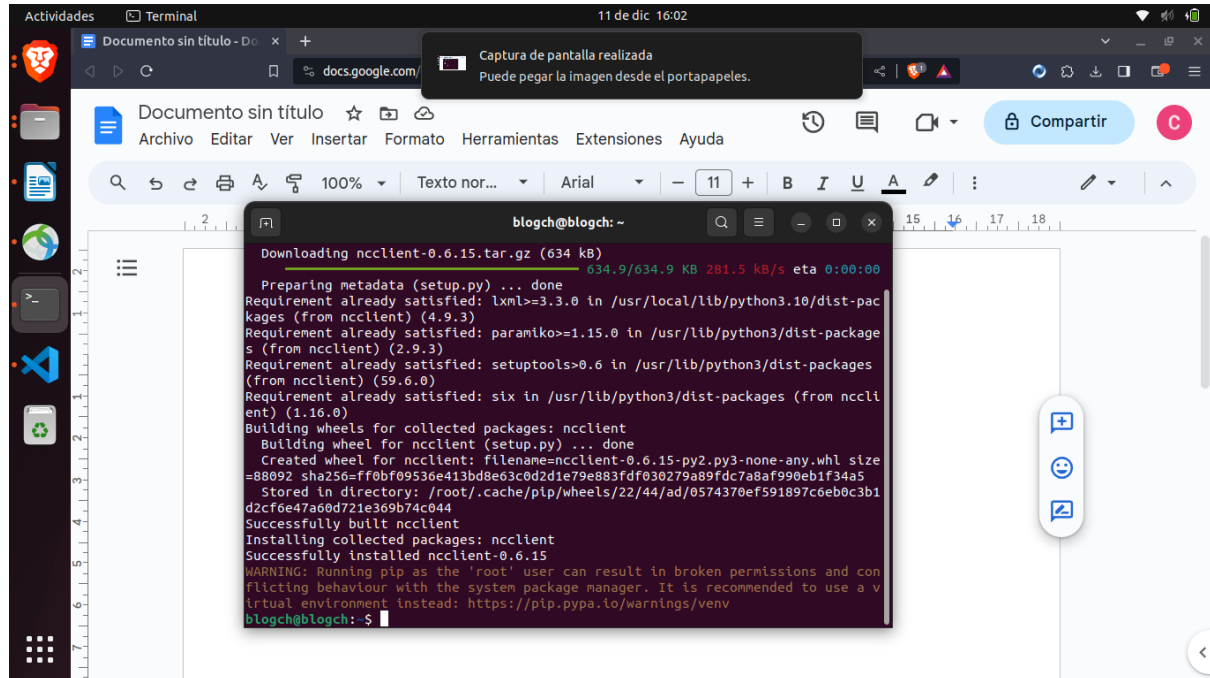
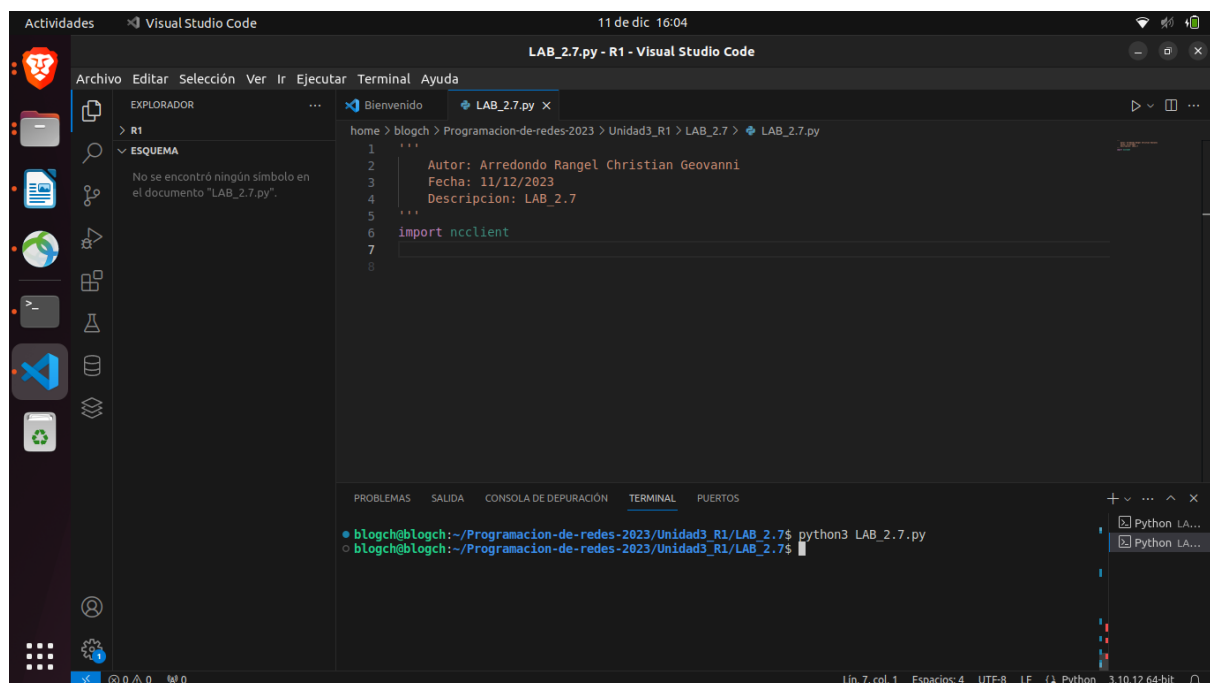


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LAB_2.7

Part 1: Install the ncclient Python module



```
blogch@blogch: ~  
Downloading ncclient-0.6.15.tar.gz (634 kB)  
634.9/634.9 KB 281.5 kB/s eta 0:00:00  
Preparing metadata (setup.py) ... done  
Requirement already satisfied: lxml>=3.3.0 in /usr/local/lib/python3.10/dist-packages (from ncclient) (4.9.3)  
Requirement already satisfied: paramiko>=1.15.0 in /usr/lib/python3/dist-packages (from ncclient) (2.9.3)  
Requirement already satisfied: setuptools>=0.6 in /usr/lib/python3/dist-packages (from ncclient) (59.6.0)  
Requirement already satisfied: six in /usr/lib/python3/dist-packages (from ncclient) (1.16.0)  
Building wheels for collected packages: ncclient  
Building wheel for ncclient (setup.py) ... done  
Created wheel for ncclient: filename=ncclient-0.6.15-py2.py3-none-any.whl size=88092 sha256=ff0bf09536e413bd8e63cd2die79e883fd030279a89fdc7a8af990eb1f34a5  
Stored in directory: /root/.cache/pip/wheels/22/44/ad/0574370ef591897c6eb0c3b1d2cf6e47a60d721e369b74c044  
Successfully built ncclient  
Installing collected packages: ncclient  
Successfully installed ncclient-0.6.15  
WARNING: Running pip as the 'root' user can result in broken permissions and conflicting behaviour with the system package manager. It is recommended to use a virtual environment instead: https://pip.pypa.io/warnings/venv  
blogch@blogch:~$
```



```
LAB_2.7.py - R1 - Visual Studio Code  
LAB_2.7.py  
1  ...  
2  Autor: Arredondo Rangel Christian Giovanni  
3  Fecha: 11/12/2023  
4  Descripción: LAB 2.7  
5  ...  
6  import ncclient  
7  
8  
blogch@blogch:~/Programacion-de-redes-2023/Unidad3_R1/LAB_2.7$ python3 LAB_2.7.py  
blogch@blogch:~/Programacion-de-redes-2023/Unidad3_R1/LAB_2.7$
```

Part 2: Connect to IOS XE's NETCONF service using ncclient

Visual Studio Code interface showing a Python script for NETCONF connection. The Explorer pane on the left shows a file named 'LAB_2.7.py' under a folder 'R1'. The main editor displays the script, and the Terminal pane at the bottom shows the output of the script execution.

```
LAB_2.7.py - R1 - Visual Studio Code
```

```
19 # Intentar establecer la conexión NETCONF
20 m = manager.connect(
21     host=host,
22     port=port,
23     username=username,
24     password=password,
25     hostkey_verify=hostkey_verify
26 )
27
28 # Si no se lanzó ninguna excepción, la conexión fue exitosa
29 print("Conexión NETCONF exitosa!")
30
31 except AuthenticationError:
32     # Manejar error de autenticación
33     print("Error")
34
35 finally:
36     # Cerrar la conexión si se estableció
37     if 'm' in locals():
38         m.close_session()
39
```

Terminal output:

```
● blogch@blogch:~/Programacion-de-redes-2023/Unidad3_R1/LAB_2.7$ python3 LAB_2.7.py
● blogch@blogch:~/Programacion-de-redes-2023/Unidad3_R1/LAB_2.7$ python3 LAB_2.7.py
Conexión NETCONF exitosa!
● blogch@blogch:~/Programacion-de-redes-2023/Unidad3_R1/LAB_2.7$ python3 LAB_2.7.py
Conexión NETCONF exitosa!
○ blogch@blogch:~/Programacion-de-redes-2023/Unidad3_R1/LAB_2.7$
```

Part 3: List the IOS XE's capabilities – supported YANG models

Visual Studio Code interface showing a Python script that lists IOS XE capabilities. The Explorer pane on the left shows a file named 'LAB_2.7.py' under a folder 'R1'. The main editor displays the script, and the Terminal pane at the bottom shows the output of the script execution.

```
LAB_2.7.py - R1 - Visual Studio Code
```

```
33 except AuthenticationError:
34     # Manejar error de autenticación
35     print("Error")
36
37 #PARTE TRES
38 finally:
39     # Cerrar la conexión si se estableció
40     if 'm' in locals():
41         m.close_session()
42
43 print("# Capacidad admitida (modelos YANG):")
44 for capability in m.server.capabilities:
```

Terminal output:

```
urn:ietf:params:xml:ns:yang:smiv2:RFC1213-MIB?module=RFC1213-MIB
urn:ietf:params:xml:ns:yang:smiv2:RFC1315-MIB?module=RFC1315-MIB
urn:ietf:params:xml:ns:yang:smiv2:RMON-MIB?module=RMON-MIB&revision=2000-05-11
urn:ietf:params:xml:ns:yang:smiv2:RMON2-MIB?module=RMON2-MIB&revision=1996-05-27
urn:ietf:params:xml:ns:yang:smiv2:RSVP-MIB?module=RSVP-MIB&revision=1998-08-25
urn:ietf:params:xml:ns:yang:smiv2:SNMP-FRAMEWORK-MIB?module=SNMP-FRAMEWORK-MIB&revision=2002-10-14
urn:ietf:params:xml:ns:yang:smiv2:SNMP-PROXY-MIB?module=SNMP-PROXY-MIB&revision=2002-10-14
urn:ietf:params:xml:ns:yang:smiv2:SNMP-TARGET-MIB?module=SNMP-TARGET-MIB&revision=1998-08-04
urn:ietf:params:xml:ns:yang:smiv2:SNMPv2-MIB?module=SNMPv2-MIB&revision=2002-10-16
urn:ietf:params:xml:ns:yang:smiv2:SNMPv2-TC?module=SNMPv2-TC
urn:ietf:params:xml:ns:yang:smiv2:SONET-MIB?module=SONET-MIB&revision=2003-08-11
urn:ietf:params:xml:ns:yang:smiv2:TCP-MIB?module=TCP-MIB&revision=2005-02-18
urn:ietf:params:xml:ns:yang:smiv2:TOKEN-RING-RMON-MIB?module=TOKEN-RING-RMON-MIB
urn:ietf:params:xml:ns:yang:smiv2:TOKENRING-MIB?module=TOKENRING-MIB&revision=1994-10-23
urn:ietf:params:xml:ns:yang:smiv2:TUNNEL-MIB?module=TUNNEL-MIB&revision=2005-05-16
urn:ietf:params:xml:ns:yang:smiv2:UDP-MIB?module=UDP-MIB&revision=2005-05-20
urn:ietf:params:xml:ns:yang:smiv2:VPN-TC-STD-MIB?module=VPN-TC-STD-MIB&revision=2005-11-15

urn:ietf:params:netconf:capability:notification:1.1
```