

# Lab Virtual Lab Build 1 - CML

## Introduction

I designed and built a virtual network in Cisco Modeling Lab (CML) using one virtual firewall, one virtual network switch, and four virtual machines running Kali Linux, Windows 10, Windows 11, and Windows 7. The network was configured according to the specified requirements: all devices were interconnected, powered on, and verified as operational. I created a detailed network diagram in Microsoft Visio showing the layout of all components and their connections. Screenshots included in this document confirm that each device is active and communicating within the lab environment. Additionally, I documented a complete, step-by-step rebuild guide that outlines every action taken from launching CML to configuring each machine so the entire network can be replicated exactly as built. This submission contains all required deliverables: the network diagram, device status proof, and rebuild instructions, fully reflecting the work completed in this lab.

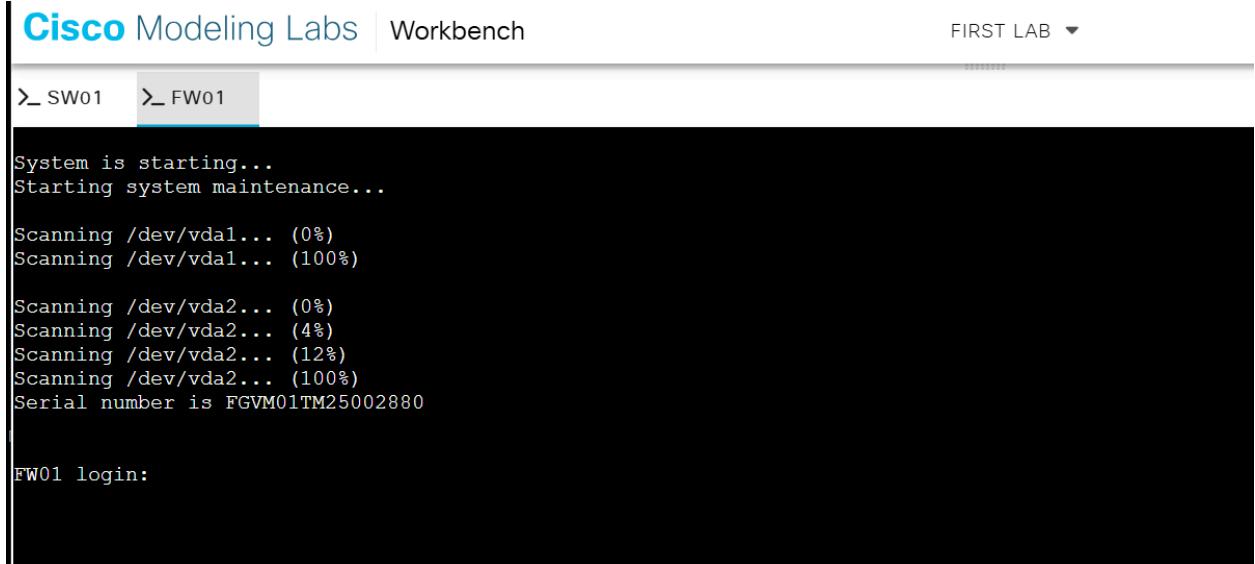
## Device Status Proof

SW01

```
However, the shell is currently disabled. You can enable  
it on this terminal by typing  
  'term shell'  
You can also enable it for all terminals by configuring the  
  'shell processing full'  
command. There is additional information in the man command.  
For more information, enable shell, and then enter:  
'man IOS.sh'  
SW01>term shell  
SW01>fetch  
  
*Sep 12 22:38:27.209: %AMDP2_FE-6-EXCESSCOLL: Ethernet0/1 TDR=0, TRC=0  
% Bad IP address or host name% Unknown command or computer name, or unable to find compute  
SW01>  
SW01>  
*Sep 12 22:38:57.236: %AMDP2_FE-6-EXCESSCOLL: Ethernet0/1 TDR=0, TRC=0  
SW01>  
*Sep 12 22:39:27.271: %AMDP2_FE-6-EXCESSCOLL: Ethernet0/1 TDR=0, TRC=0  
SW01>
```



FW01



Kali

```
cisco@cisco: ~
File Actions Edit View Help
(cisco@cisco)-[~]
$ ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
      ether 52:54:00:11:29:e4  txqueuelen 1000  (Ethernet)
      RX packets 0  bytes 0 (0.0 B)
      RX errors 0  dropped 0  overruns 0  frame 0
      TX packets 0  bytes 0 (0.0 B)
      TX errors 0  dropped 0  overruns 0  carrier 0  collisions 0

eth1: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
      inet6 fe80::5054:ff:fee4:7d66  prefixlen 64  scopeid 0x20<link>
      ether 52:54:00:e4:7d:66  txqueuelen 1000  (Ethernet)
      RX packets 0  bytes 0 (0.0 B)
      RX errors 0  dropped 0  overruns 0  frame 0
      TX packets 62  bytes 11925 (11.6 KiB)
      TX errors 0  dropped 0  overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
      inet 127.0.0.1  netmask 255.0.0.0
      inet6 ::1  prefixlen 128  scopeid 0x10<host>
      loop  txqueuelen 1000  (Local Loopback)
      RX packets 488  bytes 39360 (38.4 KiB)
      RX errors 0  dropped 0  overruns 0  frame 0
```

# Windows10

# Windows11

```
Administrator: Command Prompt
Host Name . . . . . : DESKTOP-U91CJ3C
Primary Dns Suffix . . . . . :
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No

Ethernet adapter Ethernet Instance 0:

Connection-specific DNS Suffix . . . . . :
Description . . . . . : Intel(R) PRO/1000 MT Network Connection
Physical Address. . . . . : 52-54-00-1D-C9-9C
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::454c:2f08:3b13:3a49%7(Preferred)
Autoconfiguration IPv4 Address . . . . . : 169.254.228.48(Preferred)
Subnet Mask . . . . . : 255.255.0.0
Default Gateway . . . . . :
DHCPv6 IAID . . . . . : 122835968
DHCPv6 Client DUID. . . . . : 00-01-00-01-2F-B5-60-C5-00-0C-29-B2-9F-9E
DNS Servers . . . . . : fec0:0:0:ffff::1%1
                         fec0:0:0:ffff::2%1
                         fec0:0:0:ffff::3%1
NetBIOS over Tcpip. . . . . : Enabled
```

Windows7

```
cmd Command Prompt
DHCPv6 Client DUID. . . . . : 00-01-00-01-2F-78-82-60-00-0C-29-C3-70-1F
DNS Servers . . . . . : fec0:0:0:ffff::1x1
                         fec0:0:0:ffff::2x1
                         fec0:0:0:ffff::3x1
NetBIOS over Tcpip. . . . . : Enabled

Ethernet adapter Local Area Connection 2:

Connection-specific DNS Suffix . . . . . : Intel(R) PRO/1000 MT Network Connection #
Description . . . . . : Intel(R) PRO/1000 MT Network Connection #2
Physical Address. . . . . : 52-54-00-08-B0-11
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::4d95:1f48:cd06:9dc1%13<Preferred>
Autoconfiguration IPv4 Address. . . . . : 169.254.157.193<Preferred>
Subnet Mask . . . . . : 255.255.0.0
Default Gateway . . . . . :
DHCPv6 IAID . . . . . : 273830912
DHCPv6 Client DUID. . . . . : 00-01-00-01-2F-78-82-60-00-0C-29-C3-70-1F

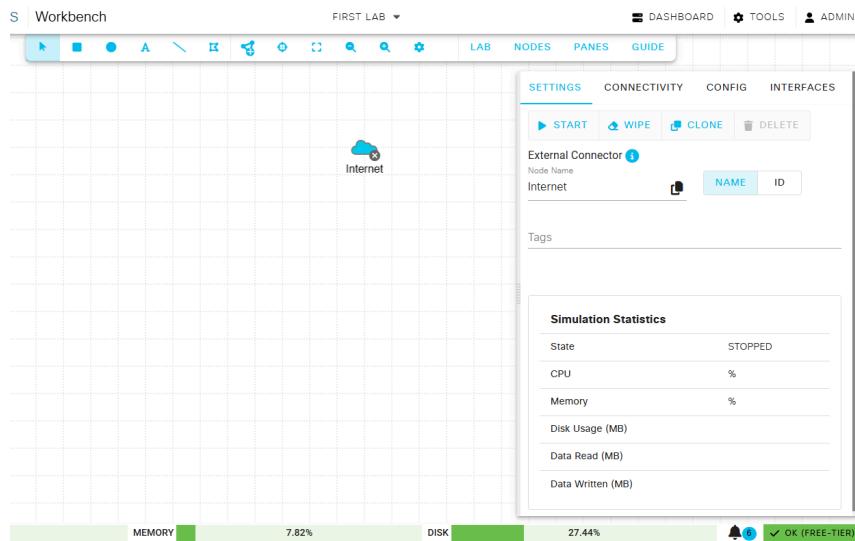
DNS Servers . . . . . : fec0:0:0:ffff::1x1
                         fec0:0:0:ffff::2x1
                         fec0:0:0:ffff::3x1
NetBIOS over Tcpip. . . . . : Enabled

Tunnel adapter isatap.{75F644B5-A914-4D9F-9F22-F103490BDFAF}:
```

## Rebuild Guide

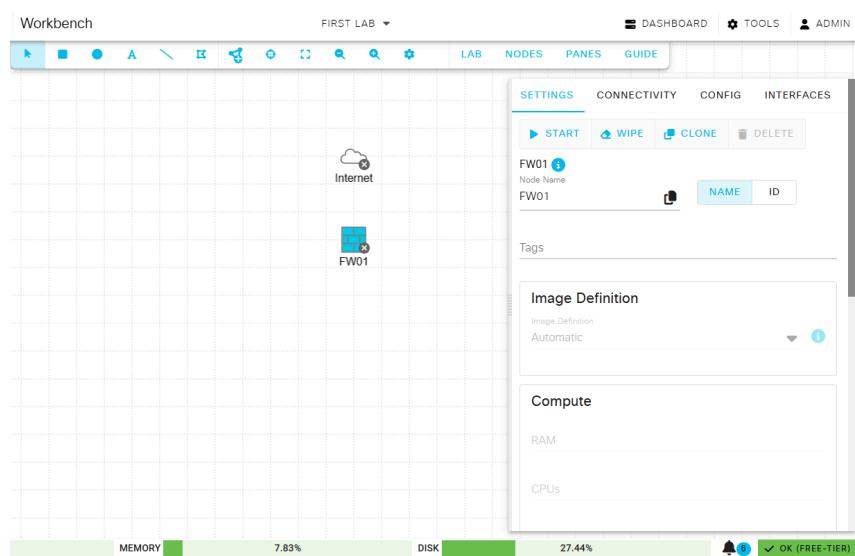
### Step 1: Add the Internet Node

- Open Cisco Modeling Labs (CML).
- In the Device Library, search for “Internet” or “Cloud”.
- Drag and drop it onto the workspace.
- Rename it to Internet.



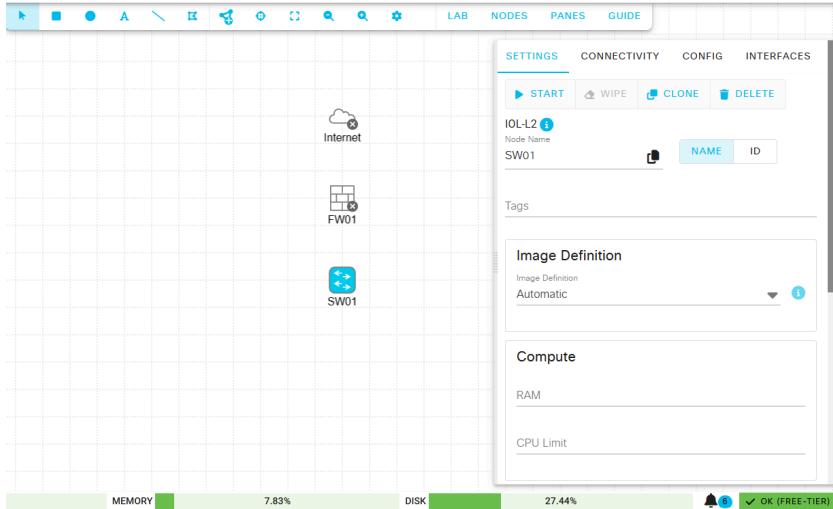
### Step 2: Add the Firewall (FW01)

In the Device Library, search for “FortiGate” (as shown in your diagram). Drag and drop it onto the workspace, placing it directly to the right of Internet. Rename the device to FW01.



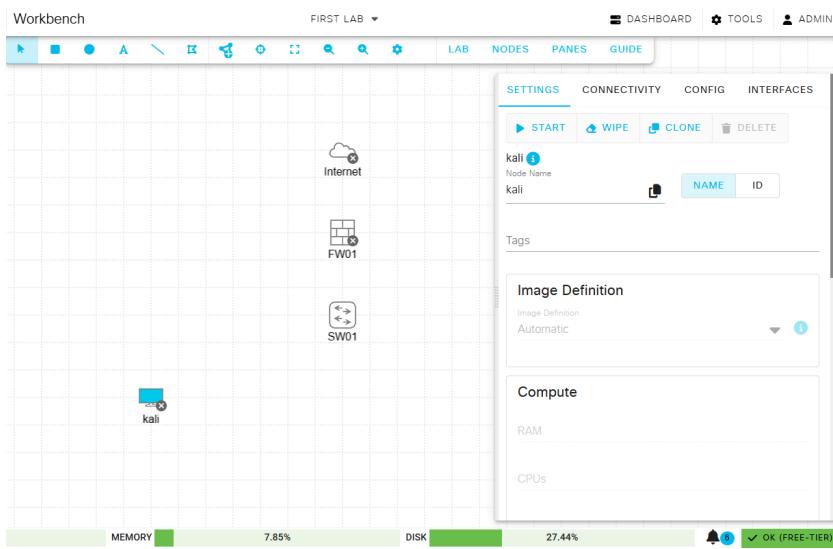
### Step 3: Add the Switch (SW01)

- In the Device Library, search for “FW (Bricks)” (Layer 2 switch).
- Drag and drop it onto the workspace, placing it directly to the right of FW01.
- Rename the device to SW01.



### Step 4: Add Kali Linux VM

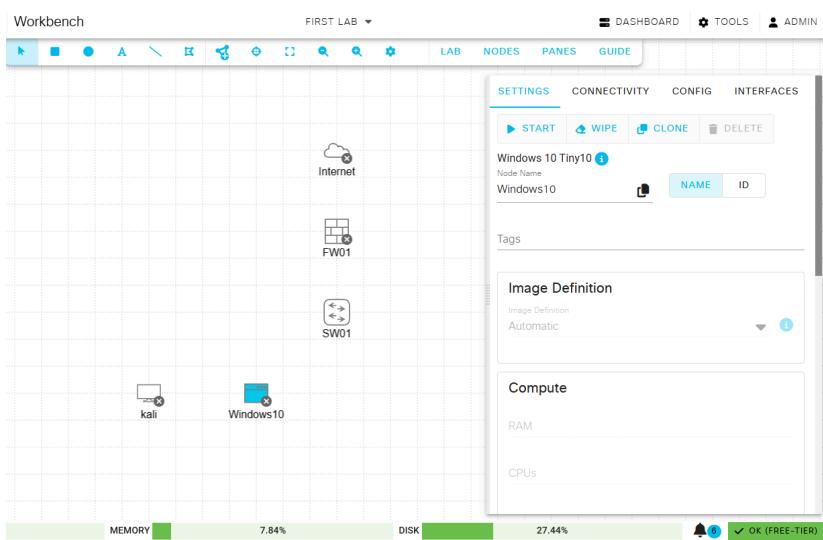
- In the Device Library, search for “Kali Linux”.
- Drag and drop it onto the workspace, placing it below SW01 to the left.
- Rename the device to Kali.



### Step 5: Add Windows 10 VM

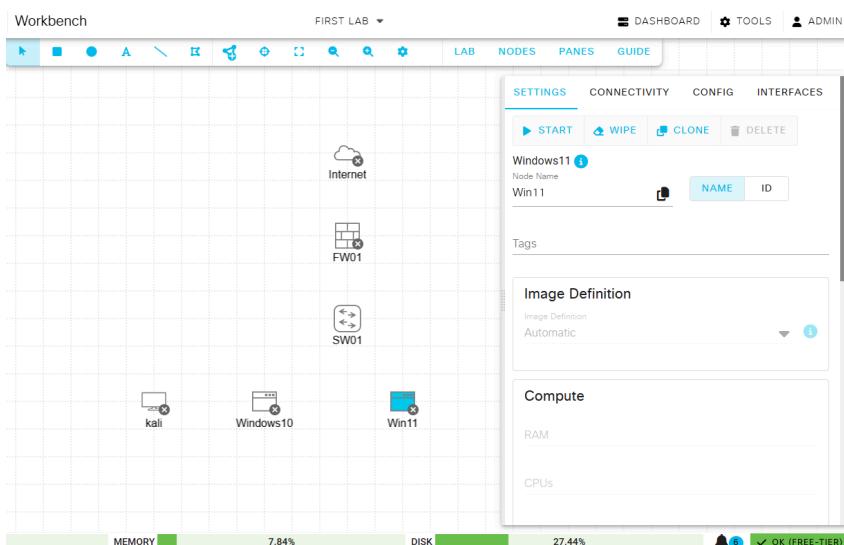
- In the Device Library, search for “Tiny10 - Windows 10”.
- Drag and drop it onto the workspace, placing it below SW01 and to the right of Kali.

- Rename the device to Windows10.



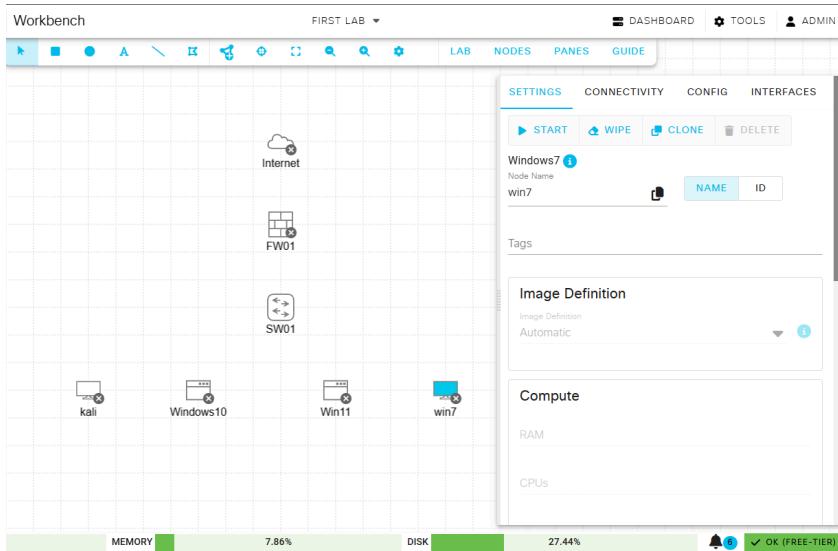
### Step 6: Add Windows 11 VM

- In the Device Library, search for “Windows 11”.
- Drag and drop it onto the workspace, placing it below SW01 and to the right of Windows 10.
- Rename the device to Windows11.



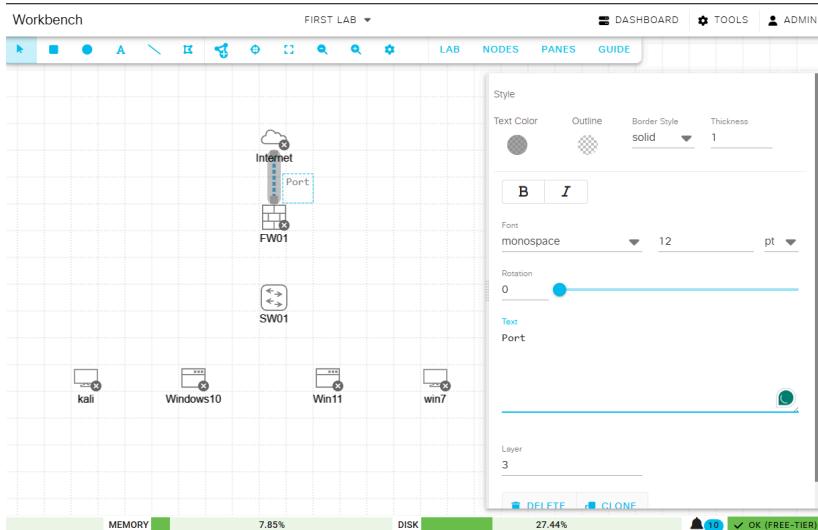
### Step 7: Add Windows 7 VM

- In the Device Library, search for “Windows 7”.
- Drag and drop it onto the workspace, placing it below SW01 and to the right of Windows 11.
- Rename the device to Windows7.



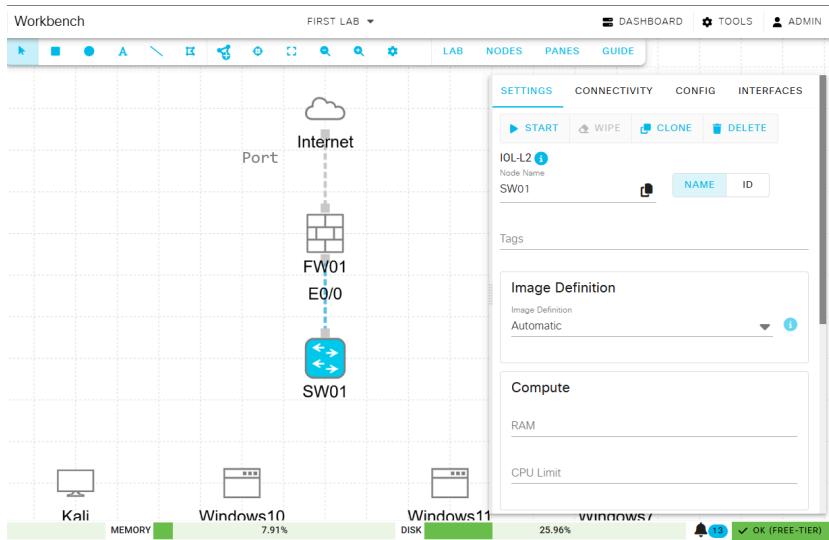
### Step 8: Connect Internet to FW01

- Click the Connect tool (cable icon) at the top of CML.
- Click on Internet → select interface Ethernet0/0 (or default port).
- Click on FW01 → select Ethernet0/0 (as labeled in your diagram).
- A link should appear.



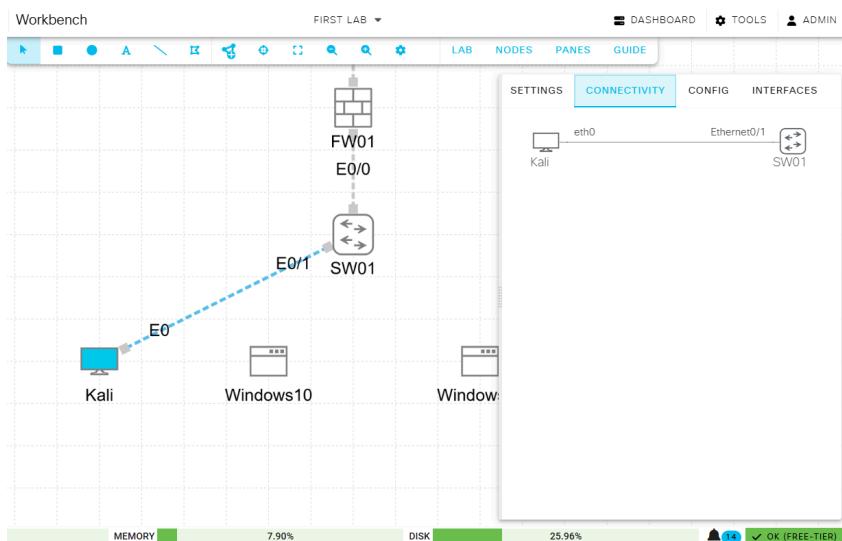
### Step 9: Connect FW01 to SW01

- Use the Connect tool again.
- Click on FW01 → select Ethernet0/1 (as labeled in your diagram).
- Click on SW01 → select any free port (e.g., GigabitEthernet0/0).
- A link should appear.



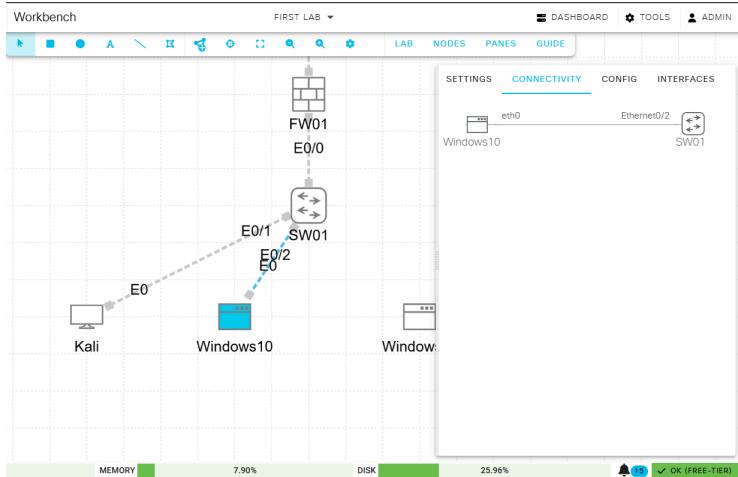
### Step 10: Connect Kali to SW01

- Use the Connect tool.
- Click on Kali → select eth0.
- Click on SW01 → select next free port (e.g., GigabitEthernet0/1).
- A link should appear.



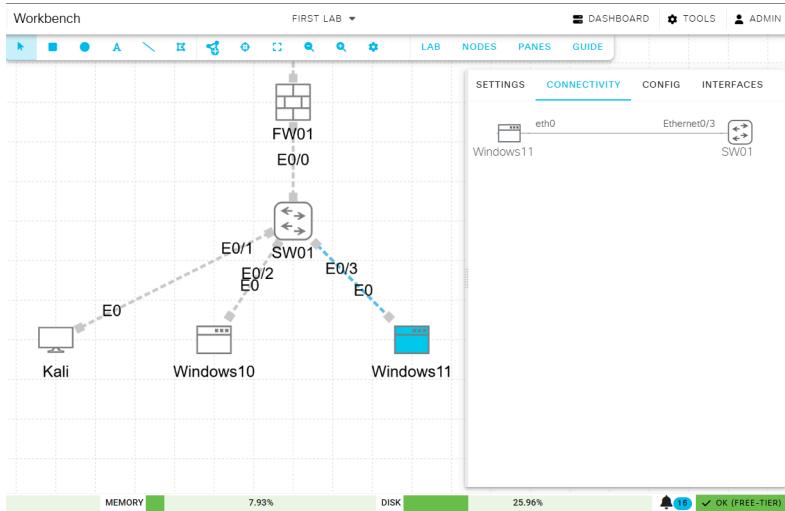
### Step 11: Connect Windows 10 to SW01

- Use the Connect tool.
- Click on Windows10 → select Ethernet0.
- Click on SW01 → select next free port (e.g., GigabitEthernet0/2).
- A link should appear.



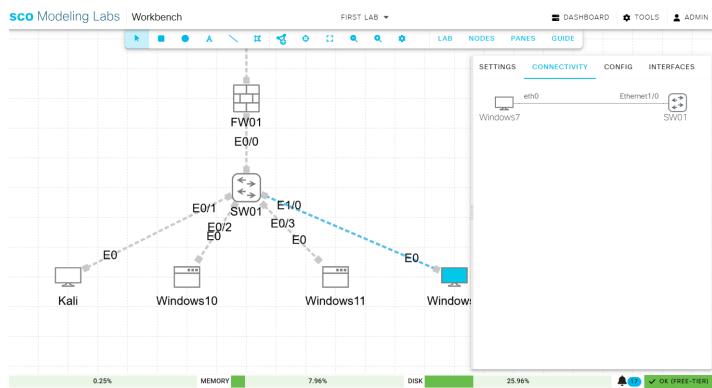
### Step 12: Connect Windows 11 to SW01

- Use the Connect tool.
- Click on Windows11 → select Ethernet0.
- Click on SW01 → select next free port (e.g., GigabitEthernet0/3).
- A link should appear.



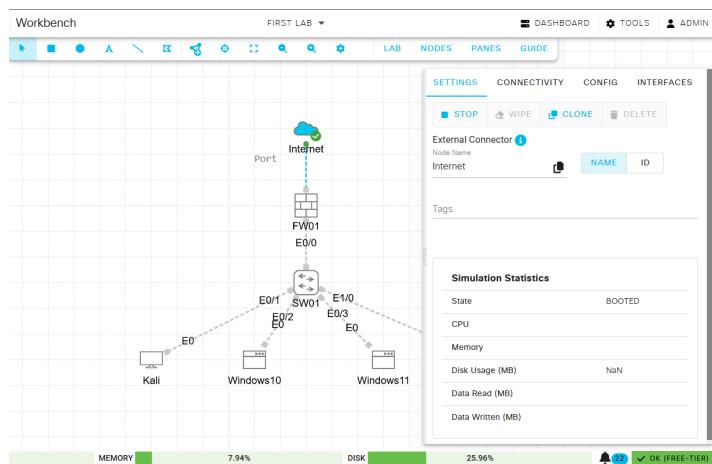
### Step 13: Connect Windows 7 to SW01

- Use the Connect tool.
- Click on Windows7 → select Ethernet0.
- Click on SW01 → select next free port (e.g., GigabitEthernet1/0).
- A link should appear.



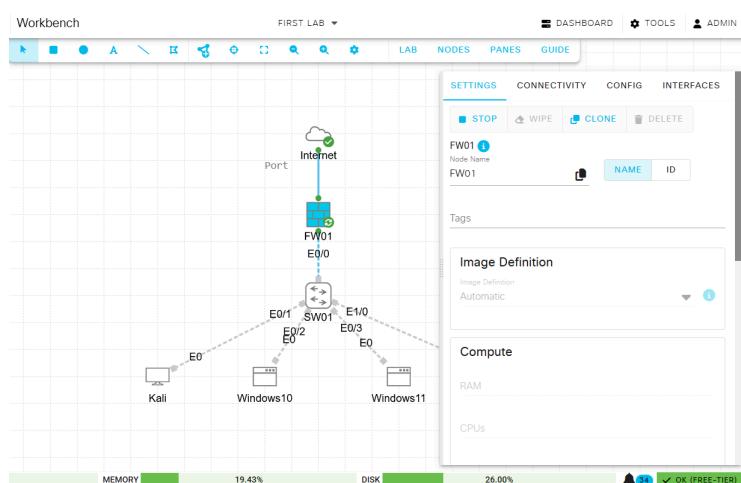
### Step 14: Start the Internet Node

- Right-click Internet → Select Start.
- Status light turns green immediately.



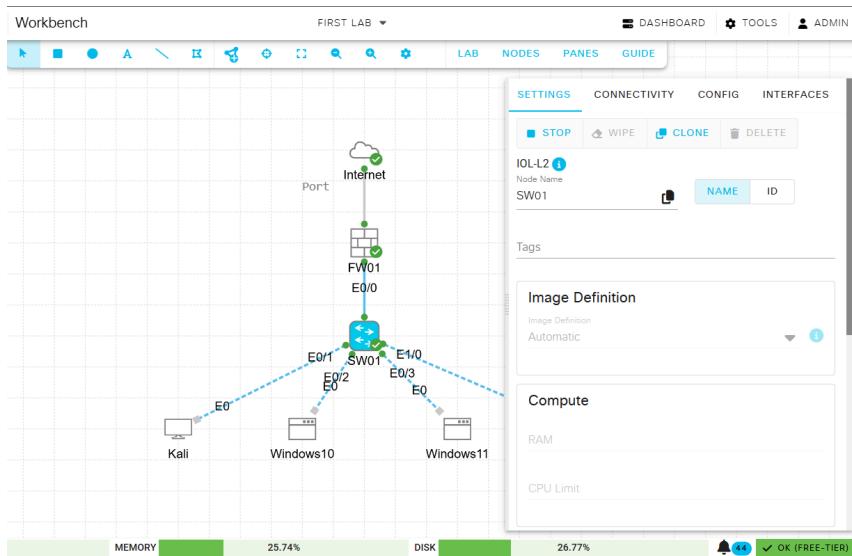
### Step 15: Start the Firewall (FW01)

- Right-click FW01 → Select Start.
- Wait until status light turns green.



### Step 16: Start the Switch (SW01)

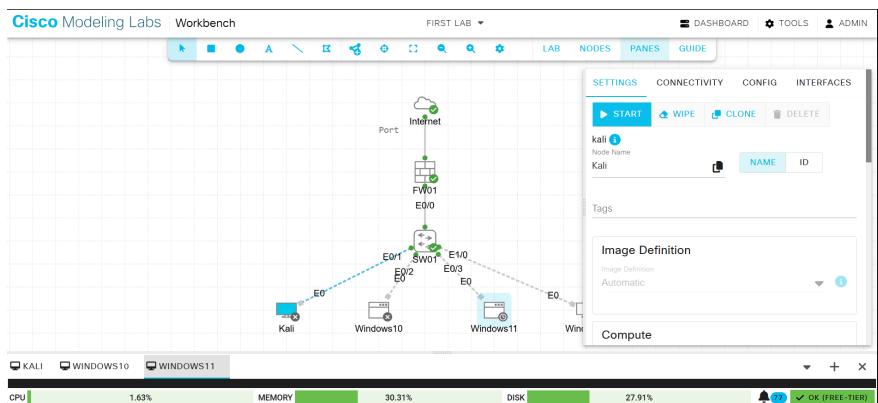
- Right-click SW01 → Select Start.
- Wait until status light turns green.



**\*Start VMs one at a time, so as not to use so much memory.\***

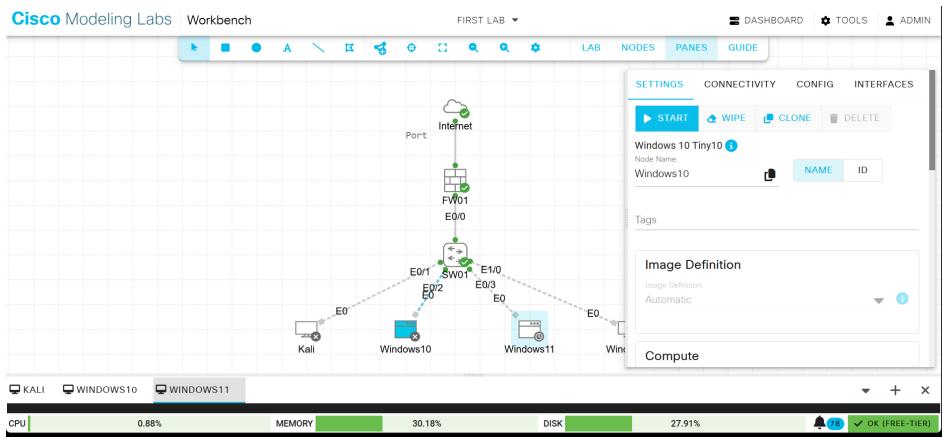
### Step 17: Start Kali Linux VM

- Right-click Kali → Select Start.
- Wait for boot sequence to complete.



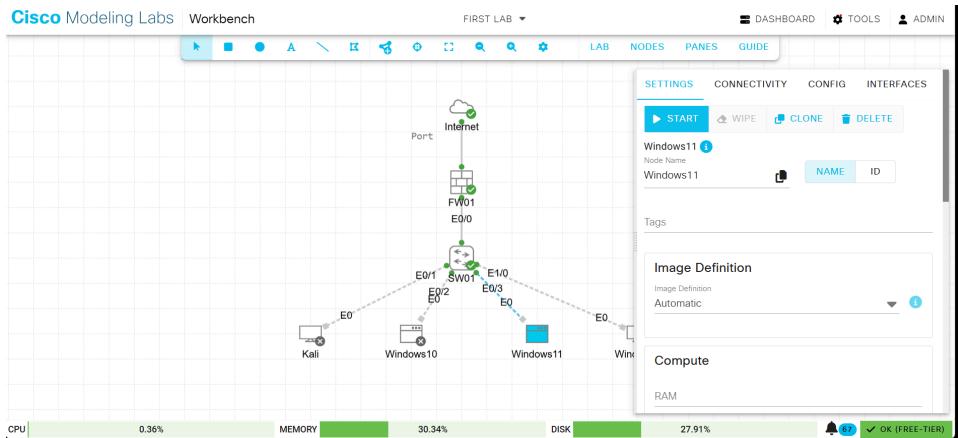
### Step 18: Start Windows 10 VM

- Right-click Windows10 → Select Start.
- Wait for status light to turn green.



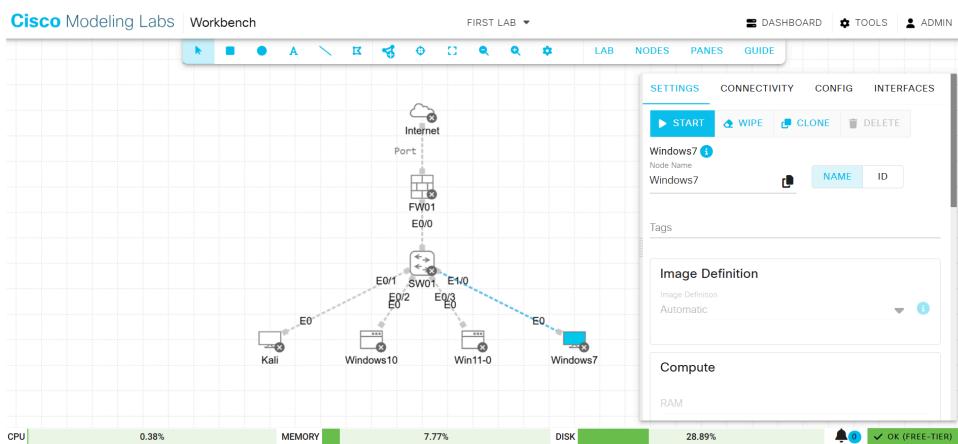
### Step 19: Start Windows 11 VM

- Right-click Windows11 → Select Start.
- Wait for status light to turn green.



### Step 20: Start Windows 7 VM

- Right-click Windows7 → Select Start.
- Wait for Windows 7 boot screen to appear.

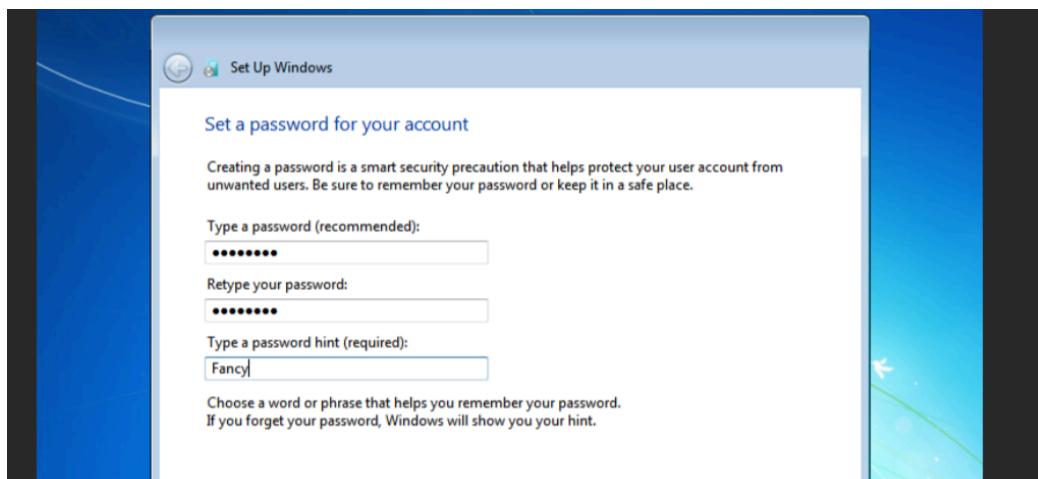


**Step 21: Log in to Kali Linux**

- Right-click Kali → Select Open Console.
- At the login prompt, enter:
- Username: cisco
- Password: cisco

**Step 22: Set Password on Windows 7 (if prompted)**

- After Windows 7 boots, you may be prompted to set a password.
- If so, click Next, then enter:
- Password: Passw0rd!
- Confirm: Passw0rd!
- Click Finish.

**Step 26: Verify Firewall is Operational**

- Right-click FW01 → Open Console.
- Make sure the login shows.

The screenshot shows the Cisco Modeling Labs Workbench interface. A terminal window is open, showing the following text:

```
System is starting...
Starting system maintenance...

Scanning /dev/vdal... (0%)
Scanning /dev/vdal... (100%)

Scanning /dev/vda2... (0%)
Scanning /dev/vda2... (4%)
Scanning /dev/vda2... (12%)
Scanning /dev/vda2... (100%)
Serial number is FGVM01TM25002880

FW01 login:
```

### Step 27: Verify Switch is Operational

Right-click SW01 → Open Console.

The screenshot shows the Cisco Modeling Labs Workbench interface with a terminal window for switch SW01. The terminal shows the following text:

```
However, the shell is currently disabled. You can enable
it on this terminal by typing
  'term shell'
You can also enable it for all terminals by configuring the
  'shell processing full'
command. There is additional information in the man command.
For more information, enable shell, and then enter:
'man IOS.sh'
SW01>term shell
SW01>fetch

*Sep 12 22:38:27.209: %AMDP2_FE-6-EXCESSCOLL: Ethernet0/1 TDR=0, TRC=0
% Bad IP address or host name% Unknown command or computer name, or unable to find compute
SW01>
SW01>
*Sep 12 22:38:57.236: %AMDP2_FE-6-EXCESSCOLL: Ethernet0/1 TDR=0, TRC=0
SW01>
*Sep 12 22:39:27.271: %AMDP2_FE-6-EXCESSCOLL: Ethernet0/1 TDR=0, TRC=0
SW01>
```



## Step 28: Verify Kali Linux is Connected

- In the Kali console (already logged in), type: ifconfig

```
cisco@cisco:~$ ifconfig
(cisco@cisco) [~]
$ ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
      ether 52:54:00:11:29:e4  txqueuelen 1000  (Ethernet)
      RX packets 0  bytes 0 (0.0 B)
      RX errors 0  dropped 0  overruns 0  frame 0
      TX packets 0  bytes 0 (0.0 B)
      TX errors 0  dropped 0  overruns 0  carrier 0  collisions 0

eth1: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
      inet6 fe80::5054:ff:fe4:7d66  prefixlen 64  scopeid 0x20<link>
      ether 52:54:00:4:7d:66  txqueuelen 1000  (Ethernet)
      RX packets 0  bytes 0 (0.0 B)
      RX errors 0  dropped 0  overruns 0  frame 0
      TX packets 62  bytes 11925 (11.6 KiB)
      TX errors 0  dropped 0  overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
      inet 127.0.0.1  netmask 255.0.0.0
      inet6 ::1  prefixlen 128  scopeid 0x10<host>
      loop  txqueuelen 1000  (Local Loopback)
      RX packets 488  bytes 39360 (38.4 KiB)
      RX errors 0  dropped 0  overruns 0  frame 0
```

## **Step 29: Verify Windows 10 is Connected**

- In the Command Prompt, type: ipconfig

**Step 30: Verify Windows 11 is Connected**

In the Command Prompt, type: ipconfig

```
Administrator: Command Prompt
Host Name . . . . . : DESKTOP-U91CJ3C
Primary Dns Suffix . . . . . :
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No

Ethernet adapter Ethernet Instance 0:

Connection-specific DNS Suffix . . . . . :
Description . . . . . : Intel(R) PRO/1000 MT Network Connection
Physical Address. . . . . : 52-54-00-10-C9-9C
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::454c:2f08:3b13:3a49%7(PREFERRED)
Autoconfiguration IPv4 Address. . . . . : 169.254.228.48(PREFERRED)
Subnet Mask . . . . . : 255.255.0.0
Default Gateway . . . . . :
DHCPv6 IAID . . . . . : 122835968
DHCPv6 Client DUID. . . . . : 00-01-00-01-2F-B5-60-C5-00-0C-29-B2-9F-9E
DNS Servers . . . . . : fec0:0:0:ffff::1%1
                         fec0:0:0:ffff::2%1
                         fec0:0:0:ffff::3%1
NetBIOS over Tcpip. . . . . : Enabled
```

**Step 31: Verify Windows 7 is Connected**

In the Command Prompt, type: ipconfig

```
Administrator: Command Prompt
DHCPv6 Client DUID. . . . . : 00-01-00-01-2F-78-82-60-00-0C-29-C3-70-1F
DNS Servers . . . . . : fec0:0:0:ffff::1%1
                         fec0:0:0:ffff::2%1
                         fec0:0:0:ffff::3%1
NetBIOS over Tcpip. . . . . : Enabled

Ethernet adapter Local Area Connection 2:

Connection-specific DNS Suffix . . . . . :
Description . . . . . : Intel(R) PRO/1000 MT Network Connection #
Physical Address. . . . . : 52-54-00-08-B0-11
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::4d95:1f48:cd06:9dc1%13(PREFERRED)
Autoconfiguration IPv4 Address. . . . . : 169.254.157.193(PREFERRED)
Subnet Mask . . . . . : 255.255.0.0
Default Gateway . . . . . :
DHCPv6 IAID . . . . . : 273830912
DHCPv6 Client DUID. . . . . : 00-01-00-01-2F-78-82-60-00-0C-29-C3-70-1F
DNS Servers . . . . . : fec0:0:0:ffff::1%1
                         fec0:0:0:ffff::2%1
                         fec0:0:0:ffff::3%1
NetBIOS over Tcpip. . . . . : Enabled

Tunnel adapter isatap.{75F644B5-A914-4D9F-9F72-F103490BDFAF}:
Media State . . . . . : Media disconnected
```

**Finished Network Diagram and connected and ready for setup.**