



# **OcNOS®**

## **Open Compute Network Operating System Version 6.5.3**

Data Model Reference

October 2024

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# 1. Overview

This document describes the YANG data models supported by OcNOS, including the command reference and XML snippets, and provides information on where to find all the documents and YANG files.

## 2. Get the datamodels

The datamodels can be retrieved from the following locations:

- Github
- OcNOS installed devices.

### 2.1 Datamodel Location in Github

Users can access the YANG data models on GitHub through the following link: [GitHub - IPInfusion/OcNOS: OcNOS™ Network Operating System](#)

Note: This link directs to the 'master' branch, which we do not update. To access specific YANG models based on OcNOS release version, follow these steps:

- Click on 'master'.
- From the dropdown menu, enter a search string, such as "5.1," "6.0.0," or "6.3.0," corresponding to the OcNOS release version for which the YANG models are needed.
- Select the desired version from the dropdown and click to switch the branch.

Before proceeding, refer to the snapshot below to understand how to choose the branch version:

Before proceeding, refer to the snapshot below to understand how to choose the branch version:

The screenshot shows the GitHub repository page for IPInfusion/OcNOS. The repository is public. The navigation tabs are Code, Issues (2), Pull requests (4), Actions, Projects, Security, and Insights. The current branch is master, and there are 92 branches and 0 tags. A dropdown menu for switching branches/tags is open, showing a search bar with the text '6.3.0'. Below the search bar, there are two tabs: Branches and Tags. Under the Branches tab, the following branches are listed: OCNOS-OTN-6.3.0, OcNOS-DC-6.3.0, OcNOS-OLT-6.3.0, and OcNOS-SP-6.3.0. A link 'View all branches' is at the bottom of the dropdown. The main content area displays the title 'OcNOS™ Network Operating System' and a description: 'Contains the SNMP MIB files, Yang files, Ansible modules etc. to use with OcNOS. Please Switch to the respective OcNOS version specific branch to access the files'.

## 2.1.1 Yang Datamodels

The Yang models are available inside the “yang-files” folder. OcNOS supports two types of Datamodels:

1. IPI Datamodels
2. OpenConfig datamodels

Here is a snapshot for reference:

The screenshot shows the GitHub repository page for `IPIInfusion / OcNOS` at the path `OcNOS-SP-6.3.0/yang-files`. The repository is public. The navigation bar includes links for `Code`, `Issues` (2), `Pull requests` (4), `Actions`, `Projects`, `Security`, and `Insights`. The current branch is `OcNOS-SP-6.3.0`. A message indicates the branch is 2 commits ahead and 4 commits behind master. The commit history shows a commit by `IPIInfusion` titled "Adding yang-files and mibs for OcNOS-6.3.0 release". The file list shows two folders: `ipi` and `openconfig`, both with the same commit message.

← ↻ 🏠 <https://github.com/IPIInfusion/OcNOS/tree/OcNOS-SP-6.3.0/yang-files>

Product ▾ Solutions ▾ Open Source ▾ Pricing

IPIInfusion / OcNOS Public

<> Code + Issues 2 🔗 Pull requests 4 ▶ Actions 📁 Projects 🛡 Security 📄 Insights

🔗 OcNOS-SP-6.3.0 ▾ OcNOS / yang-files /

This branch is 2 commits ahead, 4 commits behind master.

IPIInfusion Adding yang-files and mibs for OcNOS-6.3.0 release


..


ipi	Adding yang-files and mibs for OcNOS-6.3.0 release
openconfig	Adding yang-files and mibs for OcNOS-6.3.0 release

## 2.1.2 IPI Datamodels


OcNOS supports the IPI Datamodels, which are considered the 'native' datamodels. These models are used to represent all configurations and operational attributes of OcNOS. The IPI Datamodels adhere to OpenConfig style guidelines, ensuring a clear separation of 'config' and 'state' attributes. User can find these datamodels inside the "yang-files/ipi" folder on GitHub. Here is a snapshot for reference:

← ↻ 🏠 <https://github.com/IPInfusion/OcNOS/tree/OcNOS-SP-6.3.0/yang-files/ipi>


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 **IPInfusion / OcNOS** Public

<> Code Issues 2 Pull requests 4 Actions Projects Security Insights

 OcNOS-SP-6.3.0 ▾ **OcNOS / yang-files / ipi /**

This branch is [2 commits ahead](#), [4 commits behind](#) master.

 **IPInfusion** Adding yang-files and mibs for OcNOS-6.3.0 release

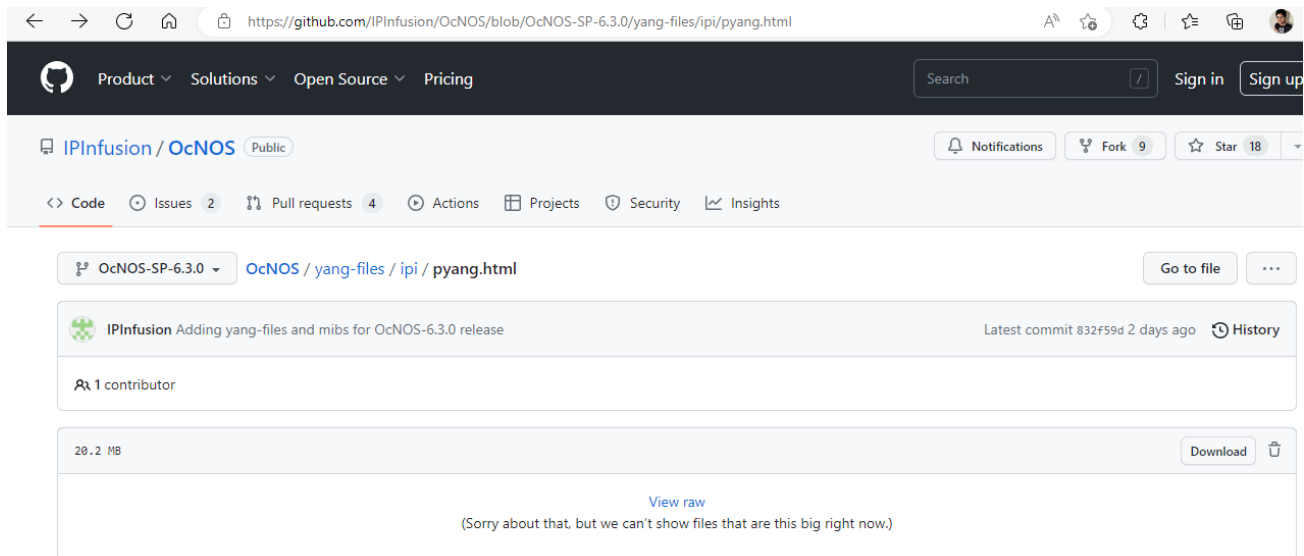
..	
 <b>aaa</b>	Adding yang-files and mibs for OcNOS-6.3.0 release
 <b>acl</b>	Adding yang-files and mibs for OcNOS-6.3.0 release
 <b>alarms</b>	Adding yang-files and mibs for OcNOS-6.3.0 release
 <b>arp</b>	Adding yang-files and mibs for OcNOS-6.3.0 release
 <b>auth</b>	Adding yang-files and mibs for OcNOS-6.3.0 release

### 2.1.2.1 IPI Pyang Tree

To access the Pyang Trees, follow these steps:

1. Scroll down to the bottom of the page and click on “pyang.html”.
2. On the Pyang page, right-click on 'view raw' and choose 'Save link as...' Do not select 'Download'.

Refer to the snapshot below:



3. After saving the pyang HTML page, user can access the Pyang tree. Once the page is open, scroll down to find the individual datamodel pyang trees. Refer to the snapshot below:

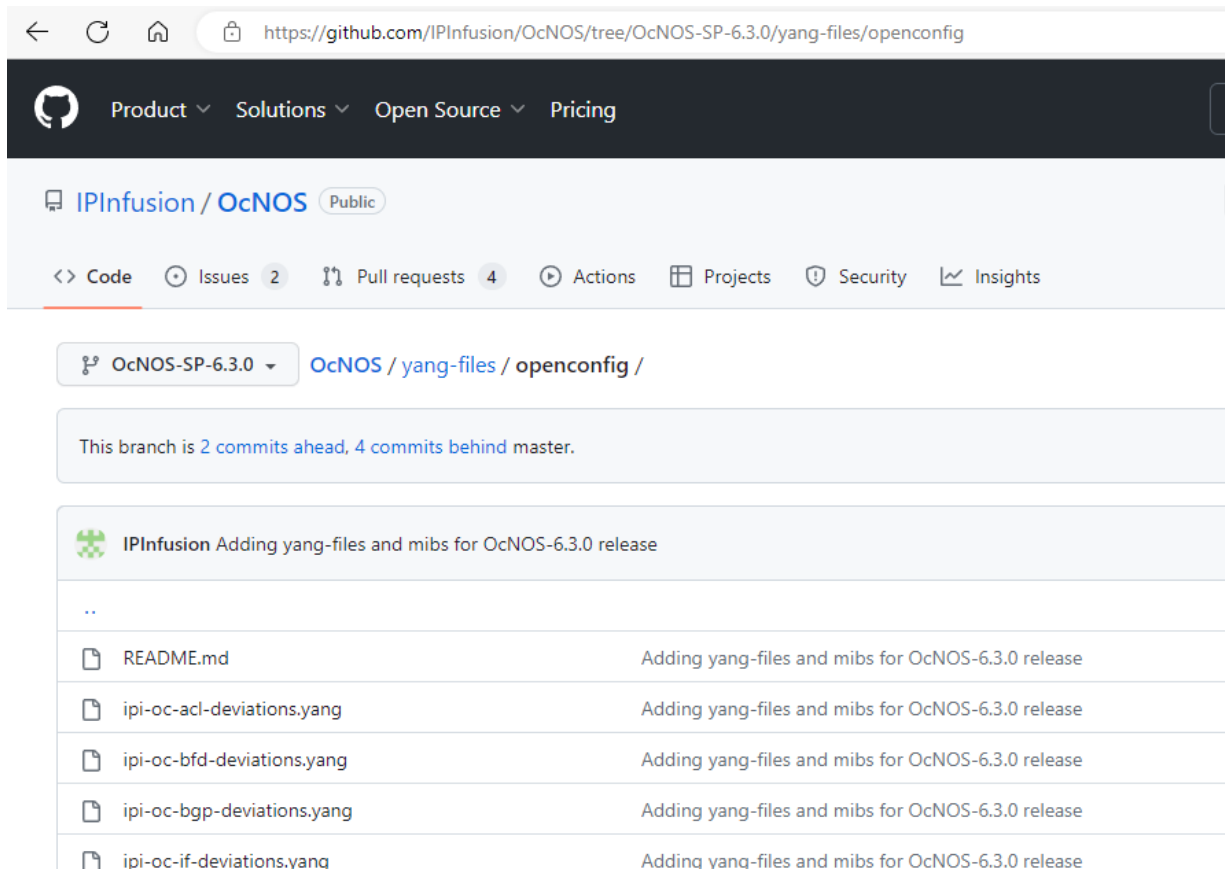
Submodule: <a href="#">ipi-vrrp-global</a> (belongs-to <a href="#">ipi-vrrp</a> )			
Submodule: <a href="#">ipi-vrrp-ipv4</a> (belongs-to <a href="#">ipi-vrrp</a> )			
Submodule: <a href="#">ipi-vrrp-ipv6</a> (belongs-to <a href="#">ipi-vrrp</a> )			
Module: <a href="#">ipi-vrrp-types</a> , Namespace: <a href="http://www.ipinfusion.com/yang/ocnos/ipi-vrrp-types">http://www.ipinfusion.com/yang/ocnos/ipi-vrrp-types</a> , Prefix: <a href="#">ipi-vrrp-types</a>			
Module: <a href="#">ipi-vrrp</a> , Namespace: <a href="http://www.ipinfusion.com/yang/ocnos/ipi-vrrp">http://www.ipinfusion.com/yang/ocnos/ipi-vrrp</a> , Prefix: <a href="#">ipi-vrrp</a>			
Module: <a href="#">ipi-vxlan-types</a> , Namespace: <a href="http://www.ipinfusion.com/yang/ocnos/ipi-vxlan-types">http://www.ipinfusion.com/yang/ocnos/ipi-vxlan-types</a> , Prefix: <a href="#">ipi-vxlan-types</a>			
Module: <a href="#">ipi-vxlan</a> , Namespace: <a href="http://www.ipinfusion.com/yang/ocnos/ipi-vxlan">http://www.ipinfusion.com/yang/ocnos/ipi-vxlan</a> , Prefix: <a href="#">ipi-vxlan</a>			
Module: <a href="#">ipi-watchdog-types</a> , Namespace: <a href="http://www.ipinfusion.com/yang/ocnos/ipi-watchdog-types">http://www.ipinfusion.com/yang/ocnos/ipi-watchdog-types</a> , Prefix: <a href="#">ipi-watchdog-types</a>			
Module: <a href="#">ipi-watchdog</a> , Namespace: <a href="http://www.ipinfusion.com/yang/ocnos/ipi-watchdog">http://www.ipinfusion.com/yang/ocnos/ipi-watchdog</a> , Prefix: <a href="#">ipi-watchdog</a>			
Module: <a href="#">ipi-xstp-types</a> , Namespace: <a href="http://www.ipinfusion.com/yang/ocnos/ipi-xstp-types">http://www.ipinfusion.com/yang/ocnos/ipi-xstp-types</a> , Prefix: <a href="#">ipi-xstp-types</a>			
Module: <a href="#">ipi-xstp</a> , Namespace: <a href="http://www.ipinfusion.com/yang/ocnos/ipi-xstp">http://www.ipinfusion.com/yang/ocnos/ipi-xstp</a> , Prefix: <a href="#">ipi-xstp</a>			
Module: <a href="#">zebm-cli</a> , Namespace: <a href="http://ipinfusion.com/ns/zebmcli">http://ipinfusion.com/ns/zebmcli</a> , Prefix: <a href="#">zebm-cli</a>			
Element <a href="#">[+]Expand all</a> <a href="#">[-]Collapse all</a>			
<a href="#">ipi-aaa</a>	Schema	Type	Flags
<a href="#">ipi-aaa:rpcs</a>	module		
<a href="#">ipi-acl</a>	module		
<a href="#">ipi-acl:rpcs</a>	module		
<a href="#">ipi-alarms</a>	module		
<a href="#">ipi-alarms:notifs</a>	module		
<a href="#">ipi-arp</a>	module		
<a href="#">ipi-arp:rpcs</a>	module		
<a href="#">ipi-authentication-radius</a>	module		
<a href="#">ipi-authentication</a>	module		
<a href="#">ipi-authentication:rpcs</a>	module		
<a href="#">ipi-bfd</a>	module		
<a href="#">ipi-bfd:rpcs</a>	module		

## 2.1.3 OpenConfig Datamodels

OcNOS supports both native IPI models and OpenConfig standard-defined datamodels. Not all attributes of OpenConfig are supported. Some additional attributes are added in OpenConfig for operational purposes, which are defined in the IPI OpenConfig deviation yang files.



To use OpenConfig datamodels, users must combine IPI deviation files with OpenConfig yang files. Here's how to do it:



The screenshot shows the GitHub repository page for IPInfusion/OcNOS. The URL is <https://github.com/IPInfusion/OcNOS/tree/OcNOS-SP-6.3.0/yang-files/openconfig>. The repository is public. The selected branch is OcNOS-SP-6.3.0. The commit message is "IPInfusion Adding yang-files and mibs for OcNOS-6.3.0 release". The files listed are:

File	Commit Message
README.md	Adding yang-files and mibs for OcNOS-6.3.0 release
ipi-oc-acl-deviations.yang	Adding yang-files and mibs for OcNOS-6.3.0 release
ipi-oc-bfd-deviations.yang	Adding yang-files and mibs for OcNOS-6.3.0 release
ipi-oc-bgp-deviations.yang	Adding yang-files and mibs for OcNOS-6.3.0 release
ipi-oc-if-deviations.yang	Adding yang-files and mibs for OcNOS-6.3.0 release

- Obtain the deviation files from the "yang-files/openconfig" folder on the IPInfusion GitHub.
- In this folder, a README file contains the OpenConfig SHA1 or version to be used.
- Retrieve the Yang files from the OpenConfig GitHub repository for the version specified in the IPInfusion README.

```
git clone git@github.com:openconfig/public.git openconfig/
```

```
git checkout <SHA1 or version from README>
```

```
cd openconfig/release/models
```

- After performing the git checkout, find the yang files in the "openconfig/release/models" folder.

Note: If a version is provided (starting in OcNOS 6.4.0), users can directly download the files using the version tag from the GitHub page.

Not all attributes of the OpenConfig datamodels are supported, and there are some variations in the ones that are supported. Detailed information is tabulated in the 'yang deviation' files located within the "yang-files/openconfig" folder.

### 2.1.3.1 OpenConfig Pyang Tree

The Pyang Tree for OpenConfig can also be found on GitHub under "yang-files/openconfig/openconfig.html".

To download the HTML file and open it, follow the same instructions provided in section [2.1.2.1 for IPI Pyang Tree](#).

This provides a consolidated view of OpenConfig support in OcNOS, including only the attributes that are supported, by incorporating the yang deviations. Refer to the snapshot below for guidance.

Module: <b>ipi-oc-platform-types-deviations</b> , Namespace: <a href="http://www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">http://www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations</a>	
Module: <b>ipi-oc-qos-deviations</b> , Namespace: <a href="http://www.ipinfusion.com/yang/ocnos/ipi-oc-qos-deviations">http://www.ipinfusion.com/yang/ocnos/ipi-oc-qos-deviations</a>	
Module: <b>ipi-oc-rpol-deviations</b> , Namespace: <a href="http://www.ipinfusion.com/yang/ocnos/ipi-oc-rpol-deviations">http://www.ipinfusion.com/yang/ocnos/ipi-oc-rpol-deviations</a>	
Module: <b>ipi-oc-sys-deviations</b> , Namespace: <a href="http://www.ipinfusion.com/yang/ocnos/ipi-oc-sys-deviations">http://www.ipinfusion.com/yang/ocnos/ipi-oc-sys-deviations</a>	
Module: <b>ipi-oc-terminal-device-deviations</b> , Namespace: <a href="http://www.ipinfusion.com/yang/ocnos/ipi-oc-terminal-device-deviations">http://www.ipinfusion.com/yang/ocnos/ipi-oc-terminal-device-deviations</a>	
Module: <b>ipi-oc-transport-types-deviations</b> , Namespace: <a href="http://www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">http://www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations</a>	
<b>Element [+]</b> <a href="#">Expand all</a> <b>[-]</b> <a href="#">Collapse all</a>	
▶ openconfig-acl	module
▶ openconfig-interfaces	module
▶ openconfig-lacp	module
▶ openconfig-lldp	module
▶ openconfig-network-instance	module
▶ openconfig-platform	module
▶ openconfig-qos	module
▶ openconfig-routing-policy	module
▶ openconfig-system	module
▶ openconfig-terminal-device	module

## 2.2 Datamodel Location in the device

After the installation of OcNOS, all Yang models are loaded onto the device and can be found in the following location:

```
OcNOS#start-shell
bash-5.0$ cd /usr/share/yuma/modules
bash-5.0$ ls
ipi netconfcentral openconfig yang
bash-5.0$ find . | sed -e "s/[^\-][^\-\/]*\// | /g" -e "s/|\([^\ ]\)/|-1/"
.
|-ipi
|tfo
|ipi-tfo.yang
|ipi-tfo-types.yang
|network-instance
|ipi-network-instance.yang
|ipi-network-instance-types.yang
|common
.....
```

Use the "find" command to explore the available models further.

# 3. Datamodel Documentation

## 3.1 NetConf Command Reference

**Document name:** *OcNOS-[SKU]-NetConf\_CmdRef*

This document provides detailed information on the XML payload for NetConf, the corresponding CLI, and descriptions of each attribute.

## 3.2 OpenConfig Command Reference

**Document name:** *OpenConfig Command Reference*

This document offers insights into the XML payload for OpenConfig, the corresponding OcNOS CLI, and the OcNOS NetConf payload for each attribute.

# 4. OcNOS Datamodels

OcNOS has three different types of Yang datamodels:

- NetConf datamodels
- IPI datamodels
- OpenConfig datamodels

## 4.1 NetConf datamodels

The NetConf datamodels define the functionality of the NetConf protocol itself, along with other utilities required for its functioning.

Here is a list of the Yang files in the NetConf datamodels:

- **yang**
  - ietf-netconf-monitoring.yang
  - ietf-yang-smiv2.yang
  - ietf-interfaces.yang
  - ietf-yang-types.yang
  - ietf-netconf-partial-lock.yang
  - yang-smi.yang
  - iana-if-type.yang
  - ietf-system.yang
  - ietf-inet-types.yang
  - ietf-netconf.yang
  - ietf-netconf-with-defaults.yang
  - iana-crypt-hash.yang
  - nc-notifications.yang
  - ietf-netconf-notifications.yang
  - ietf-netconf-acm.yang

- **netconfcentral**
  - yuma-ncx.yang
  - yuma-time-filter.yang
  - yuma-mysession.yang
  - yuma-nacm.yang
  - yuma-netconf.yang
  - yuma-types.yang
  - yuma-xsd.yang
  - yuma-proc.yang
  - yuma-system.yang
  - yuma-app-common.yang
  - netconfd.yang
  - notifications.yang
  - yangcli.yang

## 4.2 IPI OcNOS Datamodels

The IPI datamodels represent the "native" yang datamodels used in OcNOS. While these datamodels adhere to the OpenConfig `style`, they have a distinct structure and hierarchy that reflects how data is modeled within OcNOS.

Starting with OcNOS 6.2.0, the OcNOS datamodels are available for `ALL` features within OcNOS. Depending on user specific OcNOS SKU, use the corresponding feature datamodels. NetConf support is provided for all these datamodels. Additionally, all features developed in OcNOS in future versions will come with built-in datamodels and NetConf support.

Here is a list of the supported Yang files in the IPI OcNOS datamodels:

- **ipi**
  - aaa
    - ipi-aaa.yang
    - ipi-aaa-types.yang
  - acl
    - ipi-acl.yang
    - ipi-acl-arp.yang
    - ipi-acl-common.yang
    - ipi-acl-ipv6.yang
    - ipi-acl-mac.yang
    - ipi-acl-ports.yang
    - ipi-acl-types.yang
  - alarms
    - ipi-alarms.yang
    - ipi-alarms-types.yang
  - arp

- ipi-arp.yang
- ipi-arp-types.yang
- ipi-nsm-arp.yang
- auth
  - ipi-authentication.yang
  - ipi-authentication-dot1x-interface.yang
  - ipi-authentication-mac-interface.yang
  - ipi-authentication-radius.yang
  - ipi-authentication-types.yang
- bfd
  - ipi-bfd.yang
  - ipi-bfd-common.yang
  - ipi-bfd-interface.yang
  - ipi-bfd-session.yang
  - ipi-bfd-types.yang
  - ipi-mpls-bfd-session.yang
- bgp
  - ipi-bgp.yang
  - ipi-bgp-address-family.yang
  - ipi-bgp-address-family-vrf.yang
  - ipi-bgp-common.yang
  - ipi-bgp-epe.yang
  - ipi-bgp-evpn-rib.yang
  - ipi-bgp-flowspec.yang
  - ipi-bgp-flowspec-types.yang
  - ipi-bgp-instance.yang
  - ipi-bgp-link-state.yang
  - ipi-bgp-peer.yang
  - ipi-bgp-peer-group.yang
  - ipi-bgp-types.yang
  - ipi-bgp-vrf.yang
- bridge
  - ipi-bridge.yang
  - ipi-bridge-types.yang
  - bridge-domain
  - ipi-bridge-domain.yang
- cfm
  - ipi-cfm.yang
  - ipi-cfm-common.yang
  - ipi-cfm-data-types.yang
  - ipi-cfm-nvo3-oam.yang

- ipi-cfm-y1731.yang
- common
  - cml-data-types.yang
  - feature-list.yang
  - zebm-cli.yang
- cross-connect
  - ipi-cross-connect.yang
  - ipi-cross-connect-types.yang
  - ipi-vlan-xc.yang
  - ipi-vlan-xc-types.yang
- crypto
  - ipi-crypto.yang
  - customstats
  - ipi-customstats.yang
- dcb
  - ipi-dcb.yang
  - ipi-dcb-common.yang
  - ipi-dcb-interface.yang
  - ipi-dcb-types.yang
- delay-profile
  - ipi-delay-profile.yang
- dhcp
  - ipi-dhcp.yang
  - ipi-dhcp-client.yang
  - ipi-dhcp-relay.yang
  - ipi-dhcp-relay-types.yang
  - ipi-dhcp-server.yang
  - ipi-dhcp-snooping.yang
  - ipi-dhcp-snooping-interface.yang
  - ipi-dhcp-snooping-types.yang
- dns
  - ipi-dns-relay.yang
- efm
  - ipi-efm.yang

- ipi-efm-types.yang
- elk
  - ipi-elk.yang
- enhanced-pbr
  - ipi-enhanced-pbr.yang
  - ipi-enhanced-pbr-types.yang
- erpsv2
  - ipi-erpsv2.yang
  - ipi-erpsv2-types.yang
- ethernet-vpn
  - ipi-ethernet-vpn.yang
  - ipi-ethernet-vpn-types.yang
- event-manager
  - ipi-event-manager.yang
  - ipi-event-manager-types.yang
- evpn-mpls
  - ipi-evpn-mpls.yang
  - ipi-evpn-mpls-types.yang
- evpn-srv6
  - ipi-evpn-srv6.yang
  - Flexe
    - ipi-flexe.yang
    - ipi-flexe-client.yang
    - ipi-flexe-group.yang
    - ipi-flexe-types.yang
- g8031
  - ipi-g8031.yang
  - ipi-g8031-elps.yang
  - ipi-g8031-elps-types.yang
- hostp
  - ipi-vm.yang

- ipi-vm-types.yang
- if-flowspec
  - ipi-if-flowspec.yang
- igp-te
  - ipi-igp-te.yang
- interface
  - ipi-if-ethernet.yang
  - ipi-if-extended.yang
  - ipi-if-ip.yang
  - ipi-if-lbd.yang
  - ipi-if-types.yang
  - ipi-interface.yang
- ipsec
  - ipi-ipsec.yang
  - ipi-ipsec-interface.yang
  - ipi-ipsec-types.yang
- ip-sla
  - ipi-ip-sla.yang
- isis
  - ipi-isis.yang
  - ipi-isis-cspf.yang
  - ipi-isis-extended.yang
  - ipi-isis-fad.yang
  - ipi-isis-global-flxalg.yang
  - ipi-isis-interface.yang
  - ipi-isis-interface-flxalg.yang
  - ipi-isis-lsp.yang
  - ipi-isis-lsp-flxalg.yang
  - ipi-isis-sr.yang
  - ipi-isis-types.yang
- key-chain
  - ipi-keychain.yang
- l2vpn
  - ipi-l2vpn-vpls.yang
  - ipi-l2vpn-vpws.yang
  - ipi-vpls-types.yang



- ipi-vpws-types.yang
- lag
  - ipi-if-aggregate.yang
  - ipi-lacp.yang
  - ipi-lacp-types.yang
  - ipi-lag-types.yang
- lb
  - ipi-lb.yang
  - ipi-lb-group.yang
  - ipi-lb-modem.yang
  - ipi-lb-types.yang
- ldp
  - ipi-ldp.yang
  - ipi-ldp-interface.yang
  - ipi-ldp-l2vpn.yang
  - ipi-ldp-peer.yang
  - ipi-ldp-types.yang
- license
  - ipi-license.yang
  - ipi-license-types.yang
- lldp
  - ipi-lldp-types.yang
  - ipi-lldpv2.yang
- macsec
  - ipi-macsec.yang
  - ipi-macsec-interface.yang
  - ipi-macsec-types.yang
- management-server
  - ipi-management-server.yang
  - ipi-management-server-notification.yang
  - ipi-management-server-notification-types.yang
  - ipi-management-server-types.yang
- mlag
  - ipi-mcec.yang
  - ipi-mcec-types.yang
  - ipi-mlag.yang

- ipi-mlag-types.yang
- mpls
  - ipi-mpls.yang
  - ipi-mpls-bfd.yang
  - ipi-mpls-rib.yang
  - ipi-mpls-types.yang
- multicast
  - ipi-igmp.yang
  - ipi-igmp-groups.yang
  - ipi-igmp-interface.yang
  - ipi-igmp-snooping.yang
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## 4.3 OpenConfig Datamodels

OpenConfig support is available in OcNOS for the following modules.

Notes:

- Not all attributes of the OpenConfig datamodels are supported. Attributes that are not supported are mentioned in the deviation files, which can be found under "[yang-files/openconfig](#)" on GitHub. For more details, refer to section [2.1.3 OpenConfig Datamodels](#). To see the actual supported OpenConfig datamodels and attributes, refer to section [2.1.3.1 OpenConfig Pyang Tree](#).
- OpenConfig support is available only through the NetConf. As of the current date, OcNOS does not support the gNMI interface. Therefore, access configuration and operational data of OcNOS in OpenConfig format only via NetConf.

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