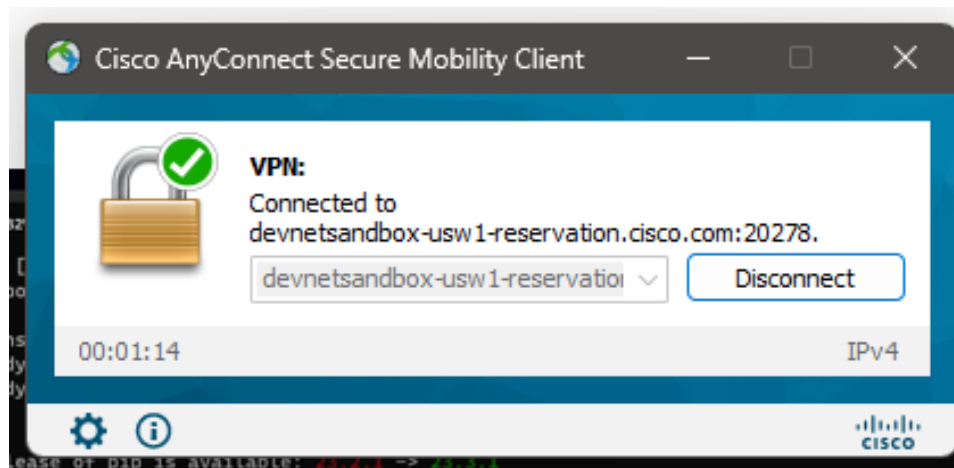


## Lab 2.3 – Explore YANG Models Using the pyang Tool

Sharon Michelle Olvera Ibarra



```
C:\WINDOWS\system32\cmd. X + v
Microsoft Windows [Versión 10.0.22621.2715]
(c) Microsoft Corporation. Todos los derechos reservados.

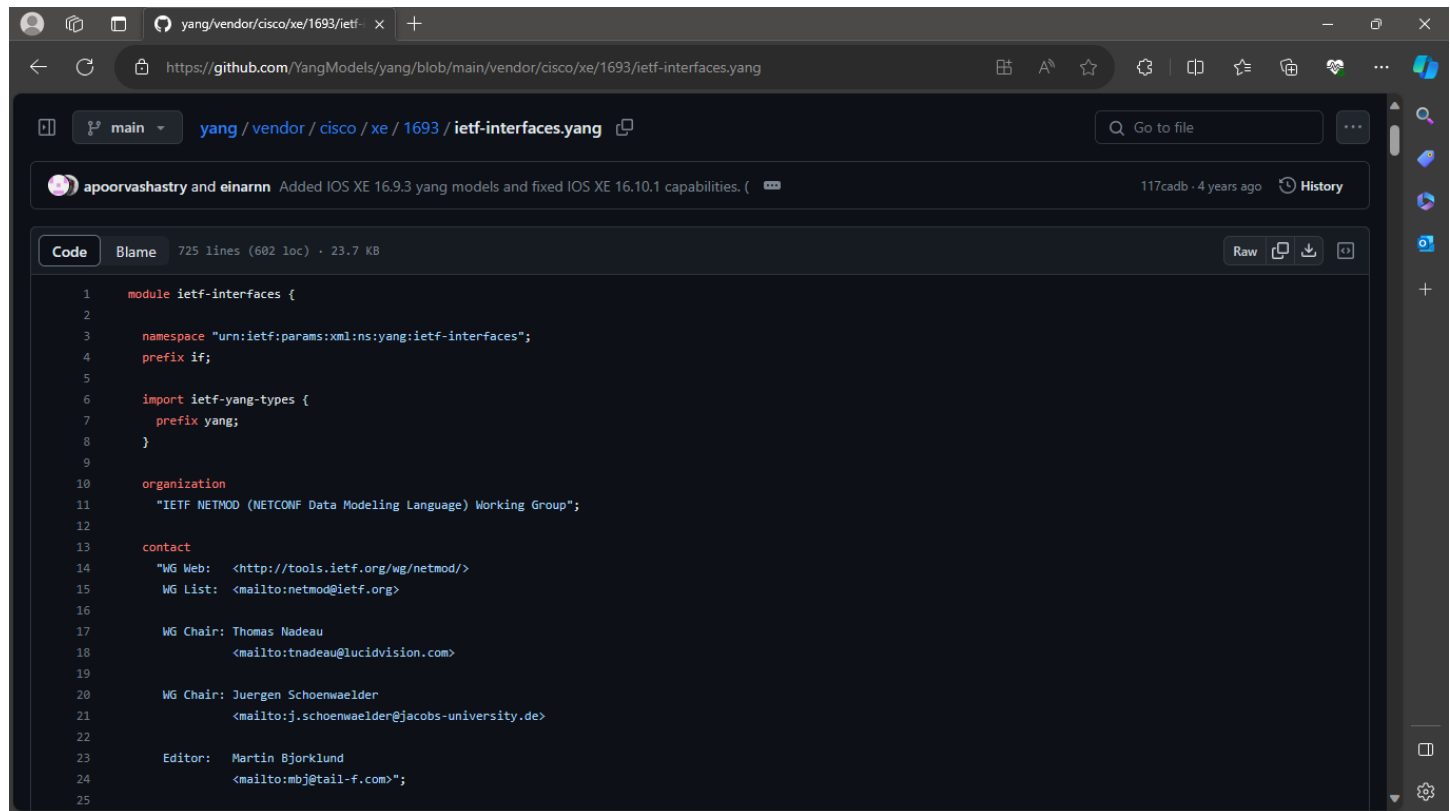
C:\Users\HP>pip install --no-binary pyang pyang
Requirement already satisfied: pyang in c:\users\hp\appdata\local\programs\python\python312\lib\site-packages (2.6.0)
Requirement already satisfied: lxml in c:\users\hp\appdata\local\programs\python\python312\lib\site-packages (from pyang) (4.9.3)

[notice] A new release of pip is available: 23.2.1 -> 23.3.1
[notice] To update, run: C:\Users\HP\AppData\Local\Programs\Python\Python312\python.exe -m pip install --upgrade pip

C:\Users\HP>pyang -v
pyang 2.6.0

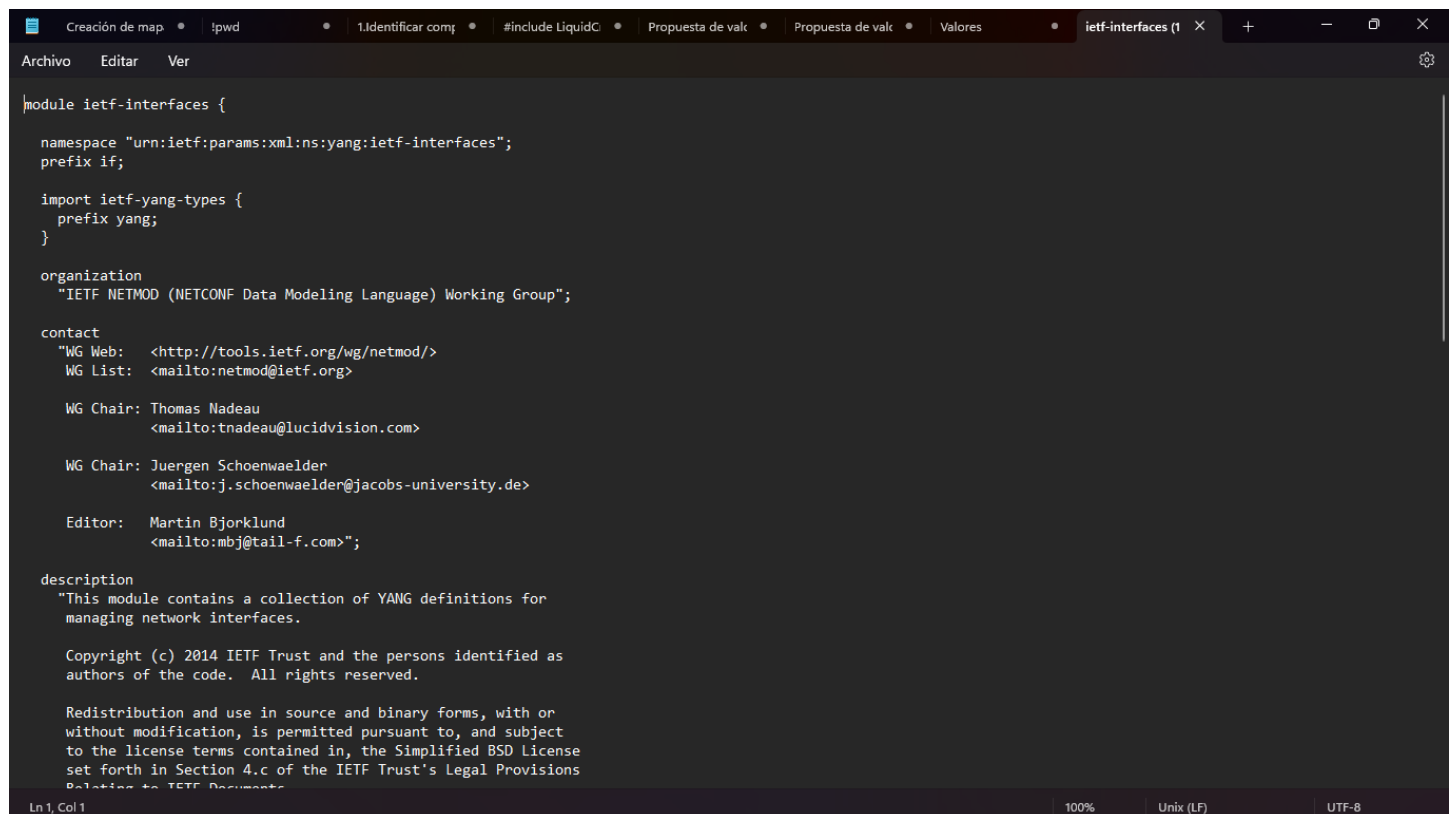
C:\Users\HP>
```

## Olvera Sharon Michelle Olvera



The screenshot shows a web browser displaying a GitHub repository file. The address bar shows the URL `https://github.com/YangModels/yang/blob/main/vendor/cisco/xe/1693/ietf-interfaces.yang`. The file name `ietf-interfaces.yang` is highlighted in the breadcrumb navigation. A commit message from `apoorvashty and einarnn` is visible: "Added IOS XE 16.9.3 yang models and fixed IOS XE 16.10.1 capabilities." The file statistics show 725 lines, 602 loc, and 23.7 KB. The code is displayed in a dark theme with syntax highlighting.

```
1 module ietf-interfaces {
2
3     namespace "urn:ietf:params:xml:ns:yang:ietf-interfaces";
4     prefix if;
5
6     import ietf-yang-types {
7         prefix yang;
8     }
9
10    organization
11        "IETF NETMOD (NETCONF Data Modeling Language) Working Group";
12
13    contact
14        "WG Web: <http://tools.ietf.org/wg/netmod/>
15        WG List: <mailto:netmod@ietf.org>
16
17        WG Chair: Thomas Nadeau
18            <mailto:tnadeau@lucidvision.com>
19
20        WG Chair: Juergen Schoenwaelder
21            <mailto:j.schoenwaelder@jacobs-university.de>
22
23        Editor: Martin Bjorklund
24            <mailto:mbj@tail-f.com>";
25
```



The screenshot shows a code editor with the same content as the GitHub view. The editor has a dark theme and syntax highlighting. The file name `ietf-interfaces (1)` is visible in the tab. The code is identical to the one in the GitHub view, but it includes a `description` block and a `copyright` notice.

```
module ietf-interfaces {

    namespace "urn:ietf:params:xml:ns:yang:ietf-interfaces";
    prefix if;

    import ietf-yang-types {
        prefix yang;
    }

    organization
        "IETF NETMOD (NETCONF Data Modeling Language) Working Group";

    contact
        "WG Web: <http://tools.ietf.org/wg/netmod/>
        WG List: <mailto:netmod@ietf.org>

        WG Chair: Thomas Nadeau
            <mailto:tnadeau@lucidvision.com>

        WG Chair: Juergen Schoenwaelder
            <mailto:j.schoenwaelder@jacobs-university.de>

        Editor: Martin Bjorklund
            <mailto:mbj@tail-f.com>";

    description
        "This module contains a collection of YANG definitions for
        managing network interfaces."

    copyright (c) 2014 IETF Trust and the persons identified as
        authors of the code. All rights reserved.

    Redistribution and use in source and binary forms, with or
        without modification, is permitted pursuant to, and subject
        to the license terms contained in, the Simplified BSD license
        set forth in Section 4.c of the IETF Trust's Legal Provisions
        Relating to IETF Documents

```

## Olvera Sharon Michelle Olvera

```
C:\WINDOWS\system32\cmd. X + v
Microsoft Windows [Versión 10.0.22621.2715]
(c) Microsoft Corporation. Todos los derechos reservados.

C:\Users\HP>cd Desktop

C:\Users\HP\Desktop>dir *.yang
El volumen de la unidad C es Windows
El número de serie del volumen es: B496-F6F6

Directorio de C:\Users\HP\Desktop

27/11/2023  10:16 a. m.          24,248 ietf-interfaces.yang
             1 archivos          24,248 bytes
             0 dirs  34,872,213,504 bytes libres

C:\Users\HP\Desktop>
```

```
C:\WINDOWS\system32\cmd. X + v
C:\Users\HP\Desktop>pyang -f tree ietf-interfaces.yang
module: ietf-interfaces
+--rw interfaces
|   +--rw interface* [name]
|   |   +--rw name                string
|   |   +--rw description?        string
|   |   +--rw type                identityref
|   |   +--rw enabled?            boolean
|   |   +--rw link-up-down-trap-enable? enumeration {if-mib}?
+--ro interfaces-state
+--ro interface* [name]
+--ro name                string
+--ro type                identityref
+--ro admin-status        enumeration {if-mib}?
+--ro oper-status        enumeration
+--ro last-change?        yang:date-and-time
+--ro if-index            int32 {if-mib}?
+--ro phys-address?       yang:phys-address
+--ro higher-layer-if*    interface-state-ref
+--ro lower-layer-if*    interface-state-ref
+--ro speed?              yang:gauge64
+--ro statistics
+--ro discontinuity-time   yang:date-and-time
+--ro in-octets?           yang:counter64
+--ro in-unicast-pkts?     yang:counter64
+--ro in-broadcast-pkts?   yang:counter64
+--ro in-multicast-pkts?   yang:counter64
+--ro in-discards?        yang:counter32
+--ro in-errors?          yang:counter32
+--ro in-unknown-protos?   yang:counter32
+--ro out-octets?         yang:counter64
+--ro out-unicast-pkts?    yang:counter64
+--ro out-broadcast-pkts?  yang:counter64
+--ro out-multicast-pkts?  yang:counter64
+--ro out-discards?       yang:counter32
```

The screenshot shows a web browser displaying a GitHub repository. The address bar shows the URL: <https://github.com/YangModels/yang/blob/main/vendor/cisco/xe/1693/Cisco-IOS-XE-cdp-oper.yang>. The page title is "yang / vendor / cisco / xe / 1693 / Cisco-IOS-XE-cdp-oper.yang". A commit message by "apoorvashastry and einarnn" is visible: "Added IOS XE 16.9.3 yang models and fixed IOS XE 16.10.1 capabilities. ( 117cadb · 4 years ago)". The file "Cisco-IOS-XE-cdp-oper.yang" is selected in the left sidebar. The main content area shows the YANG model code, which includes a module definition for "Cisco-IOS-XE-cdp-oper" with various imports, namespace, prefix, and contact information.

```
1 module Cisco-IOS-XE-cdp-oper {
2   yang-version 1;
3   namespace "http://cisco.com/ns/yang/Cisco-IOS-XE-cdp-oper";
4   prefix cdp-ios-xe-oper;
5
6   import ietf-inet-types {
7     prefix inet;
8   }
9
10  organization
11    "Cisco Systems, Inc.";
12  contact
13    "Cisco Systems, Inc.
14     Customer Service
15
16     Postal: 170 W Tasman Drive
17     San Jose, CA 95134
18
19     Tel: +1 800 553-NETS
20
21     E-mail: cs-yang@cisco.com";
22  description
23    "This module contains a collection of YANG definitions
24    for monitoring of Cisco CDP operational information.
25    Copyright (c) 2016-2017 by Cisco Systems, Inc."
```