



Supported YANG Models in NCS 1014

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Supported Yang models for NCS 1014

NCS 1014 supports a variety of YANG models for configuration, operational monitoring, and actions.

From Release 25.4.1, the new YANG model Cisco-IOS-XR-reset-optics-act.yang is introduced to enable remote resetting of 400GE and 4x100GE optics, with the exception of CIM-8. This addition significantly improves operational efficiency and simplifies remote troubleshooting.

This tables list all supported models for easy reference.

Table 1: Native Models

Config Models	Oper Models
Cisco-IOS-XR-osa-linesystem-cfg.yang	Cisco-IOS-XR-osa-hwmod-linesys-oper.yang
Cisco-IOS-XR-controller-ots-cfg.yang	Cisco-IOS-XR-controller-ots-oper.yang
Cisco-IOS-XR-ots-och-cfg.yang	Cisco-IOS-XR-controller-ots-och-oper.yang
Cisco-IOS-XR-controller-oms-cfg	Cisco-IOS-XR-controller-oms-oper.yang
Cisco-IOS-XR-controller-och-cfg	Cisco-IOS-XR-controller-och-oper.yang
Cisco-IOS-XR-controller-osc-cfg.yang	Cisco-IOS-XR-controller-osc-oper.yang
Cisco-IOS-XR-controller-dfb-cfg.yang	Cisco-IOS-XR-controller-dfb-oper.yang
Cisco-IOS-XR-pmengine-cfg.yang	Cisco-IOS-XR-pmengine-oper.yang
Cisco-IOS-XR-olc-cfg.yang	Cisco-IOS-XR-olc-oper.yang
Cisco-IOS-XR-fpd-infra-cfg.yang	
Cisco-IOS-XR-osa-ct-cfg.yang	Cisco-IOS-XR-osa-controller-optics-oper.yang

Config Models	Oper Models
Cisco-IOS-XR-osa-sp-cfg.yang	Cisco-IOS-XR-osa-hwmod-linesys-oper.yang
Cisco-IOS-XR-osa-cfg.yang	Cisco-IOS-XR-osa-oper.yang
Cisco-IOS-XR-ikev2-cfg.yang	Cisco-IOS-XR-ikev2-oper.yang
Cisco-IOS-XR-controller-optics-cfg.yang	Cisco-IOS-XR-controller-optics-oper.yang
Cisco-IOS-XR-ethernet-lldp-cfg.yang	Cisco-IOS-XR-ethernet-lldp-oper.yang
Cisco-IOS-XR-telemetry-model-driven-cfg.yang	Cisco-IOS-XR-telemetry-model-driven-oper.yang
Cisco-IOS-XR-ifmgr-cfg.yang	Cisco-IOS-XR-envmon-oper.yang
Cisco-IOS-XR-fpd-infra-cfg.yang	Cisco-IOS-XR-show-fpd-loc-ng-oper.yang
Cisco-IOS-XR-invproxy-hwmodule-cfg.yang	Cisco-IOS-XR-procfind-oper.yang
Cisco-IOS-XR-syncc-controller-cfg.yang	Cisco-IOS-XR-procthreadname-oper.yang
Cisco-IOS-XR-drivers-media-eth-gl-pfc-wd-cfg.yang	Cisco-IOS-XR-invmgr-oper.yang
Cisco-IOS-XR-drivers-media-eth-cfg.yang	Cisco-IOS-XR-plat-chas-invmgr-ng-oper.yang
Cisco-IOS-XR-drivers-icpe-ethernet-cfg.yang	Cisco-IOS-XR-platform-oper.yang
Cisco-IOS-XR-drivers-media-eth-cfg.yang	Cisco-IOS-XR-invmgr-diag-oper.yang
Cisco-IOS-XR-drivers-media-eth-gl-pfc-wd-cfg.yang	Cisco-IOS-XR-nto-misc-oper.yang
Cisco-IOS-XR-sysmgr-cfg.yang	Cisco-IOS-XR-wd-oper.yang
Cisco-IOS-XR-um-ncs-hw-module-osa-cfg.yang	Cisco-IOS-XR-ledmgr-oper.yang
	Cisco-IOS-XR-shellutil-filesystem-oper.yang
	Cisco-IOS-XR-shellutil-oper.yang
	Cisco-IOS-XR-drivers-media-eth-oper.yang
	Cisco-IOS-XR-mediasvr-linux-oper.yang
	Cisco-IOS-XR-drivers-media-eth-oper.yang
	Cisco-IOS-XR-sysmgr-oper.yang
	Cisco-IOS-XR-procmem-oper.yang
	Cisco-IOS-XR-procfind-oper.yang
Act Models	
Cisco-IOS-XR-upgrade-fpd-ng-act.yang	
Cisco-IOS-XR-shellutil-delete-act.yang	
Cisco-IOS-XR-drivers-media-eth-act.yang	

Config Models	Oper Models
Cisco-IOS-XR-shellutil-copy-act.yang	
Cisco-IOS-XR-shellutil-copy-act.yang	
Cisco-IOS-XR-drivers-media-eth-act.yang	
Cisco-IOS-XR-sysmgr-act.yang	
Cisco-IOS-XR-system-reboot-act	
Cisco-IOS-XR-install-act.yang	
Cisco-IOS-XR-install-augmented-act	
Cisco-IOS-XR-drivers-media-eth-clear-prbs-act.yang	
Cisco-IOS-XR-reset-optics-act.yang	
Ext Model	
Cisco-IOS-XR-openconfig-ospfv2-ext.yang	

Table 2: OpenConfig Models

openconfig-platform.yang
openconfig-platform-transceiver.yang
openconfig-terminal-device.yang
openconfig-interfaces.yang
openconfig-system.yang
openconfig-network-instance
openconfig-procmon.yang

See <https://cfng.cisco.com/ios-xr/yang-explorer/view-data-model> for the list of Yang models supported by NCS 1014.

Openconfig transceiver thresholds

Openconfig Transceiver Thresholds are a set of critical, read-only monitoring thresholds that

- define the transceiver operational limits for optical transceivers,
- are crucial for monitoring the health and performance of both Grey and Coherent Optics, and
- are exposed via telemetry using the Openconfig model.

Table 3: Feature History

Feature Name	Release Information	Feature Description
Enhanced OpenConfig Transceiver Threshold monitoring	Cisco IOS XR Release 25.4.1	You can now monitor read-only power, supply voltage, and temperature threshold values for all Grey optics (including 400G, 4x100G, and 100G) and Coherent Optics using the <code>openconfig-platform-transceiver.yang</code> model. This support extends across all form factors, such as ZR, CFP, and CIM8. Monitoring these thresholds is crucial for ensuring stable and reliable operation, especially for high-power 400G optics.

This is a sample snippet for the OpenConfig transceiver thresholds.

```

module: openconfig-platform-transceiver
  augment /oc-platform:components/oc-platform:component:
    +--rw transceiver
      ...
      +--rw thresholds
        +--rw threshold* [severity]
          +--rw severity    -> ../state/severity
          +--ro state
            +--ro severity?          identityref
            +--ro output-power-upper?    decimal64
            +--ro output-power-lower?    decimal64
            +--ro input-power-upper?     decimal64
            +--ro input-power-lower?     decimal64
            +--ro laser-bias-current-upper? decimal64
            +--ro laser-bias-current-lower? decimal64
            +--ro supply-voltage-upper?   decimal64
            +--ro supply-voltage-lower?   decimal64
            +--ro module-temperature-upper? decimal64
            +--ro module-temperature-lower? decimal64

```

This is a sample output for an OpenConfig transceiver thresholds query.

```

"Path":
"components/component[name=Optics0/1/0/1]/openconfig-platform-transceiver:transceiver/thresholds",

"values": {
  "components/component/openconfig-platform-transceiver:transceiver/thresholds": {
    "threshold": {
      "severity": "MINOR",
      "state": {
        "input-power-lower": "-12.00",
        "input-power-upper": "7.00",
        "laser-bias-current-lower": "20.00",
        "laser-bias-current-upper": "120.00",
        "module-temperature-lower": "-5.0",
        "module-temperature-upper": "80.0",
        "output-power-lower": "-5.00",
        "output-power-upper": "7.00",

```

```

        "severity": "MINOR",
        "supply-voltage-lower": "2.97",
        "supply-voltage-upper": "3.63"
    }
    {
        "source": "10.105.251.35:57400",
        "subscription-name": "default-1764094524",
        "timestamp": 1764094171883626985,
        "time": "2025-11-25T23:39:31.883626985+05:30",
        "prefix": "openconfig-platform:",
        "updates": [
            {
                "Path":
"components/component[name=Optics0/1/0/1]/openconfig-platform-transceiver:transceiver/thresholds",
                "values": {
                    "components/component/openconfig-platform-transceiver:transceiver/thresholds": {
                        "threshold": {
                            "severity": "WARNING",
                            "state": {
                                "input-power-lower": "-8.20",
                                "input-power-upper": "4.80",
                                "laser-bias-current-lower": "30.00",
                                "laser-bias-current-upper": "110.00",
                                "module-temperature-lower": "0.0",
                                "module-temperature-upper": "75.0",
                                "output-power-lower": "-1.90",
                                "output-power-upper": "4.80",
                                "severity": "WARNING",
                                "supply-voltage-lower": "3.13",
                                "supply-voltage-upper": "3.46"
                            }
                        }
                    }
                }
            }
        ]
    }
}

```

Limitation

Coherent optics do not support laser-bias-current [upper or lower] leaves. Only Grey optics support these leaves.

Extending Cisco Native Models for OpenConfig Support

Table 4: Feature History

Feature Name	Release Information	Feature Description
Extending Cisco Native Models for OpenConfig Support	Cisco IOS XR Release 24.3.1	The OpenConfig model is completely supported on NCS 1014 chassis, by extending the existing Cisco native model configuration. It supports the Q-margin and Enhanced Q-margin parameters as part of the extended OpenConfig model.

From R24.3.1 onwards, OpenConfig augmentation support is available for NCS 1014. For any configuration parameters that exist in the Cisco native model but are not included in the OpenConfig model, then such parameters can be added to the OpenConfig model by extending the existing Cisco native model.

Benefits of Using OpenConfig Augmentation

OpenConfig augmentation allows NCS 1014 chassis to be fully managed using OpenConfig models.

Purpose of OpenConfig Augmentation for Cisco Native Models

The purpose is to identify errors in signal transmission by including Q margin and Enhanced Q margin values in the OpenConfig model, which requires adding them as extended leaves within the existing open terminal model configuration.

Enabling OpenConfig Augmentation Support for Cisco Native Models

To enable OpenConfig Augmentation support for Cisco native models in the terminal device refer to the given example.

The entry highlighted in bold shows the newly added OpenConfig model as an extension to the existing Cisco native model.

```

module: openconfig-terminal-device
  +--rw terminal-device
    +--rw config
    +--ro state
    +--rw logical-channels
      | +--rw channel* [index]
      |   +--rw index                               -> ../config/index
      |   +--rw config
      |     | +--rw index?                          uint32
      |     | +--rw description?                    string
      |     | +--rw admin-state?                   oc-opt-types:admin-state-type
      |     | +--rw rate-class?                     identityref
      |     | +--rw trib-protocol?                  identityref
      |     | +--rw logical-channel-type?          identityref
      |     | +--rw loopback-mode?                 oc-opt-types:loopback-mode-type
      |     | +--rw test-signal?                    boolean
      |     +--ro state
      |       | +--ro index?                        uint32
      |       | +--ro description?                  string
      |       | +--ro admin-state?                 oc-opt-types:admin-state-type
      |       | +--ro rate-class?                   identityref
      |       | +--ro trib-protocol?                identityref
      |       | +--ro logical-channel-type?         identityref
      |       | +--ro loopback-mode?                oc-opt-types:loopback-mode-type
      |       | +--ro test-signal?                  boolean
      |       | +--ro link-state?                   enumeration
      |     +--rw otn
      |       | +--rw config
      |       |   | +--rw tti-msg-transmit?         string
      |       |   | +--rw tti-msg-expected?        string
      |       |   | +--rw tti-msg-auto?            boolean
      |       |   | +--rw tributary-slot-granularity? identityref
      |       |   +--ro state
      |       |     | +--ro tti-msg-transmit?       string
      |       |     | +--ro tti-msg-expected?      string
      |       |     | +--ro tti-msg-auto?          boolean
      |       |     | +--ro tributary-slot-granularity? identityref
      |       |     | +--ro tti-msg-recv?          string
      |       |     | +--ro rdi-msg?               string
      |       |     | +--ro errored-seconds?       yang:counter64
      |       |     | +--ro severely-errored-seconds? yang:counter64
      |       |     | +--ro unavailable-seconds?   yang:counter64
      |       |     | +--ro code-violations?       yang:counter64
      |       |     | +--ro errored-blocks?        yang:counter64

```

```

| | | +--ro fec-uncorrectable-blocks? yang:counter64
| | | +--ro fec-uncorrectable-words? yang:counter64
| | | +--ro fec-corrected-bytes? yang:counter64
| | | +--ro fec-corrected-bits? yang:counter64
| | | +--ro background-block-errors? yang:counter64
| | | +--ro pre-fec-ber
| | | | +--ro instant? decimal64
| | | | +--ro avg? decimal64
| | | | +--ro min? decimal64
| | | | +--ro max? decimal64
| | | | +--ro interval? oc-types:stat-interval
| | | | +--ro min-time? oc-types:timeticks64
| | | | +--ro max-time? oc-types:timeticks64
| | | +--ro post-fec-ber
| | | | +--ro instant? decimal64
| | | | +--ro avg? decimal64
| | | | +--ro min? decimal64
| | | | +--ro max? decimal64
| | | | +--ro interval? oc-types:stat-interval
| | | | +--ro min-time? oc-types:timeticks64
| | | | +--ro max-time? oc-types:timeticks64
| | | +--ro q-value
| | | | +--ro instant? decimal64
| | | | +--ro avg? decimal64
| | | | +--ro min? decimal64
| | | | +--ro max? decimal64
| | | | +--ro interval? oc-types:stat-interval
| | | | +--ro min-time? oc-types:timeticks64
| | | | +--ro max-time? oc-types:timeticks64
| | | +--ro esnr
| | | | +--ro instant? decimal64
| | | | +--ro avg? decimal64
| | | | +--ro min? decimal64
| | | | +--ro max? decimal64
| | | | +--ro interval? oc-types:stat-interval
| | | | +--ro min-time? oc-types:timeticks64
| | | | +--ro max-time? oc-types:timeticks64
| | +--ro oc-opt-ext:extended
| | | +--ro oc-opt-ext:state
| | | | +--ro oc-opt-ext:enhanced-q-margin? decimal64
| | | | +--ro oc-opt-ext:q-margin
| | | | | +--ro oc-opt-ext:instant? decimal64
| | | | | +--ro oc-opt-ext:avg? decimal64
| | | | | +--ro oc-opt-ext:min? decimal64
| | | | | +--ro oc-opt-ext:max? decimal64
| | | | | +--ro oc-opt-ext:interval? Decimal64
| | | | | +--ro oc-opt-ext:min-time? decimal64
| | | | | +--ro oc-opt-ext:max-time? decimal64
| | +--rw ethernet
| | | +--rw config
| | | | +--rw client-als? enumeration
| | | | | .....
| | | | | .....
augment /oc-platform:components/oc-platform:component:
+--rw optical-channel
+--rw config
| +--rw frequency? oc-opt-types:frequency-type
| +--rw target-output-power? decimal64
| +--rw operational-mode? uint16
| +--rw line-port? -> /oc-platform:components/component/name
+--ro state
| +--ro frequency? oc-opt-types:frequency-type
| +--ro target-output-power? decimal64

```

```

| +--ro operational-mode?                               uint16
| +--ro line-port?                                     ->
/oc-platform:components/component/name
| +--ro group-id?                                       uint32
.....
.....

```

Augmented Model

This is the augmented model configuration.

The entry highlighted in bold shows the newly added OpenConfig model as an extension to the existing Cisco native model.

```

module Cisco-IOS-XR-openconfig-terminal-device-ext{

  namespace "http://cisco.com/ns/yang/"+
    "Cisco-IOS-XR-openconfig-terminal-device-ext";

  prefix oc-opt-ext;

  import openconfig-platform {
    prefix oc-platform;
  }
  import openconfig-terminal-device {
    prefix oc-opt-term;
  }

  organization "Cisco Systems, Inc.";

  contact
    "Cisco Systems, Inc.
    Customer Service

    Postal: 170 West Tasman Drive
    San Jose, CA 95134

    Tel: +1 800 553-NETS

    E-mail: cs-yang@cisco.com";

  description
    "This module is an extension of optical terminal device model
    and contains the definition of extended parameters for Optical
    Channels in order to optimize the AC1200 settings to get the highest
    performance and spectral efficiency.

    This module contains definitions for the following management objects:
    General Parameters
    Submarine Parameters

    Copyright (c) 2013-2023 by Cisco Systems, Inc.
    All rights reserved.";

  revision 2023-05-08 {
    description
      "Addition of baud-rate configuration";
  }

  revision 2023-02-28 {
    description
      "Addition of input power lower and upper thresholds parameters and
      Fastpoll enable configuration";
    reference "7.8.1";
  }
}

```

```

    }
    revision 2020-08-30 {
        description
            "IOS XR 6.0 revision";
        reference "7.3.1";
    }
}

grouping terminal-device-optical-channel-ext-info {
    description "Submarine parameters for optical channel";
    leaf optics-cd-min {
        type int32 {
            range "-350000..350000";
        }
        description
            "Select min chromatic dispersion (in units of
            ps/nm)";
    }
    leaf optics-cd-max {
        type int32 {
            range "-350000..350000";
        }
        description
            "Select max chromatic dispersion (in units of
            ps/nm)";
        .....
        .....
    }
}

augment "/oc-platform:components/oc-platform:component/oc-opt-term:optical-channel" {
    container extended {
        description
            "Enclosing container for the list of Subsea parameters";

        container config {
            description
                "Extended Configuration parameters";
            leaf rx-voa-target-power {
                type int32 {
                    range "-190..30";
                }
                description "Receive Target Power in increments of 0.1 dBm
                Default value is -5 dBm";
            }
            leaf rx-voa-fixed-ratio {
                type int32 {
                    range "100..1700";
                }
                description "Receive Ratio of Optical Attenuation in
                increments of 0.01 dB Default value is 15 dB";
            }
            leaf fastpoll-sop-enable {
                type boolean {
                }
                description "Receive Fastpoll status if it is enabled or
                disabled";
            }
            uses terminal-device-optical-channel-ext-info;
        }

        container state {

            config false;

            description
                "Extended Operational parameters";
        }
    }
}

```

```

.....

augment
"/oc-opt-term:terminal-device/oc-opt-term:logical-channels/oc-opt-term:channel/oc-opt-term:otn"
{
    container extended {
augment
"/oc-opt-term:terminal-device/oc-opt-term:logical-channels/oc-opt-term:channel/oc-opt-term:otn"
{
    container extended {
        config false;
        container state {
            config false;

leaf enhanced-q-margin {
    type decimal64 {
        fraction-digits 2;
    }
    description
        "Enhanced Instantaneous Q-Margin Value";
}

    container q-margin {
description
    "Q-Margin value in dB with two decimal precision. Values
include the instantaneous, average, minimum, and maximum
statistics. If avg/min/max statistics are not supported,
the target is expected to just supply the instant value";

        leaf instant {
            type decimal64 {
                fraction-digits 2;
            }
description
            "The instantaneous value of the q-margin (in units of dB).";
        }

        leaf avg {
            type decimal64 {
                fraction-digits 2;
            }
description
            "The arithmetic mean value of the q-margin over the time interval of 10 or
30 sec. (in units of dB).";
        }

        leaf min {
            type decimal64 {
                fraction-digits 2;
            }
description
            "The minimum value of the q-margin over the time interval of 10 or 30 sec.
(in units of dB).";
        }

        leaf max {
            type decimal64 {
                fraction-digits 2;
            }
description
            "The maximum value of the q-margin over the time interval of 10 or 30 sec.
(in units of dB).";
        }
    }
}

```

```

    }
    leaf min-time {
        type decimal64 {
            fraction-digits 2;
        }
        description
            "The absolute time at which the minimum value occurred.
            The value is the timestamp in nanoseconds relative to
            the Unix Epoch (Jan 1, 1970 00:00:00 UTC).";
    }

        leaf max-time {
            type decimal64 {
                fraction-digits 2;
            }
            description
                "The absolute time at which the maximum value occurred.
                The value is the timestamp in nanoseconds relative to
                the Unix Epoch (Jan 1, 1970 00:00:00 UTC).";
        }

            leaf interval {
                type decimal64 {
                    fraction-digits 2;
                }
                description
                    "If supported by system, this reports the time interval
                    over which the min/max/average statistics are computed by the
                    system.";
            }
        }
    }
    description
        "This augment extends the operational data of
        'terminal-otn-protocol-state'";
}
description
    "This augment extends the operational data of
    'terminal-otn-protocol-top'";
}
}
}

```



Note The CLI appearing in bold is the augmented code added to the existing Cisco native model.

OpenConfig OSPF augmentations for distribute link-state

An OpenConfig OSPF augmentation is an enhancement that

- enables the 'distribute link-state' configuration within OSPF,
- facilitates sending Link State Advertisements (LSAs) to external services such as BGP, and
- is essential for activating OSC links within the OpenConfig model.

Table 5: Feature History

Feature Name	Release Information	Feature Description
OpenConfig OSPF augmentation to support distribute link-state	Cisco IOS XR Release 25.4.1	<p>This enhancement introduces support for the OSPF distribute link-state capability within the <code>openconfig-network-instance.yang</code> model through a new extended YANG model.</p> <p>New Extended YANG model introduced: Cisco-IOS-XR-openconfig-ospfv2-ext.yang</p> <p>This feature allows OpenConfig to deliver Operations, Administration, and Maintenance (OAM) functionality for distributed link-state capability.</p>

Key information on OpenConfig OSPF distribute link-state

You can configure distribute link-state directly through the OpenConfig model, that is integrated with the existing `openconfig-network-instance.yang`. This feature supports specific 'distribute' leaves, is available without changes to the native YANG and CLI, and is useful for OSC link activation and sharing OSPF link-state.



Note When the "enabled leaf" is set to true, the "distribute link-state" configuration is applied. If it is set to false, the "distribute link-state" configuration is removed. Additionally, when other leaves are configured through the Open-config Model, the "enabled leaf" is not set to true, those leaves will be checked in the Open-config datastore, but not applied to the device. If its value is set to true later, the "distribute link-state" configuration, along with the other leaves that is already set in the Open-config data store, is applied to the device.

Examples

This is a sample OSPF distribute link-state configuration.

```
"update": [
  {
    "path": {
      "origin": "openconfig",
      "elem": [
        {
          "name": "network-instances"
        },
        {
          "name": "network-instance",
          "key": {
            "name": "DEFAULT"
          }
        }
      ]
    }
  }
]
```

```

        "name": "config"
      },
      {
        "name": "name"
      }
    ]
  },
  "val": {
    "jsonIetfVal": "\"DEFAULT\""
  }
},
{
  "path": {
    "origin": "openconfig",
    "elem": [
      {
        "name": "network-instances"
      },
      {
        "name": "network-instance",
        "key": {
          "name": "DEFAULT"
        }
      },
      {
        "name": "protocols"
      },
      {
        "name": "protocol",
        "key": {
          "identifier": "OSPF",
          "name": "10"
        }
      },
      {
        "name": "config"
      },
      {
        "name": "identifier"
      }
    ]
  },
  "val": {
    "jsonIetfVal": "\"openconfig-policy-types:OSPF\""
  }
},
{
  "path": {
    "origin": "openconfig",
    "elem": [
      {
        "name": "network-instances"
      },
      {
        "name": "network-instance",
        "key": {
          "name": "DEFAULT"
        }
      },
      {
        "name": "protocols"
      },
      {
        "name": "protocol",

```

```

        "key": {
          "identifier": "OSPF",
          "name": "10"
        }
      },
      {
        "name": "config"
      },
      {
        "name": "name"
      }
    ]
  },
  "val": {
    "jsonIetfVal": "\"10\""
  }
},
{
  "path": {
    "origin": "openconfig",
    "elem": [
      {
        "name": "network-instances"
      },
      {
        "name": "network-instance",
        "key": {
          "name": "DEFAULT"
        }
      },
      {
        "name": "protocols"
      },
      {
        "name": "protocol",
        "key": {
          "identifier": "OSPF",
          "name": "10"
        }
      },
      {
        "name": "ospfv2"
      },
      {
        "name": "global"
      },
      {
        "name": "cisco"
      },
      {
        "name": "distribute"
      },
      {
        "name": "config"
      },
      {
        "name": "enabled"
      }
    ]
  },
  "val": {
    "jsonIetfVal": "true"
  }
}

```

This is a sample OSPF extended model structure.

```

+--rw cisco
  +--rw distribute
    +--rw config
      | +--rw enabled?          boolean
      | +--rw throttle?       uint32
      | +--rw instance-id?    uint64
      | +--rw excl-external?  boolean
      | +--rw route-policy-name? string
      | +--rw follow-on?     uint32
    +--ro state
      +--ro enabled?          boolean
      +--ro throttle?       uint32
      +--ro instance-id?    uint64
      +--ro excl-external?  boolean
      +--ro route-policy-name? string
      +--ro follow-on?     uint32

```

Limitations

- These leaves do not support Telemetry (EDT and MDT).
- You can configure distribute link-state on only one OSPF instance. Multiple instance configurations will fail with an error message.
- This feature is supported only on the Default VRF and is not available for non-default VRFs.

OpenConfig Support for FEC Data

Table 6: Feature History

Feature Name	Release Information	Feature Description
OpenConfig Support for FEC Data	Cisco IOS XR Release 24.3.1	OpenConfig model support is added for Forward Error Correction (FEC) data on the NCS 1014 chassis. It helps in avoiding deviations in the pre-fec-ber and post-fec-ber leaves for pluggables.

In the NCS 1014 chassis, Forward Error Correction (FEC) is enabled on all 400G pluggables and in 100G deployments. The OpenConfig model allows monitoring of FEC statistics through NetConf and telemetry for the NCS1K14-2.4T-X-K9 card.

Purpose of OpenConfig Support for FEC Data in NCS 1014 Chassis

In the NCS 1014 chassis, Cisco native models do not support the **pre-fec-ber** and **post-fec-ber** containers which are needed for monitoring FEC statistics on the NCS1K14-2.4T-X-K9 card. The OpenConfig model can be used for this purpose by extending the existing native commands.

Benefits of Providing OpenConfig Support for FEC Data in NCS 1014

Enabling OpenConfig model support for FEC data in NCS 1014 avoids deviations in the **pre-fec-ber** and **post-fec-ber** leaves for transceivers across all routing and optical platforms.

Supported FEC Parameters

The instant data and performance monitoring statistics parameters are enabled for supporting FEC on transceivers are:

- min,
- max,
- avg,
- min-time and
- max-time,
- instant.

Enabling OpenConfig Support for FEC Data

To enable OpenConfig operations and telemetry support for FEC data, refer to the example.

The entry highlighted in bold shows the newly added OpenConfig model telemetry support for FEC data.

```

module: openconfig-platform-transceiver
augment /oc-platform:components/oc-platform:component:
  +--rw transceiver
    +--rw config
      | +--rw enabled? boolean
      | +--rw form-factor-preconf? identityref
      | +--rw ethernet-pmd-preconf? identityref
      | +--rw fee-mode? identityref
    +--ro state
      | +--ro enabled? boolean
      | +--ro form-factor-preconf? identityref
      | +--ro ethernet-pmd-preconf? identityref
      | +--ro fee-mode? identityref
      | +--ro present? enumeration
      | +--ro form-factor? identityref
      | +--ro connector-type? identityref
      | +--ro vendor? string
      | +--ro vendor-part? string
      | +--ro vendor-rev? string
      | +--ro ethernet-pmd? identityref
      | +--ro sonet-sdh-compliance-code? identityref
      | +--ro otn-compliance-code? identityref
      | +--ro serial-no? string
      | +--ro date-code? oc-yang:date-and-time
      | +--ro fault-condition? boolean
      | +--ro fee-status? identityref
      | +--ro fee-uncorrectable-blocks? yang:counter64
      | +--ro fee-uncorrectable-words? yang:counter64
      | +--ro fee-corrected-bytes? yang:counter64
      | +--ro fee-corrected-bits? yang:counter64
    +--ro pre-fec-ber
      | +--ro instant? decimal64
      | +--ro avg? decimal&
      | +--ro min? decimal64
      | +--ro max? decimal&
      | +--ro interval? oc-types:stat-interval
      | +--ro min-time? oc-types:timeticks64
      | +--ro max-time? oc-types:timeticks64
    +--ro post-fec-ber
      | +--ro instant? decimal64
  
```

```

    | +--ro avg? decimal64
    | +--ro min? decimal64
    | +--ro max? decimal64
    | +--ro interval? oc-types:stat-interval
    | +--ro min-time? oc-types:timeticks64
    | +--ro max-time? oc-types:timeticks64
+--ro output-power
  | +--ro instant? decimal64
  | +--ro avg? decimal64
  | +--ro max-time? oc-types:timeticks64
+--ro input-power
  | +--ro instant? decimal64
  | +--ro avg? decimal64
  | +--ro min? decimal64
  | +--ro max? decimal64
  | +--ro interval? oc-types:stat-interval
  | +--ro min-time? oc-types:timeticks64
  | +--ro max-time? oc-types:timeticks64
+--ro laser-bias-current
  .....
+--ro laser-bias-current
  +--ro instant? decimal64
  +--ro avg? decimal64
  +--ro min? decimal64
  +--ro max? decimal64
  +--ro interval? oc-types:stat-interval
  +--ro min-time? oc-types:timeticks64
  +--ro max-time? oc-types:timeticks64
augment / oc-if:interfaces/oc-if:interface/oc-if:state:
+--ro transceiver? -> /oc-platform:components/component[oc
platform:name=current()/../oc-port:hardware-port]/ocplatform:subcomponents/subcomponent/name
augment / oc-if:interfaces/oc-if:interface/oc-if:state:
+--ro physical-channel* -> /oc-platform:components/component[oc
platform:name=current()/../oc-transceiver:transceiver]/transceiver/physical▶
channels/channel/index

```

Instant value example:

```

instant value:
RP/0/RP0/CPU0:N112#sh controllers fourHundredGigEctrlr 0/2/0/1
Operational data for interface FourHundredGigEctrlr0/2/0/1:

```

State:

```

Administrative state: enabled
Operational state: Up
LED state: Green On
Maintenance: Disabled
AINS Soak: None
  Total Duration: 0 hour(s) 0 minute(s)
  Remaining Duration: 0 hour(s) 0 minute(s) 0 second(s)
Laser Squelch: Disabled
Insert Idle Ingress: Disabled
Insert Idle Egress: Disabled

```

Phy:

```

Media type: Not known
Statistics:

```

```

  FEC:
    Corrected Codeword Count: 35409983          Valid: True      Start time:
14:45:53 Mon Aug 19 2024
    Uncorrected Codeword Count: 56             Valid: True      Start time:
14:45:53 Mon Aug 19 2024
  PCS:
    Total BIP errors: 0                         Valid: True      Start time:
14:45:53 Mon Aug 19 2024

```

```

Total frame errors: 0 Valid: False Start time:
14:45:53 Mon Aug 19 2024
Total Bad SH: 0 Valid: False Start time:
14:45:53 Mon Aug 19 2024

```

Autonegotiation disabled.

Operational values:

```

Speed: 400Gbps
Duplex: Full Duplex
Flowcontrol: None
Loopback: None (or external)
Pre FEC BER: 1.5E-09
Post FEC BER: 0.0E+00
BER monitoring:
    Not supported
Forward error correction: Standard (Reed-Solomon)
Holdoff Time: 0ms

```

Output CLI example of pre-fec and post-fec ber parameters:

```

min/max/avg:
RP/0/RP0/CPU0:N112#sh controllers fourHundredGigEctrlr 0/2/0/1 pm current 15-min fec

Ethernet FEC in the current interval [06:00:00 - 06:07:12 Tue Aug 20 2024]

FEC current bucket type : Valid
EC-WORDS : 313148 Threshold : 0 TCA(enable) : NO
UC-WORDS : 0 Threshold : 0 TCA(enable) : NO

MIN AVG MAX Threshold TCA Threshold TCA
(min) (enable) (max) (enable)
PreFEC BER : 8.2E-10 1.7E-09 2.6E-09 0E-15 NO 0E-15 NO
PostFEC BER : 0E-15 0E-15 0E-15 0E-15 NO 0E-15 NO

Last clearing of "show controllers ETHERNET" counters 13:52:01
RP/0/RP0/CPU0:N112#

```

OpenConfig support for pluggable temperature data

In the NCS 1014 chassis, temperature monitoring for the optical pluggable modules is enabled on all 400G pluggables and in 100G deployments. The OpenConfig model allows monitoring of pluggable modules temperature through NetConf and telemetry for all the supported NCS 1014 cards.

Supported pluggable module temperature parameters

Table 7: Feature history

Feature name	Release information	Feature description
Enhanced temperature monitoring parameters for optics	Cisco IOS XR Release 25.4.1	<p>Monitoring parameters for optical pluggable modules are enhanced with new CLI attributes and Open Config leaves.</p> <p>The CLI attribute <code>TEMP_MODULE</code> indicates the temperature of the pluggable modules in these CLI command output:</p> <ul style="list-style-type: none"> • show environment all • show environment temperature • show environment temperature location <lc location> <p>These temperature parameters are supported through the <code>openconfig-platform-transceiver.yang</code> model:</p> <ul style="list-style-type: none"> • alarm-status • instant • interval • avg • max • min • min-time • max-time <p>These parameters are present only when alarm-status is true.</p> <ul style="list-style-type: none"> • alarm-severity • alarm-threshold

These temperature and alarms parameters are enabled for monitoring pluggable modules temperature on transceivers:

- alarm-status
- instant
- interval
- avg
- max
- min
- min-time

- max-time

These parameters are present only when alarm-status is true.

- alarm-severity
- alarm-threshold

OpenConfig no alarms output

The output highlights the alarm status as false.

```
/auto/cafy/tools/mgbl/openconfig_gnmi_client -e json_ietf -u cisco -p testeng -a
10.105.57.16:57400 --insecure get --path
components/component[name=Optics0/0/0/2]/state/temperature
[
  {
    "source": "10.105.57.16:57400",
    "timestamp": 1756216557476975066,
    "time": "2025-08-26T19:25:57.476975066+05:30",
    "updates": [
      {
        "Path": "openconfig:components/component[name=Optics0/2/0/2]/state/temperature",
        "values": {
          "components/component/state/temperature": {
            "alarm-status": false,
            "avg": "38.0",
            "instant": "39.0",
            "interval": "5",
            "max": "39.0",
            "max-time": "1756216516636704112",
            "min": "37.0",
            "min-time": "1756216436521324551"
          }
        }
      }
    ]
  }
]
```

No alarm CLI output

The output highlights the temperature for the pluggable module that is within the temperature range.

```
RP/0/RP0/CPU0:ios#show environment temperature location 0/2
Wed Dec 17 10:09:48.417 UTC
```

Location	TEMPERATURE	Value	Crit	Major	Minor	Minor
Major	Crit	(deg C)	(Lo)	(Lo)	(Lo)	(Hi)
(Hi)	(Hi)					

.
.	output snipped
.
.
Optics0/2/0/0	TEMP_MODULE	26	-10	0	5	95

100	105					
Optics0/2/0/7	TEMP_MODULE	24	-10	0	5	95
100	105					
Optics0/2/0/1	TEMP_MODULE	25	-5	0	5	65
70	75					
Optics0/2/0/2	!TEMP_MODULE	39	-5	0	5	65
70	75					
Optics0/2/0/3	TEMP_MODULE	21	-5	0	5	65
70	75					
Optics0/2/0/4	TEMP_MODULE	23	-5	0	5	65
70	75					

OpenConfig critical alarm output

The output highlights the severity of the alarm as Critical and alarm threshold as 75. Critical alarm is raised because the temperature crossed the critical alarm threshold of 75.

```
/auto/cafy/tools/mgbl/openconfig_gnmi_client -e json_ietf -u cisco -p testeng -a
10.105.57.16:57400 --insecure get --path
components/component[name=Optics0/0/0/2]/state/temperature
[
  {
    "source": "10.105.57.16:57400",
    "timestamp": 1756212429538743991,
    "time": "2025-08-26T18: 17:09.538743991+05:30",
    "updates": [
      {
        "Path": "openconfig:components/component[name=Optics0/2/0/2]/state/temperature",
        "values": {
          "components/component/state/temperature": {
            "alarm-severity": openconfig-alarm-types:CRITICAL,
            "alarm-status": true,
            "alarm-threshold": 75
            "avg": "37.0",
            "instant": "78.0",
            "interval": "5",
            "max": "78.0",
            "max-time": "1756212429522568996",
            "min": "37.0",
            "min-time": "1756209702045222554"
          }
        }
      }
    ]
  }
]
```

Critical alarm CLI output

The output highlights the temperature for the affected pluggable module that has crossed the critical threshold.

```
RP/0/RP0/CPU0:ios#show environment temperature location 0/2
Wed Dec 17 10:09:48.417 UTC
```

Location	TEMPERATURE	Value	Crit	Major	Minor	Minor
Major	Crit					
(Hi)	Sensor (Hi)	(deg C)	(Lo)	(Lo)	(Lo)	(Hi)

.						
.						
output snipped						
.						
.						
Optics0/2/0/0	TEMP_MODULE	26	-10	0	5	95
100	105					
Optics0/2/0/7	TEMP_MODULE	24	-10	0	5	95
100	105					
Optics0/2/0/1	TEMP_MODULE	25	-5	0	5	65
70	75					
Optics0/2/0/2	!TEMP_MODULE	78	-5	0	5	65
70	75					
Optics0/2/0/3	TEMP_MODULE	21	-5	0	5	65
70	75					
Optics0/2/0/4	TEMP_MODULE	23	-5	0	5	65
70	75					

OpenConfig major alarm output

The output highlights the severity of the alarm as Major and alarm threshold as 70. Major alarm is raised because the temperature crossed the major alarm threshold of 70.

```
/auto/cafy/tools/mgbl/openconfig_gnmi_client -e json_ietf -u cisco -p testeng -a
10.105.57.16:57400 --insecure get --path
components/component[name=Optics0/0/0/2]/state/temperature
[
  {
    "source": "10.105.57.16:57400",
    "timestamp": 1756212409497332276,
    "time": "2025-08-26T18: 1649.497332276+05.30",
    "updates": [
      {
        "Path": "openconfig:components/component[name=Optics0/2/0/2]/state/temperature",
        "values": {
          "components/component/state/temperature": {
            "alarm-severity": openconfig-alarm-types:MAJOR,
            "alarm-status": true,
            "alarm-threshold": 70
            "avg": "37.0",
            "instant": "73.0",
            "interval": "5",
            "max": "73.0",
            "max-time": "1756212409480555088",
            "min": "37.0",
            "min-time": "1756209702045222554"
          }
        }
      }
    ]
  }
]
```

```
}
]
```

Major alarm CLI output

The output highlights the temperature for the affected pluggable module that has crossed the major threshold.

```
RP/0/RP0/CPU0:ios#show environment temperature location 0/2
Wed Dec 17 10:09:48.417 UTC
```

Location	TEMPERATURE	Value	Crit	Major	Minor	Minor
Major	Crit					
(Hi)	Sensor (Hi)	(deg C)	(Lo)	(Lo)	(Lo)	(Hi)

.
output snipped						
.
Optics0/2/0/0	TEMP_MODULE	26	-10	0	5	95
100	105					
Optics0/2/0/7	TEMP_MODULE	24	-10	0	5	95
100	105					
Optics0/2/0/1	TEMP_MODULE	25	-5	0	5	65
70	75					
Optics0/2/0/2	!TEMP_MODULE	73	-5	0	5	65
70	75					
Optics0/2/0/3	TEMP_MODULE	21	-5	0	5	65
70	75					
Optics0/2/0/4	TEMP_MODULE	23	-5	0	5	65
70	75					

OpenConfig Minor alarm output

The output highlights the severity of the alarm as Minor and alarm threshold as 5. Minor alarm is raised because the temperature crossed the minor alarm threshold of 5.

```
/auto/cafy/tools/mgbl/openconfig_gnmi_client -e json_ietf -u cisco -p testeng -a
10.105.57.16:57400 --insecure get --path
components/component[name=Optics0/0/0/2]/state/temperature
[
{
  "source": "10.105.57.16:57400",
  "timestamp": 1756212445571019326,
  "time": "2025-08-26T18: 1649.497332276+05.30",
  "updates": [
    {
      "Path": "openconfig:components/component[name=Optics0/2/0/2]/state/temperature",
      "values": {
        "components/component/state/temperature": {
          "alarm-severity": openconfig-alarm-types:MINOR,

```

```

        "alarm-status": true,
        "alarm-threshold": 5,
        "avg": "37.0",
        "instant": "2.0",
        "interval": "5",
        "max": "38.0",
        "max-time": "1756209481940797844",
        "min": "2.0",
        "min-time": "1756212445553883451"
    }
}
]
}
]

```

Minor alarm CLI output

The output highlights the temperature for the affected pluggable module that has crossed the minor threshold.

```
RP/0/RP0/CPU0:ios#show environment temperature location 0/2
Wed Dec 17 10:09:48.417 UTC
```

Location	TEMPERATURE	Value	Crit	Major	Minor	Minor
Major	Crit	(deg C)	(Lo)	(Lo)	(Lo)	(Hi)
(Hi)	(Hi)					

.						
.						
output	snipped					
.						
.						
Optics0/2/0/0						
	TEMP_MODULE	26	-10	0	5	95
100	105					
Optics0/2/0/7						
	TEMP_MODULE	24	-10	0	5	95
100	105					
Optics0/2/0/1						
	TEMP_MODULE	25	-5	0	5	65
70	75					
Optics0/2/0/2						
	!TEMP_MODULE	2	-5	0	5	65
70	75					
Optics0/2/0/3						
	TEMP_MODULE	21	-5	0	5	65
70	75					
Optics0/2/0/4						
	TEMP_MODULE	23	-5	0	5	65
70	75					

EDT enhancements

Table 8: Feature History

Feature Name	Release Information	Release Description
Enhanced EDT notifications for the OpenConfig-platform YANG model	Cisco IOS XR Release 25.2.1	This feature notifies you of deletions and updates for all components removed from or inserted into the system through Event-Driven Telemetry (EDT). These notifications are included under the OpticalChannel component of the EDT output for the sensor path <code>openconfig-platform:components/component/state</code>

The Event-Driven Telemetry (EDT) notifications for the `OpenConfig-platform` YANG model have been enhanced to better report system changes through telemetry by including additional notifications for component changes.

The additional notifications available for the telemetry sensor path

"`openconfig-platform:components/component/state`" are:

- **Delete Notifications:** Triggered when components are removed from the system.
- **Update Notifications:** Generated when new components are inserted into the system.
- **Change Detection:** Triggered when components are added, removed, or modified. The system detects these changes, updates the inventory database, and sends corresponding EDT notifications. This includes code updates to support these actions.

OpticalChannel component behavior

This enhancement is particularly helpful for the OpticalChannel component that is created whenever Coherent Optics (e.g., CIM8 in NCS1014) is configured.

It operates as a child of the `Optics0/x/0/x` component. Previously, when the configuration was removed or the optics were unplugged, a delete notification was sent only for the `Optics0/x/0/x` component, while the OpticalChannel component did not receive one.

With this enhancement, a delete notification will now also be sent for the OpticalChannel component when its corresponding configuration is removed or the optics are unplugged.

Benefits

This EDT enhancements have these benefits:

- All changes to system components, such as additions, deletions, and updates, are captured and reported through telemetry in real-time. This ensures a reliable and up-to-date view of the system state.
- By including delete notifications for child components like OpticalChannel, the telemetry system provides a more complete and consistent view of system state changes.

