Deploy Yang Suite and Test XPath on Catalyst 9800 WLC

Contents

Introduction

This document describes how to deploy Yang Suite in Python environment and test XPath on Cisco Catalyst 9800 WLC.

Prerequisites

Requirements

Cisco recommends that you have knowledge of these topics:

- Catalyst 9800 WLC configuration

- Basic knowledge of Python and virtual environments

Components Used

The information in this document is based on these software and hardware versions:

- Cisco Catalyst9800 WLC Cisco IOS® XE Version 17.15.3
- Microsoft Windows 11 Enterprise with Python 3.8.2 installed

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.

Configure

Step 1. Install **Python** on Windows PC.

Download and install **Python 3.8.2** for Windows.

Download Link: Python Releases for Windows

Explanation:
Python is required to run YANG Suite. Version 3.8.2 is used here for compatibility.

Step 2. Verify Python and PIP Installation.

After installation, confirm that Python and PIP are working correctly.

Commands:

```
C:\Users\Administrator>python --version
C:\Users\Administrator>pip --version
```

Expected Result (example):

```
C:\Users\Administrator>python --version
Python 3.8.2

C:\Users\Administrator>pip --version
pip 25.0.1 from c:\users\administrator\appdata\local\programs\python\python38-32\lib\site-packages\pip
```

Step 3. Upgrade **PIP** to the latest version to ensure compatibility with YANG Suite.

Command:

```
C:\Users\Administrator>python -m pip install --upgrade pip
```

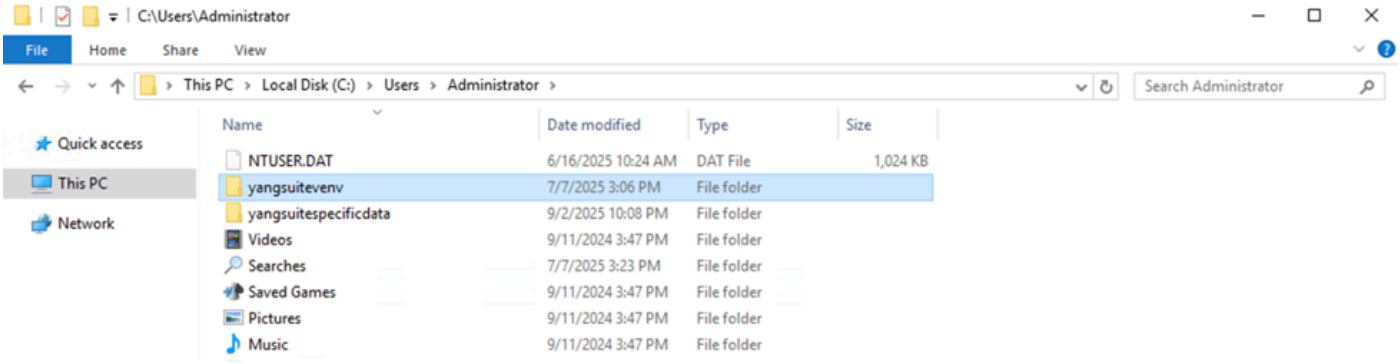
Explanation:
This command uninstalls the old version of PIP and installs the latest one to ensure compatibility with YANG Suite.
Expected Result (example):
- Old version (for example, pip 19.2.3) is uninstalled.
- New version (for example, pip 25.0.1) is successfully installed.

Step 4. Create a **Virtual Environment** to keep dependencies isolated from the system Python.

Command:

```
C:\Users\Administrator>python -m venv yangsuitevenv
```

Expected Result:
A new folder named yangsuitevenv is created on your PC C:\Users\Administrator.



Step 5. Activate the Virtual Environment.

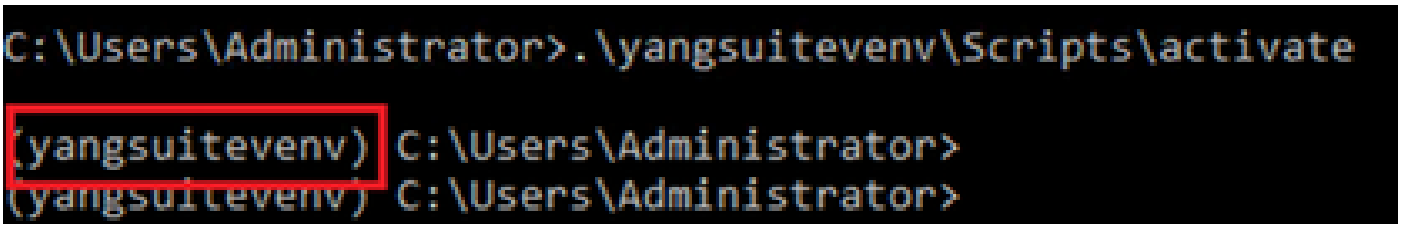
Activate the **environment** before installing packages.

Command:

```
C:\Users\Administrator>.\yangsuitevenv\Scripts\activate
```

Expected Result:
The command prompt changes to show the active environment, for example:

(yangsuitevenv) C:\Users\Administrator>



Step 6. Install YANG Suite.

Install **YANG Suite** and its required modules to ensure YANG Suite and its dependencies are installed without errors.

Command:

```
(yangsuitevenv) C:\Users\Administrator>pip install yangsuite[core]
```

If you encounter proxy errors:

```
WARNING: Retrying (Retry(total=4, connect=None, read=None, redirect=None, status=None)) after connectio
```

Please check the network connectivity or proxy. If your environment requires the use of a proxy, please use this command instead:

Command:

```
(yangsuitevenv) C:\Users\Administrator>pip install yangsuite[core] --proxy http://x.x.x.x:port
```

Step 7. Upgrade YANG Suite Modules.

Update all YANG Suite modules to ensure the full functionality.

Command:

```
pip3 install --upgrade yangsuite yangsuite-devices yangsuite-filemanager yangsuite-yangtree yangsuite-c
```

Explanation:
This step ensures that YANG Suite has the latest plugins for NETCONF, RESTCONF, gNMI, and telemetry.

Step 8. Initialize YANG Suite.

Run the **initialization** process to enter interactive configuration mode.

Command:

```
(yangsuitevenv) C:\Users\Administrator>yangsuite
```

Step 9. Configure **YANG Suite** Settings.

During initialization, you are prompted to configure the service port, hostname, username and password :

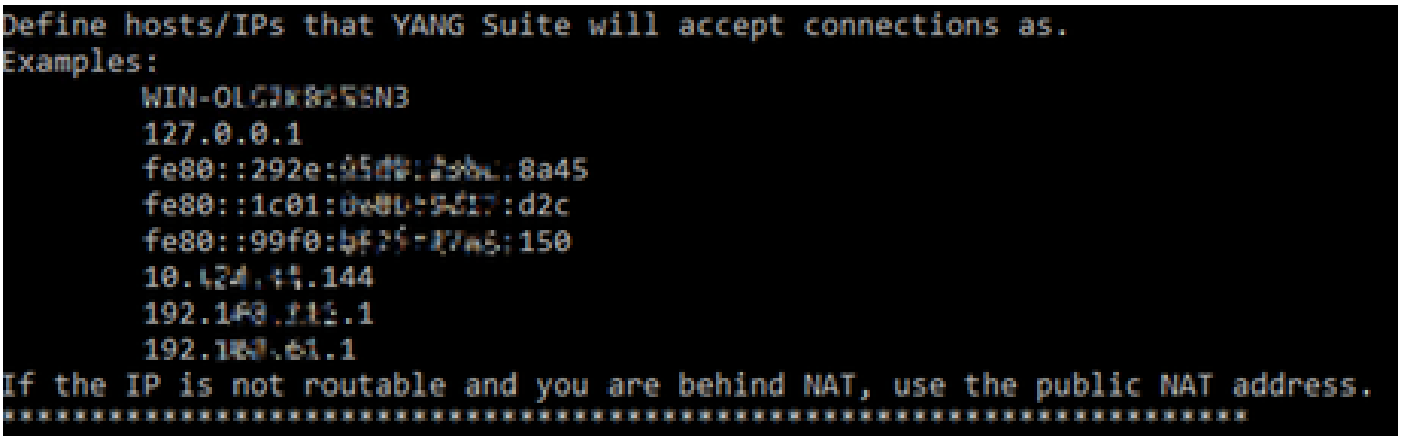
Create a folder named **yangsuitespecificdata** to store the user specific data (YANG modules,device profiles and so on).

```
YANG Suite stores user specific data (YANG modules, device profiles, etc.)
Set new path or use: [] yangsuitespecificdata
```

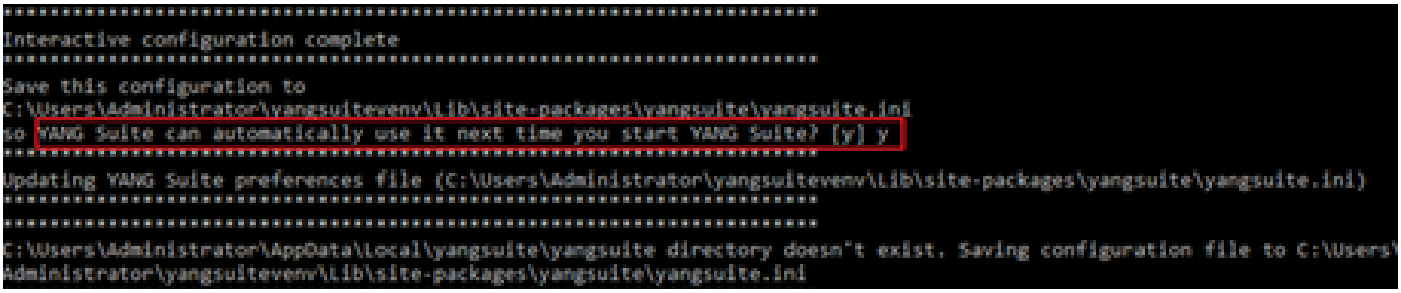
Service port number: default is 8480.

```
What port number should YANG Suite listen on? [8480]
********************************************************************************
YANG Suite can be accessed remotely over the network.
********************************************************************************
Allow remote access? [n] y
********************************************************************************
```

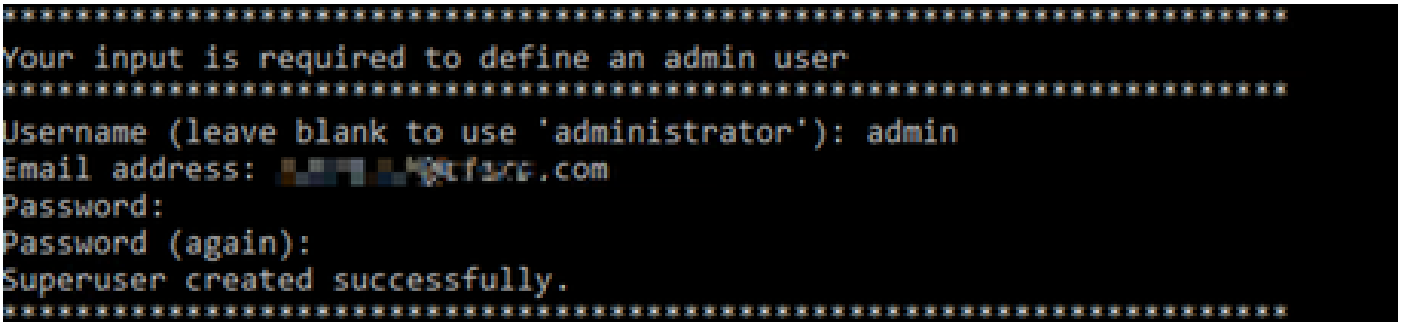
Host name: recommended to use localhost or 127.0.0.1.



Save settings: confirm with **y**.



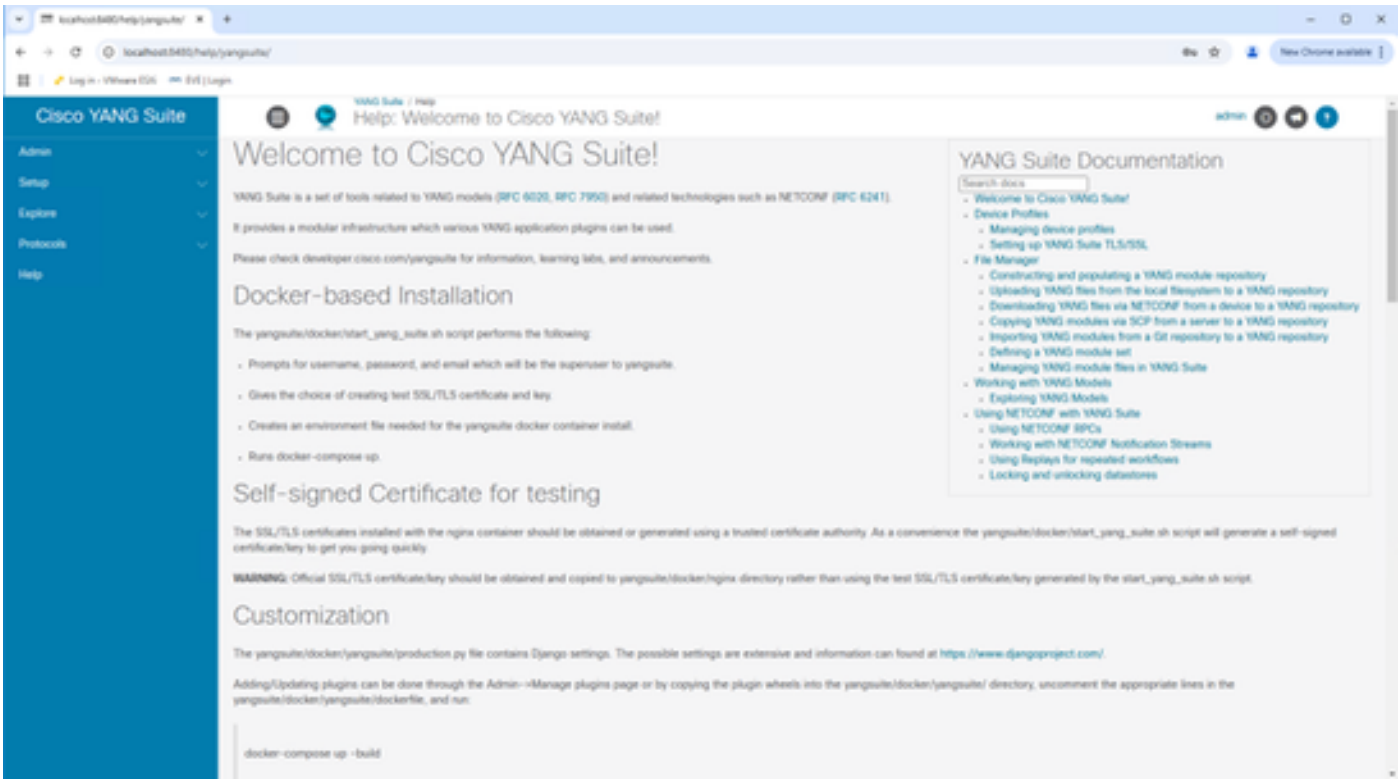
Create **username** and **password**: for accessing the YANG Suite web UI.



Expected Result:
Configuration is saved, and services can be started with the command **yangsuite**:

```
(yangsuitevenv) C:\Users\Administrator>yangsuite
```

Step 10. Log in to **Yang Suite** via the browser: http://localhost:8480/ to access Cisco Yang Suite:

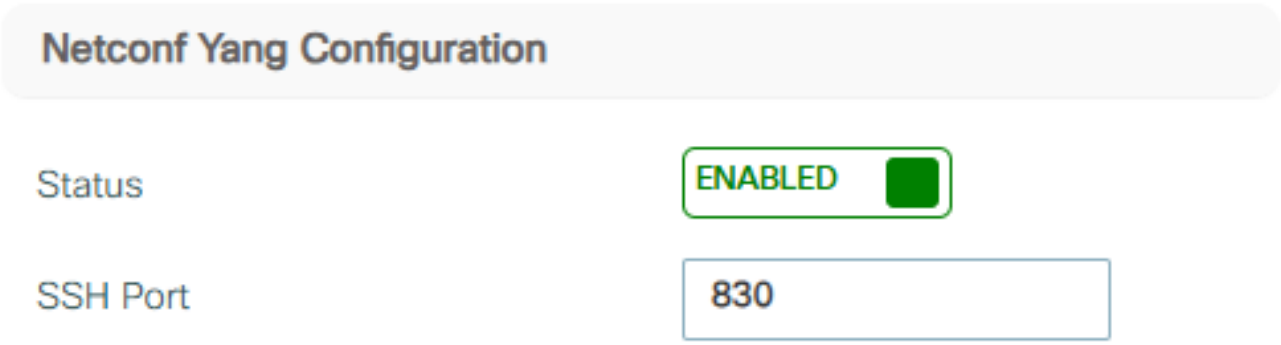


Verify

Step 1. Configure the Catalyst 9800 WLC.

Ensure the **Netconf Yang Status** and **SSH Port** are enabled on the WLC.

Navigate to **WLC > Administration > Management > HTTP/HTTPS/Netconf/VTY** to enable the Netconf Yang Configuration Status and enable SSH Port **830**.



CLI configuration:

```
9800(config)#netconf-yang
```

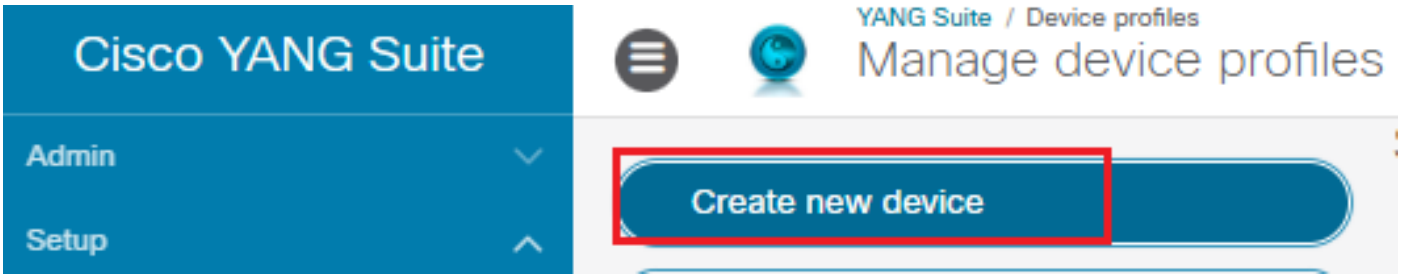
Configure **AAA** Settings.

CLI configuration:

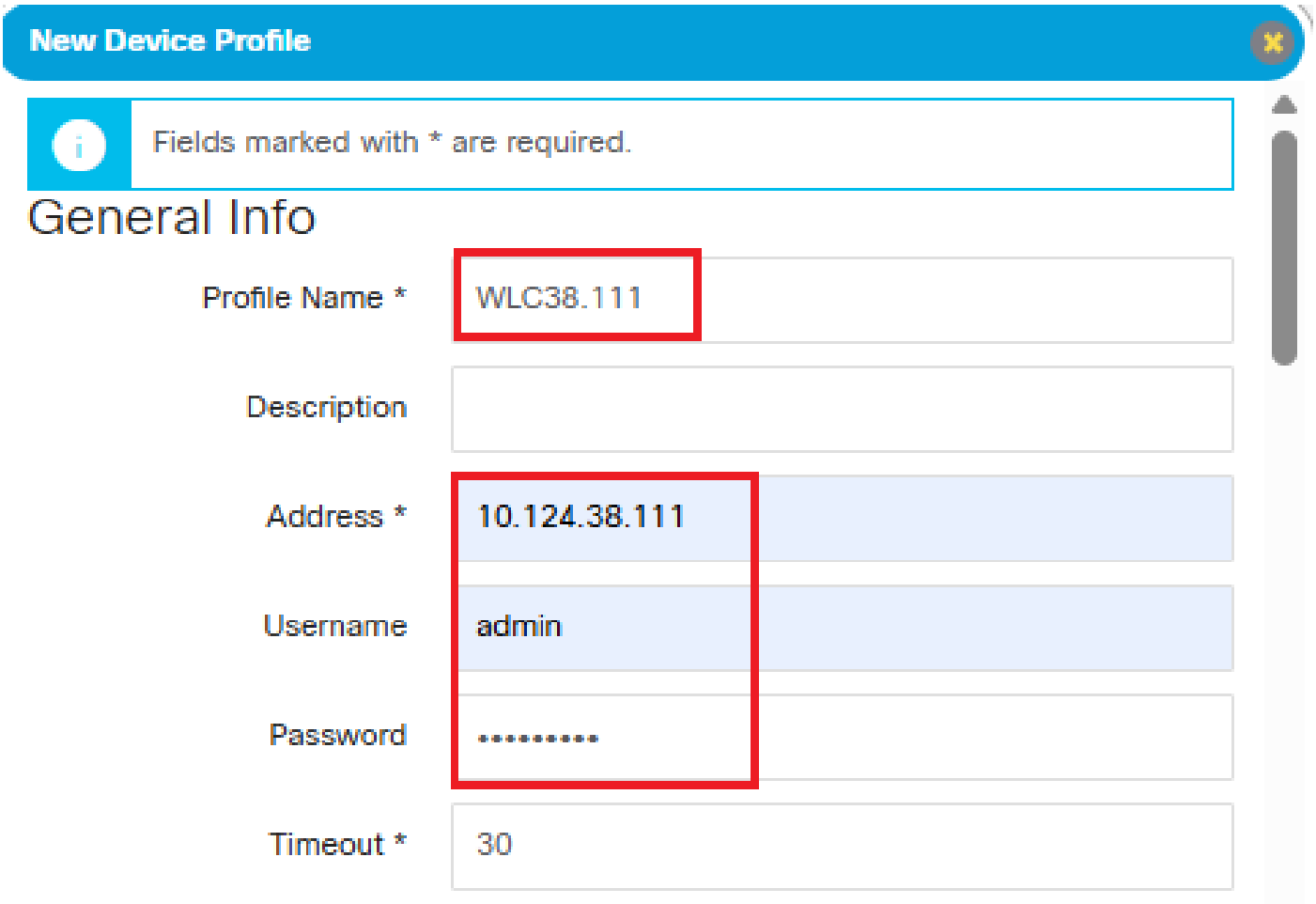
```
9800(config)#aaa authentication login default local
9800(config)#aaa authorization exec default local
```

Step 2. Add the WLC to YANG Suite.

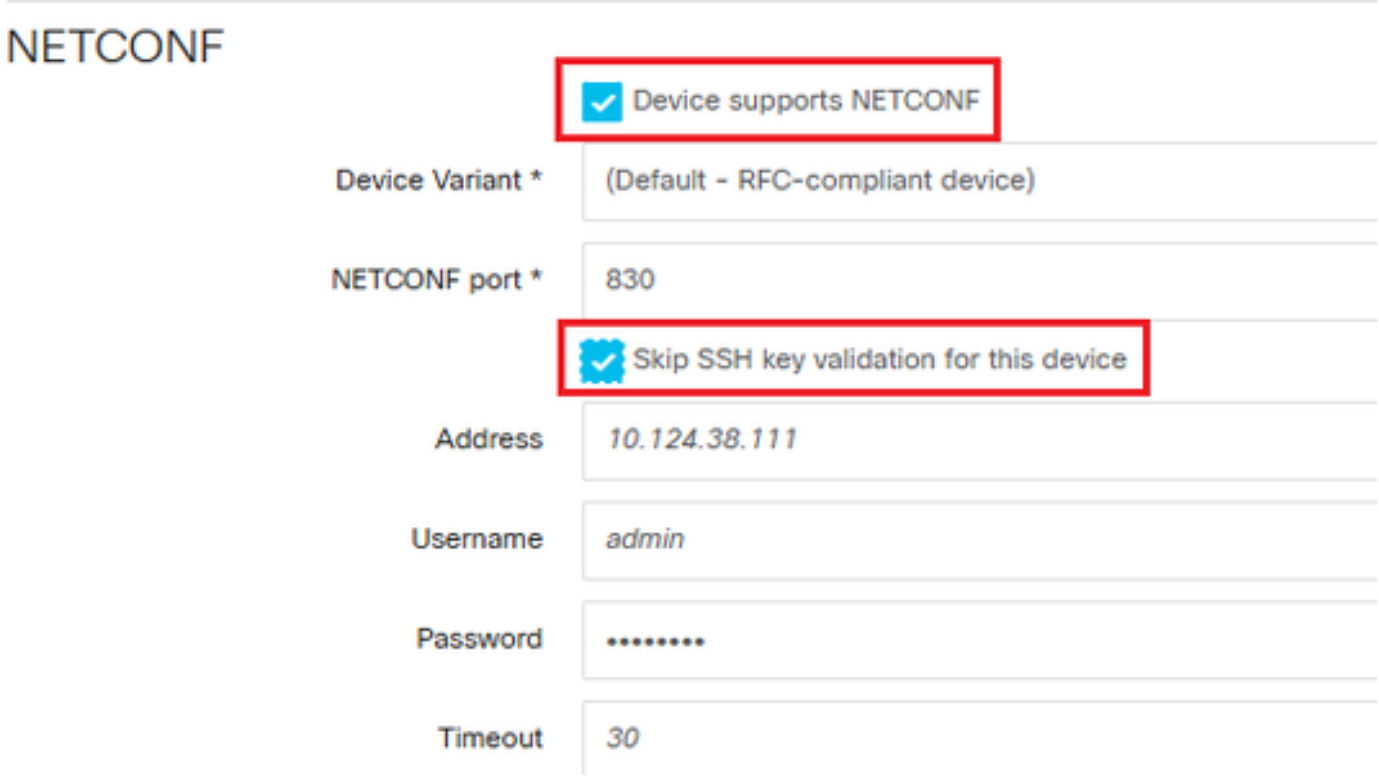
In YANG Suite, navigate to **Setup > Device Profiles > Create New Device**.



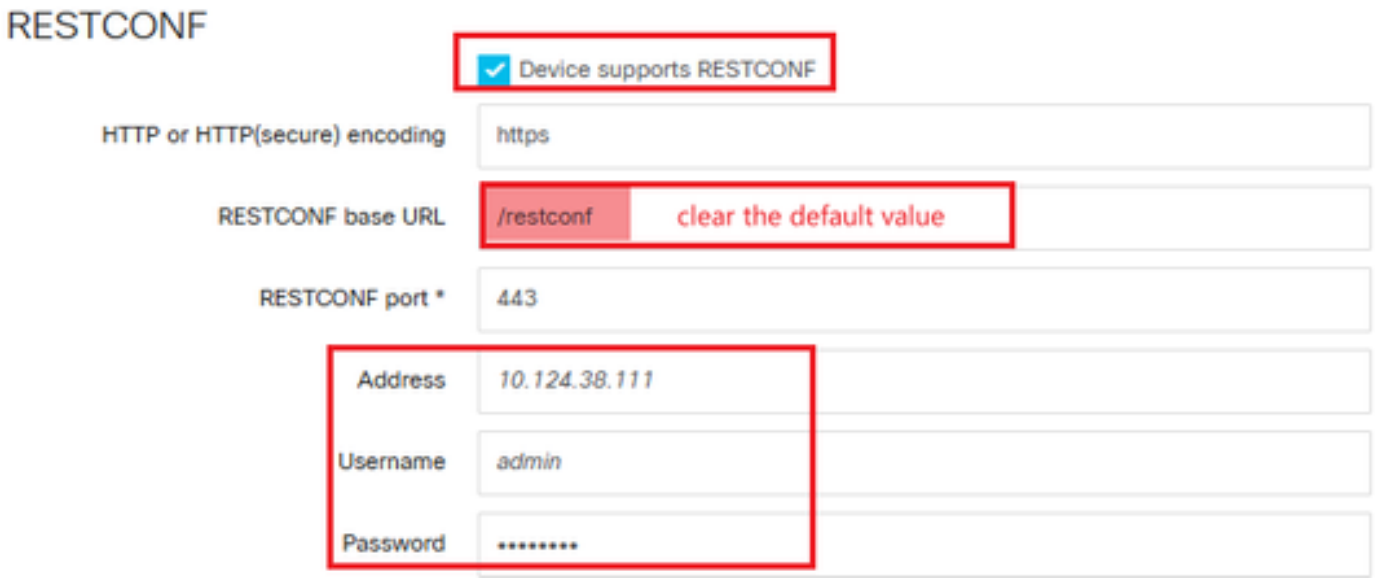
Input the **Profile Name**, **WLC IP address**, **username** and **password.**



Activate netconf by clicking **Device supports NETCONF** and clicking **Skip SSH key validation for this device**.



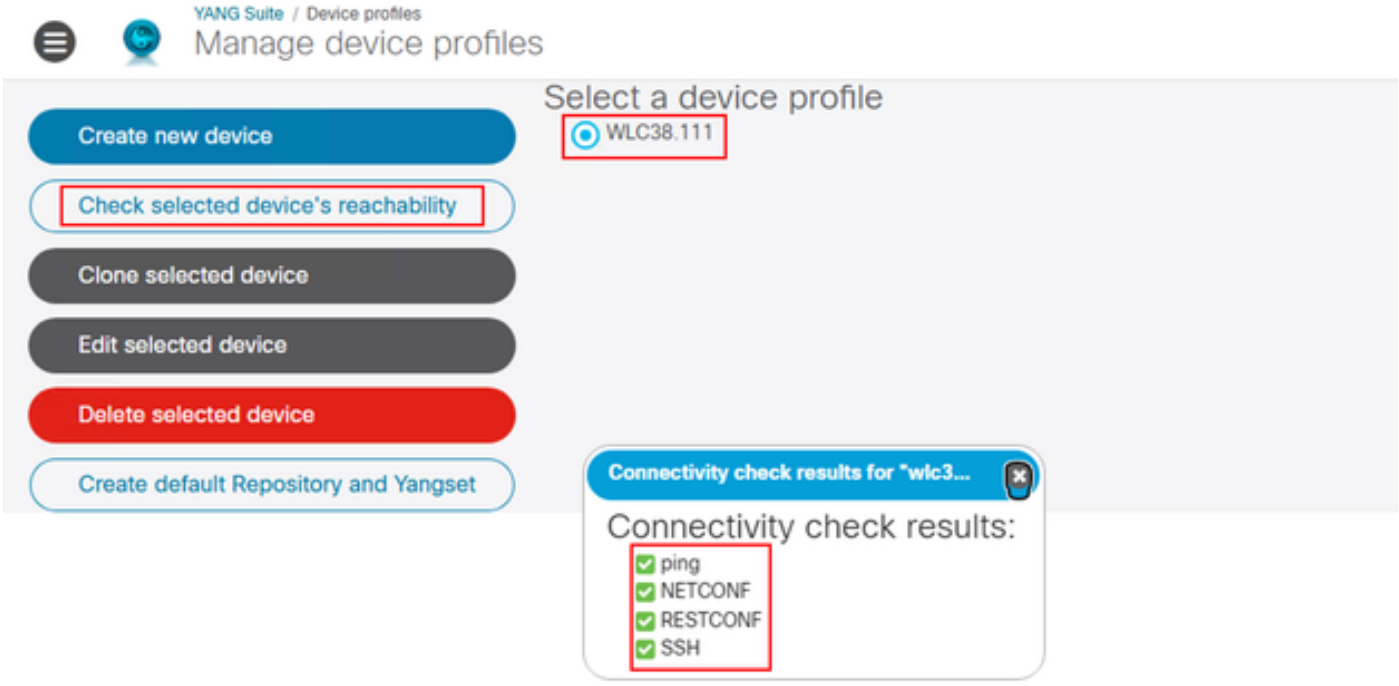
Activate Restconf by clicking **Device supports RESTCONF** and **clear the default RESTCONF base URL** to empty.



Activate SSH by clicking **Device allows SSH login** and verify the WLC info.

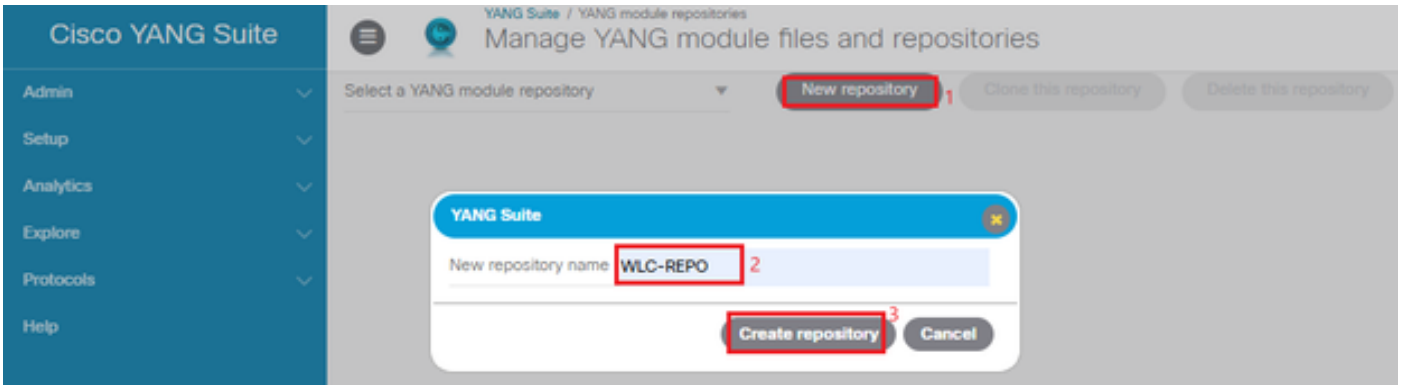
Step 3. Verify the Device Reachability.

Click the **Check selected device's reachability** and **selected the device profile** to check whether the WLC can be reached from YANG Suite.

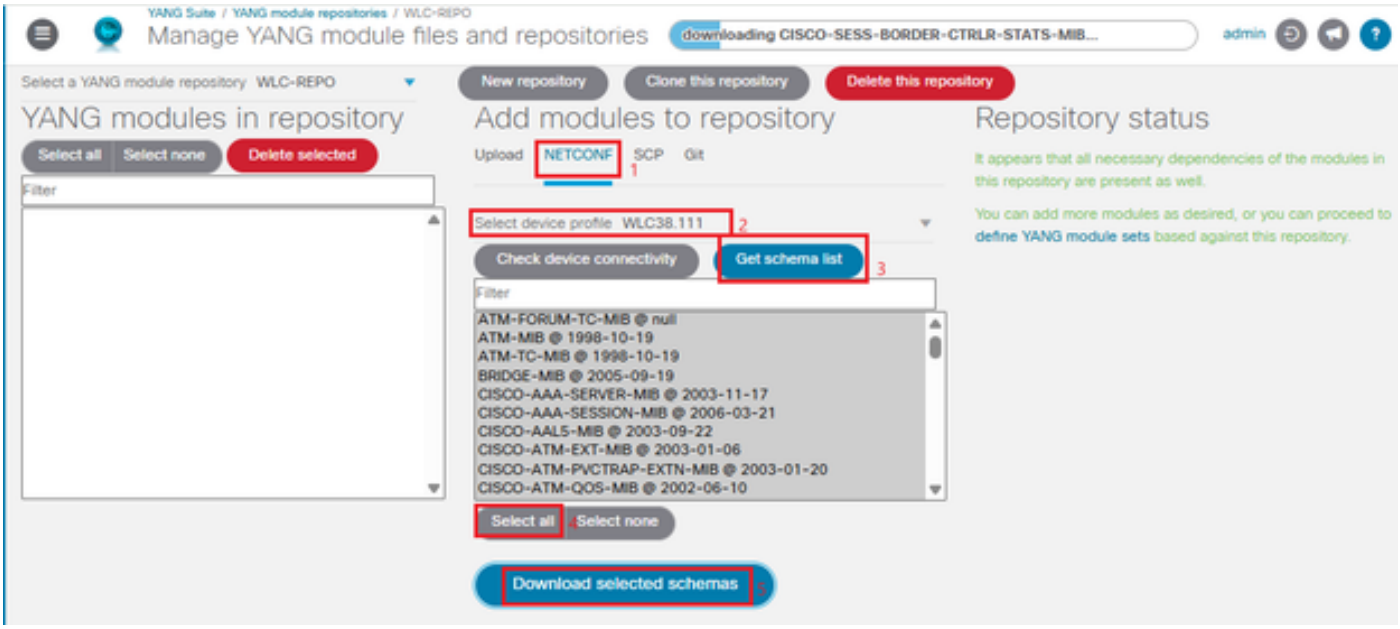


Step 4. Create a **YANG Suite Repository**.

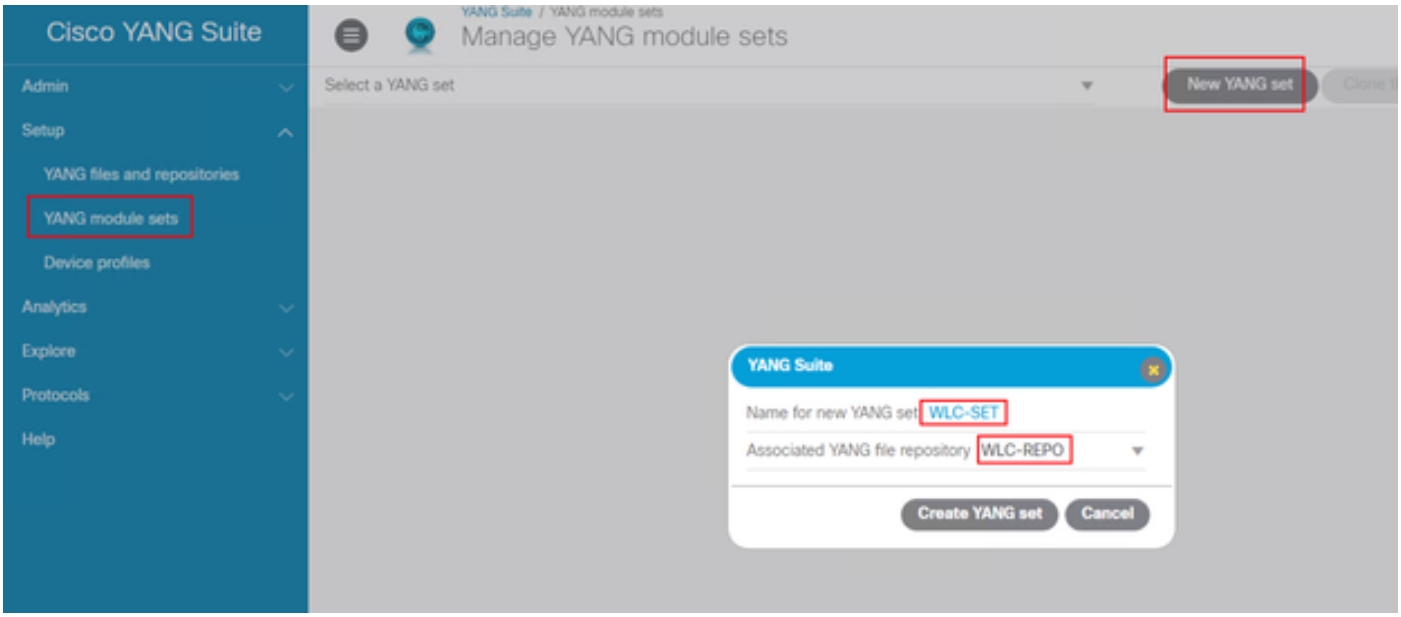
Create a **repository** to store the needed WLC YANG models.



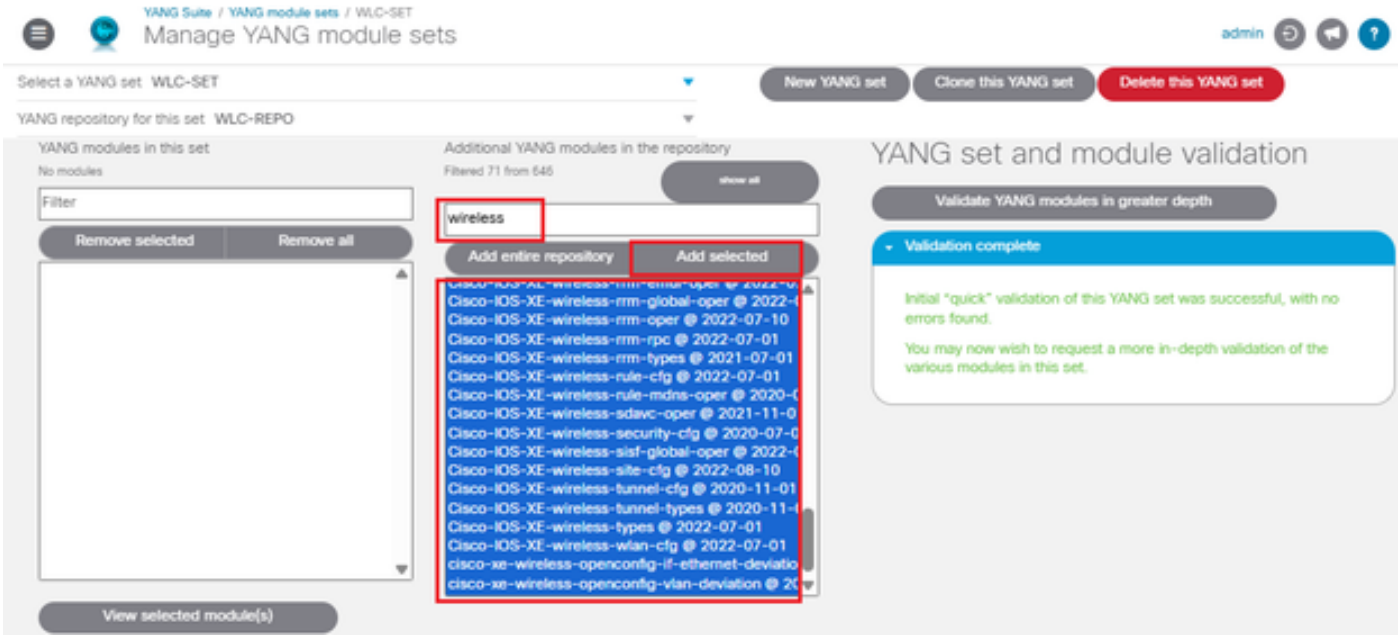
Select **NETCONF** and Select **device profile** to **Get schema List** in order to download all schema from WLC



Step 5. Create a **New YANG module** set to associated YANG file repository.

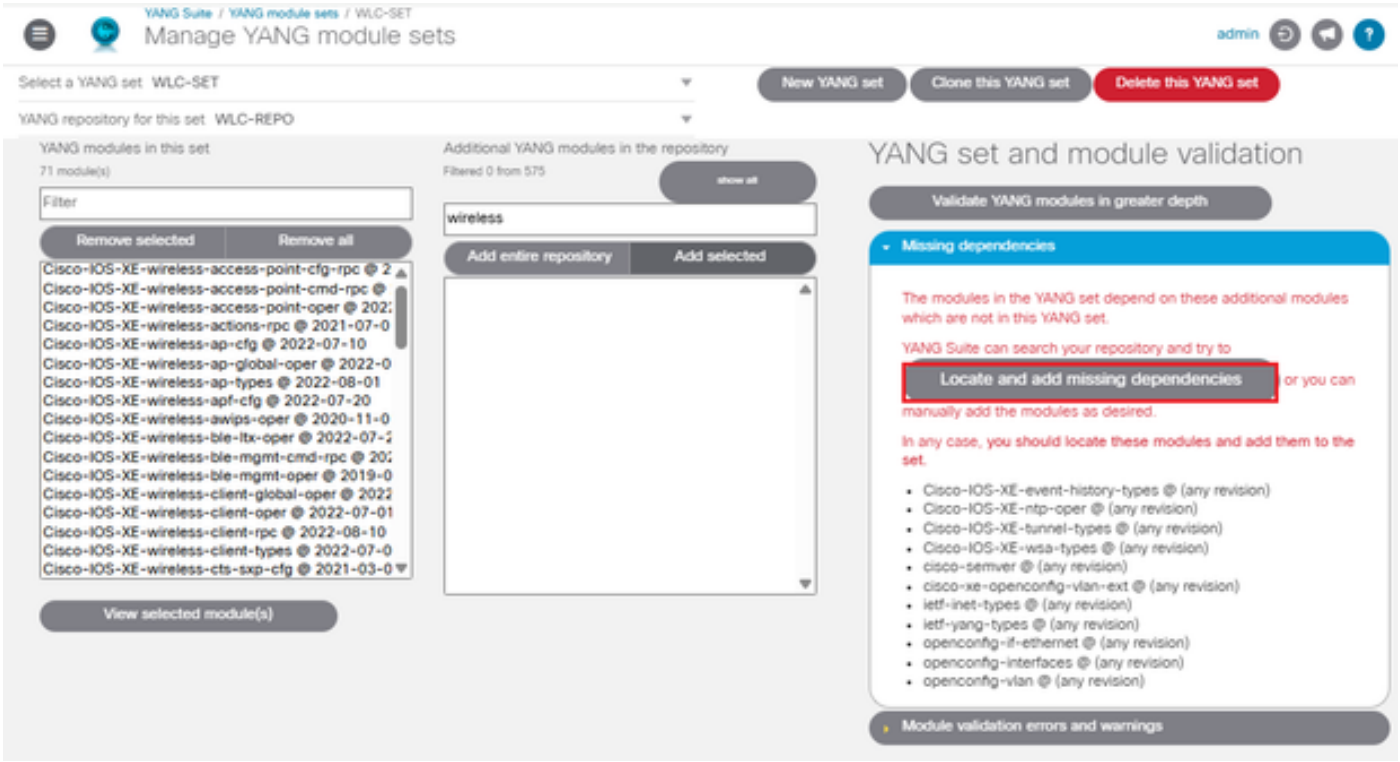


For example, if the wireless info of Catalyst 9800-specific YANG models is required, input **wireless** to choose all modules and click **Add selected**.



If you need more than just the wireless components, you can simply click **Add entire repository** at this step.

If you only add the wireless modules, there is also a button called **Locate and add missing dependencies**. Clicking it automatically pulls in any additional modules required by the wireless module.

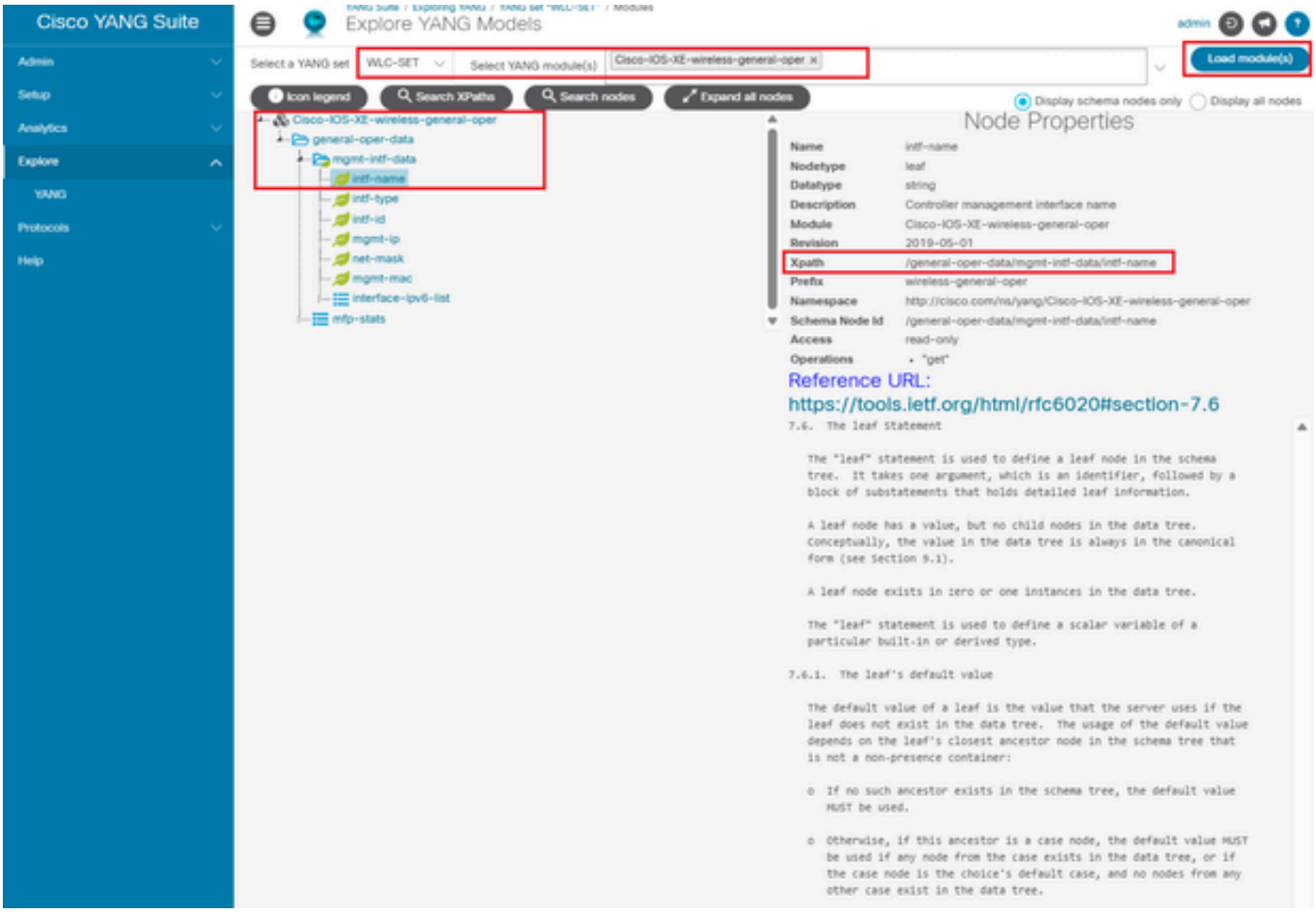


Step 6. Test XPath Queries.

Use the XPath provided by YANG Suite to obtain data from WLC.

Get the needed XPath in YANG Suite.

Here you take controller management interface name as an example.



Configure telemetry ietf on WLC CLI

```
C9800(config)#telemetry ietf subscription <subscription-id>
C9800(config-mdt-subs)#encoding encode-kvgpb
C9800(config-mdt-subs)#filter xpath <xpath-expression>
C9800(config-mdt-subs)#source-address <wlc-ip>
C9800(config-mdt-subs)#stream yang-push
C9800(config-mdt-subs)#update-policy periodic <interval-in-centiseconds>
C9800(config-mdt-subs)#receiver ip address <collector-ip> <collector-port> protocol grpc-tcp
```

For example:

<#root>

```
C9800(config)#telemetry ietf subscription
```

104

```
C9800(config-mdt-subs)#encoding encode-kvgpb
C9800(config-mdt-subs)#filter xpath
```

/general-oper-data/mgmt-intf-data/intf-name

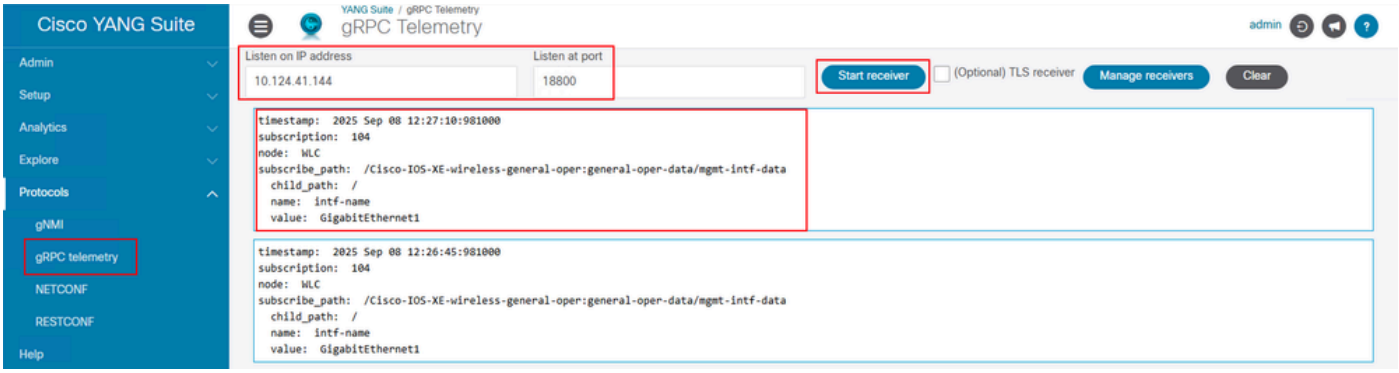
```
C9800(config-mdt-subs)#source-address
```

```
10.124.38.111


C9800(config-mdt-subs)#stream yang-push
C9800(config-mdt-subs)#update-policy periodic
2500


C9800(config-mdt-subs)#receiver ip address
10.124.41.144 18800
 protocol grpc-tcp
```

Enable monitoring in **gRPC telemetry** to get the needed data sent by WLC.



Related Information

- Catalyst 9800 Programmability and Telemetry Deployment Guide
- Welcome to Cisco YANG Suite!
- Cisco Community for DevNet