object
    additionalProperties:
      Reference: '#/components/schemas/UdmInfo'
    minProperties: 1
ausfInfo:
  Reference: '#/components/schemas/AusfInfo'
  ausInfoList:
    type: object
    additionalProperties:
      Reference: '#/components/schemas/AusInfo'
    minProperties: 1
amfInfo:
  Reference: '#/components/schemas/AmfInfo'
  amfInfoList:
    type: object
    additionalProperties:
      Reference: '#/components/schemas/AmfInfo'
```

```
    minProperties: 1
smfInfo:
  Reference: '#/components/schemas/SmfInfo'
  smfInfoList:
    type: object
    additionalProperties:
      Reference: '#/components/schemas/SmfInfo'
    minProperties: 1
upfInfo:
  Reference: '#/components/schemas/UpfInfo'
  upfInfoList:
    type: object
    additionalProperties:
      Reference: '#/components/schemas/UpfInfo'
    minProperties: 1
pcfInfo:
  Reference: '#/components/schemas/PcfInfo'
  pcfInfoList:
    type: object
    additionalProperties:
      Reference: '#/components/schemas/PcfInfo'
    minProperties: 1
bsfInfo:
  Reference: '#/components/schemas/BsfInfo'
  bsfInfoList:
    type: object
    additionalProperties:
      Reference: '#/components/schemas/BsfInfo'
    minProperties: 1
chfInfo:
  Reference: '#/components/schemas/ChfInfo'
  chfInfoList:
    type: object
    additionalProperties:
      Reference: '#/components/schemas/SmfInfo'
    minProperties: 1
  nefInfo:
    Reference: '#/components/schemas/NefInfo'
nrfInfo:
  Reference: '#/components/schemas/NrfInfo'
udsInfo:
  Reference: '#/components/schemas/UdsInfo'
  udsInfoList:
    type: object
    additionalProperties:
      Reference: '#/components/schemas/UdsInfo'
    minProperties: 1
  nwdafInfo:
    Reference: '#/components/schemas/NwdafInfo'
  pcscfInfoList:
    type: object
```

```
    additionalProperties:
      Reference: '#/components/schemas/PcscfInfo'
    minProperties: 1
  hssInfoList:
    type: object
    additionalProperties:
      Reference: '#/components/schemas/HssInfo'
    minProperties: 1
customInfo:
  Type: object
recoveryTime:
    format: date-time
    type: string
  # Reference: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
nfServicePersistence:
  Type: boolean
    nullable: true
  Default: false
nfServices:
    deprecated: true
  Type: array
  Items:
    Reference: '#/components/schemas/NFService'
  minItems: 1
  nfServiceList:
    type: object
    additionalProperties:
      Reference: '#/components/schemas/NFService'
    minProperties: 1
  nfProfileChangesSupportInd:
    type: boolean
    default: false
    writeOnly: true
  nfProfileChangesInd:
    type: boolean
    default: false
    readOnly: true
  defaultNotificationSubscriptions:
    type: array
    items:
      Reference: '#/components/schemas/DefaultNotificationSubscription'
  lmfInfo:
    Reference: '#/components/schemas/LmfInfo'
  gmlcInfo:
    Reference: '#/components/schemas/GmlcInfo'
  nfSetIdList:
    type: array
    items:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/NfSetId'
    minItems: 1
  servingScope:
```

```
        type: array
        items:
          type: string
        minItems: 1
      lcHSupportInd:
        type: boolean
        default: false
      olcHSupportInd:
        type: boolean
        default: false
      nfSetRecoveryTimeList:
        type: object
        additionalProperties:
          format: date-time
          type: string
          # Reference: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
        minProperties: 1
      serviceSetRecoveryTimeList:
        type: object
        additionalProperties:
          format: date-time
          type: string
          # Reference: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
        minProperties: 1
      scpDomains:
        type: array
        items:
          type: string
        minItems: 1
      scpInfo:
        # Reference: '#/components/schemas/ScpInfo'
 NFService:
    description: Information of a given NF Service Instance; it is part of the NFProfile
of an NF Instance
   Type: object
   Required:
     - serviceInstanceId
     - serviceName
     - versions
     - scheme
     - nfServiceStatus
   Properties:
     serviceInstanceId:
       Type: string
     serviceName:
       Reference: '#/components/schemas/ServiceName'
     versions:
       Type: array
       Items:
         Reference: '#/components/schemas/NFServiceVersion'
       minItems: 1
     scheme:
       Reference: 'TS29571_CommonData.yaml#/components/schemas/UriScheme'
```

```
nfServiceStatus:
  Reference: '#/components/schemas/NFServiceStatus'
fqdn:
  Reference: '#/components/schemas/Fqdn'
interPlmnFqdn:
  Reference: '#/components/schemas/Fqdn'
ipEndPoints:
  Type: array
  Items:
    Reference: '#/components/schemas/IpEndPoint'
  minItems: 1
apiPrefix:
  Type: string
defaultNotificationSubscriptions:
  Type: array
  Items:
    Reference: '#/components/schemas/DefaultNotificationSubscription'
  minItems: 1
allowedPlmns:
  Type: array
  Items:
    Reference: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
  minItems: 1
  allowedSnpns:
    type: array
    items:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/PlmnIdNid'
    minItems: 1
allowedNfTypes:
  Type: array
  Items:
    Reference: '#/components/schemas/NFType'
  minItems: 1
allowedNfDomains:
  Type: array
  Items:
    Type: string
  minItems: 1
allowedNssais:
  Type: array
  Items:
    Reference: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
  minItems: 1
  allowedOperationsPerNfType:
    type: object
    additionalProperties:
  Type: array
  Items:
       type: string
     minItems: 1
    minProperties: 1
```

```
  allowedOperationsPerNfInstance:
    type: object
    additionalProperties:
  Type: array
  Items:
     minItems: 1
    minProperties: 1
priority:
  Type: integer
  Minimum: 0
  Maximum: 65535
capacity:
  Type: integer
  Minimum: 0
  Maximum: 65535
load:
  Type: integer
  Minimum: 0
  Maximum: 100
  loadTimeStamp:
    format: date-time
    type: string
    # Reference: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
recoveryTime:
    format: date-time
    type: string
  # Reference: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
chfServiceInfo:
  Reference: '#/components/schemas/ChfServiceInfo'
supportedFeatures:
  Reference: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
  nfServiceSetIdList:
    type: array
    items:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/NfServiceSetId'
    minItems: 1
  sNssais:
    type: array
    items:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
    minItems: 1
  perPlmnSnssaiList:
    type: array
    items:
      Reference: '#/components/schemas/PlmnSnssai'
    minItems: 1
  vendorId:
    Reference: '#/components/schemas/VendorId'
  supportedVendorSpecificFeatures:
    type: object
    additionalProperties:
```

```
        type: array
        items:
           Reference: '#/components/schemas/VendorSpecificFeature'
        minItems: 1
        minProperties: 1
      oauth2Required:
        type: boolean
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
    - type: string
Fqdn:
  description: Fully Qualified Domain Name
  Type: string
  NefId:
    description: Identity of the NEF
    type: string
IpEndPoint:
  description: IP addressing information of a given NFService; it consists on, e.g. IP
address, TCP port, transport protocol...
  Type: object
  Properties:
```

```
      ipv4Address:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
      ipv6Address:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Addr'
      transport:
        Reference: '#/components/schemas/TransportProtocol'
      port:
        Type: integer
        Minimum: 0
        Maximum: 65535
  SubscriptionData:
    description: Information of a subscription to notifications to NRF events, included
in subscription requests and responses
    Type: object
    Required:
      - nfStatusNotificationUri
      - subscriptionId
    Properties:
      nfStatusNotificationUri:
        Type: string
        reqNfInstanceId:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
      subscrCond:
        oneOf:
          - $ref: '#/components/schemas/NfInstanceIdCond'
          - $ref: '#/components/schemas/NfTypeCond'
          - $ref: '#/components/schemas/ServiceNameCond'
          - $ref: '#/components/schemas/AmfCond'
          - $ref: '#/components/schemas/GuamiListCond'
          - $ref: '#/components/schemas/NetworkSliceCond'
          - $ref: '#/components/schemas/NfGroupCond'
      subscriptionId:
        Type: string
        Pattern: '^([0-9]{5,6}-)?[^-]+$'
        readOnly: true
      validityTime:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
          format: date-time
          type: string
      reqNotifEvents:
        Type: array
        Items:
         Reference: '#/components/schemas/NotificationEventType'
        minItems: 1
      plmnId:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
        nid:
         Reference: 'TS29571_CommonData.yaml#/components/schemas/Nid'
      notifCondition:
         Reference: '#/components/schemas/NotifCondition'
      reqNfType:
        Reference: '#/components/schemas/NFType'
      reqNfFqdn:
```

```
        Reference: '#/components/schemas/Fqdn'

        reqPerPlmnSnssais:
          type: array
          items:
            Reference: '#/components/schemas/PlmnSnssai'
          minItems: 1
        reqPlmnList:
          type: array
          items:
            Reference: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
          minItems: 1
        reqSnpnList:
          type: array
          items:
            Reference: 'TS29571_CommonData.yaml#/components/schemas/PlmnIdNid'
          minItems: 1
        servingScope:
          type: array
          items:
            type: string
          minItems: 1
        requesterFeatures:
          writeOnly: true
          allOf:
            Reference: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
        nrfSupportedFeatures:
          readOnly: true
          allOf:
            Reference: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
    NfInstanceIdCond:
       description: Subscription to a given NF Instance Id
      Type: object
      Required:
        - nfInstanceId
      Properties:
        nfInstanceId:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
    NfTypeCond:
      Type: object
      Required:
        - nfType
      Properties:
        nfType:
          Reference: '#/components/schemas/NFType'
    ServiceNameCond:
       description: Subscription to a set of NFs based on their support for a given Service
    Name
      Type: object
      Required:
        - serviceName
      Properties:
```

```
      serviceName:
        Reference: '#/components/schemas/ServiceName'
    AmfCond:
      description: Subscription to a set of AMFs, based on AMF Set Id and/or AMF Region
    Id
      Type: object
      anyOf:
        - required: [ amfSetId ]
        - required: [ amfRegionId ]
      Properties:
        amfSetId:
          Type: string
        amfRegionId:
          Type: string
    GuamiListCond:
      description: Subscription to a set of AMFs, based on their GUAMIs
      Type: object
      Required:
        - guamiList
      Properties:
        guamiList:
          Type: array
          Items:
            Reference: 'TS29571_CommonData.yaml#/components/schemas/Guami'
    NetworkSliceCond:
      description: Subscription to a set of NFs, based on the slices (S-NSSAI and NSI)
    they support
      Type: object
      Required:
        - snssaiList
      Properties:
        snssaiList:
          Type: array
          Items:
            Reference: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
        nsiList:
          Type: array
          Items:
            Type: string
    NfGroupCond:
      description: Subscription to a set of NFs based on their Group Id
      Type: object
      Required:
        - nfType
        - nfGroupId
      Properties:
        nfType:
          Type: string
          enum:
            - UDM
            - AUSF
            - UDR
            - PCF
            - CHF
```

```
    nfGroupId:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/NfGroupId'
 NotifCondition:
    description: Condition (list of attributes in the NF Profile) to determine whether
 a notification must be sent by NRF
   Type: object
   not:
     Required: [ monitoredAttributes, unmonitoredAttributes ]
   Properties:
     monitoredAttributes:
       Type: array
       Items:
         Type: string
       minItems: 1
     unmonitoredAttributes:
       Type: array
       Items:
         Type: string
       minItems: 1
 UdrInfo:
    description: Information of an UDR NF Instance
  Type: object
  Properties:
    groupId:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/NfGroupId'
    supiRanges:
      Type: array
      Items:
        Reference: '#/components/schemas/SupiRange'
      minItems: 1
    gpsiRanges:
      Type: array
      Items:
        Reference: '#/components/schemas/IdentityRange'
      minItems: 1
    externalGroupIdentifiersRanges:
      Type: array
      Items:
        Reference: '#/components/schemas/IdentityRange'
      minItems: 1
    supportedDataSets:
      Type: array
      Items:
        Reference: '#/components/schemas/DataSetId'
      minItems: 1
 SupiRange:
    description: A range of SUPIs (subscriber identities), either based on a numeric
range, or based on regular-expression matching
   Type: object
   Properties:
     start:
       Type: string
```

```
      Pattern: '^[0-9]+$'
    end:
      Type: string
      Pattern: '^[0-9]+$'
    Pattern:
      Type: string
  IdentityRange:
    description: A range of GPSIs (subscriber identities), either based on a numeric
range, or based on regular-expression matching
   Type: object
   Properties:
    start:
      Type: string
      Pattern: '^[0-9]+$'
    end:
      Type: string
      Pattern: '^[0-9]+$'
    Pattern:
      Type: string
   InternalGroupIdRange:
    description: A range of Group IDs (internal group identities), either based on a
numeric range, or based on regular-expression matching
    type: object
    properties:
      start:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/GroupId'
      end:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/GroupId'
      pattern:
        type: string
  DataSetId:
   description: Types of data sets stored in UDR
   anyOf:
    - type: string
      enum:
        - SUBSCRIPTION
        - POLICY
        - EXPOSURE
        - APPLICATION
    - type: string
  UdmInfo:
    description: Information of an UDM NF Instance
   Type: object
   Properties:
    groupId:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/NfGroupId'
    supiRanges:
      Type: array
      Items:
        Reference: '#/components/schemas/SupiRange'
      minItems: 1
    gpsiRanges:
      Type: array
```

```
      Items:
        Reference: '#/components/schemas/IdentityRange'
      minItems: 1
    externalGroupIdentifiersRanges:
      Type: array
      Items:
        Reference: '#/components/schemas/IdentityRange'
      minItems: 1
    routingIndicators:
      Type: array
      Items:
        Type: string
        Pattern: '^[0-9]{1,4}$'
      minItems: 1
      internalGroupIdentifiersRanges:
      Type: array
      Items:
          Reference: '#/components/schemas/InternalGroupIdRange'
        minItems: 1
AusfInfo:
    description: Information of an AUSF NF Instance
  Type: object
  Properties:
    groupId:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/NfGroupId'
    supiRanges:
      Type: array
      Items:
        Reference: '#/components/schemas/SupiRange'
      minItems: 1
    routingIndicators:
      Type: array
      Items:
        Type: string
        Pattern: '^[0-9]{1,4}$'
      minItems: 1
AmfInfo:
    description: Information of an AMF NF Instance
  Type: object
  Required:
    - amfSetId
    - amfRegionId
    - guamiList
  Properties:
    amfSetId:
      Type: string
    amfRegionId:
      Type: string
    guamiList:
      Type: array
      Items:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Guami'
```

```
      minItems: 1
    taiList:
      Type: array
      Items:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Tai'
      minItems: 1
    taiRangeList:
      Type: array
      Items:
        Reference: '#/components/schemas/TaiRange'
      minItems: 1
    backupInfoAmfFailure:
      Type: array
      Items:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Guami'
      minItems: 1
    backupInfoAmfRemoval:
      Type: array
      Items:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Guami'
      minItems: 1
    n2InterfaceAmfInfo:
      Reference: '#/components/schemas/N2InterfaceAmfInfo'
SmfInfo:
    description: Information of an SMF NF Instance
  Type: object
  Required:
    - sNssaiSmfInfoList
  Properties:
    sNssaiSmfInfoList:
      Type: array
      Items:
        Reference: '#/components/schemas/SnssaiSmfInfoItem'
      minItems: 1
    taiList:
      Type: array
      Items:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Tai'
      minItems: 1
    taiRangeList:
      Type: array
      Items:
        Reference: '#/components/schemas/TaiRange'
      minItems: 1
    pgwFqdn:
      Reference: '#/components/schemas/Fqdn'
    accessType:
      Type: array
      Items:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/AccessType'
      minItems: 1
      priority:
```

```
        type: integer
        minimum: 0
        maximum: 65535
      vsmfSupportInd:
        type: boolean
        default: false
SnssaiSmfInfoItem:
    description: Set of parameters supported by SMF for a given S-NSSAI
  Type: object
  Required:
    - sNssai
    - dnnSmfInfoList
  Properties:
    sNssai:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
    dnnSmfInfoList:
      Type: array
      Items:
        Reference: '#/components/schemas/DnnSmfInfoItem'
      minItems: 1
DnnSmfInfoItem:
  description: Set of parameters supported by SMF for a given DNN
  Type: object
  Required:
    - dnn
  Properties:
    dnn:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/Dnn'
UpfInfo:
  description: Information of an UPF NF Instance
  Type: object
  Required:
    - sNssaiUpfInfoList
  Properties:
    sNssaiUpfInfoList:
      Type: array
      Items:
        Reference: '#/components/schemas/SnssaiUpfInfoItem'
      minItems: 1
    smfServingArea:
      Type: array
      Items:
        Type: string
      minItems: 1
    interfaceUpfInfoList:
      Type: array
      Items:
        Reference: '#/components/schemas/InterfaceUpfInfoItem'
      minItems: 1
    iwkEpsInd:
      Type: boolean
      Default: false
```

```
      pduSessionTypes:
        type: array
        items:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/PduSessionType'
        minItems: 1
      atsssCapability:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/AtsssCapability'
      ueIpAddrInd:
        type: boolean
        default: false
      taiList:
        type: array
        items:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/Tai'
        minItems: 1
      wAgfInfo:
        Reference: '#/components/schemas/WAgfInfo'
      tngfInfo:
        Reference: '#/components/schemas/TngfInfo'
      twifInfo:
        Reference: '#/components/schemas/TwifInfo'
      priority:
        type: integer
        minimum: 0
        maximum: 65535
      redundantGtpu:
        type: boolean
        default: false
      ipups:
        type: boolean
        default: false
      dataForwarding:
        type: boolean
        default: false
SnssaiUpfInfoItem:
    description: Set of parameters supported by UPF for a given S-NSSAI
  Type: object
  Required:
    - sNssai
    - dnnUpfInfoList
  Properties:
    sNssai:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
    dnnUpfInfoList:
      Type: array
      Items:
        Reference: '#/components/schemas/DnnUpfInfoItem'
      minItems: 1
      redundantTransport:
        type: boolean
        default: false
DnnUpfInfoItem:
```

```
      description: Set of parameters supported by UPF for a given DNN
    Type: object
    Required:
      - dnn
    Properties:
      dnn:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Dnn'
      dnaiList:
        Type: array
        Items:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/Dnai'
        minItems: 1
        pduSessionTypes:
          type: array
          items:
            Reference: 'TS29571_CommonData.yaml#/components/schemas/PduSessionType'
          minItems: 1
        ipv4AddressRanges:
          type: array
          items:
            Reference: '#/components/schemas/Ipv4AddressRange'
          minItems: 1
        ipv6PrefixRanges:
          type: array
          items:
            Reference: '#/components/schemas/Ipv6PrefixRange'
          minItems: 1
        dnaiNwInstanceList:
          description: Map of network instance per DNAI for the DNN, where the key of
the map is the DNAI. When present, the value of each entry of the map shall contain a N6
network instance that is configured for the DNAI indicated by the key.
          type: object
          additionalProperties:
            type: string
          minProperties: 1
  InterfaceUpfInfoItem:
    description: Information of a given IP interface of an UPF
    Type: object
    Required:
      - interfaceType
    Properties:
      interfaceType:
        Reference: '#/components/schemas/UPInterfaceType'
      ipv4EndpointAddresses:
        Type: array
        Items:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
        minItems: 1
      ipv6EndpointAddresses:
        Type: array
        Items:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Addr'
```

```
      minItems: 1
    endpointFqdn:
       Reference: '#/components/schemas/Fqdn'
    networkInstance:
      Type: string
UPInterfaceType:
  description: Types of User-Plane interfaces of the UPF
  anyOf:
    - type: string
      enum:
        - N3
        - N6
        - N9
        - DATA_FORWARDING
    - type: string
  WAgfInfo:
    description: Information of the W-AGF end-points
    type: object
    properties:
      ipv4EndpointAddresses:
        type: array
        items:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
        minItems: 1
      ipv6EndpointAddresses:
        type: array
        items:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Addr'
        minItems: 1
      endpointFqdn:
        Reference: '#/components/schemas/Fqdn'
  TngfInfo:
    description: Infomation of the TNGF endpoints
    type: object
    properties:
      ipv4EndpointAddresses:
        type: array
        items:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
        minItems: 1
      ipv6EndpointAddresses:
        type: array
        items:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Addr'
        minItems: 1
      endpointFqdn:
        Reference: '#/components/schemas/Fqdn'
PcfInfo:
    description: Information of a PCF NF Instance
  Type: object
  Properties:
      groupId:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/NfGroupId'
```

```
    dnnList:
      Type: array
      Items:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Dnn'
      minItems: 1
    supiRanges:
      Type: array
      Items:
        Reference: '#/components/schemas/SupiRange'
      minItems: 1
      gpsiRanges:
        type: array
        items:
          Reference: '#/components/schemas/IdentityRange'
        minItems: 1
    rxDiamHost:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/DiameterIdentity'
    rxDiamRealm:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/DiameterIdentity'
      v2xSupportInd:
        type: boolean
        default: false
BsfInfo:
    description: Information of a BSF NF Instance
  Type: object
  Properties:
    dnnList:
      Type: array
      Items:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Dnn'
      minItems: 1
    ipDomainList:
      Type: array
      Items:
        Type: string
      minItems: 1
    ipv4AddressRanges:
      Type: array
      Items:
        Reference: '#/components/schemas/Ipv4AddressRange'
      minItems: 1
    ipv6PrefixRanges:
      Type: array
      Items:
        Reference: '#/components/schemas/Ipv6PrefixRange'
      minItems: 1
ChfInfo:
    description: Information of a CHF NF Instance
  Type: object
    not:
      required: [ primaryChfInstance, secondaryChfInstance ]
```

```
    Properties:
      supiRangeList:
        Type: array
        Items:
          Reference: '#/components/schemas/SupiRange'
        minItems: 1
      gpsiRangeList:
        Type: array
        Items:
          Reference: '#/components/schemas/IdentityRange'
        minItems: 1
      plmnRangeList:
        Type: array
        Items:
          Reference: '#/components/schemas/PlmnRange'
        minItems: 1
        groupId:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/NfGroupId'
        primaryChfInstance:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
        secondaryChfInstance:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
  Ipv4AddressRange:
      description: Range of IPv4 addresses
    Type: object
    Properties:
      start:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
      end:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
  Ipv6PrefixRange:
    description: Range of IPv6 prefixes
    Type: object
    Properties:
      start:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Prefix'
      end:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Prefix'
  DefaultNotificationSubscription:
    description: Data structure for specifying the notifications the NF service subscribes
by default along with callback URI
    Type: object
    Required:
      - notificationType
      - callbackUri
    Properties:
      notificationType:
        Reference: '#/components/schemas/NotificationType'
      callbackUri:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Uri'
      n1MessageClass:
        Reference: 'TS29518_Namf_Communication.yaml#/components/schemas/N1MessageClass'
```

```
      n2InformationClass:
       Reference: 'TS29518_Namf_Communication.yaml#/components/schemas/N2InformationClass'


        versions:
          type: array
          items:
            type: string
          minItems: 1
        binding:
          type: string
    NfSetCond:
      description: Subscription to a set of NFs based on their Set Id
      type: object
      required:
        - nfSetId
      properties:
        nfSetId:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/NfSetId'
    NfServiceSetCond:
      description: Subscription to a set of NFs based on their Service Set Id
      type: object
      required:
        - nfServiceSetId
      properties:
        nfServiceSetId:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/NfServiceSetId'
    UpfCond:
      description: Subscription to a set of NF Instances (UPFs), able to serve a certain
service area (i.e. SMF serving area or TAI list)
      type: object
      required:
        - conditionType
      properties:
        conditionType:
          type: string
          enum: [ UPF_COND ]
        smfServingArea:
          type: array
          items:
            type: string
          minItems: 1
        taiList:
          type: array
          items:
            Reference: 'TS29571_CommonData.yaml#/components/schemas/Tai'
          minItems: 1
    NwdafCond:
      description: Subscription to a set of NF Instances (NWDAFs), identified by Analytics
ID(s), S-NSSAI(s) or NWDAF Serving Area information, i.e. list of TAIs for which the NWDAF
can provide analytics.
      type: object
      required:
```

```
      - conditionType
    properties:
      conditionType:
        type: string
        enum: [ NWDAF_COND ]
      analyticsIds:
        type: array
        items:
          type: string
        minItems: 1
      snssaiList:
        type: array
        items:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
        minItems: 1
      taiList:
        type: array
        items:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/Tai'
        minItems: 1
      taiRangeList:
        type: array
        items:
          Reference: '#/components/schemas/TaiRange'
        minItems: 1
  NefCond:
    description: Subscription to a set of NF Instances (NEFs), identified by Event ID(s)
 provided by AF, S-NSSAI(s), AF Instance ID, Application Identifier, External Identifier,
External Group Identifier, or domain name.
    type: object
    required:
      - conditionType
    properties:
      conditionType:
        type: string
        enum: [ NEF_COND ]
      afEvents:
        type: array
        items:
          Reference: 'TS29517_Naf_EventExposure.yaml#/components/schemas/AfEvent'
        minItems: 1
      snssaiList:
        type: array
        items:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
        minItems: 1
      pfdData:
        Reference: '#/components/schemas/PfdData'
      gpsiRanges:
        type: array
        items:
          Reference: '#/components/schemas/IdentityRange'
```

```
        minItems: 1
      externalGroupIdentifiersRanges:
        type: array
        items:
          Reference: '#/components/schemas/IdentityRange'
        minItems: 1
      servedFqdnList:
        type: array
        items:
          type: string
        minItems: 1
  NotificationType:
     description: Types of notifications used in Default Notification URIs in the NF
Profile of an NF Instance
    anyOf:
      - type: string
        enum:
          - N1_MESSAGES
          - N2_INFORMATION
          - LOCATION_NOTIFICATION
          - DATA_REMOVAL_NOTIFICATION
          - DATA_CHANGE_NOTIFICATION
          - LOCATION_UPDATE_NOTIFICATION
          - NSSAA_REAUTH_NOTIFICATION
          - NSSAA_REVOC_NOTIFICATION
      - type: string
  TransportProtocol:
    description: Types of transport protocol used in a given IP endpoint of an NF Service
 Instance
    anyOf:
      - type: string
        enum:
          - TCP
      - type: string
  NotificationEventType:
    description: Types of events sent in notifications from NRF to subscribed NF Instances

    anyOf:
      - type: string
        enum:
          - NF_REGISTERED
          - NF_DEREGISTERED
          - NF_PROFILE_CHANGED
      - type: string
  NotificationData:
     description: Data sent in notifications from NRF to subscribed NF Instances
    Type: object
    Required:
      - event
      - nfInstanceUri
    allOf:
       #
       # Condition: If 'event' takes value 'NF_PROFILE_CHANGED',
       # then either 'nfProfile' or 'profileChanges' (but not both) must be present
       #
      - anyOf:
        - not:
```

```
        Properties:
          event:
            Type: string
            enum:
              - NF_PROFILE_CHANGED
    - oneOf:
        - required: [ nfProfile ]
        - required: [ profileChanges ]
    #
    # Condition: If 'event' takes value 'NF_REGISTERED',
    # then 'nfProfile' must be present
    #
  - anyOf:
    - not:
        Properties:
          event:
            Type: string
            enum:
              - NF_REGISTERED
    - required: [ nfProfile ]
Properties:
  event:
    Reference: '#/components/schemas/NotificationEventType'
  nfInstanceUri:
    Reference: 'TS29571_CommonData.yaml#/components/schemas/Uri'
  nfProfile:
    allOf:
      - $ref: '#/components/schemas/NFProfile'
      - not:
          Required: [ interPlmnFqdn ]
      - not:
          Required: [ allowedPlmns ]
      - not:
          Required: [ allowedSnpns ]
      - not:
          Required: [ allowedNfTypes ]
      - not:
          Required: [ allowedNfDomains ]
      - not:
          Required: [ allowedNssais ]
      - properties:
          nfServices:
            Type: array
            Items:
              allOf:
                - $ref: '#/components/schemas/NFService'
                - not:
                    Required: [ interPlmnFqdn ]
                - not:
                    Required: [ allowedPlmns ]
                - not:
                    Required: [ allowedNfTypes ]
                - not:
                    Required: [ allowedNfDomains ]
                - not:
                    Required: [ allowedNssais ]
```

```
    profileChanges:
      Type: array
      Items:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/ChangeItem'
      minItems: 1
      conditionEvent:
        Reference: '#/components/schemas/ConditionEventType'
NFStatus:
    description: Status of a given NF Instance stored in NRF
  anyOf:
    - type: string
      enum:
        - REGISTERED
        - SUSPENDED
        - UNDISCOVERABLE
    - type: string
NFServiceVersion:
    description: Contains the version details of an NF service
  Type: object
  Required:
    - apiVersionInUri
    - apiFullVersion
  Properties:
    apiVersionInUri:
      Type: string
    apiFullVersion:
      Type: string
    expiry:
        format: date-time
        type: string
      Reference: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
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
        - namf-comm
        - namf-evts
        - namf-mt
        - namf-loc
        - nsmf-pdusession
        - nsmf-event-exposure
        - nsmf-nidd
        - nausf-auth
        - nausf-sorprotection
        - nnef-pfdmanagement
        - nnef-smcontext
```

```
        - nnef-eventexposure
        - npcf-am-policy-control
        - npcf-smpolicycontrol
        - npcf-policyauthorization
        - npcf-bdtpolicycontrol
        - npcf-eventexposure
        - npcf-ue-policy-control
        - 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
        - nucmf-provisioning
        - nucmf-uecapabilitymanagement
        - nhss-sdm
        - nhss-uecm
        - nhss-ueau
        - nhss-ee
        - nhss-ims-sdm
        - nhss-ims-uecm
        - nhss-ims-ueau
        - nsepp-telescopic
        - nsoraf-sor
        - nspaf-secured-packet
        - nudsf-dr
        - nnssaaf-nssaa
    - type: string
N2InterfaceAmfInfo:
    description: AMF N2 interface information
  Type: object
  Properties:
    ipv4EndpointAddress:
      Type: array
      Items:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
      minItems: 1
    ipv6EndpointAddress:
      Type: array
      Items:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Addr'
      minItems: 1
    amfName:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/AmfName'
NFServiceStatus:
   description: Status of a given NF Service Instance of an NF Instance stored in NRF

  anyOf:
    - type: string
      enum:
        - REGISTERED
        - SUSPENDED
```

```
    - type: string
TaiRange:
    description: Range of TAIs (Tracking Area Identities)
  Type: object
  Required:
    - plmnId
    - tacRangeList
  Properties:
    plmnId:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
    tacRangeList:
      Type: array
      Items:
        Reference: '#/components/schemas/TacRange'
      minItems: 1
      nid:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Nid'
TacRange:
    description: Range of TACs (Tracking Area Codes)
  Type: object
  Properties:
    start:
      Type: string
      Pattern: '^([A-Fa-f0-9]{4}|[A-Fa-f0-9]{6})$'
    end:
      Type: string
      Pattern: '^([A-Fa-f0-9]{4}|[A-Fa-f0-9]{6})$'
    Pattern:
      Type: string
ChfServiceInfo:
  Type: object
  not:
    Required: [ primaryChfServiceInstance, secondaryChfServiceInstance ]
  Properties:
    primaryChfServiceInstance:
      Type: string
    secondaryChfServiceInstance:
      Type: string
PlmnRange:
    description: Range of PLMN IDs
  Type: object
  Properties:
    start:
      Type: string
      Pattern: '^[0-9]{3}[0-9]{2,3}$'
    end:
      Type: string
      Pattern: '^[0-9]{3}[0-9]{2,3}$'
    Pattern:
      Type: string
NrfInfo:
   description: Information of an NRF NF Instance, used in hierarchical NRF deployments
```

```
Type: object
Properties:
  servedUdrInfo:
    Type: object
    additionalProperties:
      Reference: '#/components/schemas/UdrInfo'
    minProperties: 1
    servedUdrInfoList:
    Type: object
    additionalProperties:
    Type: object
    additionalProperties:
         Reference: '#/components/schemas/UdrInfo'
    minProperties: 1
      minProperties: 1
  servedUdmInfo:
    Type: object
    additionalProperties:
      Reference: '#/components/schemas/UdmInfo'
    minProperties: 1
    servedUdmInfoList:
    Type: object
    additionalProperties:
    Type: object
    additionalProperties:
         Reference: '#/components/schemas/UdmInfo'
    minProperties: 1
      minProperties: 1
  servedAusfInfo:
    Type: object
    additionalProperties:
      Reference: '#/components/schemas/AusfInfo'
    minProperties: 1
    servedAusInfoList:
    Type: object
    additionalProperties:
    Type: object
    additionalProperties:
         Reference: '#/components/schemas/AusInfo'
    minProperties: 1
      minProperties: 1
  servedAmfInfo:
    Type: object
    additionalProperties:
      Reference: '#/components/schemas/AmfInfo'
    minProperties: 1
    servedAmfInfoList:
    Type: object
    additionalProperties:
    Type: object
    additionalProperties:
```

```
        Reference: '#/components/schemas/AmfInfo'
    minProperties: 1
      minProperties: 1
  servedSmfInfo:
    Type: object
    additionalProperties:
      Reference: '#/components/schemas/SmfInfo'
    minProperties: 1
    servedSmfInfoList:
    Type: object
    additionalProperties:
    Type: object
    additionalProperties:
        Reference: '#/components/schemas/SmfInfo'
    minProperties: 1
      minProperties: 1
  servedUpfInfo:
    Type: object
    additionalProperties:
      Reference: '#/components/schemas/UpfInfo'
    minProperties: 1
    servedUpfInfoList:
    Type: object
    additionalProperties:
    Type: object
    additionalProperties:
        Reference: '#/components/schemas/UpfInfo'
    minProperties: 1
      minProperties: 1
  servedPcfInfo:
    Type: object
    additionalProperties:
      Reference: '#/components/schemas/PcfInfo'
    minProperties: 1
    servedPcfInfoList:
    Type: object
    additionalProperties:
    Type: object
    additionalProperties:
        Reference: '#/components/schemas/PcfInfo'
    minProperties: 1
      minProperties: 1
  servedBsfInfo:
    Type: object
    additionalProperties:
      Reference: '#/components/schemas/BsfInfo'
    minProperties: 1
    servedBsfInfoList:
    Type: object
    additionalProperties:
    Type: object
```

```
    additionalProperties:
         Reference: '#/components/schemas/BsfInfo'
    minProperties: 1
      minProperties: 1
  servedChfInfo:
    Type: object
    additionalProperties:
      Reference: '#/components/schemas/ChfInfo'
    minProperties: 1
    servedChfInfoList:
    Type: object
    additionalProperties:
    Type: object
    additionalProperties:
         Reference: '#/components/schemas/ChfInfo'
    minProperties: 1
      minProperties: 1
    servedNefInfo:
      type: object
      additionalProperties:
        Reference: '#/components/schemas/NefInfo'
      minProperties: 1
    servedNwdafInfo:
      type: object
      additionalProperties:
        Reference: '#/components/schemas/NwdafInfo'
      minProperties: 1
    servedPcscfInfoList:
    Type: object
    additionalProperties:
    Type: object
    additionalProperties:
         Reference: '#/components/schemas/PcscfInfo'
    minProperties: 1
      minProperties: 1
    servedGmlcInfo:
      type: object
      additionalProperties:
        Reference: '#/components/schemas/GmlcInfo'
      minProperties: 1
    servedLmfcInfo:
      type: object
      additionalProperties:
        Reference: '#/components/schemas/LmfcInfo'
      minProperties: 1
    servedNfInfo:
      type: object
      additionalProperties:
        Reference: '#/components/schemas/NfInfo'
      minProperties: 1
    servedHssInfoList:
```

```
    Type: object
    additionalProperties:
    Type: object
    additionalProperties:
         Reference: '#/components/schemas/HssInfo'
    minProperties: 1
      minProperties: 1
    servedUdsfInfo:
      type: object
      additionalProperties:
        Reference: '#/components/schemas/UdsfInfo'
      minProperties: 1
    servedUdsfInfoList:
    Type: object
    additionalProperties:
    Type: object
    additionalProperties:
         Reference: '#/components/schemas/UdsfInfo'
    minProperties: 1
      minProperties: 1
    servedScpInfoList:
    Type: object
    additionalProperties:
         Reference: '#/components/schemas/ScpInfo'
    minProperties: 1
PlmnSnssai:
  description: List of network slices (S-NSSAIs) for a given PLMN ID
    Type: object
  required:
    - plmnId
    - sNssaiList
  properties:
    plmnId:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
    sNssaiList:
    Type: array
      items:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
      minItems: 1
    nid:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/Nid'
NefInfo:
  description: Information of an NEF NF Instance
    Type: object
  properties:
    nefId:
      Reference: '#/components/schemas/NefId'
    pfdData:
      Reference: '#/components/schemas/PfdData'
    afEeData:
      Reference: '#/components/schemas/AfEventExposureData'
    gpsiRanges:
```

```
          type: array
          items:
            Reference: '#/components/schemas/IdentityRange'
          minItems: 1
        externalGroupIdentifiersRanges:
          type: array
          items:
            Reference: '#/components/schemas/IdentityRange'
          minItems: 1
        servedFqdnList:
          type: array
          items:
            type: string
          minItems: 1
    PfdData:
      description: List of Application IDs and/or AF IDs managed by a given NEF Instance

        Type: object
      properties:
        appIds:
          type: array
          items:
            type: string
          minItems: 1
        afIds:
          type: array
          items:
            type: string
          minItems: 1
    NwdafInfo:
      description: Information of a NWDAF NF Instance
        Type: object
      properties:
        eventIds:
          type: array
          items:
            Reference: 'TS29520_Nnwdaf_AnalyticsInfo.yaml#/components/schemas/EventId'
          minItems: 1
        nwdafEvents:
          type: array
          items:
            Reference:
'TS29520_Nnwdaf_EventsSubscription.yaml#/components/schemas/NwdafEvent'
          minItems: 1
        taiList:
          type: array
          items:
            Reference: 'TS29571_CommonData.yaml#/components/schemas/Tai'
          minItems: 1
        taiRangeList:
          type: array
          items:
```

```
            Reference: '#/components/schemas/TaiRange'
          minItems: 1
      LmfInfo:
        description: Information of an LMF NF Instance
          Type: object
        properties:
          servingClientTypes:
            type: array
            items:
             Reference: 'TS29572_Nlmf_Location.yaml#/components/schemas/ExternalClientType'

            minItems: 1
          lmfId:
            Reference: 'TS29572_Nlmf_Location.yaml#/components/schemas/LMFIdentification'
          servingAccessTypes:
            type: array
            items:
              Reference: 'TS29571_CommonData.yaml#/components/schemas/AccessType'
            minItems: 1
          servingAnNodeTypes:
            type: array
            items:
              Reference: '#/components/schemas/AnNodeType'
            minItems: 1
          servingRatTypes:
            type: array
            items:
              Reference: 'TS29571_CommonData.yaml#/components/schemas/RatType'
            minItems: 1
      GmlcInfo:
        description: Information of a GMLC NF Instance
          Type: object
        properties:
          servingClientTypes:
            type: array
            items:
             Reference: 'TS29572_Nlmf_Location.yaml#/components/schemas/ExternalClientType'

            minItems: 1
  externalDocs:
      AfEventExposureData:
        description: AF Event Exposure data managed by a given NEF Instance
          Type: object
        required:
          - afEvents
        properties:
          afEvents:
            type: array
            items:
              Reference: 'TS29517_Naf_EventExposure.yaml#/components/schemas/AfEvent'
            minItems: 1
          afIds:
```

```
      type: array
      items:
      type: string
      minItems: 1
    appIds:
      type: array
      items:
      type: string
      minItems: 1
PcscfInfo:
  description: Information of a P-CSCF NF Instance
    Type: object
  properties:
    accessType:
      type: array
      items:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/AccessType'
      minItems: 1
    dnnList:
      type: array
      items:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Dnn'
      minItems: 1
    gmFqdn:
      Reference: '#/components/schemas/Fqdn'
    gmIpv4Addresses:
      type: array
      items:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
      minItems: 1
    gmIpv6Addresses:
      type: array
      items:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Addr'
      minItems: 1
    servedIpv4AddressRanges:
      type: array
      items:
        Reference: '#/components/schemas/Ipv4AddressRange'
      minItems: 1
    servedIpv6PrefixRanges:
      type: array
      items:
        Reference: '#/components/schemas/Ipv6PrefixRange'
      minItems: 1
NfInfo:
  description: Information of a generic NF Instance
    Type: object
  properties:
    nfType:
      Reference: '#/components/schemas/NFType'
```

```
    HssInfo:
      description: Information of an HSS NF Instance
        Type: object
      properties:
        groupId:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/NfGroupId'
        imsiRanges:
          type: array
          items:
            Reference: '#/components/schemas/ImsiRange'
          minItems: 1
        imsPrivateIdentityRanges:
          type: array
          items:
            Reference: '#/components/schemas/IdentityRange'
          minItems: 1
        imsPublicIdentityRanges:
          type: array
          items:
            Reference: '#/components/schemas/IdentityRange'
          minItems: 1
        msisdnRanges:
          type: array
          items:
            Reference: '#/components/schemas/IdentityRange'
          minItems: 1
    ImsiRange:
      description: A range of IMSIs (subscriber identities), either based on a numeric
range, or based on regular-expression matching
        Type: object
      properties:
        start:
          type: string
          pattern: '^[0-9]+$'
        end:
          type: string
          pattern: '^[0-9]+$'
          pattern:
          type: string
    TwifInfo:
      description: Addressing information (IP addresses, FQDN) of the TWIF
        Type: object
      properties:
        ipv4EndpointAddresses:
          type: array
          items:
            Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
          minItems: 1
        ipv6EndpointAddresses:
          type: array
          items:
            Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Addr'
```

```
        minItems: 1
      endpointFqdn:
        Reference: '#/components/schemas/Fqdn'
  VendorId:
   description: Vendor ID of the NF Service instance (Private Enterprise Number assigned
by IANA)
      type: string
    pattern: '^[0-9]{6}$'
  VendorSpecificFeature:
    description: Information about a vendor-specific feature
      Type: object
    required:
      - featureName
      - featureVersion
    properties:
      featureName:
        type: string
      featureVersion:
        type: string
  AnNodeType:
    description: Access Network Node Type (gNB, ng-eNB...)
    anyOf:
      - type: string
        enum:
          - GNB
          - NG_ENB
      - type: string
  UdsfInfo:
    description: Information related to UDSF
      Type: object
    properties:
      groupId:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/NfGroupId'
      supiRanges:
        type: array
        items:
          Reference: '#/components/schemas/SupiRange'
        minItems: 1
      storageIdRanges:
        description: A map (list of key-value pairs) where realmId serves as key and
each value in the map is an array of IdentityRanges. Each IdentityRange is a range of
storageIds.
      Type: object
    additionalproperties:
        type: array
        items:
            Reference: '#/components/schemas/IdentityRange'
        minItems: 1
        minProperties: 1
  ScpInfo:
    description: Information of an SCP Instance
      Type: object
    properties:
```

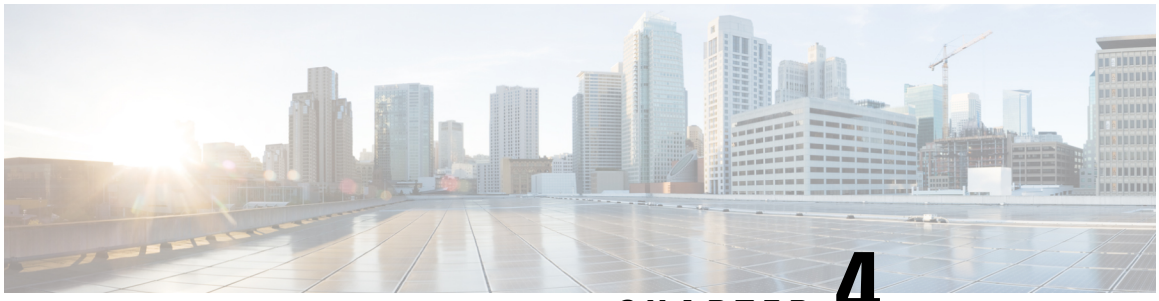
```
  scpDomainInfoList:
  Type: object
additionalproperties:
    items:
        Reference: '#/components/schemas/ScpDomainInfo'
    minProperties: 1
  scpPrefix:
    type: string
  scpPorts:
  Type: object
additionalproperties:
     type: integer
     minimum: 0
     maximum: 65535
    minProperties: 1
  addressDomains:
    type: array
    items:
    type: string
    minItems: 1
  ipv4Addresses:
    type: array
    items:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
    minItems: 1
  ipv6Prefixes:
    type: array
    items:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Prefix'
    minItems: 1
  ipv4AddrRanges:
    type: array
    items:
      Reference: '#/components/schemas/Ipv4AddressRange'
    minItems: 1
  ipv6PrefixRanges:
    type: array
    items:
      Reference: '#/components/schemas/Ipv6PrefixRange'
    minItems: 1
  servedNfSetIdList:
    type: array
    items:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/NfSetId'
    minItems: 1
  remotePlmnList:
    type: array
    items:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
    minItems: 1
  ipReachability:
```

```
          Reference: '#/components/schemas/IpReachability'

    ScpDomainInfo:
      description: SCP Domain specific information
        Type: object
      properties:
        scpFqdn:
          Reference: '#/components/schemas/Fqdn'
        scpIpEndPoints:
          type: array
          items:
            Reference: '#/components/schemas/IpEndPoint'
          minItems: 1
        scpPrefix:
          type: string
        scpPorts:
          type: object
      additionalproperties:
           type: integer
           minimum: 0
           maximum: 65535
          minProperties: 1

description: 3GPP TS 29.510 V15.3.0; 5G System; Network Function Repository Services;
Stage 3
  url: 'http://www.3gpp.org/ftp/Specs/archive/29_series/29.510/'
    ScpDomainCond:
      description: Subscription to a set of NF or SCP instances belonging to certain SCP
 domains
          type: object
      additionalproperties:
    ScpDomains:
          type: array
          items:
          type: string
          minItems: 1

    OptionsResponse:
      description: Communication options of the NRF sent in response payload of OPTIONS
 method
          type: object
      additionalproperties:
        supportedFeatures:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'

    ConditionEventType:
      description: Indicates whether a notification is due to the NF Instance to start
or stop being part of a condition for a subscription to a set of NFs
      anyOf:
        - type: string
          enum:
            - NF_ADDED
            - NF_REMOVED
        - type: string
```

```
IpReachability:
  description: Indicates the type(s) of IP addresses reachable via an SCP
  anyOf:
    - type: string
      enum:
        - IPV4
        - IPV6
        - IPV4V6
    - type: string
```

External Docs

```
Description: 3GPP TS 29.510 V15.2.0; 5G System; Network Function Repository Services;
Stage 3
URL: 'http://www.3gpp.org/ftp/Specs/archive/29_series/29.510/'
```



CHAPTER 4

Npcf_SMPolicyControl

The Policy Control Function (PCF) uses the Npcf_SMPolicyControl service to create, update, and delete requests on the SMF.

- OpenAPI, on page 97
- Info, on page 97
- Servers, on page 97
- Security, on page 98
- Paths, on page 98
- Components, on page 104
- External Docs, on page 142

OpenAPI

OpenAPI Version: 3.0.0

Info

```
Description: Session Management Policy Control Service
Version: "1.1.5"
Title: Npcf_SMPolicyControl API
```

Servers

```
URL: '{apiRoot}/npcf-smpolicycontrol/v1'
Variables:
  API Root:
    Default: https://example.com
    Description: apiRoot as defined in subclause 4.4 of 3GPP TS 29.501
```

Security

```
- {}
- oAuth2Clientcredentials:
  - npcf-smpolicycontrol
```

Paths

/sm-policies

```
  post:
    summary: Create a new Individual SM Policy
    operationId: Create SM Policy
    tags:
          - SM Policies (Collection)
        requestBody:
        required: true:
        content:
        application/json:
          schema:
            Reference: '#/components/schemas/SmPolicyContextData'

    responses:
      '201':
        description: Created
        content:
          application/json:
            schema:
              Reference: '#/components/schemas/SmPolicyDecision'
        headers:
          location:
            description: 'Contains the URI of the newly created resource'
            required: true
            schema:
              type: string
      '308':
       description: Permanent Redirect
       headers:
         location:
           description: 'Contains the URI of the PCF within the existing PCF binding
information stored in the BSF for the same UE ID, S-NSSAI and DNN combination '
           required: true
           schema:
             type: string
      '400':
        Reference: 'TS29571_CommonData.yaml#/components/responses/400'
      '401':
```

```
      Reference: 'TS29571_CommonData.yaml#/components/responses/401'
    '403':
      Reference: 'TS29571_CommonData.yaml#/components/responses/403'
    '404':
      Description: Not Found
    '411':
      Reference: 'TS29571_CommonData.yaml#/components/responses/411'
    '413':
      Reference: 'TS29571_CommonData.yaml#/components/responses/413'
    '415':
      Reference: 'TS29571_CommonData.yaml#/components/responses/415'
    '429':
      Reference: 'TS29571_CommonData.yaml#/components/responses/429'
    '500':
      Reference: 'TS29571_CommonData.yaml#/components/responses/500'
    '503':
      Reference: 'TS29571_CommonData.yaml#/components/responses/503'
    Default:
      Reference: 'TS29571_CommonData.yaml#/components/responses/default'
  callbacks:
    SmPolicyUpdateNotification:
      '{$request.body#/notificationUri}/update':
        post:
          request Body:
            required: true
            content:
              application/json:
                schema:
                  Reference: '#/components/schemas/SmPolicyNotification'

          responses:
            '200':
            description: OK. The current applicable values corresponding to the policy
control request trigger is reported
              content:
                application/json:
                  schema:
                    oneOf:
                      - $ref: '#/components/schemas/UeCampingRep'
                      - type: array
                        items:
                          $ref: '#/components/schemas/PartialSuccessReport'
                        Min Items: 1
                      - type: array
                        items:
                          $ref: '#/components/schemas/PolicyDecisionFailureCode'
                        Min Items: 1
            '204':
              description: No Content, Notification was succesfull
            '307':
              Reference: 'TS29571_CommonData.yaml#/components/responses/307'
            '308':
```

```
          Reference: 'TS29571_CommonData.yaml#/components/responses/308'
        '400':
          description: Bad Request.
          content:
            application/json:
              schema:
                Reference: '#/components/schemas/ErrorReport'
        '401':
          Reference: 'TS29571_CommonData.yaml#/components/responses/401'
        '403':
          Reference: 'TS29571_CommonData.yaml#/components/responses/403'
        '404':
          Reference: 'TS29571_CommonData.yaml#/components/responses/404'
        '411':
          Reference: 'TS29571_CommonData.yaml#/components/responses/411'
        '413':
          Reference: 'TS29571_CommonData.yaml#/components/responses/413'
        '415':
          Reference: 'TS29571_CommonData.yaml#/components/responses/415'
        '429':
          Reference: 'TS29571_CommonData.yaml#/components/responses/429'
        '500':
          Reference: 'TS29571_CommonData.yaml#/components/responses/500'
        '503':
          Reference: 'TS29571_CommonData.yaml#/components/responses/503'
        Default:
          Reference: 'TS29571_CommonData.yaml#/components/responses/default'
SmPolicyControlTerminationRequestNotification:
  '{$request.body#/notificationUri}/terminate':
    post:
      request Body:
        required: true
        content:
          application/json:
            Schema:
              Reference: '#/components/schemas/TerminationNotification'

      responses:
        '204':
          description: No Content, Notification was succesful
        '307':
          Reference: 'TS29571_CommonData.yaml#/components/responses/307'
        '308':
          Reference: 'TS29571_CommonData.yaml#/components/responses/308'
        '400':
          Reference: 'TS29571_CommonData.yaml#/components/responses/400'
        '401':
          Reference: 'TS29571_CommonData.yaml#/components/responses/401'
        '403':
          Reference: 'TS29571_CommonData.yaml#/components/responses/403'
        '404':
          Reference: 'TS29571_CommonData.yaml#/components/responses/404'
```

```
      '411':
        Reference: 'TS29571_CommonData.yaml#/components/responses/411'
      '413':
        Reference: 'TS29571_CommonData.yaml#/components/responses/413'
      '415':
        Reference: 'TS29571_CommonData.yaml#/components/responses/415'
      '429':
        Reference: 'TS29571_CommonData.yaml#/components/responses/429'
      '500':
        Reference: 'TS29571_CommonData.yaml#/components/responses/500'
      '503':
        Reference: 'TS29571_CommonData.yaml#/components/responses/503'
      default:
        Reference: 'TS29571_CommonData.yaml#/components/responses/default'
```

/sm-policies/{smPolicyId}

```
get:
  summary:Read an Individual SM Policy
  operationId:GetSMPolicy
  tags::GetSMPolicy
    - Individual SM Policy (Document)
  parameters::GetSMPolicy
    - name: smPolicyId
      in: path
      description: Identifier of a policy association
      required: true
      schema:
        type: string
  responses::GetSMPolicy
    '200':
      description: OK. Resource representation is returned
      content:
        application/json:
          schema:
            Reference: '#/components/schemas/SmPolicyControl'
    '307':
      Reference: 'TS29571_CommonData.yaml#/components/responses/307'
    '308':
      Reference: 'TS29571_CommonData.yaml#/components/responses/308'
    '400':
      Reference: 'TS29571_CommonData.yaml#/components/responses/400'
    '401':
      Reference: 'TS29571_CommonData.yaml#/components/responses/401'
    '403':
      Reference: 'TS29571_CommonData.yaml#/components/responses/403'
    '404':
      Reference: 'TS29571_CommonData.yaml#/components/responses/404'
    '406':
      Reference: 'TS29571_CommonData.yaml#/components/responses/406'
```

```
    '429':
      Reference: 'TS29571_CommonData.yaml#/components/responses/429'
    '500':
      Reference: 'TS29571_CommonData.yaml#/components/responses/500'
    '503':
      Reference: 'TS29571_CommonData.yaml#/components/responses/503'
    Default:
      Reference: 'TS29571_CommonData.yaml#/components/responses/default'
```

/sm-policies/{smPolicyId}/update

```
post:
  summary: Update an existing Individual SM Policy
  operationId: UpdateSMPolicy
  tags:
    - Individual SM Policy (Document)
  requestBody:
    required: true
    content:
      application/json:
        schema:
          reference: '#/components/schemas/SmPolicyUpdateContextData'
  parameters:
    - name: smPolicyId
      in: path
      description: Identifier of a policy association
      required: true
      schema:
        type: string
  responses:
    '200':
      description: OK. Updated policies are returned
      content:
        application/json:
          schema:
            Reference: '#/components/schemas/SmPolicyDecision'
    '307':
      Reference: 'TS29571_CommonData.yaml#/components/responses/307'
    '308':
      Reference: 'TS29571_CommonData.yaml#/components/responses/308'
    '400':
      Reference: 'TS29571_CommonData.yaml#/components/responses/400'
    '401':
      Reference: 'TS29571_CommonData.yaml#/components/responses/401'
    '403':
      Reference: 'TS29571_CommonData.yaml#/components/responses/403'
    '404':
      Reference: 'TS29571_CommonData.yaml#/components/responses/404'
    '411':
      Reference: 'TS29571_CommonData.yaml#/components/responses/411'
```

```
      '413':
        Reference: 'TS29571_CommonData.yaml#/components/responses/413'
      '415':
        Reference: 'TS29571_CommonData.yaml#/components/responses/415'
      '429':
        Reference: 'TS29571_CommonData.yaml#/components/responses/429'
      '500':
        Reference: 'TS29571_CommonData.yaml#/components/responses/500'
      '503':
        Reference: 'TS29571_CommonData.yaml#/components/responses/503'
      Default:
        Reference: 'TS29571_CommonData.yaml#/components/responses/default'
```

/sm-policies/{smPolicyId}/delete

```
  post:
    summary: Delete an existing Individual SM Policy
    operationId: DeleteSMPolicy
    tags:
      - Individual SM Policy (Document)
    requestBody:
      required: true
content:
        application/json:
          schema:
            Reference: '#/components/schemas/SmPolicyDeleteData'
    parameters:
      - name: smPolicyId
        in: path
        description: Identifier of a policy association
        required: true
        schema:
          type: string
    responses:
      '204':
        description: No content
      '307':
        Reference: 'TS29571_CommonData.yaml#/components/responses/307'
      '308':
        Reference: 'TS29571_CommonData.yaml#/components/responses/308'
      '400':
        Reference: 'TS29571_CommonData.yaml#/components/responses/400'
      '401':
        Reference: 'TS29571_CommonData.yaml#/components/responses/401'
      '403':
        Reference: 'TS29571_CommonData.yaml#/components/responses/403'
      '404':
        Reference: 'TS29571_CommonData.yaml#/components/responses/404'
      '411':
        Reference: 'TS29571_CommonData.yaml#/components/responses/411'
```

```
      '413':
        Reference: 'TS29571_CommonData.yaml#/components/responses/413'
      '415':
        Reference: 'TS29571_CommonData.yaml#/components/responses/415'
      '429':
        Reference: 'TS29571_CommonData.yaml#/components/responses/429'
      '500':
        Reference: 'TS29571_CommonData.yaml#/components/responses/500'
      '503':
        Reference: 'TS29571_CommonData.yaml#/components/responses/503'
      Default:
        Reference: 'TS29571_CommonData.yaml#/components/responses/default'
```

Components

```
securitySchemes:
  oAuth2ClientCredentials:
    Type: oauth2
    Flows:
      clientCredentials:
        tokenUrl: '{nrfApiRoot}/oauth2/token'
        scopes:
          npcf-smpolicycontrol: Access to the Npcf_SMPolicyControl API

schemas:
  SmPolicyControl :
    Type: object
    Properties:
      context:
        Reference: '#/components/schemas/SmPolicyContextData'
      policy:
        Reference: '#/components/schemas/SmPolicyDecision'
    Required:
      - context
      - policy
  SmPolicyContextData:
    Type: object
    Properties:
      accNetChId:
        Reference: '#/components/schemas/AccNetChId'
      chargEntityAddr:
        Reference: '#/components/schemas/AccNetChargingAddress'
      gpsi:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
      supi:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Supi'
      invalidSupi:
        Type: boolean
        Description: When this attribute is included and set to true, it indicates that
 the supi attribute contains an invalid value.This attribute shall be present if the SUPI
```

```
is not available in the SMF or the SUPI is unauthenticated. When present it shall be set
to true for an invalid SUPI and false (default) for a valid SUPI.
      interGrpIds:
        Type: array
        Items:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/GroupId'
        minItems: 1
      pduSessionId:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/PduSessionId'
      pduSessionType:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/PduSessionType'
      chargingcharacteristics:
        Type: string
      dnn:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Dnn'
      dnnSelMode:
        Reference: 'TS29502_Nsmf_PDUSession.yaml#/components/schemas/DnnSelectionMode'
      notificationUri:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Uri'
      accessType:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/AccessType'
      ratType:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/RatType'
      addAccessInfo:
        Reference: '#/components/schemas/AdditionalAccessInfo'
      servingNetwork:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/PlmnIdNid'
      userLocationInfo:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/UserLocation'
      ueTimeZone:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/TimeZone'
      pei:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Pei'
      ipv4Address:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
      ipv6AddressPrefix:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Prefix'
      ipDomain:
        Type: string
        Description: Indicates the IPv4 address domain
      subsSessAmbr:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Ambr'
      authProfIndex:
        Type: string
        Description: Indicates the DN-AAA authorization profile index
      subsDefQos:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/SubscribedDefaultQos'
      vplmnQos:
        Reference: 'TS29502_Nsmf_PDUSession.yaml#/components/schemas/VplmnQos'
      numOfPackFilter:
        Type: integer
        Description: Contains the number of supported packet filter for signalled QoS
```

```
rules.
      online:
        Type: boolean
        Description: If it is included and set to true, the online charging is applied
to the PDU session.
      offline:
        Type: boolean
        Description: If it is included and set to true, the offline charging is applied
 to the PDU session.
      3gppPsDataOffStatus:
        Type: boolean
       Description: If it is included and set to true, the 3GPP PS Data Off is activated
 by the UE.
      refQosIndication:
        Type: boolean
        Description: If it is included and set to true, the reflective QoS is supported
 by the UE.
      traceReq:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/TraceData'
      sliceInfo:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
      qosFlowUsage:
        Reference: '#/components/schemas/QosFlowUsage'
      servNfId:
        Reference: '#/components/schemas/ServingNfIdentity'
      suppFeat:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
      smfId:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
      recoveryTime:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      maPduInd:
        Reference: '#/components/schemas/MaPduIndication'
      atsssCapab:
        Reference: '#/components/schemas/AtsssCapability'
      ipv4FrameRouteList:
        type: array
        items:
        Reference: '#/components/schemas/Ipv4AddrMask'
        minItems: 1
      ipv6FrameRouteList:
        type: array
        items:
        Reference: '#/components/schemas/Ipv6Prefix'
        minItems: 1
    Required:
      - pduSessionId
      - pduSessionType
      - dnn
      - notificationUri
      - sliceInfo
  SmPolicyDecision:
    Type: object
```

```
    Properties:
      sessRules:
        Type: object
        additionalProperties:
          Reference: '#/components/schemas/SessionRule'
        minProperties: 1
        Description: A map of Sessionrules with the content being the SessionRule as
described in subclause 5.6.2.7.
      pccRules:
        Type: object
        additionalProperties:
          Reference: '#/components/schemas/PccRule'
        minProperties: 1
        Description: A map of PCC rules with the content being the PCCRule as described
 in subclause 5.6.2.6.
        nullable: true
      pcscfRestIndication:
        Type: boolean
       Description: If it is included and set to true, it indicates the P-CSCF Restoration
 is requested.
      qosDecs:
        Type: object
        additionalProperties:
          Reference: '#/components/schemas/QosData'
        minProperties: 1
        Description: Map of QoS data policy decisions.
      chgDecs:
        Type: object
        additionalProperties:
          Reference: '#/components/schemas/ChargingData'
        minProperties: 1
        Description: Map of Charging data policy decisions.
        nullable: true
      chargingInfo:
        Reference: '#/components/schemas/ChargingInformation'
      traffContDecs:
        Type: object
        additionalProperties:
          Reference: '#/components/schemas/TrafficControlData'
        minProperties: 1
        Description: Map of Traffic Control data policy decisions.
      umDecs:
        Type: object
        additionalProperties:
          Reference: '#/components/schemas/UsageMonitoringData'
        minProperties: 1
        Description: Map of Usage Monitoring data policy decisions.
        nullable: true
      qosChars:
        Type: object
        additionalProperties:
          Reference: '#/components/schemas/QosCharacteristics'
```

```
      minProperties: 1
      Description: Map of QoS characteristics for non standard 5QIs. This map uses the
 5QI values as keys.
    qosMonDecs:
      Type: object
      additionalProperties:
        Reference: '#/components/schemas/QosMonitoringData'
      minProperties: 1
      Description: Map of QoS Monitoring data policy decisions.
      nullable: true
    reflectiveQoSTimer:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/DurationSec'
    conds:
      Type: object
      additionalProperties:
        Reference: '#/components/schemas/ConditionData'
      minProperties: 1
      Description: A map of condition data with the content being as described in
subclause 5.6.2.9.
      nullable: true
    revalidationTime:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
    offline:
      Type: boolean
      Description: Indicates the offline charging is applicable to the PDU session when
 it is included and set to true.
    online:
      Type: boolean
      Description: Indicates the online charging is applicable to the PDU session when
 it is included and set to true.
    policyCtrlReqTriggers:
      Type: array
      Items:
        Reference: '#/components/schemas/PolicyControlRequestTrigger'
      minItems: 1
      Description: Defines the policy control request triggers subscribed by the PCF.
      nullable: true
    lastReqRuleData:
      Type: array
      Items:
        Reference: '#/components/schemas/RequestedRuleData'
      minItems: 1
      Description: Defines the last list of rule control data requested by the PCF.
    lastReqUsageData:
      Reference: '#/components/schemas/RequestedUsageData'
    praInfos:
      Type: object
      additionalProperties:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/PresenceInfoRm'
      minProperties: 1
      Description: Map of PRA information.
      nullable: true
```

```
      ipv4Index:
        Reference: 'TS29519_Policy_Data.yaml#/components/schemas/IpIndex'
      ipv6Index:
        Reference: 'TS29519_Policy_Data.yaml#/components/schemas/IpIndex'
      qosFlowUsage:
        Reference: '#/components/schemas/QosFlowUsage'
      relCause:
        Reference: '#/components/schemas/SmPolicyAssociationReleaseCause'
      suppFeat:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
      tsnBridgeManCont:
       Reference: 'TS29571_CommonData.yaml#/components/schemas/BridgeManagementContainer'

      tsnPortManContDstt:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/PortManagementContainer'

      tsnPortManContDstt:
        type: array
        items:
         Reference: 'TS29571_CommonData.yaml#/components/schemas/PortManagementContainer'

        minItems: 1
  SmPolicyNotification:
    Type: object
    Properties:
      resourceUri:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Uri'
      smPolicyDecision:
        Reference: '#/components/schemas/SmPolicyDecision'
  PccRule:
    Type: object
    Properties:
      flowInfos:
        Type: array
        Items:
          Reference: '#/components/schemas/FlowInformation'
        minItems: 1
        Description: An array of IP flow packet filter information.
      appId:
        Type: string
        Description: A reference to the application detection filter configured at the
UPF.
      appDescriptor:
         Reference: '#/components/schemas/ApplicationDescriptor'
      contVer:
        Reference:
'TS29514_Npcf_PolicyAuthorization.yaml#/components/schemas/ContentVersion'
      pccRuleId:
        Type: string
        Description: Univocally identifies the PCC rule within a PDU session.
      precedence:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Uinteger'
```

```
      afSigProtocol:
        Reference: '#/components/schemas/AfSigProtocol'
      appReloc:
        Type: boolean
        Description: Indication of application relocation possibility.
      refQosData:
        Type: array
        Items:
          Type: string
        minItems: 1
        maxItems: 1
        Description: A reference to the QoSData policy decision type. It is the qosId
described in subclause 5.6.2.8. (NOTE)
      refAltQosParams:
        Type: array
        Items:
          Type: string
        minItems: 1
       Description: A Reference to the QosData policy decision type for the Alternative
 QoS parameter sets of the service data flow.
      refTcData:
        Type: array
        Items:
          Type: string
        minItems: 1
        maxItems: 1
        Description: A reference to the TrafficControlData policy decision type. It is
the tcId described in subclause 5.6.2.10.
      refChgData:
        Type: array
        Items:
          Type: string
        minItems: 1
        maxItems: 1
        Description: A reference to the ChargingData policy decision type. It is the
chgId described in subclause 5.6.2.11.
        nullable: true
      refChgN3gData:
        Type: array
        Items:
          Type: string
        minItems: 1
        maxItems: 1
       Description: A reference to the ChargingData policy decision type only applicable
 to Non-3GPP access if "ATSSS" feature is supported. It is the chgId described in subclause
 5.6.2.11.
        nullable: true
      refUmData:
        Type: array
        Items:
          Type: string
        minItems: 1
        maxItems: 1
```

```
        Description: A reference to UsageMonitoringData policy decision type. It is the
 umId described in subclause 5.6.2.12.
        nullable: true
      refUmN3gData:
        Type: array
        Items:
          Type: string
        minItems: 1
        maxItems: 1
        Description: A reference to UsageMonitoringData policy decision type only
applicable to Non-3GPP access if "ATSSS" feature is supported. It is the umId described in
 subclause 5.6.2.12.
        nullable: true
      refCondData:
        Type: string
        Description: A reference to the condition data. It is the condId described in
subclause 5.6.2.9.
        nullable: true
      refQosMon:
        Type: array
        Items:
          Type: string
        minItems: 1
        maxItems: 1
        Description: A reference to the QosMonitoringData policy decision type. It is
the qmId described in subclause 5.6.2.40.
        nullable: true
      addrPreserInd:
        Type: boolean
        nullable: true
      tscaiInputDl:
        Reference:
'TS29514_Npcf_PolicyAuthorization.yaml#/components/schemas/TscaiInputContainer'
      tscaiInputUl:
        Reference:
'TS29514_Npcf_PolicyAuthorization.yaml#/components/schemas/TscaiInputContainer'
      ddNotifCtrl:
        Reference: '#/components/schemas/DownlinkDataNotificationControl'
      ddNotifCtrl2:
        Reference: '#/components/schemas/DownlinkDataNotificationControlRm'
      disUeNotif:
        Type: boolean
        nullable: true
    Required:
      - pccRuleId
    nullable: true
  SessionRule:
    Type: object
    Properties:
      authSessAmbr:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Ambr'
      authDefQos:
        Reference: '#/components/schemas/AuthorizedDefaultQos'
```

```
      sessRuleId:
        Type: string
        Description: Univocally identifies the session rule within a PDU session.
      refUmData:
        Type: string
        Description: A reference to UsageMonitoringData policy decision type. It is the
 umId described in subclause 5.6.2.12.
        nullable: true
      refUmN3gData:
        Type: string
        Description: A reference to UsageMonitoringData policy decision type to apply
for Non-3GPP access. It is the umId described in subclause 5.6.2.
        nullable: true
      refCondData:
        Type: string
        Description: A reference to the condition data. It is the condId described in
subclause 5.6.2.9.
        nullable: true
    Required:
      - sessRuleId
    nullable: true
  QosData:
    Type: object
    Properties:
      qosId:
        Type: string
        Description: Univocally identifies the QoS control policy data within a PDU
session.
      5qi:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/5Qi'
      maxbrUl:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/BitRateRm'
      maxbrDl:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/BitRateRm'
      gbrUl:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/BitRateRm'
      gbrDl:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/BitRateRm'
      arp:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Arp'
      qnc:
        Type: boolean
        Description: Indicates whether notifications are requested from 3GPP NG-RAN when
 the GFBR can no longer (or again) be guaranteed for a QoS Flow during the lifetime of the
 QoS Flow.
      priorityLevel:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/5QiPriorityLevelRm'
      averWindow:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/AverWindowRm'
      maxDataBurstVol:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/MaxDataBurstVolRm'
      reflectiveQos:
        Type: boolean
```

```
        Description: Indicates whether the QoS information is reflective for the
corresponding service data flow.
      sharingKeyDl:
        Type: string
        Description: Indicates, by containing the same value, what PCC rules may share
resource in downlink direction.
      sharingKeyUl:
        Type: string
        Description: Indicates, by containing the same value, what PCC rules may share
resource in uplink direction.
      maxPacketLossRateDl:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/PacketLossRateRm'
      maxPacketLossRateUl:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/PacketLossRateRm'
      defQosFlowIndication:
        Type: boolean
        Description: Indicates that the dynamic PCC rule shall always have its binding
with the QoS Flow associated with the default QoS rule
      extMaxDataBurstVol:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/ExtMaxDataBurstVolRm'
      packetDelayBudget:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/PacketDelBudget'
      packetErrorRate:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/PacketErrRate'
    Required:
      - qosId
    nullable: true
  ConditionData:
    Type: object
    Properties:
      condId:
        Type: string
        Description: Uniquely identifies the condition data within a PDU session.
      activationTime:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/DateTimeRm'
      deactivationTime:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/DateTimeRm'
      accessType:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/AccessType'
      ratType:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/RatType'
    Required:
      - condId
    nullable: true
  TrafficControlData:
    Type: object
    Properties:
      tcId:
        Type: string
        Description: Univocally identifies the traffic control policy data within a PDU
 session.
      flowStatus:
       Reference: 'TS29514_Npcf_PolicyAuthorization.yaml#/components/schemas/FlowStatus'
```

```
      redirectInfo:
        Reference: '#/components/schemas/RedirectInformation'
      addRedirectInfo:
        Type: array
        Items:
        Reference: '#/components/schemas/RedirectInformation'
        minItems: 1
      muteNotif:
        Type: boolean
       Description: Indicates whether applicat'on's start or stop notification is to be
 muted.
      trafficSteeringPolIdDl:
        Type: string
        Description: Reference to a pre-configured traffic steering policy for downlink
 traffic at the SMF.
        nullable: true
      trafficSteeringPolIdUl:
        Type: string
        Description: Reference to a pre-configured traffic steering policy for uplink
traffic at the SMF.
        nullable: true
      routeToLocs:
        Type: array
        Items:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/RouteToLocation'
        minItems: 1
        Description: A list of location which the traffic shall be routed to for the AF
 request
      traffCorreInd:
        Type: boolean
      upPathChgEvent:
        Reference: '#/components/schemas/UpPathChgEvent'
      steerFun:
        Reference: '#/components/schemas/SteeringFunctionality'
      :
        Reference: '#/components/schemas/SteeringMode'
      :
        Reference: '#/components/schemas/SteeringMode'
      :
        Reference: '#/components/schemas/MulticastAccessControl'
    Required:
      - tcId
    nullable: true
  ChargingData:
    Type: object
    Properties:
      chgId:
        Type: string
       Description: Univocally identifies the charging control policy data within a PDU
 session.
      meteringMethod:
        Reference: '#/components/schemas/MeteringMethod'
```

```
    offline:
      Type: boolean
     Description: Indicates the offline charging is applicable to the PDU session when
it is included and set to true..
    online:
      Type: boolean
     Description: Indicates the online charging is applicable to the PDU session when
it is included and set to true..
    ratingGroup:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/RatingGroup'
    reportingLevel:
      Reference: '#/components/schemas/ReportingLevel'
    serviceId:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/ServiceId'
    sponsorId:
      Type: string
      Description: Indicates the sponsor identity.
    appSvcProvId:
      Type: string
      Description: Indicates the application service provider identity.
    afChargingIdentifier:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/ChargingId'
    afChargId:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/ApplicationChargingId'
  Required:
    - chgId
  nullable: true
 UsageMonitoringData:
  Type: object
  Properties:
    umId:
      Type: string
     Description: Univocally identifies the usage monitoring policy data within a PDU
session.
    volumeThreshold:
      Reference: 'TS29122_CommonData.yaml#/components/schemas/VolumeRm'
    volumeThresholdUplink:
      Reference: 'TS29122_CommonData.yaml#/components/schemas/VolumeRm'
    volumeThresholdDownlink:
      Reference: 'TS29122_CommonData.yaml#/components/schemas/VolumeRm'
    timeThreshold:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/DurationSecRm'
    monitoringTime:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/DateTimeRm'
    nextVolThreshold:
      Reference: 'TS29122_CommonData.yaml#/components/schemas/VolumeRm'
    nextVolThresholdUplink:
      Reference: 'TS29122_CommonData.yaml#/components/schemas/VolumeRm'
    nextVolThresholdDownlink:
      Reference: 'TS29122_CommonData.yaml#/components/schemas/VolumeRm'
    nextTimeThreshold:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/DurationSecRm'
```

```
      inactivityTime:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/DurationSecRm'
      exUsagePccRuleIds:
        Type: array
        Items:
          Type: string
        minItems: 1
       Description: Contains the PCC rule identifier(s) which corresponding service data
 flow(s) shall be excluded from PDU Session usage monitoring. It is only included in the
UsageMonitoringData instance for session level usage monitoring.
        nullable: true
    Required:
      - umId
    nullable: true
  RedirectInformation:
    Type: object
    Properties:
      redirectEnabled:
        Type: boolean
        Description: Indicates the redirect is enable.
      redirectAddressType:
        Reference: '#/components/schemas/RedirectAddressType'
      redirectServerAddress:
        Type: string
       Description: Indicates the address of the redirect server. If "redirectAddressType"
 attribute indicates the IPV4_ADDR, the encoding is the same as the Ipv4Addr data type
defined in 3GPP TS 29.571.If "redirectAddressType" attribute indicates the IPV6_ADDR, the
encoding is the same as the Ipv6Addr data type defined in 3GPP TS 29.571.If
"redirectAddressType" attribute indicates the URL or SIP_URI, the encoding is the same as
the Uri data type defined in 3GPP TS 29.571.
  FlowInformation:
    Type: object
    Properties:
      flowDescription:
        Reference: '#/components/schemas/FlowDescription'
      ethFlowDescription:
        Reference:
'TS29514_Npcf_PolicyAuthorization.yaml#/components/schemas/EthFlowDescription'
      packFiltId:
        Type: string
        Description: An identifier of packet filter.
      packetFilterUsage:
        Type: boolean
        Description: The packet shall be sent to the UE.
      tosTrafficClass:
        Type: string
        Description: Contains the Ipv4 Type-of-Service and mask field or the Ipv6
Traffic-Class field and mask field.
        nullable: true
      spi:
        Type: string
        Description: the security parameter index of the IPSec packet.
        nullable: true
```

```
    flowLabel:
      Type: string
      Description: the Ipv6 flow label header field.
      nullable: true
    flowDirection:
      Reference: '#/components/schemas/FlowDirectionRm'
SmPolicyDeleteData:
  Type: object
  Properties:
    userLocationInfo:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/UserLocation'
    ueTimeZone:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/TimeZone'
    servingNetwork:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/PlmnIdNid'
    userLocationInfoTime:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
    ranNasRelCauses:
      Type: array
      Items:
        Reference: '#/components/schemas/RanNasRelCause'
      minItems: 1
      Description: Contains the RAN and/or NAS release cause.
    accuUsageReports:
      Type: array
      Items:
        Reference: '#/components/schemas/AccuUsageReport'
      minItems: 1
      Description: Contains the usage report
    pduSessRelCause:
        Reference: '#/components/schemas/PduSessionRelCause'
    qosMonReports:
      Type: array
      Items:
        Reference: '#/components/schemas/QosMonitoringReport'
      minItems: 1
QosCharacteristics:
  Type: object
  Properties:
    5qi:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/5Qi'
    resourceType:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/QosResourceType'
    priorityLevel:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/5QiPriorityLevel'
    packetDelayBudget:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/PacketDelBudget'
    packetErrorRate:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/PacketErrRate'
    averagingWindow:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/AverWindow'
```

```
    maxDataBurstVol:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/MaxDataBurstVol'
    extMaxDataBurstVol:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/ExtMaxDataBurstVol'
  Required:
    - 5qi
    - resourceType
    - priorityLevel
    - packetDelayBudget
    - packetErrorRate
ChargingInformation:
  Type: object
  Properties:
    primaryChfAddress:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/Uri'
    secondaryChfAddress:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/Uri'
    primaryChfAddress:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/NfSetId'
    primaryChfAddress:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
    secondaryChfAddress:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/NfSetId'
    secondaryChfAddress:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
  Required:
    - primaryChfAddress
    - secondaryChfAddress
AccuUsageReport:
  Type: object
  Properties:
    refUmIds:
      Type: string
      Description: An id referencing UsageMonitoringData objects associated with this
usage report.
    volUsage:
      Reference: 'TS29122_CommonData.yaml#/components/schemas/Volume'
    volUsageUplink:
      Reference: 'TS29122_CommonData.yaml#/components/schemas/Volume'
    volUsageDownlink:
      Reference: 'TS29122_CommonData.yaml#/components/schemas/Volume'
    timeUsage:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/DurationSec'
    nextVolUsage:
      Reference: 'TS29122_CommonData.yaml#/components/schemas/Volume'
    nextVolUsageUplink:
      Reference: 'TS29122_CommonData.yaml#/components/schemas/Volume'
    nextVolUsageDownlink:
      Reference: 'TS29122_CommonData.yaml#/components/schemas/Volume'
    nextTimeUsage:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/DurationSec'
  Required:
    - refUmIds
```

```
 SmPolicyUpdateContextData:
   Type: object
   Properties:
     repPolicyCtrlReqTriggers:
       Type: array
       Items:
         Reference: '#/components/schemas/PolicyControlRequestTrigger'
       minItems: 1
       Description: The policy control reqeust trigges which are met.
     accNetChIds:
       Type: array
       Items:
         Reference: '#/components/schemas/AccNetChId'
       minItems: 1
      Description: Indicates the access network charging identifier for the PCC rule(s)
or whole PDU session.
     accessType:
       Reference: 'TS29571_CommonData.yaml#/components/schemas/AccessType'
     ratType:
       Reference: 'TS29571_CommonData.yaml#/components/schemas/RatType'
     addAccessInfo:
       Reference: '#/components/schemas/AdditionalAccessInfo'
     relAccessInfo:
       Reference: '#/components/schemas/AdditionalAccessInfo'
     servingNetwork:
       Reference: 'TS29571_CommonData.yaml#/components/schemas/PlmnIdNid'
     userLocationInfo:
       Reference: 'TS29571_CommonData.yaml#/components/schemas/UserLocation'
     ueTimeZone:
       Reference: 'TS29571_CommonData.yaml#/components/schemas/TimeZone'
     relIpv4Address:
       Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
     ipv4Address:
       Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
     ipDomain:
       Type: string
       Description: Indicates the IPv4 address domain
     ipv6AddressPrefix:
       Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Prefix'
     relIpv6AddressPrefix:
       Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Prefix'
     addIpv6AddressPrefix:
       Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Prefix'
     addrelIpv6AddressPrefix:
       Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Prefix'
     relUeMac:
       Reference: 'TS29571_CommonData.yaml#/components/schemas/MacAddr48'
     ueMac:
       Reference: 'TS29571_CommonData.yaml#/components/schemas/MacAddr48'
     subsSessAmbr:
       Reference: 'TS29571_CommonData.yaml#/components/schemas/Ambr'
     authProfIndex:
```

```
        Type: string
        Description: Indicates the DN-AAA authorization profile index
      subsDefQos:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/SubscribedDefaultQos'
      vplmnQos:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/VplmnQos'
      numOfPackFilter:
        Type: integer
        Description: Contains the number of supported packet filter for signalled QoS
rules.
      accuUsageReports:
        Type: array
        Items:
          Reference: '#/components/schemas/AccuUsageReport'
        minItems: 1
        Description: Contains the usage report
      3gppPsDataOffStatus:
        Type: boolean
       Description: If it is included and set to true, the 3GPP PS Data Off is activated
 by the UE.
      appDetectionInfos:
        Type: array
        Items:
          Reference: '#/components/schemas/AppDetectionInfo'
        minItems: 1
        Description: Report the start/stop of the application traffic and detected SDF
descriptions if applicable.
      ruleReports:
        Type: array
        Items:
          Reference: '#/components/schemas/RuleReport'
        minItems: 1
        Description: Used to report the PCC rule failure.
      qncReports:
        Type: array
        Items:
          Reference: '#/components/schemas/QosNotificationControlInfo'
        minItems: 1
        Description: QoS Notification Control information.
      qosMonReports:
        Type: array
        Items:
          Reference: '#/components/schemas/QosMonitoringReport'
        minItems: 1
      userLocationInfoTime:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
      repPraInfos:
        Type: object
        additionalProperties:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/PresenceInfo'
        minProperties: 1
        Description: Reports the changes of presence reporting area.
```

```
      ueInitResReq:
        Reference: '#/components/schemas/UeInitiatedResourceRequest'
      refQosIndication:
        Type: boolean
        Description: If it is included and set to true, the reflective QoS is supported
by the UE. If it is included and set to false, the reflective QoS is revoked by the UE.
      qosFlowUsage:
        Reference: '#/components/schemas/QosFlowUsage'
      creditManageStatus:
        Reference: '#/components/schemas/CreditManagementStatus'
      servNfId:
        Reference: '#/components/schemas/ServingNfIdentity'
      traceReq:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/TraceData'
      maPduInd:
        Reference: '#/components/schemas/MaPduIndication'
      atsssCapab:
        Reference: '#/components/schemas/AtsssCapability'
      tsnBridgeInfo:
        Reference: '#/components/schemas/TsnBridgeInfo'
      tsnBridgeManCont:
        Reference: '#/components/schemas/BridgeManagementContainer'
      tsnPortManContDstt:
        Reference: '#/components/schemas/PortManagementContainer'
      tsnPortManContNwtts:
        Type: array
        Items:
        Reference: '#/components/schemas/PortManagementContainer'
        minItems: 1
      mulAddrInfos:
        Type: array
        Items:
        Reference: '#/components/schemas/IpMulticastAddressInfo'
        minItems: 1
      policyDecFailureReports:
        Type: array
        Items:
        Reference: '#/components/schemas/PolicyDecisionFailureCode'
        minItems: 1
      trafficDescriptors:
        Type: array
        Items:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/DddTrafficDescriptor'
        minItems: 1
      pccRuleId:
        Type: string
        Decscription: Contains the identifier of the PCC rule which is used for traffic
detection of event.
      interGrpIds:
        Type: array
        Reference: 'TS29571_CommonData.yaml#/components/schemas/GroupId'
        minItems: 1
```

```
      typesOfNotif:
        Type: array
        Reference: 'TS29571_CommonData.yaml#/components/schemas/DlDataDeliveryStatus'
        minItems: 1
  UpPathChgEvent:
    Type: object
    Properties:
      notificationUri:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Uri'
      notifCorreId:
        Type: string
        Description: It is used to set the value of Notification Correlation ID in the
notification sent by the SMF.
      dnaiChgType:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/DnaiChangeType'
      afAckInd:
    Type: boolean
    Required:
      - notificationUri
      - notifCorreId
      - dnaiChgType
    nullable: true
  TerminationNotification:
    Type: object
    Properties:
      resourceUri:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Uri'
      cause:
        Reference: '#/components/schemas/SmPolicyAssociationReleaseCause'
    Required:
      - resourceUri
      - cause
  AppDetectionInfo :
    Type: object
    Properties:
      appId:
        Type: string
        Description: A reference to the application detection filter configured at the
UPF
      instanceId:
        Type: string
        Description: Identifier dynamically assigned by the SMF in order to allow
correlation of application Start and Stop events to the specific service data flow
description, if service data flow descriptions are deducible.
      sdfDescriptions:
        Type: array
        Items:
          Reference: '#/components/schemas/FlowInformation'
        minItems: 1
        Description: Contains the detected service data flow descriptions if they are
deducible.
    Required:
      - appId
  AccNetChId:
```

```
    Type: object
    Properties:
      accNetChaIdValue:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/ChargingId'
      refPccRuleIds:
        Type: array
        Items:
          Type: string
        minItems: 1
       Description: Contains the identifier of the PCC rule(s) associated to the provided
 Access Network Charging Identifier.
      sessionChScope:
        Type: boolean
        Description: When it is included and set to true, indicates the Access Network
Charging Identifier applies to the whole PDU Session
    Required:
      - accNetChaIdValue
  AccNetChargingAddress:
    Description: Describes the network entity within the access network performing charging

    Type: object
    anyOf:
      - required: [anChargIpv4Addr]
      - required: [anChargIpv6Addr]
    Properties:
      anChargIpv4Addr:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
      anChargIpv6Addr:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Addr'
  RequestedRuleData:
    Type: object
    Properties:
      refPccRuleIds:
        Type: array
        Items:
          Type: string
        minItems: 1
       Description: An array of PCC rule id references to the PCC rules associated with
 the control data.
      reqData:
        Type: array
        Items:
          Reference: '#/components/schemas/RequestedRuleDataType'
        minItems: 1
        Description: Array of requested rule data type elements indicating what type of
 rule data is requested for the corresponding referenced PCC rules.
    Required:
      - refPccRuleIds
      - reqData
  RequestedUsageData:
    Type: object
    Properties:
      refUmIds:
```

```
        Type: array
        Items:
          Type: string
        minItems: 1
        Description: An array of usage monitoring data id references to the usage
monitoring data instances for which the PCF is requesting a usage report. This attribute
shall only be provided when allUmIds is not set to true.
      allUmIds:
        Type: boolean
        Description: This booleanean indicates whether requested usage data applies to
all usage monitoring data instances. When it's not included, it means requested usage data
 shall only apply to the usage monitoring data instances referenced by the refUmIds attribute.

  UeCampingRep:
    Type: object
    Properties:
      accessType:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/AccessType'
      ratType:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/RatType'
      servingNetwork:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/NetworkId'
      userLocationInfo:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/UserLocation'
      ueTimeZone:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/TimeZone'
      netLocAccSupp:
        Reference: '#/components/schemas/NetLocAccessSupport'
  RuleReport:
    Type: object
    Properties:
      pccRuleIds:
        Type: array
        Items:
          Type: string
        minItems: 1
        Description: Contains the identifier of the affected PCC rule(s).
      ruleStatus:
        Reference: '#/components/schemas/RuleStatus'
      contVers:
        Type: array
        Items:
          Reference:
'TS29514_Npcf_PolicyAuthorization.yaml#/components/schemas/ContentVersion'
        minItems: 1
        Description: Indicates the version of a PCC rule.
      failureCode:
        Reference: '#/components/schemas/FailureCode'
      finUnitAct:
       Reference: 'TS32291_Nchf_ConvergedCharging.yaml#/components/schemas/FinalUnitAction'

      ranNasRelCauses:
        Type: array
```

```
      Items:
        Reference: '#/components/schemas/RanNasRelCause'
      minItems: 1
      Description: indicates the RAN or NAS release cause code information.
  Required:
    - pccRuleIds
    - ruleStatus
    - failureCode
RanNasRelCause:
  Type: object
  Properties:
    ngApCause:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/NgApCause'
    5gMmCause:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/5GMmCause'
    5gSmCause:
      Reference: '#/components/schemas/5GSmCause'
    epsCause:
      Reference: '#/components/schemas/EpsRanNasRelCause'
UeInitiatedResourceRequest:
  Type: object
  Properties:
    packFiltOp:
      Reference: '#/components/schemas/PacketFilterOperation'
      Description: Indicates a UE requests specific QoS handling for selected SDF.
    packFiltInfo:
      Type: array
      Items:
        Reference: '#/components/schemas/PacketFilterInfo'
      minItems: 1
    reqQos:
      Reference: '#/components/schemas/RequestedQos'
      Description: Contains the QoS information requested by the UE.
  Required:
    - packFiltOp
    - packFiltInfo
PacketFilterInfo:
  Type: object
  Properties:
    packFiltId:
      Type: string
      Description: An identifier of packet filter.
    precedence:
      Type: integer
      Description: The requested order for the PCC rule generated fromt the packet
fitler information.
    packFiltCont:
      Reference: '#/components/schemas/PacketFilterContent'
      Description: Contains the content of the packet filter as requested by the UE
and required by the PCF to create the PCC rules.
    tosTrafficClass:
      Type: string
      Description: Contains the Ipv4 Type-of-Service and mask field or the Ipv6
```

```
Traffic-Class field and mask field.
      spi:
        Type: string
        Description: The security parameter index of the IPSec packet.
      flowLabel:
        Type: string
        Description: The Ipv6 flow label header field.
      flowDirection:
        Reference: '#/components/schemas/FlowDirection'
        Description: Indicates the direction/directions that a filter is applicable,
downlink only, uplink only or both down- and uplink (bidirectional).
  RequestedQos:
    Type: object
    Properties:
      5qi:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/5Qi'
      gbrUl:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/BitRate'
      gbrDl:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/BitRate'
    Required:
      - 5qi
  QosNotificationControlInfo:
    Type: object
    Properties:
      refPccRuleIds:
        Type: array
        Items:
          Type: string
        minItems: 1
        Description: An array of PCC rule id references to the PCC rules associated with
 the QoS notification control info.
      notifType:
       Reference: 'TS29514_Npcf_PolicyAuthorization.yaml#/components/schemas/QosNotifType'

      contVer:
        Reference:
'TS29514_Npcf_PolicyAuthorization.yaml#/components/schemas/ContentVersion'
      altQosParamId:
        Type: string
    Required:
      - refPccRuleIds
      - notifType
  PartialSuccessReport:
    Type: object
    Properties:
      failureCause:
        Type: string
        Description: Application error cause specific to this report.
      ruleReports:
        Type: array
        Items:
          Reference: '#/components/schemas/RuleReport'
```

```
          minItems: 1
          Description: Information about the PCC rules provisioned by the PCF not
successfully installed/activated.
      ueCampingRep:
        Reference: '#/components/schemas/UeCampingRep'
      policyDecFailureReports:
        Type: array
        Items:
        Reference: '#/components/schemas/PolicyDecisionFailureCode'
          minItems: 1
        Description: Contains the type(s) of failed policy decision and/or condition
data.
    Required:
      - failureCause
      - ruleReports
  AuthorizedDefaultQos:
    Type: object
    Properties:
      5qi:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/5Qi'
      arp:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Arp'
      priorityLevel:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/5QiPriorityLevelRm'
      averWindow:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/AverWindowRm'
      maxDataBurstVol:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/MaxDataBurstVolRm'
      maxbrUl:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/BitRateRm'
      maxbrDl:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/BitRateRm'
      gbrUl:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/BitRateRm'
      gbrDl:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/BitRateRm'
      extMaxDataBurstVol:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/ExtMaxDataBurstVolRm'
  ErrorReport:
    Type: object
    Properties:
      error:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
      ruleReports:
        Type: array
        Items:
          Reference: '#/components/schemas/RuleReport'
        minItems: 1
        Description: Used to report the PCC rule failure.
      sessRuleReports:
        Type: array
        Items:
```

```
          Reference: '#/components/schemas/SessionRuleReport'
        minItems: 1       Description: Used to report the PCC rule failure.
      polDecFailureReports:
        Type: array
        Items:
          Reference: '#/components/schemas/PolicyDecisionFailureCode'
        minItems: 1
       Description: Used to report failure of the policy decision and/or condition data.

      altQosParamId:
        Type: string
  SessionRuleReport:
    Type: object
    Properties:
      ruleIds:
        Type: array
        Items:
        Type: string
        minItems: 1
        Description: Contains the identifier of the affected session rule(s).
      rulestatus:
        Reference: '#/components/schemas/RuleStatus'
      SessionFailureCode:
        Reference: '#/components/schemas/SessionRuleFailureCode'
      policyDecFailureReports:
        Type: array
        Items:
        Reference: '#/components/schemas/PolicyDecisionFailureCode'
        minItems: 1
        Description: Contains the type(s) of failed policy decision and/or condition
data.
     required::
      - ruleIds
      - ruleStatus
  ServingNfIdentity:
        type: object
        properties:
          servNfInstId:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
          guami:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Guami'
          anGwAddr:
       Reference: 'TS29514_Npcf_PolicyAuthorization.yaml#/components/schemas/AnGwAddress'

  SteeringMode:
        type: object
        properties:
          SteeringModeValue:
        Reference: '#/components/schemas/SteerModeValue'
          active:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/AccessType'
          standby:
```

```
      Reference: 'TS29571_CommonData.yaml#/components/schemas/AccessTypeRm'
        3gLoad:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/Uinteger'
        prioAcc:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/AccessType'
    required::
     - steerModeValue
 AdditionalAccessInfo:
      type: object
      properties:
        accessType:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/AccessType'
        ratType:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/RatType'
    required::
     - accessType
 QosMonitoringData:
     type: object
     properties:
       qmId:
         type: string
        description: Univocally identifies the QoS monitoring policy data within a PDU
 session.
       reqQosMonParams:
         type: array
         items:
           Reference: '#/components/schemas/RequestedQosMonitoringParameter'
         minItems: 1
         description: indicates the UL packet delay, DL packet delay and/or round trip
  packet delay between the UE and the UPF is to be monitored when the QoS Monitoring for
 URLLC is enabled for the service data flow.
       repFreqs:
         type: array
         items:
           Reference: '#/components/schemas/ReportingFrequency'
         minItems: 1
       repThreshDl:
         type: integer
         description: Unsigned integer identifying a period of time in units of
 miliiseconds for DL packet delay.
         nullable: true
       repThreshUl:
         type: integer
         description: Unsigned integer identifying a period of time in units of
 miliiseconds for UL packet delay.
         nullable: true
       repThreshRp:
         type: integer
         description: Unsigned integer identifying a period of time in units of
 miliiseconds for round trip packet delay.
         nullable: true
       waitTime:
         Reference: 'TS29571_CommonData.yaml#/components/schemas/DurationSecRm'
```

```
        repPeriod:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/DurationSecRm'
        notifyUri:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/Uri'
        notifyCorreId:
          type: string
      required:
        - qmId
        - reqQosMonParams
        - repFreqs
      nullable: true
    QosMonitoringReport:
      type: object
      properties:
        refPccRuleIds:
          type: array
          items:
            type: string
          minItems: 1
          description: An array of PCC rule id references to the PCC rules associated
with the QoS monitoring report.
        ulDelays:
          type: array
          items:
            type: integer
          minItems: 1
        dlDelays:
          type: array
          items:
            type: integer
          minItems: 1
        rtDelays:
          type: array
          items:
            type: integer
          minItems: 1
      required:
        - refPccRuleIds
#
    TsnBridgeInfo:
      type: object
      properties:
        bridgeId:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/Uint64'
        dsttAddr:
          Reference:'TS29571_CommonData.yaml#/components/schemas/MacAddr48'
        dsttPortNum:
          Reference: '#/components/schemas/TsnPortNumber'
        dsttResidTime:
          Reference: 'TS29571_CommonData.yaml#/components/schemas/Uinteger'
#
    PortManagementContainer:
      type: object
```

```
    properties:
      portManCont:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Bytes'
      portNum:
        Reference: '#/components/schemas/TsnPortNumber'
    required:
      - portManCont
      - portNum
  BridgeManagementContainer:
    type: object
    properties:
      bridgeManCont:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Bytes'
    required:
      - bridgeManCont
  IpMulticastAddressInfo:
    type: object
    properties:
      srcIpv4Addr:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
      ipv4MulAddr:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
      srcIpv6Addr:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Addr'
      ipv6MulAddr:
        Reference: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Addr'
  DownlinkDataNotificationControl:
    description: Contains the downlink data notification control information.
    type: object
    properties:
      notifCtrlInds:
        type: array
        items:
          Reference: '#/components/schemas/NotificationControlIndication'
        minItems: 1
      typesOfNotif:
        type: array
        items:
         Reference: 'TS29571_CommonData.yaml#/components/schemas/DlDataDeliveryStatus'

        minItems: 1
  DownlinkDataNotificationControlRm:
    description: this data type is defined in the same way as the
DownlinkDataNotificationControl data type, but with the OpenAPI nullable property set to
true.
    type: object
    properties:
      notifCtrlInds:
        type: array
        items:
          Reference: '#/components/schemas/NotificationControlIndication'
        minItems: 1
        nullable: true
```

```
        typesOfNotif:
          type: array
          items:
           Reference: 'TS29571_CommonData.yaml#/components/schemas/DlDataDeliveryStatus'

          minItems: 1
          nullable: true
      nullable: true
  5GSmCause:
    Reference: 'TS29571_CommonData.yaml#/components/schemas/Uinteger'
    EpsRanNasRelCause:
      type: string
    Description: Defines the EPS RAN/NAS release cause.
  PacketFilterContent:
    Type: string
   Description: Defines a packet filter for an IP flow.Refer to subclause 5.3.54 of 3GPP
 TS 29.212 [23] for encoding.
  FlowDescription:
    Type: string
   Description: Defines a packet filter for an IP flow.Refer to subclause 5.4.2 of 3GPP
 TS 29.212 [23] for encoding.
    TsnPortNumber:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/Uinteger'
    ApplicationDescriptor:
      Reference: 'TS29571_CommonData.yaml#/components/schemas/Bytes'
  FlowDirection:
    anyOf:
    - type: string
      enum:
        - DOWNLINK
        - UPLINK
        - BIDIRECTIONAL
        - UNSPECIFIED
    - type: string
      Description:
        This string provides forward-compatibility with future
        extensions to the enumeration but is not used to encode
        content defined in the present version of this API.
    Description:
      Possible values are
      - DOWNLINK: The corresponding filter applies for traffic to the UE.
      - UPLINK: The corresponding filter applies for traffic from the UE.
      - BIDIRECTIONAL: The corresponding filter applies for traffic both to and from the
UE.
      - UNSPECIFIED: The corresponding filter applies for traffic to the UE (downlink), but
 has no specific direction declared. The service data flow detection shall apply the filter
 for uplink traffic as if the filter was bidirectional. The PCF shall not use the value
UNSPECIFIED in filters created by the network in NW-initiated procedures. The PCF shall
only include the value UNSPECIFIED in filters in UE-initiated procedures if the same value
 is received from the SMF.
  FlowDirectionRm:
    - type: string
      enum:
        - DOWNLINK
        - UPLINK
        - BIDIRECTIONAL
        - UNSPECIFIED
```

```
        - NULL
    ReportingLevel:
      anyOf:
      - type: string
        enum:
          - SER_ID_LEVEL
          - RAT_GR_LEVEL
          - SPON_CON_LEVEL
        - $ref: 'TS29571_CommonData.yaml#/components/schemas/NullValue'
        - type: string
        Description:
          This string provides forward-compatibility with future
          extensions to the enumeration but is not used to encode
          content defined in the present version of this API.
      Description:
        Possible values are
        - SER_ID_LEVEL: Indicates that the usage shall be reported on service id and rating
group combination level.
        - RAT_GR_LEVEL: Indicates that the usage shall be reported on rating group level.
        - SPON_CON_LEVEL: Indicates that the usage shall be reported on sponsor identity and
 rating group combination level.
    MeteringMethod:
      anyOf:
      - type: string
        enum:
          - DURATION
          - VOLUME
          - DURATION_VOLUME
          - EVENT
        - $ref: 'TS29571_CommonData.yaml#/components/schemas/NullValue'
        - type: string
        Description:
          This string provides forward-compatibility with future
          extensions to the enumeration but is not used to encode
          content defined in the present version of this API.
      Description:
        Possible values are
        - DURATION: Indicates that the duration of the service data flow traffic shall be
metered.
        - VOLUME: Indicates that volume of the service data flow traffic shall be metered.
        - DURATION_VOLUME: Indicates that the duration and the volume of the service data
flow traffic shall be metered.
        - EVENT: Indicates that events of the service data flow traffic shall be metered.
    PolicyControlRequestTrigger:
      anyOf:
      - type: string
        enum:
          - PLMN_CH
          - RES_MO_RE
          - AC_TY_CH
          - UE_IP_CH
          - UE_MAC_CH
          - AN_CH_COR
          - US_RE
          - APP_STA
          - APP_STO
          - AN_INFO
          - CM_SES_FAIL
          - PS_DA_OFF
          - DEF_QOS_CH
          - SE_AMBR_CH
```

```
          - QOS_NOTIF
          - NO_CREDIT
          - REALLO_OF_CREDIT
          - PRA_CH
          - SAREA_CH
          - SCNN_CH
          - RE_TIMEOUT
          - RES_RELEASE
          - SUCC_RES_ALLO
          - RAT_TY_CH
          - REF_QOS_IND_CH
          - AUTH_PROF_CH
          - QOS_MONITORING
          - SCELL_CH
          - EPS_FALLBACK
          - MA_PDU
          - TSN_BRIDGE_INFO
          - 5G_RG_JOIN
          - 5G_RG_LEAVE
          - DDN_FAILURE
          - DDN_DELIVERY_STATUS
          - GROUP_ID_LIST_CHG
          - DDN_FAILURE_CANCELLATION
          - DDN_DELIVERY_STATUS_CANCELLATION
          - VPLMN_QOS_CH
      - type: string
        Description:
          This string provides forward-compatibility with future
          extensions to the enumeration but is not used to encode
          content defined in the present version of this API.
      Description:
        Possible values are
        - PLMN_CH: PLMN Change
        - RES_MO_RE: A request for resource modification has been received by the SMF. The
SMF always reports to the PCF.
        - AC_TY_CH: Access Type Change
        - UE_IP_CH: UE IP address change. The SMF always reports to the PCF.
        - UE_MAC_CH: A new UE MAC address is detected or a used UE MAC address is inactive
for a specific period
        - AN_CH_COR: Access Network Charging Correlation Information
        - US_RE: The PDU Session or the Monitoring key specific resources consumed by a UE
either reached the threshold or needs to be reported for other reasons.
        - APP_STA: The start of application traffic has been detected.
        - APP_STO: The stop of application traffic has been detected.
        - AN_INFO: Access Network Information report
        - CM_SES_FAIL: Credit management session failure
        - PS_DA_OFF: The SMF reports when the 3GPP PS Data Off status changes. The SMF always
 reports to the PCF.
        - DEF_QOS_CH: Default QoS Change. The SMF always reports to the PCF.
        - SE_AMBR_CH: Session AMBR Change. The SMF always reports to the PCF.
        - QOS_NOTIF: The SMF notify the PCF when receiving notification from RAN that QoS
targets of the QoS Flow cannot be guranteed or gurateed again.
        - NO_CREDIT: Out of credit
        - REALLO_OF_CREDIT: Reallocation of credit
        - PRA_CH: Change of UE presence in Presence Reporting Area
        - SAREA_CH: Location Change with respect to the Serving Area
        - SCNN_CH: Location Change with respect to the Serving CN node
        - RE_TIMEOUT: Indicates the SMF generated the request because there has been a PCC
revalidation timeout
        - RES_RELEASE: Indicate that the SMF can inform the PCF of the outcome of the release
 of resources for those rules that require so.
        - SUCC_RES_ALLO: Indicates that the requested rule data is the successful resource
allocation.
        - RAT_TY_CH: RAT Type Change.
```

```
      - REF_QOS_IND_CH: Reflective QoS indication Change
      - NUM_OF_PACKET_FILTER: Indicates that the SMF shall report the number of supported
packet filter for signalled QoS rules
      - UE_STATUS_RESUME: Indicates that the UE’s status is resumed.
      - UE_TZ_CH: UE Time Zone Change
      - AUTH_PROF_CH: The DN-AAA authorization profile index has changed
      - QOS_MONITORING: Indicate that the SMF notifies the PCF of the QoS Monitoring
information.
      - SCELL_CH: Location Change with respect to the Serving Cell.
      - EPS_FALLBACK: EPS Fallback report is enabled in the SMF.
      - MA_PDU: UE Indicates that the SMF notifies the PCF of the MA PDU session request
      - TSN_BRIDGE_INFO: 5GS Bridge information available
      - 5G_RG_JOIN: The 5G-RG has joined to an IP Multicast Group.
      - 5G_RG_LEAVE: The 5G-RG has left an IP Multicast Group.
      - DDN_FAILURE: Event subscription for DDN Failure event received.
      - DDN_DELIVERY_STATUS: Event subscription for DDN Delivery Status received.
      - GROUP_ID_LIST_CHG: UE Internal Group Identifier(s) has changed: the SMF reports
that UDM provided list of group Ids has changed.
     - DDN_FAILURE_CANCELLATION: The event subscription for DDN Failure event is cancelled.

     - DDN_DELIVERY_STATUS_CANCELLATION: The event subscription for DDD STATUS is cancelled.

      - VPLMN_QOS_CH: Change of the QoS supported in the VPLMN.
  RequestedRuleDataType:
    anyOf:
    - type: string
      enum:
        - CH_ID
        - MS_TIME_ZONE
        - USER_LOC_INFO
        - RES_RELEASE
        - SUCC_RES_ALLO
        - EPS_FALLBACK
    - type: string
      Description:
        This string provides forward-compatibility with future
        extensions to the enumeration but is not used to encode
        content defined in the present version of this API.
    Description:
      Possible values are
      - CH_ID: Indicates that the requested rule data is the charging identifier.
      - MS_TIME_ZONE: Indicates that the requested access network info type is the UE's
timezone.
      - USER_LOC_INFO: Indicates that the requested access network info type is the UE's
location.
      - RES_RELEASE: Indicates that the requested rule data is the result of the release
of resource.
      - SUCC_RES_ALLO: Indicates that the requested rule data is the successful resource
allocation.
      - EPS_FALLBACK: Indicates that the requested rule data is the report of QoS flow
rejection due to EPS fallback.
  RuleStatus:
    anyOf:
    - type: string
      enum:
        - ACTIVE
        - INACTIVE
    - type: string
      Description:
        This string provides forward-compatibility with future
        extensions to the enumeration but is not used to encode
        content defined in the present version of this API.
```

```
    Description:
      Possible values are
      - ACTIVE: Indicates that the PCC rule(s) are successfully installed (for those
provisioned from PCF) or activated (for those pre-defined in SMF), or the session rule(s)
are successfully installed
      - INACTIVE: Indicates that the PCC rule(s) are removed (for those provisioned from
PCF) or inactive (for those pre-defined in SMF) or the session rule(s) are removed.
  FailureCode:
    anyOf:
    - type: string
      enum:
        - UNK_RULE_ID
        - RA_GR_ERR
        - SER_ID_ERR
        - NF_MAL
        - RES_LIM
        - MAX_NR_QoS_FLOW
        - MISS_FLOW_INFO
        - RES_ALLO_FAIL
        - UNSUCC_QOS_VAL
        - INCOR_FLOW_INFO
        - PS_TO_CS_HAN
        - APP_ID_ERR
        - NO_QOS_FLOW_BOUND
        - FILTER_RES
        - MISS_REDI_SER_ADDR
        - CM_END_USER_SER_DENIED
        - CM_CREDIT_CON_NOT_APP
        - CM_AUTH_REJ
        - CM_USER_UNK
        - CM_RAT_FAILED
        - SESS_AMBR_FAILURE
        - DEF_QOS_FAILURL
    - type: string
      Description:
        This string provides forward-compatibility with future
        extensions to the enumeration but is not used to encode
        content defined in the present version of this API.
    Description:
      Possible values are
       - UNK_RULE_ID: Indicates that the pre-provisioned PCC rule could not be successfully
 activated because the PCC rule identifier is unknown to the SMF.
       - RA_GR_ERR: Indicate that the PCC rule could not be successfully installed or
enforced because the Rating Group specified within the Charging Data policy decision which
 the PCC rule refers to is unknown or, invalid.
       - SER_ID_ERR: Indicate that the PCC rule could not be successfully installed or
enforced because the Service Identifier specified within the Charging Data policy decision
 which the PCC rule refers to is invalid, unknown, or not applicable to the service being
charged.
       - NF_MAL: Indicate that the PCC rule could not be successfully installed (for those
 provisioned from the PCF) or activated (for those pre-defined in SMF) or enforced (for
those already successfully installed) due to SMF/UPF malfunction.
       - RES_LIM: Indicate that the PCC rule could not be successfully installed (for those
 provisioned from PCF) or activated (for those pre-defined in SMF) or enforced (for those
already successfully installed) due to a limitation of resources at the SMF/UPF.
       - MAX_NR_QoS_FLOW: Indicate that the PCC rule could not be successfully installed
(for those provisioned from PCF) or activated (for those pre-defined in SMF) or enforced
(for those already successfully installed) due to the fact that the maximum number of QoS
flows has been reached for the PDU session.
       - MISS_FLOW_INFO: Indicate that the PCC rule could not be successfully installed
or enforced because the Flow Information AVP is not specified within the "pccRule" attribute
 by the PCF during the first install request of the PCC rule.
       - RES_ALLO_FAIL: Indicate that the PCC rule could not be successfully installed or
```

```
 maintained since the QoS flow establishment/modification failed, or the QoS flow was
released.
        - UNSUCC_QOS_VAL: indicate that the QoS validation has failed or when Guaranteed
Bandwidth > Max-Requested-Bandwidth.
        - INCOR_FLOW_INFO: Indicate that the PCC rule could not be successfully installed
or modified at the SMF because the provided flow information is not supported by the network
 (e.g. the provided IP address(es) or Ipv6 prefix(es) do not correspond to an IP version
applicable for the PDU session).
        - PS_TO_CS_HAN: Indicate that the PCC rule could not be maintained because of PS
to CS handover.
       - APP_ID_ERR: Indicate that the rule could not be successfully installed or enforced
 because the Application Identifier is invalid, unknown, or not applicable to the application
 required for detection.
        - NO_QOS_FLOW_BOUND: Indicate that there is no QoS flow which the SMF can bind the
 PCC rule(s) to.
        - FILTER_RES: Indicate that the Flow Information within the "flowInfos" attribute
cannot be handled by the SMF because any of the restrictions defined in subclause 5.4.2 of
 3GPP TS 29.212 was not met.
       - MISS_REDI_SER_ADDR: Indicate that the PCC rule could not be successfully installed
 or enforced at the SMF because there is no valid Redirect Server Address within the Traffic
 Control Data policy decision which the PCC rule refers to provided by the PCF and no
preconfigured redirection address for this PCC rule at the SMF.
        - CM_END_USER_SER_DENIED: Indicate that the charging system denied the service
request due to service restrictions (e.g. terminate rating group) or limitations related
to the end-user, for example the end-user's account could not cover the requested service.
        - CM_CREDIT_CON_NOT_APP: Indicate that the charging system determined that the
service can be granted to the end user but no further credit control is needed for the
service (e.g. service is free of charge or is treated for offline charging).
       - CM_AUTH_REJ: Indicate that the charging system denied the service request in order
 to terminate the service for which credit is requested.
        - CM_USER_UNK: Indicate that the specified end user could not be found in the
charging system.
        - CM_RAT_FAILED: Indicate that the charging system cannot rate the service request
 due to insufficient rating input, incorrect AVP combination or due to an attribute or an
attribute value that is not recognized or supported in the rating.
        - SESS_AMBR_FAILURE: Indicate that the session AMBR update is failure.
        - DEF_QOS_FAILURL: Indicate that the default QoS update is failure.
  AfSigProtocol:
    anyOf:
    - type: string
      enum:
        - NO_INFORMATION
        - SIP
      - $ref: 'TS29571_CommonData.yaml#/components/schemas/NullValue'
      - type: string
      Description:
        This string provides forward-compatibility with future
        extensions to the enumeration but is not used to encode
        content defined in the present version of this API.
    Description:
      Possible values are
      - NO_INFORMATION: Indicate that no information about the AF signalling protocol is
being provided.
      - SIP: Indicate that the signalling protocol is Session Initiation Protocol.
    RuleOperation:
      anyOf:
      - type: string
        enum:
          - CREATE_PCC_RULE
          - DELETE_PCC_RULE
          - MODIFY_PCC_RULE_AND_ADD_PACKET_FILTERS
          - MODIFY_ PCC_RULE_AND_REPLACE_PACKET_FILTERS
```

```
          - MODIFY_ PCC_RULE_AND_DELETE_PACKET_FILTERS
          - MODIFY_PCC_RULE_WITHOUT_MODIFY_PACKET_FILTERS
      - type: string
        description:
          This string provides forward-compatibility with future
          extensions to the enumeration but is not used to encode
          content defined in the present version of this API.
      description:
        Possible values are
        - CREATE_PCC_RULE: Indicates to create a new PCC rule to reserve the resource
requested by the UE.
        - DELETE_PCC_RULE: Indicates to delete a PCC rule corresponding to reserve the
resource requested by the UE.
       - MODIFY_PCC_RULE_AND_ADD_PACKET_FILTERS: Indicates to modify the PCC rule by adding
 new packet filter(s).
        - MODIFY_ PCC_RULE_AND_REPLACE_PACKET_FILTERS: Indicates to modify the PCC rule by
 replacing the existing packet filter(s).
        - MODIFY_ PCC_RULE_AND_DELETE_PACKET_FILTERS: Indicates to modify the PCC rule by
deleting the existing packet filter(s).
        - MODIFY_PCC_RULE_WITHOUT_MODIFY_PACKET_FILTERS: Indicates to modify the PCC rule
by modifying the QoS of the PCC rule.
    RedirectAddressType:
      anyOf:
      - type: string
        enum:
          - IPV4_ADDR
          - IPV6_ADDR
          - URL
          - SIP_URI
      - type: string
        description:
          This string provides forward-compatibility with future
          extensions to the enumeration but is not used to encode
          content defined in the present version of this API.
      description:
        Possible values are
        - IPV4_ADDR: Indicates that the address type is in the form of "dotted-decimal"
IPv4 address.
        - IPV6_ADDR: Indicates that the address type is in the form of IPv6 address.
        - URL: Indicates that the address type is in the form of Uniform Resource Locator.
        - SIP_URI: Indicates that the address type is in the form of SIP Uniform Resource
Identifier.
  PacketFilterOperation:
    anyOf:
    - type: string
      enum:
        - DELETION
        - ADDITION
        - MODIFICATION
    - type: string
      Description:
        This string provides forward-compatibility with future
        extensions to the enumeration but is not used to encode
        content defined in the present version of this API.
    Description:
      Possible values are
      - DELETION: Indicates that the resources reserved for the provided packet filter
identifiers are to be deleted and are no longer used by the UE.
     - ADDITION: Indicates that the UE requests resources allocated for the provided packet
 filters.
      - MODIFICATION: Indicates that the reserved QoS, the filter, the precedence, or any
of the fields for the provided packet filter identifiers are being modified.
```

```
  RedirectAddressType:
    anyOf:
    - type: string
      enum:
        - IPV4_ADDR
        - IPV6_ADDR
        - URL
        - SIP_URI
    - type: string
      Description:
        This string provides forward-compatibility with future
        extensions to the enumeration but is not used to encode
        content defined in the present version of this API.
    Description:
      Possible values are
      - IPV4_ADDR: Indicates that the address type is in the form of "dotted-decimal" IPv4
 address.
      - IPV6_ADDR: Indicates that the address type is in the form of IPv6 address.
      - URL: Indicates that the address type is in the form of Uniform Resource Locator.
      - SIP_URI: Indicates that the address type is in the form of SIP Uniform Resource
Identifier.
  QosFlowUsage:
    anyOf:
    - type: string
      enum:
        - GENERAL
        - IMS_SIG
    - type: string
      Description:
        This string provides forward-compatibility with future
        extensions to the enumeration but is not used to encode
        content defined in the present version of this API.
    Description:
      Possible values are
      - GENERAL: Indicate no specific QoS flow usage information is available.
      - IMS_SIG: Indicate that the QoS flow is used for IMS signalling only.
    FailureCause:
      anyOf:
      - type: string
        enum:
          - PCC_RULE_EVENT
          - PCC_QOS_FLOW_EVENT
          - RULE_PERMANENT_ERROR
          - RULE_TEMPORARY_ERROR
          - POL_DEC_ERROR
      - type: string
    CreditManagementStatus:
      anyOf:
      - type: string
        enum:
          - END_USER_SER_DENIED
          - CREDIT_CTRL_NOT_APP
          - AUTH_REJECTED
          - USER_UNKNOWN
          - RATING_FAILED
      - type: string
    SessionRuleFailureCode:
      anyOf:
      - type: string
        enum:
```

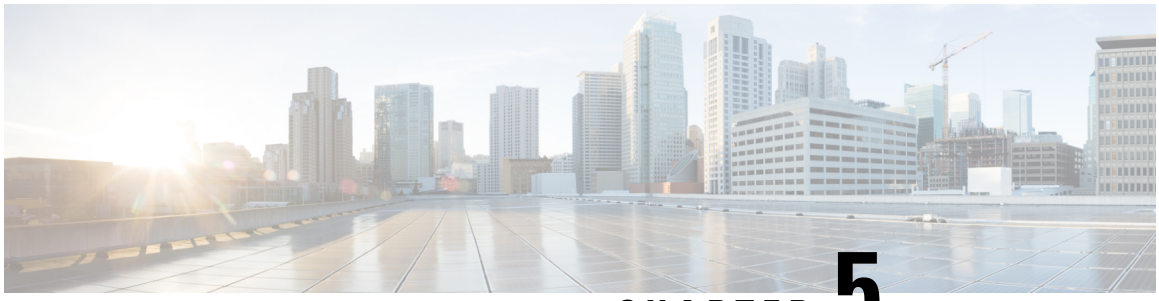
```
          - NF_MAL
          - RES_LIM
          - UNSUCC_QOS_VAL
          - UE_STA_SUSP
      - type: string
        description:
          This string provides forward-compatibility with future
          extensions to the enumeration but is not used to encode
          content defined in the present version of this API.
      description:
        Possible values are
          - NF_MAL: Indicate that the PCC rule could not be successfully installed (for
those provisioned from the PCF) or activated (for those pre-defined in SMF) or enforced
(for those already successfully installed) due to SMF/UPF malfunction.
          - RES_LIM: Indicate that the PCC rule could not be successfully installed (for
those provisioned from PCF) or activated (for those pre-defined in SMF) or enforced (for
those already successfully installed) due to a limitation of resources at the SMF/UPF.
          - UNSUCC_QOS_VAL: indicate that the QoS validation has failed.
          - UE_STA_SUSP: Indicates that the UE is in suspend state.
    SteeringFunctionality:
      anyOf:
      - type: string
        enum:
          - MPTCP
          - ATSSS_LL
      - type: string
        description:
          This string provides forward-compatibility with future
          extensions to the enumeration but is not used to encode
          content defined in the present version of this API.
      description:
        Possible values are
          - MPTCP: Indicates that PCF authorizes the MPTCP functionality to support traffic
 steering, switching and splitting.
          - ATSSS_LL: Indicates that PCF authorizes the ATSSS-LL functionality to support
traffic steering, switching and splitting.
    SteerModeValue:
      anyOf:
      - type: string
        enum:
          - ACTIVE_STANDBY
          - LOAD_BALANCING
          - SMALLEST_DELAY
          - PRIORITY_BASED
      - type: string
    MulticastAccessControl:
      anyOf:
      - type: string
        enum:
          - ALLOWED
          - NOT_ALLOWED
      - type: string
    RequestedQosMonitoringParameter:
      anyOf:
      - type: string
        enum:
          - DOWNLINK
          - UPLINK
          - ROUND_TRIP
      - type: string
```

```
    ReportingFrequency:
      anyOf:
      - type: string
        enum:
          - EVENT_TRIGGERED
          - PERIODIC
          - SESSION_RELEASE
      - type: string
    SmPolicyAssociationReleaseCause:
      anyOf:
      - type: string
        enum:
          - UNSPECIFIED
          - UE_SUBSCRIPTION
          - INSUFFICIENT_RES
          - VALIDATION_CONDITION_NOT_MET
      - type: string
    PduSessionRelCause:
      anyOf:
      - type: string
        enum:
          - PS_TO_CS_HO
      - type: string
    MaPduIndication:
      anyOf:
      - type: string
        enum:
          - MA_PDU_REQUEST
          - MA_PDU_NETWORK_UPGRADE_ALLOWED
      - type: string
    AtsssCapability:
      anyOf:
      - type: string
        enum:
          - MPTCP_ATSSS_LL_WITH_ASMODE_UL
          - MPTCP_ATSSS_LL_WITH_EXSDMODE_DL_ASMODE_UL
          - MPTCP_ATSSS_LL_WITH_ASMODE_DLUL
          - ATSSS_LL
          - MPTCP_ATSSS_LL
      - type: string
#
    NetLocAccessSupport:
      anyOf:
      - type: string
        enum:
          - ANR_NOT_SUPPORTED
          - TZR_NOT_SUPPORTED
          - LOC_NOT_SUPPORTED
      - type: string
        description:
          This string provides forward-compatibility with future
          extensions to the enumeration but is not used to encode
          content defined in the present version of this API.
      description:
        Possible values are
        - ANR_NOT_SUPPORTED: Indicates that the access network does not support the report
 of access network information.
        - TZR_NOT_SUPPORTED: Indicates that the access network does not support the report
 of UE time zone.
        - LOC_NOT_SUPPORTED: Indicates that the access network does not support the report
```

```
 of UE Location (or PLMN Id).
    PolicyDecisionFailureCode:
      anyOf:
      - type: string
        enum:
          - TRA_CTRL_DECS_ERR
          - QOS_DECS_ERR
          - CHG_DECS_ERR
          - USA_MON_DECS_ERR
          - QOS_MON_DECS_ERR
          - CON_DATA_ERR
      - type: string
#
    NotificationControlIndication:
      anyOf:
      - type: string
        enum:
          - DDN_FAILURE
          - DDD_STATUS
      - type: string
#
```

External Docs

```
Description: 3GPP TS 29.512 V16.9.0; 5G System; Session Management Policy Control Service.
URL: 'http://www.3gpp.org/ftp/Specs/archive/29_series/29.512/'
```



CHAPTER 5

Nchf_SpendingLimitControl

The Nchf_SpendingLimitControl service enables the NF service consumer to retrieve policy counter status information per UE from the CHF by subscribing to spending limit reporting (that is notifications of policy counter status changes).

- OpenAPI, on page 143
- Info, on page 143
- Servers, on page 143
- Security, on page 144
- Paths, on page 144
- Components, on page 148
- External Docs, on page 150

OpenAPI

OpenAPI Version: 3.0.0

Info

```
Description: Spending Limit Control Service API
Version: "1.0.0"
Title: Nchf_SpendingLimitControl
```

Servers

```
URL: 'http://{apiRoot}/nchf-spendinglimitcontrol/v1'
Variables:
  API Root:
    Default: https://example.com
    Description: apiRoot as defined in subclause subclause 4.4 of 3GPP TS 29.501
```

Security

```
- {}
- oAuth2ClientCredentials:
  - nchf-spendinglimitcontrol
```

Paths

/subscriptions

```
  Method: Post
    Request Body:
      Required/Optional: true
      Content:
        Application/JSON:
          Schema:
            Reference: '#/components/schemas/SpendingLimitContext'

    Responses:
      '201':
        Description: Success
        Content:
          Application/JSON:
            Schema:
              Reference: '#/components/schemas/SpendingLimitStatus'
        Headers:
          Location:
          description: 'Contains the URI of the created individual spending
 limit resource, according to the structure:
{apiRoot}/nchf-spendinglimitcontrol/v1/subscriptions/{subscriptionId}'
            Required/Optional: true
            Schema:
              Type: string
      '400':
        Reference: './TS29571_CommonData.yaml#/components/responses/400'
      '401':
        Reference: './TS29571_CommonData.yaml#/components/responses/401'
      '403':
        Reference: './TS29571_CommonData.yaml#/components/responses/403'
      '404':
        Reference: './TS29571_CommonData.yaml#/components/responses/404'
      '411':
        Reference: './TS29571_CommonData.yaml#/components/responses/411'
      '413':
        Reference: './TS29571_CommonData.yaml#/components/responses/413'
      '415':
        Reference: './TS29571_CommonData.yaml#/components/responses/415'
```

```
    '429':
      Reference: './TS29571_CommonData.yaml#/components/responses/429'
    '500':
      Reference: './TS29571_CommonData.yaml#/components/responses/500'
    '503':
      Reference: './TS29571_CommonData.yaml#/components/responses/503'
    Default:
      Reference: './TS29571_CommonData.yaml#/components/responses/default'
  Callbacks:
    statusNotification:
      '{$request.body#/notifUri}/notify':
        Method: Post
          Request Body:
            Required/Optional: true
            Content:
              Application/JSON:
                Schema:
                  Reference: '#/components/schemas/SpendingLimitStatus'

          Responses:
            '204':
              Description: No Content, Notification was succesfull
            '400':
              Reference: './TS29571_CommonData.yaml#/components/responses/400'
            '401':
              Reference: './TS29571_CommonData.yaml#/components/responses/401'
            '403':
              Reference: './TS29571_CommonData.yaml#/components/responses/403'
            '404':
              Reference: './TS29571_CommonData.yaml#/components/responses/404'
            '411':
              Reference: './TS29571_CommonData.yaml#/components/responses/411'
            '413':
              Reference: './TS29571_CommonData.yaml#/components/responses/413'
            '415':
              Reference: './TS29571_CommonData.yaml#/components/responses/415'
            '429':
              Reference: './TS29571_CommonData.yaml#/components/responses/429'
            '500':
              Reference: './TS29571_CommonData.yaml#/components/responses/500'
            '503':
              Reference: './TS29571_CommonData.yaml#/components/responses/503'
            Default:
              Reference: './TS29571_CommonData.yaml#/components/responses/default'
    subscriptionTermination:
      '{$request.body#/notifUri}/terminate':
        Method: Post
          Request Body:
            Required/Optional: true
            Content:
              Application/JSON:
                Schema:
```

```
            Reference: '#/components/schemas/SubscriptionTerminationInfo'

        Responses:
          '204':
            Description: No Content, Notification was succesfull
          '400':
            Reference: './TS29571_CommonData.yaml#/components/responses/400'
          '401':
            Reference: './TS29571_CommonData.yaml#/components/responses/401'
          '403':
            Reference: './TS29571_CommonData.yaml#/components/responses/403'
          '404':
            Reference: './TS29571_CommonData.yaml#/components/responses/404'
          '411':
            Reference: './TS29571_CommonData.yaml#/components/responses/411'
          '413':
            Reference: './TS29571_CommonData.yaml#/components/responses/413'
          '415':
            Reference: './TS29571_CommonData.yaml#/components/responses/415'
          '429':
            Reference: './TS29571_CommonData.yaml#/components/responses/429'
          '500':
            Reference: './TS29571_CommonData.yaml#/components/responses/500'
          '503':
            Reference: './TS29571_CommonData.yaml#/components/responses/503'
          Default:
            Reference: './TS29571_CommonData.yaml#/components/responses/default'
```

/subscriptions/{subscriptionId}

```
Parameters:
  - in: path
    name: subscriptionId
    Description: Identifies an individual spending limit retrieval subscription.
    Required/Optional: true
    Schema:
      Type: string
put:
  Request Body:
    Required/Optional: true
    Content:
      Application/JSON:
        Schema:
          Reference: '#/components/schemas/SpendingLimitContext'

  Responses:
    '200':
     Description: OK. Resource was succesfully modified and representation is returned

      Content:
```

```
        Application/JSON:
          Schema:
            Reference: '#/components/schemas/SpendingLimitStatus'
      '400':
        Reference: './TS29571_CommonData.yaml#/components/responses/400'
      '401':
        Reference: './TS29571_CommonData.yaml#/components/responses/401'
      '403':
        Reference: './TS29571_CommonData.yaml#/components/responses/403'
      '404':
        Reference: './TS29571_CommonData.yaml#/components/responses/404'
      '411':
        Reference: './TS29571_CommonData.yaml#/components/responses/411'
      '413':
        Reference: './TS29571_CommonData.yaml#/components/responses/413'
      '415':
        Reference: './TS29571_CommonData.yaml#/components/responses/415'
      '429':
        Reference: './TS29571_CommonData.yaml#/components/responses/429'
      '500':
        Reference: './TS29571_CommonData.yaml#/components/responses/500'
      '503':
        Reference: './TS29571_CommonData.yaml#/components/responses/503'
      Default:
        Reference: './TS29571_CommonData.yaml#/components/responses/default'
  delete:

    Responses:
      '204':
        Description: No Content. Resource was succesfully deleted
      '400':
        Reference: './TS29571_CommonData.yaml#/components/responses/400'
      '401':
        Reference: './TS29571_CommonData.yaml#/components/responses/401'
      '403':
        Reference: './TS29571_CommonData.yaml#/components/responses/403'
      '404':
        Reference: './TS29571_CommonData.yaml#/components/responses/404'
      '429':
        Reference: './TS29571_CommonData.yaml#/components/responses/429'
      '500':
        Reference: './TS29571_CommonData.yaml#/components/responses/500'
      '503':
        Reference: './TS29571_CommonData.yaml#/components/responses/503'
      Default:
        Reference: './TS29571_CommonData.yaml#/components/responses/default'
```

Components

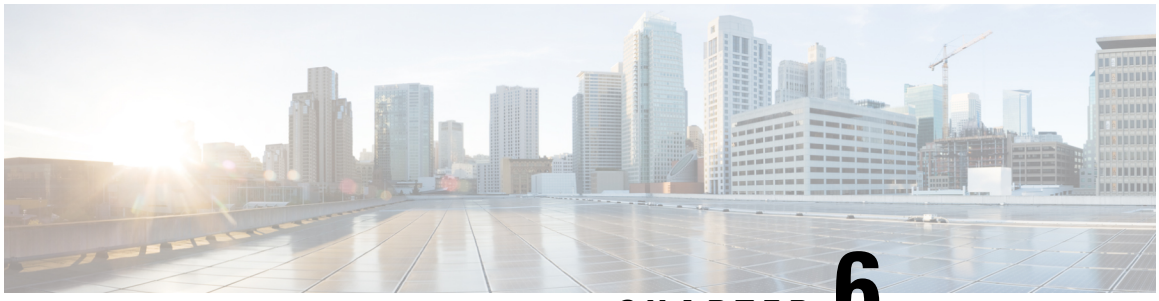
```
securitySchemes:
  oAuth2ClientCredentials:
    Type: oauth2
    Flows:
      clientCredentials:
        tokenUrl: '{nrfApiRoot}/oauth2/token'
        scopes:
          nchf-spendinglimitcontrol: Access to the Nchf_SpendingLimitControl API

schemas:
  SpendingLimitContext:
    Type: object
    Properties:
      supi:
       Description: The Subscription Permanent Identifier (Supi) shall be present within
 the initial spending limit retrieval procedure (creation of a new individual subscription).

        Reference: './TS29571_CommonData.yaml#/components/schemas/Supi'
      gpsi:
        Description: The Generic Public Subscription Identifier (Gpsi) may be present
within the initial spending limit retrieval procedure (creation of a new individual
subscription).
        Reference: './TS29571_CommonData.yaml#/components/schemas/Gpsi'
      policyCounterIds:
        Type: array
        Items:
          Reference: '#/components/schemas/PolicyCounterId'
        minItems: 1
        Description: This is a list of policy counter identifier(s), which identifies
policy counters maintained per subscriber within the CHF.
      notifUri:
        Description: This attribute identifies the recipient of spending limit
notifications sent to the NF service consumer by the CHF. The notifUri shall be present
within the initial spending limit retrieval procedure (creation of a new individual
subscription). It may be present within the intermediate spending limit retrieval procedure
 (modification of an existing subscription).
        Reference: './TS29571_CommonData.yaml#/components/schemas/Uri'
      supportedFeatures:
        Description: The list of supported features as described in subclause 5.8 shall
 be supplied by the NF service consumer in the POST request that request the creation of a
 spending limit report resource.
        Reference: './TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
  SpendingLimitStatus:
    Type: object
    Properties:
      supi:
       Description: The Subscription Permanent Identifier (Supi) shall be present within
 the callback notify service operation (notification of the status of subscribed policy
counters).
        Reference: './TS29571_CommonData.yaml#/components/schemas/Supi'
```

```
      statusInfos:
        Type: object
        additionalProperties:
          Reference: '#/components/schemas/PolicyCounterInfo'
        minProperties: 1
        Description: Status of the requested policy counters. The key of the map is the
attribute "policyCounterId".
      supportedFeatures:
       Description: If the supportedFeatures is included in the request by the NF service
consumer, it shall be supplied in the reply of the corresponding request by the CHF.
        Reference: './TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
    Required:
      - statusInfos
  PolicyCounterInfo:
    Type: object
    Properties:
      policyCounterId:
        Reference: '#/components/schemas/PolicyCounterId'
      currentStatus:
        Type: string
       Description: Identifies the policy counter status applicable for a specific policy
counter identified by the policyCounterId. The values (e.g. valid, invalid or any other
status) are not specified. The interpretation and actions related to the defined values are
out of scope of 3GPP.
      penPolCounterStatuses:
        Type: array
        Items:
          Reference: '#/components/schemas/PendingPolicyCounterStatus'
        minItems: 1
        Description: Provides the pending policy counter status.
    Required:
      - policyCounterId
      - currentStatus
  PendingPolicyCounterStatus:
    Type: object
    Properties:
      policyCounterStatus:
        Type: string
       Description: Identifies the policy counter status applicable for a specific policy
counter identified by the policyCounterId. The values (e.g. valid, invalid or any other
status) are not specified. The interpretation and actions related to the defined values are
out of scope of 3GPP.
      activationTime:
        Description: Indicates the activation times per required policy counter.
        Reference: './TS29571_CommonData.yaml#/components/schemas/DateTime'
    Required:
      - policyCounterStatus
      - activationTime
  PolicyCounterId:
    Type: string
    Description: Identifies a policy counter.
  SubscriptionTerminationInfo:
    Type: object
    Properties:
```

```
      supi:
        Reference: './TS29571_CommonData.yaml#/components/schemas/Supi'
      termCause:
        Reference: '#/components/schemas/TerminationCause'
    Required:
      - supi
  TerminationCause:
    Type: string
    enum:
      - REMOVED_SUBSCRIBER
```

External Docs

```
Description: 3GPP TS 29.594 V15.2.0; 5G System; Spending Limit Control Service.
URL: 'http://www.3gpp.org/ftp/Specs/archive/29_series/29.594/'
```



CHAPTER 6

Nchf_SpendingLimitControl_Callbacks

- OpenAPI, on page 151
- Info, on page 151
- Servers, on page 151
- Security, on page 151
- Paths, on page 152
- Components, on page 153

OpenAPI

OpenAPI Version: 3.0.0

Info

```
Description: Spending Limit Control Service API Callbacks
Version: "1.0.0"
Title: Nchf_SpendingLimitControl Callbacks
```

Servers

```
URL: 'http://{apiRoot}/'
Variables:
  API Root:
    Default: https://example.com
    Description: apiRoot as defined in subclause subclause 4.4 of 3GPP TS 29.501
```

Security

```
- {}
```

```
- oAuth2ClientCredentials:
  - nchf-spendinglimitcontrol
```

Paths

/npcf/callbacks/nchf-spendinglimitcontrol/v1/subscriptions/{subscriptionId}/notify

```
  Method: Post

    Parameters:
    - in: path
      name: subscriptionId
      Description: Identifies an individual spending limit retrieval subscription.
      Required/Optional: true
      Schema:
        Type: string
    Request Body:
      Required/Optional: true
      Content:
        Application/JSON:
          Schema:
            Reference:
'./TS29594_Nchf_SpendingLimitControl.yaml#/components/schemas/SpendingLimitStatus'

    Responses:
      '204':
        Description: No Content, Notification was succesfull
      '400':
        Reference: './TS29571_CommonData.yaml#/components/responses/400'
      '401':
        Reference: './TS29571_CommonData.yaml#/components/responses/401'
      '403':
        Reference: './TS29571_CommonData.yaml#/components/responses/403'
      '404':
        Reference: './TS29571_CommonData.yaml#/components/responses/404'
      '411':
        Reference: './TS29571_CommonData.yaml#/components/responses/411'
      '413':
        Reference: './TS29571_CommonData.yaml#/components/responses/413'
      '415':
        Reference: './TS29571_CommonData.yaml#/components/responses/415'
      '429':
        Reference: './TS29571_CommonData.yaml#/components/responses/429'
      '500':
        Reference: './TS29571_CommonData.yaml#/components/responses/500'
      '503':
        Reference: './TS29571_CommonData.yaml#/components/responses/503'
      Default:
        Reference: './TS29571_CommonData.yaml#/components/responses/default'
```

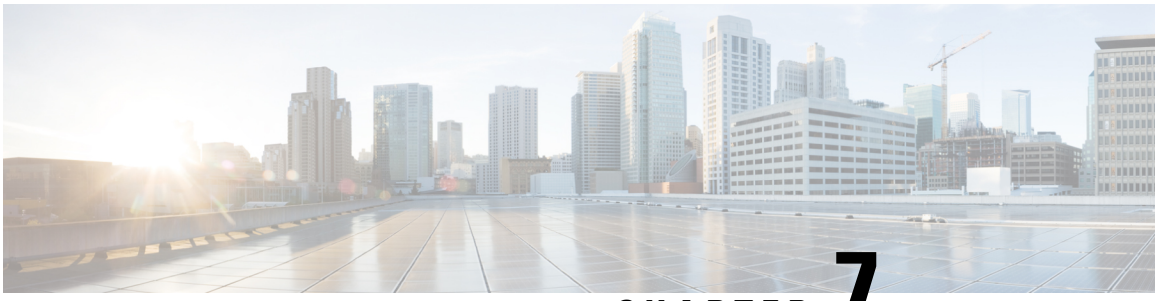
/npcf/callbacks/nchf-spendinglimitcontrol/v1/subscriptions/{subscriptionId}/termi

```
  Method: Post

    Parameters:
    - in: path
      name: subscriptionId
      Description: Identifies an individual spending limit retrieval subscription.
      Required/Optional: true
      Schema:
        Type: string
    Request Body:
      Required/Optional: true
      Content:
        Application/JSON:
          Schema:
            Reference:
'./TS29594_Nchf_SpendingLimitControl.yaml#/components/schemas/SubscriptionTerminationInfo'

    Responses:
      '204':
        Description: No Content, Notification was succesfull
      '400':
        Reference: './TS29571_CommonData.yaml#/components/responses/400'
      '401':
        Reference: './TS29571_CommonData.yaml#/components/responses/401'
      '403':
        Reference: './TS29571_CommonData.yaml#/components/responses/403'
      '404':
        Reference: './TS29571_CommonData.yaml#/components/responses/404'
      '411':
        Reference: './TS29571_CommonData.yaml#/components/responses/411'
      '413':
        Reference: './TS29571_CommonData.yaml#/components/responses/413'
      '415':
        Reference: './TS29571_CommonData.yaml#/components/responses/415'
      '429':
        Reference: './TS29571_CommonData.yaml#/components/responses/429'
      '500':
        Reference: './TS29571_CommonData.yaml#/components/responses/500'
      '503':
        Reference: './TS29571_CommonData.yaml#/components/responses/503'
      Default:
        Reference: './TS29571_CommonData.yaml#/components/responses/default'
```

Components

```
securitySchemes:
  oAuth2ClientCredentials:
```

```
Type: oauth2
Flows:
  clientCredentials:
    tokenUrl: '{nrfApiRoot}/oauth2/token'
    scopes:
      nchf-spendinglimitcontrol: Access to the Nchf_SpendingLimitControl API
```



CHAPTER 7

Requests, Responses and Schemas

- ChangeCredentialUsernameRequest, on page 155
- CreateSubscriberRequest, on page 155
- DeleteSubscriberRequest, on page 156
- GetSubscriberRequest, on page 157

ChangeCredentialUsernameRequest

This API changes the networkId (username) for a subscriber's credential..

Schema

```
<ChangeCredentialUsernameRequest>
   <audit> AuditType </audit> [0..1] ?
   <networkId> xsd:string </networkId> [1] ?
   <oldNetworkId> xsd:string </oldNetworkId> [1]
</ChangeCredentialUsernameRequest>
```

Example

```
<se:Envelope xmlns:se="http://schemas.xmlsoap.org/soap/envelope/">
  <se:Body>
    <ChangeCredentialUsernameRequest xmlns="http://broadhop.com/unifiedapi/soap/types">
      <audit>
        <id>username</id>
        <comment>comment</comment>
      </audit>
      <networkId>newUniqueIdentifier</networkId>
      <oldNetworkId>uniqueIdentifier</oldNetworkId>
    </ChangeCredentialUsernameRequest>
  </se:Body>
</se:Envelope>
```

CreateSubscriberRequest

This API creates a subscriber in the USuM database. It also allows provisioning initial quota/balance using the CreateBalance element.

Schema

```
<CreateSubscriberRequest>
   <audit> AuditType </audit> [0..1] ?
   <subscriber> SubscriberType </subscriber> [1]
</CreateSubscriberRequest>
```

Example

Minimun Required Fields

```
<se:Envelope xmlns:se="http://schemas.xmlsoap.org/soap/envelope/">
  <se:Body>
    <CreateSubscriberRequest xmlns="http://broadhop.com/unifiedapi/soap/types">
      <audit>
        <id>username</id>
        <comment>comment</comment>
      </audit>
      <subscriber>
        <credential>
          <networkId>uniqueIdentifier</networkId>
          <password>password</password>
        </credential>
        <status>ACTIVE</status>
      </subscriber>
    </CreateSubscriberRequest>
  </se:Body>
</se:Envelope>
```

DeleteSubscriberRequest

This API deletes a subscriber from the USuM database.

Schema

```
<DeleteSubscriberRequest>
   <audit> AuditType </audit> [0..1] ?
   <networkId> xsd:string </networkId> [1] ?
   <hardDelete> xsd:boolean </hardDelete> [0..1] ?
</DeleteSubscriberRequest>
```

Example

```
<se:Envelope xmlns:se="http://schemas.xmlsoap.org/soap/envelope/">
  <se:Body>
    <DeleteSubscriberRequest xmlns="http://broadhop.com/unifiedapi/soap/types">
      <audit>
        <id>username</id>
        <comment>comment</comment>
      </audit>
      <networkId>uniqueIdentifier</networkId>
      <hardDelete>false</hardDelete>
    </DeleteSubscriberRequest>
  </se:Body>
</se:Envelope>
```

GetSubscriberRequest

This API retrieves a subscriber from the USuM database.

Note Success Response

The GetSubscriber API returns error code 0 (success) even if no subscriber is found.

Schema

```
<GetSubscriberRequest>
   <audit> AuditType </audit> [0..1] ?
   <networkId> xsd:string </networkId> [1] ?
   <returnSessions> xsd:boolean </returnSessions> [0..1] ?
   <returnBalances> xsd:boolean </returnBalances> [0..1] ?
   <includeExpiredData> xsd:boolean </includeExpiredData> [0..1] ?
   <excludeReservationsFromCreditTotal> xsd:boolean </excludeReservationsFromCreditTotal>
[0..1] ?
</GetSubscriberRequest>
```

Example

```
<se:Envelope xmlns:se="http://schemas.xmlsoap.org/soap/envelope/">
  <se:Body>
    <GetSubscriberRequest xmlns="http://broadhop.com/unifiedapi/soap/types">
      <audit>
        <id>username</id>
        <comment>comment</comment>
      </audit>
      <networkId>uniqueIdentifier</networkId>
      <returnSessions>false</returnSessions>
      <returnBalances>true</returnBalances>
      <includeExpiredData>false</includeExpiredData>
      <excludeReservationsFromCreditTotal>true</excludeReservationsFromCreditTotal>
    </GetSubscriberRequest>
  </se:Body>
</se:Envelope>
```