

TAPI Provisioning support in MCP 4.0

The following details the service types and options supported via TAPI provisioning in MCP 4.0.

MCP 4.0 TAPI supports the following MCP service types

- 1) Photonic Service
- 2) Photonic Service Restorable
- 3) Transport Client
- 4) Transport Client Restorable
- 5) Transport Client Restorable Protected

TAPI provisioning is not at parity with MCP UI and flexibility in routing is more limited in MCP 4.0 TAPI.

TAPI Path computation is not supported.

The following chapters specify the supported options and settings for each of the available service types.

All Services are created using a ConnectivityService POST operation on the

<mcp-host>/mcpview/api/v1/tapi/core/context/provisioning/connectivity-service/

API endpoint.

Generic Service Settings

The following settings applies

ConnectivityService

Property	Type	Description	Example
name	Array Items NameValue	MCP support limited to a single Element containing service label	"name": [{ "value-name": "label", "value": "CDC-MRSNC- 27-postman" }]
service-layer	String	Specifies the TAPI service layer. Which can be one of PHOTONIC_MEDIA, ODU, DSR or ETH MCP 4.0 supports 1) PHOTONIC_MEDIA which maps to MCP photonic services 2) ODU which maps to MCP L1 ODU services	"service-layer": "PHOTONIC_MEDIA"

		3) DSR which maps to MCP L1 rates other than ODU 4) ETH is not supported in 4.0	
end-point	Array Items: ConnectivityServiceEndPoint	The list of service endpoints	(see table below)
resilience-type	Object: Members: restoration-policy:String protection-type:String	The protection-type member specifies the requested resilience type. Values can be one of NO_PROTECTION, ONE_PLUS_ONE_PROTECTION, ONE_PLUS_ONE_PROTECTION_WITH_DYNAMIC_RESTORATION DYNAMIC_RESTORATION 1) NO_PROTECTION is used for un-protected photonic service and for layer 1 unprotected p-snc services 2) DYNAMIC_RESTORATION is used for MR photonic services and s-snc L1 services 3) ONE_PLUS_ONE_PROTECTION is used for protected L1 service with p-snc 4) ONE_PLUS_ONE_PROTECTION_WITH_DYNAMIC_RESTORATION is used for protected L1 service with s-snc restoration-policy member is not used and is ignored if supplied	"resilience-type":{"protection-type": "DYNAMIC_RESTORATION"}
exclude-node	Array Items: String	Routing constraint to specify a list of nodes to be excluded, when routing the service. Nodes are specified as TAPI node uuids	"exclude-node": ["f344643b-0be9-3e5e-8e52-81fc4bb85509"]
include-node	Array Items:String	Routing constraint to specify a list of nodes to be included when routing the service. Nodes are specified as TAPI node uuids	"include-node": ["f6f45f17-5e9f-32f2-a3d7-258bf68e670c"],
requested-capacity	Object: Members: total-size: ValueUnit baud-rate: String	Specifies the requested capacity of the service	"requested-capacity": { "total-size": {"value": "300", "unit": "GBPS" }, "baud-rate" : "56GBAUD"} }

ConnectivityServiceEndPoint

Property	Type	Description	Example
name	Array Items NameValue	MCP support limited to a single Element containing endpoint location in the form node:<node name>-shelf:<shelf>-slot:<slot>-port:<port>	name": [{"value-name": "location", "value": "node:PV0728CRFE-shelf:1-slot:26-port:1"}],
service-interface-point	String	Uuid of TAPI service interface point (SIP) A request may use either the name property or the service-interface-point property to specify the requested service port. If both are specified the name property will be ignored.	"service-interface-point": "8132aa4a-9887-3364-94bf-11766050a1ea"
layer-protocol-qualifier	String	Specifies the requested service layer. Values can be one of "ODU2", "ODU2e", "ODU4", "ODU3", "DSR_10GE", "DSR_40GE", "DSR_100GE", "OC192", "STM64", "OC768", "STM256", "DSR_1GE",	"layer-protocol-qualifier": "ODU1"

		<div>“OC48”, “STM16”, “ODU1”, “FC100”, “FC200”, “FC400”, “FC800”, “FC1200”, “FC1600”, “FC3200”, “FICON1G”, “FICONEXPRESS2G”, “FICON4G”, “FICON8G”, “FICON16G” “OTSI”</div> <div>MCP does not support asymmetric service creation and the specified layer-protocol-qualifier must be the same for both endpoints in the service</div>	
--	--	--	--

Example Service Request

```
{
  "name": [
    {
      "value-name": "label",
      "value": "ODU1-unprotected-postman"
    }
  ],
  "end-point": [
    {
      "name": [{"value-name": "location", "value": "node:DELHI-NORTH-T-S-shelf:200-slot:16-port:7"}],
      "layer-protocol-qualifier": "ODU1"
    },
    {
      "name": [{"value-name": "location", "value": "node:KOLKATA-EAST-T-S-shelf:201-slot:26-port:9"}],
      "layer-protocol-qualifier": "ODU1"
    }
  ],
  "service-layer": "ODU"
}
```

Photonic Service Restorable Settings

The following details the TAPI values necessary to create a restorable photonic service. The settings are additions and constraints to the generic service settings specified above

ConnectivityService Settings for Photonic Service Restorable

Property	Type	Description	Example
service-layer	String	Must be set to PHOTONIC_MEDIA	"service-layer": "PHOTONIC_MEDIA"
resilience-type	Object: Members: restoration-policy:String protection-type:String	protection-type must be set to DYNAMIC_RESTORATION	"resilience-type":{"protection-type": "DYNAMIC_RESTORATION"}
spectral-assign-option	String	Specifies the spectral assignment option and can be one of the following SPECTRUM_SPREAD, PACK_LOW, PACK_HIGH	
center-frequency	Number	Specifies the requested center frequency. If specified this overrides the spectral-assign-option	
maximize-capacity	Boolean	Maximize capacity for a single photonic service	
diversity-exclusion	Array Items: String	UUIDs of TAPI Connections to be used as diversity exclusions	"diversity-exclusion": ["f6f45f17-5e9f-32f2-a3d7-258bf68e670c"]
restoration-path-exclude-node	Array Items: String	Routing constraint for the restoration path to specify a list of nodes to be excluded, when routing the service. Nodes are specified as TAPI node uuids	"restoration-path-exclude-node": ["f344643b-0be9-3e5e-8e52-81fc4bb85509"]
restoration-path-include-node	Array Items:String	Routing constraint for the restoration path to specify a list of nodes to be included when routing the service. Nodes are specified as TAPI node uuids	"restoration-path-include-node": ["f6f45f17-5e9f-32f2-a3d7-258bf68e670c"],
restoration-path-diversity-exclusions	Array Items: String	UUIDs of TAPI Connections to be used as diversity exclusions for the restoration path	"restoration-path-diversity-exclusion": ["f6f45f17-5e9f-32f2-a3d7-258bf68e670c"]

ConnectivityServiceEndpoint Settings for Photonic Service Restorable

Property	Type	Description	Example
layer-protocol-qualifier	String	Must be set to "OTSI" or the property can be left out.	"layer-protocol-qualifier": "OTSI"
photonic-interface-point	String	UUID of TAPI Service Interface Point (SIP), allows for the specification of the CMD port on the photonic NE	"photonic-interface-point": "27ea607e-f757-34b4-98cf-bc67759740b8"

Example Photonic Service Request

<pre>{ "name": [{ "value-name": "label", "value": "MOTR-2-1-1-AC-postman" }], }</pre>

```

"requested-capacity": {"total-size": {"value": "100", "unit": "GBPS" }},
"end-point": [
  {
    "service-interface-point": "b5108f91-774f-3f79-9337-487696d5d20f",
    "photonic-interface-point": "2d681f52-6b72-30bd-afe3-06f8558f0520"
  },
  {
    "service-interface-point": "928ca43f-c6e6-339c-82da-f0d216202b28",
    "photonic-interface-point": "cec9dc11-b9e8-339d-b6f4-b72426a360b4"
  }
],
"resilience-type": {"protection-type": "DYNAMIC_RESTITUTION"},
"exclude-node": ["f344643b-0be9-3e5e-8e52-81fc4bb85509"],
"include-node": ["f6f45f17-5e9f-32f2-a3d7-258bf68e670c"],
"diversity-exclusion": ["e2f45f17-5b9f-5453-a432-25834e670c"],
"restoration-path-exclude-node": ["f344643b-0be9-3e5e-8e52-81fc4bb85509"],
"restoration-path-include-node": ["f6f45f17-5e9f-32f2-a3d7-258bf68e670c"],
"restoration-path-diversity-exclusion": ["e2f45f17-5b9f-5453-a432-25834e670c"],
"layer-protocol-name": "PHOTONIC_MEDIA"
}

```

MCP Options not supported or limitations in TAPI

- 1) Service scheduling. Provisioning is always now
- 2) SNC and SNC label. Always defaults to create SNC with default label
- 3) Service Bundling. Always defaults to “auto-assign service bundle” with default label
- 4) Routing constraints (applies both the home and restoration path)
 - a. “Compute best route”, explicit route not supported
 - b. “constrain routes by latency” with minimum latency
 - c. ROADM lines exclusions, inclusions not supported

Photonic Service Settings

The following details the TAPI values necessary to create a photonic service. The settings are additions and constraints to the generic service settings specified above

ConnectivityService Settings for Photonic Service

Property	Type	Description	Example
service-layer	String	Must be set to PHOTONIC_MEDIA	"service-layer": "PHOTONIC_MEDIA"
resilience-type	Object: Members: restoration-policy:String protection-type:String	protection-type must be set to NO_PROTECTION or the resilience-type can be left out of the request	"resilience-type":{"protection-type": "NO_PROTECTION"}
spectral-assign-option	String	Specifies the spectral assignment option and can be one of the following SPECTRUM_SPREAD, PACK_LOW, PACK_HIGH	
center-frequency	Number	Specifies the requested center frequency. If specified this overrides the spectral-assign-option	
maximize-capacity	Boolean	Maximize capacity for a single photonic service	"maximize-capacity": true
diversity-exclusion	Array Items: String	UUIDs of TAPI Connections to be used as diversity exclusions	"diversity-exclusion": ["f6f45f17-5e9f-32f2-a3d7-258bf68e670c"]

ConnectivityServiceEndpoint Settings for Photonic Service

Property	Type	Description	Example
layer-protocol-qualifier	String	Must be set to "OTSI" or the property can be left out.	"layer-protocol-qualifier": "OTSI"
photonic-interface-point	String	UUID of TAPI Service Interface Point (SIP), allows for the specification of the CMD port on the photonic NE	"photonic-interface-point": "27ea607e-f757-34b4-98cf-bc67759740b8"

Example Photonic Service Request

<pre>{ "name": [{ "value-name": "label", "value": "MOTR-2-1-1-AC-postman" }], "requested-capacity": {"total-size": {"value": "100", "unit": "GBPS" }}, "end-point": [{ "service-interface-point": "b5108f91-774f-3f79-9337-487696d5d20f", "photonic-interface-point": "2d681f52-6b72-30bd-afe3-06f8558f0520" }, { "service-interface-point": "928ca43f-c6e6-339c-82da-f0d216202b28", "photonic-interface-point": "cec9dc11-b9e8-339d-b6f4-b72426a360b4" }], }</pre>

```
"exclude-node": ["f344643b-0be9-3e5e-8e52-81fc4bb85509"],  
"include-node": ["f6f45f17-5e9f-32f2-a3d7-258bf68e670c"],  
"diversity-exclusion": ["e2f45f17-5b9f-5453-a432-25834e670c"],  
"layer-protocol-name": "PHOTONIC_MEDIA"  
}
```

MCP Options not supported or limitations in TAPI

- 1) Service scheduling. Provisioning is always now
- 2) SNC and SNC label. Always defaults to create SNC with default label
- 3) Service Bundling. Always defaults to “auto-assign service bundle” with default label
- 4) Routing constraints
 - a. “Compute best route”
 - b. “constrain routes by latency” with minimum latency.
 - c. ROADM lines exclusions, inclusions not supported

Transport Client Service non-switched Settings

The following details the TAPI values necessary to create a non-switched transport client service. The settings are additions or constraints to the generic service settings specified above

ConnectivityService Settings for non-switched Transport Client

Property	Type	Description	Example
service-layer	String	Must be set to ODU or DSR	"service-layer": "ODU"
resilience-type	Object: Members: restoration-policy:String protection-type:String	protection-type must be set to NO_PROTECTION or the resilience-type can be left out of the request	"resilience-type":{"protection-type": "NO_PROTECTION"}
service-type-constraint	String	Directs MCP to choose the specific service type, possible values are SWITCHED, NON_SWITCHED Must be set to NON_SWITCHED	"service-type-constraint": "NON_SWITCHED"

ConnectivityServiceEndpoint Settings for non-switched Transport Client

Property	Type	Description	Example
layer-protocol-qualifier	String	Must be set to one of the following values "ODU2", "ODU2e", "ODU4", "ODU3", "DSR_10GE", "DSR_40GE", "DSR_100GE", "OC192", "STM64", "OC768", "STM256", "DSR_1GE", "OC48", "STM16", "ODU1", "FC100", "FC200", "FC400", "FC800", "FC1200", "FC1600", "FC3200", "FICON1G", "FICONEXPRESS2G", "FICON4G", "FICON8G", "FICON16G"	"layer-protocol-qualifier": "ODU1"

Example non-switched Transport Client

```
{
  "name": [
    {
      "value-name": "label",
      "value": "ODU1-unprotected-postman"
    }
  ],
  "end-point": [
    {
      "name": [{"value-name": "location", "value": "node:DELHI-NORTH-T-S-shelf:200-slot:16-port:7"}],
      "layer-protocol-qualifier": "ODU1"
    },
    {
      "name": [{"value-name": "location", "value": "node:KOLKATA-EAST-T-S-shelf:201-slot:26-port:9"}],
      "layer-protocol-qualifier": "ODU1"
    }
  ],
  "layer-protocol-name": "ODU"
}
```

MCP Options not supported or limitations in TAPI

- 1) Service scheduling. Provisioning is always now

Transport Client Service Switched (control-plane) Settings

The following details the TAPI values necessary to create a non-switched transport client service. The settings are additions or constraints to the generic service settings specified above

ConnectivityService Settings for switched Transport Client

Property	Type	Description	Example
service-layer	String	Must be set to ODU or DSR	"service-layer": "ODU"
resilience-type	Object: Members: restoration-policy:String protection-type:String	protection-type must be set to NO_PROTECTION or DYNAMIC_RESTORATION If protection-type is set to NO_PROTECTION, then a service with p-snc will be created DYNAMIC_RESTORATION will create a service with mr-sncs	"resilience-type":{"protection-type": "DYNAMIC_RESTORATION"}
service-type-constraint	String	Directs MCP to choose the specific service type, possible values are SWITCHED, NON_SWITCHED Must be set to SWITCHED	"service-type-constraint": "SWITCHED"
restoration-path-exclude-node	Array Items: String	Routing constraint for the restoration path to specify a list of nodes to be excluded, when routing the service. Nodes are specified as TAPI node uuids	"restoration-path-exclude-node": ["f344643b-0be9-3e5e-8e52-81fc4bb85509"]
restoration-path-include-node	Array Items:String	Routing constraint for the restoration path to specify a list of nodes to be included when routing the service. Nodes are specified as TAPI node uuids	"restoration-path-include-node": ["f6f45f17-5e9f-32f2-a3d7-258bf68e670c"],

ConnectivityServiceEndpoint Settings for switched Transport Client

Property	Type	Description	Example
layer-protocol-qualifier	String	Must be set to one of the following values "ODU2", "ODU2e", "ODU4", "ODU3", "DSR_10GE", "DSR_40GE", "DSR_100GE", "OC192", "STM64", "OC768", "STM256", "DSR_1GE", "OC48", "STM16", "ODU1", "FC100", "FC200", "FC400", "FC800", "FC1200", "FC1600", "FC3200",	"layer-protocol-qualifier": "ODU1"

		"FICON1G", "FICONEXPRESS2G", "FICON4G", "FICON8G", "FICON16G"	
--	--	---	--

Example switched Transport Client

```
{
  "name": [
    {
      "value-name": "label",
      "value": "ODU1-unprotected-postman"
    }
  ],
  "end-point": [
    {
      "name": [{"value-name": "location", "value": "node:DELHI-NORTH-T-S-shelf:200-slot:16-port:7"}],
      "layer-protocol-qualifier": "ODU1"
    },
    {
      "name": [{"value-name": "location", "value": "node:KOLKATA-EAST-T-S-shelf:201-slot:26-port:9"}],
      "layer-protocol-qualifier": "ODU1"
    }
  ],
  "layer-protocol-name": "ODU",
  "service-type-constraint": "SWITCHED"
}
```

MCP Options not supported or limitations in TAPI

- 1) Service scheduling. Provisioning is always now
- 2) Routing constraints
 - a. "Compute best route"
 - b. "Cost Criteria" not supported defaults to None
 - c. OSRP lines exclusions, inclusions not supported

Transport Client Service Switched protected (control-plane) Settings

The following details the TAPI values necessary to create a protected switched transport client service. The settings are additions or constraints to the generic service settings specified above

ConnectivityService Settings for protected switched Transport Client

Property	Type	Description	Example
service-layer	String	Must be set to ODU or DSR	"service-layer": "ODU"
resilience-type	Object: Members: restoration-policy:String protection-type:String	protection-type must be set to ONE_PLUS_ONE_PROTECTION or ONE_PLUS_ONE_PROTECTION_WITH_DYNAMIC_RESTORATION If protection-type is set to ONE_PLUS_ONE_PROTECTION, then a service with p-snc on both home and restoration path will be created ONE_PLUS_ONE_PROTECTION_WITH_DYNAMIC_RESTORATION will create a service with mr-snc on both home and restoration paths	"resilience-type":{"protection-type": "ONE_PLUS_ONE_PROTECTION"}
service-type-constraint	String	Directs MCP to choose the specific service type, possible values are SWITCHED, NON_SWITCHED Must be set to SWITCHED	"service-type-constraint": "SWITCHED"
restoration-path-exclude-node	Array Items: String	Routing constraint for the restoration path to specify a list of nodes to be excluded, when routing the service. Nodes are specified as TAPI node uuids	"restoration-path-exclude-node": ["f344643b-0be9-3e5e-8e52-81fc4bb85509"]
restoration-path-include-node	Array Items:String	Routing constraint for the restoration path to specify a list of nodes to be included when routing the service. Nodes are specified as TAPI node uuids	"restoration-path-include-node": ["f6f45f17-5e9f-32f2-a3d7-258bf68e670c"],
protecting-path-exclude-node	Array Items: String	Routing constraint for the protection home path to specify a list of nodes to be excluded, when routing the service. Nodes are specified as TAPI node uuids	"protection-path-exclude-node": ["f344643b-0be9-3e5e-8e52-81fc4bb85509"]
protecting-path-include-node	Array Items:String	Routing constraint for the protection path to specify a list of nodes to be included when routing the service. Nodes are specified as TAPI node uuids	"protection-path-include-node": ["f6f45f17-5e9f-32f2-a3d7-258bf68e670c"],
protecting-restoration-path-exclude-node	Array Items: String	Routing constraint for the protection restoration path to specify a list of nodes to be excluded, when routing the service. Nodes are specified as TAPI node uuids	"protecting-restoration-path-exclude-node": ["f344643b-0be9-3e5e-8e52-81fc4bb85509"]
protecting-restoration-path-include-node	Array Items:String	Routing constraint for the protection restoration path to specify a list of nodes to be included when routing the service. Nodes are specified as TAPI node uuids	"protecting-restoration-path-include-node": ["f6f45f17-5e9f-32f2-a3d7-258bf68e670c"],

ConnectivityServiceEndpoint Settings for protected switched Transport Client

Property	Type	Description	Example
layer-protocol-qualifier	String	Must be set to one of the following values "ODU2", "ODU2e", "ODU4",	"layer-protocol-qualifier": "ODU1"

		"ODU3", "DSR_10GE", "DSR_40GE", "DSR_100GE", "OC192", "STM64", "OC768", "STM256", "DSR_1GE", "OC48", "STM16", "ODU1", "FC100", "FC200", "FC400", "FC800", "FC1200", "FC1600", "FC3200", "FICON1G", "FICONEXPRESS2G", "FICON4G", "FICON8G", "FICON16G"	
--	--	--	--

Example protected switched Transport Client

```
{
  "name": [
    {
      "value-name": "label",
      "value": "OC192-protected-postman"
    }
  ],
  "end-point": [
    {
      "name": [{"value-name": "location", "value": "node:DELHI-NORTH-T-S-shelf:200-slot:16-port:1"}],
      "layer-protocol-qualifier": "OC192"
    },
    {
      "name": [{"value-name": "location", "value": "node:KOLKATA-EAST-T-S-shelf:201-slot:26-port:1"}],
      "layer-protocol-qualifier": "OC192"
    }
  ],
  "layer-protocol-name": "ODU",
  "resilience-type": {"protection-type": "ONE_PLUS_ONE_PROTECTION_WITH_DYNAMIC_RESTORATION"},
  "exclude-node": ["4e7a320b-a595-3d11-886e-ae063ee10402"],
  "include-node": ["5c11f955-e27e-3fdb-bd3a-88c7ce55b65a"],
  "protecting-exclude-node": ["4e7a320b-a595-3d11-886e-ae063ee10402"],
  "restoration-path-exclude-node": ["4e7a320b-a595-3d11-886e-ae063ee10402"],
  "protecting-restoration-path-exclude-node": ["4e7a320b-a595-3d11-886e-ae063ee10402"],
  "service-type-constraint": "SWITCHED"
}
```

MCP Options not supported or limitations in TAPI

- 1) Service scheduling. Provisioning is always now
- 2) Routing constraints (applies to both home and restoration paths)
 - a. "Compute best route"
 - b. "Cost Criteria" not supported defaults to None
 - c. OSRP lines exclusions, inclusions not supported

Example Request and Response

Create Transport Client service with ODU1 payload

Post: {{BP_SERVER}}/mcpview/api/v1/tapi/core/context/provisioning/connectivity-service/

Payload data (application/json)

```
{
  "name": [
    {
      "value-name": "label",
      "value": "ODU1-unprotected-postman"
    }
  ],
  "end-point": [
    {
      "name": [{"value-name": "location", "value": "node:DELHI-NORTH-T-S-shelf:200-slot:16-port:7"}],
      "layer-protocol-qualifier": "ODU1"
    },
    {
      "name": [{"value-name": "location", "value": "node:KOLKATA-EAST-T-S-shelf:201-slot:26-port:9"}],
      "layer-protocol-qualifier": "ODU1"
    }
  ],
  "service-layer": "ODU"
}
```

Response

```
{
  "uuid": "5cf81b12-03c4-4e0d-ac4b-57036c176db7",
  "name": [
    {
      "value-name": "label",
      "value": "ODU1-unprotected-postman"
    }
  ],
  "end-point": [
    {
      "name": [
        {
          "value-name": "location",
          "value": "node:DELHI-NORTH-T-S-shelf:200-slot:16-port:7"
        }
      ],
      "layer-protocol-qualifier": "ODU1"
    }
  ],
  {
    "name": [
      {
        "value-name": "location",
        "value": "node:KOLKATA-EAST-T-S-shelf:201-slot:26-port:9"
      }
    ],
    "layer-protocol-qualifier": "ODU1"
  }
],
  "service-layer": "ODU",
  "lifecycle-state": "PLANNED",
  "operational-state": "ENABLED",
  "bulk-sync-url": "wss://<host>/mcp-view/api/v1/tapi/bulksync/core/connectivity-
service/?start_from=IW5F%3A1559763736194_0%3A500594682%3AAAAAAQAagzc%3D&q=header.key%20%3D%3D%205cf
81b12-03c4-4e0d-ac4b-57036c176db7"
}
```