对接ODL的南向设备报文

**更新时间**：2022年11月9日

**设备模型版本**：3.1.3

|  |  |  |
| --- | --- | --- |
| **时间/版本** | **人员** | **说明** |
| 2022年7月13日  v3.0.1 | 汪成龙 | 根据联通标准（V1.0）要求下，根据3.0.1下设备的下发和返回接口，确定报文格式，开始初步报文整理，建立模板 |
| 2022年10月10日  v3.0.6 | 汪成龙 | 联通标准（V1.0）要求下，根据3.0.6下设备的下发和返回接口调整报文 |
| 2022年11月9日  v3.1.3 | 汪成龙 | 新联通标准（V1.1）要求下调整报文  **标注说明**：   * 使用 的背景标注为修改或新增（基于前版本） |

**说明**

背景

本文档基于《中国联通接入型光传送网（OTN）管控平台接口规范》要求，按照其结构从上而下定义本文的模块及接口名称，结合ODL（OpenDaylight）服务器提供API及报文整理而得。

标注

**说明**：对接口功能、下发报文约束、返回报文约束的描述

**URL：**路径，当不存在完整路径描述时即为完整路径

**完整路径：**直接对接ODL接口（API）的完整路径

**请求：**对ODL接口（API）的请求方式，一般有GET、POST、PUT、DELETE

**下发报文：**发送到ODL接口的报文结构，一般PUT和POST请求需要下发报文

**返回报文：**请求下发到ODL侧返回的报文，一般GET和POST请求完成后会返回报文

**状态：**操作完成后HTTP响应的状态码

版本

**2022年7月13日**，确定建立该文档，并组织结构如标注说明，实验完成（除去Connections模块）的报文和URL，但由于设备功能不完善，只对设备基本属性数据进行读取测试，其他报文结构还未测试，本阶段网元层报文及ODL侧功能测试无问题。

**本版本下发报文 背景来标注，返回报文无颜色背景标注**。

**2022年10月10日**，底层软件升级到v3.0.6，本阶段对交叉连接（Connections）部分进行测试，由于下发报文导致设备掉线问题无法验证，解决了对数据修改的问题：ODL侧提供的edit-config接口，将修改的报文下发，修改成功。

本版本规定：**网元层级**的GET请求取数据在路径中均需要使用**operational**，POST请求需要在路径中使用**operations**，PUT请求在路径中用**config**，DELETE请求在路径中使用**config，**在URL中均如上标注。

**2022年11月9日**，由于底层软件的升级，改动和增加部分报文的字段。并且规范调整增加了如下接口：

①设置/查询性能状态

②创建/删除SDH-FTP 虚端口

③创建 SDH 线性复用段保护组

④增加/删除/查询 DHCP RELAY 目标服务器

⑤查询/删除/激活网元上的文件

本版本标注说明：较前版本改动不同、新增接口均用 此背景颜色来标注。

## 一、拓扑层级下的操作

### 创建/修改网元节点

|  |  |
| --- | --- |
| 说明 | 创建或修改网元节点信息 |
| URL | http://127.0.0.1:8181/restconf/**config**/network-topology:network-topology/topology/topology-netconf/node/{node-id} |
| 请求 | PUT |
| 下发报文 | {      "node": {          "node-id": "hclink3",//必选，网元节点名称，和路径中一致          "netconf-node-topology:host": "192.168.11.60",//必选，ip          "netconf-node-topology:password": "root",//必选，用户名          "netconf-node-topology:username": "dfqxyfy",//必选，密码          "netconf-node-topology:port": 830,//必选，端口，默认830          "netconf-node-topology:reconnect-on-changed-schema": **true**,//可选          "netconf-node-topology:tcp-only": **false**//可选      }  } |
| 状态 | 200 OK（存在数据时进行修改）/201 Created（当无此数据时） |

### 查询指定网元节点配置信息

|  |  |
| --- | --- |
| 说明 | 获取**指定网元节点**信息 |
| URL | http://127.0.0.1:8181/restconf/**config**/network-topology:network-topology/topology/topology-netconf/node/{node-id} |
| 请求 | GET |
| 返回报文 | {      "node": [          {              "node-id": "hclink3",              "netconf-node-topology:host": "192.168.11.60",              "netconf-node-topology:password": "dfqxyfy",              "netconf-node-topology:username": "root",              "netconf-node-topology:port": 830          }      ]  } |
| 状态 | 200 OK |

### 查询所有网元节点配置信息

|  |  |
| --- | --- |
| 说明 | 获取所有网元节点信息 |
| URL | http://127.0.0.1:8181/restconf/**config**/network-topology:network-topology/topology/topology-netconf |
| 请求 | GET |
| 返回报文 | {      "topology": [          {              "topology-id": "topology-netconf",              "node": [                  {                      "node-id": "hclink3",                      "netconf-node-topology:host": "192.168.11.60",                      "netconf-node-topology:password": "dfqxyfy",                      "netconf-node-topology:username": "root",                      "netconf-node-topology:port": 830                  },                  {                      "node-id": "hclink1",                      "netconf-node-topology:reconnect-on-changed-schema": **true**,                      "netconf-node-topology:host": "192.168.135.117",                      "netconf-node-topology:password": "root",                      "netconf-node-topology:username": "dfqxyfy",                      "netconf-node-topology:port": 830,                      "netconf-node-topology:tcp-only": **false**                  }              ]          }      ]  } |
| 状态 | 200 OK |

### 查询所有网元节点状态信息

|  |  |
| --- | --- |
| 说明 | 获取所有网元节点信息 |
| URL | http://127.0.0.1:8181/restconf/**operational**/network-topology:network-topology/topology/topology-netconf |
| 请求 | GET |
| 返回报文 | {      "topology": [          {              "topology-id": "topology-netconf",              "node": [                  {                      "node-id": "hclink3",                      "netconf-node-topology:host": "192.168.11.60",                      "netconf-node-topology:connection-status": "connected",                      "netconf-node-topology:port": 830                  },                  {                      "node-id": "hclink1",                      "netconf-node-topology:host": "192.168.135.117",                      "netconf-node-topology:connection-status": "connecting",                      "netconf-node-topology:port": 830                  }              ]          }      ]  } |
| 状态 | 200 OK |

### 查询指定网元节点状态信息

|  |  |
| --- | --- |
| 说明 | 获取**指定网元节点**信息 |
| URL | http://127.0.0.1:8181/restconf/**operational**/network-topology:network-topology/topology/topology-netconf/node/hclink3 |
| 请求 | GET |
| 返回报文 | {      "node": [          {              "node-id": "hclink3",              "netconf-node-topology:host": "192.168.11.60",              "netconf-node-topology:connection-status": "connected",              "netconf-node-topology:port": 830          }      ]  } |
| 状态 | 200 OK |

### 删除指定网元节点

|  |  |
| --- | --- |
| 说明 | **删除指定网元节点**信息 |
| URL | http://127.0.0.1:8181/restconf/**config**/network-topology:network-topology/topology/topology-netconf/node/hclink1 |
| 请求 | **DELETE** |
| 状态 | 200 OK |

## 二、网元层级下的操作

注：以网元hclink3为例

### 告警模块

#### 告警实时上报

|  |  |
| --- | --- |
| 说明 | 以通知方式实时上报 CPE-OTN 设备产生的告警信息，包括告警名称、告警位置、告警级别、告警类别、告警状态、告警产生和结束时间等信息  基于告警上报效率的要求，**告警详细原因（additional-text）通过 CPE-OTN 上报的告警中携带的alarm-serial-no 字段来自行关联**。  **返回值：**  ①告警状态(alarm-state)有:start、end  ②告警级别(perceived-severity)有：critical、major、minor、warning  **注：目前操作（operational、或者config）不确定** |
| 通知名称 | alarm-notification |
| 请求 | Notification |
| 返回报文 | {      "alarm": {          "alarm-serial-no": 16,//告警编号：告警唯一定位号          "alarm-state": "start",//告警状态：start或者end          "alarm-code": "OPT\_ABSENT",//告警编码：对应告警编码名称          "start-time": "2022-11-10T16:38:44+08:00",//开始时间          "end-time": "2022-11-10T16:38:44+08:00",//结束时间 **当前告警时为空**          "object-type": "PTP",//类型：ME、EQ、PTP等          "object-name": "PTP=/shelf=1/slot=5/subslot=1/port=8",//对象名称          "perceived-severity": "major"//告警级别：critical、major、minor、warning      }   } |
| 状态 | 200 OK |

### 设备不应答告警产生或结束状态实时上报

|  |  |
| --- | --- |
| 说明 | 以通知方式实时上报 CPE-OTN 设备产生的设备不应答告警状态，因为设备不应答告警不是设备直接产生的，如果serial-no是动态变化的，则可能与设备产生的其他告警的serial-no出现相同，影响正常告警的通过serial-no唯一定位，故设备不应答告警的serial-no固定为-1，当接收到告警通知后先判断告警编码是否为“设备不应答告警”，如果不是“设备不应答告警”，则根据serial-no来唯一确定一条告警，如果是设备不应答告警，因为多台设备产生的告警不应答告警，serial-no都是-1，需要根据me的值去进一步定位哪个设备的告警。  注：**需要后端接收ODL的消息队列的推送** |
| 通知名称 | alarm-notification |
| 请求 | Notification |
| 返回报文 | {          "alarm": {  "alarm-serial-no":-1,//不应答告警，serialno固定为-1  "object-name":"hclink3",//网元挂载点名称  "start-time":"2022-04-06T01:27:52.518Z",//结束告警时，不用关心该时间，时间取的是当前时间，并不准确  "end-time":"2022-09-20T14:58:46.831Z",//alarm-state=end时填写  "alarm-state":"end",//告警产生start或告警结束end  "object-type":"ME",//告警类型为网元  "perceived-severity":"major",//告警级别  "alarm-code":"Device\_does\_not\_response"//告警编码          }  } |
| 状态 | 200 OK |

### 查询指定告警序列号的告警

|  |  |
| --- | --- |
| 说明 | 接口返回指定序列号的单条告警。 |
| URL | http://127.0.0.1:8181/restconf/**operational**/acc-alarms:alarms/alarm/{alarm-serial-no} |
| 完整路径 | http://127.0.0.1:8181/restconf/**operational**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-alarms:alarms/alarm/{alarm-serial-no} |
| 请求 | GET |
| 返回报文 | {      "alarm": [          {              "alarm-serial-no": 16,              "alarm-state": "start",              "alarm-code": "OPT\_ABSENT",              "start-time": "2022-11-10T16:38:44+08:00",              "object-type": "PTP",              "object-name": "PTP=/shelf=1/slot=5/subslot=1/port=8",              "perceived-severity": "major"          }      ]  } |
| 状态 | 200 OK |

### 查询设备所有告警

|  |  |
| --- | --- |
| 说明 | 接口返回指定对象的所有告警，然后由CPE-OTN管控平台根据告警的产生时间进行二次过滤。 |
| URL | http://127.0.0.1:8181/restconf/**operational**/acc-alarms:alarms |
| 完整路径 | http://127.0.0.1:8181/restconf/**operational**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-alarms:alarms |
| 请求 | GET |
| 返回报文 | {    "alarms": {      "alarm": [        {          "alarm-serial-no": 1,          "alarm-state": "start",          "alarm-code": "OPT\_ABSENT",          "perceived-severity": "major",          "start-time": "2000-01-05T05:16:02.671Z",          "object-name": "PTP=/shelf=1/slot=1/subslot=1/port=1",          "object-type": "PTP"        },        {          "alarm-serial-no": 2,          "alarm-state": "start",          "alarm-code": "OPT\_ABSENT",          "perceived-severity": "major",          "start-time": "2000-01-05T05:16:02.671Z",          "object-name": "PTP=/shelf=1/slot=1/subslot=1/port=2",          "object-type": "PTP"        }      ]    }  } |
| 状态 | 200 OK |

### 查询设备历史告警

|  |  |
| --- | --- |
| 说明 | 通过输入查询条件，查询指定范围内的历史告警（前提条件：告警已经结束）。  **返回值：**  ①查询网元告警产生的起始时间（start-time）  ②查询网元告警产生的结束时间（end-time） |
| URL | http://127.0.0.1:8181/restconf/**operations**/acc-alarms:get-history-alarms |
| 完整路径 | http://127.0.0.1:8181/restconf/**operations**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-alarms:get-history-alarms |
| 请求 | POST |
| 下发报文 | {    "input": {      "start-time": "2022-10-09T10:04:18+08:00",//开始时间      "end-time": "2022-11-09T10:04:18+08:00"//结束时间    }  } |
| 返回报文 | {  "alarms": [{  "alarm-serial-no": "484571",  "object-name": "HC-OTN208\_BOX\_NETCONFIG",  "object-type": "PTP",  "alarm-code": "OPT\_MISMATCH",  "alarm-state": "start",  "perceived-severity": "critical",  "start-time": "2022-01-29T13:42:00Z",  "end-time": "2022-02-09T13:42:00Z"  }],  "tcas": [{  "tca-serial-no": "484571",  "tca-parameters": {  "tca-parameter": [{  "object-name": "PTP=/shelf=1/slot=8/subslot=1/port=101",  "pm-parameter-name": "OPT\_INPUTPOW",  "granularity": "15min",  "threshold-type": "low",  "object-type": "PTP",  "threshold-value": "1"  }]  },  "tca-state": "otn",  "current-value": "001",  "start-time": "2022-01-29T13:42:00Z",  "end-time": "2022-02-09T13:42:00Z"  }]  } |
| 状态 | 200 OK |

### 设置告警抑制状态

|  |  |
| --- | --- |
| 说明 | 如果某告警被设为抑制状态，相应的网元或单板将不再监视该告警。  命令直接下发到设备侧，CPE-OTN 无法查询到被抑制掉的告警。  对于端口告警抑制，只支持 PTP 端口。  如果厂家设备不支持,需要返回不支持的错误码。  设置告警抑制状态（alarm-mask-state= true/false）true表示告警不被监视，false表示告警监视开启。  备注： object-type=ME 时，表达的是整网元属性的告警；与其他类型是并列存在的关系。  **下发参数：**  ①告警抑制状态（alarm-mask-state）  ②指定查询告警抑制的对象名称和类型（object-name 和 object-type） （**不需要输入类型**）  ③指定查询告警抑制的告警编码（alarm-code）（可空）（**目前实现暂与规范不符,非空**）2022/10/10  返回参数：  设置成功  设置失败，并且返回错误码： 告警名称错误、对象类型错误、对象不存在 |
| URL | http://127.0.0.1:8181/restconf/**config**/acc-alarms:alarm-mask-states/alarm-mask-state/:{object-name}/:{alarm-code} |
| 完整路径 | http://127.0.0.1:8181/restconf/**config**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-alarms:alarm-mask-states/alarm-mask-state/:{object-name}/:{alarm-code} |
| 请求 | PUT |
| 下发报文 | {    "alarm-mask-state": {      "object-name": "PTP=/shelf=1/slot=9/subslot=1/port=1",      "alarm-code": "RS\_DEG",      "object-type": "PTP",      "mask-state": **false**    }  } |
| 状态 | 200 OK |

### 查询指定的告警抑制设置状态

|  |  |
| --- | --- |
| 说明 | 查询结果返回本级（objectType）对象告警抑制状态。  **下发参数：**  ①指定查询告警抑制的对象名称（objectName ）  ②类型（object-type）  ②告警编码（alarm-code）（可空） |
| URL | http://127.0.0.1:8181/restconf/**config**/acc-alarms:alarm-mask-states/alarm-mask-state/:{object-name}/:{alarm-code} |
| 完整路径 | http://127.0.0.1:8181/restconf/**config**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-alarms:alarm-mask-states/alarm-mask-state/:{object-name}/:{alarm-code} |
| 请求 | GET |
| 返回报文 | {      "alarm-mask-state": [          {              "object-name": "PTP=/shelf=1/slot=5/subslot=1/port=7/CTP=1",              "alarm-code": "ETH\_RDI",              "object-type": "CTP",              "mask-state": **false**          }      ]  } |
| 状态 | 200 OK |

### 查询所有的告警抑制

|  |  |
| --- | --- |
| 说明 | 查询结果返回全部对象告警抑制状态。 |
| URL | http://127.0.0.1:8181/restconf/**operational**/acc-alarms:alarm-mask-states |
| 完整路径 | http://127.0.0.1:8181/restconf/**operational**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-alarms:alarm-mask-states |
| 请求 | GET |
| 返回报文 | {      "alarm-mask-states": {          "alarm-mask-state": [              {                  "object-name": "PTP=/shelf=1/slot=5/subslot=1/port=7/CTP=1",                  "alarm-code": "ETH\_RDI",                  "object-type": "CTP",                  "mask-state": **false**              },              {                  "object-name": "PTP=/shelf=1/slot=8/subslot=1/port=101",                  "alarm-code": "ODUk\_PM\_AIS",                  "object-type": "PTP",                  "mask-state": **false**              }          ]      }  } |
| 状态 | 200 OK |

### 性能模块

#### 实时性能越限通知上报

|  |  |
| --- | --- |
| 说明 | 进行性能值预警的判断，根据门限设置等规则判断是否产生预警  单条上报 |
| URL | http://127.0.0.1:8181/restconf/config/acc-alarms:tcas |
| 请求 | Notification |
| 返回报文 | {    "tcas": {      "tca": {        "tca-parameter": {          "object-name": "PTP=/shelf=1/slot=9/subslot=1/port=7",          "granularity": "15min",          "object-type": "PTP",          "pm-parameter-name": "OPT\_INPUTPOW",          "threshold-type": "low",          "threshold-value": "-40.00"        },        "tca-serial-no": "1233830",        "tca-state": "start",        "start-time": "2000-01-16T06:05:54+08:00",        "current-value": "-40.00"      }    }  } |
| 状态 | 200 OK |

### 门限参数（tca-parameters）

#### 设置门限阈值

|  |  |
| --- | --- |
| 说明 | 设置性能越限阈值（设置的门限阀值仅设置在性能监控对象自身）  - granularity:{1min（只用于EthPerformance 定义的以太网业务性能） ,15min, 24h}  - threshold-type：{HIGH, LOW}  （**目前设置后会产生两条一致的数据**）-2022/10/10 |
| URL | http://127.0.0.1:8181/restconf/**config**/acc-alarms:tca-parameters/tca-parameter/:{object-name}/:{pm-parameter-name}/:{granularity}/:{threshold-type}/:{object-type} |
| 完整路径 | http://127.0.0.1:8181/restconf/**config**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-alarms:tca-parameters/tca-parameter/:{object-name}/:{pm-parameter-name}/:{granularity}/:{threshold-type}/:{object-type} |
| 请求 | PUT |
| 下发报文 | {    "tca-parameter": {          "object-name": "PTP=/shelf=1/slot=9/subslot=1/port=7",          "pm-parameter-name": "LASER\_TMP",          "granularity": "15min",          "threshold-type": "high",          "object-type": "PTP",          "threshold-value": 20      }  } |
| 状态 | 200 OK |

#### 查询指定门限阈值

|  |  |
| --- | --- |
| 说明 | 查询性能越限阈值  （输入值为：  ①需要查询的性能监控对象类型（object-type）：ME、EQ、PTP  ②需要查询的性能监控对象标识（object-name）：具体的ME、EQ、PTP的name字符串  ③周期类型（granularity）：15min、24h （目前还有1min）  ④性能参数名称(pm-parameter-name)：参考性能表中的性能参数代号（英文)  ⑤阈值类型(threshold-type) ）：HIGH，LOW |
| URL | http://127.0.0.1:8181/restconf/**config**/acc-alarms:tca-parameters |
| 完整路径 | http://127.0.0.1:8181/[/restconf/](http://192.168.10.58:8181/apidoc/explorer/index.html" \l "!/acc-alarms(2020-07-26)/GET_tca_parameter_get_20)**[config](http://192.168.10.58:8181/apidoc/explorer/index.html" \l "!/acc-alarms(2020-07-26)/GET_tca_parameter_get_20)**[/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-alarms:tca-parameters/tca-parameter/{object-name}/{pm-parameter-name}/{granularity}/{threshold-type}/{object-type}](http://192.168.10.58:8181/apidoc/explorer/index.html" \l "!/acc-alarms(2020-07-26)/GET_tca_parameter_get_20) |
| 请求 | GET |
| 返回报文 | {      "tca-parameter": [          {              "object-name": "PTP=/shelf=1/slot=9/subslot=1/port=4",              "pm-parameter-name": "LD\_BIAS",              "granularity": "15min",              "threshold-type": "low",              "object-type": "PTP",              "threshold-value": -60          }      ]  } |
| 状态 | 200 OK |

#### 查询所有门限阈值

|  |  |
| --- | --- |
| 说明 | 查询所有性能越限阈值 |
| URL | http://127.0.0.1:8181/restconf/**operational**/acc-alarms:tca-parameters |
| 完整路径 | http://127.0.0.1:8181/restconf/**operational**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-alarms:tca-parameters |
| 请求 | GET |
| 返回报文 | {      "tca-parameters": {          "tca-parameter": [              {                  "object-name": "PTP=/shelf=1/slot=9/subslot=1/port=4",                  "pm-parameter-name": "LD\_BIAS",                  "granularity": "15min",                  "threshold-type": "low",                  "object-type": "PTP",                  "threshold-value": -60              },              {                  "object-name": "PTP=/shelf=1/slot=5/subslot=1/port=5",                  "pm-parameter-name": "LASER\_TMP",                  "granularity": "15min",                  "threshold-type": "low",                  "object-type": "PTP",                  "threshold-value": -70              },  ]  }  } |
| 状态 | 200 OK |

### 查询指定当前性能

|  |  |
| --- | --- |
| 说明 | 查询当前性能（~~目前仅有加粗部分参数~~）  （①需要查询的性能监控对象标识（objectName）  ②周期类型（granularity）：15min、24h  ③**性能参数(pmParameterName)**(可选、可为空)最多只能指定一个参数，如果为空则返回全部  ④**性能任务开始时间（starTime）** ） |
| URL | http://127.0.0.1:8181/restconf/**operational**/acc-performance:performances/performance[/{object-name}/{pm-parameter-name}/{granularity}/{start-time}](http://192.168.10.58:8181/apidoc/explorer/index.html" \l "!/acc-performance(2020-07-26)/GET_performance_get_6) |
| 完整路径 | http://127.0.0.1:8181/restconf/operational/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-performance:performances/performance[/{object-name}/{pm-parameter-name}/{granularity}/{start-time}](http://192.168.10.58:8181/apidoc/explorer/index.html" \l "!/acc-performance(2020-07-26)/GET_performance_get_6) |
| 请求 | GET |
| 返回报文 | {  "performance": [              {                  "object-name": "PTP=/shelf=1/slot=5/subslot=1/port=1",                  "pm-parameter-name": "TX\_PKT\_SUM",                  "granularity": "15min",                  "start-time": "2022-11-11T10:00:00+08:00",                  "digital-pm-value": 0.00,                  "object-type": "PTP"              }  ]  } |
| 状态 | 200 OK |

### 查询所有性能

|  |  |
| --- | --- |
| 说明 | 查询所有性能 |
| URL | http://127.0.0.1:8181/restconf/**operational**/acc-performance:performances |
| 完整路径 | http://127.0.0.1:8181/restconf/operational/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-performance:performances |
| 请求 | GET |
| 返回报文 | {      "performances": {          "performance": [              {                  "object-name": "PTP=/shelf=1/slot=5/subslot=1/port=1",                  "pm-parameter-name": "TX\_PKT\_SUM",                  "granularity": "15min",                  "start-time": "2022-11-11T10:00:00+08:00",                  "digital-pm-value": 0.00,                  "object-type": "PTP"              },              {                  "object-name": "PTP=/shelf=1/slot=5/subslot=1/port=1",                  "pm-parameter-name": "TX\_PKT\_SUM",                  "granularity": "24h",                  "start-time": "2022-11-11T08:00:00+08:00",                  "digital-pm-value": 0.00,                  "object-type": "PTP"              },  ]  }  } |
| 状态 | 200 OK |

### 查询历史性能

|  |  |
| --- | --- |
| 说明 | 查询历史性能（标准的RPC请求）  （查询的性能监测点的对象过滤条件，包括：  ①需要查询的性能监控对象标识（objectName） **对于查询网元下全部监测点的场景，该字**  **段下发“all”。**  ②周期类型（granularity）：15min、24h  ③性能参数(pmParameterName)(可选、可为空) 最多只能指定一个参数，如果为空则返回全部起始时间和终止时间  ） |
| URL | http://127.0.0.1:8181/restconf/**operations**/acc-performance:get-history-performance-monitoring-data |
| 完整路径 | http://127.0.0.1:8181/restconf/**operations**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-performance:get-history-performance-monitoring-data |
| 请求 | POST |
| 下发报文 | {      "input" :{          "start-time": "2022-09-03T07:30:00+08:00",          "end-time": "2022-11-11T10:00:00+08:00",          "object-name": "PTP=/shelf=1/slot=5/subslot=1/port=1",          "granularity": "15min",          "pm-parameter-name": "TX\_PKT\_SUM"      }  } |
| 返回报文 | {    "output": {      "performances": {          "performance": [              {                  "object-name": "PTP=/shelf=1/slot=5/subslot=1/port=1",                  "pm-parameter-name": "TX\_PKT\_SUM",                  "granularity": "15min",                  "start-time": "2022-11-11T10:00:00+08:00",                  "digital-pm-value": 0.00,                  "object-type": "PTP"              },              {                  "object-name": "PTP=/shelf=1/slot=5/subslot=1/port=1",                  "pm-parameter-name": "TX\_PKT\_SUM",                  "granularity": "15min",                  "start-time": "2022-11-11T08:00:00+08:00",                  "digital-pm-value": 0.00,                  "object-type": "PTP"              }          ]      }    }  } |
| 状态 | 200 OK |

### 设置性能状态

|  |  |
| --- | --- |
| 说明 | 设置性能状态（标准的RPC请求）  设置对象及性能参数，包括：  ①性能监控对象标识（object-name）  ②性能监控对象类型（object-type）  ③是否包含子对象（include-sub-obj）：可选，默认不包含子对象  ④周期类型（granularity）：15min、24h，不下发时，代表均设置  ⑤性能参数(pm-parameter-name)(可选、可为空) 最多只能指定一个参数，如果空则代表全部参数  ⑥对象的性能监控开关状态（pm-state）：true（打开）、false（关闭） |
| URL | http://127.0.0.1:8181/restconf/**operations**/acc-performance:set-pm-state |
| 完整路径 | http://127.0.0.1:8181/restconf/**operations**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-performance:set-pm-state |
| 请求 | POST |
| 下发报文 | {    "input": {      "object-name": "PTP=/shelf=1/slot=5/subslot=1/port=1",      "object-type": "PTP",      "include-sub-obj": **false**,//默认false      "granularity": "15min",      "pm-parameter-name": "RX\_PKT\_SUM",      "pm-state": **true**    }  } |
| 状态 | 200 OK |

### 查询性能状态

|  |  |
| --- | --- |
| 说明 | 查询性能状态（标准的RPC请求）  查询性能参数，包括：  ①性能监控对象标识（object-name）  ②性能监控对象类型（object-type）  ③是否包含子对象（include-sub-obj）：可选，默认不包含子对象  ④周期类型（granularity）：15min、24h，不下发时，代表均设置  ⑤性能参数(pm-parameter-name)(可选、可为空) 最多只能指定一个参数，如果空则代表全部参数 |
| URL | http://127.0.0.1:8181/restconf/**operations**/acc-performance:get-pm-state |
| 完整路径 | http://127.0.0.1:8181/restconf/**operations**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-performance:get-pm-state |
| 请求 | POST |
| 下发报文 | {    "input": {      "object-name": "PTP=/shelf=1/slot=5/subslot=1/port=1",      "object-type": "PTP",      "include-sub-obj": **false**,//默认false      "granularity": "15min",  "pm-parameter-name": "RX\_PKT\_SUM"  }  } |
| 返回报文 | {    "output": {      "report-policy": "all",      "pm-state": [        {          "object-name": "PTP=/shelf=1/slot=5/subslot=1/port=1",          "pm-parameter-name": "RX\_PKT\_SUM",          "granularity": "15min",          "object-type": "PTP",          "pm-state": **false**        }      ]    }  } |
| 状态 | 200 OK |

### 故障诊断

#### 执行端口环回操作-PTP

|  |  |
| --- | --- |
| 说明 | 环回类型解释：  内环回：指在本端设备内将已经经过信号处理，即将从输出口输出的信号再环回到本段设备的信号输入端。内环回操作可用于测试信号在单板中的处理是否正常。  外环回：指不改变信号结构，将接入本端设备的信号在信号处理之前直接环回至其对应输出端口的环回操作。外环回可用于测试光纤线路和连接器。  必须支持 PTP 的环回设置  **输入值：**  ①端口唯一标识符(tpName)（可以是 PTP/CTP/FTP 以PTP为例）  ②环回类型(loopbackType)：{FACILITY\_LOOPBACK（外环回）,TERMINAL\_LOOPBACK（内环回）,MAC\_FACILITY\_LOOPBACK（外环回）,MAC\_TERMINAL\_LOOPBACK（内环回）, NON\_LOOPBACK（无环回）} |
| URL | http://127.0.0.1:8181/restconf/**operations**/ietf-netconf:edit-config |
| 完整路径 | http://127.0.0.1:8181/restconf/**operations**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/ietf-netconf:edit-config |
| 请求 | POST |
| 下发报文 | {    "input": {      "target": {        "running": ""      },      "config": {          "ptps":{              "ptp":{                  "name":"PTP=/shelf=1/slot=3/subslot=1/port=101",                  "loop-back": "terminal-loopback"                  //[facility-loopback, terminal-loopback, mac-facility-loopback, mac-terminal-loopback, non-loopback]              }          }      }    }  } |
| 状态 | 200 OK |

### 执行端口环回操作-CTP

|  |  |
| --- | --- |
| 说明 | 环回类型解释：  内环回：指在本端设备内将已经经过信号处理，即将从输出口输出的信号再环回到本段设备的信号输入端。内环回操作可用于测试信号在单板中的处理是否正常。  外环回：指不改变信号结构，将接入本端设备的信号在信号处理之前直接环回至其对应输出端口的环回操作。外环回可用于测试光纤线路和连接器。  必须支持 PTP 的环回设置  **输入值：**  ①端口唯一标识符(tpName)（可以是 PTP/CTP/FTP 以PTP为例，路径和端口名变动）  ②环回类型(loopbackType)：{FACILITY\_LOOPBACK（外环回）,TERMINAL\_LOOPBACK（内环回）,MAC\_FACILITY\_LOOPBACK（外环回）,MAC\_TERMINAL\_LOOPBACK（内环回）, NON\_LOOPBACK（无环回）} |
| URL | http://127.0.0.1:8181/restconf/**operations**/ietf-netconf:edit-config |
| 完整路径 | http://127.0.0.1:8181/restconf/**operations**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/ietf-netconf:edit-config |
| 请求 | POST |
| 下发报文 | {    "input": {      "target": {        "running": ""      },      "config": {          "ctps":{              "ctp":{                  "name":"PTP=/shelf=1/slot=6/subslot=1/port=102/CTP=1",                  "loop-back": "terminal-loopback"                  //[facility-loopback, terminal-loopback, mac-facility-loopback, mac-terminal-loopback, non-loopback]              }          }      }    }  } |
| 状态 | 200 OK |

### 执行端口环回操作-FTP

|  |  |
| --- | --- |
| 说明 | 环回类型解释：  内环回：指在本端设备内将已经经过信号处理，即将从输出口输出的信号再环回到本段设备的信号输入端。内环回操作可用于测试信号在单板中的处理是否正常。  外环回：指不改变信号结构，将接入本端设备的信号在信号处理之前直接环回至其对应输出端口的环回操作。外环回可用于测试光纤线路和连接器。  必须支持 PTP 的环回设置  **输入值：**  ①端口唯一标识符(tpName)（可以是 PTP/CTP/FTP 以PTP为例，路径和端口名变动）  ②环回类型(loopbackType)：{FACILITY\_LOOPBACK（外环回）,TERMINAL\_LOOPBACK（内环回）,MAC\_FACILITY\_LOOPBACK（外环回）,MAC\_TERMINAL\_LOOPBACK（内环回）, NON\_LOOPBACK（无环回）} |
| URL | http://127.0.0.1:8181/restconf/**operations**/ietf-netconf:edit-config |
| 完整路径 | http://127.0.0.1:8181/restconf/**operations**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/ietf-netconf:edit-config |
| 请求 | POST |
| 下发报文 | {    "input": {      "target": {        "running": ""      },      "config": {          "ftps":{              "ftp":{                  "name":"FTP=/shelf=1/slot=5/subslot=1/port=201",                  "loop-back": "terminal-loopback"                  //[facility-loopback, terminal-loopback, mac-facility-loopback, mac-terminal-loopback, non-loopback]              }          }      }    }  } |
| 状态 | 200 OK |

### 查询端口的环回状态

|  |  |
| --- | --- |
| 说明 | 查询网元上所有端口维护操作状态  若支持 FTP/CTP 环回，查询结果需要包含环回状态。  无环回是查询结果值为空。  支持网元和端口两种查询粒度。  **返回值：**  ①端口名称（tpName）  ②环回类型(loopbackType) |
| URL | [http://127.0.0.1:8181/restconf/](http://127.0.0.1:8181/restconf/operational/acc-devm:ptps)**[operations](http://127.0.0.1:8181/restconf/operational/acc-devm:ptps)**[/ietf-netconf:get](http://127.0.0.1:8181/restconf/operational/acc-devm:ptps) |
| 完整路径 | http://127.0.0.1:8181/restconf/**operations**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/ietf-netconf:get |
| 请求 | POST |
| 下发报文 | {    "input": {      "filter": {          "ptps":{              "ptp":{                  "name":"PTP=/shelf=1/slot=3/subslot=1/port=101",                  "loop-back":""              }          }      },      "ietf-netconf-with-defaults:with-defaults": "report-all-tagged"      //[report-all, report-all-tagged, trim, explicit]    }  } |
| 返回报文 | {      "output": {          "data": {              "ptps": {                  "ptp": {                      "name": "PTP=/shelf=1/slot=3/subslot=1/port=101",                      "loop-back": "terminal-loopback"                  }              }          }      }  } |
| 状态 | 200 OK |

### 单板复位

|  |  |
| --- | --- |
| 说明 | 对指定单板进行软、硬复位。  可调衰耗和可设置增益等设置值在单板复位后的值须与复位前保持一致。  软复位(soft-reset)：复位软件，不影响业务  硬复位(hard-reset)：包括软件和硬件的复位，影响业务  **输入值：**  ①要复位的单板名称（eq-name）  ②维护操作命令类型(reset-type)：{soft-reset(软复位)、hard-reset(硬复位)} |
| URL | http://127.0.0.1:8181/restconf/**operations**/acc-devm:reset |
| 完整路径 | http://127.0.0.1:8181/restconf/**operations**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:reset |
| 请求 | POST |
| 下发报文 | {      "input": {          "eq-name": "2022-08-31T15:02:36.320Z",          "reset-type":"soft-reset"//soft-reset、 hard-reset      }  } |
| 状态 | 200 OK |

### 打开/关闭端口激光器

|  |  |
| --- | --- |
| 说明 | 对指定单板端口激光器进行打开、关闭操作。  可以执行激光器关断的设备包括光支路板、光线路板。  **输入值：**  ①端口标识符名称（ptp-name）  ②激光器开关（laser-status）：{laser-on, laser-off} |
| URL | http://127.0.0.1:8181/restconf/**operations**/ietf-netconf:edit-config |
| 完整路径 | http://127.0.0.1:8181/restconf/**operations**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/ietf-netconf:edit-config |
| 请求 | POST |
| 下发报文 | {    "input": {      "target": {        "running": ""      },      "config": {          "ptps":{              "ptp":{                  "name":"PTP=/shelf=1/slot=5/subslot=1/port=1",                  "laser-status": "laser-on"  //可选：laser-on、laser-off，默认为laser-on  //注意：对于"laser-status": "no-optical-module"时，不可以打开/关闭激光器              }          }      }    }  } |
| 状态 | 200 OK |

### 查询激光器工作状态

|  |  |
| --- | --- |
| 说明 | 查询指定单板端口激光器工作状态。  **输入值：**  ①端口唯一标识符（ptp-name）  ②激光器字段（laser-status）  **返回值：**  ①端口标识符名称（ptp-name）  ②激光器开关（laser-status）： laser-on,laser-off,no-optical-module |
| URL | http://127.0.0.1:8181/restconf/**operations**/ietf-netconf:get |
| 完整路径 | http://127.0.0.1:8181/restconf/**operations**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/ietf-netconf:get |
| 请求 | GET |
| 下发报文 | {    "input": {      "filter": {          "ptps":{              "ptp":{                  "name":"PTP=/shelf=1/slot=5/subslot=1/port=1",                  "laser-status":""              }          }      }    }  } |
| 返回报文 | {      "output": {          "data": {              "ptps": {                  "ptp": {                      "name": "PTP=/shelf=1/slot=5/subslot=1/port=1",                      "laser-status": "laser-on"                  }              }          }      }  } |
| 状态 | 200 OK |

### Connection下的操作

#### ETH

#### 创建ETH连接

|  |  |
| --- | --- |
| 说明 | 创建连接（createEthConnection）前提：存在要创建 Connection 的相关资源  **输入值：**  ①连接名称(connectionName):可选  ②业务类型（serviceType）  ③连接层协议名称（layerProtocolName）  layerProtocolName:['ETH', 'ODU' ,'SDH','OCH',OMS],  ④请求带宽（requestedCapacity）  ⑤以太网UNI（ethUNI）属性：可选，用于建立以太网业务  - 客户侧物理端口名称（uniPtpName）  - 客户Vlan属性（Client-vlanSpec）：用于客户Vlan的匹配校验，创建EVPL业务时使用；  - 入口Vlan属性（Uni-VlanSpec）：用于客户VLAN是否变更；keep和exchange操作；  - FTPVlan属性（Ftp-VlanSpec）：用于网络的S-VLAN的配置；push-pop操作；  远端设备也将是采用同样的结构  ⑥主用NNI属性（primaryNNI）  - 线路侧物理端口名称（nniPtpName）  - 线路侧时隙信息（nniTsDetail）  - 净荷类型（oduSignalType）  oduSignalType:['ODU0','ODU1' ,'ODU2' , 'ODU4' , 'STM-1' ,'STM-4', 'STM-16' ,'STM-64' , 'GE','10GE-LAN']  - 适配类型（adaptationType）  默认使用GFP-F  adaptationType:['CBR\_AMP', 'CBR\_BMP', 'GFP-T' ,'GFP-F', 'NULL', 'PRBS' ,'CBRx', 'CBRX\_GMP' ,'ODUij' ,'ODUj21','ODUk ','unknown']  默认使用GFP-F  {CBR\_AMP,CBR\_BMP,GFP-T,GFP-F,NULL,PRBS ,CBRx ,CBRX\_GMP ,ODUij ,ODUj21 ,ODUk ,unknown}  - 交换能力（switchCapability）  {ODU0,ODU1 ,ODU2 ,ODU2e ,ODU3 ,ODU4 ,ODUflex-GFP ,ODUflex-CBR}  ⑦ 备用NNI属性（secondaryNNI）:可选，参数同主用NNI，用于建立SNCP 1+1业务。  **返回值：**  ①所创建的连接(connection)。  ②另外通过接口返回参数返回创建的FTP、服务层CTP等 |
| URL | http://127.0.0.1:8181/restconf/**operations**/acc-eth:create-eth-connection |
| 完整路径 | http://127.0.0.1:8181/restconf/**operations**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-eth:create-eth-connection |
| 请求 | POST |
| 下发报文 | {    "input": {      "service-type": "EPL",      "layer-protocol-name": "acc-eth:ETH",      "requested-capacity": {        "total-size": 2000,        "cir": 999,        "pir": 1001,        "cbs": 1002,        "pbs": 1003      },      "eth-uni": {        "uni-ptp-name": "PTP=/shelf=1/slot=5/subslot=1/port=7"      },      "primary-nni-1": {        "nni-ptp-name": "PTP=/shelf=1/slot=6/subslot=1/port=102",        "nni-ts-detail": "8-80"      },      "secondary-nni-1": {        "nni-ptp-name": "PTP=/shelf=1/slot=6/subslot=1/port=102",        "nni-ts-detail": "8-40"      }    }  } |
| 返回报文 | {      "output": {          "connection": {              "layer-protocol-name": "acc-eth:ETH",              "requested-capacity": {                  "pbs": 1003,                  "pir": 1001,                  "cbs": 1002,                  "cir": 999              },              "service-type": "EPL",              "state-pac": {                  "admin-state": "enabled",                  "operational-state": "up"              },              "ctp": [                  "FTP=/shelf=1/slot=5/subslot=1/port=201/CTP=2",                  "PTP=/shelf=1/slot=5/subslot=1/port=7/CTP=1"              ],              "name": "CONNECTION=ETH1"          },          "create-component": {              "ftp-name": [                  "FTP=/shelf=1/slot=5/subslot=1/port=201"              ],              "ctp-name": [                  "PTP=/shelf=1/slot=6/subslot=1/port=102/CTP=1",                  "PTP=/shelf=1/slot=6/subslot=1/port=102/CTP=2"              ]          }      }  } |
| 状态 | 200 OK |

#### 创建 ETH-ETH connection

|  |  |
| --- | --- |
| 说明 | **输入值：**  ①连接名称(connectionName):可选  ②业务类型（serviceType）  ③连接层协议名称（layerProtocolName）  ④请求带宽（requestedCapacity）  ⑤以太网UNI（ethUNI）属性：可选，用于建立以太网业务  - 客户侧物理端口名称（uniPtpName）  - 客户Vlan属性（Client-vlanSpec）：用于客户Vlan的匹配校验；  - 入口Vlan属性（Uni-VlanSpec）：用于客户VLAN是否变更；keep和exchange操作；  - 线路侧Vlan属性（Nni-VlanSpec）：用于选路侧VLAN的配置  ⑥主用ETH-NNI属性（primaryEthNNI）  - 线路侧物理端口名称（nniPtpName）  - 客户Vlan属性（Client-vlanSpec）：用于客户Vlan的匹配校验；  - 入口Vlan属性（Nni-VlanSpec）：用于客户VLAN是否变更；keep和exchange操作；  - FTPVlan属性（Ftp-VlanSpec）：用于网络的S-VLAN的配置；push-pop操作；  ⑦LAG保护属性：  - LAG组FTP名称（lag-ftp-name） |
| URL | http://127.0.0.1:8181/restconf/**operations**/acc-eth:create-eth-to-eth-connection |
| 完整路径 | http://127.0.0.1:8181/restconf/**operations**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-eth:create-eth-to-eth-connection |
| 请求 | POST |
| 下发报文 | {    "input": {      //"connection-name": "Optional.empty",      "service-type": "EPL",      "layer-protocol-name": "ETH",      "requested-capacity": {        "total-size": 4000,        "cir": 1000,        "pir": 1001,        "cbs": 1002,        "pbs": 1003      },      "eth-uni": {        "uni-ptp-name": "PTP=/shelf=1/slot=5/subslot=1/port=8"      },      "primary-eth-nni": {        "nni-ptp-name": "PTP=/shelf=1/slot=6/subslot=1/port=108"      }      //"lag-ftp-name": "Optional.empty"    }  } |
| 状态 | 200 OK |

#### 修改ETH带宽（暂无）

|  |  |
| --- | --- |
| 说明 |  |
| URL |  |
| 请求 |  |
| 下发报文 |  |
| 状态 | 200 OK |

### SDH

#### 创建SDH连接

|  |  |
| --- | --- |
| 说明 | 创建 SDH connection 前提：存在要创建 Connection 的相关资源  **输入值：**  ①连接名称(connectionName):可选  ②业务类型（serviceType）  ③连接层协议名称（layerProtocolName）  ④请求带宽（requestedCapacity）  ⑤SDH-UNI属性  - 客户侧物理端口名称（uniPtpName）  - 交换颗粒：vcType :{VC4 ,VC3 ,VC12}  - A-CTP映射路径：mappingPath  ⑥ SDH NNI属性  - ftp客户信号类型：sdhSignalType  - Z-CTP映射路径：mappingPath  - ftp客户信号类型（保护）：sdhSignalType  - Z-CTP映射路径（保护）：mappingPath  ⑦主用ODU NNI属性（primaryNNI）  - 线路侧物理端口名称（nniPtpName）  - 线路侧时隙信息（nniTsDetail）  - 净荷类型（oduSignalType）  oduSignalType:['ODU0','ODU1' ,'ODU2' , 'ODU4' , 'STM-1' ,'STM-4', 'STM-16' ,'STM-64' , 'GE','10GE-LAN']  - 适配类型（adaptationType）  默认使用GFP-F  adaptationType:['CBR\_AMP', 'CBR\_BMP', 'GFP-T' ,'GFP-F', 'NULL', 'PRBS' ,'CBRx', 'CBRX\_GMP' ,'ODUij' ,'ODUj21','ODUk ','unknown']  - 交换能力（switchCapability）  {ODU0,ODU1 ,ODU2 ,ODU2e ,ODU3 ,ODU4 ,ODUflex-GFP ,ODUflex-CBR}  ⑧备用ODU NNI属性（secondaryNNI）:可选，参数同主用NNI，用于建立SNCP 1+1业务  **返回值：**  ①所创建的连接(connection)  ②另外通过接口返回参数返回创建的FTP、服务层CTP等 |
| URL | http://127.0.0.1:8181/restconf/**operations**/acc-sdh:create-sdh-connection |
| 完整路径 | http://127.0.0.1:8181/restconf/**operations**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-sdh:create-sdh-connection |
| 请求 | POST |
| 下发报文 | {    "input": {      "connection-name": "Optional-TEST",//连接名称，即使指定也另起名      "service-type": "SDH",//EPL、EVPL、SDH、ODU      "layer-protocol-name": "SDH",      "requested-capacity": {        "total-size": 2000,        "cir": 999,        "pir": 1001,        "cbs": 1002,        "pbs": 1003      },      "sdh-uni": {        "uni-ptp-name": "PTP=/shelf=1/slot=9/subslot=1/port=5",        "vc-type": "VC4",//交换颗粒 VC12, VC3, VC4        "ctp-mapping-path": "1-1-1-1"//A-CTP映射路径      },      "primary-nni-1": {        "vc-type": "VC4",        "nni-ptp-name": "PTP=/shelf=1/slot=6/subslot=1/port=107",        "nni-ts-detail": "2-40",        "adaptation-type": "ODUj21",//CBR\_AMP, CBR\_BMP, GFP-T, GFP-F, CBRx, TTT+GMP, CBRX\_GMP, ODUij, ODUj21, ODUk        "client-signal-type": "acc-otn:ODU0",//STM1, STM4, STM16, STM64, STM256        "switch-capability": "ietf-otn-types:ODU1",//VC3 VC4 VC12        "sdh-spec": {          "sdh-type": "STM1",//STM1, STM4, STM16, STM64, STM256          "ctp-mapping-path": "1-1-1-1"        }      },      "secondary-nni-1": {        "vc-type": "VC4",        "nni-ptp-name": "PTP=/shelf=1/slot=6/subslot=1/port=107",        "nni-ts-detail": "2-80",        "adaptation-type": "ODUj21",//CBR\_AMP, CBR\_BMP, GFP-T, GFP-F, CBRx, TTT+GMP, CBRX\_GMP, ODUij, ODUj21, ODUk        "client-signal-type": "acc-otn:ODU0",//STM1, STM4, STM16, STM64, STM256          //"switch-capability": "ietf-otn-types:ODU1",//VC3 VC4 VC12        "sdh-spec": {          "sdh-type": "STM1",//STM1, STM4, STM16, STM64, STM256          "ctp-mapping-path": "1-1-1-1"        }      }    }  } |
| 返回报文 | {      "output": {          "create-component": {              "ftp-name": [                  "FTP=/shelf=1/slot=5/subslot=1/port=206"              ],              "ctp-name": [                  "PTP=/shelf=1/slot=6/subslot=1/port=107/CTP=2"              ]          },          "connection": {              "layer-protocol-name": "acc-sdh:SDH",              "name": "CONNECTION=SDH2",              "requested-capacity": {                  "total-size": 4006              },              "ctp": [                  "PTP=/shelf=1/slot=9/subslot=1/port=5/CTP=528",                  "FTP=/shelf=1/slot=5/subslot=1/port=206/CTP=529"              ],              "state-pac": {                  "admin-state": "enabled",                  "operational-state": "up"              },              "service-type": "SDH"          }      }  } |
| 状态 | 200 OK |

### ODU

#### 创建ODU连接

|  |  |
| --- | --- |
| 说明 | 创建 ODU connection 前提：存在要创建 Connection 的相关资源  **输入值：**  ①连接名称(connectionName):可选  ②业务类型（serviceType）  ③连接层协议名称（layerProtocolName）  ④请求带宽（requestedCapacity）  ⑤客户侧OTN接口属性（clientSideNNI）  - 客户侧物理端口名称（uniPtpName）  - 客户侧时隙信息（uniTsDetail）  - 净荷类型（oduSignalType）(**以下相同名称可选value一致，不再赘述**)  oduSignalType:['ODU0','ODU1' ,'ODU2' , 'ODU4' , 'STM-1' ,'STM-4', 'STM-16' ,'STM-64' , 'GE','10GE-LAN']  - 适配类型（adaptationType）  默认使用GFP-F  adaptationType:['CBR\_AMP', 'CBR\_BMP', 'GFP-T' ,'GFP-F', 'NULL', 'PRBS' ,'CBRx', 'CBRX\_GMP' ,'ODUij' ,'ODUj21','ODUk ','unknown']  - 交换能力（switchCapability）  {ODU0,ODU1 ,ODU2 ,ODU2e ,ODU3 ,ODU4 ,ODUflex-GFP ,ODUflex-CBR}  ⑥主用NNI-1属性（primaryNNI-1）  - 线路侧物理端口名称（nniPtpName）  - 线路侧时隙信息（nniTsDetail）  - 适配类型（adaptationType）  - 交换能力（switchCapability）  ⑦备用NNI-1属性（secondaryNNI-1）:可选，参数同主用NNI，用于建立SNCP 1+1业务  ⑧主用NNI-2属性（primaryNNI-1）：用于NNI-NNI场景。  NNI-NNI的交叉创建：  1) 连接名称(connectionName):可选  2) 业务类型（serviceType）  3) 连接层协议名称（layerProtocolName）  4) 请求带宽（requestedCapacity）  5) 主用NNI-1属性（primaryNNI-1）  - 线路侧物理端口名称（nniPtpName）  - 线路侧时隙信息（nniTsDetail）  - 适配类型（adaptationType）  - 交换能力（switchCapability）  - 客户信号类型（client-signal-type）  6) 备用NNI-1属性（secondaryNNI-1）:可选，参数同主用NNI，用于建立SNCP 1+1业 务  7) 主用NNI-2属性（primaryNNI-2）：  - 线路侧物理端口名称（nniPtpName）  - 线路侧时隙信息（nniTsDetail）  - 适配类型（adaptationType）  - 交换能力（switchCapability）  - 客户信号类型（client-signal-type）  **返回值：**  ①所创建的连接(connection) |
| URL | http://127.0.0.1:8181/restconf/**operations**/acc-otn:create-odu-connection |
| 完整路径 | http://127.0.0.1:8181/restconf/**operations**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-otn:create-odu-connection |
| 请求 | POST |
| 下发报文 | {    "input": {      //"connection-name": "Optional.empty",      "service-type": "ODU",      "layer-protocol-name": "ODU",      "requested-capacity": {        "total-size": 4007,        "cir": 1000,        "pir": 1001,        "cbs": 1002,        "pbs": 1003      },      "client-side-uni": {        "nni-ptp-name": "PTP=/shelf=1/slot=7/subslot=1/port=2",        "nni-ts-detail": "8-80",        "adaptation-type": "ODUk",        "client-signal-type": "acc-otn:ODU1",        "switch-capability": "ietf-otn-types:ODU2"      },      "primary-nni-1": {        "nni-ptp-name": "PTP=/shelf=1/slot=6/subslot=1/port=108",        "nni-ts-detail": "8-80",        "adaptation-type": "ODUj21",        "client-signal-type": "ODU0",        "switch-capability": "ietf-otn-types:ODU2"      },      "secondary-nni-1": {         "nni-ptp-name": "PTP=/shelf=1/slot=6/subslot=1/port=108",        "nni-ts-detail": "8-40",        "adaptation-type": "ODUj21",        "client-signal-type": "acc-otn:ODU0",         "switch-capability": "ietf-otn-types:ODU0"      }    }  } |
| 返回报文 | {      "output": {          "connection": {              "service-type": "ODU",              "ctp": [                  "PTP=/shelf=1/slot=6/subslot=1/port=101/CTP=1",                  "PTP=/shelf=1/slot=6/subslot=1/port=108/CTP=2",                  "PTP=/shelf=1/slot=6/subslot=1/port=108/CTP=1"              ],              "requested-capacity": {                  "total-size": 4007              },              "state-pac": {                  "operational-state": "up",                  "admin-state": "enabled"              },              "name": "CONNECTION=ODU5",              "layer-protocol-name": "acc-otn:ODU"          }      }  } |
| 状态 | 200 OK |

#### 修改ODU带宽

|  |  |
| --- | --- |
| 说明 | 存在相关 ODU 资源  **输入值：**  ①ODU 交叉连接端口（OduCtpName）  ②端口位置（oduPosition）：clientODU/lineODU  - Client ODU（不需要时隙列表，BWR 协议）  - LineODU（需要时隙列表，LCR 协议）  ③动作：对 ODU 交叉的操作 增加、删除、终止  ④交换能力（switchCapability.）  ⑤目标 ODU 时隙个数（currentNumberOfTributarySlots）  ⑥目标 ODU 时隙列表（tsDetail，可选，ClientODU 不需要）  ⑦超时时间（timeOut，秒）  **返回值：**  ①成功/失败标志 |
| URL | http://127.0.0.1:8181/restconf/**operations**/acc-otn:modify-odu-connection-capacity |
| 完整路径 | http://127.0.0.1:8181/restconf/**operations**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-otn:modify-odu-connection-capacity |
| 请求 | POST |
| 下发报文 | {    "input": {      "odu-ctp-name": "PTP=/shelf=1/slot=6/subslot=1/port=102/CTP=1",      //"position": "Optional.empty",      //"action": "Optional.empty",      "switch-capability": "ietf-otn-types:ODU1",      //"current-number-of-tributary-slots": "Optional.empty",      "ts-detail": "2-40",      "timeout": 200    }  } |
| 状态 | 200 OK |

### EOS

#### 创建EOS连接

|  |  |
| --- | --- |
| 说明 | 创建 EOS connection 前提：存在要创建 Connection 的相关资源  （①连接名称(connectionName):可选  ②业务类型（serviceType）:EPL/EVPL  ③连接层协议名称（layerProtocolName）:ETH  ④请求带宽（requestedCapacity）  ⑤以太网UNI（ethUNI）属性：可选，用于建立以太网业务  - 客户侧物理端口名称（uniPtpName）  - 客户Vlan属性（Client-vlanSpec）：用于客户Vlan的匹配校验；  - 入口Vlan属性（Uni-VlanSpec）：用于客户VLAN是否变更；keep和exchange操作；  - FTPVlan属性（Ftp-VlanSpec）：用于网络的S-VLAN的配置；push-pop操作；  ⑥主用NNI属性（primaryNNI）  - 线路侧物理端口名称（nniPtpName）  - 线路侧时隙信息（nniTsDetail）  - 适配类型（adaptationType）  - 交换能力（switchCapability）  ⑦备用NNI属性（secondaryNNI）:可选，参数同主用NNI，用于建立SNCP 1+1业务  ⑧ EoS属性  - STM-N类型（sdhSignalType）  - STM-N类型（sdhSignalType-protect）  - VC类型（vcType）  - VC占用列表（mappingPath）  - VC占用列表（mappingPath-protect）  - LCAS使能（lcasEnable）  - HoldOff时间（HoldOff）  - WTR时间（WTR）  - TSD使能（tsdEnable）  ） |
| URL | http://127.0.0.1:8181/restconf/**operations**/acc-eos:create-eos-connection |
| 完整路径 | http://127.0.0.1:8181/restconf/**operations**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-eos:create-eos-connection |
| 请求 | POST |
| 下发报文 | {    "input": {      //"connection-name": "Optional.empty",      "service-type": "EPL",      "layer-protocol-name": "acc-eth:ETH",      "requested-capacity": {        "total-size": 4007,        "cir": 1000,        "pir": 1001,        "cbs": 1002,        "pbs": 1003      },      "eth-uni": {        "uni-ptp-name": "PTP=/shelf=1/slot=7/subslot=1/port=2"        //"client-vlan-spec": {        //  "vlan-id": [        //    "Optional.empty"        //  ],        //  "vlan-priority": "Optional.empty",        //  "access-action": "Optional.empty",        //  "vlan-type": "Optional.empty"        //},        //"uni-vlan-spec": {        //  "vlan-id": [        //    "Optional.empty"        //  ],        //  "vlan-priority": "Optional.empty",        //  "access-action": "Optional.empty",        //  "vlan-type": "Optional.empty"        //},        //"ftp-vlan-spec": {        //  "vlan-id": [        //    "Optional.empty"        //  ],        //  "vlan-priority": 0,        //  "access-action": "Optional.empty",        //  "vlan-type": "Optional.empty"        //}      },      "primary-nni": {        "nni-ptp-name": "PTP=/shelf=1/slot=6/subslot=1/port=108",        "nni-ts-detail": "8-40",        "adaptation-type": "ODUj21",        "client-signal-type": "acc-otn:ODU0",        "switch-capability": "ietf-otn-types:ODU2"      },      "secondary-nni": {       "nni-ptp-name": "PTP=/shelf=1/slot=6/subslot=1/port=107",        "nni-ts-detail": "8-40",        "adaptation-type": "ODUj21",        "client-signal-type": "acc-otn:ODU0",        "switch-capability": "ietf-otn-types:ODU2"      },      "eos-pac": {        "sdh-signal-type": "STM16",        "vc-type": "VC4",        "mapping-path": [          1,2        ],        //"sdh-signal-type-protect": "Optional.empty",        //"mapping-path-protect": [        //  "Optional.empty"        //],        "lcas": **false**,//默认false        "hold-off": 1,//默认0        "wtr": 300,//默认300        "tsd": **false**//默认false      }    }  } |
| 返回报文 | {      "output": {          "create-component": {              "ftp-name": [                  "FTP=/shelf=1/slot=6/subslot=1/port=201",                  "FTP=/shelf=1/slot=7/subslot=1/port=201"              ],              "ctp-name": [                  "PTP=/shelf=1/slot=6/subslot=1/port=107/CTP=2",                  "PTP=/shelf=1/slot=6/subslot=1/port=108/CTP=2"              ],              "vc-connection-name": [                  "CONNECTION=SDH11",                  "CONNECTION=SDH10"              ]          },          "connection": {              "layer-protocol-name": "acc-eth:ETH",              "service-type": "EPL",              "ctp": [                  "FTP=/shelf=1/slot=7/subslot=1/port=201/CTP=7",                  "FTP=/shelf=1/slot=5/subslot=1/port=201/CTP=1"              ],              "requested-capacity": {                  "pbs": 1003,                  "pir": 1001,                  "cbs": 1002,                  "cir": 1000              },              "state-pac": {                  "admin-state": "enabled",                  "operational-state": "up"              },              "name": "CONNECTION=ETH4"          }      }  } |
| 状态 | 200 OK |

#### 修改VCG带宽

|  |  |
| --- | --- |
| 说明 | 调整连接点带宽（modifyVcgConnectionCapacity）前提：EOS 场景，使能 LCAS 功能  **输入值：**  ①ETH FTP 名称（EthFtpName）  ②SDH FTP 名称（SdhFtpName）  ③SDH 保护 FTP 名称（带保护支持，可选）  ④VC 占用列表（mappingPath）  **返回值：**  ①成功/失败标志 |
| URL | http://127.0.0.1:8181/restconf/**operations**/acc-eos:modify-vcg-connection-capacity |
| 完整路径 | http://127.0.0.1:8181/restconf/**operations**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-eos:modify-vcg-connection-capacity |
| 请求 | POST |
| 下发报文 | {    "input": {      "eth-ftp-name": "",      "sdh-ftp-name": "",      "sdh-protect-ftp-name": "",      "mapping-path": [        ""      ],      "mapping-path-protected": [        ""      ]    }  } |
| 状态 | 200 OK |

### 创建 SDH-FTP 虚端口

|  |  |
| --- | --- |
| 说明 | 创建SDH-FTP虚端口  **输入值：**  端口 nni-1、PG 是否随业务删除信息（delete-cascade）  **返回值：**  创建 SDH(VC)-FTP 以及 ODU CTP。 |
| URL | http://127.0.0.1:8181/restconf/**operations**/acc-sdh:create-sdh-ftp-manual |
| 完整路径 | http://127.0.0.1:8181/restconf/**operations**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-sdh:create-sdh-ftp-manual |
| 请求 | POST |
| 下发报文 | {    "input": {      "nni-1": {        "nni-ptp-name": "PTP=/shelf=1/slot=6/subslot=1/port=102",        "nni-ts-detail": "8-80",**//时隙**        "adaptation-type": "ODUij",//ODUij, ODUj21, ODUk        "client-signal-type": "acc-otn:ODU0",//STM1,STM4,STM16,STM64,STM256        "nni-signal-type": "acc-otn:ODU2",        "nni-odu-adaptation-type": "ODUij",        "switch-capability": "ietf-otn-types:ODU1",        "delete-cascade": **true//删除业务是否同步删除该ftp及其服务层ctp；true表示在该ftp上无其他业务时会删除，但有业务时不删除；false表示不随业务删除**      }    }  } |
| 返回报文 | {    "output": {      "create-component": {        "ftp-name": "FTP=/shelf=1/slot=5/subslot=1/port=201",        "ctp-name": "PTP=/shelf=1/slot=6/subslot=1/port=102/CTP=1"      }    }  } |
| 状态 | 200 OK |

### 删除 SDH-FTP 虚端口

|  |  |
| --- | --- |
| 说明 | 删除SDH-FTP虚端口指令（标准rpc）  人工删除SDH-FTP及其服务层CTP,若该FTP在删除时承载有业务，此时应返回删除失败 |
| URL | http://127.0.0.1:8181/restconf/**operations**/acc-sdh:delete-sdh-ftp-manual |
| 完整路径 | http://127.0.0.1:8181/restconf/**operations**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-sdh:delete-sdh-ftp-manual |
| 请求 | POST |
| 下发报文 | {    "input": {      "ftp-name": "FTP=/shelf=1/slot=5/subslot=1/port=201"    }  } |
| 状态 | 200 OK |

### 查询所有connection 的信息

|  |  |
| --- | --- |
| 说明 | 查询 Connection 指令  查询所有 Connection 对象 |
| URL | http://127.0.0.1:8181/restconf/**operational**/acc-connection:connections |
| 完整路径 | http://127.0.0.1:8181/restconf/**operational**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-connection:connections |
| 请求 | GET |
| 返回报文 | {      "connections": {           "connection": [              {                  "name": "CONNECTION=ETH1",                  "service-label": "ETH1",//业务别名，用于标识交叉连接归属的业务                  "ctp": [                      "PTP=/shelf=1/slot=1/subslot=1/port=8/CTP=8",                      "FTP=/shelf=1/slot=1/subslot=1/port=108/CTP=16"                  ],                  "requested-capacity": {                      "total-size": 0,                      "pbs": 130048,                      "pir": 1000,                      "cbs": 130048,                      "cir": 1000                  },                  "state-pac": {                      "admin-state": "enabled",                      "operational-state": "up"                  },                  "layer-protocol-name": "acc-eth:ETH",                  "pg-id": [1,2],//保护组id变更为数组形式                  "service-type": "EPL"              }          ]      }  } |
| 状态 | 200 OK |

### 查询指定connection 名称的信息

|  |  |
| --- | --- |
| 说明 | 查询 Connection 指令  查询指定connection - name的Connection 对象 |
| URL | http://127.0.0.1:8181/restconf/**operational**/acc-connection:connections/connection/{name} |
| 完整路径 | http://127.0.0.1:8181/restconf/**operational**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-connection:connections/connection/{name} |
| 请求 | GET |
| 返回报文 | {      "connection": [          {              "name": "CONNECTION=ETH1",              "service-label": "ETH1",//业务别名，用于标识交叉连接归属的业务              "ctp": [                  "PTP=/shelf=1/slot=1/subslot=1/port=8/CTP=8",                  "FTP=/shelf=1/slot=1/subslot=1/port=108/CTP=16"              ],              "requested-capacity": {                  "total-size": 0,                  "pbs": 130048,                  "pir": 1000,                  "cbs": 130048,                  "cir": 1000              },              "state-pac": {                  "admin-state": "enabled",                  "operational-state": "up"              },              "layer-protocol-name": "acc-eth:ETH",              "pg-id": [1,2],//保护组id变更为数组形式              "service-type": "EPL"          }      ]  } |
| 状态 | 200 OK |

### 删除 connection

|  |  |
| --- | --- |
| 说明 | 1. 删除操作会同时删除 connection 下的 CTP； 2. 对于多个 CTP 使用同一个 FTP 承载的情况，需要删除所有的客户层连接之后 才能删除 FTP 连接。   3、可采用标准的 edit-config 接口删除制定的 FTP 信息，FTP 删除的同时，应能够 同时删除对应的服务层 CTP 信息 |
| URL | http://127.0.0.1:8181/restconf/**config**/acc-connection:connections/connection/{name} |
| 完整路径 | http://127.0.0.1:8181/restconf/**config**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-connection:connections/connection/{name} |
| 请求 | DELETE |
| 状态 | 200 OK |

### Protection-group下的操作

#### 查询保护组信息

|  |  |
| --- | --- |
| 说明 | 查询保护组信息  **输入值：**  ①保护组唯一标识符(pgId)（可选）  **返回值：**  ②保护组信息(pg)列表  **关于主端口和备用端口的说明：**  **查询上来的pg保护组信息，数据格式有两种分别是SNCP保护和OCH保护，分别对应保护主界面中的保护类型，两种数据都需要解析出来：**  第一种OCH保护数据：  "primary-port": "PTP=/shelf=1/slot=1/subslot=1/port=101",  "secondary-port": "PTP=/shelf=1/slot=2/subslot=1/port=101"  第二种sncp保护数据：  "primary-port": "PTP=/shelf=1/slot=1/subslot=1/port=101/CTP=1"  "secondary-port": "PTP=/shelf=1/slot=2/subslot=1/port=101/CTP=1" |
| URL | http://127.0.0.1:8181/restconf/**operational**/acc-protection-group:pgs/pg/{name} |
| 完整路径 | http://127.0.0.1:8181/restconf/**operational**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-protection-group:pgs/pg/{name} |
| 请求 | GET |
| 返回报文 | {      "pgs": {          "pg": [              {                  "pg-id": 1,                  "primary-port": "PTP=/shelf=1/slot=3/subslot=1/port=102",                  "hold-off": 30,                  "secondary-port": "PTP=/shelf=1/slot=3/subslot=1/port=103",                  "switch-reason": "no-switch",                  "switch-type": "uni-switch",                  "protection-type": "olp-1-plus-1",                  "protection-direction": "to-primary",                  "wait-to-restore-time": 60,                  "tcm-level": 1,//用于 SNCP-S 保护组使用的TCM 级别,取值 1-6                  "selected-port": "PTP=/shelf=1/slot=3/subslot=1/port=102",                  "reversion-mode": "return",                  "delete-cascade": **true**//删除业务是否同步删除该业务相关的 PG              }          ]      }  } |
| 状态 | 200 OK |

### 创建保护组

|  |  |
| --- | --- |
| 说明 | 保护组固定为返回模式，WTR 固定为 5 分钟，保护为 OCH 1+1 或者 SNCP 1+1（SNCP 保护建议用 SNC/I 类型） 对于 OCH1+1 保护，应在创建业务之前完成 pg 的创建，然后业务应创建在主用端口上。而 SNCP 1+1 PG 通过建立连接接口创建实现，不需要先创建保护组。  创建的保护组可以是 LAG 保护。  创建保护组指的就是创建OCH保护组，所以输入的PTP命名规则就是OCH保护组PTP格式，样例如下发报文所示。  **输入值：**  保护组信息(pg)  - id: 保护组id的取值范围为1~65535，创建时指定的id是该取值范围内未被使用的空闲值即可。可以唯一标识保护组信息，数据库保存的保护组信息可追加一个id字段，主备用端口字段是后续我们方便关联业务时备用。  - protection-type: {SNCP1+1, OCH1+1}  - switch-type:{uni-switch,bi-switch}  - reversion-mode:{return,non\_return}  **返回值：**  成功失败标记 |
| URL | http://127.0.0.1:8181/restconf/config/acc-protection-group:pgs/pg/{pg-id} |
| 完整路径 | http://127.0.0.1:8181/restconf/config/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-protection-group:pgs/pg/{pg-id} |
| 请求 | PUT |
| 下发报文 | {      "pg":{          "pg-id": 2,          "primary-port": "PTP=/shelf=1/slot=4/subslot=1/port=102",          "switch-type": "uni-switch",          "protection-type": "olp-1-plus-1",          "wait-to-restore-time": 0,          "hold-off": 0,          "secondary-port": "PTP=/shelf=1/slot=4/subslot=1/port=103",          "tcm-level": 1,//用于 SNCP-S 保护组使用的TCM 级别,取值 1-6          "reversion-mode": "return",          "delete-cascade": **true**//删除业务是否同步删除该业务相关的 PG      }  } |
| 状态 | 200 OK |

### 删除保护组

|  |  |
| --- | --- |
| 说明 | 删除网元上保护组信息，operation="remove"  **输入值：**  保护组唯一标识符(pg-id)  **返回值：**  成功失败标记 |
| URL | http://127.0.0.1:8181/restconf/**config**/acc-protection-group:pgs/pg/{pg-id} |
| 完整路径 | http://127.0.0.1:8181/restconf/**config**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-protection-group:pgs/pg/{pg-id} |
| 请求 | DELETE |
| 状态 | 200 OK |

### 保护组倒换操作

|  |  |
| --- | --- |
| 说明 | 执行保护倒换操作  **输入值：**  ①保护组唯一标识符(ID)  ②倒换命令(protection-command)  - 触发倒换条件： {“NO\_SWITCH”,“SF\_SWITCH” ,“SD\_SWITCH”,“MANUAL\_SWITCH”}  ③方向(protection-direction)  - {“to-primary”, “to-secondary”}  **不支持 SF\_SWITCH、SD\_SWITCH的倒换**  **返回值：**  成功失败标记  报文中的字段组合：  手动到主：switch-reason：MANUAL\_SWITCH， protection-direction：ToPrimary  手动到备：switch-reason：MANUAL\_SWITCH， protection-direction：ToSecondary  强制到主：switch-reason：FORCE\_SWITCH， protection-direction：ToPrimary  强制到备：switch-reason：FORCE\_SWITCH， protection-direction：ToSecondary  锁定到主：switch-reason：LOCKOUT， protection-direction：ToPrimary  锁定到备：switch-reason：LOCKOUT， protection-direction：ToSecondary  清除：switch-reason：CLEARED |
| URL | http://127.0.0.1:8181/restconf/**operations**/acc-protection-group:perform-protection-command |
| 完整路径 | http://127.0.0.1:8181/restconf/**operations**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-protection-group:perform-protection-command |
| 请求 | POST |
| 下发报文 | {      "input":{          "pg-id":1,          "protection-command":"manual-switch",          "protection-direction":"to-primary"      }  } |
| 状态 | 200 OK |

### SD 触发保护倒换设置

|  |  |
| --- | --- |
| 说明 | 使能 sd 触发保护倒换  **输入值：**  ①保护组唯一标识符(ID)  ②SD 触发倒换使能或者禁止（SdTrigger）  sd-trigger: {enable,disable}  **返回值：**  ①成功/失败的标志 |
| URL | http://127.0.0.1:8181/restconf/**operations**/acc-protection-group:[switch-sd-trigger-enable](http://localhost:8181/apidoc/explorer/index.html" \l "!/acc-protection-group(2019-02-13)/switch_sd_trigger_enable_post_18) |
| 完整路径 | http://127.0.0.1:8181/restconf/**operations**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-protection-group:[switch-sd-trigger-enable](http://localhost:8181/apidoc/explorer/index.html" \l "!/acc-protection-group(2019-02-13)/switch_sd_trigger_enable_post_18) |
| 请求 | POST |
| 下发报文 | {      "input":{          "pg-id":1,          "sd-trigger":**true**      }  } |
| 状态 | 200 OK |

### SD 触发保护倒换设置状态查询

|  |  |
| --- | --- |
| 说明 | 查询 sd 触发保护倒换的设置状态  **输入值：**  ①保护组唯一标识符(ID)  **返回值：**  ①Sd 触发倒换设置状态 |
| URL | http://127.0.0.1:8181/restconf/**operations**/acc-protection-group: get-switch-sd-trigger-status |
| 完整路径 | http://127.0.0.1:8181/restconf/**operations**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-protection-group: get-switch-sd-trigger-status |
| 请求 | POST |
| 下发报文 | {      "input":{          "pg-id":1  }  } |
| 返回报文 | {      "output": {          "sd-trigger-status": **false**      }  } |
| 状态 | 200 OK |

### 设置/修改lag保护

|  |  |
| --- | --- |
| 说明 | 设置 lag保护，对于已存在的相同的id的lag保护，输入相同的id即可覆盖修改  **输入值：**  ①id值（lag-id）  ②LACP协商模式（lacp-mode） 枚举： [Manual,Static]  ③主用端口（primary-port）  ④LAG 保护策略（lag-policy），前提LAG模式为sharing 枚举：[sourceMac ,destMac ,sourceIp ,destIp ,source-dest-Mac ,source-dest-Ip]  ⑤LAG 保护的端口（lag-port）  ⑥LAG 模式（lag-mode），enum：[sharing ,non-sharing] 默认：non-sharing  ⑦延迟倒换时间（hold-off），单位 ms，默认值0  ⑧等待恢复时间（wait-to-restore-time），单位 s，默认值300  ⑨返回模式（reversion-mode，）， enum：[“REVERTIVE” ,“NON\_REVERTIVE”] 默认REVERTIVE |
| URL | http://127.0.0.1:8181/restconf/**config**/acc-protection-group: lagPGs/lagPG/:id |
| 完整路径 | http://127.0.0.1:8181/restconf/**config**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-protection-group:lagPGs/lagPG/:id |
| 请求 | PUT |
| 下发报文 | {    "lagPG": {          "lag-id": 2,          "lacp-mode": "Manual",          "primary-port": "PTP=/shelf=1/slot=8/subslot=1/port=6",          "lag-policy": "destMac",//当 lag-mode 为 sharing 时此属性生效          "lag-port": [            "PTP=/shelf=1/slot=8/subslot=1/port=6"          ],          "lag-mode": "sharing",          "hold-off": 0,          "wait-to-restore-time": 0,          "reversion-mode": "NON\_REVERTIVE"    }  } |
| 状态 | 200 OK |

### 查询指定lag-id保护

|  |  |
| --- | --- |
| 说明 | 查询 lag保护  **输入值：**  ①保护组唯一标识符(ID) （可选，不输入即为查询全部）  **返回值：**  ①lagPG |
| URL | http://127.0.0.1:8181/restconf/**operational**/acc-protection-group: lagPGs/lagPG/{lag-id} |
| 完整路径 | http://127.0.0.1:8181/restconf/**operational**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-protection-group:lagPGs/lagPG/{lag-id} |
| 请求 | GET |
| 返回报文 | {      "lagPG": [          {              "lag-id": 3,              "lacp-mode": "Manual",              "primary-port": "PTP=/shelf=1/slot=8/subslot=1/port=6",              "lag-policy": "destMac",              "lag-port": [                  "PTP=/shelf=1/slot=8/subslot=1/port=6"              ],              "lag-mode": "sharing",              "wait-to-restore-time": 0,              "hold-off": 0,              "reversion-mode": "NON\_REVERTIVE"          }      ]  } |
| 状态 | 200 OK |

### 查询所有lag保护

|  |  |
| --- | --- |
| 说明 | 查询 lag保护  **返回值：**  ①lagPGs |
| URL | http://127.0.0.1:8181/restconf/**operational**/acc-protection-group: lagPGs |
| 完整路径 | http://127.0.0.1:8181/restconf/**operational**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-protection-group:lagPGs |
| 请求 | GET |
| 返回报文 | {      "lagPGs": {          "lagPG": [              {                  "lag-id": 3,                  "lacp-mode": "Manual",                  "primary-port": "PTP=/shelf=1/slot=8/subslot=1/port=6",                  "lag-policy": "destMac",                  "lag-port": [                      "PTP=/shelf=1/slot=8/subslot=1/port=6"                  ],                  "lag-mode": "sharing",                  "wait-to-restore-time": 0,                  "hold-off": 0,                  "reversion-mode": "NON\_REVERTIVE"              }          ]      }  } |
| 状态 | 200 OK |

### 删除lag保护

|  |  |
| --- | --- |
| 说明 | 设置 lag保护  **输入值：**  ①保护组唯一标识符(ID) （可选，不输入即为删除全部） |
| URL | http://127.0.0.1:8181/restconf/config/acc-protection-group: lagPGs/lagPG/{lag-id} |
| 完整路径 | http://127.0.0.1:8181/restconf/config/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-protection-group:lagPGs/lagPG/{lag-id} |
| 请求 | Delete |
| 状态 | 200 OK |

### Devm下的操作

#### ODU 网元端口获取（为后面修改数据的前提条件）

|  |  |
| --- | --- |
| 说明 | **输入值：**  ①网元客户侧端口唯一标识符(端口名字) |
| URL | http://127.0.0.1:8181/restconf/**config**/acc-devm:ptps/ptp/{name}/acc-otn:odu-ptp-pac |
| 完整路径 | http://127.0.0.1:8181/restconf/**config**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:ptps/ptp/{name}/acc-otn:odu-ptp-pac |
| 请求 | GET |
| 返回  报文 | {  "odu-ptp-pac": {  "odu-capacity": "8021445",  "odu-signal-type": ["ODU0", "ODU1", "ODU2"],  "adaptation-type": ["CBR\_AMP", "GFP-T", "CBR\_BMP", "NULL"],  "switch-capability": ["ODU0", "ODU1", "ODU2"],  "ts-detail": "1-2-3",  "sm-trail-trace-expected-rx": "03-2d-01",  "sm-trail-trace-actual-tx": "03-2d-01",  "sm-trail-trace-actual-rx": "02-2d-01",  "pm-trail-trace-expected-rx": "14-25-ad",  "pm-trail-trace-actual-tx": "14-25-ad",  "pm-trail-trace-actual-rx": "00-05-00",  }  } |
| 状态 | 200 OK |

### ODU 网元端口属性修改

|  |  |
| --- | --- |
| 说明 | **输入值：**  ①网元客户侧端口唯一标识符(端口名字)  ②SM实际发送开销  ③SM期望接收开销  ④PM实际发送开销  ⑤PM期望接收开销 |
| URL | http://127.0.0.1:8181/restconf/**config**/acc-devm:ptps/ptp/{name}/acc-otn:odu-ptp-pac |
| 完整路径 | http://127.0.0.1:8181/restconf/**config**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:ptps/ptp/{name}/acc-otn:odu-ptp-pac |
| 请求 | PUT |
| 返回  报文 | {  "odu-ptp-pac": {  "sm-trail-trace-expected-rx": "03-2d-01",  "sm-trail-trace-actual-tx": "03-2d-01",  "pm-trail-trace-expected-rx": "14-25-ad",  "pm-trail-trace-actual-tx": "14-25-ad",  }  } |
| 状态 | 200 OK |

### SDH 客户侧端口获取（为后面修改数据的前提条件）

|  |  |
| --- | --- |
| 说明 | **输入值：**  ①网元客户侧端口唯一标识符(端口名字)  ②属性/取值列表(transmissionParameters.)  －sdh-signal-type 取值{STM1,STM4 ,STM16.STM64.STM256}  －J0 字节发送值（TrailTraceActualTx）  －J0 字节接收期望值 (TrailTraceExpectedRx)  **返回值：**  成功或失败标记 |
| URL | http://127.0.0.1:8181/restconf/**config**/acc-devm:ptps/ptp/{name}/acc-sdh:sdh-ptp-pac |
| 完整路径 | http://127.0.0.1:8181/restconf/**config**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:ptps/ptp/{name}/acc-sdh:sdh-ptp-pac |
| 请求 | GET |
| 下发报文 | {  "sdh-ptp-pac": {  "supported-sdh-signal-type":'',  "sdh-signal-type": "STM4",  "switch-capability":['VC3','VC4'],  "j0-actual-tx": "000000000000000000000000000000",  "j0-expected-rx": "000000000000000000000000000000",  "j0-trail-trace-actual-rx":'',  }  } |
| 状态 | 200 OK |

### SDH 客户侧端口配置

|  |  |
| --- | --- |
| 说明 | **输入值：**  ①网元客户侧端口唯一标识符(端口名字)  ②属性/取值列表(transmissionParameters.)  －sdh-signal-type 取值{STM1,STM4 ,STM16.STM64.STM256}  －J0 字节发送值（TrailTraceActualTx）  －J0 字节接收期望值 (TrailTraceExpectedRx)  **返回值：**  成功或失败标记 |
| URL | http://127.0.0.1:8181/restconf/**config**/acc-devm:ptps/ptp/{name}/acc-sdh:sdh-ptp-pac |
| 完整路径 | http://127.0.0.1:8181/restconf/**config**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:ptps/ptp/{name}/acc-sdh:sdh-ptp-pac |
| 请求 | PUT |
| 下发报文 | {  "sdh-ptp-pac": {  "sdh-signal-type": "STM4",  "j0-actual-tx": "000000000000000000000000000000",  "j0-expected-rx": "000000000000000000000000000000"  }  } |
| 状态 | 200 OK |

### ETH 端口属性获取（为后面修改数据的前提条件）

|  |  |
| --- | --- |
| 说明 | **输入值：**  ①网元端口唯一标识符(ptpName 在路径中)  **返回值：**  成功或失败标记 |
| URL | http://127.0.0.1:8181/restconf/**operational**/acc-devm:ptps/ptp/{name}/acc-eth:eth-ptp-pac |
| 完整路径 | http://127.0.0.1:8181/restconf/**operational**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:ptps/ptp/{name}/acc-eth:eth-ptp-pac |
| 请求 | GET |
| 下发报文 | {  "eth-ptp-pac": {  "pause-control": "true",  "current-mtu": 1518,  "current-working-mode": "auto",  "supported-working-mode": [  "auto",  "1000MFullDuplex",  "10GEFullDuplex",  "100MFullDuplex"  ],  "port-type": "unknown",  "supported-mtu": 9600,  "mac-address": "00:00:00:00:00:00",  "lldp-enable": false,  "lldp-peer-chassis-id": 16,  "lldp-peer-port-id": 22066,  "lldp-peer-system-name": 'Huawei v1.2.3',  "lldp-peer-management-address": '192.168.1.1'  }  } |
| 状态 | 200 OK |

### ETH 端口属性修改

|  |  |
| --- | --- |
| 说明 | **输入值：**  ①网元端口唯一标识符(ptpName 在路径中)  ②属性/取值列表(EthPtpPac)  - pause-control、lldp-enable：TRUE/FALSE  - 根据 supported-working-mode返回current-working-mode选择  - 根据supported-mtu返回current-mtu选择  **返回值：**  成功或失败标记 |
| URL | http://127.0.0.1:8181/restconf/**config**/acc-devm:ptps/ptp/{name}/acc-eth:eth-ptp-pac |
| 完整路径 | http://127.0.0.1:8181/restconf/**config**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:ptps/ptp/{name}/acc-eth:eth-ptp-pac |
| 请求 | PUT |
| 下发报文 | {  "eth-ptp-pac": {  "current-working-mode": "100MFullDuplex",  "current-mtu": "1",  "pause-control": "true",  "mac-address": "00:00:00:00:00:00",  "lldp-enable": "true"  }  } |
| 状态 | 200 OK |

### ETH 端口 OAM 配置修改

|  |  |
| --- | --- |
| 说明 | **输入值：**  ①以太网 CTP 标识符(CTP name 在路径中)  ②以太网 OAM 配置(ethOamConfig)  **返回值：**  成功或失败标记 |
| URL | http://127.0.0.1:8181/restconf/**config**/acc-devm:ctps/ctp/{name}/acc-eth:eth-ctp-pac/oam-config |
| 完整路径 | http://127.0.0.1:8181/restconf/**config**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:ctps/ctp/{name}/acc-eth:eth-ctp-pac/oam-config |
| 请求 | PUT |
| 下发报文 | {  "oam-config": {  "mep-id": "1",  "remote-mep-id": "1",  "meg-id": "1",  "md-name": "s",  "mel": "1",  "cc-interval": "interval-10ms",  "lm-interval": "interval-3ms33",  "dm-interval": "interval-10ms"  }  } |
| 状态 | 200 OK |

### ETH 性能测量使能开关修改

|  |  |
| --- | --- |
| 说明 | **输入值：**  ①以太网 CTP 标识符(CTP name 在路径中)  ②以太网 OAM 状态属性(ethOamStatePac) Enum：TRUE、FALSE、NULL，默认值为FALSE  **返回值：**  成功或失败标记 |
| URL | http://127.0.0.1:8181/restconf/**config**/acc-devm:ctps/ctp/{name}/acc-eth:eth-ctp-pac/oam-state-pac |
| 完整路径 | http://127.0.0.1:8181/restconf/**config**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:ctps/ctp/{name}/acc-eth:eth-ctp-pac/oam-state-pac |
| 请求 | PUT |
| 下发报文 | {  "oam-state-pac": {  "dm-state": "true",  "tm-state": "false",  "lm-state": "true",  "cc-state": "null"  }  } |
| 状态 | 200 OK |

### 光模块

#### 基本信息

|  |  |
| --- | --- |
| 说明 | **输入值：**  ①以太网 PTP 标识符(PTP name 在路径中)  **返回值：**  成功或失败标记 |
| URL | http://127.0.0.1:8181/restconf/config/acc-devm:ptps/ptp/{name}/optical-module-pac |
| 完整路径 | http://127.0.0.1:8181/restconf/config/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:ptps/ptp/{name}/optical-module-pac |
| 请求 | PUT |
| 返回报文 | {  "optical-module-pac": {  "opt-mod-type": "CWDM",  "opt-mod-service-type": "link",  "opt-mod-singledouble": "single",  "opt-mod-tx-wavelength": "2.66",  "opt-mod-rx-wavelength": "3.25",  "opt-mod-bitrate": "1.2",  "opt-mod-distance": "10",  "opt-mod-attenuation": "0.2",  "opt-mod-vendor-pac": {  "opt-mod-vendor-name: "山东华辰泰尔信息科技有限公司",  "opt-mod-vendor-pn": "8088-12345678",  "opt-mod-vendor-sn": "5055-123456789",  "opt-mod-vendor-rev": "v1.0.0.1.2",  },  "ddm-info-pac": {  "input-power": "16",  "output-power": "6",  temperature: "28.4",  "bias-current": "0.81",  voltage: 220,  },  },  } |
| 状态 | 200 OK |

#### 光模块衰减修改

|  |  |
| --- | --- |
| 说明 | **输入值：**  ①PTP 标识符(PTP name 在路径中)  ②光模块衰减数据  **返回值：**  成功或失败标记 |
| URL | http://127.0.0.1:8181/restconf/config/acc-devm:ptps/ptp/{name}/optical-module-pac |
| 完整路径 | http://127.0.0.1:8181/restconf/config/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:ptps/ptp/{name}/optical-module-pac |
| 请求 | PUT |
| 返回报文 | {  "optical-module-pac": {  //只有此项可以修改 光模块衰减，单位：dB  "opt-mod-attenuation": "0.2",  }  } |
| 状态 | 200 OK |

#### 光功率（只读）

|  |  |
| --- | --- |
| 说明 | **输入值：**  ①PTP 标识符(PTP name 在路径中)  **返回值：**  ①输入光功率  ②输出光功率  ③光功率过高门限  ④光功率过低门限 |
| URL | http://127.0.0.1:8181/restconf/config/acc-devm:ptps/ptp/{name}/optical-power-pac |
| 完整路径 | http://127.0.0.1:8181/restconf/config/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:ptps/ptp/{name}/optical-power-pac |
| 请求 | GET |
| 返回报文 | {  "optical-power-pac": {  "input-power": 200,  "output-power": 30,  "input-power-upper-threshold": 500,  "input-power-lower-threshold": 600  }  } |
| 状态 | 200 OK |

#### Hee获取

|  |  |
| --- | --- |
| 说明 | **输入值：**  ①以太网 PTP 标识符(PTP name 在路径中)  **返回值：**  成功或失败标记 |
| URL | http://127.0.0.1:8181/restconf/config/acc-devm:ptps/ptp/{name}/acc-eth:och-ptp-pac/hee-pac |
| 完整路径 | http://127.0.0.1:8181/restconf/config/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:ptps/ptp/{name}/acc-eth:och-ptp-pac/hee-pac |
| 请求 | GET |
| 下发报文 | {  "hee-pac": {  "tee-device-cpu": true,  "tee-device-mac": "de-23-fd-45",  "tee-device-sn": "1578-g45f",  "tee-device-software": "v1.0.1.2.3.6",  "tee-device-hardware": "per2022.1.00.1",  "tee-board-name": "OTN2X8",  "tee-line-ptp-name": "",  "tee-client-ptp-name": "",  // Enum： - UNKNOW - WHITELIGHT - CWDM - DWDM - G\_METRO  "tee-line-opt-mod-type": "CWDM",  "tee-client-opt-mod-type": "",  //SDH 信号类型 STM1 STM4 STM16 STM64 STM256  "tee-client-signal-type": "",  "tee-line-ddminfo-pac": {  "input-power": "16",  "output-power": "6",  "temperature": "36.5",  "bias-current": "0.81",  "voltage": "134",  },  "tee-client-ddminfo-pac": {  "input-power": "16",  "output-power": "6",  "temperature": "36.5",  "bias-current": "0.81",  "voltage": "134",  },  "tee-line-vendor-pac": {  "opt-mod-vendor-name: "山东华辰泰尔信息科技有限公司",  "opt-mod-vendor-pn": "8088-12345678",  "opt-mod-vendor-sn": "5055-123456789",  "opt-mod-vendor-rev": "v1.0.0.1.2",  },  "tee-client-vendor-pac": {  "opt-mod-vendor-name: "山东华辰泰尔信息科技有限公司",  "opt-mod-vendor-pn": "8088-12345678",  "opt-mod-vendor-sn": "5055-123456789",  "opt-mod-vendor-rev": "v1.0.0.1.2",  },  "tee-opt-mod-type-name": "HEE",  "tee-line-loopback": "NON\_LOOPBACK",  "tee-update": "END",  },  } |
| 状态 | 200 OK |

#### Hee修改

|  |  |
| --- | --- |
| 说明 | **输入值：**  ①以太网 PTP 标识符(PTP name 在路径中)  ②TEE端g.metro模式名称： NULL、 HEE、TEE  ③TEE端LINE侧端口环回(类型见环回说明)  ④TEE端升级：END、START  **返回值：**  成功或失败标记 |
| URL | http://127.0.0.1:8181/restconf/config/acc-devm:ptps/ptp/{name}/acc-gmetro:och-ptp-pac/hee-pac |
| 完整路径 | http://127.0.0.1:8181/restconf/config/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:ptps/ptp/{name}/acc-gmetro:och-ptp-pac/hee-pac |
| 请求 | PUT |
| 下发报文 | {  "hee-pac": {  "tee-opt-mod-type-name": "HEE",  "tee-line-loopback": "NON\_LOOPBACK",  "tee-update": "END",  },  } |
| 状态 | 200 OK |

### Vcg 属性修改

|  |  |
| --- | --- |
| 说明 | 修改下列 Vcg 属性:  －LCAS 使能  －HoldOFF  －WTR  －TSD 使能  **输入值：**  ①EthFTP 标识符(FTP name 路径中)  ②VCG 配置内容  **返回值：**  成功失败标记 |
| URL | http://127.0.0.1:8181/restconf/**config**/acc-devm:ftps/ftp/{name}/acc-eth:eth-ftp-pac/acc-eos:vcg-pac |
| 完整路径 | http://127.0.0.1:8181/restconf/**config**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-eth:eth-ftp-pac/acc-eos:vcg-pac |
| 请求 | PUT |
| 下发报文 | {  "vcg-pac": {  "vc-type": "VC12",  "lcas": "true",  "hold-off": "1",  "wtr": "1",  "tsd": "true"  }  } |
| 状态 | 200 OK |

### FTP 关联服务层 CTP 属性修改

|  |  |
| --- | --- |
| 说明 | 修改下列 FTP 端口属性，用于实现 VC 虚级联绑定关系定义  **输入参数：**  EthFTP 标识符(FTP name)  EthFTP 关联的 serverCTP 列表 |
| URL | http://127.0.0.1:8181/restconf/**config**/acc-devm:ftps/ftp/{name} |
| 完整路径 | http://127.0.0.1:8181/restconf/**config**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:ftps/ftp/{name} |
| 请求 | PUT |
| 下发报文 | {  "ftp": [  {  "server-ctp": [  "17", "18"  ]  }  ]  } |
| 状态 | 200 OK |
| 状态 | 200 OK |

### 设置网元时间配置

|  |  |
| --- | --- |
| 说明 | 将网元时间与接入型 OTN 时间进行同步 (要求网元具备 NTP 功能或与接入型 OTN 自动同步功能)  仅下发 ntp ，接入型 OTN 支持设置 NTP。即一个参数下发有效值，另一个参数下发为空。对 于 不支持NTP的网元，若适配层下发的是NTP server 地址，返回异常 operation-not-supported，在 reason 中描述详细原因“Not support NTP”。  若设置的 NTP 不可达或者 NTP 服务器断了，需要上报告警。  NTP 数据结构如下：  NTP:{  ntpServerName: 字符串，必填。  ntpIpAddress: 地址，必填，只支持设置一个 NTP Server 地址  port：端口，可选，默认为标准 UDP 的 123  ntpVersion：版本，可选  }  **输入值：**  ①ntp 信息 (NTP)  **返回值：**  成功或失败标记 |
| URL | http://127.0.0.1:8181/restconf/**config**/acc-devm:me/ntp-servers |
| 完整路径 | http://127.0.0.1:8181/restconf/**config**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:me/ntp-servers |
| 请求 | PUT |
| 下发报文 | {  "ntp-servers": {  "ntp-server": [  {  "name": "s",  "ip-address": "192.168.135.117",  "port": "123",  "ntp-version": "s"  }  ]  }  } |
| 状态 | 200 OK |

### 非 NTP 时间设置

|  |  |
| --- | --- |
| 说明 | RPC接口，将网元时间与接入型 OTN 时间进行同步 (要求网元具备 NTP 功能或与接入型 OTN 自动同步功能)  **输入值：**  ①设置网元时间(newTime)：可选  **返回值：**  成功或失败标记 |
| URL | http://127.0.0.1:8181/restconf/**operations**/acc-devm:set-managed-element-time |
| 完整路径 | http://127.0.0.1:8181/restconf/**operations**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:set-managed-element-time |
| 请求 | POST |
| 下发报文 | {      "input": {          "new-time": "2022-11-09T10:55:50+08:00"      }  } |
| 状态 | 200 OK |

### 查询网元当前时间

|  |  |
| --- | --- |
| 说明 | 获取网元当前时间，当配置了 NTP 使能后，网元的当前时间由 NTP 时间提供。 |
| URL | http://127.0.0.1:8181/restconf/**operations**/acc-devm:get-managed-element-time |
| 完整路径 | http://127.0.0.1:8181/restconf/**operations**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:get-managed-element-time |
| 请求 | POST |
| 返回报文 | {      "output": {          "current-time": "2022-11-09T16:34:25+08:00"      }  } |
| 状态 | 200 OK |

### 查询网元配置

|  |  |
| --- | --- |
| 说明 | 查询被管网元的信息，网元没有删除时，网元名称（name）不允许改变。 |
| URL | http://127.0.0.1:8181/restconf/**operational**/acc-devm:me |
| 完整路径 | http://127.0.0.1:8181/restconf/**operational**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:me |
| 请求 | GET |
| 返回报文 | {      "me": {          "yang-model-version": "20220506",//yangModelVersion用于体现该网元遵循的YANG MODEL版本号，目前存在2个版本号，分别对应20200726，20220506          "ntp-server-in-use": "ntp1",          "ntp-enable": "true",          "manufacturer": "huachentel",          "software-version": "V2.0.1",          "uuid": "b4-a2-60-11-00-04",          "eq": [              "EQ=/shelf=1/slot=6/subslot=1/EQ=L1M8",              "EQ=/shelf=1/slot=7/subslot=1/EQ=C2M2",              "EQ=/shelf=1/slot=3/subslot=1/EQ=SXC2",              "EQ=/shelf=1/slot=99/subslot=1/EQ=FTR",              "EQ=/shelf=1/slot=8/subslot=1/EQ=L2M2",              "EQ=/shelf=1/slot=2/subslot=1/EQ=PWDC",              "EQ=/shelf=1/slot=4/subslot=1/EQ=SXC2",              "EQ=/shelf=1/slot=11/subslot=1/EQ=FAN",              "EQ=/shelf=1/slot=10/subslot=1/EQ=L2M2",              "EQ=/shelf=1/slot=5/subslot=1/EQ=C1M8",              "EQ=/shelf=1/slot=1/subslot=1/EQ=PWDC",              "EQ=/shelf=1/slot=9/subslot=1/EQ=C1T8"          ],          "ntp-state": "clock-never-set",          "gate-way1": "192.168.11.1",          "ip-address": "192.192.192.192",          "device-type": "po-pnp",          "name": "ME=huachentel.hcOTN4001",          "product-name": "HC-OTN4001",          "hardware-version": "A1",          "mask": "255.255.255.255",          "status": "running",          "layer-protocol-name": [              "acc-otn:ODU",              "acc-eth:ETH",              "acc-sdh:SDH"          ],          "ntp-servers": {              "ntp-server": [                  {                      "name": "ntp1",                      "ntp-version": "V3",                      "port": 125,                      "ip-address": "192.168.1.2"                  }              ]          }      }  } |
| 状态 | 200 OK |

### 配置网元ME信息

|  |  |
| --- | --- |
| 说明 | 配置当前网元的信息 |
| URL | http://127.0.0.1:8181/restconf/**operations**/ietf-netconf:edit-config |
| 完整路径 | http://127.0.0.1:8181/restconf/**operations**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/ietf-netconf:edit-config |
| 请求 | POST |
| 返回报文 | {    "input": {      "target": {        "running": ""      },      "config": {          "me": {              "ip-address": "192.168.11.60",              "ntp-enable": "true",// true, false, null 未配置ntp时即为null              "mask": "255.255.255.255",              "name": "ME=huachentel.hcOTN4001",              "gate-way1": "192.168.11.1",              "status": "running"          }      }    }  } |

### 查询所有的 EQ

|  |  |
| --- | --- |
| 说明 | 查询网元下所有 EQ。 |
| URL | http://127.0.0.1:8181/restconf/**operational**/acc-devm:eqs |
| 完整路径 | http://127.0.0.1:8181/restconf/**operational**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:eqs |
| 请求 | GET |
| 返回报文 | {      "eqs": {          "eq": [              {                  "name": "EQ=/shelf=1/slot=1/subslot=1/EQ=PWDC",                  "plug-slot-name": [                      "1"                  ],//当板卡需插入标准槽位时，需上报板卡插入的槽位名称，当单板需多个槽位时，需全部列出                  "eq-type": [                      "power"                  ],                  "eq-state": "working",                  "plug-state": **true**,                  "hardware-version": "A1",                  "eq-sn": "P6UP0071",                  "software-version": "V2.0.1"              },              {                  "name": "EQ=/shelf=1/slot=3/subslot=1/EQ=SXC2",                  "plug-slot-name": [                      "3"                  ],//当板卡需插入标准槽位时，需上报板卡插入的槽位名称，当单板需多个槽位时，需全部列出                  "eq-type": [                      "cross-connection",                      "system-control",                      "clock"                  ],                  "eq-state": "working",                  "plug-state": **true**,                  "hardware-version": "A1",                  "ptp": [                      "PTP=/shelf=1/slot=3/subslot=1/port=102",                      "PTP=/shelf=1/slot=3/subslot=1/port=101"                  ],                  "eq-sn": "P6UP0073",                  "software-version": "V2.0.1",                  "provided-central-cross-capacity": [                      {                          "central-cross-type": "ETH",                          "cross-capacity": 20                      },                      {                          "central-cross-type": "ODUFlex-gfp",                          "cross-capacity": 20                      }                  ]//集中交叉盘需上报              }          ]      }  } |
| 状态 | 200 OK |

### 查询指定的 EQ

|  |  |
| --- | --- |
| 说明 | 查询网元下指定eqName的 EQ |
| URL | http://127.0.0.1:8181/restconf/**operational**/acc-devm:eqs/eq/{eqName} |
| 完整路径 | http://127.0.0.1:8181/restconf/**operational**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:eqs/eq/{eqName} |
| 请求 | GET |
| 返回报文 | {      "eq": [          {              "name": "EQ=/shelf=1/slot=1/subslot=1/EQ=PWDC",              "plug-slot-name": [                  "1"              ],              "eq-type": [                  "power"              ],              "eq-state": "working",              "plug-state": **true**,              "hardware-version": "A1",              "eq-sn": "P6UP0071",              "software-version": "V2.0.1"          }      ]  } |
| 状态 | 200 OK |

### 批量配置PTP信息

|  |  |
| --- | --- |
| 说明 | 批量配置PTP的信息  **（备注：目前设备不支持ptp以数组下形式批量下发，需要批量修改端口信息，目前需要多次下发报文 --- 2022/10/10）** |
| URL | http://127.0.0.1:8181/restconf/**operations**/ietf-netconf:edit-config |
| 完整路径 | http://127.0.0.1:8181/restconf/**operations**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/ietf-netconf:edit-config |
| 请求 | POST |
| 下发报文 | {    "input": {      "target": {        "running": ""      },      "config": {          "ptps":{              "ptp":{                  "name":"PTP=/shelf=1/slot=7/subslot=1/port=2",                  "loop-back": "terminal-loopback",  //[facility-loopback, terminal-loopback, mac-facility-loopback, mac-terminal-loopback, non-loopback]                  "laser-status": "no-optical-module",  //no-optical-module时不可修改，状态可以切换laser-on, laser-off                  "state-pac": {                      "admin-state": "disabled"//enabled, disabled                  },                  "layer-protocol-name": "acc-otn:ODU"  //根据"supported-layer-protocol-name"中数组的值决定              }          }      }    }  } |
| 状态 | 200 OK |

### 查询所有 PTP

|  |  |
| --- | --- |
| 说明 | 获取所有 PTP，ptpName（可选）。  - layer-protocol-name : {ETH ,ODU ,SDH ,OCH ,OMS}  - 当"layer-protocol-name": "acc-eth:ETH" 才有eth-ptp-pac、eth-ftp-pac、eth-ctp-pac  - 当"layer-protocol-name": "acc-otn:ODU" 才有odu-ptp-pac、odu-ctp-pac  - 当"layer-protocol-name": "acc-sdh:SDH" 才有sdh-ptp-pac、sdh-ftp-pac、vc-ctp-pac  **注： 以下出现layer-protocol-name的key值时都应注意判断支持的响应协议再显示配置** |
| URL | http://127.0.0.1:8181/restconf/**operational**/acc-devm:ptps |
| 完整路径 | http://127.0.0.1:8181/restconf/**operational**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:ptps |
| 请求 | GET |
| 返回报文 | {      "ptps": {          "ptp": [              {                  "name": "PTP=/shelf=1/slot=7/subslot=1/port=2",                  "laser-ais-enable": **false**,//若支持激光器自动关断，需报当前是  否使能，若使能状态，则报 TRUE；若不支持 AIS，该字段不用报                  "supported-layer-protocol-name": [                      "acc-otn:ODU",                      "acc-eth:ETH"                  ],                  "optical-module-pac": {                      "opt-mod-attenuation": 0.00,                      "opt-mod-distance": 0,                      "opt-mod-type": "unknown",                      "opt-mod-bitrate": 0,                      "opt-mod-singledouble": "null"                  },                  "peer-ip-address": "0.0.0.0",                  "supported-central-cross-type": [                      "VC12",                      "VC4",                      "VC3",                      "ETH",                      "ODU2e",                      "ODUFlex-cbr",                      "ODU2",                      "ODUFlex-gfp",                      "ODU1",                      "ODU0"                  ],//具备业务端口的板卡需上报，业务端 口支持的集中交叉颗粒度，ENUM: 包括 ODU0/ODU2/ODU1/ODU2e/ODUFlex-cbr/ODUFlex-gfp/VC12/VC3/VC4/ETH 等                  "loop-back": "non-loopback",                  "state-pac": {                      "admin-state": "enabled",                      "operational-state": "up"                  },                  "peer-tcp-id": "00000000",                  "supported-interface-type": [                      "NNI",                      "UNI"                  ],                  "och-supported": **false**,                  "ppp-status": "failure",                  "laser-status": "no-optical-module",                  "laser-ais-support": **false**,//若支持激光器自动关断，则报true, 不支持则报 false                  "local-tcp-id": "01070002",                  "remote-ptp": [],//该 PTP 连接的 A7 端口列表 可选                  "interface-type": "UNI",                  "acc-eth:eth-ptp-pac": {                      "mgm-vlan-spec": {                          "access-action": "keep",                          "vlan-type": "c-tag",                          "vlan-id": [                              1                          ],                          "vlan-priority": 0                      },                      "current-mtu": 9600,                      "pause-control": "false",                      "supported-mtu": 9600,                      "lldp-peer-system-name": "unknown",                      "lldp-peer-chassis-id": "unknown",                      "broadcast-inhibition-support": **false**,                      "lldp-enable": **false**,                      "port-type": "optical",                      "current-working-mode": "10GEFullDuplex",                      "supported-working-mode": [                          "10GEFullDuplex"                      ],                      "lldp-peer-management-address": "unknown",                      "lldp-peer-port-id": "unknown",                      "mgm-vlan-manual-enable": **false**,                      "mac-address": "00:00:00:00:00:00"                  },                  "supported-inside-board-cross-type": [                      "ODU2",                      "ODU0",                      "ODU1",                      "ODUFlex-gfp",                      "ODU2e",                      "ETH",                      "ODUFlex-cbr",                      "VC12",                      "VC4",                      "VC3"                  ],                  "optical-power-pac": {                      "input-power-lower-threshold": -40.00,                      "input-power": -40.00,                      "input-power-upper-threshold": 0.00,                      "output-power": -40.00                  },                  "layer-protocol-name": "acc-eth:ETH"              },          ]      }  } |
| 状态 | 200 OK |

### 查询指定 PTP

|  |  |
| --- | --- |
| 说明 | 获取指定 PTP，ptpName |
| URL | http://127.0.0.1:8181/restconf/**operational**/acc-devm:ptps/ptp/{ptpname} |
| 完整路径 | http://127.0.0.1:8181/restconf/**operational**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:ptps/ptp/{ptpname} |
| 请求 | GET |
| 返回报文 | {      "ptp": [          {              "name": "PTP=/shelf=1/slot=5/subslot=1/port=6",              "laser-ais-enable": **false**,              "supported-layer-protocol-name": [                  "acc-otn:ODU",                  "acc-eth:ETH"              ],              "optical-module-pac": {                  "opt-mod-attenuation": 0.00,                  "opt-mod-distance": 0,                  "opt-mod-type": "unknown",                  "opt-mod-bitrate": 0,                  "opt-mod-singledouble": "null"              },              "peer-ip-address": "0.0.0.0",              "supported-central-cross-type": [                  "VC12",                  "VC4",                  "VC3",                  "ETH",                  "ODU2e",                  "ODUFlex-cbr",                  "ODU2",                  "ODUFlex-gfp",                  "ODU1",                  "ODU0"              ],              "loop-back": "terminal-loopback",              "state-pac": {                  "admin-state": "enabled",                  "operational-state": "up"              },              "peer-tcp-id": "00000000",              "supported-interface-type": [                  "NNI",                  "UNI"              ],              "och-supported": **false**,              "ppp-status": "failure",              "laser-status": "no-optical-module",              "laser-ais-support": **false**,              "local-tcp-id": "01050006",              "interface-type": "UNI",              "acc-eth:eth-ptp-pac": {                  "mgm-vlan-spec": {                      "access-action": "keep",                      "vlan-type": "c-tag",                      "vlan-id": [                          1                      ],                      "vlan-priority": 0                  },                  "current-mtu": 9600,                  "pause-control": "false",                  "supported-mtu": 9600,                  "lldp-peer-system-name": "unknown",                  "lldp-peer-chassis-id": "unknown",                  "broadcast-inhibition-support": **false**,                  "lldp-enable": **false**,                  "port-type": "optical",                  "current-working-mode": "1000MFullDuplex",                  "supported-working-mode": [                      "auto",                      "100MFullDuplex",                      "1000MFullDuplex"                  ],                  "lldp-peer-management-address": "unknown",                  "lldp-peer-port-id": "unknown",                  "mgm-vlan-manual-enable": **false**,                  "mac-address": "00:00:00:00:00:00"              },              "supported-inside-board-cross-type": [                  "ODU2",                  "ODU0",                  "ODU1",                  "ODUFlex-gfp",                  "ODU2e",                  "ETH",                  "ODUFlex-cbr",                  "VC12",                  "VC4",                  "VC3"              ],              "optical-power-pac": {                  "input-power-lower-threshold": -40.00,                  "input-power": -40.00,                  "input-power-upper-threshold": 0.00,                  "output-power": -40.00              },              "layer-protocol-name": "acc-eth:ETH"          }      ]  } |
| 状态 | 200 OK |

### 设置指定 PTP

|  |  |
| --- | --- |
| 说明 | 获取指定 PTP，ptpName |
| URL | http://127.0.0.1:8181/restconf/**config**/acc-devm:ptps/ptp/{ptpname} |
| 完整路径 | http://127.0.0.1:8181/restconf/**config**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:ptps/ptp/{ptpname} |
| 请求 | Put |
| 返回报文 | {  "ptp": [  {  "name": "PTP=/shelf=1/slot=1/subslot=1/port=8",//界面显示端口8  "layer-protocol-name": "acc-eth:ETH",//层协议名称，支持修改  "laser-status": "laser-on",//激光器状态，支持修改  "state-pac": {  "admin-state": "enabled"//管理状态，支持读写  },  }  ]  }  } |
| 状态 | 200 OK |

### 查询所有 FTP

|  |  |
| --- | --- |
| 说明 | 查询网元下所有 FTP，ftpName（可选）。 |
| URL | [http://127.0.0.1:8181/restconf/](http://127.0.0.1:8181/restconf/operational)**[operational](http://127.0.0.1:8181/restconf/operational)**/acc-devm:ftps |
| 完整路径 | http://127.0.0.1:8181/restconf/**operational**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:ftps |
| 请求 | GET |
| 返回报文 | {      "ftps": {          "ftp": [              {                  "name": "FTP=/shelf=1/slot=5/subslot=1/port=201",                  "server-ctp": [                      "PTP=/shelf=1/slot=6/subslot=1/port=102/CTP=1"                  ],                  "acc-eth:eth-ftp-pac": {                      "current-mtu": 1518,                      "service-mapping-mode": "GFP-F",                      "supported-mtu": 9600,                      "mapping-type": "EoO"                  },                  "loop-back": "non-loopback",                  "state-pac": {                      "admin-state": "enabled",                      "operational-state": "up"                  },                  "layer-protocol-name": "acc-eth:ETH",                  "delete-cascade": **true**,//删除业务是否同步删除该 FTP 及服务层 CTP                  "client-ctp": [                      "FTP=/shelf=1/slot=5/subslot=1/port=201/CTP=2"                  ]              }          ]      }  } |
| 状态 | 200 OK |

### 查询指定 FTP

|  |  |
| --- | --- |
| 说明 | 查询网元下指定 ftpName的FTP |
| URL | [http://127.0.0.1:8181/restconf/](http://127.0.0.1:8181/restconf/operational)**[operational](http://127.0.0.1:8181/restconf/operational)**/acc-devm:ftps/ftp/{ftpname} |
| 完整路径 | http://127.0.0.1:8181/restconf/**operational**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:ftps/ftp/{ftpname} |
| 请求 | GET |
| 返回报文 | {  "ftp": [              {                  "name": "FTP=/shelf=1/slot=5/subslot=1/port=201",                  "server-ctp": [                      "PTP=/shelf=1/slot=6/subslot=1/port=102/CTP=1"                  ],                  "acc-eth:eth-ftp-pac": {                      "current-mtu": 1518,                      "service-mapping-mode": "GFP-F",                      "supported-mtu": 9600,                      "mapping-type": "EoO"                  },                  "loop-back": "non-loopback",                  "state-pac": {                      "admin-state": "enabled",                      "operational-state": "up"                  },                  "layer-protocol-name": "acc-eth:ETH",                  "delete-cascade": **true**,                  "client-ctp": [                      "FTP=/shelf=1/slot=5/subslot=1/port=201/CTP=2"                  ]              }          ]  } |
| 状态 | 200 OK |

### 查询所有 CTP

|  |  |
| --- | --- |
| 说明 | 查询网元下所有 CTP，ctpName（可选）。 |
| URL | http://127.0.0.1:8181/restconf/**operational**/acc-devm:ctps |
| 完整路径 | http://127.0.0.1:8181/restconf/**operational**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:ctps |
| 请求 | GET |
| 返回报文 | {      "ctps": {          "ctp": [              {                  "name": "PTP=/shelf=1/slot=5/subslot=1/port=7/CTP=1",                  "acc-eth:eth-ctp-pac": {                      "performance": {                          "near-packet-loss-rate": 0.0,                          "far-packet-loss-rate": 0.0,                          "delay": 0,                          "tx-bytes": 0,                          "rx-bytes": 0                      },                      "oam-enable-pac": {                          "dm-enable": "false",                          "cc-enable": "false",                          "tm-enable": "false",                          "lm-enable": "false"                      },                      "oam-config": {                          "cc-interval": "interval-1s",                          "mel": 0,                          "mep-id": 0,                          "remote-mep-id": 0,                          "meg-id": "unknown",                          "lm-interval": "interval-1s",                          "dm-interval": "interval-1s"                      },                      "vlan-spec": {                          "access-action": "keep",                          "vlan-type": "un-tag",                          "vlan-priority": 0                      }                  },                  "loop-back": "non-loopback",                  "port-role": "root",                  "state-pac": {                      "admin-state": "enabled",                      "operational-state": "up"                  },                  "layer-protocol-name": "acc-eth:ETH",                  "protect-role": "null",                  "server-tp": "PTP=/shelf=1/slot=5/subslot=1/port=7"              },              {                  "name": "PTP=/shelf=1/slot=6/subslot=1/port=102/CTP=1",                  "acc-otn:odu-ctp-pac": {                      "odu-signal-type": "acc-otn:ODU1",                      "pmtrail-trace-actual-rx": "0000000000000000000000000000000000000000000000000000000000000000",                      "ts-detail": "2-80",                      "g-hao-status": "idle",                      "pmtrail-trace-expected-rx": "0000000000000000000000000000000000000000000000000000000000000000",                      "pmtrail-trace-actual-tx": "0000000000000000000000000000000000000000000000000000000000000000",                      "switch-capability": "ietf-otn-types:ODU0",                      "odu-delay-performance": {                          "last-update-time": "2022-11-09T17:40:12+08:00",                          "delay": -1                      },                      "adaptation-type": "ODUj21",                      "odu-delay-type": "src-measurement",                      "odu-delay-enable": {                          "odu-ctp-delay-enable": **false**                      },                      "current-number-of-tributary-slots": [                          1                      ],                      "nni-odu-adaptation-type": "ODUj21"                  },                  "loop-back": "non-loopback",                  "port-role": "root",                  "state-pac": {                      "admin-state": "enabled",                      "operational-state": "down"                  },                  "layer-protocol-name": "acc-otn:ODU",                  "protect-role": "null",                  "server-tp": "PTP=/shelf=1/slot=6/subslot=1/port=102"              },          ]      }  } |
| 状态 | 200 OK |

### 查询指定 CTP

|  |  |
| --- | --- |
| 说明 | 查询网元下指定ctpName的CTP |
| URL | http://127.0.0.1:8181/restconf/**operational**/acc-devm:ctps/ctp/{name} |
| 完整路径 | http://127.0.0.1:8181/restconf/**operational**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:ctps/ctp/{name} |
| 请求 | GET |
| 返回报文 | {     "ctp": [              {                  "name": "PTP=/shelf=1/slot=5/subslot=1/port=7/CTP=1",                  "acc-eth:eth-ctp-pac": {                      "performance": {                          "near-packet-loss-rate": 0.0,                          "far-packet-loss-rate": 0.0,                          "delay": 0,                          "tx-bytes": 0,                          "rx-bytes": 0                      },                      "oam-enable-pac": {                          "dm-enable": "false",                          "cc-enable": "false",                          "tm-enable": "false",                          "lm-enable": "false"                      },                      "oam-config": {                          "cc-interval": "interval-1s",                          "mel": 0,                          "mep-id": 0,                          "remote-mep-id": 0,                          "meg-id": "unknown",                          "lm-interval": "interval-1s",                          "dm-interval": "interval-1s"                      },                      "vlan-spec": {                          "access-action": "keep",                          "vlan-type": "un-tag",                          "vlan-priority": 0                      }                  },                  "loop-back": "non-loopback",                  "port-role": "root",                  "attached-pg-id": 1,//所属的pg-id，若无pg信息，不报该字段                  "state-pac": {                      "admin-state": "enabled",                      "operational-state": "up"                  },                  "layer-protocol-name": "acc-eth:ETH",                  "protect-role": "null",                  "client-tp": "",//关联的客户层 tp                  "server-tp": "PTP=/shelf=1/slot=5/subslot=1/port=7"              }  ]  } |
| 状态 | 200 OK |

### 增加 DHCP RELAY 目标服务器

|  |  |
| --- | --- |
| 说明 | 增加一个中继服务器。  **输入值：**  ①ip（relay-serverip）  ②使能（relay-server-enable）  **返回值：**  ①成功/失败 |
| URL | http://127.0.0.1:8181/restconf/**operations**/acc-devm:add-dhcp-relay-serverip |
| 完整报文 | http://127.0.0.1:8181/restconf/**operations**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:add-dhcp-relay-serverip |
| 请求 | POST |
| 下发报文 | {    "input": {      "relay-serverip": "192.168.11.60",      "relay-server-enable": **false**    }  } |
| 状态 | 200 OK |

### 删除DHCP RELAY 目标服务器

|  |  |
| --- | --- |
| 说明 | 删除一个中继服务器。  **输入值：**  ①ip（relay-serverip）  **返回值：**  ①成功/失败 |
| URL | http://127.0.0.1:8181/restconf/**operations**/acc-devm:del-dhcp-relay-serverip |
| 完整报文 | http://127.0.0.1:8181/restconf/**operations**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:del-dhcp-relay-serverip |
| 请求 | POST |
| 下发报文 | {    "input": {      "relay-serverip": "192.168.11.60"    }  } |
| 状态 | 200 OK |

### 查询DHCP RELAY 目标服务器

|  |  |
| --- | --- |
| 说明 | 获取所有的中继服务器ip。  **返回值：**  ①成功/失败 |
| URL | http://127.0.0.1:8181/restconf/**operations**/acc-devm:get-dhcp-relay-serverip |
| 完整报文 | http://127.0.0.1:8181/restconf/**operations**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:get-dhcp-relay-serverip |
| 请求 | POST |
| 返回报文 | {  "output": {  "relay-serverip-info": [  {  "relay-serverip": "192.168.11.60",  "relay-server-enable": **false**  }  ]  }  } |
| 状态 | 200 OK |

### 通知上报

#### 通用通知消息

|  |  |
| --- | --- |
| 说明 | 对象创建上报消息，有配置对象发生创建操作 |
| 接口名称 | CommonNotification |
| 请求 | Notification |
| 返回报文 | {  “event”:{  “event-serial-no”:”1”,  “event-type”:” object-creation”,  “object-name”:”123”,  “object-type”:”123”  }  } |
| 状态 | 200 OK |

### 对象属性修改上报消息

|  |  |
| --- | --- |
| 说明 | 对象属性修改上报消息，有配置对象的属性发生修改操作。 |
| 接口名称 | AttributeValueChangeNotification |
| 请求 | Notification |
| 返回报文 | {  “event”:{  “event-serial-no”:”1”,  “event-type”:” attribute-value-change”,  “object-name”:”123”,  “object-type”:”123”  },  “attribute-value-change”:{  “attribute-name”:”1”,  “new-attribute-value”:” 456”,  “old-attribute-value”:”123”  }  } |
| 状态 | 200 OK |

### 保护倒换通知上报

|  |  |
| --- | --- |
| 说明 | 发生保护倒换后，接口主动上报通知消息 |
| 接口名称 | ProtectionSwitchNotification |
| 请求 | Notification |
| 返回报文 | {  "protection-switch":{  "protection-switch-serial-no":"1"  "pg":{  "pg-id":"1",  "protection-type":"odu-sncp-i",  "switch-type":"uni-switch",  "reversion-mode":"return",  "wait-to-restore-time":"10",  "hold-off":"0",  "primary-port":"PTP=/shelf=1/slot=8/subslot=1/port=101/CTP=1",  "secondary-port":"PTP=/shelf=1/slot=8/subslot=1/port=101/CTP=101"  }  }  } |
| 状态 | 200 OK |

### Peer 变更通知上报

|  |  |
| --- | --- |
| 说明 | PTP 对端变化后，接口主动上报通知消息。 |
| 接口名称 | PeerChangeNotification |
| 请求 | Notification |
| 下发报文 | {  "peer-change":{  "ptp-name":"PTP=/shelf=1/slot=3/subslot=1/port=102",  "peer-ip-address":"192.168.1.1",  "switch-type":"uni-switch"  }  } |
| 状态 | 200 OK |

### LLDP 的信息变更通知上报

|  |  |
| --- | --- |
| 说明 | LLDP 使能标识变更后， 接口主动上报通知消息。  ①PTP 端口名称（Name）  ②对端设备信息 lldpChassisId  ③对端端口 lldpPortId  ④对端系统名称 lldpPeerSystemName  ⑤对端网管地址 lldpPeerManagementAddress |
| 接口名称 | LLDPEnableChangeNotification |
| 请求 | Notification |
| 下发报文 | {  "lldp-enable-change":{  "ptp-name":"PTP=/shelf=1/slot=3/subslot=1/port=102",  "lldp-peer-chassis-id":"2",  "lldp-peer-port-id":"123",  "lldp-peer-system-name":"pg ",  "lldp-peer-management-address":"11111"  }  } |
| 状态 | 200 OK |

### G.HAO 带宽调整通知上报

|  |  |
| --- | --- |
| 说明 | 执行完 G.HAO 调整后，接口主动上报通知消息  ①G.Hao 调整通知序列号（GHaoAdjustSerialNo）  ②ODU CTP 信息  ③调整结果 ：（成功、失败、终止） |
| 请求 | GHaoNotification |
| 请求 | Notification |
| 下发报文 | {  "g-hao-change":{  "g-hao-adjust-serial-no": "1",  "ctp-name": "FTP=/shelf=1/slot=10/port=201/CTP=501",  "modify-result": "ok"  }  } |
| 状态 | 200 OK |

### 用户管理

### 修改网元层用户密码

|  |  |
| --- | --- |
| 说明 | 适配层提供的新密码设置要求：  设置用户密码长度最小值（系统默认为 8 字符）和密码长度最大值（系统默认为 16字符）。  设置密码与历史密码的相关性策略，包含密码不能与历史密码重复次数、新旧密码最少差别字符数、密码是否允许和历史密码相似。  设置密码组成的规则(例如：大写字母、小写字母、数字、特殊符号四种中至少选择其中三种)。  **输入值：**  ①网元层管理员当前密码（old-password）  ②用户新密码（new-password）  **返回值：**  ①成功/失败 |
| URL | http://127.0.0.1:8181/restconf/**operations**/acc-devm:modify-user-password |
| 完整报文 | http://127.0.0.1:8181/restconf/**operations**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:modify-user-password |
| 请求 | POST |
| 下发报文 | {      "input": {          "old-password": "sysadmin",          "new-password": "12345678"      }  } |
| 状态 | 200 OK |

### FTP 下载文件

|  |  |
| --- | --- |
| 说明 | ftp 下载指定文件。  **输入值：**  ①FTP 服务器 IP（ftpServerIp）  ②FTP 用户名（ftpUserName）  ③FTP 用户密码（ftpPassWord）  ④FTP模式（ftp-mode) 默认active，可选active,passive  ⑤设备端口号（ftp-device-port-num）  ⑥服务器端口号（ftp-server-port-num）  ⑦FTP 服务器文件名（ftpServerFileName）  ⑧设备文件名（ftpDeviceFileName）  **返回值：**  ①成功/失败 |
| URL | http://127.0.0.1:8181/restconf/**operations**/acc-devm:download-ftp-file |
| 完整报文 | http://127.0.0.1:8181/restconf/**operations**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:download-ftp-file |
| 请求 | POST |
| 下发报文 | {    "input": {      "ftp-server-ip-address": "192.168.11.60",      "ftp-server-username": "root",      "ftp-server-password": "123456",      "ftp-mode": "ACTIVE",//ACTIVE or PASSIVE,默认ACTIVE      "ftp-device-port-num": 20,//端口号      "ftp-server-port-num": 20,//端口号      "ftp-server-file-name": "configdb",      "ftp-device-file-name": "configdb"    }  } |
| 状态 | 200 OK |

### FTP 上载文件

|  |  |
| --- | --- |
| 说明 | ftp 上载指定文件。  **输入值：**  ①FTP 服务器 IP（ftpServerIp）  ②FTP 用户名（ftpUserName）  ③FTP 用户密码（ftpPassWord）  ④FTP模式（ftp-mode) 默认active，可选active,passive  ⑤设备端口号（ftp-device-port-num）  ⑥服务器端口号（ftp-server-port-num）  ⑦FTP 服务器文件名（ftpServerFileName）  ⑧设备文件名（ftpDeviceFileName）  **返回值：**  ①成功/失败 |
| URL | http://127.0.0.1:8181/restconf/**operations**/acc-devm:upload-ftp-file |
| 完整报文 | http://127.0.0.1:8181/restconf/**operations**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:upload-ftp-file |
| 请求 | POST |
| 下发报文 | {    "input": {      "ftp-server-ip-address": "192.168.11.60",      "ftp-server-username": "root",      "ftp-server-password": "123456",      "ftp-mode": "ACTIVE",//ACTIVE or PASSIVE,默认ACTIVE      "ftp-device-port-num": 20,//端口号      "ftp-server-port-num": 20,//端口号      "ftp-server-file-name": "configdb",      "ftp-device-file-name": "configdb"    }  } |
| 状态 | 200 OK |

### 查询网元上的文件名

|  |  |
| --- | --- |
| 说明 | 获取指定类型的文件列表。  **输入值：**  ①文件类型（file-type）  **返回值：**  ①文件列表 |
| URL | http://127.0.0.1:8181/restconf/**operations**/acc-devm:get-filename-list |
| 完整报文 | http://127.0.0.1:8181/restconf/**operations**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:get-filename-list |
| 请求 | POST |
| 下发报文 | {    "input": {      "file-type": "all"//查询的文件类型，data代表数据配置，upgrade代表升级文件，all代表所有文件    }  } |
| 返回报文 | {      "output": {          "filename-list": [              "huachentel\_1234\_data.txt"          ]      }  } |
| 状态 | 200 OK |

### 删除网元上的文件

|  |  |
| --- | --- |
| 说明 | 删除指定文件。  **输入值：**  ①文件名（file-name）  ②文件类型（file-type）  **返回值：**  ①成功/失败 |
| URL | http://127.0.0.1:8181/restconf/**operations**/acc-devm:delete-file |
| 完整报文 | http://127.0.0.1:8181/restconf/**operations**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:delete-file |
| 请求 | POST |
| 下发报文 | {    "input": {      "file-name": "huachentel\_1234\_data.txt",      "file-type": "data"    }  } |
| 状态 | 200 OK |

### 激活网元上的文件

|  |  |
| --- | --- |
| 说明 | ftp 上载指定文件。  **输入值：**  ①文件名（file-name）  ②文件类型（file-type）  **返回值：**  ①成功/失败 |
| URL | http://127.0.0.1:8181/restconf/**operations**/acc-devm:active-file |
| 完整报文 | http://127.0.0.1:8181/restconf/**operations**/network-topology:network-topology/topology/topology-netconf/node/hclink3/yang-ext:mount/acc-devm:active-file |
| 请求 | POST |
| 下发报文 | {    "input": {      "file-name": "huachentel\_1234\_data.txt",      "file-type": "data"//查询的文件类型，data代表数据配置，upgrade代表升级文件，all代表所有文件    }  } |
| 状态 | 200 OK |