

Password Security, Remote Accessing & Eigrp Routing

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ABSTRACT

On a very small computer network, it is feasible to use simple broadcast or sequential mechanism for moving data from point to point. An Ethernet local area network (LAN) is essentially a broadcast network. In larger, more complex computer networks, data must be directed specifically to the intended destination. Router direct network data messages, or packets based on internal addresses and tables of routes, or known destination that serves certain addresses. Directing data between portions of network is the primary purpose of a router.

Keywords: LAN, Router, TELNET, Switch, IGRP, EIGRP, DUAL Algorithm.

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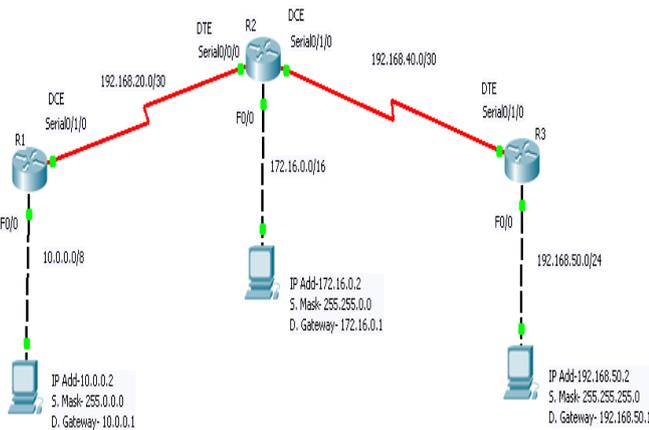
I. INTRODUCTION

Routers provide services that are essential to the correct, secure operation of the networks they serve. Compromise of a router can lead to various security problems on the network served by that router, or even other networks with which that router communicates. In general, well-configured secure routers can greatly improve the overall security posture of a network. Further, security policy enforced at a router is difficult for end-users to circumvent, thus avoiding one very serious potential source of security problems. EIGRP is an enhanced version of IGRP. The same distance vector technology found in IGRP is also used in EIGRP, and the underlying distance information remains unchanged. The convergence properties and the operating efficiency of this protocol have improved significantly. This allows for an improved architecture while retaining existing investment in IGRP.

The convergence technology is based on research conducted at SRI International. The Diffusing Update Algorithm (DUAL) is the algorithm used to obtain loop-freedom at every instant throughout a route computation. This allows all routers involved in a topology change to synchronize at the same time. Routers that are not affected by topology changes are not involved in the re-computation. The convergence time with DUAL rivals that

of any other existing routing protocol. TELNET came from the word Terminal Network which is a network or local area networks to provide a bidirectional interactive text-oriented communications facility using a virtual terminal connection. It is a tool that allows you to remotely connect into other computers and access them just as if you were sitting directly in front of them. Using telnet is as simple as launching the telnet application, and then opening a connection to a host. Once the connection is established, you can interact with the remote computer directly by typing commands. Cisco Switches are managed through the several commands. Among those commands, in this tutorial I will explain some basic configuration commands with examples. These commands are highly tested in CCNA exam and most frequently used in real world scenario.

1. Block Diagram :



The various protocols we analyzed are RIP, OSPF, IGRP and EIGRP respectively. Then for OSPF we have divided the network into areas. OSPF-area 1 is confined to communicate within a given area whereas in OSPF-area inters network communication is allowed. We have analyzed the performance of various routing protocols naming RIP, OSPF, IGRP and EIGRP over a scenario of size 15 sq km consisting of slip8_gateway routers and on simulating the network we obtained the following results for best effort traffic. In recent years, routing protocols has unique challenges and design issues in this Paper; we have discussed evaluation of various routing protocols parameters are varied for various routing protocols. When it is used real scenarios.

EIGRP also has a great quality of being very easy on CPU utilization for devices. It is scalable; it does accommodate very large networks. EIGRP features a very simple configuration. Automatic summarization is enabled by default; so EIGRP acts in a class full manner and automatically summarizes prefixes. It also supports routing for multiple network protocols like IP, IPX, and AppleTalk through the concept of Protocol Dependent Modules (PDM), by which EIGRP process uses a different route table for each network layer protocol.

In this paper we evaluate the Enhanced Interior Gateway Routing Protocol (EIGRP) via packets simulation. EIGRP, an intra-domain routing protocols developed by Cisco, is mainly based on the Diffusing Update Algorithm (DUAL) which computes shortest paths distributed without creating routing-table loops or incurring counting-to-infinity problem. Previous studies showed EIGRP's ability to adapt quickly to routing changes in medium-scale networks. In our research, we developed a detailed simulation model of EIGRP (publicly available), and we used it to evaluate EIGRP performance under a very dynamic network. Our results showed that EIGRP converges faster than a single TCP timeout in most cases.

The simulated network was a composite of wired and wireless hosts, and the results hold for both types of media. In addition, the study showed a feasible approach for seamless mobility and continuous connectivity for users of

mobile wireless devices as they move within an Autonomous System (AS).

In this paper, we model power of core routers which are using OSPF and EIGRP protocols. The model can accurately predict the power consumption of the routers with an important speedup. Also we establish the total quantity of routers required to support thousands of servers in the mentioned network. Simulations done with NS2 in a wide range of network configurations to support the proposed.

2. Flow Diagram:

Where there are some dynamic routing protocol can be used to configuring routing tables in the router. There is Interior Gateway Protocol (IGP) than should be used for the routers in same domain network such as Routing Information Protocol (RIP), Enhanced Interior Gateway Routing Protocol (EIGRP), Open Shortest Path First (OSPF) and IS-IS (Intermediate System – Intermediate System). And for the routers in different domain network, Exterior Gateway Protocol (EGP) can be used such as Border Gateway Protocol (BGP). For the router in the same domain network, there are two types of dynamic routing protocols that can be used on computer networks, namely distance vector and link-state routing protocols. Both types of routing protocols have advantage and disadvantages.

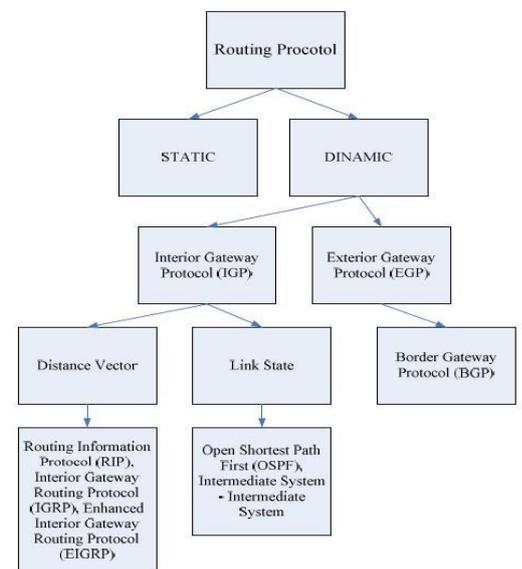


Fig3.1 Flow Diagram of Border Gate Protocol

The classification of routing protocol is depicted in below:

This paper presents the implementation decisions to be made when the choice is between protocols that involve distance vector or link state or the combination of both. Here a comparison is made between different parameters and a detailed simulation study is performed on the network with different routing protocols and it has been

shown that EIGRP provides a better network convergence time, less bandwidth requirements and better CPU and memory utilization compared to OSPF also RIP. EIGRP, OSPF also RIP are the active routing protocols being used in the practical networks to propagate network topology information to the neighboring routers. There have been a large number of static and dynamic routing protocols available but choice of the right protocol for routing is dependent on many parameters critical being network convergence time, scalability, memory and CPU requirements, Security and bandwidth requirement etc.

Distance vector routing protocol present routes as function of distance and direction vectors where the distance is represented as hop count and direction is represented interface. In the distance vector routing protocol, Bellman-Ford algorithm is used for the path calculation where router take the position of the vertices and the links. For each destination, a specific distance vector is maintained for all the router joined the network. The distance vector consists of destination ID, shortest distance and after that hop. Now every node passes a distance vector to its neighbor and informs about the shortest paths. Each router depends on its neighboring routers for collecting the routing information. The routers are responsible for exchanging the distance vector. When a router in the network receives the advertisement of the lowest cost from its neighbors, it followed by add this admission to the routing table.

In distance vector routing protocol, the router do not know the information of the entire path. The router knows only the information about the direction and the interface where the packet will be forwarded. One of distance vector routing protocol is Enhanced Interior Gateway Routing Protocol. If we pick up reliability and load for metric calculation, the metrics would be changing way too often and this will cause instabilities and problems in CPU utilization. So it was decided to use only bandwidth and delay. MTU is not involved in metric formula at all and it is just a potential tie-breaker. These components have corresponding values. And the metric can be manipulated accordingly, changing these K values. For two EIGRP routers to become neighbours, these values must match.

EIGRP is an enhanced version of IGRP. The same distance vector technology found in IGRP is also used in EIGRP, and the underlying distance information remains unchanged. The convergence properties and the operating efficiency of this protocol have improved significantly.

Feasible Successor is the next best route to the destination. The advantage with DUAL is that when a successor fails, it is immediately replaced by a feasible successor into the routing table. While choosing a feasible successor, it has to satisfy the feasibility condition – Next hop must have AD less than current FD of the current successor.

Routers provide services that are essential to the correct, secure operation of the networks they serve. Compromise of a router can lead to various security problems on the network served by that router, or even other

networks with which that router communicates. In general, well-configured secure routers can greatly improve the overall security posture of a network. Further, security policy enforced at a router is difficult for end-users to circumvent, thus avoiding one very serious potential source of security problems.

3. DISCUSSION

Scope :

In modern era, computer communication networks are growing rapidly day by day. Communication technology facilitates provision of such services as file transferring, print sharing, video streaming and voice conferencing. Internet is a global system of interconnected computer networks. Today Internet is playing a vital role in communication networks. Computer communication networks are based on a technology that provides the technical infrastructure, where routing protocols are used to transmit packets across the Internet. Routing protocols specify how routers communicate with each other by disseminating information. The router has prior knowledge about the adjacent networks, which can assist in selecting the routes between two nodes. There are various types of routing protocols being widely used. Among different routing protocols, Enhanced Interior Gateway Routing Protocol (EIGRP) and Routing Information protocol (RIP) and have been considered as the pre-eminent routing protocols for real-time applications.

Objectives :

The proposed work will be carried out with following steps:

- 1) Study of routing protocols.
- 2) Development of flow chart for design project.
- 3) Study of router and networking device.
- 4) Design a network.
- 5) Configure desired network.
- 6) Troubleshoot the network.
- 7) Study of programming instruction.
- 8) Debug the network.
- 9) Results.

Literature Survey :

Kirti Dangwal et. al illustrated Enhanced Interior Gateway Routing protocol (EIGRP) is an interior gateway protocol suited for many different topologies and media. In a well-designed network, EIGRP scales well and provides extremely quick convergence times with minimal network traffic. When a change occurs, only routing table changes are propagated, not the entire routing table; this reduces the load the routing protocol itself places on the network.

Mohd Khairi et. al states Telnet, by default, does not encrypt any data sent over the connection including

passwords and so it is often practical to eavesdrop on the communications and use the password later for malicious purposes. Telnet is being used can intercept the packets passing by and obtain login and password information. Communication between a telnet client and server is initiated by the client opening a TCP/IP socket to a port on the server and the assigned telnet well-known port is 23.

Haresh Patel et. al states EIGRP is an enhanced distance vector protocol, relying on the Diffused Update Algorithm (DUAL) to calculate the shortest path to a destination within a network. EIGRP is an enhanced version of IGRP. The same distance vector technology found in IGRP is also used in EIGRP, and the underlying distance information remains unchanged. The convergence properties and the operating efficiency of this protocol have improved significantly. This allows for an improved architecture while retaining existing investment in IGRP.

V.Vetriselven et. al states The Diffusing Update Algorithm (DUAL) is the algorithm used to obtain loop-freedom at every instant throughout a route computation. This allows all routers involved in a topology change to synchronize at the same time.

4. Results :

EIGRP, instead of counting on full periodic updates to re-converge, builds a topology table from each of its neighbor's advertisements (rather than discarding the data), and converges by either looking for a likely loop-free route in the topology table, or, if it knows of no other route, by quering its neighbors.

EIGRP does not require a hierarchical network design to operate efficiently. EIGRP is protocol independent, apart from ipv4 /6 it also supports IPX and AppleTalk, customers who are using these protocols can leverage the protocol independent EIGRP capabilities.

EIGRP is less complex to implement and it also offers efficient route calculations when compared with OSPF, e.g. EIGRP uses bandwidth, delay, reliability and load when calculating optimal routes where as OSPF only takes bandwidth into consideration when calculating optimal routes.

Keeping the above points in mind, EIGRP will be more viable commercially provided that it's a full end to end Cisco implementation; EIGRP can also redistribute routing information with other routing protocol with router redistribution.

Conclusion :

The main goal of this project is to compare the proposed routing protocols and to evaluate them based on some performance metrics. This evaluation is performed theoretically and by simulation. EIGRP is a Cisco

proprietary hybrid-vector protocol supporting both distance and link based on Diffusing Update Algorithm (DUAL). The cost of EIGRP is calculated on the basis of bandwidth and delay.

In contrast, RIP is not a Cisco proprietary. RIP is a distance vector protocol based on Bellman-ford. The RIP routing protocol is calculated based on hop count. These protocols use different algorithm to route the packets and this may vary the route processing delay. As a consequence, the impact of different algorithm can affect the overall network performance. So, the main contributions of this project are :

To design two network models that are configured respectively with EIGRP and RIP in order to evaluate the EIGRP and RIP performance.

To simulate these network models with packets transfer and to observe how the performance varies from the EIGRP network to the RIP network.

To report the simulated results and to analyze them. It carry out the network simulations, CISCO Packet tracer 5.0 simulator is used.

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