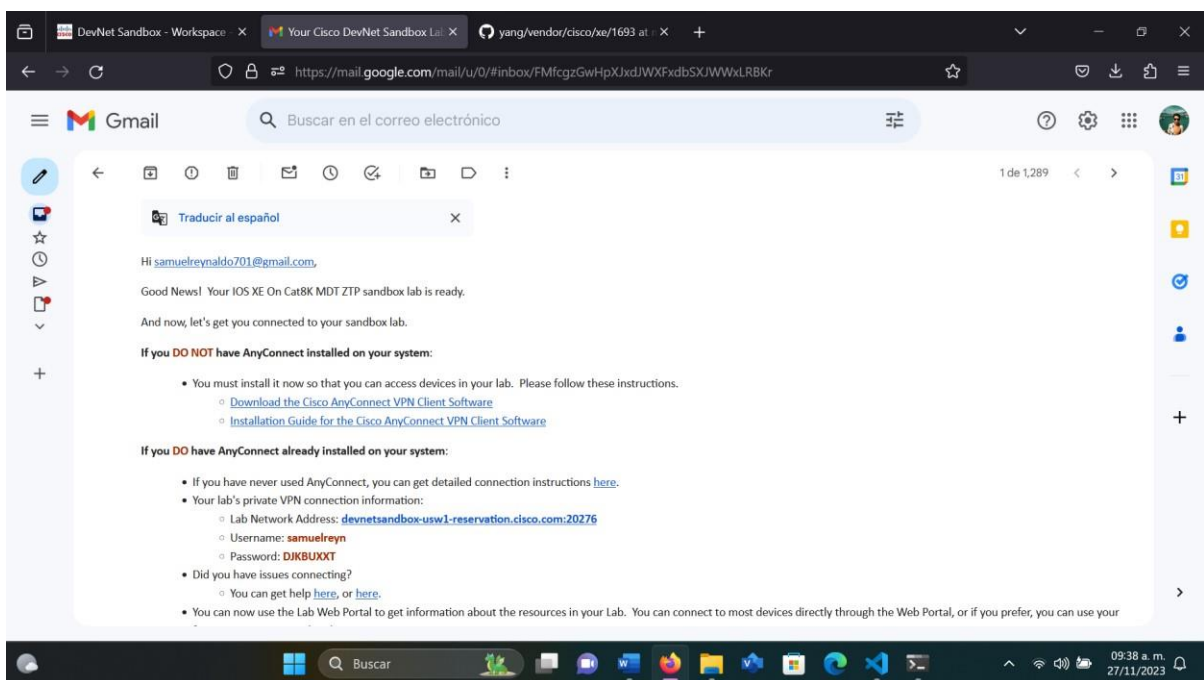
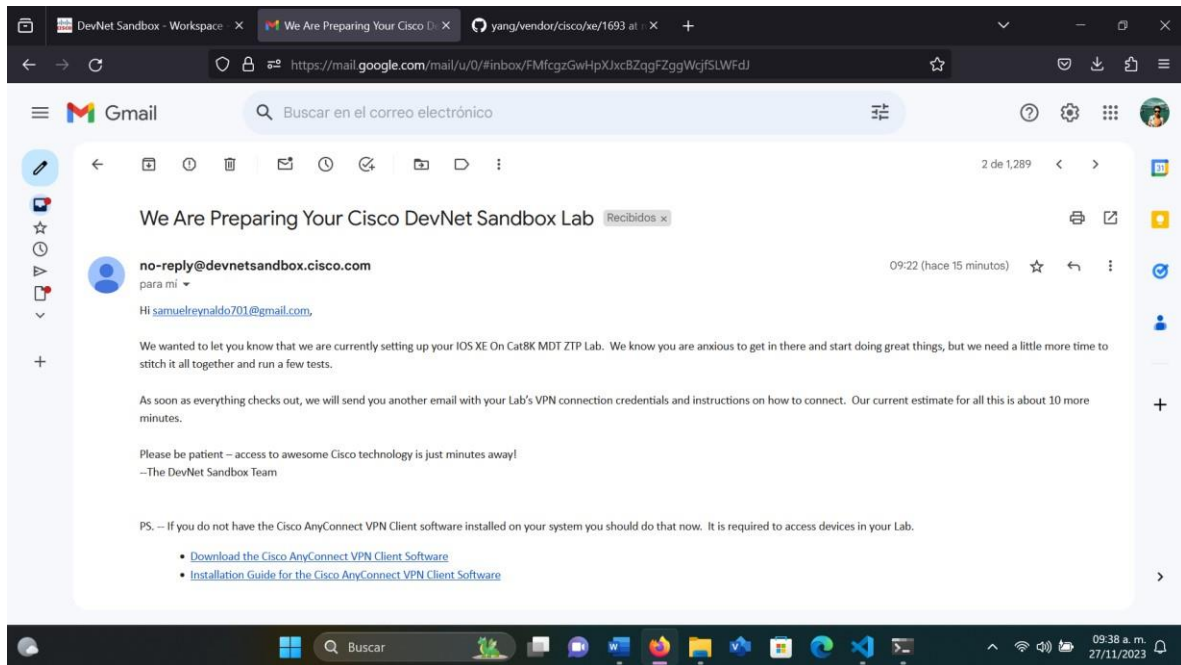
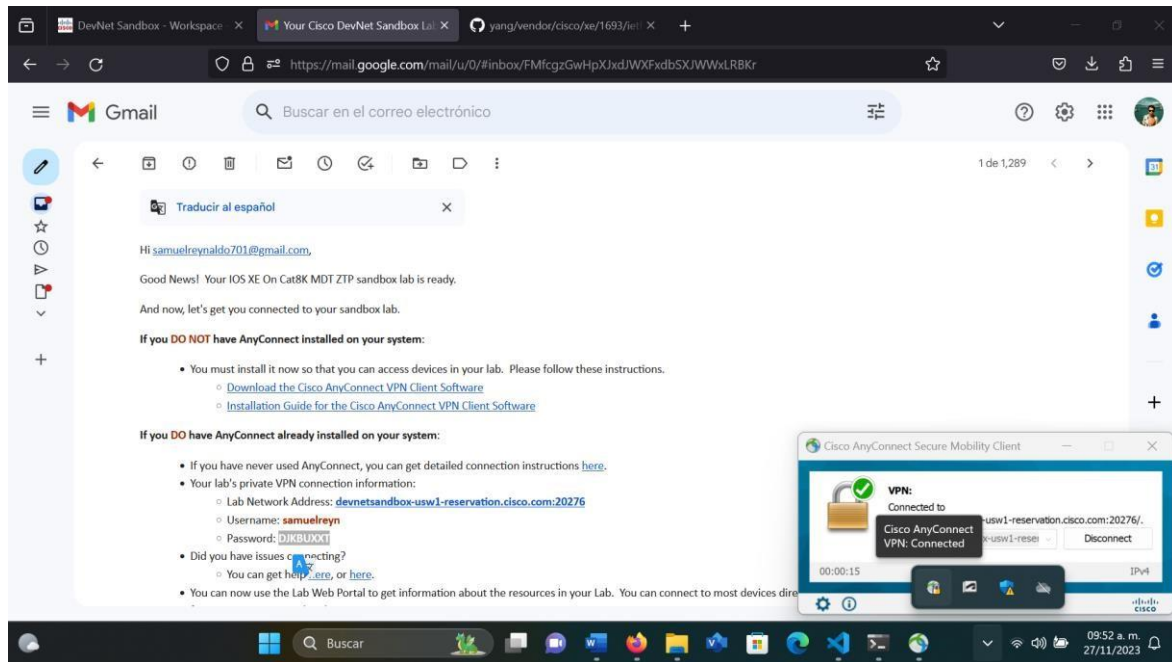


Olvera lira samuel Reynaldo, GIRO541





## Step 1: Use pip to install pyang.

- Start a new Windows command prompt (cmd).
- Install pyang using pip in the Windows command prompt:

```
pip install --no-binary pyang pyang
```

NOTE: on mac or linux you can simply "pip install pyang" but temporarily on Windows the binary WHL file won't include the Windows executable pyang file.

- Verify that pyang has been successfully installed. In the command prompt, type:

```
pyang -v
```

to display the installed  
pyang version.

```
Símbolo del sistema
Microsoft Windows [Versión 10.0.22621.2715]
(c) Microsoft Corporation. Todos los derechos reservados.

C:\Users\samuel>pip install --no-binary pyang pyang
Collecting pyang
  Downloading pyang-2.6.0.tar.gz (492 kB)
    492.8/492.8 kB 2.8 MB/s eta 0:00:00
  Installing build dependencies ... done
  Getting requirements to build wheel ... done
  Preparing metadata (pyproject.toml) ... done
Requirement already satisfied: lxml in c:\users\samuel\appdata\local\programs\python\python312\lib\site-packages (from pyang) (4.9.3)

Building wheels for collected packages: pyang
  Building wheel for pyang (pyproject.toml) ... done
  Created wheel for pyang: filename=pyang-2.6.0-py2.py3-none-any.whl size=594153 sha256=5f2e8326d92fd34ff2551e896a2a9b21b5d38c90fe727676a1fa794f8e944f81
  Stored in directory: c:\users\samuel\appdata\local\pip\cache\wheels\d8\6c\9c4bd1c1e24f5dd57ff074290f77e7d998d2b2f5030da2bf2e
Successfully built pyang
Installing collected packages: pyang
Successfully installed pyang-2.6.0

[notice] A new release of pip is available: 23.2.1 -> 23.3.1
[notice] To update, run: python.exe -m pip install --upgrade pip

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

C:\Users\samuel>
```

Use the pyang command line tool to transform the YANG models

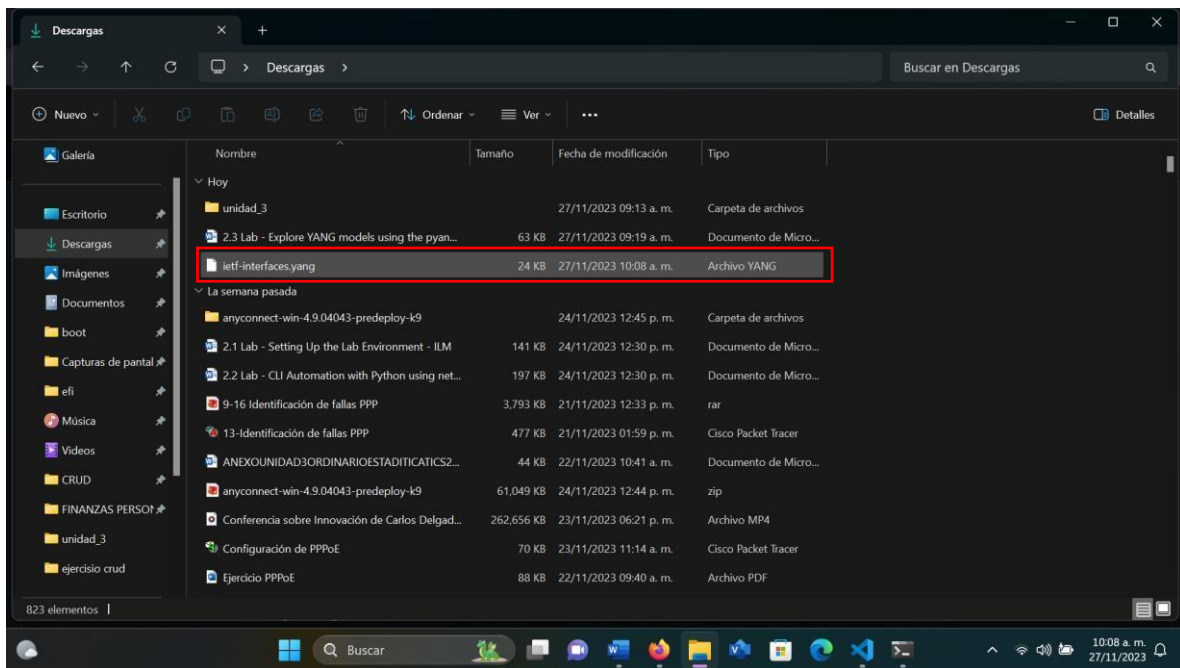
```
Simbolo del sistema
14/11/2023 03:59 a. m. 536 Windows (C) - Acceso directo.lnk
07/05/2022 11:55 a. m. 407,049 worksheet-so-because20_removed.pdf
04/09/2023 09:10 p. m. 13,339,662 Características políticas, sociales, económicas y culturales del MUNDO PREHISPÁNICO.mp4

Directorio de C:\Users\samuel\Downloads

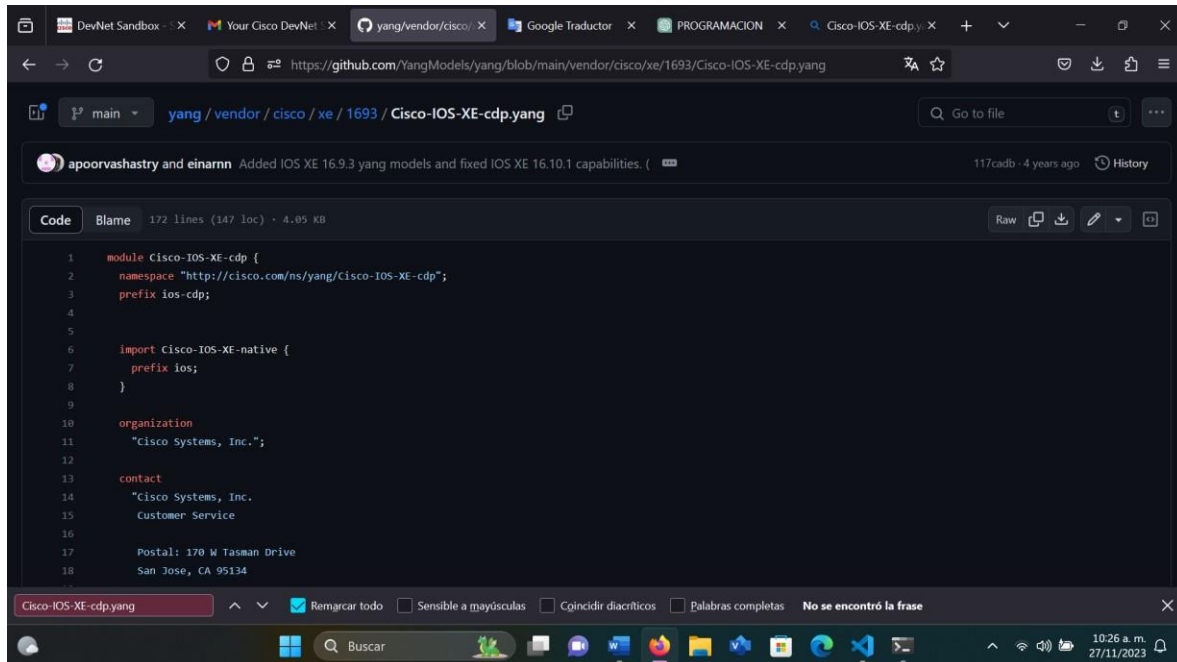
805 archivos 5,560,288,896 bytes
20 dirs 49,794,932,736 bytes libres

C:\Users\samuel\Downloads>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
```

## Step 2: Download the YANG models for the IOS XE VM



Explore other YANG modules, for example the Cisco Native model for CDP: `Cisco-IOS-XEcdp.yang`



The screenshot shows a web browser displaying the GitHub repository for the Cisco-IOS-XEcdp.yang file. The repository is located at `https://github.com/YangModels/yang/blob/main/vendor/cisco/xe/1693/Cisco-IOS-XE-cdp.yang`. The file is named `Cisco-IOS-XE-cdp.yang` and is 172 lines long (147 loc) and 4.05 KB in size. The code is written in YANG and defines the `Cisco-IOS-XE-cdp` module. The code includes a namespace, prefix, and organization information. The code is as follows:

```
1 module Cisco-IOS-XE-cdp {
2   namespace "http://cisco.com/ns/yang/Cisco-IOS-XE-cdp";
3   prefix ios-cdp;
4
5
6   import Cisco-IOS-XE-native {
7     prefix ios;
8   }
9
10  organization
11    "Cisco Systems, Inc.";
12
13  contact
14    "Cisco Systems, Inc.
15     Customer Service
16
17     Postal: 170 W Tasman Drive
18     San Jose, CA 95134
```

a. Are there any “read only” operation data in the `Cisco-IOS-XE-cdp.yang` model?

Si, si hay varios nodos, **`cdp-neighbor-details`**, **`cdp-cache-entries`**

b. Is there any other YANG model that includes operational CDP data?

Sí, además del modelo `Cisco-IOS-XE-cdp.yang`, existen otros modelos YANG que incluyen datos CDP