

Networking group project

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Background of the organization

**Name and Purpose**

St. John Baptist De La Salle Catholic School is an educational establishment that provides education for both elementary and high school students. Its main goal is to deliver high academic instruction while promoting discipline and character growth among learners.

**Location and Infrastructure**

The school is located in Addis Ababa, Ethiopia, specifically near Asko. It operates within a single, architecturally distinct building that accommodates all its facilities. The spacious structure houses classrooms, administrative offices for teachers and directors, libraries, science laboratories, and dedicated ICT rooms, all under one roof.

**Existing IT Infrastructure**

Currently, the school has a basic IT setup that partially supports its academic and administrative functions:

 **ICT Room**: Equipped with computers connected through a hub, facilitating student learning in information and communication technology. This room is located in the third floor of the building.

 **Library**: Contains a computer system linked to a hub, allowing limited digital resources and research access. There is one library with these facilities located at the ground floor of the building.

 **Administrative Offices**: Computers are available for the directors and staff, supporting office tasks and communication. It is located in the second and third floor of the building.

 **Finance Office**: A computer is used by cashiers for financial transactions and record-keeping. The office is located in the ground floor.

While the school has some IT infrastructure, the lack of an integrated network limits its ability to maximize efficiency and connectivity.

**Need for a Local Area Network (LAN)**  
A Local Area Network is essential to modernize the school’s IT systems and address existing inefficiencies. Key benefits of implementing a LAN include:

1. **Improved Communication**: Enables seamless communication among departments, teachers, and administrative staff.
2. **Resource Sharing**: Facilitates sharing of printers, scanners, and digital learning resources across all departments.
3. **Centralized Data Access**: Provides a secure and centralized repository for managing student records, academic reports, and administrative data.
4. **Enhanced Learning Opportunities**: Allows students and teachers to access online resources and collaborate in real time through the ICT room and library systems.
5. **Operational Efficiency**: Streamlines administrative processes such as attendance tracking, financial transactions, and report generation.
6. **Network Security**: Implements advanced security measures to protect sensitive data and prevent unauthorized access.

**Potential Impact of the LAN**

Establishing a strong LAN will lead to notable enhancements in both operational efficiency and academic support within the school. It will improve the educational experience by granting students and staff dependable access to digital tools and resources, while also facilitating effective collaboration between departments. Furthermore, the LAN will establish the school as an advanced technology school, equipping its students more effectively for the challenges of a digital future.

**configuration**

1. Vlan **configuration**

Below configuration apply on multilayer switch

Switch>enable

Switch#

Switch#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

Switch(config)#

Switch(config-vlan)#vlan 10

Switch(config-vlan)# name datacenter

Switch(config)#vlan 20

Switch(config-vlan)# name dep1

Switch(config-vlan)#vlan 30

Switch(config-vlan)# name dep2

Switch(config-vlan)#vlan 40

Switch(config-vlan)# name dep3

Switch(config-vlan)#vlan 50

Switch(config-vlan)# name dep4

Switch(config-vlan)#

Switch(config-vlan)#exit

Switch(config)#exit

Switch#

%SYS-5-CONFIG\_I: Configured from console by console

Port configuration

Switch(config)#int fa0/1

Switch(config-if)#switchport mode trunk

Switch(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

Switch(config-if)#switchport trunk allowed vlan 10,20,30,40,50

Switch(config-if)#exit

Switch(config)#do write

Building configuration...

[OK]

Switch(config)#int fa0/2

Switch(config-if)#switchport mode trunk

Switch(config-if)#

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed state to up

Switch(config-if)#switchport trunk allowed vlan 10,20,30,40,50

Switch(config-if)#exit

Switch(config)#do write

Building configuration...

[OK]

Switch(config)#int fa0/3

Switch(config-if)#switchport mode trunk

Switch(config-if)#

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to up

Switch(config-if)#switchport trunk allowed vlan 10,20,30,40,50

Switch(config-if)#exit

Switch(config)#do write

Building configuration...

[OK]

Switch(config)#int fa0/4

Switch(config-if)#switchport mode trunk

Switch(config-if)#

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed state to up

Switch(config-if)#switchport trunk allowed vlan 10,20,30,40,50

Switch(config-if)#exit

Switch(config)#do write

Building configuration...

[OK]

Switch(config)#int fa0/5

Switch(config-if)#switchport mode trunk

Switch(config-if)#

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

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

Switch(config-if)#switchport trunk allowed vlan 10,20,30,40,50

Switch(config-if)#exit

Switch(config)#do write

Building configuration...

[OK]

Switch0

Switch>enable

Switch#conf t

Enter configuration commands, one per line. End with CNTL/Z.

Switch(config-vlan)#int range fa0/1-24

Switch(config-if-range)#switchport mode access

Switch(config-if-range)#switchport access vlan 10

Switch(config-if-range)#exit

Switch(config)#exit

Switch#

%SYS-5-CONFIG\_I: Configured from console by console

Switch1

Switch>enable

Switch#conf t

Enter configuration commands, one per line. End with CNTL/Z.

Switch(config)#int fa0/1

Switch(config-if)#switchport mode trunk

Switch(config-if)#switchport trunk allowed vlan 10,20,30,40,50

Switch(config-if)#exit

Switch(config)#do write

Building configuration...

[OK]

Switch(config-vlan)#int range fa0/2-24

Switch(config-if-range)#switchport mode access

Switch(config-if-range)#switchport access vlan 20

Switch(config-if-range)#exit

Switch(config)#exit

Switch#

%SYS-5-CONFIG\_I: Configured from console by console

Switch2

Switch>enable

Switch#conf t

Enter configuration commands, one per line. End with CNTL/Z.

Switch(config)#int fa0/1

Switch(config-if)#switchport mode trunk

Switch(config-if)#switchport trunk allowed vlan 10,20,30,40,50

Switch(config-if)#exit

Switch(config)#do write

Building configuration...

[OK]

Switch(config-vlan)#int range fa0/2-24

Switch(config-if-range)#switchport mode access

Switch(config-if-range)#switchport access vlan 30

Switch(config-if-range)#exit

Switch(config)#exit

Switch#

%SYS-5-CONFIG\_I: Configured from console by console

Switch3

Switch>enable

Switch#conf t

Enter configuration commands, one per line. End with CNTL/Z.

Switch(config)#int fa0/1

Switch(config-if)#switchport mode trunk

Switch(config-if)#switchport trunk allowed vlan 10,20,30,40,50

Switch(config-if)#exit

Switch(config)#do write

Building configuration...

[OK]

Switch(config-vlan)#int range fa0/2-24

Switch(config-if-range)#switchport mode access

Switch(config-if-range)#switchport access vlan 40

Switch(config-if-range)#exit

Switch(config)#exit

Switch#

%SYS-5-CONFIG\_I: Configured from console by console

Switch4

Switch>enable

Switch#conf t

Enter configuration commands, one per line. End with CNTL/Z.

Switch(config)#int fa0/1

Switch(config-if)#switchport mode trunk

Switch(config-if)#switchport trunk allowed vlan 10,20,30,40,50

Switch(config-if)#exit

Switch(config)#do write

Building configuration...

[OK]

Switch(config-vlan)#int range fa0/2-24

Switch(config-if-range)#switchport mode access

Switch(config-if-range)#switchport access vlan 50

Switch(config-if-range)#exit

Switch(config)#exit

Switch#

%SYS-5-CONFIG\_I: Configured from console by console

Router cofiguration

Router(config)#interface GigabitEthernet0/1

Router(config-subif)#

%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up

Router(config-subif)# ip address 192.168.10.1 255.255.255.0

Router(config-subif)#exit

Router(config)#do write

Building configuration...

[OK]

Router(config)#interface GigabitEthernet0/0.20

Router(config-subif)#encapsulation dot1Q 20

Router(config-subif)# ip address 10.0.0.1 255.128.0.0

Router(config-subif)#exit

Router(config)#do write

Building configuration...

[OK]

Router(config)#interface GigabitEthernet0/0.30

Router(config-subif)#encapsulation dot1Q 30

Router(config-subif)# ip address 10.128.0.1 255.128.0.0

Router(config-subif)#exit

Router(config)#do write

Building configuration...

[OK]

Router(config)#interface GigabitEthernet0/0.40

Router(config-subif)#encapsulation dot1Q 40

Router(config-subif)# ip address 172.16.0.1 255.255.0.0

Router(config-subif)#exit

Router(config)#do write

Building configuration...

[OK]

Router(config)#interface GigabitEthernet0/0.50

Router(config-subif)#encapsulation dot1Q 50

Router(config-subif)# ip address 192.168.0.1 255.255.255.0

Router(config-subif)#exit

Router(config)#do write

Building configuration…

[OK]

Router(config)#ip dhcp pool VLAN20

Router(dhcp-config)#network 10.0.0.0 255.128.0.0

Router(dhcp-config)#default-router 10.0.0.1

Router(dhcp-config)#dns-server 192.168.10.3

Router(dhcp-config)#exit

Router(config)#do write

Building configuration...

[OK]

Router(config)#ip dhcp pool VLAN30

Router(dhcp-config)#network 10.128.0.0 255.128.0.0

Router(dhcp-config)#default-router 10.128.0.1

Router(dhcp-config)#dns-server 192.168.10.3

Router(dhcp-config)#exit

Router(config)#do write

Building configuration...

[OK]

Router(config)#ip dhcp pool VLAN40

Router(dhcp-config)#network 172.16.0.0 255.255.255.0

Router(dhcp-config)#default-router 172.16.0.1

Router(dhcp-config)#dns-server 192.168.10.3

Router(dhcp-config)#exit

Router(config)#do write

Building configuration...

[OK]

Router(config)#ip dhcp pool VLAN50

Router(dhcp-config)#network 192.168.0.0 255.255.255.0

Router(dhcp-config)#default-router 192.168.0.1

Router(dhcp-config)#dns-server 192.168.10.3

Router(dhcp-config)#exit

Router(config)#do write

Building configuration...

[OK]

Router(config)#ip dhcp excluded-address 192.168.10.0 192.168.20.0

Router(config)#exit