NIT SRINAGAR

Computer Networks Semester Project - Submission 01

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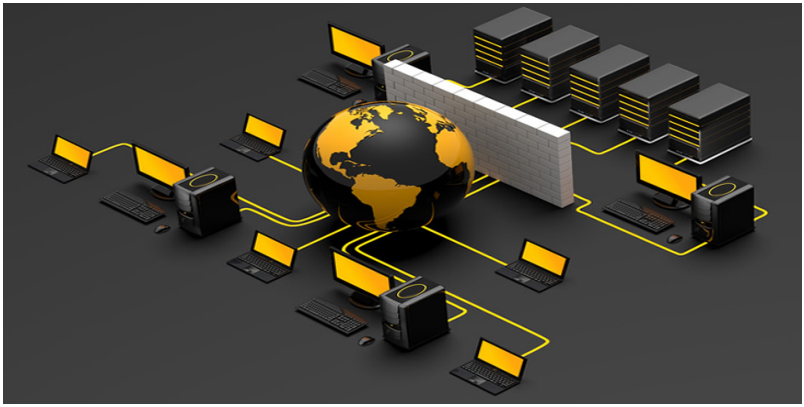

Instructor **Iqra Altaf Gillani**

Members Details :

Rajkamal Singh	**2018BITE054**	**35**
Prashant Maurya	**2018BITE078**	**59**

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1 Language and Libraries Used

1.1 Language

C++ : These project is created and executed on Visual Studio with all the required extensions downloaded to compile and run a C++ file.

1.2 Libraries

All the libraries are included in the code with the help of the header files. The list of header files used by program are listed below.

1. iostream
2. sstream
3. string
4. queue
5. cmath
6. algorithm

Note : To run the program properly keep all the custom created header files and executable file(.cpp) in same folder.

2 Important Functions, Files and Their Explanation

2.1 Devices

2.1.1 End Device

Different functionalities and properties of End Devices are implemented in header file **(EndDevices.h)**.

Properties inculded are :

1. Device Id
2. Display Name
3. Ip address
4. Mac address
5. Connection

2.1.2 Hub

Different functionalities and properties of Hubs are implemented in header file **(Hub.h)**.

Properties inculded are :

1. Device Id
2. Display Name
3. List of Connections

2.1.3 Switch

Different functionalities and properties of Switches are implemented in header file **(Switch.h)**.

Properties inculded are :

1. Device Id
2. Display Name
3. List of Connections
4. Address Learning

2.1.4 Bridge

Different functionalities and properties of Bridges are implemented in header file **(Bridge.h)**.

Properties inculded are :

1. Device Id
2. Display Name
3. List of Connections

2.2 Protocols

2.2.1 Access Control

Token Passing is the only access control protocol which is used and it's properties are implemented in header file **(AccessControl.h)**.Whenever there is first time a switch is detected during message transfer it passes the token to the source device.

2.2.2 Flow Control

There are three flow control protocols which are implemented in project. Whenever there is first time a switch is detected during message transfer it asks to choose a flow control protocol and provided the needed information.

1. Stop And Wait protocol is implemented in header file **(StopAndWait.h)**.
2. Go Back N is implemented in header file **(GoBackN.h)**.
3. Selective Repeat protocol is implemented in header file **(SelectiveRepeat.h)**.

2.3 SemProject.cpp File

To excute the program these file is to be compiled and run.These file includes all the custom made header files and takes gives user different choices to create (end devices, hubs, switches, bridges) establish connection between devices, display all the devices and data transfer between end devices with the help of command line input.

2.4 Other Files

There is one more header file **(addressRandom.h)** which is used to generate the mac and ip address for end devices randomly.

3 Assumptions

All the assumptions made while creating and implementing the code are based on the instructions provided.

Following assumptions were made :

1. If selection is to be made then input data type and data type of the value given by user must be same like if input data type is integer then data provided by user must be integer otherwise program might enter a infinite loop.
2. In case of collision either the packet was lost(packet not received) or ack was lost(time out). Any one of the cases is chosen randomly.
3. The device id of end device lies in range 0 and 99 and is generated by system.
4. The device id of hub lies in range 100 and 199 and is generated by system.
5. The device id of switch lies in range 200 and 299 and is generated by system.
6. The device id of bridge lies in range 300 and 399 and is generated by system.

4 Running the Code

To run the program compile and execute the SemProject.cpp file.Keeping all the custom made header files and SemProject.cpp file in same folder .

Basic Requirements

1. In order to run the code the basic software requirements are the c++ compiler and the environment path is set for c++ files.
2. The header files included are already present in basic c++ compiler. No extra library is needed to be downloaded.
3. In order to open the c++ or custom created header files any text editor will do the job.