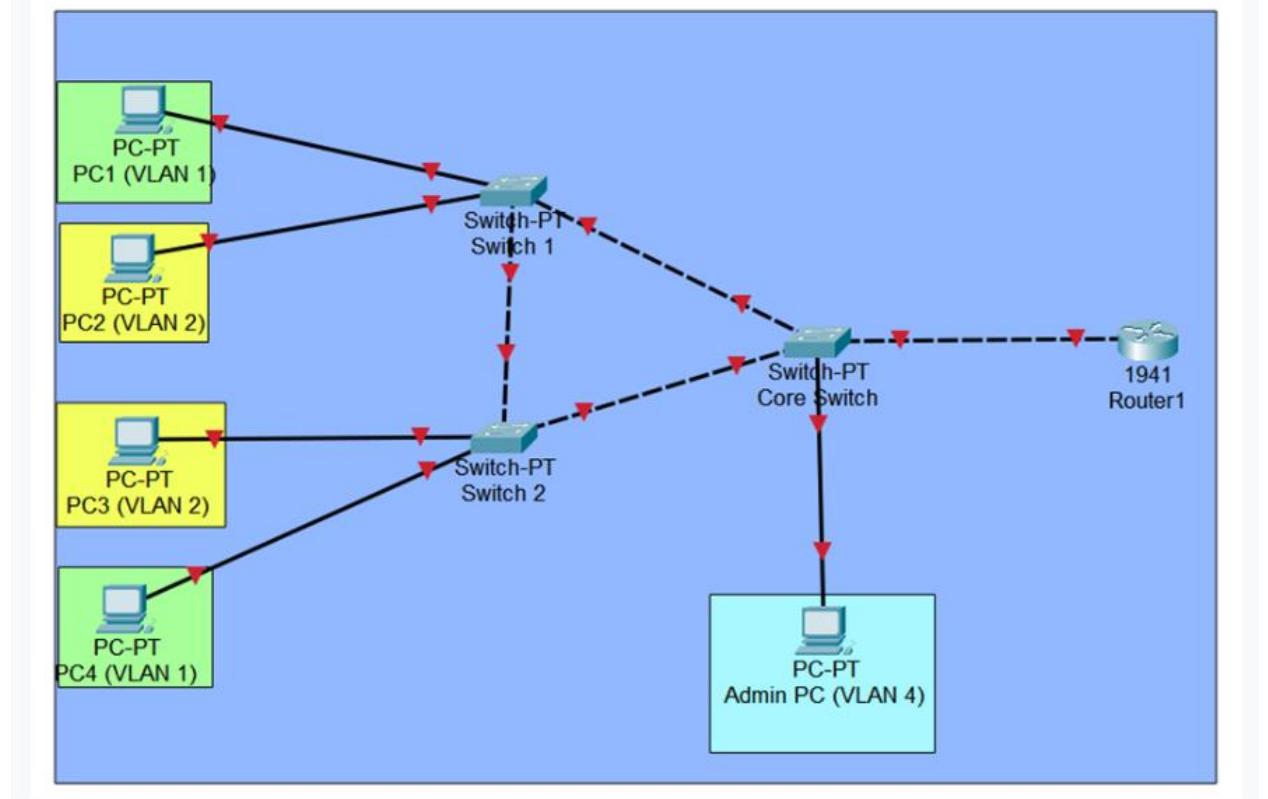


Project 2:

Introduction:

A network topology is provided to you in a PKA file. Your responsibility as the network administrator of this company is to set up the network devices at the branch site based on the given requirements. Specifically, you are tasked with configuring 3 VLANs and implementing inter-VLAN routing in the router. Additionally, you need to configure the switches in the branch office according to the specified requirements for STP and Etherchannel.

Figure 1: The Topology:



Objectives:

- Subnet the provided network and determine the IP address range for each subnet.
- Set up VLANs on all switches.
- Set customized device hostnames.
- Enable SSH in the core switch.
- Configure trunk and access ports on all switches according to the specified requirements.
- Assign switch ports to appropriate VLANs based on the given requirements.
- Configure IP settings for PCs and SVI interfaces of switches, selecting IPs from the correct subnets.
- Enable Intervlan Routing on Router R1.
- Implement STP/Etherchannel as per the provided requirements.
- Conduct connectivity testing.

SOLUTION:

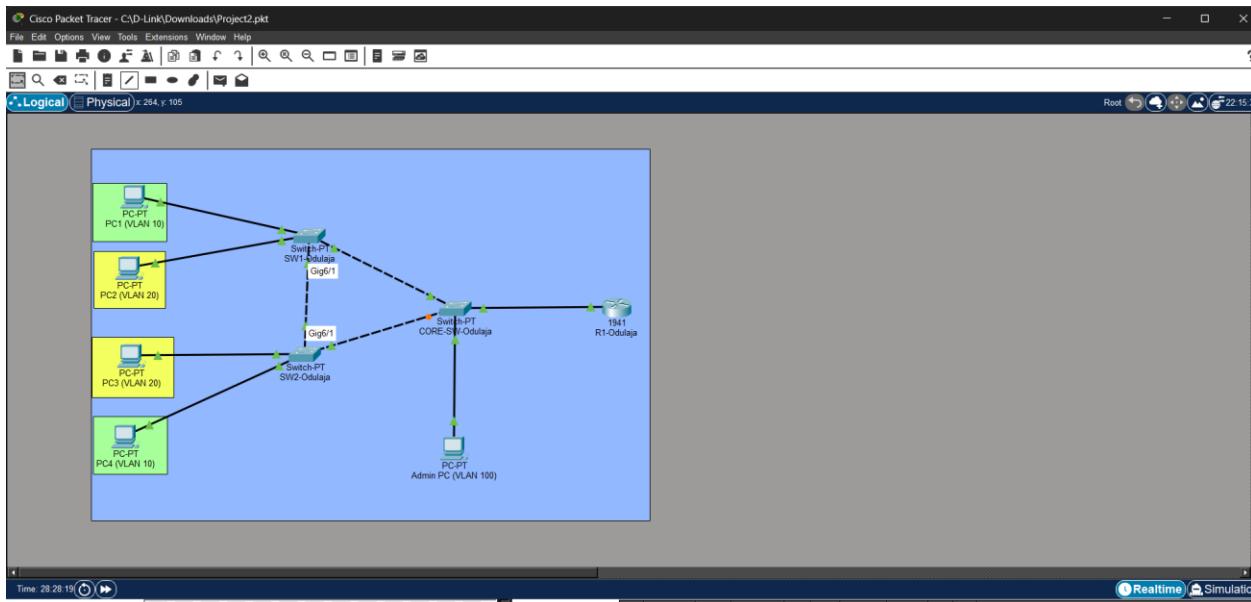
Networking Lab Report

Networking Project Report: VLAN, Trunking, STP, and SSH Configuration

Part 1: Network Topology

Label: Final VLAN and Inter-VLAN Routing Topology

Description: This topology connects multiple access switches (SW1-Odulaja and SW2-Odulaja) to a core switch (CORE-SW-Odulaja) and a router (R1-Odulaja) using trunk links and EtherChannel. The Admin PC is placed in VLAN 100 for secure SSH management.



Part 2: VLAN Configuration Verification

Label: VLAN Configuration on Switches

Description: VLANs 10 (Dept1), 20 (Dept2), and 100 (Management) were created and assigned to their respective ports on each switch.

SW1-Odulaja VLAN Configuration:

SW1-Odulaja

Physical Config **CLI** Attributes

```
Bridge ID Priority 32868 (priority 32768 sys-id-ext 100)
Address 00E0.F9DD.B783
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 20

Interface Role Sts Cost Prio.Nbr Type
-----
Fa2/1 Desg FWD 19 128.3 P2p
Gi6/1 Root FWD 4 128.7 P2p

SW1-Odulaja>
```

SW1-Odulaja con0 is now available

Press RETURN to get started.

```
SW1-Odulaja>show vlan brief
```

VLAN Name	Status	Ports
1 default	active	F0/1, Fa3/1, Fa4/1, Fa5/1 Gig8/1, Gig9/1
10 Dept1	active	Fa0/1
20 Dept2	active	Fa1/1
100 MGMT	active	Fa2/1
1002 fddi-default	active	
1003 token-ring-default	active	
1004 fddinet-default	active	
1005 trnet-default	active	

SW1-Odulaja>

Copy Paste

Top

SW2-Odulaja VLAN Configuration:

The screenshot shows a terminal window titled "SW2-Odulaja". The tab bar at the top has four tabs: "Physical", "Config", "CLI" (which is selected), and "Attributes". The main pane displays the following CLI session output:

```
d - default port

Number of channel-groups in use: 1
Number of aggregators: 1

Group Port-channel Protocol Ports
----+-----+-----+
2      Po2 (SU)       LACP    Gig3/1(P)
SW2-Odulaja>

SW2-Odulaja con0 is now available

Press RETURN to get started.

SW2-Odulaja>show vlan brie

VLAN Name          Status    Ports
----+-----+-----+
1   default         active   Fa3/1, Fa4/1, Fa5/1, Gig7/1
                               Gig9/1
10  Dept1           active   Fa1/1
20  Dept2           active   Fa0/1
100 MGMT            active   Fa2/1
1002 fddi-default   active
1003 token-ring-default active
1004 fddinet-default active
1005 trnet-default  active
SW2-Odulaja>
```

At the bottom right of the terminal window are two buttons: "Copy" and "Paste".

CORE-SW-Odulaja VLAN Configuration:



The screenshot shows a terminal window titled "CORE-SW-Odulaja" with the "CLI" tab selected. The window displays the following text:

```
!
!
--More--

CORE-SW-Odulaja con0 is now available

Press RETURN to get started.

%LINK-3-UPDOWN: Interface Port-channel2, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface Port-channel2, changed state to down
%LINK-5-CHANGED: Interface Port-channel2, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Port-channel2, changed state to up

CORE-SW-Odulaja>show vlan brief

VLAN Name          Status    Ports
---- -----
1    default        active    Po1, Fa0/1, Fa1/1, Fa2/1
                           Fa3/1, Fa4/1, Gig6/1
10   Dept1          active
20   Dept2          active
100  MGMT           active    Gig7/1, Gig9/1
1002 fddi-default  active
1003 token-ring-default  active
1004 fddinet-default  active
1005 trnet-default  active

CORE-SW-Odulaja>
```

At the bottom right of the window are two buttons: "Copy" and "Paste".

Part 3: Trunk and EtherChannel Verification

Label: Trunk and EtherChannel Configuration

Description: Trunk ports were configured using IEEE 802.1Q encapsulation to allow VLANs 10, 20, and 100 across links. LACP (802.3ad) was implemented for redundancy and load balancing.

CORE-SW-Odulaja Trunk Links and EtherChannel:

The screenshot shows a terminal window titled "CORE-SW-Odulaja". The tab bar at the top includes "Physical", "Config", "CLI" (which is selected), and "Attributes". A message "Press RETURN to get started." is displayed at the top of the terminal window. The main area contains the following CLI session output:

```
%LINK-3-UPDOWN: Interface Port-channel12, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface Port-channel12, changed state to down
%LINK-5-CHANGED: Interface Port-channel12, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Port-channel12, changed state to up

CORE-SW-Odulaja>show vlan brief
VLAN Name          Status    Ports
---- -----
1    default        active    Po1, Fa0/1, Fa1/1, Fa2/1
                           Fa3/1, Fa4/1, Gig6/1
10   Dept1          active
20   Dept2          active
100  MGMT           active    Gig7/1, Gig9/1
1002 fddi-default  active
1003 token-ring-default  active
1004 fddinet-default active
1005 trnet-default  active
CORE-SW-Odulaja>
CORE-SW-Odulaja>show interfaces trunk
Port      Mode      Encapsulation  Status      Native vlan
Po2       on        802.1q         trunking    1
Gig5/1    on        802.1q         trunking    1

Port      Vlans allowed on trunk
Po2      10,20,100
Gig5/1   10,20,100

Port      Vlans allowed and active in management domain
Po2      10,20,100
Gig5/1   10,20,100

Port      Vlans in spanning tree forwarding state and not pruned
Po2      10,20,100
Gig5/1   10,20,100

CORE-SW-Odulaja>
```

At the bottom right of the terminal window are two buttons: "Copy" and "Paste". At the bottom left is a "Top" button.

SW1-Odulaja EtherChannel Summary:

The screenshot shows a terminal window titled "SW1-Odulaja". The tab bar at the top includes "Physical", "Config", "CLI" (which is selected), and "Attributes". The main pane displays the following CLI session output:

```
SW1-Odulaja con0 is now available

Press RETURN to get started.

SW1-Odulaja>show vlan brief
VLAN Name          Status    Ports
---- ----
1    default        active   Po1, Fa3/1, Fa4/1, Fa5/1
                               Gig8/1, Gig9/1
10   Dept1          active   Fa0/1
20   Dept2          active   Fa1/1
100  MGMT           active   Fa2/1
1002 fddi-default  active
1003 token-ring-default  active
1004 fddinet-default  active
1005 trnet-default   active
SW1-Odulaja>
SW1-Odulaja>show etherchannel summary
Flags:  D - down      P - in port-channel
       I - stand-alone s - suspended
       H - Hot-standby (LACP only)
       R - Layer3     S - Layer2
       U - in use      f - failed to allocate aggregator
       u - unsuitable for bundling
       w - waiting to be aggregated
       d - default port

Number of channel-groups in use: 1
Number of aggregators: 1

Group  Port-channel  Protocol    Ports
----+-----+-----+
1      Po1 (SD)     LACP        Gig6/1(I) Gig7/1(I)
SW1-Odulaja>
```

At the bottom right of the terminal window are two buttons: "Copy" and "Paste".

SW2-Odulaja EtherChannel Summary:

The screenshot shows a terminal window titled "SW2-Odulaja". The tab bar at the top has four tabs: "Physical", "Config", "CLI" (which is selected), and "Attributes". The main pane displays the following CLI session output:

```
SW2-Odulaja con0 is now available

Press RETURN to get started.

SW2-Odulaja>show vlan brie
VLAN Name Status Ports
-----+-----+-----+
1 default active Fa3/1, Fa4/1, Fa5/1, Gig7/1
      Gig9/1
10 Dept1 active Fa1/1
20 Dept2 active Fa0/1
100 MGMT active Fa2/1
1002 fddi-default active
1003 token-ring-default active
1004 fddinet-default active
1005 trnet-default active
SW2-Odulaja>
SW2-Odulaja>show etherchannel summary
Flags: D - down P - in port-channel
I - stand-alone S - suspended
H - Hot-standby (LACP only)
R - Layer3 S - Layer2
U - in use f - failed to allocate aggregator
u - unsuitable for bundling
w - waiting to be aggregated
d - default port

Number of channel-groups in use: 1
Number of aggregators: 1
Group Port-channel Protocol Ports
-----+-----+-----+
2 Po2(SU) LACP Gig8/1(P)
SW2-Odulaja>
```

At the bottom right of the terminal window are two buttons: "Copy" and "Paste".

Part 4: Spanning Tree Protocol (STP)

Label: STP Root Bridge Configuration

Description: STP was verified for VLANs 10, 20, and 100 to ensure loop prevention and redundancy. SW1 is root for VLAN 10, SW2 is root for VLAN 20, and CORE-SW is root for VLAN 100.

CORE-SW-Odulaja

Physical Config **CLI** Attributes

```
Cost      8
Port      13(Port-channel2)
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32778 (priority 32768 sys-id-ext 10)
Address 00D0.FF04.11EE
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 20

Interface Role Sts Cost Prio.Nbr Type
----- ---- -- -- --
Gi5/1     Desg FWD 4    128.6   P2p
Po2       Root FWD 4    128.13  P2p

CORE-SW-Odulaja>show spanning-tree vlan 20
VLAN020
Spanning tree enabled protocol ieee
Root ID  Priority 24596
Address 00D0.97A9.E74E
Cost    4
Port    13(Port-channel2)
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32788 (priority 32768 sys-id-ext 20)
Address 00D0.FF04.11EE
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 20

Interface Role Sts Cost Prio.Nbr Type
----- ---- -- -- --
Gi5/1     Desg FWD 4    128.6   P2p
Po2       Root FWD 4    128.13  P2p

CORE-SW-Odulaja>show spanning-tree vlan 100
VLAN0100
Spanning tree enabled protocol ieee
Root ID  Priority 24676
Address 00D0.FF04.11EE
This bridge is the root
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 24676 (priority 24576 sys-id-ext 100)
Address 00D0.FF04.11EE
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 20

Interface Role Sts Cost Prio.Nbr Type
----- ---- -- -- --
Gi7/1     Desg FWD 4    128.8   P2p
Gi5/1     Desg FWD 4    128.6   P2p
Gi9/1     Desg FWD 19   128.10  P2p
Po2       Desg FWD 4    128.13  P2p

CORE-SW-Odulaja>
```

Copy Paste

SW1-Odulaja

Physical Config **CLI** Attributes

```
Address 00E0.F9DD.B783
This bridge is the root
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 24586 (priority 24576 sys-id-ext 10)
Address 00E0.F9DD.B783
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 20

Interface Role Sts Cost Prio.Nbr Type
-----
Fa0/1 Desg FWD 19 128.1 P2p
Gi7/1 Desg FWD 4 128.8 P2p
Gi6/1 Desg FWD 4 128.7 P2p

SW1-Odulaja>show spanning-tree vlan 20
VLAN0020
Spanning tree enabled protocol ieee
Root ID Priority 24596
Address 00D0.97A9.E74E
Cost 4
Port 7(GigabitEthernet6/1)
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32788 (priority 32768 sys-id-ext 20)
Address 00E0.F9DD.B783
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 20

Interface Role Sts Cost Prio.Nbr Type
-----
Gi7/1 Desg FWD 4 128.8 P2p
Gi6/1 Root FWD 4 128.7 P2p

SW1-Odulaja>show spanning-tree vlan 100
VLAN0100
Spanning tree enabled protocol ieee
Root ID Priority 24676
Address 00D0.FF04.11EE
Cost 8
Port 7(GigabitEthernet6/1)
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32868 (priority 32768 sys-id-ext 100)
Address 00E0.F9DD.B783
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 20

Interface Role Sts Cost Prio.Nbr Type
-----
Fa2/1 Desg FWD 19 128.3 P2p
Gi6/1 Root FWD 4 128.7 P2p

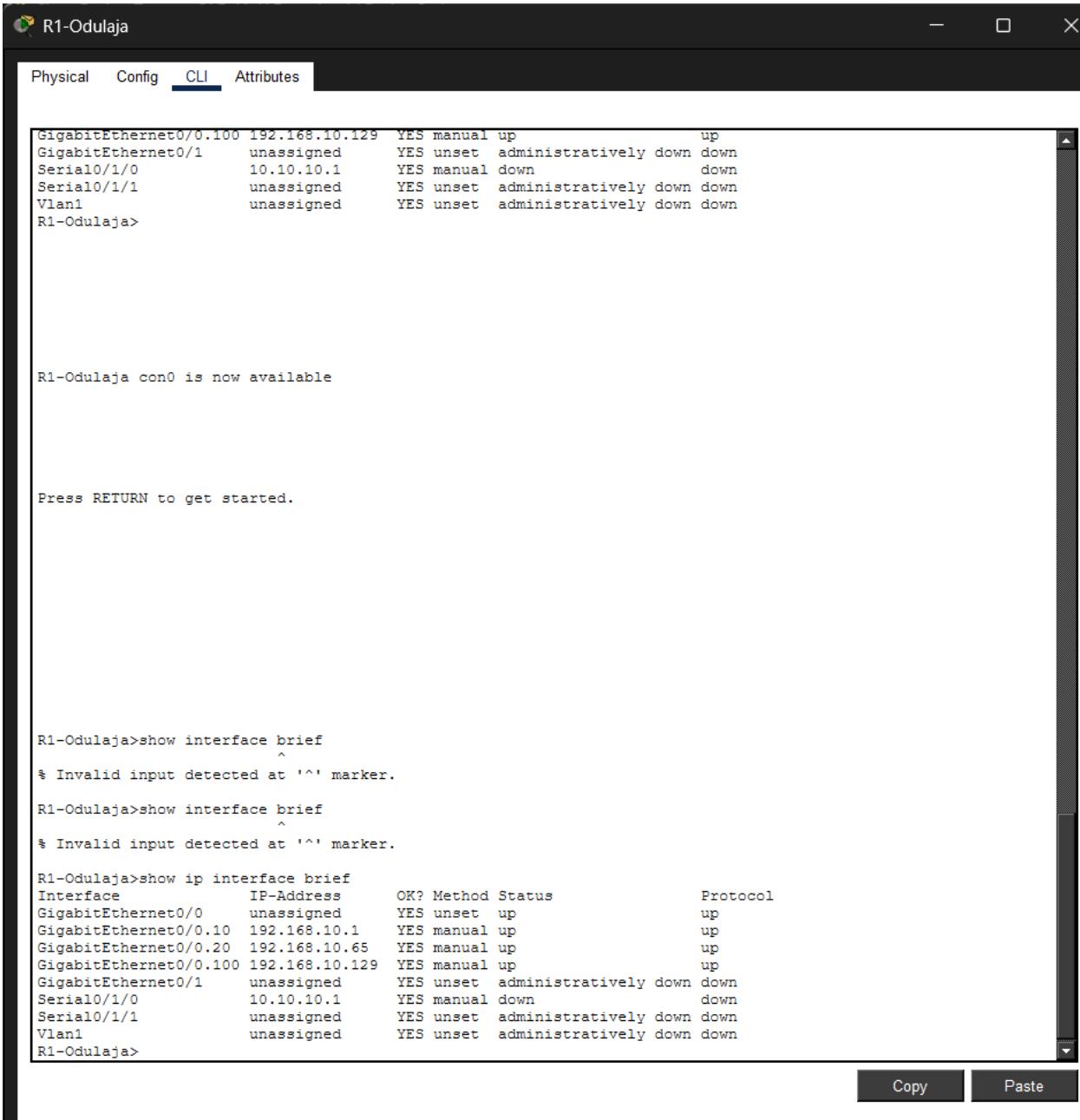
SW1-Odulaja>
```

Copy Paste

Part 5: Router-on-a-Stick Configuration

Label: Inter-VLAN Routing Verification

Description: Router R1-Odulaja subinterfaces were created for each VLAN to enable inter-VLAN communication.



The screenshot shows a terminal window titled "R1-Odulaja". The tab bar at the top has four tabs: "Physical", "Config", "CLI" (which is selected), and "Attributes". The main pane displays the following text:

```
GigabitEthernet0/0.100 192.168.10.129 YES manual up          up
GigabitEthernet0/1      unassigned     YES unset administratively down down
Serial0/1/0             10.10.10.1  YES manual down          down
Serial0/1/1             unassigned     YES unset administratively down down
Vlan1                  unassigned     YES unset administratively down down
R1-Odulaja>

R1-Odulaja con0 is now available

Press RETURN to get started.

R1-Odulaja>show interface brief
^
% Invalid input detected at '^' marker.

R1-Odulaja>show interface brief
^
% Invalid input detected at '^' marker.

R1-Odulaja>show ip interface brief
Interface      IP-Address      OK? Method Status      Protocol
GigabitEthernet0/0  unassigned    YES unset up          up
GigabitEthernet0/0.10 192.168.10.1 YES manual up          up
GigabitEthernet0/0.20 192.168.10.65 YES manual up          up
GigabitEthernet0/0.100 192.168.10.129 YES manual up          up
GigabitEthernet0/1      unassigned    YES unset administratively down down
Serial0/1/0             10.10.10.1  YES manual down          down
Serial0/1/1             unassigned    YES unset administratively down down
Vlan1                  unassigned    YES unset administratively down down
R1-Odulaja>
```

At the bottom right of the terminal window, there are two buttons: "Copy" and "Paste".

Part 6: Management and SSH Access

Label: Secure SSH Access Verification

Description: SSH was configured on CORE-SW-Odulaja for remote administrative access using domain branch.local and username admin. RSA keys were generated and SSH version 2 enabled.

CORE-SW-Odulaja SSH Configuration:

```
Spanning tree enabled protocol ieee
Root ID Priority 24596
Address 00D0.97A9.E74E
Cost 4
Port 13(Port-channel2)
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32788 (priority 32768 sys-id-ext 20)
Address 00D0.FF04.11EE
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 20

Interface Role Sts Cost Prio.Nbr Type
-----
Gi5/1 Desg FWD 4 128.6 P2p
Po2 Root FWD 4 128.13 P2p

CORE-SW-Odulaja>show spanning-tree vlan 100
VLAN0100
Spanning tree enabled protocol ieee
Root ID Priority 24676
Address 00D0.FF04.11EE
This bridge is the root
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 24676 (priority 24576 sys-id-ext 100)
Address 00D0.FF04.11EE
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 20

Interface Role Sts Cost Prio.Nbr Type
-----
Gi7/1 Desg FWD 4 128.8 P2p
Gi5/1 Desg FWD 4 128.6 P2p
Gi9/1 Desg FWD 19 128.10 P2p
Po2 Desg FWD 4 128.13 P2p

CORE-SW-Odulaja>show ip interface brief
Interface IP-Address OK? Method Status Protocol
Port-channel1 unassigned YES manual down down
Port-channel2 unassigned YES manual up up
FastEthernet0/1 unassigned YES manual down down
FastEthernet1/1 unassigned YES manual down down
FastEthernet2/1 unassigned YES manual down down
FastEthernet3/1 unassigned YES manual down down
FastEthernet4/1 unassigned YES manual down down
GigabitEthernet5/1 unassigned YES manual up up
GigabitEthernet6/1 unassigned YES manual down down
GigabitEthernet7/1 unassigned YES manual up down
GigabitEthernet8/1 unassigned YES manual up up
GigabitEthernet9/1 unassigned YES manual up up
Vlan1 unassigned YES manual administratively down down
Vlan100 192.168.10.130 YES manual up up

CORE-SW-Odulaja>
```

Copy Paste

Admin PC SSH Login and Ping Test:

The screenshot shows a Windows Command Prompt window titled "Admin PC (VLAN 100)". The window has tabs at the top: Physical, Config, Desktop, Programming, and Attributes. The Desktop tab is selected. The main area is a "Command Prompt" window.

```
Request timed out.  
Request timed out.  
Request timed out.  
Request timed out.  
  
Ping statistics for 192.168.10.130:  
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),  
  
C:\>ping 192.168.10.130  
  
Pinging 192.168.10.130 with 32 bytes of data:  
  
Request timed out.  
Reply from 192.168.10.130: bytes=32 time<1ms TTL=255  
Reply from 192.168.10.130: bytes=32 time=12ms TTL=255  
Reply from 192.168.10.130: bytes=32 time<1ms TTL=255  
  
Ping statistics for 192.168.10.130:  
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),  
Approximate round trip times in milli-seconds:  
    Minimum = 0ms, Maximum = 12ms, Average = 4ms  
  
C:\>ssh -l admin 192.168.10.130  
  
Password:  
  
CORE-SW-Odulaja>exit  
  
[Connection to 192.168.10.130 closed by foreign host]  
C:\>  
C:\>  
C:\>  
C:\>  
C:\>ping 192.168.10.130  
  
Pinging 192.168.10.130 with 32 bytes of data:  
  
Reply from 192.168.10.130: bytes=32 time<1ms TTL=255  
  
Ping statistics for 192.168.10.130:  
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),  
Approximate round trip times in milli-seconds:  
    Minimum = 0ms, Maximum = 0ms, Average = 0ms  
  
C:\>ssh -l admin 192.168.10.130  
  
Password:  
  
CORE-SW-Odulaja>
```

Part 7: Connectivity and Testing

Label: Ping and Connectivity Tests

Description: Successful ping tests were conducted between PCs in different VLANs and between Admin PC and Core Switch to confirm inter-VLAN routing and management connectivity.

PC1 Ping Test:

The screenshot shows a Windows Command Prompt window titled "PC1 (VLAN 10)". The window has tabs at the top: Physical, Config, Desktop, Programming, and Attributes. The Command Prompt tab is active. The window displays the following command-line session:

```
Minimum = 5ms, Maximum = 12ms, Average = 9ms
C:\>ssh -1 admin 192.168.10.130
Invalid Command.

C:\>ipconfig

FastEthernet0 Connection:(default port)
  Connection-specific DNS Suffix...:
  Link-local IPv6 Address.....: FE80::201:96FF:FE00:461D
  IPv6 Address.....: :::
  IPv4 Address.....: 192.168.10.10
  Subnet Mask.....: 255.255.255.192
  Default Gateway.....: :::
                           192.168.10.1

Bluetooth Connection:
  Connection-specific DNS Suffix...:
  Link-local IPv6 Address.....: :::
  IPv6 Address.....: :::
  IPv4 Address.....: 0.0.0.0
  Subnet Mask.....: 0.0.0.0
  Default Gateway.....: :::
                           0.0.0.0

C:\>ping 192.168.10.130
Pinging 192.168.10.130 with 32 bytes of data:
Request timed out.
Request timed out.
Reply from 192.168.10.130: bytes=32 time<1ms TTL=254
Reply from 192.168.10.130: bytes=32 time=11ms TTL=254

Ping statistics for 192.168.10.130:
  Packets: Sent = 4, Received = 2 (50% loss),
  Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 11ms, Average = 5ms

C:\>ping 192.168.10.71
Pinging 192.168.10.71 with 32 bytes of data:

Reply from 192.168.10.71: bytes=32 time<1ms TTL=127
Reply from 192.168.10.71: bytes=32 time=10ms TTL=127
Reply from 192.168.10.71: bytes=32 time=11ms TTL=127
Reply from 192.168.10.71: bytes=32 time=11ms TTL=127

Ping statistics for 192.168.10.71:
  Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
  Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 11ms, Average = 8ms

C:\>
```

At the bottom left of the window, there is a "Top" button.

Admin PC Ping and SSH Verification:

The screenshot shows a Windows Command Prompt window titled "Admin PC (VLAN 100)". The window has tabs at the top: Physical, Config, Desktop, Programming, and Attributes. The "Desktop" tab is selected. The main area is a "Command Prompt" window with the following text output:

```
Ping statistics for 192.168.10.130:
  Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
  Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 12ms, Average = 4ms

C:\>ssh -l admin 192.168.10.130
Password:

CORE-SW-Odulaja>exit
[Connection to 192.168.10.130 closed by foreign host]
C:\>
C:\>
C:\>
C:\>
C:\>ping 192.168.10.130

Pinging 192.168.10.130 with 32 bytes of data:
Reply from 192.168.10.130: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.10.130:
  Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
  Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ssh -l admin 192.168.10.130
Password:

CORE-SW-Odulaja>exit
[Connection to 192.168.10.130 closed by foreign host]
C:\>ping 192.168.10.130

Pinging 192.168.10.130 with 32 bytes of data:
Reply from 192.168.10.130: bytes=32 time<1ms TTL=255

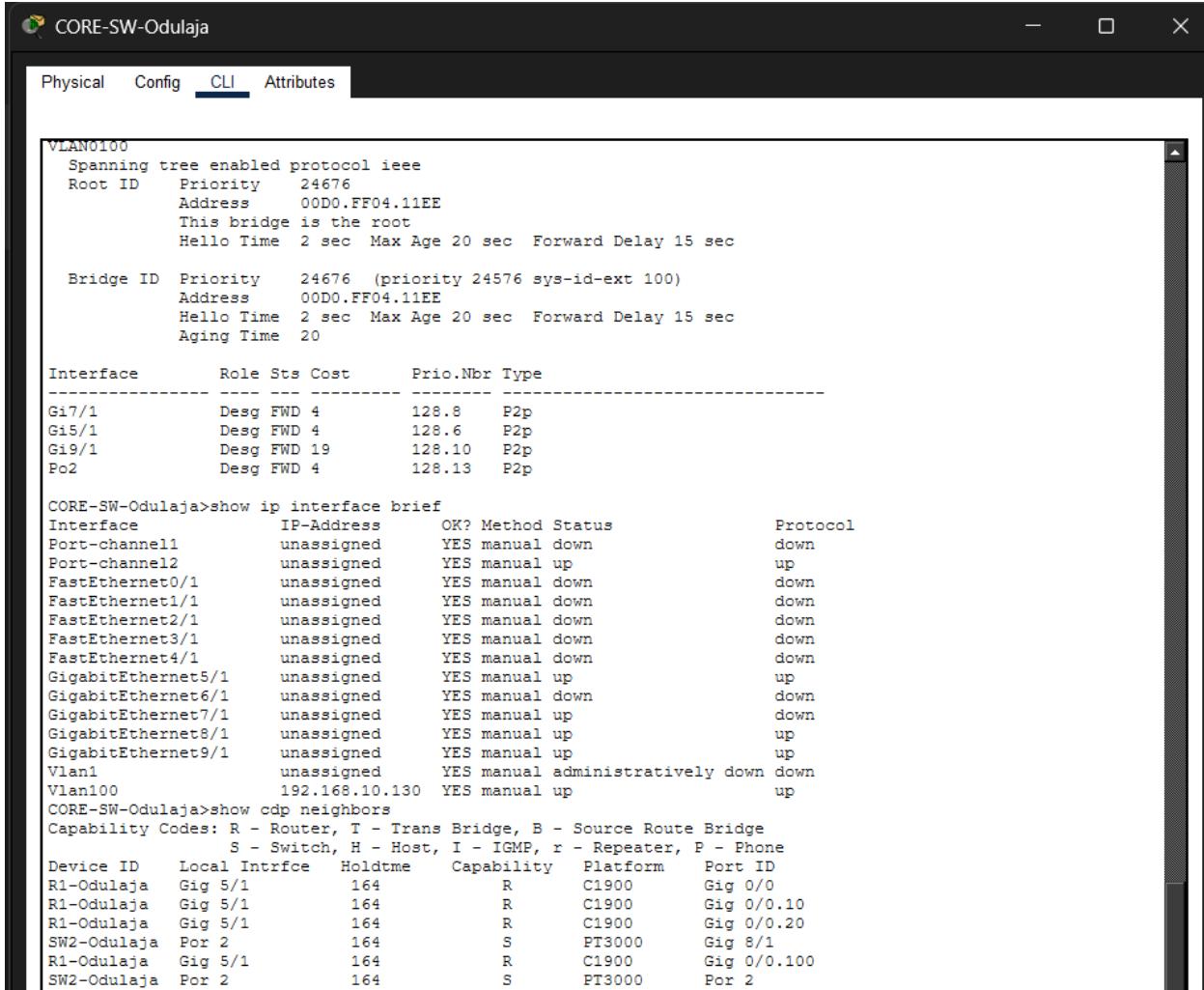
Ping statistics for 192.168.10.130:
  Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
  Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

Part 8: CDP Neighbor and Running Config Verification

Label: CDP Neighbor Discovery

Description: Cisco Discovery Protocol was used to verify device interconnections and identify connected interfaces.



```
VLAN0100
  Spanning tree enabled protocol ieee
  Root ID    Priority    24676
              Address     00D0.FF04.11EE
              This bridge is the root
              Hello Time   2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    24676 (priority 24576 sys-id-ext 100)
              Address     00D0.FF04.11EE
              Hello Time   2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time   20

Interface      Role Sts Cost      Prio.Nbr Type
-----  
Gi7/1          Desg FWD 4      128.8    P2p
Gi5/1          Desg FWD 4      128.6    P2p
Gi9/1          Desg FWD 19     128.10   P2p
Po2            Desg FWD 4      128.13   P2p

CORE-SW-Odulaja>show ip interface brief
Interface          IP-Address      OK? Method Status      Protocol
Port-channel1      unassigned      YES manual down      down
Port-channel2      unassigned      YES manual up       up
FastEthernet0/1    unassigned      YES manual down      down
FastEthernet1/1    unassigned      YES manual down      down
FastEthernet2/1    unassigned      YES manual down      down
FastEthernet3/1    unassigned      YES manual down      down
FastEthernet4/1    unassigned      YES manual down      down
GigabitEthernet5/1 unassigned      YES manual up       up
GigabitEthernet6/1 unassigned      YES manual down      down
GigabitEthernet7/1 unassigned      YES manual up       down
GigabitEthernet8/1 unassigned      YES manual up       up
GigabitEthernet9/1 unassigned      YES manual up       up
Vlan1             unassigned      YES manual administratively down down
Vlan100           192.168.10.130 YES manual up       up

CORE-SW-Odulaja>show cdp neighbors
Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
                  S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone
Device ID      Local Intrfce     Holdtme    Capability      Platform  Port ID
R1-Odulaja    Gig 5/1          164         R             C1900      Gig 0/0
R1-Odulaja    Gig 5/1          164         R             C1900      Gig 0/0.10
R1-Odulaja    Gig 5/1          164         R             C1900      Gig 0/0.20
SW2-Odulaja   Po 2            164         S             PT3000     Gig 8/1
R1-Odulaja    Gig 5/1          164         R             C1900      Gig 0/0.100
SW2-Odulaja   Po 2            164         S             PT3000     Po 2
```

Part 9: Summary and Conclusion

Summary:

This project successfully demonstrates VLAN segmentation, trunking, EtherChannel (LACP), STP redundancy, router-on-a-stick inter-VLAN routing, and SSH secure management. Each switch and router was configured according to best practices for redundancy, scalability, and security.

Key Achievements:

- VLANs 10, 20, and 100 implemented across three switches.
- LACP EtherChannel created between core and access switches.
- STP verified with distinct root bridges per VLAN.
- Router subinterfaces configured for inter-VLAN routing.
- SSH access enabled and verified from Admin PC.
- Full end-to-end connectivity achieved with redundancy and secure management.