

### PROJECT SYNOPSIS

DEPARTMENT	Computer Science and Engineering		
TITLE OF THE PROJECT	Design & Implementation of 15 Subnets with BGP		
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MINI - PROJECT TIMELINE (Tentative Start date- End Date)	September 2020 - January 2021		
PROJECT GUIDE DETAILS	Dr. Nagaraj J		
FIELD OF PROJECT	<p>Computer Network is a group of computers connected with each other through wires, optical fibers or optical links so that various devices can interact with each other through a network. The aim of the computer network is the sharing of resources among various devices. In the case of computer network technology, there are several types of networks that vary from simple to complex level. A Router is a process of selecting path along which the data can be transferred from source to the destination. Routing is performed by a special device known as a router.</p> <p>A Router works at the network layer in the OSI model and internet layer in TCP/IP model. A router is a networking device that forwards the packet based on the information available in the packet header and forwarding table. The routing algorithms are used for routing the packets. The routing algorithm is nothing but a software responsible for deciding the optimal path through which packet can be transmitted. The routing protocols use the metric to determine the best path for the packet delivery. The metric is the standard of measurement such as hop count, bandwidth, delay, current load on the path, etc. used by the routing algorithm to determine the optimal path to the destination. The routing algorithm initializes and maintains the routing table for the process of path determination.</p>		

<p>BACKGROUND OF PROJECT WITH REGARD TO THE DRAWBACK ASSOCIATED WITH EXISTING PRODUCT/PROJECT</p>	<p>Border gateway protocol is how the internet routes traffic. Its origins date back to the early days of the internet.</p> <p>Before the complex web of cables, we have today, there were humble beginnings. Sending short words over networks. And half the words didn't arrive. As the internet grows, the need for network routing protocols increases. As the internet becomes more dynamic, we need more dynamic protocols. Today, we have border gateway protocol as the primary routing protocol.</p> <p>BGP was not the first attempt at an internet routing protocol. It also continues to evolve as we have more internet transit and connected devices.</p> <p>Here are some significant events in the years leading up to BGP.</p> <p>1969</p> <p>UCLA sends the first internet message to the Stanford Research Institute. The message was "login", which only "lo" was received. This is the first successful internet message.</p> <p>1971</p> <p>ARPANET (Advanced Research Projects Agency Network) begins to implement the future internet protocol. This is early data packet switching. Later, this provides TCP/IP, which gives us a system of 15 nodes and email.</p> <p>1982</p> <p>The gateway-to-gateway protocol (GGP) is developed. One of the early internet protocols, the only focus was routing based on the number of AS hops. GGP focused on routing internet transit the fewest number of autonomous system (AS) hops to a destination.</p> <p>1984</p> <p>Exterior gateway protocol was formally developed in 1984. It was conceptually discussed in 1982, but the formal announcement did not come until RFC 904. EGP was a tree-like distance-vector internet routing protocol.</p> <p>In December 1984, Cisco Systems is founded. Cisco Systems plays one of the largest roles in the building of the modern internet.</p> <p>1985</p> <p>The National Science Foundation begins to support advanced research and education in networking.</p> <p>1986</p> <p>The first super computers are connected to the internet. The National Science Foundation Network (NSFNET) initiated TCP/IP connections and operations. This becomes the first form of the internet backbone.</p> <p>1988</p> <p>The Routing Information Protocol (RIP), RFC 1058, is developed. This is the oldest distance-vector routing protocol in its modern context. This begins to lay the groundwork for BGP.</p>
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	<p>Border Gateway Protocol is Invented</p> <p>The 1990s are the decade where the internet takes off. BGP is a development that makes this possible.</p>
OBJECTIVE OF THE PROJECT	Subnetting Class B IP – 16 PCs/subnet.
PROJECT STATEMENT	Design & Implement 15 Subnets with BGP using class B IP with 16 PCs per subnet.
SUMMARY OF THE PROJECT	<p>We have designed and implemented 15 subnets with BGP.</p> <p>To achieve this we use Class B IP address with 16 systems/subnet, where first two octets represent network while the last two octets represent the host. In our project we are making use of the address 172.0.0.0. We also used 15 routers, 15 switches and 240 pcs to get the desired result. The router used is 2620XM Router and switch 2960-24TT. We also make use of DNS &amp; HTTP server to integrate our project with an application. Block size is 4,096. Number of bits borrowed by host is 4 bits. So using all these conditions we are going to design and implement our project.</p>
MODE OF CARRYING OUT THE PROJECT (Give details such as Lab/ /Innovation Lab details.)	Personal Laptop

<p>INTENDED BENEFICIARIES OF THE PROJECT (industrial/commercial/R&amp;D/social)</p>	<p>BGP is standard for Internet routing and required of most Internet service providers (ISPs) to establish routing between one another. Very large private IP networks use BGP internally.</p> <p>Another reason to use BGP is multihoming a network for better redundancy, either to multiple access points of a single ISP or to multiple ISPs.</p> <p>Thus, BGP allows an AS to collect all the routing information from its neighbouring autonomous systems and “advertise” that information further. Each peer transfers the information internally inside its own autonomous system.</p> <p>Just like in real life, usually more than one route exists to reach a given destination. BGP is responsible for determining the most suitable route according to the information collected and an organization’s routing policy, which is based on cost, reliability, speed, etc.</p>
ABSTRACT	<p>A routing protocol specifies how routers communicate with each other in the best possible path. So the routing protocol we will be using in our project is Dynamic Routing Protocol. Dynamic Routing automatically adjusts the routes according to the current state of the route in the routing table. We use BGP which is an example of dynamic routing protocol. Border Gateway Protocol (BGP) advertises, learns, and chooses the best paths inside the Internet. When two ISPs are connected, they typically use BGP to exchange routing information. BGP defines two classes for neighbours: Internal BGP (iBGP) operates within the same autonomous system. External BGP (eBGP) operates in-between the multiple autonomous system. We have used these concepts while designing our project.</p>