**Project** **Title: Designing Local Area Network for Shikudad High school**

**Background of the organization**

Shikudad Preparatory and High School has been a longstanding pillar in the local education community, dedicated to nurturing the intellectual growth of its students. However, the school currently grapples with a significant challenge - a weak or virtually non-existent network infrastructure. The absence of a robust network has hindered the smooth operation of various aspects of the institution, posing challenges to the learning system.

In the absence of an adequate network infrastructure, Shikudad School faces difficulties in facilitating efficient communication between students, teachers, and administrators. Traditional methods of information dissemination, such as paper-based communication and manual record-keeping, have become time-consuming and error-prone. This inefficiency not only impacts the administrative workflow but also hampers the timely dissemination of important information to parents and guardians.

Moreover, the lack of a proper network infrastructure limits the integration of technology in the classroom. Modern education relies heavily on digital resources, online collaboration tools, and e-learning platforms. Shikudad School's students and faculty are unable to leverage these technological advancements fully, hindering the potential for interactive and dynamic learning experiences.

**Why the network is so important for the organization ?**

Absolutely, in the modern educational landscape, implementing a Local Area Network (LAN) is crucial for the effective functioning of schools and educational institutions, including preparatory and high schools like Shikudad. A Local Area Network enables the interconnection of computers, devices, and resources within a limited geographic area, such as a school campus. Here are some reasons why Shikudad School would benefit from having a Local Area Network:

1. **Improved Communication:**

A LAN facilitates seamless communication among different departments, classrooms, and administrative offices within the school. It streamlines the exchange of information, making it easier for teachers, staff, and administrators to collaborate and share important updates.

1. **Efficient Resource Sharing:**

With a LAN in place, resources such as printers, projectors, and other equipment can be shared more efficiently among different departments and classrooms. This reduces redundancy and promotes cost-effective use of resources.

1. **Centralized Data Management:**

Implementing a LAN allows for centralized data storage and management. Student records, academic materials, and administrative documents can be stored securely and accessed by authorized personnel, streamlining data organization and retrieval.

1. **Enhanced Teaching and Learning:**

A LAN supports the integration of technology in the classroom. Teachers can access online resources, conduct virtual lessons, and utilize interactive educational tools. Students can collaborate on projects, participate in online discussions, and access digital learning materials.

1. **Administrative Efficiency:**

From attendance tracking to grade management, administrative tasks become more efficient with a well-implemented LAN. Automation of routine tasks reduces the administrative burden on staff, allowing them to focus on more strategic aspects of school management.

**Number of Hosts**

**physics Department(Department A)** = 15  
**Maths Department** **(Department B)** = 15

**Biology Department (Department C)** = 15

**ICT Department(Department D)** = 30

**Total Approximate host** = 75

**Configuration’s detail**

**ROUTER 0 (Data center)**

Current configuration : 764 bytes

!

version 12.4

no service timestamps log datetime msec

no service timestamps debug datetime msec

no service password-encryption

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hostname Router

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ip cef

no ipv6 cef

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spanning-tree mode pvst

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!

interface FastEthernet0/0

ip address 192.168.2.193 255.255.255.192

duplex auto

speed auto

!

interface FastEthernet0/1

ip address 172.16.0.4 255.255.0.0

duplex auto

speed auto

!

interface Vlan1

no ip address

shutdown

!

ip classless

ip route 10.0.0.0 255.192.0.0 172.16.0.5

ip route 10.64.0.0 255.192.0.0 172.16.0.5

ip route 192.168.2.64 255.255.255.192 172.16.0.5

ip route 192.168.2.0 255.255.255.192 172.16.0.5

!

ip flow-export version 9

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line con 0

!

line aux 0

!

line vty 0 4

login

!

!

!

end

**ROUTER 1 (Physics Department )**

Current configuration : 890 bytes

!

version 15.1

no service timestamps log datetime msec

no service timestamps debug datetime msec

no service password-encryption

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hostname Router

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ip cef

no ipv6 cef

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!

license udi pid CISCO2911/K9 sn FTX15240NQR-

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!

spanning-tree mode pvst

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!

interface GigabitEthernet0/0

no ip address

duplex auto

speed auto

!

interface GigabitEthernet0/1

ip address 10.0.0.1 255.192.0.0

duplex auto

speed auto

!

interface GigabitEthernet0/2

ip address 10.192.0.1 255.192.0.0

duplex auto

speed auto

!

interface Vlan1

no ip address

shutdown

!

ip classless

ip route 192.168.2.0 255.255.255.192 10.192.0.2

ip route 192.168.2.64 255.255.255.192 10.192.0.2

ip route 10.64.0.0 255.192.0.0 10.192.0.2

ip route 192.168.2.192 255.255.255.192 10.192.0.2

!

ip flow-export version 9

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!

line con 0

!

line aux 0

!

line vty 0 4

login

!

!

!

End

**ROUTER 2(Maths Department)**

Current configuration : 1001 bytes

!

version 15.1

no service timestamps log datetime msec

no service timestamps debug datetime msec

no service password-encryption

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hostname Router

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no ip cef

no ipv6 cef

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license udi pid CISCO2911/K9 sn FTX15245KH8-

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spanning-tree mode pvst

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!

interface GigabitEthernet0/0

no ip address

duplex auto

speed auto

!

interface GigabitEthernet0/1

ip address 10.64.0.1 255.192.0.0

duplex auto

speed auto

!

interface GigabitEthernet0/2

no ip address

duplex auto

speed auto

!

interface Serial0/3/0

ip address 10.128.0.1 255.192.0.0

!

interface Serial0/3/1

no ip address

clock rate 2000000

shutdown

!

interface Vlan1

no ip address

shutdown

!

ip classless

ip route 192.168.2.0 255.255.255.192 10.128.0.2

ip route 192.168.2.64 255.255.255.192 10.128.0.2

ip route 10.0.0.0 255.192.0.0 10.128.0.2

ip route 192.168.2.192 255.255.255.192 10.128.0.2

!

ip flow-export version 9

!

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!

line con 0

!

line aux 0

!

line vty 0 4

login

!

!

!

end

**Router 3 (Biology Department)**

Current configuration : 1050 bytes

!

version 15.1

no service timestamps log datetime msec

no service timestamps debug datetime msec

no service password-encryption

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hostname Router

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no ip cef

no ipv6 cef

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license udi pid CISCO2911/K9 sn FTX1524RCB0-

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spanning-tree mode pvst

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!

interface GigabitEthernet0/0

no ip address

duplex auto

speed auto

!

interface GigabitEthernet0/1

ip address 192.168.2.1 255.255.255.192

duplex auto

speed auto

!

interface GigabitEthernet0/2

no ip address

duplex auto

speed auto

shutdown

!

interface Serial0/3/0

no ip address

clock rate 2000000

shutdown

!

interface Serial0/3/1

ip address 192.168.2.129 255.255.255.192

clock rate 2000000

!

interface Vlan1

no ip address

shutdown

!

ip classless

ip route 10.0.0.0 255.192.0.0 192.168.2.130

ip route 192.168.2.64 255.255.255.192 192.168.2.130

ip route 10.64.0.0 255.192.0.0 192.168.2.130

ip route 192.168.2.192 255.255.255.192 192.168.2.130

!

ip flow-export version 9

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!

line con 0

!

line aux 0

!

line vty 0 4

login

!

!

!

end

**ROUTER 4(Central router)**

Current configuration : 1061 bytes

!

version 15.1

no service timestamps log datetime msec

no service timestamps debug datetime msec

no service password-encryption

!

hostname Router

!

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no ip cef

no ipv6 cef

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!

license udi pid CISCO2911/K9 sn FTX1524M2O7-

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spanning-tree mode pvst

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!

interface GigabitEthernet0/0

ip address 192.168.2.70 255.255.255.192

duplex auto

speed auto

!

interface GigabitEthernet0/1

ip address 172.16.0.5 255.255.0.0

duplex auto

speed auto

!

interface GigabitEthernet0/2

ip address 10.192.0.2 255.192.0.0

duplex auto

speed auto

!

interface Serial0/3/0

ip address 10.128.0.2 255.192.0.0

clock rate 2000000

!

interface Serial0/3/1

ip address 192.168.2.130 255.255.255.192

!

interface Vlan1

no ip address

shutdown

!

ip classless

ip route 10.0.0.0 255.192.0.0 10.192.0.1

ip route 10.64.0.0 255.192.0.0 10.128.0.1

ip route 192.168.2.0 255.255.255.192 192.168.2.129

ip route 192.168.2.192 255.255.255.192 172.16.0.4

!

ip flow-export version 9

!

!

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!

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!

line con 0

!

line aux 0

!

line vty 0 4

login

!

!

!

end