Analysis AND SIMULATION OF EXTENDED INTERIOR GRP BASED ROUTING PROTOCOL

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Abstract— Everything in the modern age of wireless technology is a part of wireless data transfer in diverse patterns. an entity is pushing the open shortest path interior improve gateway routing protocol in this work. distance vector routing protocol is discussed in INTERIOR GATEWAY routing protocol, and advanced distance vector routing protocol is an extended interior gateway routing protocol. EXTENDED INTERIOR GRP, as the name implies, is always superior than distance vector INTERIOR GRP in terms of routing performance when compared to other routing protocols. in this article, an entity will compare the results of open shortest path first, INTERIOR GRP, and RIP with EXTENDED INTERIOR GRP, and whatever issue exists in rip, open shortest path first, and INTERIOR GRP will be eliminated by UTILIZING EXTENDED INTERIOR GRP..

Keywords: Networking, RIP, OSPF, IGRP, EIGRP

I. INTRODUCTION :

A routing protocol is the simulation algorithmic language of router to speak with other devices in order to exchange information about the process ability and status of wireless network. Process routing technic and rules for computer communication network is explain as a set of recovery query and information transfer over network, rules for computer communication network, and simulating algorithms mentioned by routing process for the overall process of learning path in a network [2]. Each router chooses the best possible shortest route with their quality of services to every subnet in a network technique known as routing route porcess and their selection and finally intimate those best and possible routes process in its IP next hope routing table for near by hope count. Network complexity will increase with the size of routing table and maintaining the data base of routing table and near by hope count of routers then route summarization is necessity, to reduce the network traffic and quality of service complexity of network an entity use different routing protocols that are RIP, INTERIOR GRP, OPEN SHORTEST PATH FIRST, EXTENDED INTERIOR GRP, and IS-IS. Routing is proceeding in such a way that first it exchange the outing table information with the immediate neighbours, then to the entire network.

Due to some restriction and limitation in Routing Information Protocol, in the era of 1980s developed by Cisco Systems, nwo using INTERIOR GRP to solve the limitations. Interior Gateway is a part of Distance vector protocol so it has been involve and majorly used in within Autonomous System. EXTENDED INTERIOR GRP involved advanced distance vector routing protocol and associated with link state system. EXTENDED INTERIOR GRP also mentioned some advanced feature i.e. best traits, such as partial updates of routing table and neighbor discovery in a network, are similarly put to use by OPEN SHORTEST PATH FIRST. Routers always maintain routing table with their nearby intermediate devices. As routing information broadcast by the source through the network, routers can identify new transmitting end as they are added to the network, also aware about network loss in to the design network, and identify distances assign to all known destinations. Our proposed protocol is also a distance-vector. It means that router find out best path for broadcasting the information in a network. Creation of EXTENDED INTERIOR GRP is to answer the required demand and needs in networking and demands of diverse, large-scale internetworks. EXTENDED INTERIOR GRP transports the subnet mask network information, which makes it a Classless routing protocol.

It has been found that INTERIOR GRP can not support VLSM where EXTENDED INTERIOR GRP can easily supports VLSM. VLSM (variable length subnet masking) is used to accept condition to subdivide a classful network into various different network called as subnets. EIGRAP and INTERIOR GRP are also compactible with each other. An automatic-redistribution mechanism imported into EXTENDED INTERIOR GRP and allows INTERIOR GRP routes. INTERIOR GRP and EXTENDED INTERIOR GRP path selection is also a part of Bandwidth/Delay metric. By using EXTENDED INTERIOR GRP commands maximum bandwidth can be changed as required.

II. EXTENDED INTERIOR GRP FUNDAMENTALS:

EXTENDED INTERIOR GRP routers broadcast and converge quickly, it is depend on a state-of-the-art routing protocol called the Diffusing Update Algorithm (DUAL)

EXTENDED INTERIOR GRP update routing table by minimal use of bandwidth and the limiting the bandwidth for maintaining the routing table.

EXTENDED INTERIOR GRP supports classless routing IP address with proper subnet mask.

EXTENDED INTERIOR GRP allows IPv4, Ipv6, and AppleTalk through protocol-dependent modules (PDMs).

EXTENDED INTERIOR GRP generates updates in 60 sec and supports for IPX: It crowd low speed bandwidth. EXTENDED INTERIOR GRP updates in routing whenever is required. Routing table may change if they would bea part of EXTENDED INTERIOR GRP computer communication network - using partial required updates, thus conserving required bandwidth changes is require for the minimum required speed wireless area network links. neighbor next hope routing table listing adjacent sortest path information, similar standard to the OPEN SHORTEST PATH FIRST adjacency database.

Important terminology are mention below.

Topology Table **-** EXTENDED INTERIOR GRP router properly manage a routing topology next hope routing table for every simulate neighbor node in a network indicating all new learned available routes to a transmitting end devices.

Routing Table **-** EXTENDED INTERIOR GRP selects the best shortest path towards the transmitting end from the routing next hope table and places properly these mentioned routes in the next hope routing table.

Following four basic components of EXTENDED INTERIOR GRP:

1. Routing Neighbor discovery of recovery neighbor
2. Consistent transmission protocol
3. DUAL finite state machine
4. Rules for communication -based units

EXTENDED INTERIOR GRP routing table discover and recover it when it is required. When the neighbor is unreachable or not in network. Next hope count discovery and identify of recovery neighbor is completed with small overhead by periodically transfer request packets. On condition that demand and acceptance packets are available, the Cisco Internetwork Operating System software can control that a neighbor is active and operative. Once this position is resolute, the adjacent routers can interchange routing data.

Distance-vector routing protocol classify and their most valuable protocol is EXTENDED INTERIOR GRP, with decreasing the routing improper stability process acquired after topology pattern changes in new topology. Routers those can support EXTENDED INTERIOR GRP will routinely re-transmitted route information i.e. request and acknowledgement to Interior Gateway Routing Protocol natives by exchanging the 32-bit EXTENDED INTERIOR GRP metric to the 24-bit INTERIOR GRP metric. Most of the routing those who are decreasing the routing improper stability are designed on the Diffusing Update Algorithm (DUAL), which properly permits loop-free operational procedure and provides rapid recovery router convergence [9].

III. EXTENDED INTERIOR GRP PACKET TYPES

The EXTENDED INTERIOR GRP packet catogery are classify in five catagory

- *Hello* – it is use to discover routing route, verify the path and rediscover neighbor routing path. Hello interval be contingent on bandwidth, in 60 seconds - 1.54 mbps or less and 5 seconds - 1.54 mega byte per second. Hellos packets are transmit multicast to Iinternet protocol address 224.0.0.10.

Acknowledgment – During the reliable exchange the routing maintain transferring of information.

Update – use when new neighbor is involved in a network Sent unicast and reliably.

Query - Transmit reliably.

Reply - It is used to reply a problem or query. Always sent as a unicast.

Table shown below the differences identification between INTERIOR GRP & EXTENDED INTERIOR GRP.

TABLE I

Interior GRP	Eextended Interior GRP
Classful Protocol	Classless Protocol VLSM, CIDR
Bandwidth requirement for INTERIOR GRP = (10,000,000/*bandwidth kbps*) delay = *delay*/10 24 bit metric required for bandwidth and delay	Bandwidth requirement for EXTENDED INTERIOR GRP = (10,000,000/*bandwidth kbps*) * 256 delay = (*delay*/10) * 256 32 bit metric for bandwidth and delay
Maximum new hope Count for maintaining routing table = 255	Maximum new hope Count for maintaining routing table = 224
Internal and external network path does not have differentiation	Outside network path (redistributed) are mentioned as external routes.
Automatically redistribution of INTERIOR GRP and EXTENDED INTERIOR GRP as long as "AS" numbers are the same.	

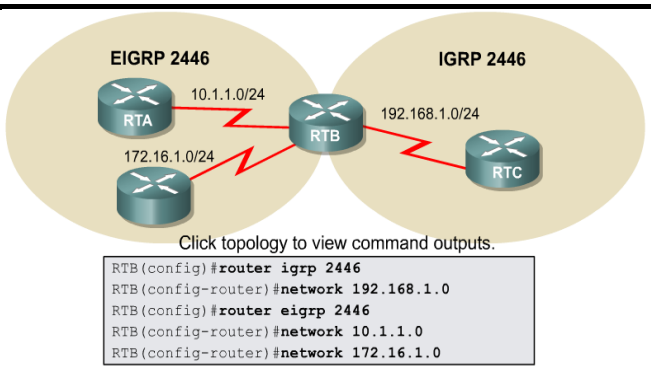

Fig. 1 EXTENDED INTERIOR GRP and INTERIOR GRP redistributed routing tracks between autonomous systems

As mentioned in the above figure for INTERIOR GRP and EXTENDED INTERIOR GRP redistributed and automatically diverted path in process of autonomous systems with the as it is previous autonomous number. Steps are given below

1. Automatically diversion is possible if only the equal AS number is allow for extended interior GRP and interior GRP.
2. EXTENDED INTERIOR GRP scales in the properly INTERIOR GRP metric by a part of 256.
3. INTERIOR GRP decrease the metric count by a factor o 256
4. EXTENDED INTERIOR GRP will easily tag shortest route path identified from INTERIOR GRP, or any other external source, as external network, did not originate from EXTENDED INTERIOR GRP network routers.
5. No INTERIOR GRP differentiation between internal and external network routes

Compare EXTENDED INTERIOR GRP with other protocol.

Comparison between OPEN SHORTEST PATHS FIRST, RIP an EXTENDED INTERIOR GRP.

TABLE II

Protocol	EIGRP	OSPF	RIP
Type of protocol	Hybrid	Link-state	Distance vector
Knowledge of network topology	Maintains limited topology table	Maintains table with complete knowledge of each area	None
Routing updates	Incremental updates sent to affected routers when necessary	Incremental updates sent to all routers in an area when necessary	Complete routing table sent to all neighbors every 30 seconds
Sends acknowledgements after receiving routing updates	Yes (ACK packet)	Yes (LSAck packet)	No
Convergence	Fast	Fast	Slow
Prone to routing loops	No	No	Yes
Supports VLSMs	Yes	Yes	No
Supports route summarization on arbitrary boundaries	Yes	Yes	No
Supports hierarchical routing	Yes	Yes	No
Proprietary to Cisco	Yes	No	No
Supports multiple protocols	Yes	No	No

Table III Difference between DS and LS Vector

DISTANCE VECTOR	LINK STATE VECTOR
Types: RIP :- RIPv1,RIPv2 IGRP	EIGRP OSPF IS-IS
Algorithm: Distance vector follows Bellman-ford	Algorithm: Link state follows Dijkstra and DUAL
Advantage: Distance Vector is a relatively simple approach and easy to use, implement and maintain.	Advantage: Link-state protocols use cost metrics to choose paths through the network. The cost metric reflects the capacity of the links on those paths.
Disadvantage: This method is used for small application as the network increases the complexity increases.	Disadvantage: They require more memory and processor power than distance vector protocols. This makes it expensive to use for organizations with small budgets and legacy hardware

Table IV Difference between Routing Protocol

Features	**RipV1**	**RipV2**	**OSPF**	**EIGRP**
Type	Distance Vector	Distance Vector	Link State	Hybrid
Algorithm	Bellman-ford	Bellman-ford	Dijkstra	DUAL
Class full/Class less	Class full	Class less	Class less	Class less
Metric	Hop count	Hop count	Cost	Bandwidth/delay
AS Distance	120	120	110	Internal 90 External 170
Hop count	15	15	224	None
Convergence	Slow	Slow	Fast	Very fast
Types of updates	Full table	Full table	Only changes	Only changes
Support VLSM	No	Yes	Yes	Yes
Network size	Small	Small	Large	Large

EXTENDED INTERIOR GRP supports big networks better than INTERIOR GRP. Therefore, design two internetworks or dissimilar network of each has six dissimilar physical networks connect to each other, and each of them uses different dynamic routing protocol for interchanging the information, i.e. either from INTERIOR GRP or EXTENDED INTERIOR GRP.

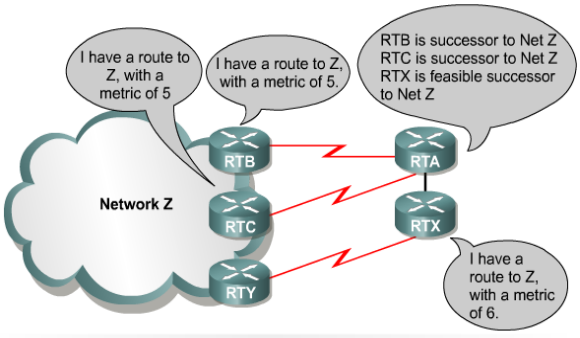

Fig. 2 identifying feasible successors, EXTENDED INTERIOR GRP routers can suddenly insert substitute routers if a successor flops.

Select Routes

If a network connection failed, DUAL looks for an additional finest route path which is available, or feasible successor, in the topology table.

If a feasible successor is not accessible in network, the superlative path is flagged as Active, or unusable at present.

Troubleshooting Process steps are given below for network using EXTENDED INTERIOR GRP.

Analyze disappointment in network.

Contemplate possible quesry based on the facts of network that have been generate.

Simulating each and all step carefully while testing simulation to see whether the problematic statement is disappears.

Prudently classify the consequence climate the problem is resolved or not. If it is, then an entity consider the process is complete.

If the problem is motionless there, create correct action plan basis of explanation and the next most likely problem in the list. Return to Step 4, try to make changes in one variable at a time, and repeat the same process until the problem is resolved.

Once the exact problem is identified, try to find out solution based on the problem.

IV. RESULT

Configuration of Open Shortest Path First

Router>en

Router#conf t

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#router extended interior GRP 10

Router(config-router)#network 10.0.0.0

Router(config-router)#network 40.0.0.0

Router(config-router)#network 192.168.2.0

Router(config-router)#^Z

Output

Router#sh ip route

Codes: C - connected, S - static, I - INTERIOR GRP, R - RIP, M - mobile, B - BGP

D - EXTENDED INTERIOR GRP, EX - EXTENDED INTERIOR GRP external, O - OPEN SHORTEST PATH FIRST, IA - OPEN SHORTEST PATH FIRST inter area

N1 - OPEN SHORTEST PATH FIRST NSSA external type 1, N2 - OPEN SHORTEST PATH FIRST NSSA external type 2

E1 - OPEN SHORTEST PATH FIRST external type 1, E2 - OPEN SHORTEST PATH FIRST external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is not set

C 10.0.0.0/8 is directly connected, Serial1/0

C 40.0.0.0/8 is directly connected, Serial1/1

D 50.0.0.0/8 [90/21024000] via 40.0.0.2, 00:02:39, Serial1/1

C 192.168.2.0/24 is directly connected, FastEthernet0/0

D 192.168.3.0/24 [90/20514560] via 40.0.0.2, 00:02:39, Serial1/1

D 192.168.4.0/24 [90/21026560] via 40.0.0.2, 00:02:39, Serial1/1

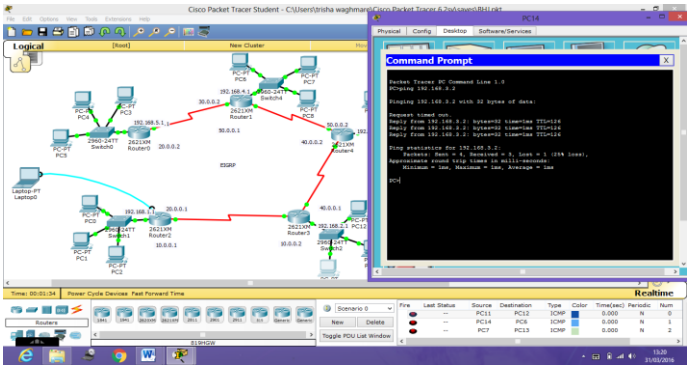

Fig. 3: Configuration of EXTENDED INTERIOR GRP

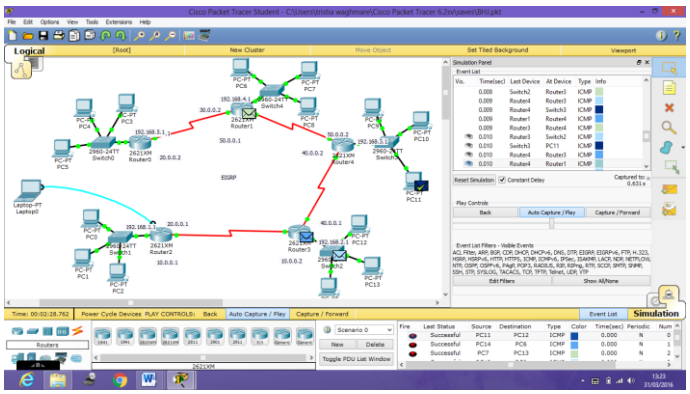

Fig. 4: Simulation of EXTENDED INTERIOR GRP

V. EXTENDED INTERIOR GRP ADVANTAGES:

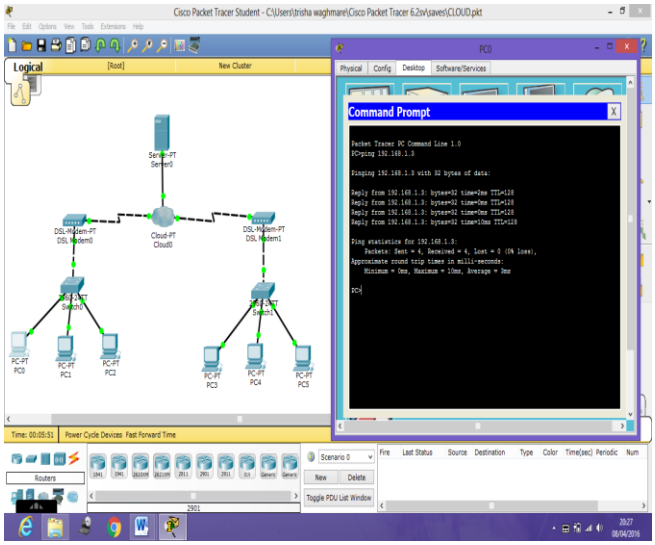

Fig 5:- Configuration and Simulation of Cloud

Name of Device	IP Address	Default Gateway
Server	192.168.0.1	
PC0	192.168.1.2	192.168.1.1
PC1	192.168.1.3	192.168.1.1
PC2	192.168.1.4	192.168.1.1
PC3	192.168.2.2	192.168.2.1
PC4	192.168.2.3	192.168.2.1
PC5	192.168.2.4	192.168.2.1

Fig 6: Network Details

Classless routing protocol is EXTENDED INTERIOR GRP and classful protocol is INTERIOR GRP.

Faster convergence times is one of the advantage of EXTENDED INTERIOR GRP, which improved scalability of a network, and fast and properly manage the routing loops.

Novell RIP can be replaced by EXTENDED INTERIOR GRP and AppleTalk is used for next hope Routing Table Maintenance Protocol (RTMP), applying both Ipv4, IPv6 and AppleTalk networks with maximum efficiency.

VI. CONCLUSION:

Routing Protocols are used basically for designing network and routing of data in that particular network. In this an entity have find the best protocol as an EXTENDED INTERIOR GRP because it provides better performance, stability and QoS than RIPv2 and OPEN SHORTEST PATH FIRST. In this paper an entity have developed a virtual network model based on RIP routing protocol. Similarly in future an entity will implement EXTENDED INTERIOR GRP in virtual as well as in real world.

Our simulation indicates that, RIP and OPEN SHORTEST PATH FIRST INTERIOR GRP cant not provide superior network performance than EXTENDED INTERIOR GRP, EXTENDED INTERIOR GRP network if an entity will add in big network has on average greater performance than other protocol., networks all across the world. An entity were able to prove that EXTENDED INTERIOR GRP is a more efficient protocol even with our smaller scale routing network.

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