CONC TAPI Northbound Interface API Guide

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Table of Contents

Preface *6*

Conventions *7*

Obtaining Documentation and Submitting a Service Request *8*

Introduction *9*

Overview of TAPI **9**

CONC TAPI Northbound Interface **9**

TAPI Models **9**

TAPI NBI Protocols & Operations **10**

RESTCONF Northbound Interface *11*

Overview **11**

RESTCONF standards 11

Protocol & Security 11

RESTCONF Protocol Operations 11

TAPI Retrieval Operations **13**

Common Context: Context Retrieval 13

Common Context: Service Interface Point Discovery 15

Common Context: Service Interface Point Retrieval 16

Topology Context: Context Retrieval 18

Topology Context: Topology Discovery 19

Topology Context: Topology Retrieval 21

Topology Context: Node Retrieval 22

Topology Context: Node Edge Point Retrieval 24

Topology Context: CEP List Retrieval 25

Topology Context: CEP Retrieval 27

Topology Context: Link Retrieval 28

Connectivity Context: Context Retrieval 30

Connectivity Context: Connectivity Services Discovery 31

Connectivity Context: Connectivity Service Retrieval 33

Connectivity Context: Connectivity Services Retrieval 34

Connectivity Context: Connectivity Service Connections Discovery 36

Connectivity Context: Connection Retrieval 37

Physical Context: Context Retrieval 38

Physical Context: Device Discovery 40

Physical Context: Device Retrieval 41

Physical Context: Equipment Retrieval 43

Physical Context: Access Port Retrieval 44

Physical Context: Physical Span Discovery 45

Physical Context: Physical Span Retrieval 47

TAPI Provisioning Operations 48
Connectivity Context: Connectivity Service Creation 48
Connectivity Context: Connectivity Service Name Update 50
Connectivity Context: Connectivity Service Deletion 51

TAPI Notifications 53
Overview 53
Notification Subscription 53
Create Notifications 53
Update Notifications 53
Delete Notifications 54

NETCONF Northbound Interface 54

Overview 54
NETCONF standard 55
Protocol & Security 55
NETCONF Protocol Operations 55
NETCONF Capabilities 56

TAPI Retrieval Operations 57
Common Context: Context Retrieval 57
Common Context: Service Interface Point Discovery 57
Common Context: Service Interface Point Retrieval 58
Topology Context: Context Retrieval 59
Topology Context: Topology Discovery 59
Topology Context: Topology Retrieval 60
Topology Context: Node Retrieval 61
Topology Context: Node Edge Point Retrieval 62
Topology Context: CEP List Retrieval 63
Topology Context: CEP Retrieval 64
Topology Context: Link Retrieval 65
Connectivity Context: Context Retrieval 66
Connectivity Context: Connectivity Services Discovery 66
Connectivity Context: Connectivity Service Retrieval 67
Connectivity Context: Connectivity Services Retrieval 68
Connectivity Context: Connectivity Service Connections Discovery 68
Connectivity Context: Connection Retrieval 69
Physical Context: Context Retrieval 70
Physical Context: Device Discovery 71
Physical Context: Device Retrieval 71
Physical Context: Equipment Retrieval 72
Physical Context: Access Port Retrieval 73
Physical Context: Physical Span Discovery 74
Physical Context: Physical Span Retrieval 74

TAPI Provisioning Operations 75

Connectivity Context: Connectivity Service Creation 75
Connectivity Context: Connectivity Service Name Update 76
Connectivity Context: Connectivity Service Deletion 77

TAPI Notifications 77

Overview 77
Notification Subscription 78
Create Notifications 78
Update Notifications 78
Delete Notifications 79

Preface

This guide provides information about the APIs exposed by Transport API (T-API/TAPI) Northbound Interface supported by Cisco Optical Network Controller.

Conventions

This document uses the following conventions.

Convention	Indication
bold font	Commands and keywords and user-entered text appear in bold font.
italic font	Document titles, new or emphasized terms, and arguments for which you supply values are in *italic* font.
[ ]	Elements in square brackets are optional.
{x | y | z }	Required alternative keywords are grouped in braces and separated by vertical bars.
[x | y | z]	Optional alternative keywords are grouped in brackets and separated by vertical bars.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.
`courier font`	Terminal sessions and information the system displays appear in `courier` font.
< >	Nonprinting characters such as passwords are in angle brackets.
[ ]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

Note: Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the manual.

SAVE THESE INSTRUCTIONS

Regulatory: Provided for additional information and to comply with regulatory and customer requirements.

Obtaining Documentation and Submitting a Service Request

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Introduction

Overview of TAPI

T-API (Transport API) is a standard API developed by the Open Networking Foundation (ONF). A T-API client can be a carrier's orchestration platform or a customer 3rd party application. For transport network administered by a T-API server (for example, Transport SDN Controller), a client can do the following:

- Retrieve equipment and topology information from the network
- Manage connectivity services across the transport network domain

T-API has been designed to allow network operators to deploy SDN across a multi-layer, multi-domain, multi-vendor transport infrastructure, hence extending programmability across their networks. T-API can be leveraged to manage network resources at different levels of abstraction, by being an interface between controllers at different levels of a SDN controller hierarchy. Example of a typical deployment of T-API would be an interface between a set of network domain controllers and an upper-level network orchestrator that acts as a multi-domain or Hierarchical Controller.

CONC TAPI Northbound Interface

Cisco Optical Network Controller (CONC) which acts as an optical domain controller, exposes a standard T-API Northbound interface (NBI) towards northbound clients such as Hierarchical Controller.

The TAPI NBI exposes standard RESTCONF and NETCONF interfaces to northbound clients. Any SDN-C client such as Hierarchical Controller can communicate with CONC TAPI NBI Server (SDN-C) using any one these protocols and exchange TAPI model information.

TAPI Models

TAPI specification is based on the Open Networking Foundation's (ONF) Core Information Model (CIM) and is defined using UML. The specification is also mapped from UML to YANG modelling language.

CONC NBI supports TAPI Version 2.1.3.

The list of YANG models composing the TAPI information model can be found in the table below.

Table 1 – List of TAPI YANG models

Model	Version	Revision (mm/dd/yyyy)
tapi-common.yang	2.1.3	04/23/2020
tapi-connectivity.yang	2.1.3	06/16/2020
tapi-dsr.yang	2.1.3	04/23/2020
tapi-equipment.yang	2.1.3	04/23/2020
tapi-eth.yang	2.1.3	04/23/2020
tapi-notification.yang	2.1.3	06/16/2020
tapi-oam.yang	2.1.3	04/23/2020

tapi-odu.yang	2.1.3	04/23/2020
tapi-path-computation.yang	2.1.3	04/23/2020
tapi-photonic-media.yang	2.1.3	06/16/2020
tapi-streaming.yang	2.1.3	06/16/2020
tapi-topology.yang	2.1.3	04/23/2020
tapi-virtual-network.yang	2.1.3	06/16/2020

T-API is based on a context relationship between server and client. A Context is an abstraction that allows for logical isolation and grouping of network resource abstractions for specific purposes/applications and/or information exchange with its users/clients over an interface.

TAPI NBI Protocols & Operations

CONC TAPI NBI supports the following protocols for facilitating communication between SDN-C client and CONC TAPI NBI Server (SDN-C).

- RESTCONF
- NETCONF

TAPI is a model-driven interface. Hence it is possible to execute large number of Data APIs over RESTCONF/NETCONF interface. CONC TAPI NBI supports retrieval of configuration/operational data as per the TAPI Models supported by it. It also supports provisioning operations on specific configuration data model, and notifications for any configuration/operational data changes happening within the SDN-C.

The following table summarizes various NBI operations possible over CONC TAPI NBI. All supported operations are available on both RESTCONF and NETCONF interfaces.

Table 2 – TAPI NBI Operations overview

NBI Operation Type	Data Type	TAPI Context	TAPI Model Path	Comments
Retrieval	Configuration/ Operational	• Common Context • Topology Context • Connectivity Con-text • Physical Context	All valid model paths supported within CONC TAPI NBI	All Model Get APIs
Provisioning	Configuration	• Connectivity Con-text	/context/tapi-connectivity:connectivity-context	Connectivity Service Create, Update and Delete APIs

Notification	Configuration/ Operational	• Common Context • Topology Context • Connectivity Con-text • Physical Context	All valid model paths supported within CONC TAPI NBI	All Create, Update and Delete Model Notifications. Note: CONC TAPI NBI does not support TAPI standard notifications via notification-context. It only support NETCONF model notifications

Note: The retrieval operations listed in this document covers typical TAPI use cases. However, it is possible to execute other retrieval operations as per the various model paths supported within CONC TAPI Model.

See *CONC TAPI Northbound Interface Description Document* for description of TAPI Models supported within CONC TAPI NBI.

RESTCONF Northbound Interface

Overview

RESTCONF is a HTTP-based protocol that provides a programmatic interface for accessing data defined in YANG, using the datastore concepts defined in the Network Configuration Protocol (NETCONF).

CONC TAPI NBI supports standard RESTCONF protocol as one of its Northbound interfaces.

RESTCONF standards

CONC TAPI RESTCONF NBI is a RESTful Web Services Interface that follows the IETF specification of RESTCONF protocol for defining its interfaces. It uses the TAPI YANG data models which is defined as per the standard YANG specification. The following IETF standards are used:

- RESTCONF Protocol – RFC 8040
- YANG Specification – RFC 6020
- Hypertext Transfer Protocol HTTP 1.1 - RFCs 7230-7237

Protocol & Security

CONC TAPI RESTCONF NBI uses secure HTTP(s) protocol with TLS1.2. The TAPI server uses port 30603 for supporting RESTCONF protocol operations.

RESTCONF Protocol Operations

The RESTCONF protocol operations are described in RFC 8040. RESTCONF protocol uses HTTP methods to identify the CRUD operations requested for a particular resource.

The major RESTCONF operations supported by CONC TAPI NBI are summarized in the table below.

Table 3 – RESTCONF Operations overview

Method Type	NBI Operation Type	Description	Parameters	Positive Response	Negative Response
GET	Retrieval Notification (for subscription)	The GET method is sent by the client to retrieve data and metadata for a resource. It is supported for all resource types, except operation resources.	• A valid request URI • The *Accept* HTTP header indicating what format the returned result will be in. • Authentication HTTP Header • Query parameters (optional) – *content* (select config and/or non-config data resources) – *depth* (request limited subtree depth in the reply content) – *fields* (request a subset of the target resource contents)	200 OK - Success with response message-body	4xx status codes 5xx status codes
POST	Provisioning	The POST method is sent by the client to create a data resource or invoke an operation resource	• A valid request URI that contains a target resource • The *Content-Type* HTTP header indicating request input content encoding format • Authentication HTTP Header • Request body	201 Created	4xx status codes 5xx status codes
PUT	Provisioning	The PUT method is sent by the client to create or replace the target resource	• A valid request URI that contains a target resource • The *Content-Type* HTTP header indicating request input content encoding format • Authentication HTTP Header • Request body	204 No Content	4xx status codes 5xx status codes
DELETE	Provisioning	The DELETE method is used to delete the target resource	• A valid request URI that identifies a target resource • Authentication HTTP Header	204 No Content	4xx status codes 5xx status codes

The standard HTTP status codes and their descriptions are captured in the following table.

Status code	Description
200 OK	The request was successfully completed, and a response body is returned containing a representation of the resource.
201 Created	A resource was created, and the new resource URI is returned in the "Location" header.
204 No Content	The request was successfully completed, but no response body is returned.

400 Bad Request	The request could not be processed because it contains missing or invalid information (such as validation error on an input field, a missing required value, and so on).
401 Unauthorized	The request requires user authentication. The response includes a "WWW-Authenticate" header field for basic authentication.
403 Forbidden	Access to the resource was denied by the server, due to authorization rules.
404 Not Found	The requested resource does not exist.
405 Method Not Allowed	The HTTP method specified in the request (DELETE, GET, HEAD, PATCH, POST, PUT) is not supported for this resource.
406 Not Acceptable	The resource identified by this request is not capable of generating the requested representation, specified in the "Accept" header or in the "format" query parameter.
409 Conflict	This code is used if a request tries to create a resource that already exists.
415 Unsupported Media Type	The format of the request is not supported.
500 Internal Error	The server encountered an unexpected condition which prevented it from fulfilling the request.
501 Not Implemented	The server does not (currently) support the functionality required to fulfill the request.
503 Unavailable	The server is currently unable to handle the request due to the resource being used by someone else, or the server is temporarily overloaded.

TAPI Retrieval Operations

Common Context: Context Retrieval

GET /crosswork/onc-tapi/restconf/data/tapi-common:context HTTP/1.1

This API retrieves the entire TAPI common context from the TAPI NBI Server (SDN-C). It allows the SDN-C client to retrieve TAPI data within the SDN-C in single shot. In order to limit the amount of data retrieved, it is also possible to apply standard RESTCONF query filters such as *depth*. The below example retrieves context filtered subtree up to 3 levels:

GET /crosswork/onc-tapi/restconf/data/tapi-common:context?depth=3 HTTP/1.1

Resource	Description
context	TAPI model root object
HTTP Method	Request URI
GET	/crosswork/onc-tapi/restconf/data/tapi-common:context

Query Params		
Name	Value	Description
depth	<Number>	The level of subtree filtering required. This is optional parameter.
<Any other RESTCONF query filters>		
Headers		
Accept	application/yang-data+json, application/yang-data+xml	
Authorization	Basic Auth (Username/Password)	
Response Message		
Content-Type	application/yang-data+json, application/yang-data+xml	
Response Data	TAPI common-context – in full or filtered as per the query filter	
HTTP Status Code	200 OK - Success with response message-body 404 Not Found - Resource does not exist 400 Bad Request - Invalid request 500 Internal Error - Server Error	

Request Example:

GET /crosswork/onc-tapi/restconf/data/tapi-common:context HTTP/1.1

Host: <conc-nbi-host>

Accept: application/yang-data+json

Authorization: Basic ...

Response Example:

HTTP/1.1 200 OK

Server: <conc-nbi-host>

Content-Type: application/yang-data+json

Body:

```
{
  "tapi-common:context": {
```

```
      ......
      ......
  }
}
```

Response Data Description:

The API Response contains the TAPI common context – either in full or filtered as per the query filters - present within the CONC TAPI SDN-C. For details of the common context object, see *CONC TAPI Northbound Interface Description Document*.

Common Context: Service Interface Point Discovery

GET /crosswork/onc-tapi/restconf/data/tapi-common:context?fields=service-interface-point(uuid) HTTP/1.1

This API retrieves all Service Interface Point (SIP) UUIDs from the TAPI NBI Server (SDN-C). The retried UUIDs can be further used to recursively to retrieve the full content of each SIP object.

Resource	Description	
service-interface-point	TAPI SIP object	
HTTP Method	Request URI	
GET	/crosswork/onc-tapi/restconf/data/tapi-common:context	
Query Params		
Name	Value	Description
fields	service-interface-point(uuid)	To retrieve service-interface-point.uuid attribute.
Headers		
Accept	application/yang-data+json, application/yang-data+xml	
Authorization	Basic Auth (Username/Password)	
Response Message		
Content-Type	application/yang-data+json, application/yang-data+xml	
Response Data	List of Service Interface Point UUIDs	

HTTP Status Code	200 OK - Success with response message-body 404 Not Found - Resource does not exist 400 Bad Request - Invalid request 500 Internal Error - Server Error

Request Example:

GET /crosswork/onc-tapi/restconf/data/tapi-common:context?fields=service-interface-point(uuid) HTTP/1.1

Host: <conc-nbi-host>

Accept: application/yang-data+json

Authorization: Basic ...

Response Example:

HTTP/1.1 200 OK

Server: <conc-nbi-host>

Content-Type: application/yang-data+json

Body:

```
{
  "tapi-common:context": {
    "service-interface-point": [
      {
        "uuid": "005e5b3b-b0c9-3cb5-b902-d70759314fea"
      },
      ......
      ......
    ]
  }
}
```

Response Data Description:

The API Response contains list of all Service Interface Point UUIDs present within the CONC TAPI SDN-C. For details of the Service Interface Point UUID, see *CONC TAPI Northbound Interface Description Document*.

Common Context: Service Interface Point Retrieval

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/service-interface-point={{uuid}} HTTP/1.1

This API retrieves the full content of the Service Interface Point (SIP) object identified by the given UUID from the TAPI NBI Server (SDN-C).

Resource	Description

service-interface-point	TAPI SIP object	
HTTP Method	Request URI	
GET	/crosswork/onc-tapi/restconf/data/tapi-common:context/service-interface-point={{uuid}}	
Query Params		
Name	Value	Description
<None>		
Headers		
Accept	application/yang-data+json, application/yang-data+xml	
Authorization	Basic Auth (Username/Password)	
Response Message		
Content-Type	application/yang-data+json, application/yang-data+xml	
Response Data	Service Interface Point object	
HTTP Status Code	200 OK - Success with response message-body 404 Not Found - Resource does not exist 400 Bad Request - Invalid request 500 Internal Error - Server Error	

Request Example:

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/service-interface-point=005e5b3b-b0c9-3cb5-b902-d70759314fea HTTP/1.1

Host: <conc-nbi-host>

Accept: application/yang-data+json

Authorization: Basic ...

Response Example:

HTTP/1.1 200 OK

Server: <conc-nbi-host>

Content-Type: application/yang-data+json

Body:

```
{
  "tapi-common:service-interface-point": [
    {
      "uuid": "005e5b3b-b0c9-3cb5-b902-d70759314fea",
      ......
      ......
    }
  ]
}
```

Response Data Description:

The API Response contains the Service Interface Point object (identified by the given UUID) present within the CONC TAPI SDN-C. For details of the Service Interface Point object, see *CONC TAPI Northbound Interface Description Document*.

Topology Context: Context Retrieval

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-topology:topology-context HTTP/1.1

This API retrieves the entire TAPI Topology context from the TAPI NBI Server (SDN-C). It allows the SDN-C client to retrieve TAPI topology data within the SDN-C in single shot.

In order to limit the amount of data retrieved, it is also possible to apply standard RESTCONF query filters such as depth. The below example retrieves context filtered subtree up to 3 levels:

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-topology:topology-context?depth=3 HTTP/1.1

Resource	Description	
topology-context	TAPI Topology model root object	
HTTP Method	Request URI	
GET	/crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-topology:topology-context	
Query Params		
Name	Value	Description
depth	<Number>	The level of subtree filtering required. This is optional parameter.
<Any other standard RESTCONF query filters>		
Headers		
Accept	application/yang-data+json, application/yang-data+xml	
Authorization	Basic Auth (Username/Password)	

Response Message	
Content-Type	application/yang-data+json, application/yang-data+xml
Response Data	TAPI topology-context – in full or filtered as per the query filter
HTTP Status Code	200 OK - Success with response message-body 404 Not Found - Resource does not exist 400 Bad Request - Invalid request 500 Internal Error - Server Error

Request Example:

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-topology:topology-context HTTP/1.1

Host: <conc-nbi-host>

Accept: application/yang-data+json

Authorization: Basic ...

Response Example:

HTTP/1.1 200 OK

Server: <conc-nbi-host>

Content-Type: application/yang-data+json

Body:

```
{
  "tapi-topology:topology-context": {
    ......
    ......
  }
}
```

Response Data Description:

The API Response contains the TAPI topology-context – either in full or filtered as per the query filters - present within the CONC TAPI SDN-C. For details of the topology-context object, see “CONC TAPI Northbound Interface Description Document”.

Topology Context: Topology Discovery

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-topology:topology-context?fields=topology(uuid) HTTP/1.1

This API retrieves all Topology UUIDs from the TAPI NBI Server (SDN-C). The retried UUID can be further used to retrieve the full content of the Topology object.

Resource	Description	
topology	TAPI Topology object	
HTTP Method	Request URI	
GET	/crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-topology:topology-context	
Query Params		
Name	Value	Description
fields	topology(uuid)	To retrieve topology.uuid attribute.
Headers		
Accept	application/yang-data+json, application/yang-data+xml	
Authorization	Basic Auth (Username/Password)	
Response Message		
Content-Type	application/yang-data+json, application/yang-data+xml	
Response Data	List of Topology UUIDs	
HTTP Status Code	200 OK - Success with response message-body 404 Not Found - Resource does not exist 400 Bad Request - Invalid request 500 Internal Error - Server Error	

Request Example:

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-topology:topology-context?fields=topology(uuid) HTTP/1.1

Host: <conc-nbi-host>

Accept: application/yang-data+json

Authorization: Basic ...

Response Example:

HTTP/1.1 200 OK

Server: <conc-nbi-host>

Content-Type: application/yang-data+json

Body:

```
{
  "tapi-topology:topology-context": {
    "topology": [
      {
        "uuid": "4b1b5fac-a97f-32bc-af8a-7fd5cec82ad7"
      }
    ]
  }
}
```

Response Data Description:

The API Response contains list of Topology UUIDs present within the CONC TAPI SDN-C. For details of the Topology UUID, see *CONC TAPI Northbound Interface Description Document*.

Topology Context: Topology Retrieval

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-topology:topology-context/topology={{uuid}} HTTP/1.1

This API retrieves the full content of the Topology object identified by the given UUID from the TAPI NBI Server (SDN-C).

In order to limit the amount of data retrieved, it is also possible to apply standard RESTCONF query filters such as *depth*. The below example retrieves Topology filtered subtree up to 3 levels:

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-topology:topology-context/topology={{uuid}}?depth=3 HTTP/1.1

Resource	Description	
topology	TAPI Topology object	
HTTP Method	Request URI	
GET	/crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-topology:topology-context/topology={{uuid}}	
Query Params		
Name	Value	Description
depth	<Number>	The level of subtree filtering required. This is optional parameter.
<Any other standard RESTCONF query filters>		
Headers		
Accept	application/yang-data+json, application/yang-data+xml	
Authorization	Basic Auth (Username/Password)	
Response Message		

Content-Type	application/yang-data+json, application/yang-data+xml
Response Data	Topology object
HTTP Status Code	200 OK - Success with response message-body 404 Not Found - Resource does not exist 400 Bad Request - Invalid request 500 Internal Error - Server Error

Request Example:

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-topology:topology-context/topology=4b1b5fac-a97f-32bc-af8a-7fd5cec82ad7 HTTP/1.1

Host: <conc-nbi-host>

Accept: application/yang-data+json

Authorization: Basic ...

Response Example:

HTTP/1.1 200 OK

Server: <conc-nbi-host>

Content-Type: application/yang-data+json

Body:

```
{
  "tapi-topology:topology": [
    {
      "uuid": "4b1b5fac-a97f-32bc-af8a-7fd5cec82ad7",
      ......
      ......
    }
  ]
}
```

Response Data Description:

The API Response contains the Topology object (identified by the given UUID) present within the CONC TAPI SDN-C. For details of the Topology object, see *CONC TAPI Northbound Interface Description Document*.

Topology Context: Node Retrieval

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-topology:topology-context/topology={{uuid}}/node={{uuid}} HTTP/1.1

This API retrieves the full content of the Node object identified by the given UUID from the TAPI NBI Server (SDN-C).

Resource	Description	
node	TAPI Node object	
HTTP Method	Request URI	
GET	/crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-topology:topology-context/topology={{uuid}}/node={{uuid}}	
Query Params		
Name	Value	Description
<None>		
Headers		
Accept	application/yang-data+json, application/yang-data+xml	
Authorization	Basic Auth (Username/Password)	
Response Message		
Content-Type	application/yang-data+json, application/yang-data+xml	
Response Data	Node object	
HTTP Status Code	200 OK - Success with response message-body 404 Not Found - Resource does not exist 400 Bad Request - Invalid request 500 Internal Error - Server Error	

Request Example:

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-topology:topology-context/topology=4b1b5fac-a97f-32bc-af8a-7fd5cec82ad7/node=2bff8c78-6ed3-3efd-b3df-7388d88d62d2 HTTP/1.1

Host: <conc-nbi-host>

Accept: application/yang-data+json

Authorization: Basic ...

Response Example:

HTTP/1.1 200 OK

Server: <conc-nbi-host>

Content-Type: application/yang-data+json

Body:

```
{
  "tapi-topology:node": [
    {
      "uuid": "2bff8c78-6ed3-3efd-b3df-7388d88d62d2",
      ......
      ......
    }
  ]
}
```

Response Data Description:

The API Response contains the Node object (identified by the given UUID) present within the CONC TAPI SDN-C. For details of the Node object, see *CONC TAPI Northbound Interface Description Document*.

Topology Context: Node Edge Point Retrieval

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-topology:topology-context/topology={{uuid}}/node={{uuid}}/owned-node-edge-point={{uuid}} HTTP/1.1

This API retrieves the full content of the NEP object identified by the given UUID from the TAPI NBI Server (SDN-C).

Resource	Description	
node-edge-point	TAPI NEP object	
HTTP Method	Request URI	
GET	/crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-topology:topology-context/topology={{uuid}}/node={{uuid}}/owned-node-edge-point={{uuid}}	
Query Params		
Name	Value	Description
<None>		
Headers		
Accept	application/yang-data+json, application/yang-data+xml	
Authorization	Basic Auth (Username/Password)	
Response Message		
Content-Type	application/yang-data+json, application/yang-data+xml	
Response Data	NEP object	

HTTP Status Code	200 OK - Success with response message-body 404 Not Found - Resource does not exist 400 Bad Request - Invalid request 500 Internal Error - Server Error

Request Example:

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-topology:topology-context/topology=4b1b5fac-a97f-32bc-af8a-7fd5cec82ad7/node=2bff8c78-6ed3-3efd-b3df-7388d88d62d2/owned-node-edge-point=026e92c8-1b2f-37c9-a8f0-768b5d2f5696 HTTP/1.1

Host: <conc-nbi-host>

Accept: application/yang-data+json

Authorization: Basic ...

Response Example:

HTTP/1.1 200 OK

Server: <conc-nbi-host>

Content-Type: application/yang-data+json

Body:

```
{
  "tapi-topology:owned-node-edge-point": [
    {
      "uuid": "026e92c8-1b2f-37c9-a8f0-768b5d2f5696",
      ......
      ......
    }
  ]
}
```

Response Data Description:

The API Response contains the NEP object (identified by the given UUID) present within the CONC TAPI SDN-C. For details of the NEP object, see *CONC TAPI Northbound Interface Description Document*.

Topology Context: CEP List Retrieval

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-topology:topology-context/topology={{uuid}}/node={{uuid}}/owned-node-edge-point={{uuid}}/tapi-connectivity:cep-list HTTP/1.1

This API retrieves the List of CEP objects contained within a NEP object identified by the given UUID from the TAPI NBI Server (SDN-C).

Resource	Description
node-edge-point	TAPI NEP object

HTTP Method	Request URI	
GET	/crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-topology:topology-context/topology={{uuid}}/node={{uuid}}/owned-node-edge-point={{uuid}}/tapi-connectivity:cep-list	
Query Params		
Name	Value	Description
<None>		
Headers		
Accept	application/yang-data+json, application/yang-data+xml	
Authorization	Basic Auth (Username/Password)	
Response Message		
Content-Type	application/yang-data+json, application/yang-data+xml	
Response Data	List of CEP objects	
HTTP Status Code	200 OK - Success with response message-body 404 Not Found - Resource does not exist 400 Bad Request - Invalid request 500 Internal Error - Server Error	

Request Example:

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-topology:topology-context/topology=4b1b5fac-a97f-32bc-af8a-7fd5cec82ad7/node=2bff8c78-6ed3-3efd-b3df-7388d88d62d2/owned-node-edge-point=026e92c8-1b2f-37c9-a8f0-768b5d2f5696/tapi-connectivity:cep-list HTTP/1.1

Host: <conc-nbi-host>

Accept: application/yang-data+json

Authorization: Basic ...

Response Example:

HTTP/1.1 200 OK

Server: <conc-nbi-host>

Content-Type: application/yang-data+json

Body:

```
{
  "tapi-connectivity:cep-list": {
    "connection-end-point": [
      {
        "uuid": "d1a22e55-b856-30de-9315-5f0b5f8280d4",
        ......
        ......
      },
      ......
      ......
    ]
  }
}
```

Response Data Description:

The API Response contains the List of CEP objects contained within a NEP object (identified by the given UUID) present within the CONC TAPI SDN-C. For details of the NEP object, see *CONC TAPI Northbound Interface Description Document*.

Topology Context: CEP Retrieval

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-topology:topology-context/topology={{uuid}}/node={{uuid}}/owned-node-edge-point={{uuid}}/tapi-connectivity:cep-list/connection-end-point={{uuid}} HTTP/1.1

This API retrieves the CEP object identified by the given UUID from the TAPI NBI Server (SDN-C).

Resource	Description	
connection-end-point	TAPI CEP object	
HTTP Method	Request URI	
GET	/crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-topology:topology-context/topology={{uuid}}/node={{uuid}}/owned-node-edge-point={{uuid}}/tapi-connectivity:cep-list/connection-end-point={{uuid}}	
Query Params		
Name	Value	Description
<None>		
Headers		
Accept	application/yang-data+json, application/yang-data+xml	
Authorization	Basic Auth (Username/Password)	
Response Message		
Content-Type	application/yang-data+json, application/yang-data+xml	

Response Data	CEP object
HTTP Status Code	200 OK - Success with response message-body 404 Not Found - Resource does not exist 400 Bad Request - Invalid request 500 Internal Error - Server Error

Request Example:

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-topology:topology-context/topology=4b1b5fac-a97f-32bc-af8a-7fd5cec82ad7/node=2bff8c78-6ed3-3efd-b3df-7388d88d62d2/owned-node-edge-point=026e92c8-1b2f-37c9-a8f0-768b5d2f5696/tapi-connectivity:cep-list/connection-end-point=d1a22e55-b856-30de-9315-5f0b5f8280d4 HTTP/1.1

Host: <conc-nbi-host>

Accept: application/yang-data+json

Authorization: Basic ...

Response Example:

HTTP/1.1 200 OK

Server: <conc-nbi-host>

Content-Type: application/yang-data+json

Body:

```
{
  "tapi-connectivity:connection-end-point": [
    {
      "uuid": "d1a22e55-b856-30de-9315-5f0b5f8280d4",
      ......
      ......
    }
  ]
}
```

Response Data Description:

The API Response contains CEP object (identified by the given UUID) present within the CONC TAPI SDN-C. For details of the NEP object, see *CONC TAPI Northbound Interface Description Document*.

Topology Context: Link Retrieval

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-topology:topology-context/topology={{uuid}}/link={{uuid}} HTTP/1.1

This API retrieves the full content of the Link object identified by the given UUID from the TAPI NBI Server (SDN-C).

Resource	Description

node	TAPI Link object	
HTTP Method	Request URI	
GET	/crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-topology:topology-context/topology={{uuid}}/link={{uuid}}	
Query Params		
Name	Value	Description
<None>		
Headers		
Accept	application/yang-data+json, application/yang-data+xml	
Authorization	Basic Auth (Username/Password)	
Response Message		
Content-Type	application/yang-data+json, application/yang-data+xml	
Response Data	Link object	
HTTP Status Code	200 OK - Success with response message-body 404 Not Found - Resource does not exist 400 Bad Request - Invalid request 500 Internal Error - Server Error	

Request Example:

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-topology:topology-context/topology=4b1b5fac-a97f-32bc-af8a-7fd5cec82ad7/link=0a040b5b-5787-4e13-8285-6397984740ab HTTP/1.1

Host: <conc-nbi-host>

Accept: application/yang-data+json

Authorization: Basic ...

Response Example:

HTTP/1.1 200 OK

Server: <conc-nbi-host>

Content-Type: application/yang-data+json

Body:

{

```
  "tapi-topology:link": [
    {
      "uuid": "0a040b5b-5787-4e13-8285-6397984740ab",
      ......
      ......
    }
  ]
}
```

Response Data Description:

The API Response contains the Link object (identified by the given UUID) present within the CONC TAPI SDN-C. For details of the Node object, see *CONC TAPI Northbound Interface Description Document*.

Connectivity Context: Context Retrieval

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-connectivity:connectivity-context HTTP/1.1

This API retrieves the entire TAPI Connectivity context from TAPI NBI Server (SDN-C). It allows the SDN-C client to retrieve TAPI connectivity data within the SDN-C in a single request.

Resource	Description	
connectivity-context	TAPI Connectivity model root object	
HTTP Method	Request URI	
GET	/crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-connectivity:connectivity-context	
Query Params		
Name	Value	Description
<Any standard RESTCONF query filters>		
Headers		
Accept	application/yang-data+json, application/yang-data+xml	
Authorization	Basic Auth (Username/Password)	
Response Message		
Content-Type	application/yang-data+json, application/yang-data+xml	
Response Data	TAPI connectivity-context	
HTTP Status Code	200 OK - Success with response message-body 404 Not Found - Resource does not exist 400 Bad Request - Invalid request 500 Internal Error - Server Error	

Request Example:

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-connectivity:connectivity-context HTTP/1.1

Host: <conc-nbi-host>

Accept: application/yang-data+json

Authorization: Basic ...

Response Example:

HTTP/1.1 200 OK

Server: <conc-nbi-host>

Content-Type: application/yang-data+json

Body:

```
{
  "tapi-connectivity:connectivity-context": {
    ......
    ......
  }
}
```

Response Data Description:

The API Response contains the TAPI connectivity-context present within the CONC TAPI SDN-C. For details of the connectivity-context object, see *CONC TAPI Northbound Interface Description Document*.

Connectivity Context: Connectivity Services Discovery

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-connectivity:connectivity-context?fields=connectivity-service(uuid) HTTP/1.1

This API retrieves all Connectivity Service UUIDs from TAPI NBI Server (SDN-C). The retried UUIDs can be further used to recursively retrieve the full content of each Connectivity Service object.

Resource	Description	
connectivity-context	TAPI Connectivity model root object	
HTTP Method	Request URI	
GET	/crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-connectivity:connectivity-context	
Query Params		
Name	Value	Description

fields	connectivity-service(uuid)	To retrieve connectivity-service.uuid attribute.
Headers		
Accept	application/yang-data+json, application/yang-data+xml	
Authorization	Basic Auth (Username/Password)	
Response Message		
Content-Type	application/yang-data+json, application/yang-data+xml	
Response Data	List of Connectivity Service UUIDs	
HTTP Status Code	200 OK - Success with response message-body 404 Not Found - Resource does not exist 400 Bad Request - Invalid request 500 Internal Error - Server Error	

Request Example:

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-connectivity:connectivity-context?fields=connectivity-service(uuid) HTTP/1.1

Host: <conc-nbi-host>

Accept: application/yang-data+json

Authorization: Basic ...

Response Example:

HTTP/1.1 200 OK

Server: <conc-nbi-host>

Content-Type: application/yang-data+json

Body:

```
{
  "tapi-connectivity:connectivity-context": {
    "connectivity-service": [
      {
        "uuid": "9e17c6b7-ee37-34d7-ad10-b1a518e4e63f"
      },
      ......
      ......
    ]
  }
}
```

Response Data Description:

The API Response contains a list of Connectivity Service UUIDs present within the CONC TAPI SDN-C. For details of the Connectivity Service UUID, see *CONC TAPI Northbound Interface Description Document*.

Connectivity Context: Connectivity Service Retrieval

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-connectivity:connectivity-context/connectivity-service={{uuid}} HTTP/1.1

This API retrieves the full content of Connectivity Service object identified by the given UUID from the TAPI NBI Server (SDN-C).

Resource	Description	
connectivity-service	TAPI Connectivity Service object	
HTTP Method	Request URI	
GET	/crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-connectivity:connectivity-context/connectivity-service={{uuid}}	
Query Params		
Name	Value	Description
<None>		
Headers		
Accept	application/yang-data+json, application/yang-data+xml	
Authorization	Basic Auth (Username/Password)	
Response Message		
Content-Type	application/yang-data+json, application/yang-data+xml	
Response Data	Connectivity Service object	
HTTP Status Code	200 OK - Success with response message-body 404 Not Found - Resource does not exist 400 Bad Request - Invalid request 500 Internal Error - Server Error	

Request Example:

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-connectivity:connectivity-context/connectivity-service=9e17c6b7-ee37-34d7-ad10-b1a518e4e63f HTTP/1.1

Host: <conc-nbi-host>

Accept: application/yang-data+json

Authorization: Basic ...

Response Example:

HTTP/1.1 200 OK

Server: <conc-nbi-host>

Content-Type: application/yang-data+json

Body:

```
{
  "tapi-connectivity:connectivity-service": [
    {
      "uuid": "9e17c6b7-ee37-34d7-ad10-b1a518e4e63f",
      ......
      ......
    }
  ]
}
```

Response Data Description:

The API Response contains the Connectivity Service object (identified by given UUID) present within the CONC TAPI SDN-C. For details of the Connectivity Service object, see *CONC TAPI Northbound Interface Description Document*.

Connectivity Context: Connectivity Services Retrieval

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-connectivity:connectivity-context/connectivity-service HTTP/1.1

This API retrieves list of Connectivity Service objects from the TAPI NBI Server (SDN-C).

Resource	Description	
connectivity-service	TAPI Connectivity Service object	
HTTP Method	Request URI	
GET	/crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-connectivity:connectivity-context/connectivity-service	
Query Params		
Name	Value	Description
<None>		
Headers		

Accept	application/yang-data+json, application/yang-data+xml
Authorization	Basic Auth (Username/Password)
Response Message	
Content-Type	application/yang-data+json, application/yang-data+xml
Response Data	List of Connectivity Service objects
HTTP Status Code	200 OK - Success with response message-body 404 Not Found - Resource does not exist 400 Bad Request - Invalid request 500 Internal Error - Server Error

Request Example:

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-connectivity:connectivity-context/connectivity-service HTTP/1.1

Host: <conc-nbi-host>

Accept: application/yang-data+json

Authorization: Basic ...

Response Example:

HTTP/1.1 200 OK

Server: <conc-nbi-host>

Content-Type: application/yang-data+json

Body:

```
{
  "tapi-connectivity:connectivity-service": [
    {
      "uuid": "9e17c6b7-ee37-34d7-ad10-b1a518e4e63f",
      ......
      ......
    },
    ......
    ......
  ]
}
```

Response Data Description:

The API Response contains list of Connectivity Service objects present within the CONC TAPI SDN-C. For details of the Connectivity Service object, see *CONC TAPI Northbound Interface Description Document*.

Connectivity Context: Connectivity Service Connections Discovery

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-connectivity:connectivity-context/connectivity-service={{uuid}}/connection HTTP/1.1

This API retrieves the Connection references associated with the Connectivity Service object identified by the given UUID from the TAPI NBI Server (SDN-C). The retrieved UUIDs can be further used to recursively retrieve the full content of each Connection object.

Resource	Description	
connectivity-service	TAPI Connectivity Service object	
HTTP Method	Request URI	
GET	/crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-connectivity:connectivity-context/ connectivity-service={{uuid}}/connection	
Query Params		
Name	Value	Description
<None>		
Headers		
Accept	application/yang-data+json, application/yang-data+xml	
Authorization	Basic Auth (Username/Password)	
Response Message		
Content-Type	application/yang-data+json, application/yang-data+xml	
Response Data	List of Connection UUID references	
HTTP Status Code	200 OK - Success with response message-body 404 Not Found - Resource does not exist 400 Bad Request - Invalid request 500 Internal Error - Server Error	

Request Example:

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-connectivity:connectivity-context/connectivity-service=9e17c6b7-ee37-34d7-ad10-b1a518e4e63f/connection HTTP/1.1

Host: <conc-nbi-host>

Accept: application/yang-data+json

Authorization: Basic ...

Response Example:

HTTP/1.1 200 OK

Server: <conc-nbi-host>

Content-Type: application/yang-data+json

Body:

```
{
  "tapi-connectivity:connection": [
    {
      "connection-uuid": "efc5e438-a021-3974-a356-3a426dc0ffa7"
    },
    ......
    ......
  ]
}
```

Response Data Description:

The API Response contains list of Connection UUID references of the Connectivity Service object (identified by the given UUID) present within the CONC TAPI SDN-C. For details of the Connection UUID reference, see *CONC TAPI Northbound Interface Description Document*.

Connectivity Context: Connection Retrieval

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-connectivity:connectivity-context/connection={{uuid}} HTTP/1.1

This API retrieves the full content of Connection object identified by the given UUID from the TAPI NBI Server (SDN-C).

Resource	Description	
connection	TAPI Connection object	
HTTP Method	Request URI	
GET	/crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-connectivity:connectivity-context/connection={{uuid}}	
Query Params		
Name	Value	Description
<None>		
Headers		
Accept	application/yang-data+json, application/yang-data+xml	
Authorization	Basic Auth (Username/Password)	

Response Message	
Content-Type	application/yang-data+json, application/yang-data+xml
Response Data	Connection object
HTTP Status Code	200 OK - Success with response message-body 404 Not Found - Resource does not exist 400 Bad Request - Invalid request 500 Internal Error - Server Error

Request Example:

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-connectivity:connectivity-context/connection=efc5e438-a021-3974-a356-3a426dc0ffa7 HTTP/1.1

Host: <conc-nbi-host>

Accept: application/yang-data+json

Authorization: Basic ...

Response Example:

HTTP/1.1 200 OK

Server: <conc-nbi-host>

Content-Type: application/yang-data+json

Body:

```
{
  "tapi-connectivity:connection": [
    {
      "uuid": "efc5e438-a021-3974-a356-3a426dc0ffa7",
      ......
      ......
    }
  ]
}
```

Response Data Description:

The API Response contains the Connection object (identified by the given UUID) present within the CONC TAPI SDN-C. For details of the Connectivity Service object, see *CONC TAPI Northbound Interface Description Document*.

Physical Context: Context Retrieval

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-equipment:physical-context HTTP/1.1

This API retrieves the entire TAPI Physical context from TAPI NBI Server (SDN-C). It allows the SDN-C client to retrieve TAPI equipment data within the SDN-C in single request.

Resource	Description	
physical-context	TAPI Equipment model root object	
HTTP Method	Request URI	
GET	/crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-equipment:physical-context	
Query Params		
Name	Value	Description
<Any standard RESTCONF query filters>		
Headers		
Accept	application/yang-data+json, application/yang-data+xml	
Authorization	Basic Auth (Username/Password)	
Response Message		
Content-Type	application/yang-data+json, application/yang-data+xml	
Response Data	TAPI physical-context	
HTTP Status Code	200 OK - Success with response message-body 404 Not Found - Resource does not exist 400 Bad Request - Invalid request 500 Internal Error - Server Error	

Request Example:

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-equipment:physical-context HTTP/1.1

Host: <conc-nbi-host>

Accept: application/yang-data+json

Authorization: Basic ...

Response Example:

HTTP/1.1 200 OK

Server: <conc-nbi-host>

Content-Type: application/yang-data+json

Body:

```
{
  "tapi-equipment:physical-context": {
    ......
```

```
    ......
  }
}
```

Response Data Description:

The API Response contains the TAPI physical-context present within the CONC TAPI SDN-C. For details of the physical-context object, see *CONC TAPI Northbound Interface Description Document*.

Physical Context: Device Discovery

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-equipment:physical-context?fields=device(uuid) HTTP/1.1

This API retrieves all Device UUIDs from the TAPI NBI Server (SDN-C). The retried UUIDs can be further used to recursively retrieve the full content of each device object.

Resource	Description	
physical-context	TAPI Equipment model root object	
HTTP Method	Request URI	
GET	/crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-equipment:physical-context	
Query Params		
Name	Value	Description
fields	device(uuid)	To retrieve device.uuid attribute.
Headers		
Accept	application/yang-data+json, application/yang-data+xml	
Authorization	Basic Auth (Username/Password)	
Response Message		
Content-Type	application/yang-data+json, application/yang-data+xml	
Response Data	List of Device UUIDs	
HTTP Status Code	200 OK - Success with response message-body 404 Not Found - Resource does not exist 400 Bad Request - Invalid request 500 Internal Error - Server Error	

Request Example:

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-equipment:physical-context?fields=device(uuid) HTTP/1.1

Host: <conc-nbi-host>

Accept: application/yang-data+json

Authorization: Basic ...

Response Example:

HTTP/1.1 200 OK

Server: <conc-nbi-host>

Content-Type: application/yang-data+json

Body:

```
{
  "tapi-equipment:physical-context": {
    "device": [
      {
        "uuid": "642e71f1-9929-3601-b28a-1c949fe72be5"
      },
      ......
      ......
    ]
  }
}
```

Response Data Description:

The API Response contains list of Device UUIDs present within the CONC TAPI SDN-C. For details of the Device UUID, see *CONC TAPI Northbound Interface Description Document*.

Physical Context: Device Retrieval

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-equipment:physical-context/device={{uuid}} HTTP/1.1

This API retrieves the full content of the Device object identified by the given UUID from TAPI NBI Server (SDN-C).

Resource	Description	
device	TAPI Device object	
HTTP Method	Request URI	
GET	/crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-equipment:physical-context/device={{uuid}}	
Query Params		
Name	Value	Description
<None>		

Headers	
Accept	application/yang-data+json, application/yang-data+xml
Authorization	Basic Auth (Username/Password)
Response Message	
Content-Type	application/yang-data+json, application/yang-data+xml
Response Data	Device object
HTTP Status Code	200 OK - Success with response message-body 404 Not Found - Resource does not exist 400 Bad Request - Invalid request 500 Internal Error - Server Error

Request Example:

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-equipment:physical-context/device=642e71f1-9929-3601-b28a-1c949fe72be5 HTTP/1.1

Host: <conc-nbi-host>

Accept: application/yang-data+json

Authorization: Basic ...

Response Example:

HTTP/1.1 200 OK

Server: <conc-nbi-host>

Content-Type: application/yang-data+json

Body:

```
{
  "tapi-equipment:device": [
    {
      "uuid": "642e71f1-9929-3601-b28a-1c949fe72be5",
      ......
      ......
    }
  ]
}
```

Response Data Description:

The API Response contains the Device object (identified by the given UUID) present within the CONC TAPI SDN-C. For details of the Node object, see *CONC TAPI Northbound Interface Description Document*.

Physical Context: Equipment Retrieval

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-equipment:physical-context/device={{uuid}}/equipment={{uuid}} HTTP/1.1

This API retrieves the full content of the Equipment object identified by the given UUID from TAPI NBI Server (SDN-C).

Resource	Description	
equipment	TAPI Equipment object	
HTTP Method	Request URI	
GET	/crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-equipment:physical-context/device={{uuid}}/equipment={{uuid}}	
Query Params		
Name	Value	Description
<None>		
Headers		
Accept	application/yang-data+json, application/yang-data+xml	
Authorization	Basic Auth (Username/Password)	
Response Message		
Content-Type	application/yang-data+json, application/yang-data+xml	
Response Data	Equipment object	
HTTP Status Code	200 OK - Success with response message-body 404 Not Found - Resource does not exist 400 Bad Request - Invalid request 500 Internal Error - Server Error	

Request Example:

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-equipment:physical-context/device=642e71f1-9929-3601-b28a-1c949fe72be5/equipment=89778acd-b5ea-3e6f-a62f-56d35f6324e7 HTTP/1.1

Host: <conc-nbi-host>

Accept: application/yang-data+json

Authorization: Basic ...

Response Example:

HTTP/1.1 200 OK

Server: <conc-nbi-host>

Content-Type: application/yang-data+json

Body:

```
{
  "tapi-equipment:equipment": [
    {
      "uuid": "89778acd-b5ea-3e6f-a62f-56d35f6324e7",
      ......
      ......
    }
  ]
}
```

Response Data Description:

The API Response contains the Equipment object (identified by the given UUID) present within the CONC TAPI SDN-C. For details of the Equipment object, see *CONC TAPI Northbound Interface Description Document*.

Physical Context: Access Port Retrieval

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-equipment:physical-context/device={{uuid}}/access-port={{uuid}} HTTP/1.1

This API retrieves the full content of Access Port object identified by the given UUID from the TAPI NBI Server (SDN-C).

Resource	Description	
access-port	TAPI Access Port object	
HTTP Method	Request URI	
GET	/crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-equipment:physical-context/device={{uuid}}/access-port={{uuid}}	
Query Params		
Name	Value	Description
<None>		
Headers		
Accept	application/yang-data+json, application/yang-data+xml	
Authorization	Basic Auth (Username/Password)	
Response Message		
Content-Type	application/yang-data+json, application/yang-data+xml	

Response Data	Access Port object
HTTP Status Code	200 OK - Success with response message-body 404 Not Found - Resource does not exist 400 Bad Request - Invalid request 500 Internal Error - Server Error

Request Example:

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-equipment:physical-context/device=642e71f1-9929-3601-b28a-1c949fe72be5/access-port=4e5babd4-ffd0-3420-ac68-faf0bdc08289 HTTP/1.1

Host: <conc-nbi-host>

Accept: application/yang-data+json

Authorization: Basic ...

Response Example:

HTTP/1.1 200 OK

Server: <conc-nbi-host>

Content-Type: application/yang-data+json

Body:

```
{
  "tapi-equipment:access-port": [
    {
      "uuid": "4e5babd4-ffd0-3420-ac68-faf0bdc08289",
      ......
      ......
    }
  ]
}
```

Response Data Description:

The API Response contains the Access Port object (identified by the given UUID) present within the CONC TAPI SDN-C. For details of the Access Port object, see *CONC TAPI Northbound Interface Description Document*.

Physical Context: Physical Span Discovery

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-equipment:physical-context?fields=physical-span(uuid) HTTP/1.1

This API retrieves all Physical Span UUIDs from the TAPI NBI Server (SDN-C). The retried UUIDs can be further used to recursively retrieve the full content of each Physical Span object.

Resource	Description
physical-context	TAPI Equipment model root object

HTTP Method	Request URI	
GET	/crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-equipment:physical-context	
Query Params		
Name	Value	Description
fields	physical-span(uuid)	To retrieve physical-span.uuid attribute.
Headers		
Accept	application/yang-data+json, application/yang-data+xml	
Authorization	Basic Auth (Username/Password)	
Response Message		
Content-Type	application/yang-data+json, application/yang-data+xml	
Response Data	List of Physical Span UUIDs	
HTTP Status Code	200 OK - Success with response message-body 404 Not Found - Resource does not exist 400 Bad Request - Invalid request 500 Internal Error - Server Error	

Request Example:

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-equipment:physical-context?fields=physical-span(uuid) HTTP/1.1

Host: <conc-nbi-host>

Accept: application/yang-data+json

Authorization: Basic ...

Response Example:

HTTP/1.1 200 OK

Server: <conc-nbi-host>

Content-Type: application/yang-data+json

Body:

```
{
  "tapi-equipment:physical-context": {
```

```
    "physical-span": [
      {
        "uuid": "0a040b5b-5787-4e13-8285-6397984740ab"
      },
      ......
      ......
    ]
  }
}
```

Response Data Description:

The API Response contains list of Physical Span UUIDs present within the CONC TAPI SDN-C. For details of the Device UUID, see *CONC TAPI Northbound Interface Description Document*.

Physical Context: Physical Span Retrieval

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-equipment:physical-context/physical-span={{uuid}} HTTP/1.1

This API retrieves the full content of the Physical Span object identified by the given UUID from the TAPI NBI Server (SDN-C).

Resource	Description	
physical-span	TAPI Physical Span object	
HTTP Method	Request URI	
GET	/crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-equipment:physical-context/physical-span={{uuid}}	
Query Params		
Name	Value	Description
<None>		
Headers		
Accept	application/yang-data+json, application/yang-data+xml	
Authorization	Basic Auth (Username/Password)	
Response Message		
Content-Type	application/yang-data+json, application/yang-data+xml	
Response Data	Physical Span object	

HTTP Status Code	200 OK - Success with response message-body 404 Not Found - Resource does not exist 400 Bad Request - Invalid request 500 Internal Error - Server Error

Request Example:

GET /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-equipment:physical-context/physical-span=0a040b5b-5787-4e13-8285-6397984740ab HTTP/1.1

Host: <conc-nbi-host>

Accept: application/yang-data+json

Authorization: Basic ...

Response Example:

HTTP/1.1 200 OK

Server: <conc-nbi-host>

Content-Type: application/yang-data+json

Body:

```
{
  "tapi-equipment:physical-span": [
    {
      "uuid": "0a040b5b-5787-4e13-8285-6397984740ab",
      ......
      ......
    }
  ]
}
```

Response Data Description:

The API Response contains the Physical Span object (identified by the given UUID) present within CONC TAPI SDN-C. For details of the Node object, see *CONC TAPI Northbound Interface Description Document*.

TAPI Provisioning Operations

Connectivity Context: Connectivity Service Creation

POST /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-connectivity:connectivity-context HTTP/1.1

This API provisions a TAPI connectivity-service in the TAPI NBI Server (SDN-C). Depending upon the request data, connectivity-service can be provisioned in OTSiMCA/MCA, ODU or DSR layers.

Resource	Description

connectivity-context	TAPI context for connectivity services
HTTP Method	Request URI
POST	/crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-connectivity:connectivity-context
Headers	
Content-Type	application/yang-data+json, application/yang-data+xml
Accept	application/yang-data+json, application/yang-data+xml
Authorization	Basic Auth (Username/Password)
Request Data	Connectivity Service configuration data
Response Message	
Content-Type	application/yang-data+json, application/yang-data+xml
Response Data	Empty
HTTP Status Code	201 Created - Success 400 Bad Request - Invalid request 500 Internal Error - Server Error

Request Example:

POST /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-connectivity:connectivity-context HTTP/1.1

Host: <conc-nbi-host>

Content-Type: application/yang-data+json

Accept: application/yang-data+json

Authorization: Basic ...

Body:

```
{
  "connectivity-service": {
    "uuid": "9e17c6b7-ee37-34d7-ad10-b1a518e4e63f",
    ......
    ......
  }
}
```

Response Example:

HTTP/1.1 201 Created

Server: <conc-nbi-host>

Content-Type: application/yang-data+json

Request Data Description:

The API Request takes Connectivity Service configuration data as the input. The model of connectivity-service remains the same regardless of the type of the service. However, the input configuration data required varies according to the type of service, the resiliency requirements, etc. Once the request is successfully processed, the operational data within the Connectivity Service object is filled by the SDN-C. For details of configuration and operational data within Connectivity Service object, see *CONC TAPI Northbound Interface Description Document*.

In addition to the operational data within the Connectivity Service object, new Connection object operational data is created as part of the successful service provisioning. For details of Connection object operational data, see *CONC TAPI Northbound Interface Description Document*.

Connectivity Context: Connectivity Service Name Update

PUT /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-connectivity:connectivity-context/connectivity-service={{uuid}}/name=SERVICE_NAME/value HTTP/1.1

This API updates name (value-name=SERVICE_NAME) of an already existing TAPI connectivity-service in the TAPI NBI Server (SDN-C).

Resource	Description
connectivity-service/name=SERVICE_NAME/value	TAPI connectivity service name
HTTP Method	Request URI
PUT	/crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-connectivity:connectivity-context/connectivity-service={{uuid}}/name=SERVICE_NAME/value
Headers	
Content-Type	application/yang-data+json, application/yang-data+xml
Accept	application/yang-data+json, application/yang-data+xml
Authorization	Basic Auth (Username/Password)
Request Data	Updated Name
Response Message	
Content-Type	application/yang-data+json, application/yang-data+xml
Response Data	Empty

HTTP Status Code	204 No Content - Success 400 Bad Request - Invalid request 500 Internal Error - Server Error

Request Example:

PUT /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-connectivity:connectivity-context/connectivity-service=9e17c6b7-ee37-34d7-ad10-b1a518e4e63f/name=SERVICE_NAME/value HTTP/1.1

Host: <conc-nbi-host>

Content-Type: application/yang-data+json

Accept: application/yang-data+json

Authorization: Basic ...

Body:

```
{
  "tapi-connectivity:value": "new_name"
}
```

Response Example:

HTTP/1.1 204 No Content

Server: <conc-nbi-host>

Content-Type: application/yang-data+json

Request Data Description:

The API Request takes the new name that needs to be set on the connectivity-service. For details of Connectivity Service name data, see *CONC TAPI Northbound Interface Description Document*.

Connectivity Context: Connectivity Service Deletion

DELETE /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-connectivity:connectivity-context/connectivity-service={{uuid}} HTTP/1.1

This API deletes the Connectivity Service object identified by the given UUID from TAPI NBI Server (SDN-C).

Resource	Description
connectivity-service	TAPI Connectivity Service object
HTTP Method	Request URI
DELETE	/crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-connectivity:connectivity-context/connectivity-service={{uuid}}
Query Params	

Name	Value	Description
<None>		
Headers		
Accept	application/yang-data+json, application/yang-data+xml	
Authorization	Basic Auth (Username/Password)	
Response Message		
Content-Type	application/yang-data+json, application/yang-data+xml	
Response Data	<empty>	
HTTP Status Code	204 No Content - Success 400 Bad Request - Invalid request 500 Internal Error - Server Error	

Request Example:

DELETE /crosswork/onc-tapi/restconf/data/tapi-common:context/tapi-connectivity:connectivity-context/connectivity-service=9e17c6b7-ee37-34d7-ad10-b1a518e4e63f HTTP/1.1

Host: <conc-nbi-host>

Accept: application/yang-data+json

Authorization: Basic ...

Body: <empty>

Response Example:

HTTP/1.1 204 No Content

Server: <conc-nbi-host>

Content-Type: application/yang-data+json

Request Data Description:

The API Request has no body. The URI indicates connectivity-service resource to be deleted. For details of Connectivity Service object, see *CONC TAPI Northbound Interface Description Document*.

TAPI Notifications

Overview

CONC TAPI RESTCONF NBI supports YANG-defined event notifications. It preserves aspects of NETCONF event notifications while utilizing the Server-Sent Events transport strategy.

Notifications are generated whenever any data changes such as Create, Update or Delete happens within the TAPI database. Both Configuration and Operational data changes raise Notifications.

Currently, CONC TAPI NBI does not support Notification Replay feature.

Notification Subscription

TAPI client can subscribe for Notifications over the RESTCONF interface by using the following command:

For JSON format:

curl --location --request GET 'https://<conc-nbi-host>:30603/crosswork/onc-tapi/restconf/streams/NETCONF/json' -u <username>:<password>

For XML format:

curl --location --request GET 'https://<conc-nbi-host>:30603/crosswork/onc-tapi/restconf/streams/NETCONF/xml' -u <username>:<password>

Create Notifications

Notification is generated when object is created in the TAPI CDB.

Notification Example:

```
data: {
data:   "ietf-restconf:notification": {
data:     "eventTime": "2021-05-19T14:59:49.4605+00:00",
data:     "ietf-netconf-notifications:netconf-config-change": {
data:       "changed-by": {
data:         "username": "admin",
data:         "session-id": 0,
data:         "source-host": "10.43.16.101"
data:       },
data:       "datastore": "running",
data:       "edit": [
data:         {
data:           "target": "/tapi-common:context/tapi-equipment:physical-context/tapi-
equipment:device[tapi-equipment:uuid='306b36c5-bc9c-3b3f-ad01-94e834c270fd']/tapi-
equipment:equipment[tapi-equipment:uuid='92e8b512-33e6-3e73-a795-ad903413bf76']",
data:           "operation": "create"
data:         }
data:       ]
data:     }
data:   }
data: }
```

Update Notifications

Notification is generated when object attribute is updated in the TAPI CDB.

Notification Example:

```
data: {
data:   "ietf-restconf:notification": {
data:     "eventTime": "2021-05-19T15:00:56.238614+00:00",
data:     "ietf-netconf-notifications:netconf-config-change": {
data:       "changed-by": {
data:         "username": "admin",
data:         "session-id": 0,
data:         "source-host": "10.43.16.101"
data:       },
data:       "datastore": "running",
data:       "edit": [
data:         {
data:           "target": "/tapi-common:context/tapi-connectivity:connectivity-context/tapi-
connectivity:connectivity-service[tapi-connectivity:uuid='ad818bed-25da-34b9-b98b-a8f0c56333b0']/tapi-
connectivity:lifecycle-state",
data:           "operation": "replace"
data:         }
data:       ]
data:     }
data:   }
data: }
```

Delete Notifications

Notification is generated when object is deleted from the TAPI CDB.

Notification Example:

```
data: {
data:   "ietf-restconf:notification": {
data:     "eventTime": "2021-05-19T15:00:56.68858+00:00",
data:     "ietf-netconf-notifications:netconf-config-change": {
data:       "changed-by": {
data:         "username": "admin",
data:         "session-id": 0,
data:         "source-host": "10.43.16.101"
data:       },
data:       "datastore": "running",
data:       "edit": [
data:         {
data:           "target": "/tapi-common:context/tapi-connectivity:connectivity-context/tapi-
connectivity:connection[tapi-connectivity:uuid='c6b01568-5508-3bf1-a2f5-67caf945bda4']",
data:           "operation": "delete"
data:         }
data:       ]
data:     }
data:   }
data: }
```

NETCONF Northbound Interface

Overview

NETCONF is XML-based protocol which provides mechanisms to install, manipulate, and delete network configurations. It uses a simple RPC-based mechanism to facilitate communication between a client and a server.

CONC TAPI NBI supports standard NETCONF protocol as one of its Northbound interfaces. In the context of NETCONF, the CONC TAPI server acts as a NETCONF device as defined in RFC 6241.

NETCONF standard

CONC TAPI NETCONF NBI follows the IETF specification of NETCONF protocol for defining its interfaces. It uses the TAPI YANG data models which is defined as per the standard YANG specification. The following IETF standards are mainly used:

- YANG Specification – RFC 6020
- NETCONF Protocol – RFC 6241
- NETCONF Notifications – RFC 5277

Protocol & Security

NETCONF protocol uses a secure transport layer for providing a communication path between the client and the server. It is not bound to any specific transport protocol. The transport protocol can be any protocol that fulfills a set of basic requirements as defined in RFC 6241. For example, it is required that the transport protocol supports Connection-Oriented operation and provides authentication, data integrity, confidentiality, and replay protection.

CONC TAPI NBI supports Secure Shell (SSH) [RFC4251] as the NETCONF transport protocol. The TAPI server uses port 30666 for supporting NETCONF protocol operations.

NETCONF Protocol Operations

The NETCONF protocol operations are detailed in RFC 6241. The NETCONF protocol provides a set of low-level operations to manage device configurations and retrieve device state information. It uses an RPC-based communication model. NETCONF peers use <rpc> and <rpc-reply> elements to provide transport-protocol-independent framing of NETCONF requests and responses.

The major NETCONF operations supported by CONC TAPI NBI are summarized in the following table.

Table 4 – NETCONF Operations overview

Operation Type	NBI Operation Type	Description	Parameters	Positive Response	Negative Response
<get-config>	Retrieval	Retrieves all or part of the specified configuration datastore	• source: Name of the configuration datastore from which the data being queried. • filter: This parameter identifies part of the configuration datastore to retrieve. If this parameter is not present, the entire configuration is returned.	Server sends an <rpc-reply> element containing a <data> element with the results of the query	An <rpc-error> element is included in the <rpc-reply>

<edit-config>	Provisioning	Loads all or part of a specified configuration to the specified target configuration datastore (merge, create, replace, delete etc.).	• target: Name of the configuration datastore being edited. • config: A hierarchy of configuration data as defined by one of the device's data models	Server sends an <rpc-reply> element containing a <ok> element	An <rpc-error> element is included in the <rpc-reply>
<get>	Retrieval	Retrieves running configuration and device state information	• filter: This parameter identifies part of the system configuration and state data to retrieve. If this parameter is not present, the entire configuration and state data is returned.	Server sends an <rpc-reply> element containing a <data> element with the results of the query	An <rpc-error> element is included in the <rpc-reply>
<create-subscription>	Notification (for subscription)	Subscribes for notifications	• stream: The notification stream associated with the subscription • filter: Indicates which subset of all possible events is of interest	Server sends an <rpc-reply> element containing a <ok> element Client starts receiving Notifications	An <rpc-error> element is included in the <rpc-reply>

NETCONF Capabilities

CONC TAPI NBI NETCONF Agent supports the following NETCONF capabilities:

```
"urn:ietf:params:netconf:capability:writable-running:1.0"

"urn:ietf:params:netconf:capability:rollback-on-error:1.0"

"urn:ietf:params:netconf:capability:url:1.0?scheme=ftp,sftp,file"

"urn:ietf:params:netconf:capability:validate:1.0"

"urn:ietf:params:netconf:capability:validate:1.1"

"urn:ietf:params:netconf:capability:xpath:1.0"

"urn:ietf:params:netconf:capability:notification:1.0"

"urn:ietf:params:netconf:capability:partial-lock:1.0"

"urn:ietf:params:netconf:capability:with-defaults:1.0?basic-mode=explicit&also-supported=report-all-tagged,report-all"

"urn:ietf:params:netconf:capability:yang-library:1.0?revision=2019-01-04&module-set-id=115c3b3b980bdd84be33000295c37bc5"
```

```
"urn:ietf:params:netconf:capability:yang-library:1.1?revision=2019-01-04&content-
id=115c3b3b980bdd84be33000295c37bc5"
```

The *writable-running* capability indicates that the device supports direct write operations to the <running> configuration datastore. In other words, the device supports <edit-config> and <copy-config> operations where the <running> configuration is the target.

The *rollback-on-error* capability indicates that if an error condition occurs during the <edit-config> operation such that an error severity <rpc-error> element is generated, the server stops processing the <edit-config> operation and restores the specified configuration to its complete state at the start of this <edit-config> operation.

The *notification* capability indicates that the server can process and send event notifications.

TAPI Retrieval Operations

Common Context: Context Retrieval

This API retrieves the entire TAPI common context from TAPI NBI Server (SDN-C). It allows the SDN-C client to retrieve TAPI data within the SDN-C in a single request.

To limit the amount of data retrieved, it is possible to apply various filters in the request.

Request Example:

```
<nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:d2ea05dd-2f71-4605-a695-
7d657ec8168b">
  <nc:get>
    <nc:filter>
      <context xmlns="urn:onf:otcc:yang:tapi-common"/>
    </nc:filter>
  </nc:get>
</nc:rpc>
```

Response Example:

```
<?xml version="1.0" ?>
<rpc-reply message-id="urn:uuid:d2ea05dd-2f71-4605-a695-7d657ec8168b"
xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0">
  <data>
    <context xmlns="urn:onf:otcc:yang:tapi-common">
    ......
    ......
    </context>
  </data>
</rpc-reply>
```

Response Data Description:

The API Response contains the TAPI common context present within CONC TAPI SDN-C. For details of the common context object, see *CONC TAPI Northbound Interface Description Document*.

Common Context: Service Interface Point Discovery

This API retrieves all Service Interface Point (SIP) UUIDs from TAPI NBI Server (SDN-C). The retrieved UUIDs can be further used to recursively retrieve the full content of each SIP object.

Request Example:

```
<nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:33f7b475-3fed-4719-b85e-
3fb9a0535033">
  <nc:get>
    <nc:filter>
      <context xmlns="urn:onf:otcc:yang:tapi-common">
        <service-interface-point>
          <uuid/>
        </service-interface-point>
      </context>
    </nc:filter>
  </nc:get>
</nc:rpc>
```

Response Example:

```
<?xml version="1.0" ?>
<rpc-reply message-id="urn:uuid:33f7b475-3fed-4719-b85e-3fb9a0535033"
xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0">
  <data>
    <context xmlns="urn:onf:otcc:yang:tapi-common">
      <service-interface-point>
        <uuid>005e5b3b-b0c9-3cb5-b902-d70759314fea</uuid>
      </service-interface-point>
      ......
      ......
    </context>
  </data>
</rpc-reply>
```

Response Data Description:

The API Response contains a list of all Service Interface Point UUIDs present within the CONC TAPI SDN-C. For details of the Service Interface Point UUID, see *CONC TAPI Northbound Interface Description Document*.

Common Context: Service Interface Point Retrieval

This API retrieves the full content of Service Interface Point (SIP) object identified by the given UUID from TAPI NBI Server (SDN-C).

Request Example:

```
<nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:8aa635bd-7d1c-42aa-8b48-
591a98c7279e">
  <nc:get>
    <nc:filter>
      <context xmlns="urn:onf:otcc:yang:tapi-common">
        <service-interface-point>
          <uuid>005e5b3b-b0c9-3cb5-b902-d70759314fea</uuid>
        </service-interface-point>
      </context>
    </nc:filter>
  </nc:get>
</nc:rpc>
```

Response Example:

```
<?xml version="1.0" ?>
<rpc-reply message-id="urn:uuid:8aa635bd-7d1c-42aa-8b48-591a98c7279e"
xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0">
  <data>
    <context xmlns="urn:onf:otcc:yang:tapi-common">
```

```
      <service-interface-point>
        <uuid>005e5b3b-b0c9-3cb5-b902-d70759314fea</uuid>
        ......
        ......
      </service-interface-point>
    </context>
  </data>
</rpc-reply>
```

Response Data Description:

The API Response contains the Service Interface Point object (identified by the given UUID) present within CONC TAPI SDN-C. For details of the Service Interface Point object, see *CONC TAPI Northbound Interface Description Document*.

Topology Context: Context Retrieval

This API retrieves the entire TAPI Topology context from TAPI NBI Server (SDN-C). It allows the SDN-C client to retrieve TAPI topology data within SDN-C in a single request.

Different filters can be used in the request to limit the amount of data retrieved.

Request Example:

```
<nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:4761c489-230d-4297-a48e-
2d7d7dc26b57">
  <nc:get>
    <nc:filter>
      <context xmlns="urn:onf:otcc:yang:tapi-common">
        <topology-context xmlns="urn:onf:otcc:yang:tapi-topology"/>
      </context>
    </nc:filter>
  </nc:get>
</nc:rpc>
```

Response Example:

```
<?xml version="1.0" ?>
<rpc-reply message-id="urn:uuid:4761c489-230d-4297-a48e-2d7d7dc26b57"
xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0">
  <data>
    <context xmlns="urn:onf:otcc:yang:tapi-common">
      <topology-context xmlns="urn:onf:otcc:yang:tapi-topology">
      ......
      ......
      </topology-context>
    </context>
  </data>
</rpc-reply>
```

Response Data Description:

The API Response contains the TAPI topology-context present within CONC TAPI SDN-C. For details of the topology-context object, see *CONC TAPI Northbound Interface Description Document*.

Topology Context: Topology Discovery

This API retrieves all Topology UUIDs from the TAPI NBI Server (SDN-C). The retrieved UUID can be further used to retrieve the full content of the Topology object.

Request Example:

```
<nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:69e6d650-2e64-4332-8333-
30e4eaa204ba">
  <nc:get>
    <nc:filter>
      <context xmlns="urn:onf:otcc:yang:tapi-common">
        <topology-context xmlns="urn:onf:otcc:yang:tapi-topology">
          <topology>
            <uuid/>
          </topology>
        </topology-context>
      </context>
    </nc:filter>
  </nc:get>
</nc:rpc>
```

Response Example:

```
<?xml version="1.0" ?>
<rpc-reply message-id="urn:uuid:69e6d650-2e64-4332-8333-30e4eaa204ba"
xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0">
  <data>
    <context xmlns="urn:onf:otcc:yang:tapi-common">
      <topology-context xmlns="urn:onf:otcc:yang:tapi-topology">
        <topology>
          <uuid>4b1b5fac-a97f-32bc-af8a-7fd5cec82ad7</uuid>
        </topology>
      </topology-context>
    </context>
  </data>
</rpc-reply>
```

Response Data Description:

The API Response contains a list of Topology UUIDs present within the CONC TAPI SDN-C. For details of the Topology UUID, see *CONC TAPI Northbound Interface Description Document*.

Topology Context: Topology Retrieval

This API retrieves the full content of the Topology object identified by the given UUID from TAPI NBI Server (SDN-C).

Different filters can be used in the request to limit the amount of data retrieved.

Request Example:

```
<nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:d3bd576d-543b-4ddb-beec-
c44b80ffffff">
  <nc:get>
    <nc:filter>
      <context xmlns="urn:onf:otcc:yang:tapi-common">
        <topology-context xmlns="urn:onf:otcc:yang:tapi-topology">
          <topology>
            <uuid>4b1b5fac-a97f-32bc-af8a-7fd5cec82ad7</uuid>
          </topology>
        </topology-context>
      </context>
    </nc:filter>
  </nc:get>
</nc:rpc>
```

Response Example:

```
<?xml version="1.0" ?>
<rpc-reply message-id="urn:uuid:d3bd576d-543b-4ddb-beec-c44b80ffffff"
xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0">
  <data>
    <context xmlns="urn:onf:otcc:yang:tapi-common">
      <topology-context xmlns="urn:onf:otcc:yang:tapi-topology">
        <topology>
          <uuid>4b1b5fac-a97f-32bc-af8a-7fd5cec82ad7</uuid>
          ......
          ......
        </topology>
      </topology-context>
    </context>
  </data>
</rpc-reply>
```

Response Data Description:

The API Response contains Topology object (identified by the given UUID) present within the CONC TAPI SDN-C. For details of the Topology object, see *CONC TAPI Northbound Interface Description Document*.

Topology Context: Node Retrieval

This API retrieves the full content of the Node object identified by the given UUID from TAPI NBI Server (SDN-C).

Request Example:

```
<nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:8d9d03d6-a95a-49dc-8dc4-
32b91e898926">
  <nc:get>
    <nc:filter>
      <context xmlns="urn:onf:otcc:yang:tapi-common">
        <topology-context xmlns="urn:onf:otcc:yang:tapi-topology">
          <topology>
            <uuid>4b1b5fac-a97f-32bc-af8a-7fd5cec82ad7</uuid>
            <node>
              <uuid>2bff8c78-6ed3-3efd-b3df-7388d88d62d2</uuid>
            </node>
          </topology>
        </topology-context>
      </context>
    </nc:filter>
  </nc:get>
</nc:rpc>
```

Response Example:

```
<?xml version="1.0" ?>
<rpc-reply message-id="urn:uuid:8d9d03d6-a95a-49dc-8dc4-32b91e898926"
xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0">
  <data>
    <context xmlns="urn:onf:otcc:yang:tapi-common">
      <topology-context xmlns="urn:onf:otcc:yang:tapi-topology">
        <topology>
          <uuid>4b1b5fac-a97f-32bc-af8a-7fd5cec82ad7</uuid>
          <node>
            <uuid>2bff8c78-6ed3-3efd-b3df-7388d88d62d2</uuid>
            ......
            ......
          </node>
        </topology>
      </topology-context>
```

```
    </context>
  </data>
</rpc-reply>
```

Response Data Description:

The API Response contains the Node object (identified by the given UUID) present within the CONC TAPI SDN-C. For details of the Node object, see *CONC TAPI Northbound Interface Description Document*.

Topology Context: Node Edge Point Retrieval

This API retrieves the full content of NEP object identified by the given UUID from the TAPI NBI Server (SDN-C).

Request Example:

```
<nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:2ed0b279-3b99-475b-8ff5-
a95bad1e102f">
  <nc:get>
    <nc:filter>
      <context xmlns="urn:onf:otcc:yang:tapi-common">
        <topology-context xmlns="urn:onf:otcc:yang:tapi-topology">
          <topology>
            <uuid>4b1b5fac-a97f-32bc-af8a-7fd5cec82ad7</uuid>
            <node>
              <uuid>2bff8c78-6ed3-3efd-b3df-7388d88d62d2</uuid>
              <owned-node-edge-point>
                <uuid>026e92c8-1b2f-37c9-a8f0-768b5d2f5696</uuid>
              </owned-node-edge-point>
            </node>
          </topology>
        </topology-context>
      </context>
    </nc:filter>
  </nc:get>
</nc:rpc>
```

Response Example:

```
<?xml version="1.0" ?>
<rpc-reply message-id="urn:uuid:2ed0b279-3b99-475b-8ff5-a95bad1e102f"
xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0">
  <data>
    <context xmlns="urn:onf:otcc:yang:tapi-common">
      <topology-context xmlns="urn:onf:otcc:yang:tapi-topology">
        <topology>
          <uuid>4b1b5fac-a97f-32bc-af8a-7fd5cec82ad7</uuid>
          <node>
            <uuid>2bff8c78-6ed3-3efd-b3df-7388d88d62d2</uuid>
            <owned-node-edge-point>
              <uuid>026e92c8-1b2f-37c9-a8f0-768b5d2f5696</uuid>
              ......
              ......
            </owned-node-edge-point>
          </node>
        </topology>
      </topology-context>
    </context>
  </data>
</rpc-reply>
```

Response Data Description:

The API Response contains NEP object (identified by the given UUID) present within the CONC TAPI SDN-C. For details of the NEP object, see *CONC TAPI Northbound Interface Description Document*.

Topology Context: CEP List Retrieval

This API retrieves the List of CEP objects contained within an NEP object identified by the given UUID from TAPI NBI Server (SDN-C).

Request Example:

```
<nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:5b7215a7-a468-4f51-9694-
c6622d8f9ec2">
  <nc:get>
    <nc:filter>
      <context xmlns="urn:onf:otcc:yang:tapi-common">
        <topology-context xmlns="urn:onf:otcc:yang:tapi-topology">
          <topology>
            <uuid>4b1b5fac-a97f-32bc-af8a-7fd5cec82ad7</uuid>
            <node>
              <uuid>2bff8c78-6ed3-3efd-b3df-7388d88d62d2</uuid>
              <owned-node-edge-point>
                <uuid>026e92c8-1b2f-37c9-a8f0-768b5d2f5696</uuid>
                <cep-list xmlns="urn:onf:otcc:yang:tapi-connectivity"/>
              </owned-node-edge-point>
            </node>
          </topology>
        </topology-context>
      </context>
    </nc:filter>
  </nc:get>
</nc:rpc>
```

Response Example:

```
<?xml version="1.0" ?>
<rpc-reply message-id="urn:uuid:5b7215a7-a468-4f51-9694-c6622d8f9ec2"
xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0">
  <data>
    <context xmlns="urn:onf:otcc:yang:tapi-common">
      <topology-context xmlns="urn:onf:otcc:yang:tapi-topology">
        <topology>
          <uuid>4b1b5fac-a97f-32bc-af8a-7fd5cec82ad7</uuid>
          <node>
            <uuid>2bff8c78-6ed3-3efd-b3df-7388d88d62d2</uuid>
            <owned-node-edge-point>
              <uuid>026e92c8-1b2f-37c9-a8f0-768b5d2f5696</uuid>
              <cep-list xmlns="urn:onf:otcc:yang:tapi-connectivity">
                <connection-end-point>
                  <uuid>d1a22e55-b856-30de-9315-5f0b5f8280d4</uuid>
                  ......
                  ......
                </connection-end-point>
                ......
                ......
              </cep-list>
            </owned-node-edge-point>
          </node>
        </topology>
      </topology-context>
    </context>
  </data>
</rpc-reply>
```

Response Data Description:

The API Response contains a List of CEP objects contained within an NEP object (identified by the given UUID) present within the CONC TAPI SDN-C. For details of the NEP object, see *CONC TAPI Northbound Interface Description Document*.

Topology Context: CEP Retrieval

This API retrieves the CEP object identified by the given UUID from TAPI NBI Server (SDN-C).

Request Example:

```
<nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:fc5b6221-c5ef-499f-b378-
1cf167c03a39">
  <nc:get>
    <nc:filter>
      <context xmlns="urn:onf:otcc:yang:tapi-common">
        <topology-context xmlns="urn:onf:otcc:yang:tapi-topology">
          <topology>
            <uuid>4b1b5fac-a97f-32bc-af8a-7fd5cec82ad7</uuid>
            <node>
              <uuid>2bff8c78-6ed3-3efd-b3df-7388d88d62d2</uuid>
              <owned-node-edge-point>
                <uuid>026e92c8-1b2f-37c9-a8f0-768b5d2f5696</uuid>
                <cep-list xmlns="urn:onf:otcc:yang:tapi-connectivity">
                  <connection-end-point>
                    <uuid>d1a22e55-b856-30de-9315-5f0b5f8280d4</uuid>
                  </connection-end-point>
                </cep-list>
              </owned-node-edge-point>
            </node>
          </topology>
        </topology-context>
      </context>
    </nc:filter>
  </nc:get>
</nc:rpc>
```

Response Example:

```
<?xml version="1.0" ?>
<rpc-reply message-id="urn:uuid:fc5b6221-c5ef-499f-b378-1cf167c03a39"
xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0">
  <data>
    <context xmlns="urn:onf:otcc:yang:tapi-common">
      <topology-context xmlns="urn:onf:otcc:yang:tapi-topology">
        <topology>
          <uuid>4b1b5fac-a97f-32bc-af8a-7fd5cec82ad7</uuid>
          <node>
            <uuid>2bff8c78-6ed3-3efd-b3df-7388d88d62d2</uuid>
            <owned-node-edge-point>
              <uuid>026e92c8-1b2f-37c9-a8f0-768b5d2f5696</uuid>
              <cep-list xmlns="urn:onf:otcc:yang:tapi-connectivity">
                <connection-end-point>
                  <uuid>d1a22e55-b856-30de-9315-5f0b5f8280d4</uuid>
                  ......
                  ......
                </connection-end-point>
              </cep-list>
            </owned-node-edge-point>
```

```
          </node>
        </topology>
      </topology-context>
    </context>
  </data>
</rpc-reply>
```

Response Data Description:

The API Response contains CEP object (identified by the given UUID) present within the CONC TAPI SDN-C. For details of the NEP object, see *CONC TAPI Northbound Interface Description Document*.

Topology Context: Link Retrieval

This API retrieves the full content of the Link object identified by the given UUID from TAPI NBI Server (SDN-C).

Request Example:

```
<nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:e1e4d0f7-8e27-4670-a660-
cfc034e7019b">
  <nc:get>
    <nc:filter>
      <context xmlns="urn:onf:otcc:yang:tapi-common">
        <topology-context xmlns="urn:onf:otcc:yang:tapi-topology">
          <topology>
            <uuid>4b1b5fac-a97f-32bc-af8a-7fd5cec82ad7</uuid>
            <link>
              <uuid>0a040b5b-5787-4e13-8285-6397984740ab</uuid>
            </link>
          </topology>
        </topology-context>
      </context>
    </nc:filter>
  </nc:get>
</nc:rpc>
```

Response Example:

```
<?xml version="1.0" ?>
<rpc-reply message-id="urn:uuid:e1e4d0f7-8e27-4670-a660-cfc034e7019b"
xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0">
  <data>
    <context xmlns="urn:onf:otcc:yang:tapi-common">
      <topology-context xmlns="urn:onf:otcc:yang:tapi-topology">
        <topology>
          <uuid>4b1b5fac-a97f-32bc-af8a-7fd5cec82ad7</uuid>
          <link>
            <uuid>0a040b5b-5787-4e13-8285-6397984740ab</uuid>
            ......
            ......
          </link>
        </topology>
      </topology-context>
    </context>
  </data>
</rpc-reply>
```

Response Data Description:

The API Response contains the Link object (identified by the given UUID) present within CONC TAPI SDN-C. For details of the Node object, see *CONC TAPI Northbound Interface Description Document*.

Connectivity Context: Context Retrieval

This API retrieves entire TAPI Connectivity context from TAPI NBI Server (SDN-C). It allows the SDN-C client to retrieve TAPI connectivity data within SDN-C in a single request.

Request Example:

```
<nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:5c952269-bb8e-41ee-9bdc-
b99cbc98b890">
  <nc:get>
    <nc:filter>
      <context xmlns="urn:onf:otcc:yang:tapi-common">
        <connectivity-context xmlns="urn:onf:otcc:yang:tapi-connectivity"/>
      </context>
    </nc:filter>
  </nc:get>
</nc:rpc>
```

Response Example:

```
<?xml version="1.0" ?>
<rpc-reply message-id="urn:uuid:5c952269-bb8e-41ee-9bdc-b99cbc98b890"
xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0">
  <data>
    <context xmlns="urn:onf:otcc:yang:tapi-common">
      <connectivity-context xmlns="urn:onf:otcc:yang:tapi-connectivity">
      ......
      ......
      </connectivity-context>
    </context>
  </data>
</rpc-reply>
```

Response Data Description:

The API Response contains the TAPI connectivity-context present within CONC TAPI SDN-C. For details of the connectivity-context object, see *CONC TAPI Northbound Interface Description Document*.

Connectivity Context: Connectivity Services Discovery

This API retrieves all Connectivity Service UUIDs from TAPI NBI Server (SDN-C). The retrieved UUIDs can be further used to recursively retrieve the full content of each Connectivity Service object.

Request Example:

```
<nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:6e0bcdad-5d41-446a-b6ca-
8c5a2a62cff2">
  <nc:get>
    <nc:filter>
      <context xmlns="urn:onf:otcc:yang:tapi-common">
        <connectivity-context xmlns="urn:onf:otcc:yang:tapi-connectivity">
          <connectivity-service>
            <uuid/>
          </connectivity-service>
        </connectivity-context>
      </context>
    </nc:filter>
  </nc:get>
</nc:rpc>
```

Response Example:

```
<?xml version="1.0" ?>
<rpc-reply message-id="urn:uuid:6e0bcdad-5d41-446a-b6ca-8c5a2a62cff2"
xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0">
  <data>
    <context xmlns="urn:onf:otcc:yang:tapi-common">
      <connectivity-context xmlns="urn:onf:otcc:yang:tapi-connectivity">
        <connectivity-service>
          <uuid>9e17c6b7-ee37-34d7-ad10-b1a518e4e63f</uuid>
        </connectivity-service>
        ......
        ......
      </connectivity-context>
    </context>
  </data>
</rpc-reply>
```

Response Data Description:

The API Response contains list of Connectivity Service UUIDs present within the CONC TAPI SDN-C. For details of the Connectivity Service UUID, see *CONC TAPI Northbound Interface Description Document*.

Connectivity Context: Connectivity Service Retrieval

This API retrieves the full content of Connectivity Service object identified by the given UUID from TAPI NBI Server (SDN-C).

Request Example:

```
<nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:69b9ee94-916b-40f8-aa15-
3dc953ed0036">
  <nc:get>
    <nc:filter>
      <context xmlns="urn:onf:otcc:yang:tapi-common">
        <connectivity-context xmlns="urn:onf:otcc:yang:tapi-connectivity">
          <connectivity-service>
            <uuid>9e17c6b7-ee37-34d7-ad10-b1a518e4e63f</uuid>
          </connectivity-service>
        </connectivity-context>
      </context>
    </nc:filter>
  </nc:get>
</nc:rpc>
```

Response Example:

```
<?xml version="1.0" ?>
<rpc-reply message-id="urn:uuid:69b9ee94-916b-40f8-aa15-3dc953ed0036"
xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0">
  <data>
    <context xmlns="urn:onf:otcc:yang:tapi-common">
      <connectivity-context xmlns="urn:onf:otcc:yang:tapi-connectivity">
        <connectivity-service>
          <uuid>9e17c6b7-ee37-34d7-ad10-b1a518e4e63f</uuid>
          ......
          ......
        </connectivity-service>
      </connectivity-context>
    </context>
  </data>
</rpc-reply>
```

Response Data Description:

The API Response contains the Connectivity Service object (identified by the given UUID) present within the CONC TAPI SDN-C. For details of the Connectivity Service object, see *CONC TAPI Northbound Interface Description Document*.

Connectivity Context: Connectivity Services Retrieval

This API retrieves a list of Connectivity Service objects from the TAPI NBI Server (SDN-C).

Request Example:

```
<nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:0a4327c4-f7b9-47a4-b146-
3c033533cd18">
  <nc:get>
    <nc:filter>
      <context xmlns="urn:onf:otcc:yang:tapi-common">
        <connectivity-context xmlns="urn:onf:otcc:yang:tapi-connectivity">
          <connectivity-service/>
        </connectivity-context>
      </context>
    </nc:filter>
  </nc:get>
</nc:rpc>
```

Response Example:

```
<?xml version="1.0" ?>
<rpc-reply message-id="urn:uuid:0a4327c4-f7b9-47a4-b146-3c033533cd18"
xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0">
  <data>
    <context xmlns="urn:onf:otcc:yang:tapi-common">
      <connectivity-context xmlns="urn:onf:otcc:yang:tapi-connectivity">
        <connectivity-service>
          <uuid>9e17c6b7-ee37-34d7-ad10-b1a518e4e63f</uuid>
          ......
          ......
        </connectivity-service>
        ......
        ......
      </connectivity-context>
    </context>
  </data>
</rpc-reply>
```

Response Data Description:

The API Response contains a list of Connectivity Service objects present within the CONC TAPI SDN-C. For details of the Connectivity Service object, see *CONC TAPI Northbound Interface Description Document*.

Connectivity Context: Connectivity Service Connections Discovery

This API retrieves the Connection references associated with Connectivity Service object identified by the given UUID from TAPI NBI Server (SDN-C). The retrieved UUIDs can be further used to recursively retrieve the full content of each Connection object.

Request Example:

```
<nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:f052546f-4fa6-4660-9405-
d51a456feb1c">
```

```
  <nc:get>
    <nc:filter>
      <context xmlns="urn:onf:otcc:yang:tapi-common">
        <connectivity-context xmlns="urn:onf:otcc:yang:tapi-connectivity">
          <connectivity-service>
            <uuid>9e17c6b7-ee37-34d7-ad10-b1a518e4e63f</uuid>
            <connection/>
          </connectivity-service>
        </connectivity-context>
      </context>
    </nc:filter>
  </nc:get>
</nc:rpc>
```

Response Example:

```
<?xml version="1.0" ?>
<rpc-reply message-id="urn:uuid:f052546f-4fa6-4660-9405-d51a456feb1c"
xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0">
  <data>
    <context xmlns="urn:onf:otcc:yang:tapi-common">
      <connectivity-context xmlns="urn:onf:otcc:yang:tapi-connectivity">
        <connectivity-service>
          <uuid>9e17c6b7-ee37-34d7-ad10-b1a518e4e63f</uuid>
          <connection>
            <connection-uuid>efc5e438-a021-3974-a356-3a426dc0ffa7</connection-uuid>
          </connection>
          ......
          ......
        </connectivity-service>
      </connectivity-context>
    </context>
  </data>
</rpc-reply>
```

Response Data Description:

The API Response contains a list of Connection UUID references of Connectivity Service object (identified by the given UUID) present within the CONC TAPI SDN-C. For details of the Connection UUID reference, see *CONC TAPI Northbound Interface Description Document*.

Connectivity Context: Connection Retrieval

This API retrieves the full content of Connection object identified by the given UUID from TAPI NBI Server (SDN-C).

Request Example:

```
<nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:21c3a59c-ea57-4625-b3a9-
cc9e4cb54207">
  <nc:get>
    <nc:filter>
      <context xmlns="urn:onf:otcc:yang:tapi-common">
        <connectivity-context xmlns="urn:onf:otcc:yang:tapi-connectivity">
          <connection>
            <uuid>efc5e438-a021-3974-a356-3a426dc0ffa7</uuid>
          </connection>
        </connectivity-context>
      </context>
    </nc:filter>
  </nc:get>
</nc:rpc>
```

Response Example:

```
<?xml version="1.0" ?>
<rpc-reply message-id="urn:uuid:21c3a59c-ea57-4625-b3a9-cc9e4cb54207"
xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0">
  <data>
    <context xmlns="urn:onf:otcc:yang:tapi-common">
      <connectivity-context xmlns="urn:onf:otcc:yang:tapi-connectivity">
        <connection>
          <uuid>efc5e438-a021-3974-a356-3a426dc0ffa7</uuid>
          ......
          ......
        </connection>
      </connectivity-context>
    </context>
  </data>
</rpc-reply>
```

Response Data Description:

The API Response contains the Connection object (identified by the given UUID) present within the CONC TAPI SDN-C. For details of the Connectivity Service object, see *CONC TAPI Northbound Interface Description Document*.

Physical Context: Context Retrieval

This API retrieves the entire TAPI Physical context from TAPI NBI Server (SDN-C). It allows the SDN-C client to retrieve TAPI equipment data within SDN-C in a single request.

Request Example:

```
<nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:c0f23aab-1f9b-4ac4-be79-
c5e00a9ef78a">
  <nc:get>
    <nc:filter>
      <context xmlns="urn:onf:otcc:yang:tapi-common">
        <physical-context xmlns="urn:onf:otcc:yang:tapi-equipment"/>
      </context>
    </nc:filter>
  </nc:get>
</nc:rpc>
```

Response Example:

```
<?xml version="1.0" ?>
<rpc-reply message-id="urn:uuid:c0f23aab-1f9b-4ac4-be79-c5e00a9ef78a"
xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0">
  <data>
    <context xmlns="urn:onf:otcc:yang:tapi-common">
      <physical-context xmlns="urn:onf:otcc:yang:tapi-equipment">
      ......
      ......
      </physical-context>
    </context>
  </data>
</rpc-reply>
```

Response Data Description:

The API Response contains TAPI physical-context present within the CONC TAPI SDN-C. For details of the physical-context object, see *CONC TAPI Northbound Interface Description Document*.

Physical Context: Device Discovery

This API retrieves all Device UUIDs from the TAPI NBI Server (SDN-C). The retrieved UUIDs can be further used to recursively retrieve the full content of each Device object.

Request Example:

```
<nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:7bea1046-63b5-4a5f-b74a-
51133121ff76">
  <nc:get>
    <nc:filter>
      <context xmlns="urn:onf:otcc:yang:tapi-common">
        <physical-context xmlns="urn:onf:otcc:yang:tapi-equipment">
          <device>
            <uuid/>
          </device>
        </physical-context>
      </context>
    </nc:filter>
  </nc:get>
</nc:rpc>
```

Response Example:

```
<?xml version="1.0" ?>
<rpc-reply message-id="urn:uuid:7bea1046-63b5-4a5f-b74a-51133121ff76"
xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0">
  <data>
    <context xmlns="urn:onf:otcc:yang:tapi-common">
      <physical-context xmlns="urn:onf:otcc:yang:tapi-equipment">
        <device>
          <uuid>642e71f1-9929-3601-b28a-1c949fe72be5</uuid>
        </device>
        ......
        ......
      </physical-context>
    </context>
  </data>
</rpc-reply>
```

Response Data Description:

The API Response contains a list of Device UUIDs present within the CONC TAPI SDN-C. For details of the Device UUID, see *CONC TAPI Northbound Interface Description Document*.

Physical Context: Device Retrieval

This API retrieves the full content of the Device object identified by the given UUID from TAPI NBI Server (SDN-C).

Request Example:

```
<nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:05a7f3ca-c7d4-41e4-acf4-
18fe9b3a37de">
  <nc:get>
    <nc:filter>
      <context xmlns="urn:onf:otcc:yang:tapi-common">
        <physical-context xmlns="urn:onf:otcc:yang:tapi-equipment">
          <device>
            <uuid>642e71f1-9929-3601-b28a-1c949fe72be5</uuid>
          </device>
        </physical-context>
      </context>
```

```
    </nc:filter>
  </nc:get>
</nc:rpc>
```

Response Example:

```
<?xml version="1.0" ?>
<rpc-reply message-id="urn:uuid:05a7f3ca-c7d4-41e4-acf4-18fe9b3a37de"
xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0">
  <data>
    <context xmlns="urn:onf:otcc:yang:tapi-common">
      <physical-context xmlns="urn:onf:otcc:yang:tapi-equipment">
        <device>
          <uuid>642e71f1-9929-3601-b28a-1c949fe72be5</uuid>
          ......
          ......
        </device>
      </physical-context>
    </context>
  </data>
</rpc-reply>
```

Response Data Description:

The API Response contains the Device object (identified by the given UUID) present within CONC TAPI SDN-C. For details of the Node object, see *CONC TAPI Northbound Interface Description Document*.

Physical Context: Equipment Retrieval

This API retrieves the full content of Equipment object identified by the given UUID from TAPI NBI Server (SDN-C).

Request Example:

```
<nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:38e493f9-f0c9-4045-82c9-
0fab0930a528">
  <nc:get>
    <nc:filter>
      <context xmlns="urn:onf:otcc:yang:tapi-common">
        <physical-context xmlns="urn:onf:otcc:yang:tapi-equipment">
          <device>
            <uuid>642e71f1-9929-3601-b28a-1c949fe72be5</uuid>
            <equipment>
              <uuid>89778acd-b5ea-3e6f-a62f-56d35f6324e7</uuid>
            </equipment>
          </device>
        </physical-context>
      </context>
    </nc:filter>
  </nc:get>
</nc:rpc>
```

Response Example:

```
<?xml version="1.0" ?>
<rpc-reply message-id="urn:uuid:38e493f9-f0c9-4045-82c9-0fab0930a528"
xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0">
  <data>
    <context xmlns="urn:onf:otcc:yang:tapi-common">
      <physical-context xmlns="urn:onf:otcc:yang:tapi-equipment">
        <device>
          <uuid>642e71f1-9929-3601-b28a-1c949fe72be5</uuid>
```

```
          <equipment>
            <uuid>89778acd-b5ea-3e6f-a62f-56d35f6324e7</uuid>
            ......
            ......
          </equipment>
        </device>
      </physical-context>
    </context>
  </data>
</rpc-reply>
```

Response Data Description:

The API Response contains Equipment object (identified by the given UUID) present within the CONC TAPI SDN-C. For details of the Equipment object, see *CONC TAPI Northbound Interface Description Document*.

Physical Context: Access Port Retrieval

This API retrieves the full content of Access Port object identified by the given UUID from TAPI NBI Server (SDN-C).

Request Example:

```
<nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:575fc0a3-f175-43ad-8cbe-
ee3f03b7d8a9">
  <nc:get>
    <nc:filter>
      <context xmlns="urn:onf:otcc:yang:tapi-common">
        <physical-context xmlns="urn:onf:otcc:yang:tapi-equipment">
          <device>
            <uuid>642e71f1-9929-3601-b28a-1c949fe72be5</uuid>
            <access-port>
              <uuid>4e5babd4-ffd0-3420-ac68-faf0bdc08289</uuid>
            </access-port>
          </device>
        </physical-context>
      </context>
    </nc:filter>
  </nc:get>
</nc:rpc>
```

Response Example:

```
<?xml version="1.0" ?>
<rpc-reply message-id="urn:uuid:575fc0a3-f175-43ad-8cbe-ee3f03b7d8a9"
xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0">
  <data>
    <context xmlns="urn:onf:otcc:yang:tapi-common">
      <physical-context xmlns="urn:onf:otcc:yang:tapi-equipment">
        <device>
          <uuid>642e71f1-9929-3601-b28a-1c949fe72be5</uuid>
          <access-port>
            <uuid>4e5babd4-ffd0-3420-ac68-faf0bdc08289</uuid>
            ......
            ......
          </access-port>
        </device>
      </physical-context>
    </context>
  </data>
</rpc-reply>
```

Response Data Description:

The API Response contains Access Port object (identified by the given UUID) present within the CONC TAPI SDN-C. For details of the Access Port object, see *CONC TAPI Northbound Interface Description Document*.

Physical Context: Physical Span Discovery

This API retrieves all Physical Span UUIDs from the TAPI NBI Server (SDN-C). The retrieved UUIDs can be further used to recursively retrieve the full content of each Physical Span object.

Request Example:

```
<nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:26f4fb6d-2dd8-4609-846d-
e180b4b958cf">
  <nc:get>
    <nc:filter>
      <context xmlns="urn:onf:otcc:yang:tapi-common">
        <physical-context xmlns="urn:onf:otcc:yang:tapi-equipment">
          <physical-span>
            <uuid/>
          </physical-span>
        </physical-context>
      </context>
    </nc:filter>
  </nc:get>
</nc:rpc>
```

Response Example:

```
<?xml version="1.0" ?>
<rpc-reply message-id="urn:uuid:26f4fb6d-2dd8-4609-846d-e180b4b958cf"
xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0">
  <data>
    <context xmlns="urn:onf:otcc:yang:tapi-common">
      <physical-context xmlns="urn:onf:otcc:yang:tapi-equipment">
        <physical-span>
          <uuid>0a040b5b-5787-4e13-8285-6397984740ab</uuid>
        </physical-span>
        ......
        ......
      </physical-context>
    </context>
  </data>
</rpc-reply>
```

Response Data Description:

The API Response contains a list of Physical Span UUIDs present within the CONC TAPI SDN-C. For details of the Device UUID, see *CONC TAPI Northbound Interface Description Document*.

Physical Context: Physical Span Retrieval

This API retrieves the full content of the Physical Span object identified by the given UUID from TAPI NBI Server (SDN-C).

Request Example:

```
<nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:d645fc7e-0159-4069-97e2-
ad03b10701dc">
  <nc:get>
    <nc:filter>
      <context xmlns="urn:onf:otcc:yang:tapi-common">
```

```
        <physical-context xmlns="urn:onf:otcc:yang:tapi-equipment">
          <physical-span>
            <uuid>0a040b5b-5787-4e13-8285-6397984740ab</uuid>
          </physical-span>
        </physical-context>
      </context>
    </nc:filter>
  </nc:get>
</nc:rpc>
```

Response Example:

```
<?xml version="1.0" ?>
<rpc-reply message-id="urn:uuid:d645fc7e-0159-4069-97e2-ad03b10701dc"
xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0">
  <data>
    <context xmlns="urn:onf:otcc:yang:tapi-common">
      <physical-context xmlns="urn:onf:otcc:yang:tapi-equipment">
        <physical-span>
          <uuid>0a040b5b-5787-4e13-8285-6397984740ab</uuid>
          ......
          ......
        </physical-span>
      </physical-context>
    </context>
  </data>
</rpc-reply>
```

Response Data Description:

The API Response contains Physical Span object (identified by the given UUID) present within the CONC TAPI SDN-C. For details of the Node object, see *CONC TAPI Northbound Interface Description Document*.

TAPI Provisioning Operations

Connectivity Context: Connectivity Service Creation

This API provisions a TAPI connectivity-service in the TAPI NBI Server (SDN-C). Depending upon the request data, connectivity-service can be provisioned in OTSiMCA/MCA, ODU or DSR layers.

Request Example:

```
<nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:2f36bf04-031f-4bd7-b28f-
9d945c3c48d3">
  <nc:edit-config>
    <nc:target>
      <nc:running/>
    </nc:target>
    <nc:config>
      <context xmlns="urn:onf:otcc:yang:tapi-common">
        <connectivity-context xmlns="urn:onf:otcc:yang:tapi-connectivity">
          <connectivity-service>
            <uuid>9e17c6b7-ee37-34d7-ad10-b1a518e4e63f</uuid>
            ......
            ......
          </connectivity-service>
        </connectivity-context>
      </context>
    </nc:config>
  </nc:edit-config>
</nc:rpc>
```

Response Example:

```
<?xml version="1.0" ?>
<rpc-reply message-id="urn:uuid:2f36bf04-031f-4bd7-b28f-9d945c3c48d3"
xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0">
  <ok/>
</rpc-reply>
```

Request Data Description:

The API Request takes Connectivity Service configuration data as the input. The model of connectivity-service remains the same regardless of the type of the service. However, the input configuration data required varies according to the type of service, the resiliency requirements, etc. Once the request is successfully processed, the operational data within Connectivity Service object is filled by the SDN-C. For details of configuration and operational data within Connectivity Service object, see *CONC TAPI Northbound Interface Description Document*.

In addition to the operational data within Connectivity Service object, new Connection object operational data is created as part of the successful service provisioning. For details of Connection object operational data, see *CONC TAPI Northbound Interface Description Document*.

Connectivity Context: Connectivity Service Name Update

This API updates name (value-name=SERVICE_NAME) of an already existing TAPI connectivity-service in the TAPI NBI Server (SDN-C).

Request Example:

```
<nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:a9588a95-e36f-43b6-8081-
3cec60bbf614">
  <nc:edit-config>
    <nc:target>
      <nc:running/>
    </nc:target>
    <nc:config>
      <context xmlns="urn:onf:otcc:yang:tapi-common">
        <connectivity-context xmlns="urn:onf:otcc:yang:tapi-connectivity">
          <connectivity-service>
            <uuid>df223f2e-5202-3b82-90a3-99cb21731b41</uuid>
            <name>
              <value-name>SERVICE_NAME</value-name>
              <value>new_name</value>
            </name>
          </connectivity-service>
        </connectivity-context>
      </context>
    </nc:config>
  </nc:edit-config>
</nc:rpc>
```

Response Example:

```
<?xml version="1.0" ?>
<rpc-reply message-id="urn:uuid:a9588a95-e36f-43b6-8081-3cec60bbf614"
xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0">
  <ok/>
```

```
</rpc-reply>
```

Request Data Description:

The API Request takes the new name that needs to be set on the connectivity-service. For details of Connectivity Service name data, see *CONC TAPI Northbound Interface Description Document*.

Connectivity Context: Connectivity Service Deletion

This API deletes the Connectivity Service object identified by the given UUID from TAPI NBI Server (SDN-C).

Request Example:

```
<nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:1660768b-8a27-4af6-9fbd-
7f2e0de1e245">
  <nc:edit-config>
    <nc:target>
      <nc:running/>
    </nc:target>
    <nc:config>
      <context xmlns="urn:onf:otcc:yang:tapi-common">
        <connectivity-context xmlns="urn:onf:otcc:yang:tapi-connectivity">
          <connectivity-service nc:operation="delete">
            <uuid>9e17c6b7-ee37-34d7-ad10-b1a518e4e63f</uuid>
          </connectivity-service>
        </connectivity-context>
      </context>
    </nc:config>
  </nc:edit-config>
</nc:rpc>
```

Response Example:

```
<?xml version="1.0" ?>
<rpc-reply message-id="urn:uuid:1660768b-8a27-4af6-9fbd-7f2e0de1e245"
xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0">
  <ok/>
</rpc-reply>
```

Request Data Description:

The API Request indicates the UUID of connectivity-service resource to be deleted. For details of Connectivity Service object, see *CONC TAPI Northbound Interface Description Document*.

TAPI Notifications

Overview

CONC TAPI NETCONF NBI supports NETCONF event notifications.

Notifications are generated whenever any data changes such as Create, Update or Delete happens within the TAPI database. Both Configuration and Operational data changes raise Notifications.

Currently, CONC TAPI NBI does not support Notification Replay feature.

Notification Subscription

TAPI client can subscribe for Notifications over the NETCONF interface by using <create-subscription> RPC request.

Request Example:

```
<nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:754dc3d4-5385-472b-b5a3-
c995f5ffe0cb">
  <create-subscription xmlns="urn:ietf:params:xml:ns:netconf:notification:1.0">
    <stream>NETCONF</stream>
  </create-subscription>
</nc:rpc>
```

Response Example:

```
<?xml version="1.0" ?>
<rpc-reply message-id="urn:uuid:754dc3d4-5385-472b-b5a3-c995f5ffe0cb"
xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0">
  <ok/>
</rpc-reply>
```

The request RPC may optionally contain the *filter* attribute to receive only subset of notifications.

Create Notifications

Notification is generated when object is created in the TAPI CDB.

Notification Example:

```
<notification xmlns="urn:ietf:params:xml:ns:netconf:notification:1.0">
  <eventTime>2021-05-19T14:59:49.4605+00:00</eventTime>
  <netconf-config-change xmlns='urn:ietf:params:xml:ns:yang:ietf-netconf-notifications'>
    <changed-by>
      <username>admin</username>
      <session-id>0</session-id>
      <source-host>10.43.16.101</source-host>
    </changed-by>
    <datastore>running</datastore>
    <edit>
      <target xmlns:tapi-equipment="urn:onf:otcc:yang:tapi-equipment" xmlns:tapi-
common="urn:onf:otcc:yang:tapi-common">/tapi-common:context/tapi-equipment:physical-context/tapi-
equipment:device[tapi-equipment:uuid='306b36c5-bc9c-3b3f-ad01-94e834c270fd']/tapi-
equipment:equipment[tapi-equipment:uuid='92e8b512-33e6-3e73-a795-ad903413bf76']</target>
      <operation>create</operation>
    </edit>
  </netconf-config-change>
</notification>
```

Update Notifications

Notification is generated when object attribute is updated in the TAPI CDB.

Notification Example:

```
<notification xmlns="urn:ietf:params:xml:ns:netconf:notification:1.0">
  <eventTime>2021-05-19T15:00:56.238614+00:00</eventTime>
  <netconf-config-change xmlns='urn:ietf:params:xml:ns:yang:ietf-netconf-notifications'>
    <changed-by>
      <username>admin</username>
```

```
      <session-id>0</session-id>
      <source-host>10.43.16.101</source-host>
    </changed-by>
    <datastore>running</datastore>
    <edit>
      <target xmlns:tapi-connectivity="urn:onf:otcc:yang:tapi-connectivity" xmlns:tapi-
common="urn:onf:otcc:yang:tapi-common">/tapi-common:context/tapi-connectivity:connectivity-context/tapi-
connectivity:connectivity-service[tapi-connectivity:uuid='ad818bed-25da-34b9-b98b-a8f0c56333b0']/tapi-
connectivity:lifecycle-state</target>
      <operation>replace</operation>
    </edit>
  </netconf-config-change>
</notification>
```

Delete Notifications

Notification is generated when object is deleted from the TAPI CDB.

Notification Example:

```
<notification xmlns="urn:ietf:params:xml:ns:netconf:notification:1.0">
  <eventTime>2021-05-19T15:00:56.68858+00:00</eventTime>
  <netconf-config-change xmlns='urn:ietf:params:xml:ns:yang:ietf-netconf-notifications'>
    <changed-by>
      <username>admin</username>
      <session-id>0</session-id>
      <source-host>10.43.16.101</source-host>
    </changed-by>
    <datastore>running</datastore>
    <edit>
      <target xmlns:tapi-connectivity="urn:onf:otcc:yang:tapi-connectivity" xmlns:tapi-
common="urn:onf:otcc:yang:tapi-common">/tapi-common:context/tapi-connectivity:connectivity-context/tapi-
connectivity:connection[tapi-connectivity:uuid='c6b01568-5508-3bf1-a2f5-67caf945bda4']</target>
      <operation>delete</operation>
    </edit>
  </netconf-config-change>
</notification>
```