

Course: [Cloud and Network Security - C1-2026](#)

Student Name: [Bussllus Bertrand](#)

Student Number: [CS-CNS11-26004](#)

Saturday, February 28, 2026

**Class Exercise: Mid Exam**

## Contents

Introduction .....	2
Scenario .....	2
Task 1: Configure the Router.....	3
Task 2: Configure BOTH switches .....	7
Task 3: Hardening Switch Security.....	17
Conclusion .....	22

## Introduction

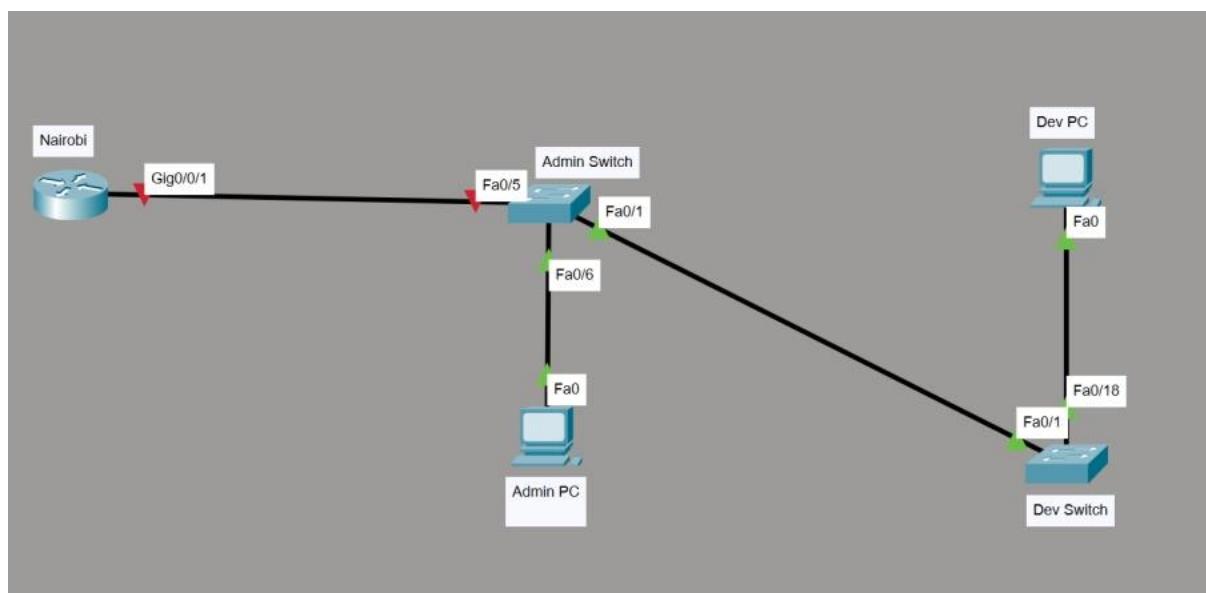
This report details the network configuration and security implementation steps undertaken. Based on the provided scenario, this write-up outlines the approach taken by a junior network engineer to establish and secure communications between two small offices at a Kenyan university. The primary objective is to successfully configure a central router, named "Nairobi," alongside two switches, "Admin-SW" and "Dev-SW," to facilitate seamless inter-office connectivity. The ensuing sections of this report will demonstrate the step-by-step configuration of device interfaces, the setup of a DHCP pool designated as "Shujaa," the creation of specific VLANs (VLAN 25 for "Office" and VLAN 66 for "Home"), and the deployment of switch hardening techniques. As required, all configuration steps are supported by full-screen screenshots displaying the exact commands executed and their corresponding timestamp.

## Scenario

Hired at a Kenyan university as a junior network engineer to configure comms between two small offices. The two routers must be connected together to allow communication between the offices.

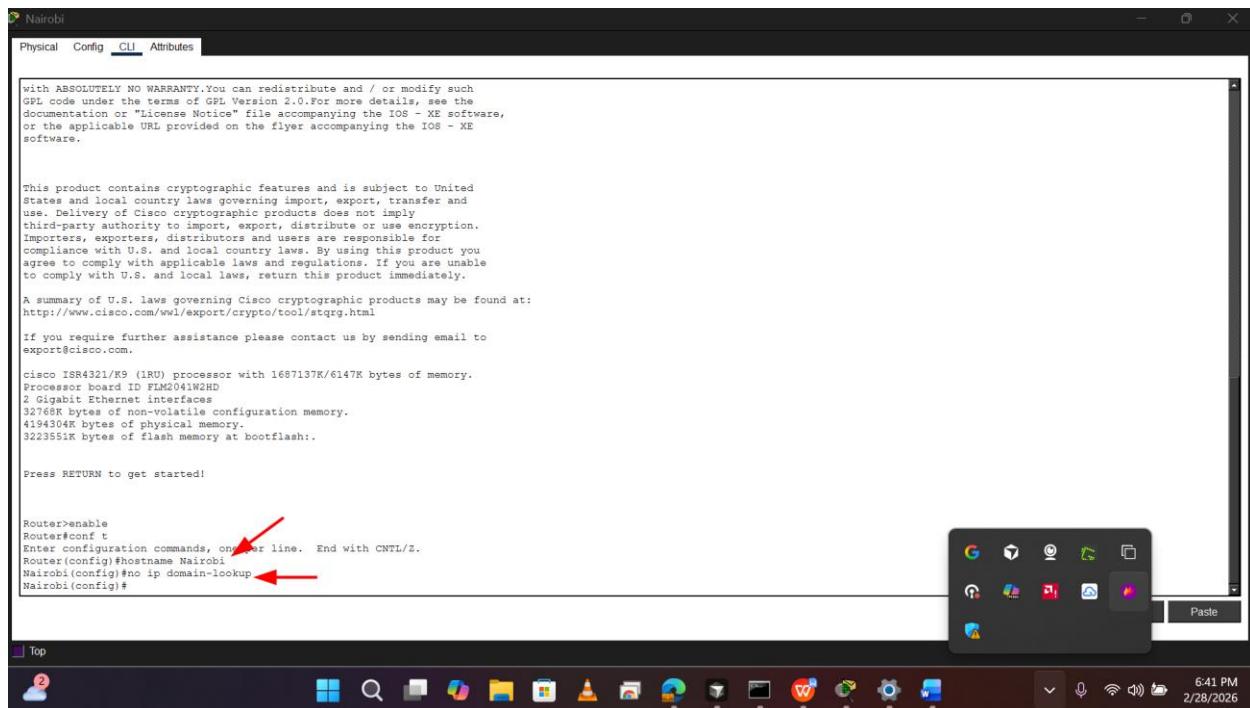
Device	Interface	IP Address	Subnet Mask
Router (Nairobi)	G0/0/1	172.16.10.1	255.255.255.0
Router (Nairobi)	Loopback	10.10.1.1	255.255.255.0

Admin-SW (switch)	VLAN 25	172.16.10.101	255.255.255.0
Dev-SW(switch)	VLAN 25	172.16.10.102	255.255.255.0
Admin PC	NIC	DHCP	255.255.255.0
Dev PC	NIC	DHCP	255.255.255.0



### Task 1: Configure the Router

- Rename the router to “Nairobi” (2mks)
- Disable IP domain lookup (2mks)



```

Nairobi
Physical Config CLI Attributes

With ABSOLUTELY NO WARRANTY. You can redistribute and / or modify such
GPL code under the terms of GPL Version 2.0. For more details, see the
documentation or "License Notice" file accompanying the IOS - XE software,
or the applicable URL provided on the flyer accompanying the IOS - XE
software.

This product contains cryptographic features and is subject to United
States and local country laws governing import, export, transfer and
use. Delivery of Cisco cryptographic products does not imply
a third-party's authority to import, export, distribute or use encryption.
Importers, exporters, distributors and users are responsible for
compliance with U.S. and local country laws. By using this product you
agree to comply with applicable laws and regulations. If you are unable
to comply with U.S. and local laws, return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at:
http://www.cisco.com/wlc/export/crypto/tool/stqrg.html

If you require further assistance please contact us by sending email to
export@cisco.com.

cisco ISR4321/K9 (IRU) processor with 1687137K/6147K bytes of memory.
Processor board ID FLM2041WHD
2 Gigabit Ethernet interfaces
32768K bytes of non-volatile configuration memory.
4194304K bytes of physical memory.
3223551K bytes of flash memory at bootflash:.

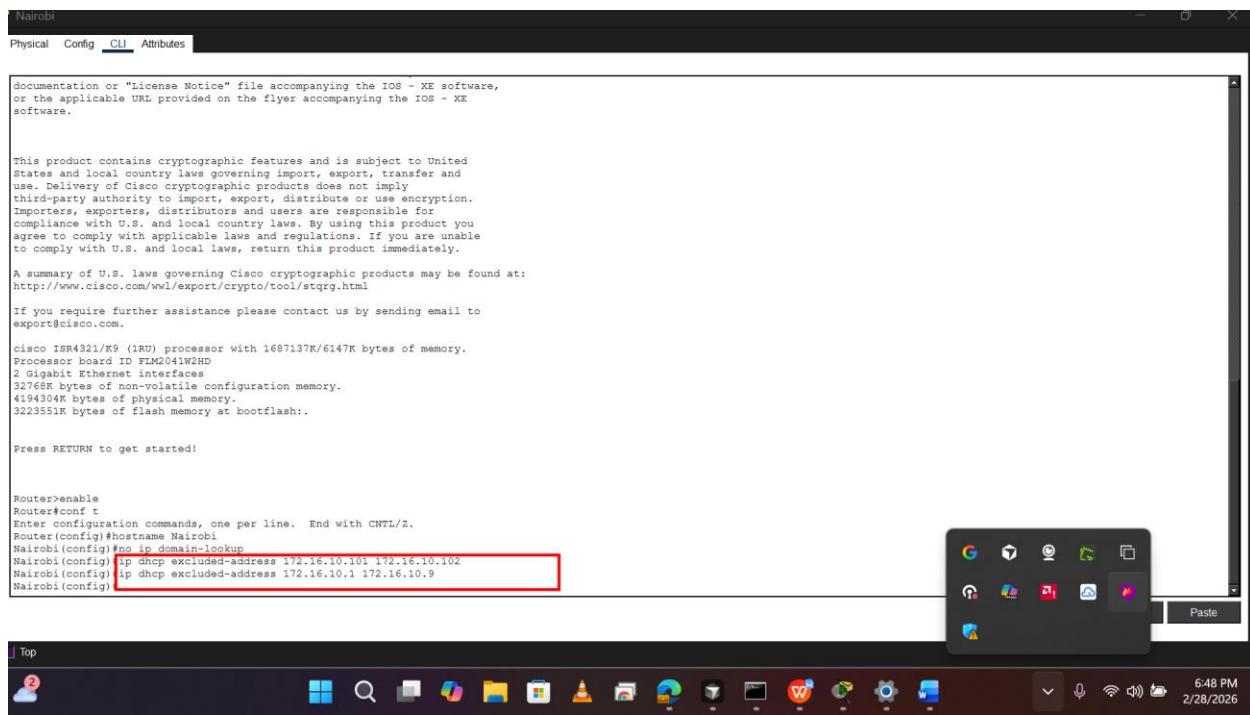
Press RETURN to get started!

Router>enable
Router>conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname Nairobi
Nairobi(config)#no ip domain-lookup
Nairobi(config)#

```

- Setup DHCP to **exclude** the following addresses:

- i) 172.16.10.1 - 172.16.10.9 (3mks)
- ii) 172.16.10.101 - 172.16.10.102 (3mks)



```

Nairobi
Physical Config CLI Attributes

documentation or "License Notice" file accompanying the IOS - XE software,
or the applicable URL provided on the flyer accompanying the IOS - XE
software.

This product contains cryptographic features and is subject to United
States and local country laws governing import, export, transfer and
use. Delivery of Cisco cryptographic products does not imply
a third-party's authority to import, export, distribute or use encryption.
Importers, exporters, distributors and users are responsible for
compliance with U.S. and local country laws. By using this product you
agree to comply with applicable laws and regulations. If you are unable
to comply with U.S. and local laws, return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at:
http://www.cisco.com/wlc/export/crypto/tool/stqrg.html

If you require further assistance please contact us by sending email to
export@cisco.com.

cisco ISR4321/K9 (IRU) processor with 1687137K/6147K bytes of memory.
Processor board ID FLM2041WHD
2 Gigabit Ethernet interfaces
32768K bytes of non-volatile configuration memory.
4194304K bytes of physical memory.
3223551K bytes of flash memory at bootflash:.

Press RETURN to get started!

Router>enable
Router>conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname Nairobi
Nairobi(config)#no ip domain-lookup
Nairobi(config)#ip dhcp excluded-address 172.16.10.101 172.16.10.102
Nairobi(config)#ip dhcp excluded-address 172.16.10.1 172.16.10.9
Nairobi(config)#

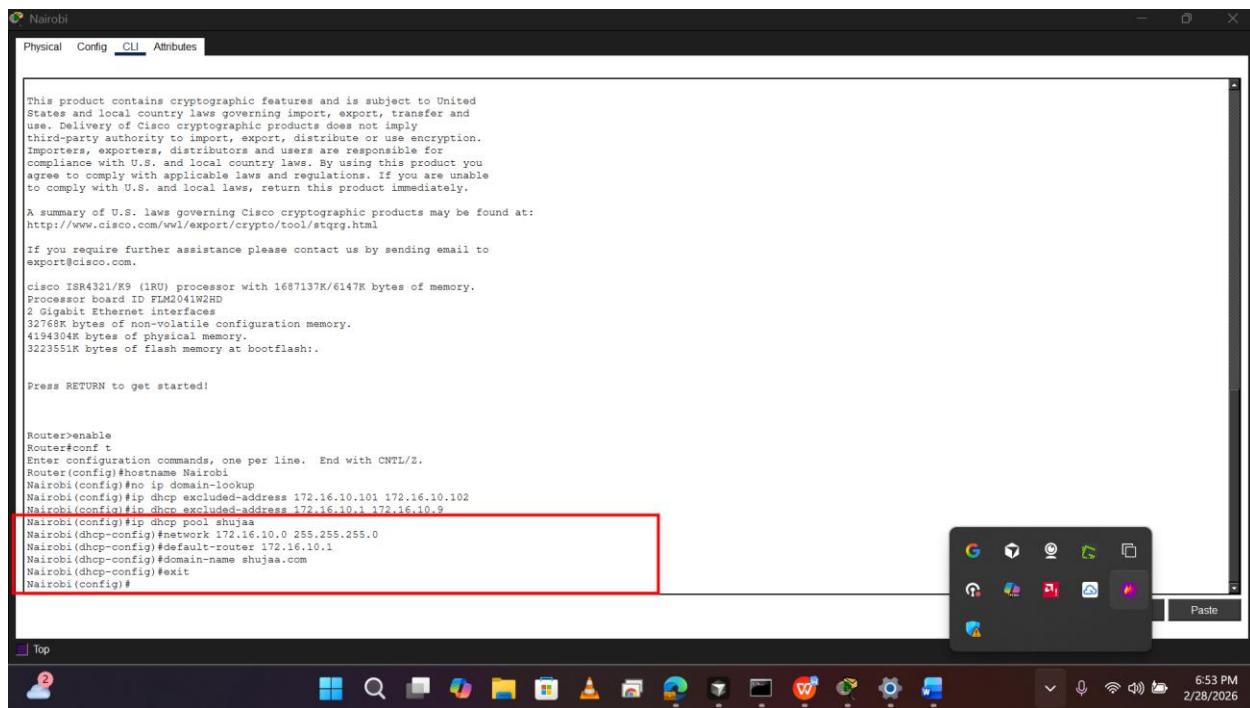
```

- Setup DHCP Pool called “Shujaa” with the following details:

i) Network: 172.16.10.0 255.255.255.0 (2mks)

ii) Default-Router: 172.16.10.1 (2mks)

iii) Domain name: shujaa.com (2mks)



The screenshot shows a Cisco router's configuration mode. The terminal window title is "Nairobi". The configuration commands are as follows:

```

Router>enable
Router>conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname Nairobi
Nairobi(config)#no ip domain-lookup
Nairobi(config)#ip dhcp excluded-address 172.16.10.101 172.16.10.102
Nairobi(config)#ip dhcp excluded-address 172.16.10.1 172.16.10.9
Nairobi(config)#ip dhcp pool shujaa
Nairobi(dhcp-config)#network 172.16.10.0 255.255.255.0
Nairobi(dhcp-config)#default-router 172.16.10.1
Nairobi(dhcp-config)#domain-name shujaa.com
Nairobi(dhcp-config)#exit
Nairobi(config)#

```

A red box highlights the configuration commands for the DHCP pool.

- Configure the **G0/0/1** interface as shown in the address table (4mks)

- Configure the **loopback** interface as shown in the address table(4mks)

Nairobi

Physical Config CLI Attributes

Importers, exporters, distributors and users are responsible for compliance with U.S. and local country laws. By using this product you agree to comply with applicable laws and regulations. If you are unable to comply with U.S. and local laws, return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at:  
<http://www.cisco.com/wl/export/crypto/tool/stqrg.html>

If you require further assistance please contact us by sending email to [export@cisco.com](mailto:export@cisco.com).

cisco ISR4321/M9 (IRU) processor with 1687137K/6147K bytes of memory.  
Processor board ID FLM2041NZHD  
2 Gigabit Ethernet interfaces  
32768K bytes of non-volatile configuration memory.  
4194304K bytes of physical memory.  
3223551K bytes of flash memory at bootflash::

Press RETURN to get started!

Router>enable  
Router#conf t  
Enter configuration commands, one per line. End with CNTL/Z.  
Router(config)#hostname Nairobi  
Nairobi(config)#nc ip domain-lookup  
Nairobi(config)#ip dhcp excluded-address 172.16.10.101 172.16.10.102  
Nairobi(config)#ip dhcp excluded-address 172.16.10.1 172.16.10.9  
Nairobi(config)#ip dhcp pool shujaa  
Nairobi(dhcp-config)#network 172.16.10.0 255.255.255.0  
Nairobi(dhcp-config)#default-router 172.16.10.1  
Nairobi(dhcp-config)#domain-name shujaa.com  
Nairobi(dhcp-config)#exit  
Nairobi(config)#  
Nairobi(config)#  
Nairobi(config)#  
Nairobi(config)#  
Nairobi(config)interface g0/0/1  
Nairobi(config-if)#ip address 172.16.10.1 255.255.255.0  
Nairobi(config-if) #



Top

6:58 PM  
2/28/2026

- Make sure ALL **unused** interfaces are shut down (4mks)

Nairobi

Physical Config CLI Attributes

```
http://www.cisco.com/wl/export/crypto/tool/stqrg.html

If you require further assistance please contact us by sending email to
export@cisco.com.

Cisco ISR4321/K9 (IRU) processor with 1687137K/6147K bytes of memory.
Processor board ID FLM2041N2HD
2 Gigabit Ethernet interfaces
32768K bytes of non-volatile configuration memory.
4194304K bytes of physical memory.
3223551K bytes of flash memory at bootflash:.

Press RETURN to get started!

Router>enable
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname Nairobi
Nairobi(config)#no ip domain-lookup
Nairobi(config)#ip dhcp excluded-address 172.16.10.101 172.16.10.102
Nairobi(config)#ip dhcp excluded-address 172.16.10.1 172.16.10.9
Nairobi(config)#ip dhcp pool shujaa
Nairobi(dhcp-config)#network 172.16.10.0 255.255.255.0
Nairobi(dhcp-config)#default-router 172.16.10.1
Nairobi(dhcp-config)#domain-name shujaa.com
Nairobi(dhcp-config)#exit
Nairobi(config)#
Nairobi(config)#
Nairobi(config)#
Nairobi(config)interface g0/0/1
Nairobi(config-if)#ip address 172.16.10.1 255.255.255.0
Nairobi(config-if)#no shutdown

Nairobi(config-if)#
$LINK-5-CHANGED: Interface GigabitEthernet0/0/1, changed state to up
$LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/1, changed state to up
```

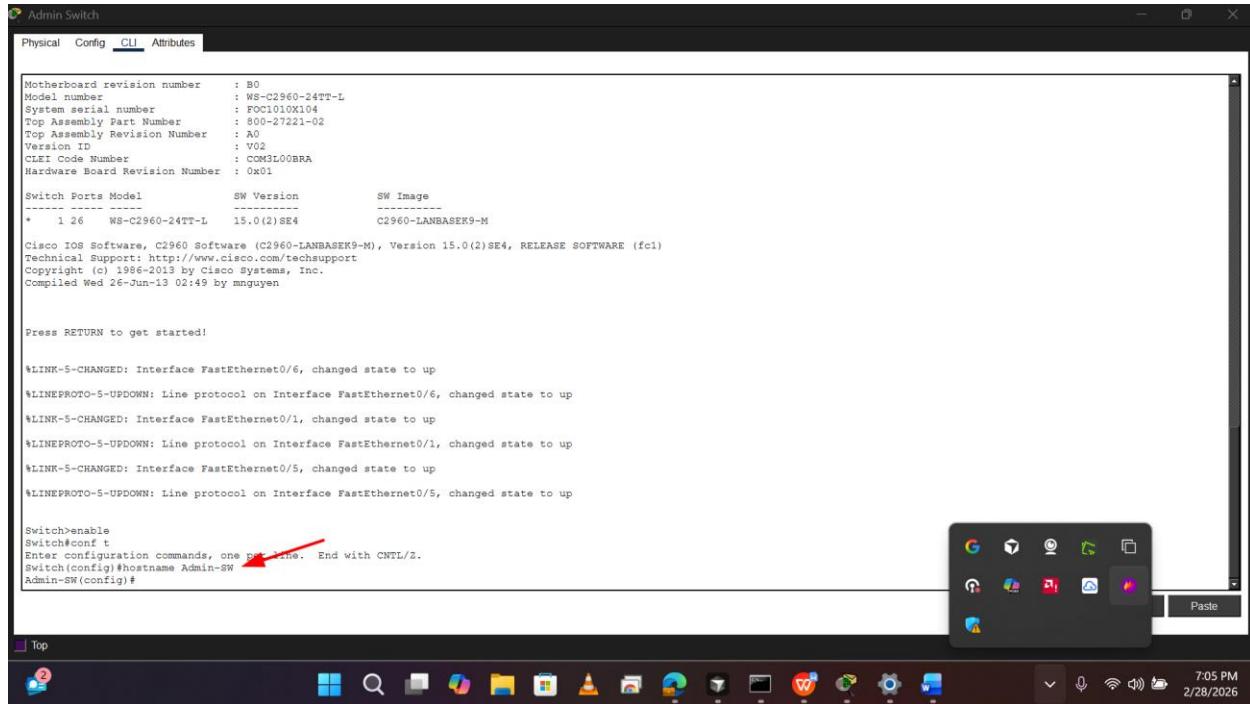


Top

7:00 PM  
2/28/2026

## Task 2: Configure BOTH switches

- Change the hostname of **BOTH** switches to the appropriate names. (4mks)



Admin Switch

Physical Config CLI Attributes

```
Motherboard revision number : B0
Model number : WS-C2960-24TT-L
System serial number : FOC1010X104
Top Assembly Part Number : 800-27221-02
Top Assembly Revision Number : A0
Version ID : V02
CLIEI Code Number : COM3L00BRA
Hardware Board Revision Number : 0x01

Switch Ports Model SW Version SW Image
----- -----
* 1 26 WS-C2960-24TT-L 15.0(2)SE4 C2960-LANBASEK9-M

Cisco IOS Software, C2960 Software (C2960-LANBASEK9-M), Version 15.0(2)SE4, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2013 by Cisco Systems, Inc.
Compiled Wed 26-Jun-13 02:49 by mnnguyen

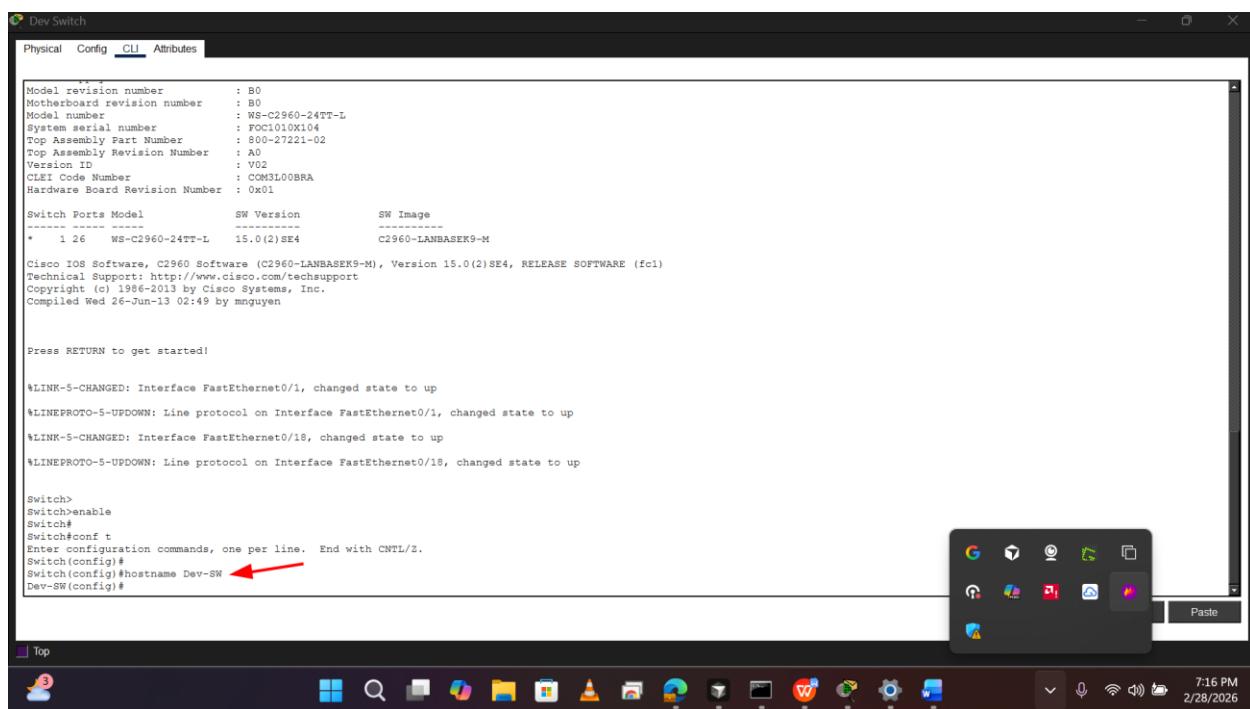
Press RETURN to get started!

%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/6, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/5, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/5, changed state to up

Switch>enable
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname Admin-SW
Admin-SW(config)#

Top
```

The screenshot shows a Windows desktop environment with a Cisco IOS terminal window titled "Admin Switch". The terminal is in "CLI" mode, displaying system information and a configuration session where the hostname is being changed from "Admin-SW" to "Admin-SW". A red arrow points to the command "Switch(config)#hostname Admin-SW". The taskbar at the bottom shows various application icons.



Dev Switch

Physical Config CLI Attributes

```
Model revision number : B0
Motherboard revision number : B0
Model number : WS-C2960-24TT-L
System serial number : FOC1010X104
Top Assembly Part Number : 800-27221-02
Top Assembly Revision Number : A0
Version ID : V02
CLIEI Code Number : COM3L00BRA
Hardware Board Revision Number : 0x01

Switch Ports Model SW Version SW Image
----- -----
* 1 26 WS-C2960-24TT-L 15.0(2)SE4 C2960-LANBASEK9-M

Cisco IOS Software, C2960 Software (C2960-LANBASEK9-M), Version 15.0(2)SE4, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2013 by Cisco Systems, Inc.
Compiled Wed 26-Jun-13 02:49 by mnnguyen

Press RETURN to get started!

%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/18, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/18, changed state to up

Switch>
Switch#enable
Switch#
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#
Switch(config)#hostname Dev-SW
Dev-SW(config)#

Top
```

The screenshot shows a Windows desktop environment with a Cisco IOS terminal window titled "Dev Switch". The terminal is in "CLI" mode, displaying system information and a configuration session where the hostname is being changed from "Dev-SW" to "Dev-SW". A red arrow points to the command "Switch(config)#hostname Dev-SW". The taskbar at the bottom shows various application icons.

- Disable IP domain lookup (4mks)

Admin Switch

Physical Config CLI Attributes

```

Model number : WS-C2960-24TT-L
System serial number : FOC1010X104
Top Assembly Part Number : 800-27221-02
Top Assembly Revision Number : A0
Version ID : V02
CIEI Code Number : CCM3L00BRA
Hardware Board Revision Number : 0x01

Switch Ports Model SW Version SW Image
----- -----
* 1 26 WS-C2960-24TT-L 15.0(2)SE4 C2960-LANBASEK9-M

Cisco IOS Software, C2960 Software (C2960-LANBASEK9-M), Version 15.0(2)SE4, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2013 by Cisco Systems, Inc.
Compiled Wed 26-Jun-13 02:49 by mnnguyen

Press RETURN to get started!

%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/6, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/5, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/5, changed state to up

Switch>enable
Switch>conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname Admin-SW
Admin-SW(config)#no ip domain-lookup
Admin-SW(config)#

```



Top

7:12 PM 2/28/2026

Dev Switch

Physical Config CLI Attributes

```

Model number : WS-C2960-24TT-L
System serial number : FOC1010X104
Top Assembly Part Number : 800-27221-02
Top Assembly Revision Number : A0
Version ID : V02
CIEI Code Number : CCM3L00BRA
Hardware Board Revision Number : 0x01

Switch Ports Model SW Version SW Image
----- -----
* 1 26 WS-C2960-24TT-L 15.0(2)SE4 C2960-LANBASEK9-M

Cisco IOS Software, C2960 Software (C2960-LANBASEK9-M), Version 15.0(2)SE4, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2013 by Cisco Systems, Inc.
Compiled Wed 26-Jun-13 02:49 by mnnguyen

Press RETURN to get started!

%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/18, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/18, changed state to up

Switch>
Switch>enable
Switch>
Switch>conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#
Switch(config)#hostname Dev-SW
Dev-SW(config)#
Dev-SW(config)#no ip domain-lookup
Dev-SW(config)#

```



Top

7:12 PM 2/28/2026

- Configure the default gateway for **BOTH** switches. HINT: IP of router (4mks)

Admin Switch

Physical Config **CLI** Attributes

```

Switch>enable
Switch>conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname Admin-SW
Admin-SW(config)#no ip domain-lookup
Admin-SW(config)#

Admin-SW con0 is now available

Press RETURN to get started.

Admin-SW>enable
Admin-SW>conf t
Enter configuration commands, one per line. End with CNTL/Z.
Admin-SW(config)#ip default-gateway 172.16.10.1
Admin-SW(config)#

```

Dev Switch

Physical Config **CLI** Attributes

```

Top Assembly Part Number      : 800-27221-02
Top Assembly Revision Number : A
Version ID                   : V02
CLME Code Number             : C03L00BRA
Hardware Board Revision Number : 0x01

Switch Ports Model           : SW Version       : SW Image
----- ----- -----
*   1 26  WS-C2960-24TT-L  15.0(2)SE4    C2960-LANBASEK9-M

Cisco IOS Software, C2960 Software (C2960-LANBASEK9-M), Version 15.0(2)SE4, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2013 by Cisco Systems, Inc.
Compiled Wed 26-Jun-13 02:49 by mnnguyen

Press RETURN to get started!

$LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
$LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
$LINK-5-CHANGED: Interface FastEthernet0/18, changed state to up
$LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/18, changed state to up

Switch>
Switch>enable
Switch#
Switch>conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#
Switch(config)#hostname Dev-SW
Dev-SW(config)#
Dev-SW(config)#no ip domain-lookup
Dev-SW(config)#
Dev-SW(config)#ip default-gateway 172.16.10.1
Dev-SW(config)#

```

- Configure VLAN 25 on **BOTH** switches and name it “Office” (4mks)

The image shows two separate windows on a Windows 10 desktop, each displaying a Cisco Admin Switch interface. The top window is titled "Admin Switch" and the bottom window is titled "Dev Switch". Both windows have tabs for "Physical", "Config", "CLI", and "Attributes", with "CLI" being the active tab. The CLI output for both windows includes configuration commands like "hostname Admin-SW", "no ip domain-lookup", and "ip default-gateway 172.16.10.1". A red box highlights the command "admin-SW(config)#vlan 25 admin-SW(config-vlan)#name office admin-SW(config-vlan)#exit admin-SW(config)". In the bottom right corner of each window, there is a dark taskbar with various icons, including a file explorer, a browser, and system status indicators. The desktop background is visible at the bottom, showing a standard Windows wallpaper.

- Configure the Switch Virtual Interface for VLAN 25 on **BOTH** switches with the following details:
    - Configure the appropriate IP address for EACH switch (4mks)

ii) Configure the description of the VLAN 25 SVI as “Cyber” (4mks)

iii) Make sure unused interfaces are shut down (4mks)

Admin Switch

Physical Config CLI Attributes

```
%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/8, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/9, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/10, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/11, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/12, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/13, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/14, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/15, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/16, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/17, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/18, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/19, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/20, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/21, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/22, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/23, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/24, changed state to administratively down
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to administratively down
%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to administratively down
Admin-SW(config-if-range)#

```

Top



Paste

7:44 PM  
2/28/2026

Dev-SW1

Physical Config CLI Attributes

```
%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/8, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/9, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/10, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/11, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/12, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/13, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/14, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/15, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/16, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/17, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/19, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/20, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/21, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/22, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/23, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/24, changed state to administratively down
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to administratively down
%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to administratively down
Dev-SW1(config-if-range)#exit
Dev-SW1(config)#

```

Top



Paste

7:44 PM  
2/28/2026

- Configure VLAN 66 on **BOTH** switches and name it “Home” (4mks)

- On **BOTH** switches, configure interface Fa0/1 as a trunk using 802.1Q encapsulation and allow VLAN 66 on the trunk (6mks)
  -

```
%LINK-5-CHANGED: Interface FastEthernet0/22, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/23, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/24, changed state to administratively down
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to administratively down
%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to administratively down
Admin-SW(config-if-range)#exit
Admin-SW(config)#
Admin-SW(config)#
Admin-SW(config)#
Admin-SW(config)#
Admin-SW(config-vlan)#
Admin-SW(config-vlan)#name Home
Admin-SW(config-vlan)#exit
Admin-SW(config)#
Admin-SW(config)#
Admin-SW(config)#
Admin-SW(config-if)#interface fa0/1
Admin-SW(config-if)#switchport trunk encapsulation dot1q
^
% Invalid input detected at '^' marker.

Admin-SW(config-if)#switchport trunk?
% Unrecognized command
Admin-SW(config-if)#switchport trunk?
trunk
Admin-SW(config-if)#switchport trunk encapsulation?
% Unrecognized command
Admin-SW(config-if)#switchport mode trunk

Admin-SW(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan25, changed state to up

Admin-SW(config-if)#

```

Dev Switch

Physical Config CLI Attributes

```
%LINK-5-CHANGED: Interface FastEthernet0/24, changed state to administratively down
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to administratively down
%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to administratively down
Dev-SW(config-if-range)#exit
Dev-SW(config)#
Dev-SW(config)#
Dev-SW(config)#
Dev-SW(config)#vlan 66
Dev-SW(config-vlan)#name Home
Dev-SW(config-vlan)#exit
Dev-SW(config)#
Dev-SW(config)#
Dev-SW(config)#
Dev-SW(config)#
Dev-SW(config)#
Dev-SW(config)#
%SPANTREE-2-RECV_PVID_ERR: Received 802.1Q BPDU on non trunk FastEthernet0/1 VLAN1.
%SPANTREE-2-BLOCK_PVID_LOCAL: Blocking FastEthernet0/1 on VLAN001. Inconsistent port type.

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan25, changed state to up

Dev-SW(config)#
Dev-SW(config)#
Dev-SW(config)#
Dev-SW(config-if)#interface fa0/1
Dev-SW(config-if)#
Dev-SW(config-if)#switchport trunk encapsulation dot1q
^
| Invalid input detected at '^' marker.

Dev-SW(config-if)#
Dev-SW(config-if)#switchport mode trunk
Dev-SW(config-if)#switchport trunk allowed vlan 66
Dev-SW(config-if)#
Dev-SW(config-if)#

```

Top



7:59 PM  
2/28/2026

- Disable DTP negotiation on interface Fa0/1 on **BOTH** switches (6mks)

Dev Switch

Physical Config CLI Attributes

```
Dev-SW(config)#  
Dev-SW(config)#  
Dev-SW(config)#vlan 66  
Dev-SW(config-vlan)#  
Dev-SW(config-vlan)name Home  
Dev-SW(config-vlan)#exit  
Dev-SW(config)#  
Dev-SW(config)#  
Dev-SW(config)#%SPAN TREE-2-RECV_PVID_ERR: Received 802.1Q BPDU on non trunk FastEthernet0/1 VLAN1.  
%SPAN TREE-2-BLOCK_PVID_LOCAL: Blocking FastEthernet0/1 on VLAN0001. Inconsistent port type.  
  
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down  
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up  
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan25, changed state to up  
  
Dev-SW(config)#  
Dev-SW(config)#  
Dev-SW(config)#  
Dev-SW(config)#interface fa0/1  
Dev-SW(config-if)#  
Dev-SW(config-if)#switchport trunk encapsulation dot1q  
"  
* Invalid input detected at '^' marker.  
  
Dev-SW(config-if)#  
Dev-SW(config-if)#switchport mode trunk  
Dev-SW(config-if)#switchport trunk allowed vlan 66  
Dev-SW(config-if)#  
Dev-SW(config-if)#exit  
Dev-SW(config)#  
Dev-SW(config)#  
Dev-SW(config)#interface fa0/1  
Dev-SW(config-if)#  
Dev-SW(config-if)#switchport nonegotiate  
Dev-SW(config-if)#  
Dev-SW(config-if)#  
Dev-SW(config-if)#
```

Top



803 PM  
2/28/2026

## Task 3: Hardening Switch Security

- On the **Admin Switch**, configure Fa0/5 and Fa0/6 as access ports that are associated with VLAN 25. (4mks)

- On the **Dev Switch**, configure Fa0/18 as an access port that is associated with VLAN 25. (4mks)

- On the **Admin Switch**, enable port security on Fa0/6 with the following settings:
    - i) Maximum MAC addresses 5 (2mks)
    - ii) Violation type: restrict (2mks)
    - iii) Aging time: 60 min (2mks)

- On the **Dev Switch**, enable port security for Fa0/18 with the following settings:
    - i) Maximum MAC addresses 2 (2mks)
    - ii) Violation type: protect (2mks)
    - iii) Aging time: 60 min (2mks)

- Configure PortFast on all the **access ports** that are in use on **BOTH** switches. (4mks)

```
Dev Switch
Physical Config CLI Attributes

[Dev-SW(config-if)]#
[Dev-SW(config-if)]#switchport access vlan 25
[Dev-SW(config-if)]#
[Dev-SW(config-if)]#exit
[Dev-SW(config)]#
[Dev-SW(config)]#
[Dev-SW(config)]#
[Dev-SW(config)]#
[Dev-SW(config)]#
[Dev-SW(config)]#
[Dev-SW(config)]#
[Dev-SW(config)]#interface fa0/18
[Dev-SW(config-if)]#switchport port-security
[Dev-SW(config-if)]#
[Dev-SW(config-if)]#switchport port-security maximum 2
[Dev-SW(config-if)]#switchport port-security violation protect
[Dev-SW(config-if)]#
[Dev-SW(config-if)]#switchport port-security aging time 60
[Dev-SW(config-if)]#
[Dev-SW(config-if)]#exit
[Dev-SW(config)]#
[Dev-SW(config)]#
[Dev-SW(config)]#
[Dev-SW(config)]#
[Dev-SW(config)]#
[Dev-SW(config)]#
[Dev-SW(config)]#
[Dev-SW(config)]#interface fa0/18
[Dev-SW(config-if)]#spanning-tree portfast
[Dev-SW(config-if)]#spanning-tree portfast
WARNING: portfast should only be enabled on ports connected to a single
host. Connecting hubs, concentrators, switches, bridges, etc... to this
interface when portfast is enabled, can cause temporary bridging loops.
Use with CAUTION
*portfast has been configured on FastEthernet0/18 but will only
have effect when the interface is in a non-trunking mode.
[Dev-SW(config-if)]#
[Dev-SW(config-if)]#
[Dev-SW(config-if)]#exit
[Dev-SW(config)]#
[Dev-SW(config)]#Top
```

- Configure BPDU guard on BOTH switches on **EACH** VLAN 25 access port connected to the two PCs (4mks)

The screenshot shows a terminal window titled "Dev Switch" with three tabs: "Physical", "Config", and "CLI". The "CLI" tab is selected, displaying the following text:

```
Dev-SW con0 is now available

Press RETURN to get started.

Dev-SW>
Dev-SW>
Dev-SW>enable
Dev-SW#
Dev-SW#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Dev-SW(config)#
Dev-SW(config)#interface fa0/18
Dev-SW(config-if)#
Dev-SW(config-if)#spanning-tree bpduguard enable
Dev-SW(config-if)#
Dev-SW(config-if)#
Dev-SW(config-if)#
Dev-SW(config-if)#
Dev-SW(config)#
Dev-SW(config)#

```

A red box highlights the configuration commands from "conf t" to "bpduguard enable". The taskbar at the bottom includes icons for File, Copy, Paste, and others, along with system status indicators like battery level and signal strength.

## Conclusion

In conclusion, the network infrastructure for the university's small offices has been successfully configured, logically separated, and secured. The Nairobi router was properly initialized with the correct interface IP addresses, and a DHCP server was configured with specific address exclusions to efficiently allocate IPs to the end devices. Both the Admin and Dev switches were tailored with appropriate hostnames, default gateways, and Switch Virtual Interfaces (SVIs) to support the newly created VLANs. Crucially, the network's security posture was hardened by disabling unused interfaces, restricting maximum MAC addresses via port security on access ports, and implementing protective features like PortFast and BPDU guard. The successful execution of these routing, switching, and security configurations culminates in the final verification step, ensuring that the Admin PC and Dev PC can successfully ping each other across the network.