PROJECT TITLE

A COURSE PROJECT REPORT

Under the guidance of

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Soc, SRMIST

In partial fulfilment for the Course

of

18CSC302J - COMPUTER NETWORKS

in

Department of Computational Intelligence

FACULTY OF ENGINEERING AND TECHNOLOGY

SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

Kattankulathur, Chenpalpattu District

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1. ABSTRACT

Course Project – Network design for bank

Bank network design

Project Scope

To implement network connection for bank using CISCO Packet Tracer. The proposed plan is for multistoried banks. The model has arrangements for multiple departments like ATM, Insurance, IT, etc. Along with proper network connection, features like effective communication in-between departments, secure ATM services is also required.

Aim

- To implement network design for a Bank that has multiple departments.
- To keep the working of these departments, separate from each other.
- Effective communication in-between all departments.
- To keep the ATM related actions as secure as possible.

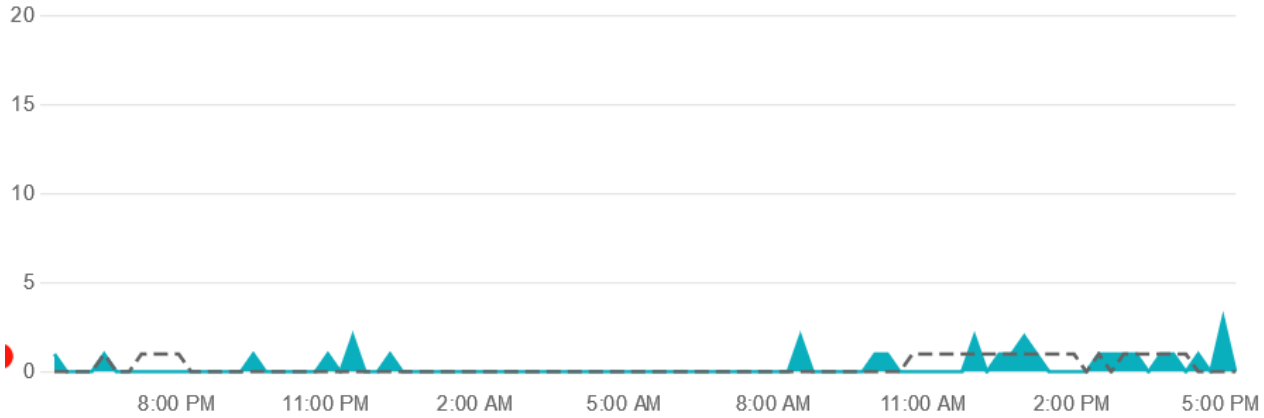
Modules:

Module	Description
Basic Network Setup	To check the scope of a project/model like this and keep a track of the competition involved. Also, to introduce new features into the model/project.
Network Design	To design a network that can function efficiently and smoothly for multiple consumer/staff.
Priority Levels	The department/network part handling consumers is expected to have maximum network usage. Thus, to set up priority levels is important in such a model/project.
Transmission Speed	Network usage is expected to be good in a bank. Thus, transmission speed along with quality is required.
Security	To meet the security requirements of a bank.
Reliability Check	To make a model such that the error rate is as low as possible.

2. INTRODUCTION

Banks in India fall prey to network outages. The analysis for the same is conducted below using some of the statistics.

Outages faced by an "***un-named***" bank of India on one particular day is shown below.

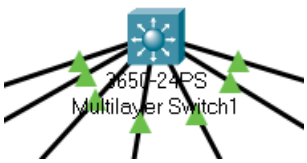


Outages faced by a bank of India is shown

These statistics show that banks in India face outages on regular basis. Thus, there should a solution to the same. Banks need a stable network with negligible power outages and proper security. Thus, the proposed model for our project is to implement the Network design for Bank. Our project tries to stabilize the network by sharing the load on appropriate basis. Moreover, we also provide accurate security to the system. The proposed bank design is expected to have multiple departments. These departments are as follows:

1. IT Department
2. ATM
3. Consumer Services
4. Investments
5. Loan Department
6. Insurance

All of these departments are connected to each other with a multi-layer switch.

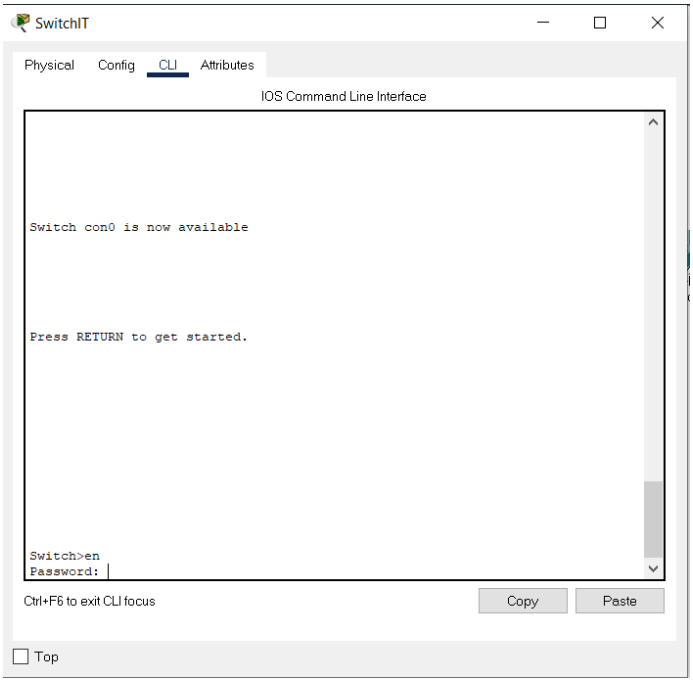


The departments include the following features:

1. **IT Department**

The IT department has a PC-PT and a Server. Both these devices can communicate within each other. The default gateway of IT deoartment is 192.168.10.1/24. This department can handle up to 3 PC-PT devices. Also, there is password enabled for the IT Department switch. In-order to edit/modify the department, user will have to provide with the password.

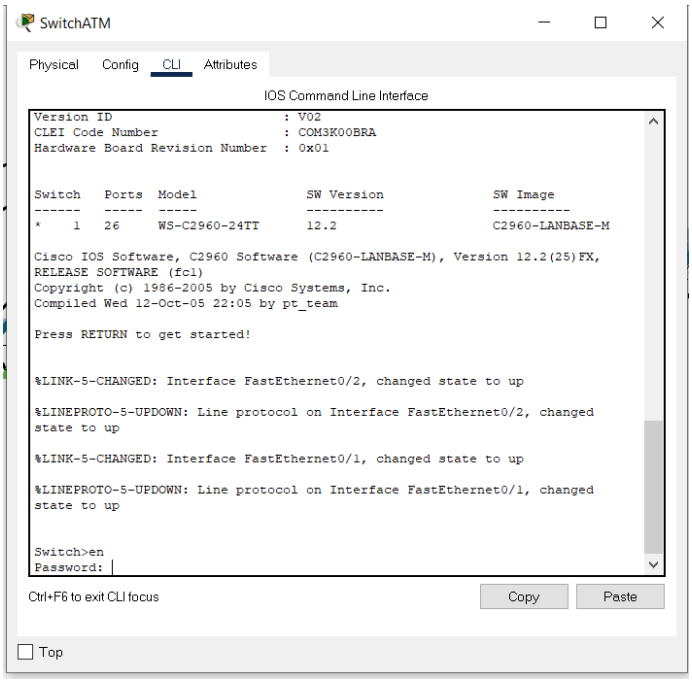
Password protected IT Switch



2. **ATM**

The ATM department consists a switch connected to a PC. The ATM department switch is of the model 2960-24TT. The switch is configured to the multi-layer switch as well. Default gateway for the ATM department is 192.168.20.1

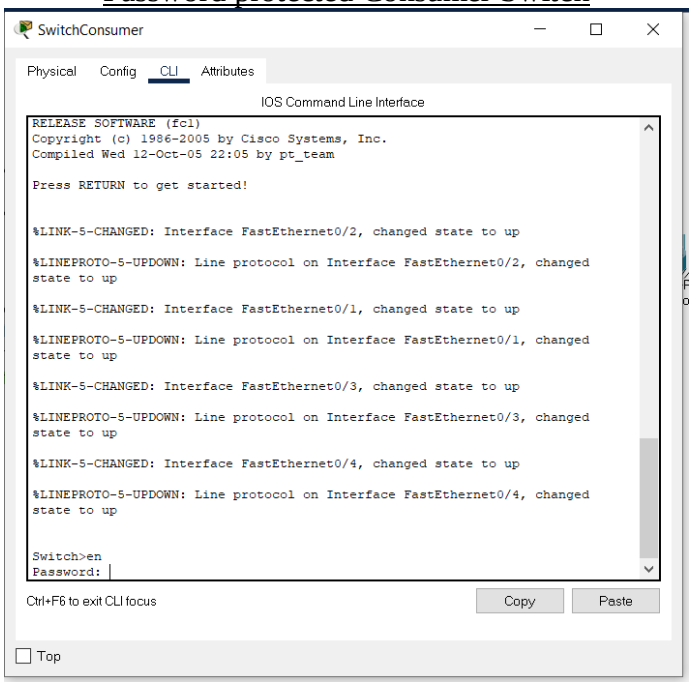
Password protected ATM Switch



3. Consumer Services

The default gateway for consumer services is 192.168.30.0. It consists of three PC of the model PC-PT. All these are configured to the multi-layer switch and can be accessed through the same as well.

Password protected Consumer Switch

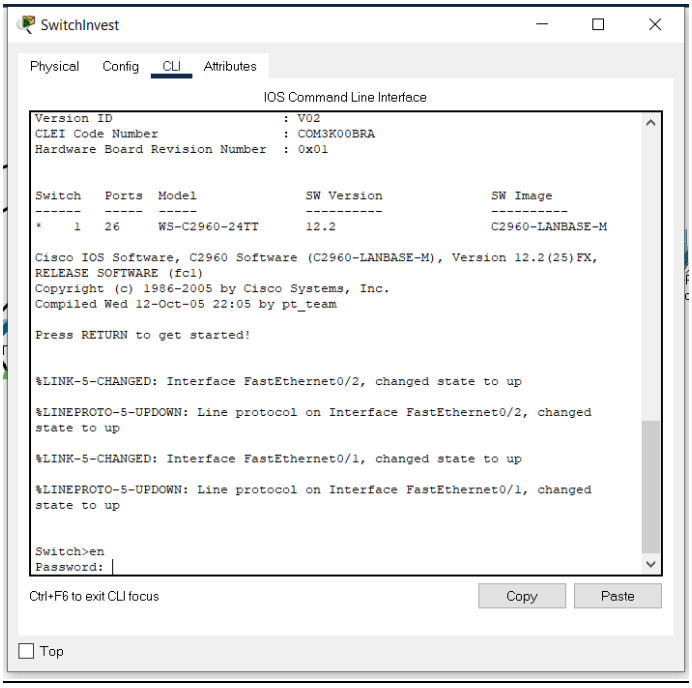


4. Investments

The investments sector consists of one PC that can be accessed through the Investments switch. The default gateway for the same is 192.168.40.0. As any other department, the

investment sector is also password protected.

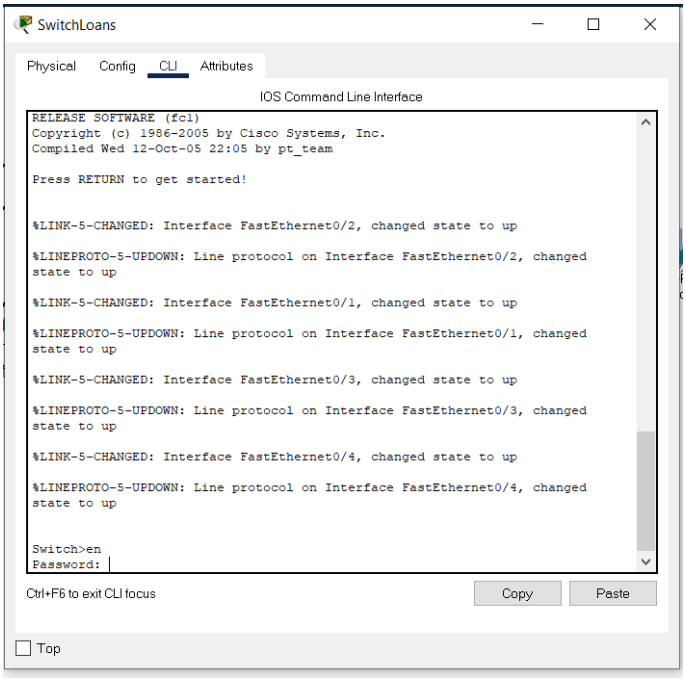
Password protected Investment Switch



5. Loan Department

The Loan Department is connected to the network through the default gateway 192.168.50.0. The department has three PC.

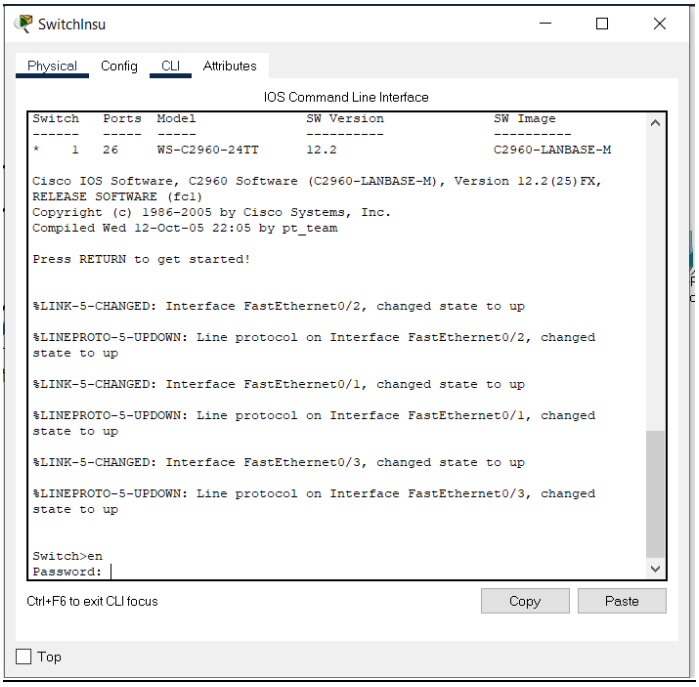
Password protected Loan Switch



6. Insurance

The default gateway of Insurance Department is 192.168.60.0. It consists of two PC's.

Password protected Insurance Switch



3. REQUIREMENT ANALYSIS

The requirement of the project are as follows:

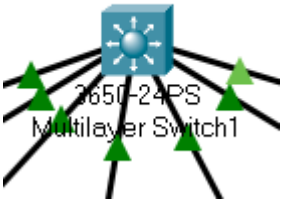
- System Requirements
    - Device/PC of model PC-PT in Cisco Packet Tracer
    - Reliable Multi-layer switch
    - Switches of model
    - Router for guest wi-fi
    - Wireless smartphone

- Other Requirements
    - A minimum connectivity speed of 100 Mbps is required.
    - Target speed is 1 Gps per 100 users.
    - Fast Ethernet/Gigabit Ethernet switches are recommended for connectivity spees
    - Peak traffic is expected to be between 10am – 4pm. Connectivity speed of atleast 10Mbps – 20Mbps during these hours is recommended.
    -

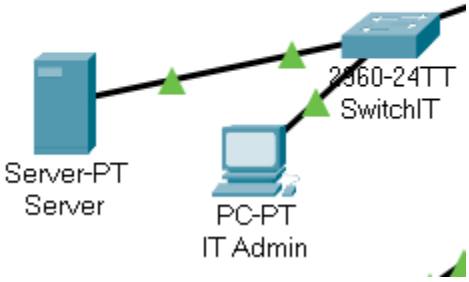
4. ARCHITECTURE AND DESIGN

The network design is divided into six departments. Each department consists of a switch. This switch can be connected to multiple PC's/devices. All these department switches are connected to a multilayer switch. The design for the same is as following:

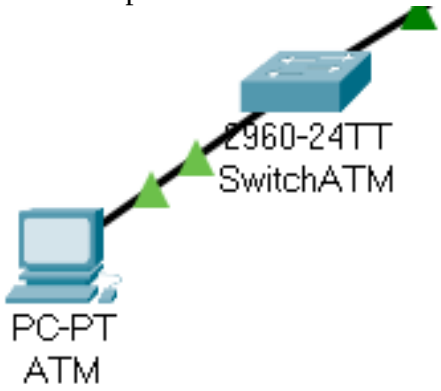
Multilayer Switch:



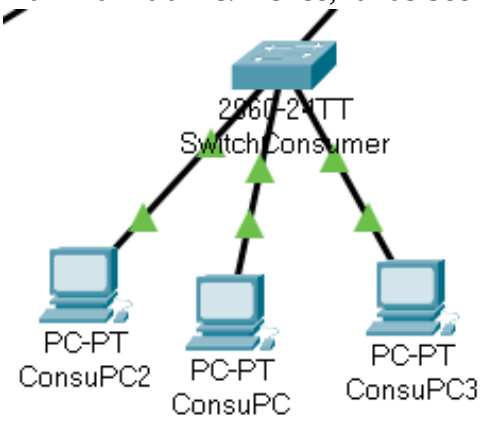
1. IT Department
   The following is the design for IT Department. It consists of a switch connected to a server and a PC.



2. ATM
   Design of ATM department. It consists of a switch connected to a PC. This department can hold up to three such devices securely.

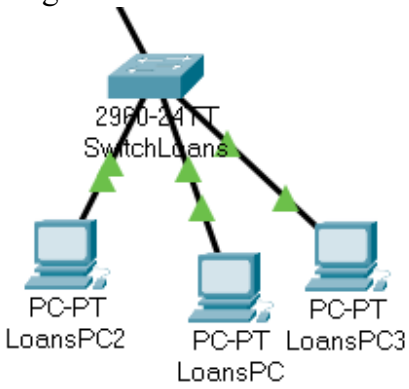


3. Consumer Department
   Design of Consumers Section. The consumers section is believed to be having maximum traffic. Hence, it has been already configured three devices.

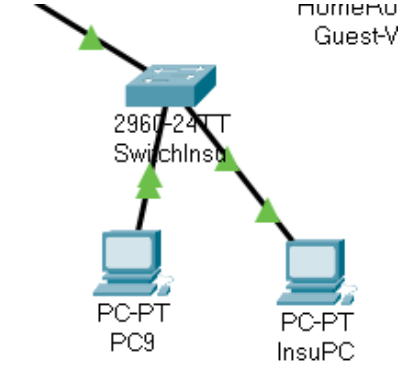


4. Investment Department
   Investment Department design. Investments department has been configured with one PC connected to the switch. It can hold up to three such devices.

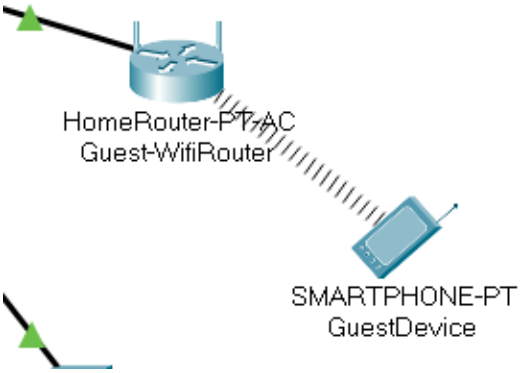
5. Loans
   Loans section design. Loans section also is believed to have considerably high amount of traffic. Thus, like consumers department, the loans department also has been configured with three PC's.



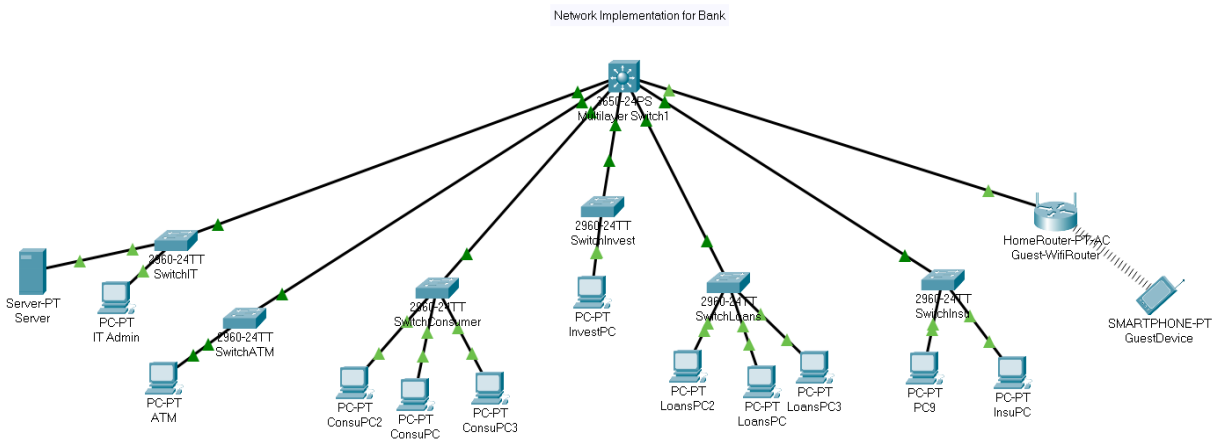
6. Insurance
   Insurance department design. The insurance section has two PC's connected to the same switch.



Home router/Guest Wi-Fi
The design for home router and guest Wi-Fi is as below. The guest Wi-Fi is wirelessly connected to a smartphone/guest device. A PT-AC device is used to show the home router on the cisco packet tracer.



The full design of our project is as shown below:

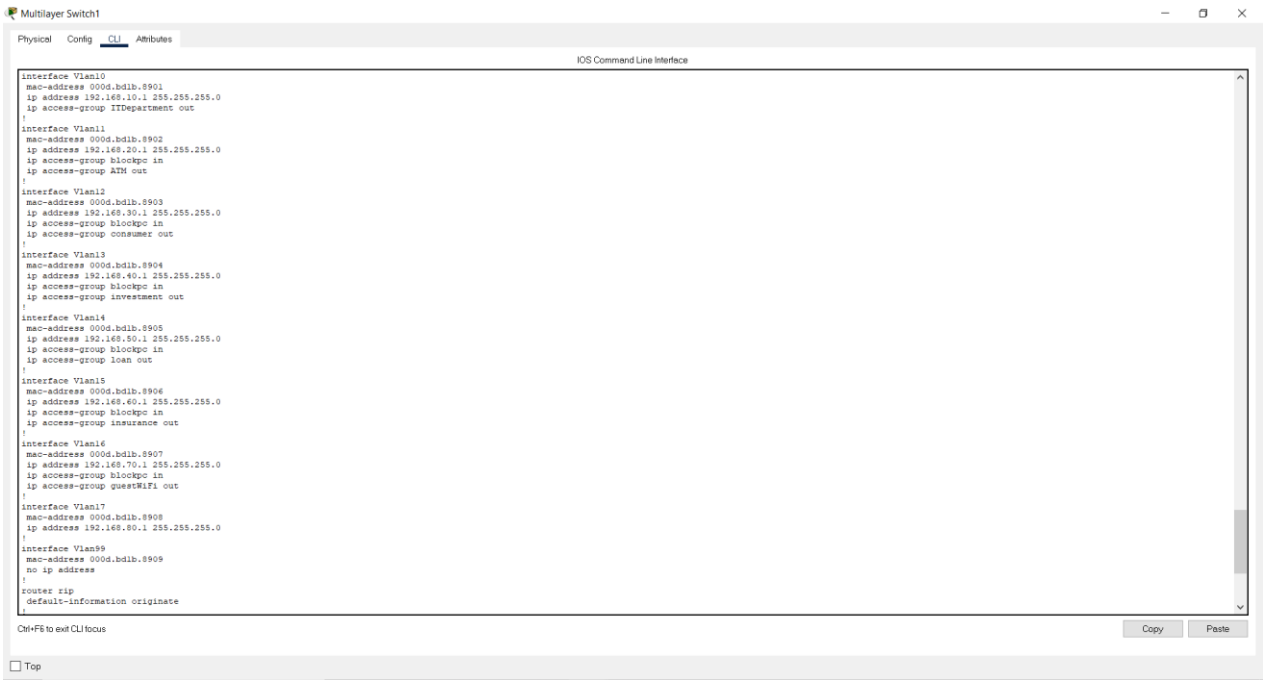

Network Implementation for Bank
3650-24PS
Multilayer Switch1
2960-24TT
SwitchIT
Server-PT
Server
PC-PT
IT Admin
2960-24TT
SwitchATM
PC-PT
ATM
2960-24TT
SwitchConsumer
PC-PT
ConsuPC2
PC-PT
ConsuPC
PC-PT
ConsuPC3
2960-24TT
SwitchInvest
PC-PT
InvestPC
2960-24TT
SwitchLoans
PC-PT
LoansPC2
PC-PT
LoansPC
PC-PT
LoansPC3
2960-24TT
SwitchInsu
PC-PT
PC9
PC-PT
InsuPC
HomeRouter-PT-AC
Guest-WifiRouter
SMARTPHONE-PT
GuestDevice

5. IMPLEMENTATION

The network design is implemented on CISCO Packet Tracer. There are multiple departments in the same. These departments have been given VLAN's. These departments have been configured using these VLAN's to the main multi-layer switch. Also, as of implementing a network design for bank, the two most important features should be:

- No compromise should be made in terms of speed even if the traffic is more
- Security of the network should be proper.

The screenshots of the command line interface of the multilayer switch shows that the departments with their respective VLAN's have been configured to the same. It is illustrated below:



The VLAN connection of each department is as follows:

1. **IT Department**
   VLAN 10
   The IT Department has been configured using VLAN 10. The Ethernet cable has port Gig1/0/1

2. **ATM**
   VLAN 11
   The ATM has been configured using VLAN 20. The Ethernet cable used shall be of Gig1/0/2.

3. **Consumer Services**

VLAN 12
The consumer department has been configured with VLAN 12. Ethernet cable Gig1/0/3.

4. **Investment**
   VLAN 13
   Investments department holds VLAN 13.
   Ethernet cable Gig1/0/4

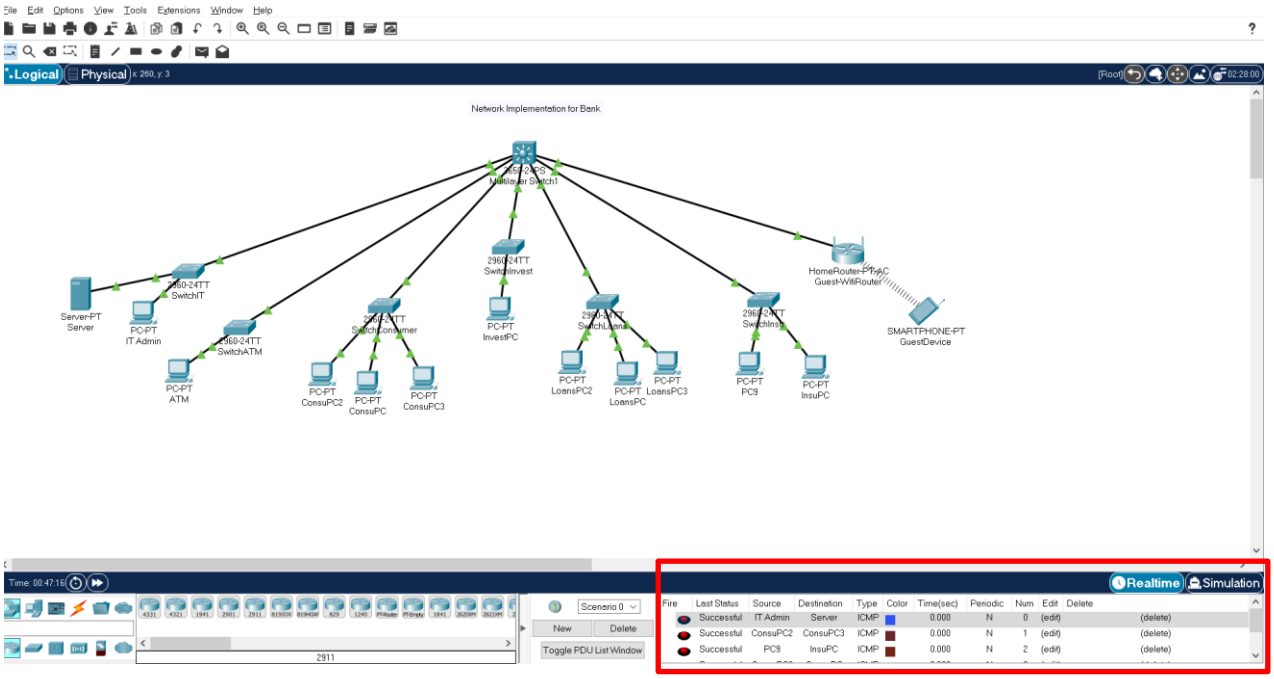
5. **Loans**
   VLAN 14
   Loans department has VLAN 14.
   Ethernet cable Gig1/0/5

6. **Insurance Department**
   VLAN 15
   Insurance department has been configured using VLAN 15.
   Ethernet cable Gig1/0/6

6. EXPERIMENT RESULTS AND ANALYSIS

6.1 RESULTS

While sending messages within the same department, we get a success message. Moreover, as mentioned earlier, since the inter department communication has not been provided, the messages sent to other department do not succeed.



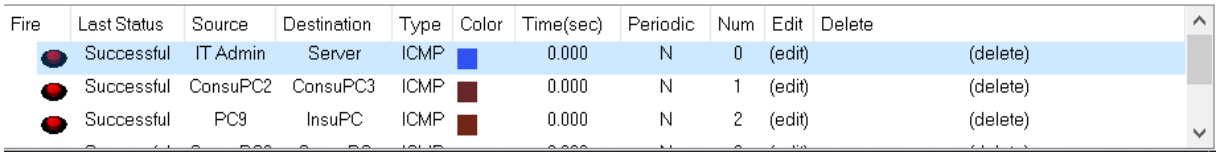
6.2 RESULT ANALYSIS

After conducting the project, the following results are interpreted.

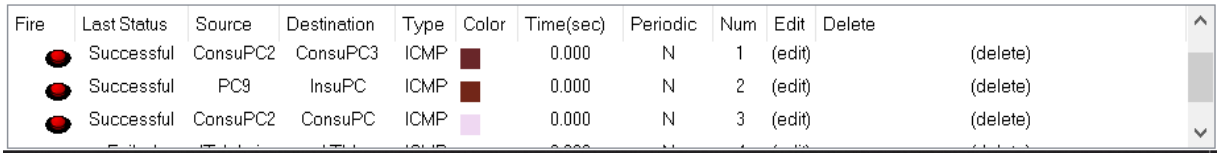
- The messages sent to a device within the department is successful
- Messages sent to a device lying in different department is not successful
- To access any switch/department, users need to enter password
- To access the main/multilayer switch, users need to go through authentication as well.

Analysis of the said results are as follows:

- **The messages sent to a device within the department is successful**
  When the messages are sent from one PC/device to other PC/device lying in the same department, we get a success message. This is true for all departments present. The same is illustrated in the results below.

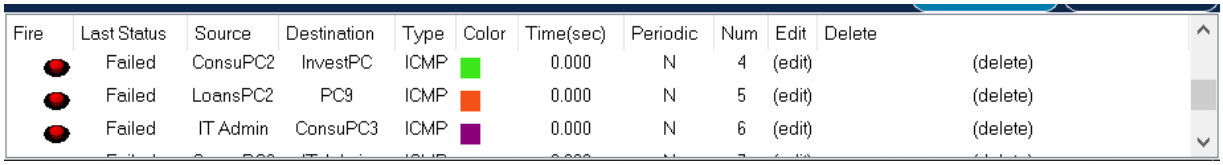


Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	IT Admin	Server	ICMP		0.000	N	0	(edit)	(delete)
	Successful	ConsuPC2	ConsuPC3	ICMP		0.000	N	1	(edit)	(delete)
	Successful	PC9	InsuPC	ICMP		0.000	N	2	(edit)	(delete)

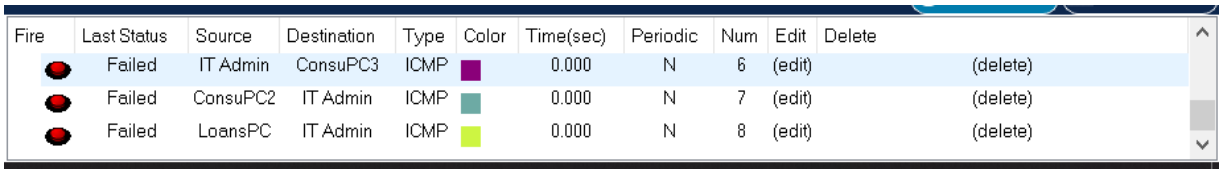


Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	ConsuPC2	ConsuPC3	ICMP		0.000	N	1	(edit)	(delete)
	Successful	PC9	InsuPC	ICMP		0.000	N	2	(edit)	(delete)
	Successful	ConsuPC2	ConsuPC	ICMP		0.000	N	3	(edit)	(delete)

- **Messages sent to a device lying in different department is not successful**
  When the messages are sent from one PC/device to other PC/device lying in different departments, we do not get a success message. Thus, the mentioned analysis shows that the inter department connection has not been established. This is true for all departments present. The same is illustrated in the results below.



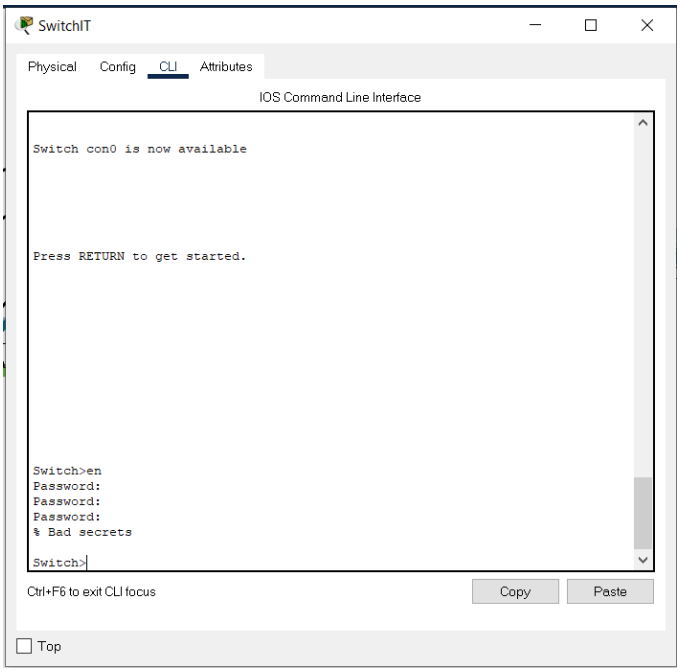
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Failed	ConsuPC2	InvestPC	ICMP		0.000	N	4	(edit)	(delete)
	Failed	LoansPC2	PC9	ICMP		0.000	N	5	(edit)	(delete)
	Failed	IT Admin	ConsuPC3	ICMP		0.000	N	6	(edit)	(delete)



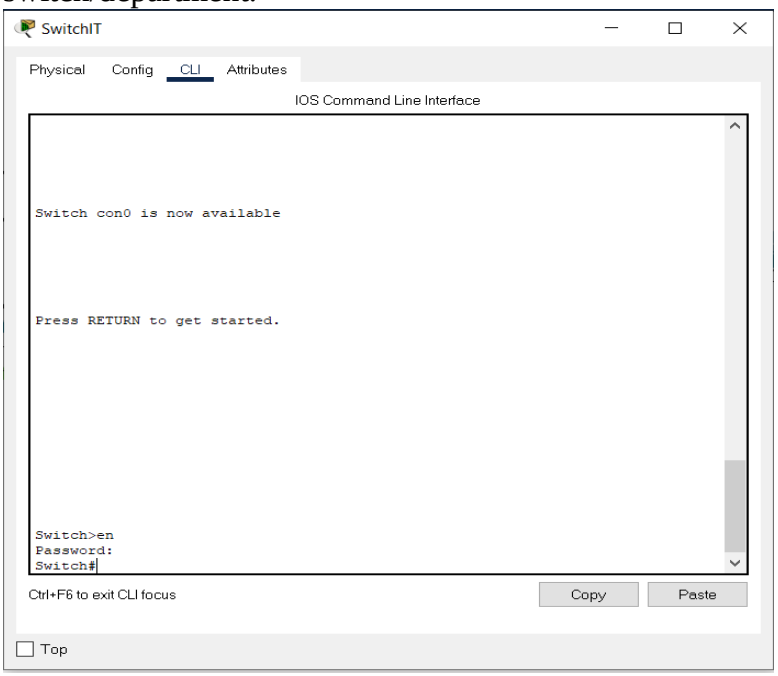
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Failed	IT Admin	ConsuPC3	ICMP		0.000	N	6	(edit)	(delete)
	Failed	ConsuPC2	IT Admin	ICMP		0.000	N	7	(edit)	(delete)
	Failed	LoansPC	IT Admin	ICMP		0.000	N	8	(edit)	(delete)

- **To access any switch/department, users need to enter password**
  To access any particular department, users have to enter password. This is done to ensure security in the system.

  When wrong password is entered
  The system will not allow a user to configure any switch/department unless the correct password is entered. Also, the limit to enter password is set to three times. If a user enters wrong password for more than three times, they will be redirected to the command line interface. The below illustrated result screenshot shows the same.

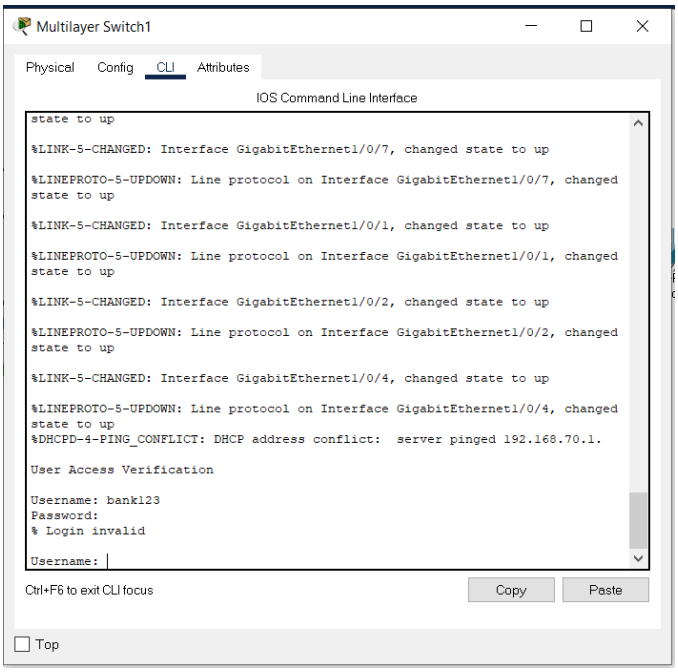


When correct password is entered
If a user enters correct password, then they can continue to configure the switch/department.



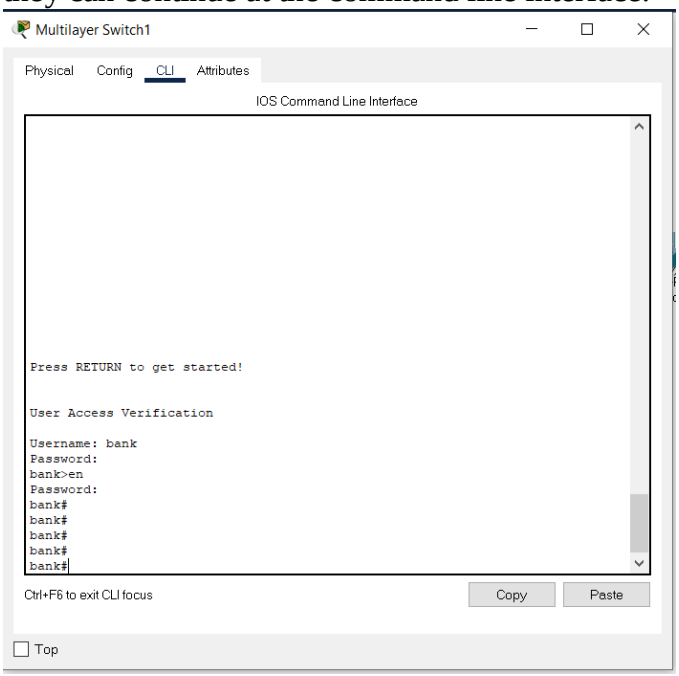
- **To access the main/multilayer switch, users need to go through authentication as well.**
  If a user wants to access the multilayer switch, they have to enter Username as well as password.

  When wrong credentials are entered
  If the credentials entered by a particular user are wrong, then the system will display a message saying the same. The user will have to enter correct username as well as password to configure the main switch. The same is illustrated:



When correct credentials are entered

When any particular user enters correct credentials i.e. username and password, they can continue at the command line interface.



6.3 CONCLUSION AND FUTURE WORK

Conclusion

The above mentioned report is to design a network for bank. The mentioned project can be implemented for any bank with multiple departments. The departments will be having effective communication. The system is accurately secured. Our project roles were maintaining, developing, implementing, supporting and designing communication networks within a bank.

Future work

Our work after the implementation and deployment of project will be:

- Update on regular intervals
- Re design the project whenever needed
- Keep a track on the recent modifications in the field
- Modify the project wherever necessary
- Ensure that the security of the project is maintained
- Check the system on regular basis.

7. REFERENCES

For references, the following resources were taken:

- Books
  The following books were used for reference to build the mentioned project:
  - Data.And.Computer.Communications.8e.WilliamStallings
  - Tcp_ip-protocol-suite-4th-ed-b-forouzan-mcgraw-hill-2010-bbs
- Our knowledge/expertise in using the cisco packet tracer.
- Other references:
  - https://prezi.com/pssdcuuyewpo/banking-network-in-cisco-packet-tracer/
  - https://www.slideshare.net/shakibansari2/banking-and-atm-networking-reports

Report Should contain minimum of 25 pages and maximum of 30 pages