



OC Support for TXP and MXP Data Paths Using ZRP

This chapter describes open configuration details for 2x100GE-MXP-DD, 3x100GE-MXP-DD, 400GE-TXP-DD, and 4x100GE-MXP-DD datapaths using QDD ZRP pluggable.

Table 1: Feature History

Feature Name	Release Information	Feature Description
OC Support for TXP and MXP Data Paths using ZRP	Cisco IOS XR Release 7.7.1	<p>From this release onwards, in NCS1K4-OTN-XP line cards, you can configure the 2x100GE-MXP-DD, 3x100GE-MXP-DD, 4x100GE-MXP-DD, and 400GE-TXP-DD card modes using ZR+ pluggable via OpenConfig.</p> <p>This enhancement improves efficiency, performance, and flexibility for customer networks allowing 2x100GE, 3x100GE, 400GE, and 4x100GE client transport over 400GE WDM wavelength.</p>

- [Slices and Port Mapping, on page 1](#)
- [Configuring Clients, on page 4](#)
- [Sample Configuration for 2x100GE-MXP-DD, on page 8](#)
- [Sample Configuration for 3x100GE-MXP-DD, on page 9](#)
- [Supported OC Models and Features, on page 10](#)

Slices and Port Mapping

To configure the 400GE-TXP-DD and 4x100GE-MXP-DD lc modes, the following data path configurations are used.

LC Mode	Datapath
400GE-TXP-DD	2x400GE-TXP-DD
4x100GE-MXP-DD	<p>You can take any combination of the following datapaths to configure the 4x100GE-MXP-DD lc mode, based on the requirement:</p> <ul style="list-style-type: none"> • 2x100GE-MXP-DD • 3x100GE-MXP-DD • 4x100GE-MXP-DD

The following tables shows port mapping for slices 0 and 1.

Table 2: 2x100GE-MXP-DD: Ports Mapping for Slice 0

Client Port	Port 7 and 10
Trunk Port	Port 11
Client Payload	100GE
Trunk Rate	200G
Client Optics	QSFP-100G-LR4, QSFP-100G-FR-S, QSFP-100G-SR4-S, QSFP-100G-CWDM4-S, QSFP-100G-LR4-S, QSFP28-100G-AOC, QSFP28-100G-PSM4, QSFP28-100G-DR-S
Trunk Optics	QDD-400G-ZRP-S

Table 3: 2x100GE-MXP-DD: Ports Mapping for Slice 1

Client Port	Port 4 and 5
Trunk Port	Port 9
Client Payload	100GE
Trunk Rate	200G
Client Optics	QSFP-100G-LR4, QSFP-100G-FR-S, QSFP-100G-SR4-S, QSFP-100G-CWDM4-S, QSFP-100G-LR4-S, QSFP28-100G-AOC, QSFP28-100G-PSM4, QSFP28-100G-DR-S
Trunk Optics	QDD-400G-ZRP-S

Table 4: 3x100GE-MXP-DD: Ports Mapping for Slice 0

Client Port	Port 1, 7, and 10
-------------	-------------------

Trunk Port	Port 11
Client Payload	100GE
Trunk Rate	300G
Client Optics	QSFP-100G-LR4, QSFP-100G-FR-S, QSFP-100G-SR4-S, QSFP-100G-CWDM4-S, QSFP-100G-LR4-S, QSFP28-100G-AOC, QSFP28-100G-PSM4, QSFP28-100G-DR-S
Trunk Optics	QDD-400G-ZRP-S

Table 5: 3x100GE-MXP-DD: Ports Mapping for Slice 1

Client Port	Port 8, 4, and 5
Trunk Port	Port 9
Client Payload	100GE
Trunk Rate	300G
Client Optics	QSFP-100G-LR4, QSFP-100G-FR-S, QSFP-100G-SR4-S, QSFP-100G-CWDM4-S, QSFP-100G-LR4-S, QSFP28-100G-AOC, QSFP28-100G-PSM4, QSFP28-100G-DR-S
Trunk Optics	QDD-400G-ZRP-S

Table 6: 400GE-TXP-DD: Ports Mapping for Slice 0

Client Port	Port 10
Trunk Port	Port 11
Client Payload	400GE
Trunk Rate	400G
Client Optics	QDD-400G-FR4-S, QDD-400G-DR4-S, and QDD-400G-LR8-S
Trunk Optics	QDD-400G-ZRP-S

Table 7: 400GE-TXP-DD: Ports Mapping for Slice 1

Client Port	Port 8
Trunk Port	Port 9
Client Payload	400GE
Trunk Rate	400G

Client Optics	QDD-400G-FR4-S, QDD-400G-DR4-S, QDD-400G-LR8-S
Trunk Optics	QDD-400G-ZRP-S

Table 8: 4x100GE-MXP-DD: Ports Mapping for Slice 0

Client Port	Port 1,6,7 and 10
Trunk Port	Port 11
Client Payload	100GE
Trunk Rate	400G
Client Optics	QSFP-100G-LR4, QSFP-100G-FR-S, QSFP-100G-SR4-S, QSFP-100G-CWDM4-S, QSFP-100G-LR4-S, QSFP28-100G-AOC, QSFP28-100G-PSM4, and QSFP28-100G-DR-S
Trunk Optics	QDD-400G-ZRP-S

Table 9: 4x100GE-MXP-DD: Ports Mapping for Slice 1

Client Port	Port 0,4,5 and 8
Trunk Port	Port 9
Client Payload	100GE
Trunk Rate	400G
Client Optics	QSFP-100G-LR4, QSFP-100G-FR-S, QSFP-100G-SR4-S, QSFP-100G-CWDM4-S, QSFP-100G-LR4-S, QSFP28-100G-AOC, QSFP28-100G-PSM4, and QSFP28-100G-DR-S
Trunk Optics	QDD-400G-ZRP-S

Configuring Clients

The commands used for configuring the 100G and 400GE client ports are explained in the following table.

Table 10: Configuration Details for 100G and 400GE Client Ports:

Client Port	Logical Channel	Coherent DSP	Optical Channel	LC Mode
100G	<pre> index": 101, "rate-class": "openconfig-transport-types: TRIB_RATE_100G", "description": "Client Logical Channel", "admin-state": "ENABLED", "loopback-mode": "NONE", "trib-protocol": "openconfig-transport-types: PROT_100G_MLG", "logical-channel-type": "openconfig-transport-types: PROT_ETHERNET" </pre>	<pre> "index": 212, "config": {"index": 212, "admin-state": "ENABLED", "loopback-mode": "NONE", "description": "Coherent DSP", "rate-class": "openconfig-transport-types: TRIB_RATE_400G", "logical-channel-type": "openconfig-transport-types: PROT_OTN" </pre>	<pre> "name": "0/1-OpticalChannel0/1/0/12", "openconfig-terminal-device: optical-channel": { "config": {"frequency": "193100000", "target-output-power": -700, "operational-mode": 4178, "line-port": "0/1-Optics0/1/0/12" </pre>	<pre> "name": "0/1", "properties": { "property": ["name": "LCMODE", "config": { "name": "LCMODE", "value": "4x100GE-MXP-DD" </pre>
400GE	<pre> "index": 101, "rate-class": "openconfig-transport-types: TRIB_RATE_400G", "description": "Client Logical Channel", "admin-state": "ENABLED", "loopback-mode": "NONE", "trib-protocol": "openconfig-transport-types: PROT_400GE", "logical-channel-type": "openconfig-transport-types: PROT_ETHERNET" </pre>	<pre> "index": 212, "config": {"index": 212,"admin-state": "ENABLED","loopback-mode": "NONE", "description": "Coherent DSP", "rate-class": "openconfig-transport-types: TRIB_RATE_400G", "logical-channel-type": "openconfig-transport-types: PROT_OTN" </pre>	<pre> "name": "0/1-OpticalChannel0/1/0/12", "openconfig-terminal-device: optical-channel": { "config": {"frequency": "193100000", "target-output-power": -700, "operational-mode": 4178, "line-port": "0/1-Optics0/1/0/12" </pre>	<pre> "name": "0/1", "properties": { "property": ["name": "LCMODE", "config": { "name": "LCMODE", "value": "400GE-TXP-DD" </pre>

Sample Configuration for 400GE-TXP-DD

```

{
  "openconfig-terminal-device:terminal-device": {
    "logical-channels": {
      "channel": [
        {
          "index": 1011,
          "config": {
            "index": 1011,
            "admin-state": "ENABLED",
            "loopback-mode": "NONE",
            "description": "Coherent Logical Channel",
            "rate-class": "openconfig-transport-types:TRIB_RATE_400G",
            "logical-channel-type": "openconfig-transport-types:PROT_OTN"
          },
          "logical-channel-assignments": {
            "assignment": [
              {
                "index": 1,
                "rate-class": "openconfig-transport-types:TRIB_RATE_400G",
                "logical-channel-type": "openconfig-transport-types:PROT_OTN"
              }
            ]
          }
        }
      ]
    }
  }
}
                    
```

```

        "config":{
            "index":1,
            "allocation":"400",
            "assignment-type":"OPTICAL_CHANNEL",
            "optical-channel":"0/1-OpticalChannel0/1/0/11"
        }
    ]
}
},
{
    "index":1010,
    "config":{
        "index":1010,
        "rate-class":"openconfig-transport-types:TRIB_RATE_400G",
        "admin-state":"ENABLED",
        "loopback-mode":"NONE",
        "description":"Client Logical Channel",
        "trib-protocol":"openconfig-transport-types:PROT_400GE",
        "logical-channel-type":"openconfig-transport-types:PROT_ETHERNET"
    },
    "ingress":{
        "config":{
            "transceiver":"0/1-Optics0/1/0/10"
        }
    },
    "logical-channel-assignments":{
        "assignment":[
            {
                "index":1,
                "config":{
                    "index":1,
                    "allocation":"400",
                    "assignment-type":"LOGICAL_CHANNEL",
                    "logical-channel":1011
                }
            }
        ]
    }
}
]
},
"openconfig-platform:components":{
    "component":[
        {
            "name":"0/1",
            "properties":{
                "property":[
                    {
                        "name":"LCMODE",
                        "config":{
                            "name":"LCMODE",
                            "value":"400GE-TXP-DD"
                        }
                    }
                ]
            }
        }
    ]
},
{
    "name": "0/1-OpticalChannel0/1/0/11",
    "openconfig-terminal-device:optical-channel": {
        "config": {
            "frequency": "193100000",

```

```

        "target-output-power": -700,
        "operational-mode": 4178,
        "line-port": "0/1-Optics0/0/0/11"
    }
}
]
}
}

```

Sample Configuration for 4x100GE-MXP-DD

```

{
  "openconfig-terminal-device:terminal-device": {
    "logical-channels": {
      "channel": [
        {
          "index": 2303,
          "config": {
            "index": 2303,
            "rate-class": "openconfig-transport-types:TRIB_RATE_100G",
            "admin-state": "ENABLED",
            "description": "Client Logical Channel",
            "trib-protocol": "openconfig-transport-types:PROT_100G_MLG",
            "logical-channel-type": "openconfig-transport-types:PROT_ETHERNET"
          },
          "ingress": {
            "config": {
              "transceiver": "0/1-Optics0/1/0/5"
            }
          },
          "logical-channel-assignments": {
            "assignment": [
              {
                "index": 1,
                "config": {
                  "index": 1,
                  "allocation": "100",
                  "assignment-type": "LOGICAL_CHANNEL",
                  "logical-channel": 30001
                }
              }
            ]
          }
        },
        {
          "index": 30001,
          "config": {
            "index": 30001,
            "admin-state": "ENABLED",
            "description": "Coherent Logical Channel",
            "rate-class": "openconfig-transport-types:TRIB_RATE_400G",
            "logical-channel-type": "openconfig-transport-types:PROT_OTN"
          },
          "logical-channel-assignments": {
            "assignment": [
              {
                "index": 1,
                "config": {
                  "index": 1,
                  "allocation": "400",
                  "assignment-type": "OPTICAL_CHANNEL",
                  "optical-channel": "0/1-OpticalChannel0/1/0/9"
                }
              }
            ]
          }
        }
      ]
    }
  }
}

```

```

        }
    ]
}
},
"openconfig-platform:components": {
  "component": [
    {
      "name": "0/1-OpticalChannel0/1/0/9",
      "openconfig-terminal-device:optical-channel": {
        "config": {
          "frequency": "193100000",
          "target-output-power": -700,
          "operational-mode": 4178,
          "line-port": "0/1-Optics0/1/0/9"
        }
      }
    },
    {
      "name": "0/1",
      "properties": {
        "property": [
          {
            "name": "LCMODE",
            "config": {
              "name": "LCMODE",
              "value": "4x100GE-MXP-DD"
            }
          }
        ]
      }
    }
  ]
}
}
}

```

Sample Configuration for 2x100GE-MXP-DD

```

{
  "openconfig-terminal-device:terminal-device": {
    "logical-channels": {
      "channel": [{"index": 2303, "config": {
        "index": 2303, "rate-class":
        "openconfig-transport-types:TRIB_RATE_100G",
        "admin-state":
        "ENABLED", "description":
        "Client Logical Channel", "trib-protocol":
        "openconfig-transport-types:PROT_100G_MLG",
        "logical-channel-type":
        "openconfig-transport-types:PROT_ETHERNET"}}, "ingress":
        {"config": {"transceiver": "0/1-Optics0/1/0/7"
        }}, "logical-channel-assignments":
        {"assignment":
        [{"index": 1, "config": {"index": 1, "allocation":
        "100", "assignment-type":
        "LOGICAL_CHANNEL", "logical-channel":
        20001}}]}}},
        {"index": 20001, "config":
        {"index": 20001, "admin-state":

```



```

"ENABLED","description": "Coherent Logical Channel","rate-class":
  "openconfig-transport-types:TRIB_RATE_200G","logical-channel-type":
"openconfig-transport-types:PROT_OTN"},
"logical-channel-assignments":
{"assignment": [{"index": 1,"config": {"index":
1,"allocation": "200","assignment-type":
"OPTICAL_CHANNEL","optical-channel":
  "0/1-OpticalChannel0/1/0/9"}}]}]}
},"openconfig-platform:components":
  {"component": [{"
"name": "0/1-OpticalChannel0/1/0/9",
"openconfig-terminal-device:optical-channel":
  {"config": {"frequency":
  "193100000","target-output-power": -700,"operational-mode":
  4178,"line-port": "0/1-Optics0/1/0/9"}}, {"name": "0/1","properties":
{"property":
[{"name": "LCMODE","config":
{"name": "LCMODE","value": "4x100GE-MXP-DD"}
]}]}]}]}

```

Sample Configuration for 3x100GE-MXP-DD

```

{
"openconfig-terminal-device:
terminal-device":
  {"logical-channels":
{"channel": [{"index": 2303,"config":
  {"index": 2303,"rate-class":
"openconfig-transport-types:TRIB_RATE_100G","admin-state":
  "ENABLED","description":
  "Client Logical Channel","trib-protocol":
"openconfig-transport-types:PROT_100G_MLG",
"logical-channel-type":
"openconfig-transport-types:PROT_ETHERNET"},
"ingress": {"config":
  {"transceiver": "0/1-Optics0/1/0/8"}},
"logical-channel-assignments": {"assignment": [{"index": 1,"config": {"index": 1,"allocation":
  "100","assignment-type": "LOGICAL_CHANNEL","logical-channel":
  30001}}]}}, {"index": 30001,"config":
  {"index": 30001,"admin-state": "ENABLED","description":
"Coherent Logical Channel","rate-class":
"openconfig-transport-types:
TRIB_RATE_300G","logical-channel-type":
  "openconfig-transport-types:PROT_OTN"},
"logical-channel-assignments":
  {"assignment": [{"index": 1,"config":
  {"index": 1,"allocation":
"300","assignment-type":
"OPTICAL_CHANNEL","optical-channel":
  "0/1-OpticalChannel0/1/0/9"}}]}]}},
"openconfig-platform:components":
  {"component": [{"name":
  "0/1-OpticalChannel0/1/0/9",
"openconfig-terminal-device:optical-channel":

  {"config": {"frequency":
"193100000","target-output-power":
  -700,"operational-mode":
  4178,"line-port": "0/1-Optics0/1/0/9"}},
{"name": "0/1","properties": {"property":
[{"name": "LCMODE","config":

```

```
{ "name": "LCMODE", "value": "4x100GE-MXP-DD" }
}}}}}}
```

Supported OC Models and Features

The 400GE-TXP-DD and 4x100GE-MXP-DD support the following OC models and fetures:

Table 11: Supported OC Models

Model	Feature
openconfig-platform.yang	Inventory and LC Mode
openconfig-platform-transceiver.yang	Pluggable Inventory and Oper Data
openconfig-terminal-device.yang	Logical and Optical Channels – Datapath and OperData
openconfig-interface.yang	Optical Interface Enable/Disable (shut/no-shut)

Supported Features

- Client loopback support for 100G and 400G logical channels.
- Trunk loopback support for the coherent DSP Optical channel.
- Admin-state support for all Logical and Optical channels.
- Laser Squelch and als-delay for ethernet client.
- Client Fec.
- LLDP.
- Trunk Fec modes such as Ofec and Cfec modes.
- Target output power and frequency on trunk optics.