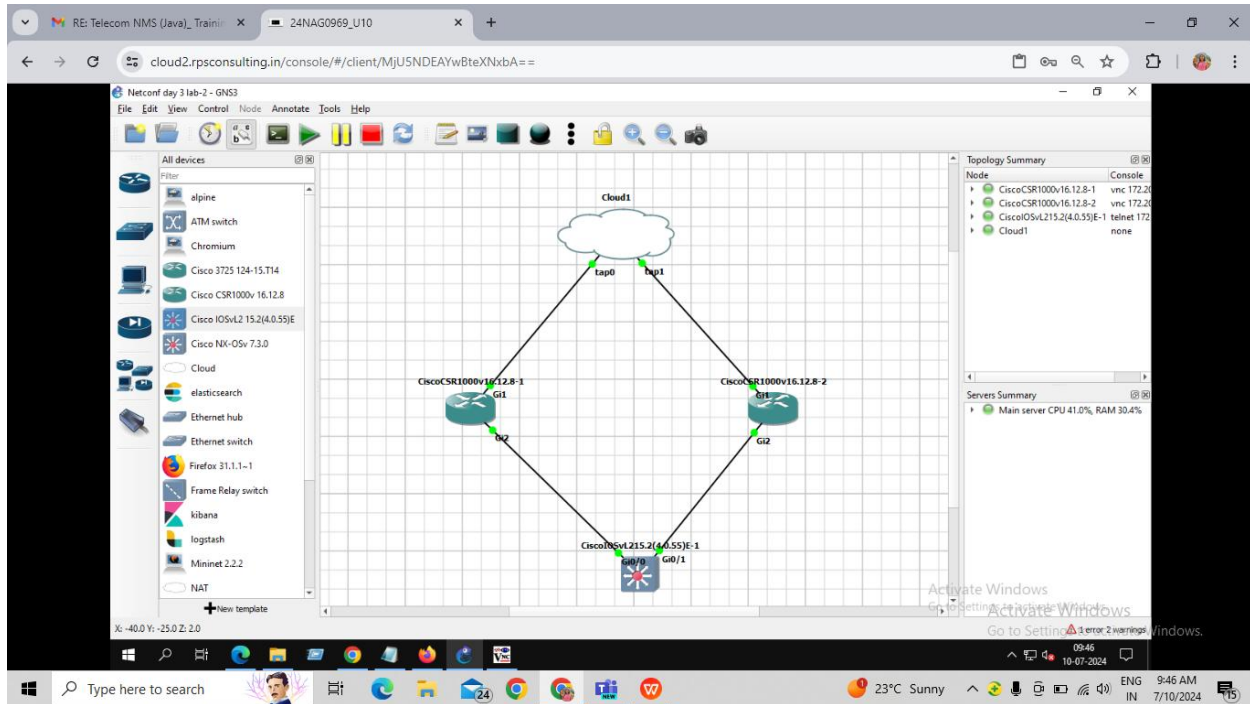
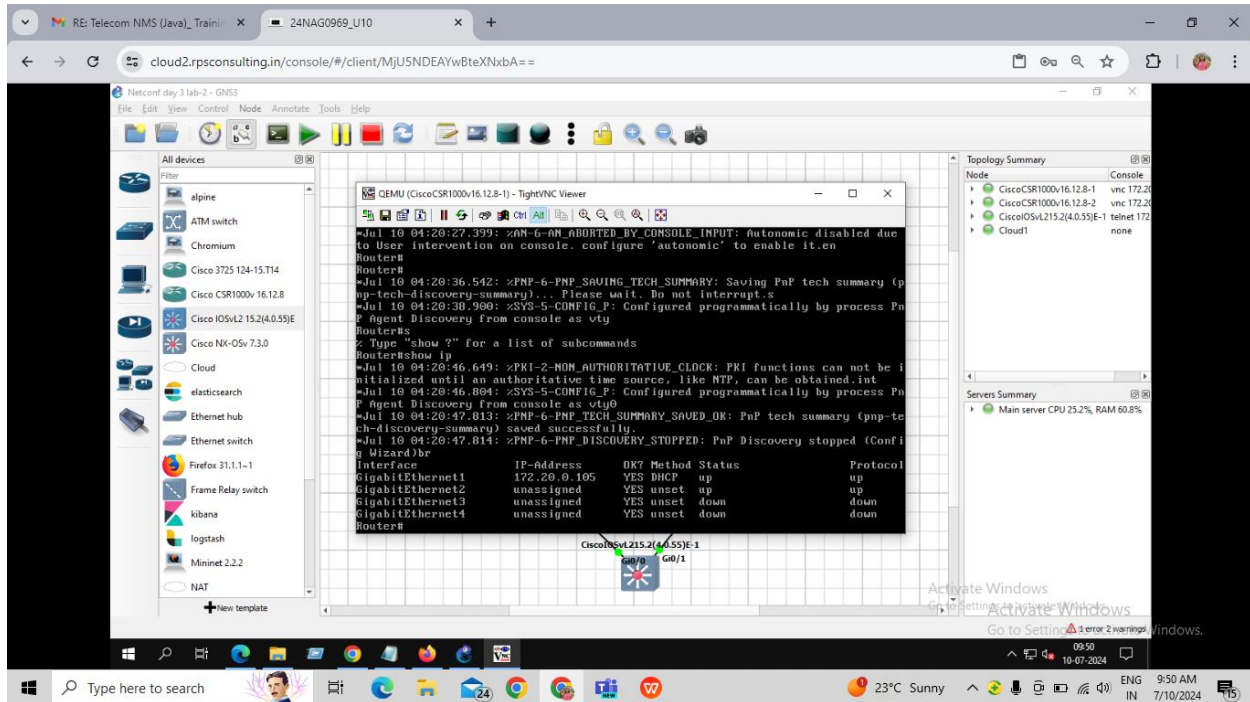


NETCONF AND RESTCONF

Topology:



DHCP will allocate the IP address to the Router



Go to Config Mode:

Conf t

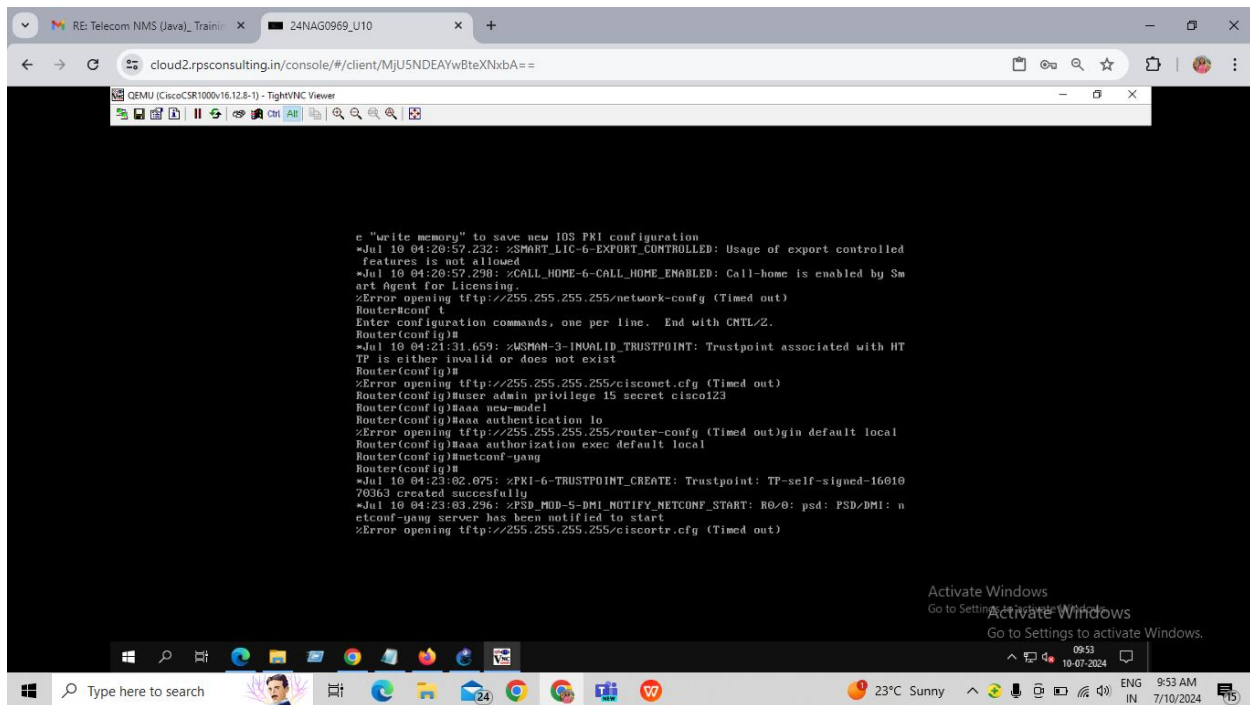
user admin privilege 15 secret cisco123

aaa new-model

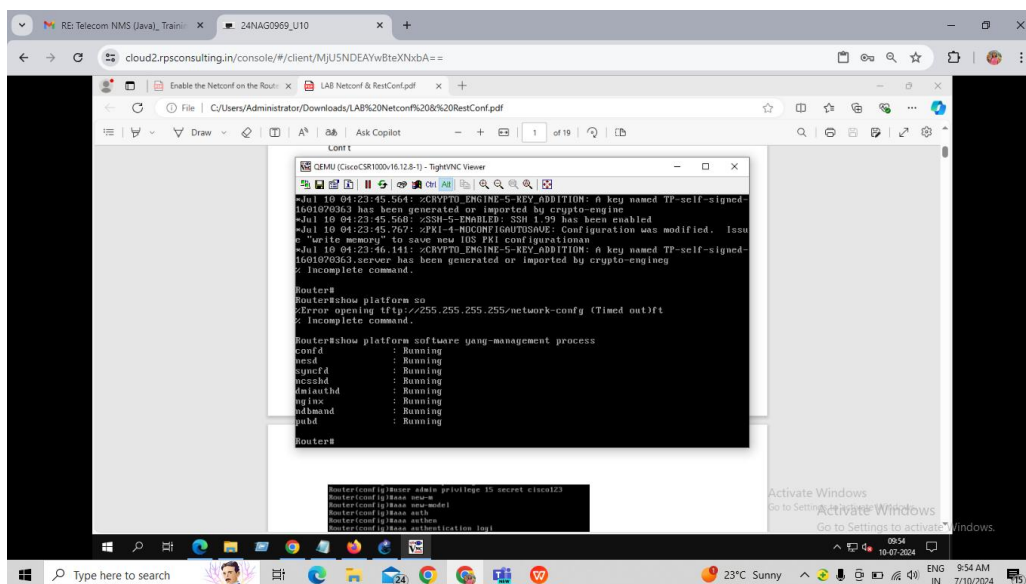
aaa authentication login default local

aaa authorization exec default local

Netconf-yang

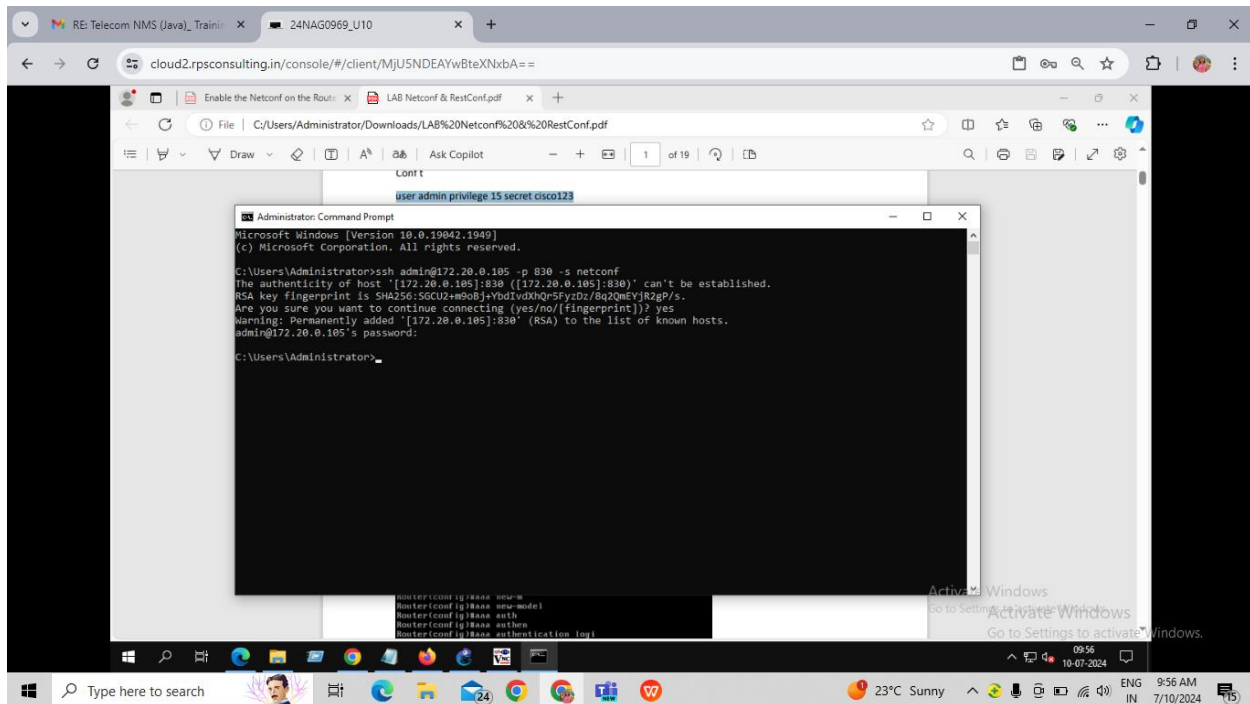


Show platform software yang-management process

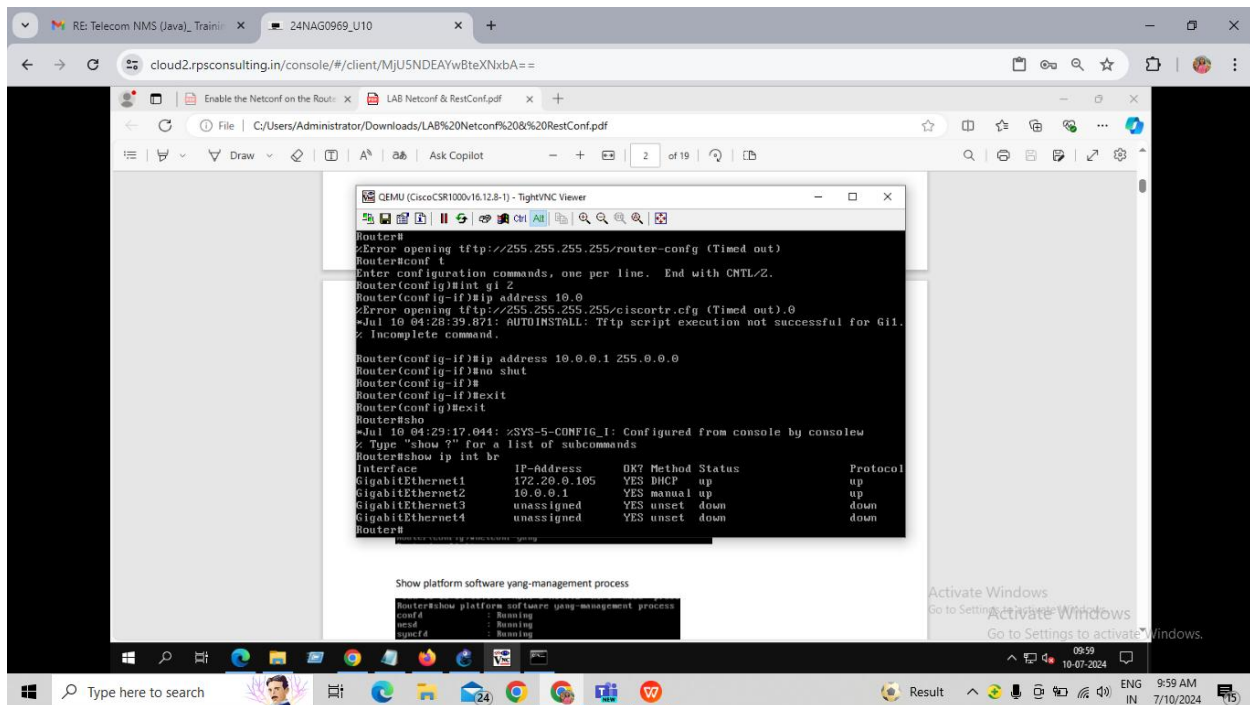


Go to Command prompt and check the yang connectivity

Ssh admin@IP -p 830 -s netconf -- connect via cmd prompt

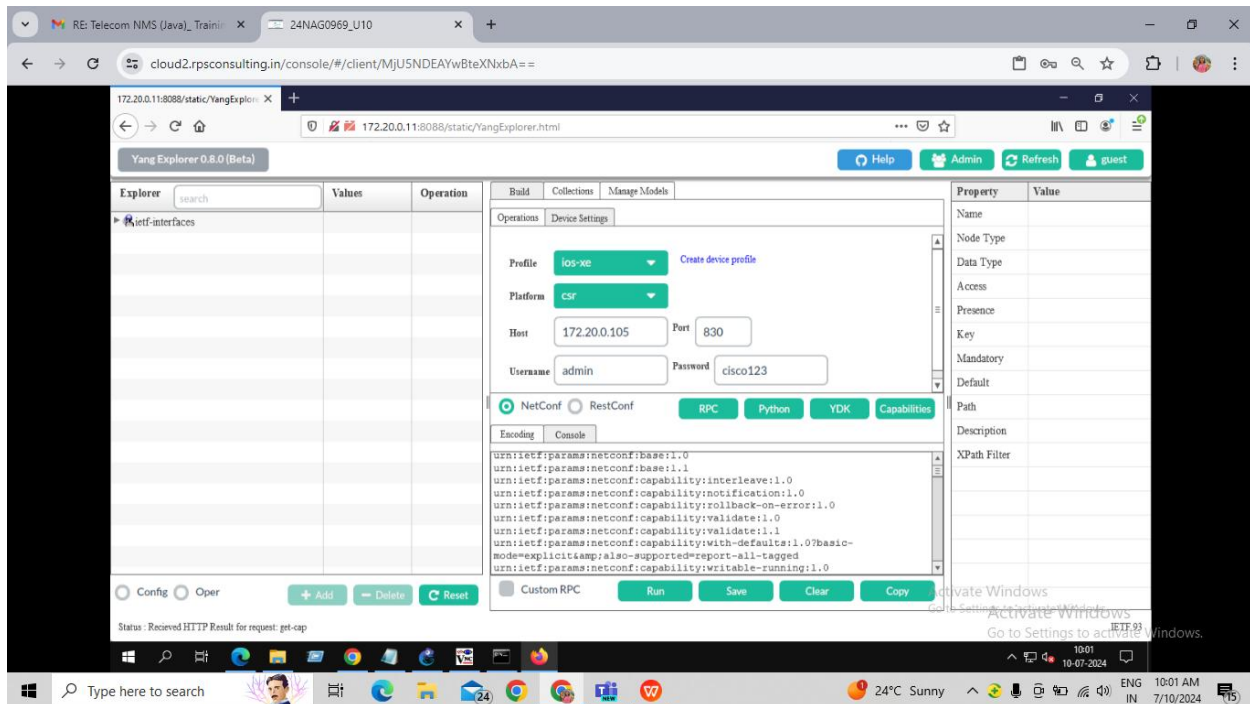


Add the additional Gi2 interface to router and assign the IP 10.0.0.1

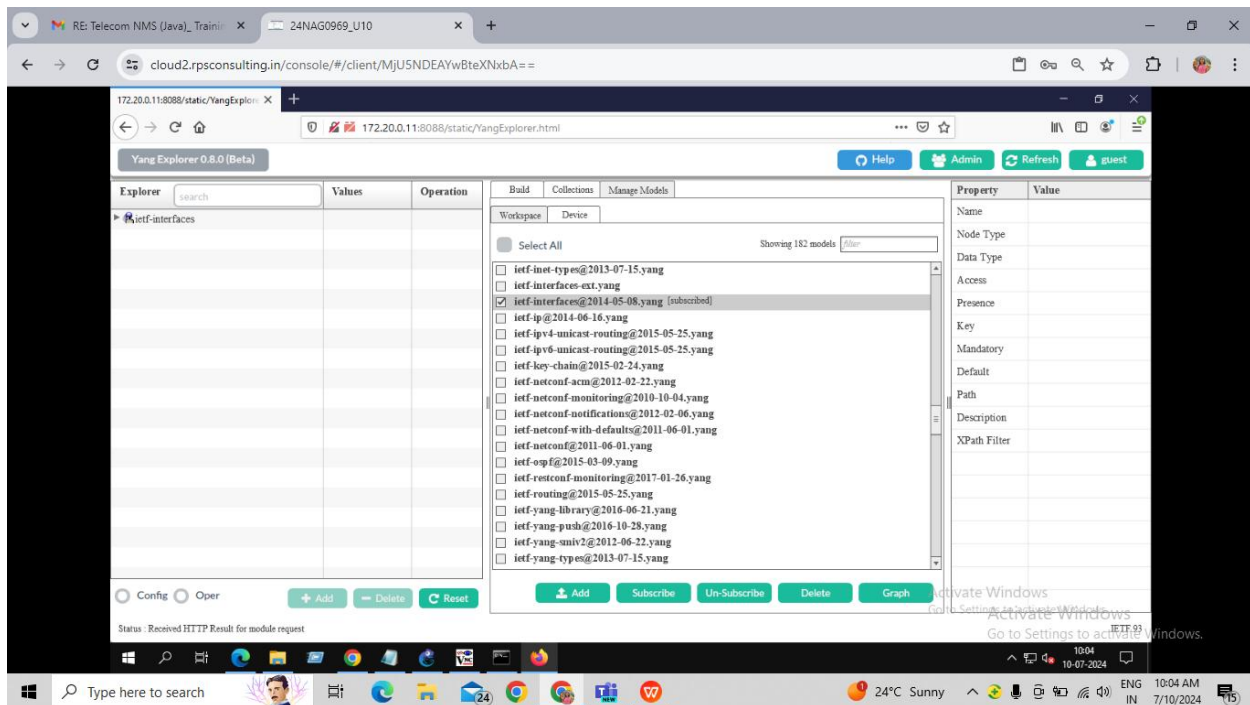


Login to YANG Explorer:

Click on capability, router will exchange the capability.



Click on Manage model and subscribe the ietf-interface yang model



Example 1: Get the Router Interface Name

The screenshot shows the Yang Explorer 0.8.0 (Beta) interface. The left pane displays the tree structure with 'interface' selected under 'ietf-interfaces'. The center pane shows the configuration for the 'name' property, with the value 'GigabitEthernet1' entered. The right pane shows the property details for 'name', including its type (string), access (read-write), and path.

Property	Value
Name	name
Node Type	leaf
Data Type	string
Access	read-write
Presence	
Key	true
Mandatory	true
Default	
Path	ietf-interfaces/ interfaces/ interface/ name
Description	The name of the interface. A device MAY restrict the allowed values for this leaf, possibly depending on the type of the interface.

Example 2; Get the Router Interface admin and Operation state

The screenshot shows the Yang Explorer 0.8.0 (Beta) interface. The left pane displays the tree structure with 'interface' selected under 'interfaces-state'. The center pane shows the configuration for the 'admin-status' and 'oper-status' properties, with the value 'up' entered for 'admin-status'. The right pane shows the property details for 'admin-status', including its type (enumeration), access (read-only), and path.

Property	Value
Name	admin-status
Node Type	leaf
Data Type	enumeration
Access	read-only
Presence	
Key	
Mandatory	true
Default	
Path	ietf-interfaces/ interfaces-state/ interface/ admin-status
Description	The current operational state of the interface. This leaf has the same semantics as ifOperStatus.None
XPath Filter	/if:interfaces-state/ interface/ admin-status

Example 3: Run the YANG query and get the Router interface and IP details

The screenshot shows the Yang Explorer 0.8.0 (Beta) interface. The left pane displays the YANG model tree with 'ip' selected under 'interface'. The middle pane shows the configuration for the 'ip' node, including fields for Host (172.20.0.105), Port (830), Username (admin), and Password (cisco123). The right pane shows the property table for the 'ip' node.

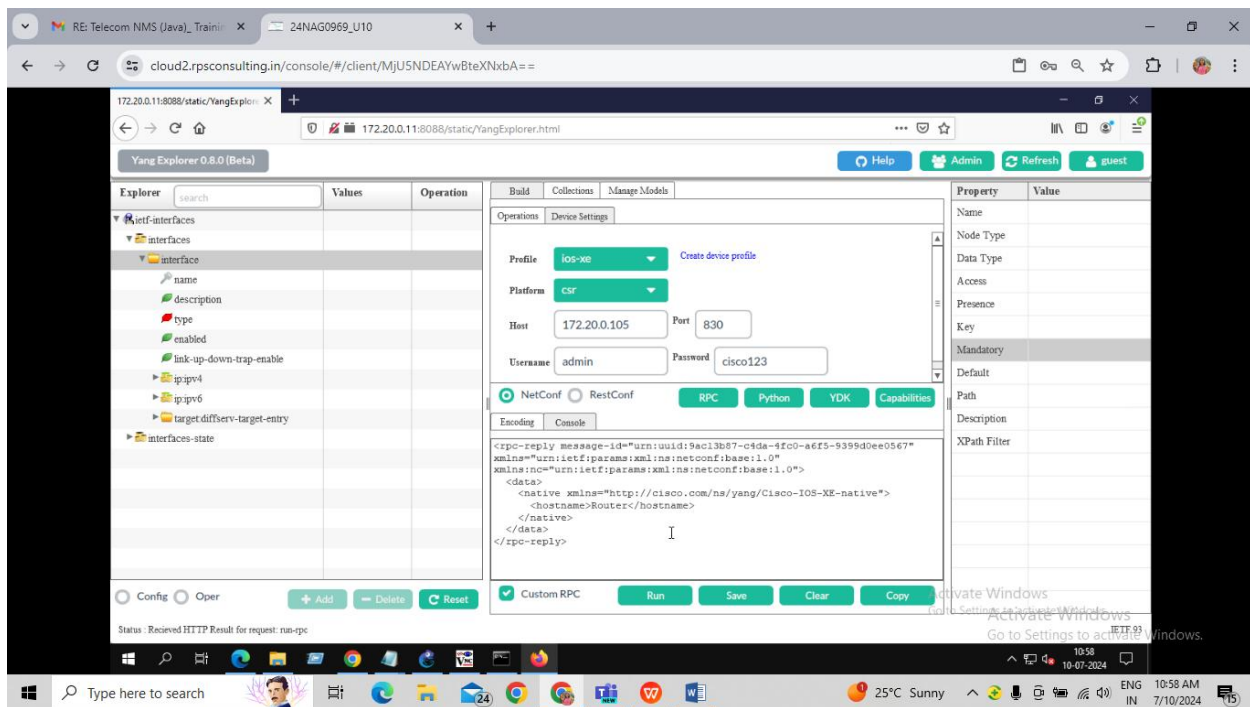
Property	Value
Name	ip:ip
Node Type	leaf
Data Type	inet:ipv4-address-no-zone
Access	read-write
Presence	
Key	true
Mandatory	true
Default	
Path	ietf-interfaces/interfaces/interface/ip:ip
Description	The IPv4 address on the interface.
XPath Filter	/if:interfaces/interface/ip:ip

Example 4; Run the YANG query and get the Router interface stats

The screenshot shows the Yang Explorer 0.8.0 (Beta) interface. The left pane displays the YANG model tree with 'in-octets' selected under 'statistics'. The middle pane shows the configuration for the 'in-octets' node, including fields for Host (172.20.0.105), Port (830), Username (admin), and Password (cisco123). The right pane shows the property table for the 'in-octets' node.

Property	Value
Name	in-octets
Node Type	leaf
Data Type	yang:counter64
Access	read-only
Presence	
Key	
Mandatory	
Default	
Path	ietf-interfaces/interfaces/interface/statistics/in-octets
Description	The total number of octets received on the interface, including framing characters.

1: Get the router hostname



Yang Explorer 0.8.0 (Beta)

Explorer

- ietf-interfaces
 - interfaces
 - interface
 - name
 - description
 - type
 - enabled
 - link-up-down-trap-enable
 - ip-ipv4
 - ip-ipv6
 - target-diffserv-target-entry
 - interfaces-state

Build Collections Manage Models

Operations Device Settings

Profile: ios-xe Create device profile

Platform: csr

Host: 172.20.0.105 Port: 830

Username: admin Password: cisco123

NetConf RestConf RPC Python YDK Capabilities

Encoding Console

Custom RPC

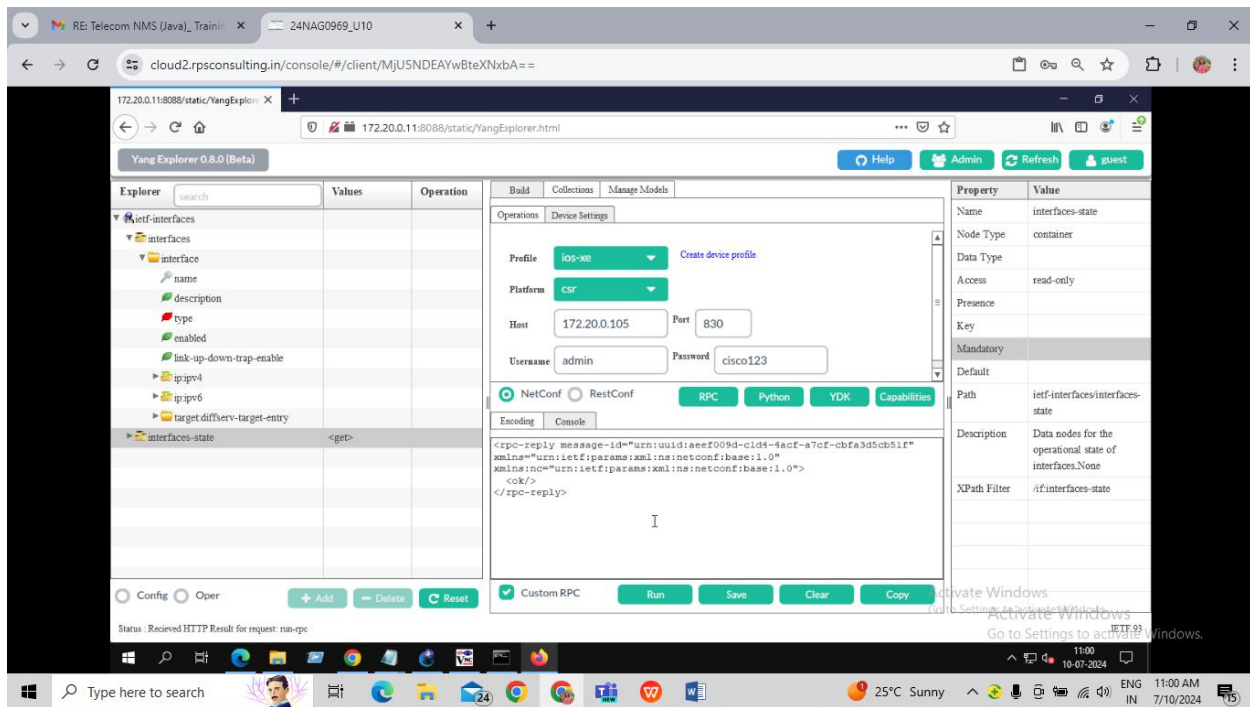
Run Save Clear Copy

Status: Received HTTP Result for request: run-rpc

Property Value

Property	Value
Name	interfaces
Node Type	container
Data Type	read-only
Access	read-only
Presence	
Key	
Mandatory	
Default	
Path	ietf-interfaces/interfaces-state
Description	Data nodes for the operational state of interfaces.
XPath Filter	/if:interfaces-state

2: Change the Router hostname



Yang Explorer 0.8.0 (Beta)

Explorer

- ietf-interfaces
 - interfaces
 - interface
 - name
 - description
 - type
 - enabled
 - link-up-down-trap-enable
 - ip-ipv4
 - ip-ipv6
 - target-diffserv-target-entry
 - interfaces-state

Build Collections Manage Models

Operations Device Settings

Profile: ios-xe Create device profile

Platform: csr

Host: 172.20.0.105 Port: 830

Username: admin Password: cisco123

NetConf RestConf RPC Python YDK Capabilities

Encoding Console

Custom RPC

Run Save Clear Copy

Status: Received HTTP Result for request: run-rpc

Property Value

Property	Value
Name	interfaces-state
Node Type	container
Data Type	read-only
Access	read-only
Presence	
Key	
Mandatory	
Default	
Path	ietf-interfaces/interfaces-state
Description	Data nodes for the operational state of interfaces.
XPath Filter	/if:interfaces-state

RE: Telecom NMS (Java)_Trainin x 24NAG0969_U10 x +

cloud2.rpsconsulting.in/console/#/client/MjU5NDEAYwBteXNxbA==

172.20.0.11:8088/static/YangExplor x +

172.20.0.11:8088/static/YangExplorer.html

Yang Explorer 0.8.0 (Beta)

Help Admin Refresh guest

Explorer search Values Operation

ietf-interfaces

interfaces

interface

name

description

type

enabled

link-up-down-trap-enable

ip-ipv4

ip-ipv6

target-diffserv-target-entry

interfaces-state <get>

Build Collections Manage Models

Operations Device Settings

Profile ios-xe Create device profile

Platform csr

Host 172.20.0.105 Port 830

Username admin Password cisco123

NetConf RestConf RPC Python YDK Capabilities

Encoding Console

<rpc-reply message-id="urn:uuid:4a64751d-42d2-413d-a6ba-42ad1dd549a8" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0">
<data>
<native xmlns="http://cisco.com/ns/yang/Cisco-IOS-XE-native">
<hostname>Router1</hostname>
</native>
</data>
</rpc-reply>

Custom RPC Run Save Clear Copy

Property Value

Name interfaces-state

Node Type container

Data Type

Access read-only

Presence

Key

Mandatory

Default

Path ietf-interfaces/interfaces-state

Description Data nodes for the operational state of interfaces.None

XPath Filter /if:interfaces-state

Status: Received HTTP Result for request: run-rpc

Windows

Activate Windows

Go to Settings to activate Windows.

11:01 10-07-2024

25°C Sunny

ENG 11:01 AM 7/10/2024

3: Change the interface operational status

RE: Telecom NMS (Java)_Trainin x 24NAG0969_U10 x +

cloud2.rpsconsulting.in/console/#/client/MjU5NDEAYwBteXNxbA==

172.20.0.11:8088/static/YangExplor x +

172.20.0.11:8088/static/YangExplorer.html

Yang Explorer 0.8.0 (Beta)

Help Admin Refresh guest

Explorer search Values Operation

ietf-interfaces

interfaces

interface

name

description

type

enabled

link-up-down-trap-enable

ip-ipv4

ip-ipv6

target-diffserv-target-entry

interfaces-state <get>

Build Collections Manage Models

Operations Device Settings

Profile ios-xe Create device profile

Platform csr

Host 172.20.0.105 Port 830

Username admin Password cisco123

NetConf RestConf RPC Python YDK Capabilities

Encoding Console

<rpc-reply message-id="urn:uuid:332ed36a-aac9-433f-9e7c-843629da609f" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0">
<ok/>
</rpc-reply>

Custom RPC Run Save Clear Copy

Property Value

Name interfaces-state

Node Type container

Data Type

Access read-only

Presence

Key

Mandatory

Default

Path ietf-interfaces/interfaces-state

Description Data nodes for the operational state of interfaces.None

XPath Filter /if:interfaces-state

Status: Received HTTP Result for request: run-rpc

Windows

Activate Windows

Go to Settings to activate Windows.

11:11 10-07-2024

Morning news

ENG 11:11 AM 7/10/2024

4: Check the IP address

The screenshot shows the Yang Explorer 0.8.0 (Beta) interface. The left sidebar displays a tree view of YANG models under 'ietf-interfaces'. The 'interfaces-state' model is selected, showing its properties: Name (interfaces-state), Node Type (container), Data Type (None), Access (read-only), Presence, Key, Mandatory, Default, Path (ietf-interfaces/interfaces-state), and Description (Data nodes for the operational state of interfaces). The main panel shows the configuration for the 'interfaces-state' model. The 'Profile' is set to 'ios-xe' and the 'Platform' is 'csr'. The 'Host' is '172.20.0.105' and the 'Port' is '830'. The 'Username' is 'admin' and the 'Password' is 'cisco123'. The 'Encoding' is 'NetConf' and the 'Console' is 'RPC'. The 'RPC' button is highlighted. The 'Console' tab is active, showing the following XML configuration:

```
<interface>
  <name>GigabitEthernet2</name>
  <ipv4 xmlns="urn:ietf:params:xml:ns:yang:ietf-ip">
    <address>
      <ip>10.0.0.1</ip>
      <netmask>255.0.0.0</netmask>
    </address>
  </ipv4>
</interface>
</data>
</rpc-reply>
```

The status bar at the bottom indicates 'Status: Received HTTP Result for request: run-rpc'.

5: Assign the Ip address on interface

The screenshot shows the Yang Explorer 0.8.0 (Beta) interface. The left sidebar displays a tree view of YANG models under 'ietf-interfaces'. The 'interfaces-state' model is selected, showing its properties: Name (interfaces-state), Node Type (container), Data Type (None), Access (read-only), Presence, Key, Mandatory, Default, Path (ietf-interfaces/interfaces-state), and Description (Data nodes for the operational state of interfaces). The main panel shows the configuration for the 'interfaces-state' model. The 'Profile' is set to 'ios-xe' and the 'Platform' is 'csr'. The 'Host' is '172.20.0.105' and the 'Port' is '830'. The 'Username' is 'admin' and the 'Password' is 'cisco123'. The 'Encoding' is 'NetConf' and the 'Console' is 'RPC'. The 'RPC' button is highlighted. The 'Console' tab is active, showing the following XML configuration:

```
<rpc-reply message-id="urn:uuid:5a5ad4f0-cb89-4cf0-8d9d-29ef352e8f7d"
  xmlns="urn:ietf:params:xml:ns:netconf:base:1.0"
  xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0">
  <ok/>
</rpc-reply>
```

The status bar at the bottom indicates 'Status: Received HTTP Result for request: run-rpc'.

6: configure the loopback IP address

The screenshot displays the Yang Explorer 0.8.0 (Beta) web interface. The browser address bar shows the URL: `cloud2.rpsconsulting.in/console/#/client/MjU5NDYwBteXNxbA==`. The interface is divided into several sections:

- Explorer:** A tree view on the left showing the YANG model structure. The selected node is `interfaces-state` under `ietf-interfaces`.
- Operations:** A central panel with tabs for `Build`, `Collections`, and `Manage Models`. The `Device Settings` tab is active, showing fields for `Profile` (ios-xe), `Platform` (csr), `Host` (172.20.0.105), `Port` (830), `Username` (admin), and `Password` (cisco123).
- Property:** A table on the right showing the properties of the selected node. The table has columns `Property` and `Value`.
- Console:** A panel at the bottom showing the RPC response in XML format.

Property	Value
Name	interfaces-state
Node Type	container
Data Type	
Access	read-only
Presence	
Key	
Mandatory	
Default	
Path	ietf-interfaces/interfaces-state
Description	Data nodes for the operational state of interfaces.
XPath Filter	/if:interfaces-state

```
<rpc-reply message-id="urn:uuid:a4def229-6d60-42ee-9415-f85beb80eede"
xmlns="urn:ietf:params:xml:ns:netconf:base:1.0"
xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0">
<ok/>
</rpc-reply>
```

The console output shows the RPC response in XML format. The status bar at the bottom indicates "Status: Received HTTP Result for request: run-rpc".

7: Attempt to create new loopback interface with same IP address

8: Delete the Loopback ip address

The screenshot shows the Yang Explorer 0.8.0 (Beta) interface. The left sidebar displays a tree view of the configuration hierarchy, with 'interfaces-state' selected. The main panel shows the configuration for 'interfaces-state' with the following details:

- Profile: ios-xe
- Platform: csr
- Host: 172.20.0.105
- Port: 830
- Username: admin
- Password: cisco123

The 'Console' tab is active, displaying the following XML configuration:

```
<?xml version='1.0'>
<config>
  <interface>
    <ip>
      <address operation='delete'>
        <primary>
          <address>14.1.1.1</address>
          <mask>255.255.255.0</mask>
        </primary>
      </address>
    </ip>
  </interface>
</config>
```

The right sidebar shows the 'Property' table for 'interfaces-state'.

Property	Value
Name	interfaces-state
Node Type	container
Data Type	
Access	read-only
Presence	
Key	
Mandatory	
Default	
Path	ietf-interfaces/interfaces-state
Description	Data nodes for the operational state of interfaces.
XPath Filter	/if:interfaces-state

9: Delete the Loopback interface

The screenshot shows the Yang Explorer 0.8.0 (Beta) interface. The left sidebar displays a tree view of the configuration hierarchy, with 'interfaces-state' selected. The main panel shows the configuration for 'interfaces-state' with the following details:

- Profile: ios-xe
- Platform: csr
- Host: 172.20.0.105
- Port: 830
- Username: admin
- Password: cisco123

The 'Console' tab is active, displaying the following XML configuration:

```
<?xml version='1.0'>
<config>
  <interface>
    <ip>
      <address operation='delete'>
        <primary>
          <address>14.1.1.1</address>
          <mask>255.255.255.0</mask>
        </primary>
      </address>
    </ip>
  </interface>
</config>
```

The right sidebar shows the 'Property' table for 'interfaces-state'.

Property	Value
Name	interfaces-state
Node Type	container
Data Type	
Access	read-only
Presence	
Key	
Mandatory	
Default	
Path	ietf-interfaces/interfaces-state
Description	Data nodes for the operational state of interfaces.
XPath Filter	/if:interfaces-state

10: Get Complete config

The screenshot shows the Yang Explorer 0.8.0 (Beta) interface. The left pane displays a tree view of the configuration hierarchy, with 'interfaces-state' selected. The main pane shows the configuration details for 'interfaces-state', including the 'Profile' (ios-xe), 'Platform' (csr), 'Host' (172.20.0.105), 'Port' (830), 'Username' (admin), and 'Password' (cisco123). The 'Encoding' tab is active, showing the XML configuration for 'interfaces-state'.

```
<?xml version='1.0' encoding='UTF-8'>
<ip>
  <address>
    <primary>14.1.1.1</primary>
    <mask>255.255.255.0</mask>
  </address>
</ip>
</interface>
</control-plane/>
</aaa>
```

The right pane shows the 'Property' table for 'interfaces-state'.

Property	Value
Name	interfaces-state
Node Type	container
Data Type	
Access	read-only
Presence	
Key	
Mandatory	
Default	
Path	ietf-interfaces/interfaces-state
Description	Data nodes for the operational state of interfaces.
XPath Filter	/if:interfaces-state

11: Get the filtered configuration

The screenshot shows the Yang Explorer 0.8.0 (Beta) interface. The left pane displays a tree view of the configuration hierarchy, with 'interfaces-state' selected. The main pane shows the configuration details for 'interfaces-state', including the 'Profile' (ios-xe), 'Platform' (csr), 'Host' (172.20.0.105), 'Port' (830), 'Username' (admin), and 'Password' (cisco123). The 'Encoding' tab is active, showing the XML configuration for 'interfaces-state'.

```
<?xml version='1.0' encoding='UTF-8'>
<interface>
  <name>GigabitEthernet2</name>
  <ipv4 xmlns="urn:ietf:params:xml:ns:yang:ietf-ip">
    <address>
      <ip>10.0.0.1</ip>
      <netmask>255.0.0.0</netmask>
    </address>
    <ip>22.22.22.2</ip>
    <netmask>255.255.255.0</netmask>
  </ipv4>
</interface>
```

The right pane shows the 'Property' table for 'interfaces-state'.

Property	Value
Name	interfaces-state
Node Type	container
Data Type	
Access	read-only
Presence	
Key	
Mandatory	
Default	
Path	ietf-interfaces/interfaces-state
Description	Data nodes for the operational state of interfaces.
XPath Filter	/if:interfaces-state

12: Enable Candidate data store

The screenshot shows the Yang Explorer 0.8.0 (Beta) interface. The left pane displays the 'ietf-interfaces' model. The main pane shows the 'Device Settings' tab with the following configuration:

- Profile: ios-xe
- Platform: csr
- Host: 172.20.0.105
- Port: 830
- Username: admin
- Password: cisco123
- NetConf: ☒ NetConf, ☐ RestConf
- Encoding: Console

The right pane shows the 'Property' table with the following data:

Property	Value
Name	
Node Type	
Data Type	
Access	
Presence	
Key	
Mandatory	
Default	
Path	
Description	
XPath Filter	

The status bar at the bottom indicates 'Status: Received HTTP Result for request: get-cap'.

13: make the changes on candidate data store

The screenshot shows the Yang Explorer 0.8.0 (Beta) interface. The left pane displays the 'ietf-interfaces' model. The main pane shows the 'Device Settings' tab with the following configuration:

- Profile: ios-xe
- Platform: csr
- Host: 172.20.0.105
- Port: 830
- Username: admin
- Password: cisco123
- NetConf: ☒ NetConf, ☐ RestConf
- Encoding: Console

The right pane shows the 'Property' table with the following data:

Property	Value
Name	interfaces-state
Node Type	container
Data Type	
Access	read-only
Presence	
Key	
Mandatory	
Default	
Path	ietf-interfaces/interfaces-state
Description	Data nodes for the operational state of interfaces.
XPath Filter	/if/interfaces-state

The status bar at the bottom indicates 'Status: Received HTTP Result for request: run-rpc'.

14: Commit the changes on candidate

The screenshot shows the Yang Explorer 0.8.0 (Beta) web interface. The left sidebar displays a tree view of YANG models under 'ietf-interfaces'. The main panel is divided into 'Operations' and 'Device Settings' tabs. Under 'Device Settings', the 'Profile' is set to 'ios-xe' and the 'Platform' is 'csr'. The 'Host' is '172.20.0.105' and the 'Port' is '830'. The 'Username' is 'admin' and the 'Password' is 'cisco123'. The 'NetConf' radio button is selected. The 'Encoding' tab is active, showing a JSON-RPC error message:

```
<nc:rpc-error xmlns:nc='urn:ietf:params:xml:ns:netconf:base:1.0'>
  <nc:error-type>protocol</nc:error-type>
  <nc:error-tag>operation-not-supported</nc:error-tag>
  <nc:error-severity>error</nc:error-severity>
  <nc:error-message lang='en' xmlns='http://www.w3.org/XML/1998/namespace'>Unsupported capability :candidate</nc:error-message>
  <nc:error-info>
    <nc:bad-element>commit</nc:bad-element>
  </nc:error-info>
</nc:rpc-error>
```

 The 'Console' tab is also visible. The right sidebar shows the 'Property' and 'Value' table for the 'interfaces-state' node, including fields like Name, Node Type, Data Type, Access, Presence, Key, Mandatory, Default, Path, Description, and XPath Filter.

15: Copy configuration from running to candidate

The screenshot shows the Yang Explorer 0.8.0 (Beta) web interface. The left sidebar displays a tree view of YANG models under 'ietf-interfaces'. The main panel is divided into 'Operations' and 'Device Settings' tabs. Under 'Device Settings', the 'Profile' is set to 'ios-xe' and the 'Platform' is 'csr'. The 'Host' is '172.20.0.105' and the 'Port' is '830'. The 'Username' is 'admin' and the 'Password' is 'cisco123'. The 'NetConf' radio button is selected. The 'Encoding' tab is active, showing a JSON-RPC error message:

```
<nc:rpc-error xmlns:nc='urn:ietf:params:xml:ns:netconf:base:1.0'>
  <nc:error-type>protocol</nc:error-type>
  <nc:error-tag>invalid-value</nc:error-tag>
  <nc:error-severity>error</nc:error-severity>
  <nc:error-message lang='en' xmlns='http://www.w3.org/XML/1998/namespace'>Unsupported capability :candidate</nc:error-message>
  <nc:error-info>
    <nc:bad-element>candidate</nc:bad-element>
  </nc:error-info>
</nc:rpc-error>
```

 The 'Console' tab is also visible. The right sidebar shows the 'Property' and 'Value' table for the 'interfaces-state' node, including fields like Name, Node Type, Data Type, Access, Presence, Key, Mandatory, Default, Path, Description, and XPath Filter.

16: Close the session

The screenshot displays the Yang Explorer 0.8.0 (Beta) web interface. The browser address bar shows the URL: `cloud2.rpsconsulting.in/console/#/client/MjU5NDYwBteXNxbA==`. The interface is divided into several sections:

- Explorer:** A tree view on the left showing the YANG model structure. The selected node is `ietf-interfaces` > `interfaces-state`.
- Operations:** A central panel with tabs for `Build`, `Collections`, and `Manage Models`. The `Operations` tab is active, showing fields for `Profile` (ios-xe), `Platform` (csr), `Host` (172.20.0.105), `Port` (830), `Username` (admin), and `Password` (cisco123). Below these fields are radio buttons for `NetConf` (selected) and `RestConf`, and buttons for `RPC`, `Python`, `YDK`, and `Capabilities`.
- Console:** A text area for entering commands. The current command is `<rpc xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="1"><close-session/></rpc>`.
- Property:** A table on the right showing properties for the selected node. The table has two columns: `Property` and `Value`.

Property	Value
Name	interfaces-state
Node Type	container
Data Type	
Access	read-only
Presence	
Key	
Mandatory	
Default	
Path	ietf-interfaces/interfaces-state
Description	Data nodes for the operational state of interfaces.
XPath Filter	/if:interfaces-state

At the bottom of the interface, there are buttons for `Config`, `Oper`, `Add`, `Delete`, `Reset`, and `Custom RPC`. The `Custom RPC` button is checked. Below the console, there are buttons for `Run`, `Save`, `Clear`, and `Copy`.

Status: Error: Received HTTP fault: HTTP request error