The 5th ICIBA 2016, International Conference on
Information Technology and Engineering Application
Palembang-Indonesia, 19-20 February 2016

Comparison Route Redistribution on Dynamic Routing Protocol (EIGRP into OSPF and EIGRP into IS-IS)

Chairul Mukmin, Darius Antoni, Edi Surya Negara

Computer Science, Universitas Bina Darma
e-mail: chairulmukmin10111992@gmail.com
Universitas Bina Darma
e-mail: darius.antoni@binadarma.ac.id
Universitas Bina Darma
e-mail: e.s.negara@binadarma.ac.id

Abstract

Each protocol has a routing algorithms and metrics that vary in Determining the best path to a network. The characteristic differences cause problems 1) applications that can only run on Certain routing protocol 2) hardware from various vendors 3) Networking with different routing domain or area. Some aspects of the reference a routing protocol such in terms of the data sent and lost in the process of the data transmission (packet loss), the speed of the data transmission (delay), Also the ability of a routing protocol in choosing the closest distance even the best path in the delivery of the data packets. Those problems can be solved by using routing redistribution techniques. This study will analyze the author's comparison redistribution routing on dynamic routing protocols, routing protocols to find out the which one is better in different networks autonomous system (AS).

Keywords : *Routing Protocol, Redistribute, EIGRP, OSPF, IS-IS*

1 INTRODUCTION

In connecting the LAN network with each other LAN networks would use a tool called a router. In the router itself is no such thing routing protocols. Routing protocol is one of the most important components on the network TCP / IP. Dynamically communicate routing protocol to determine the best path reaches the destination. The packet is forwarded from one router to another router [1].

As for the types of routing in the journal Nanda Satria Nugraha according to (Sutikno, 2012), 1) static routing 2) default routing 3) dynamic routing [2]. Classification prokotol routing versions of Cisco Routing Information Protocol (RIP), Interior Gateway Routing Protocol (IGRP), Enhanced Interior Gateway Routing Protocol (EIGRP), Open Shortest Path First (OSPF), Intermediate System to Intermediate System (IS-IS), Bolder Gateway Protocol (BGP) [3]. Each protocol has a routing algorithms and metrics that vary in determining the best path to a network.

The characteristic differences cause problems 1) applications that can only run on certain routing protocol 2) hardware from various vendors 3) Networking with different routing area or domain [1]. Some aspects of the reference a routing protocol such in terms of data sent and lost in the process of data transmission (packet loss), the speed of data transmission (delay), also the ability of a routing protocol in choosing the closest distance even the best path in the delivery of data packets.

Those problems can be solved by using routing redistribution techniques. In principle redistribution routing will distribute the routing table is then passed back to the other routing protocols through a router or router terminal which is connecting in a single autonomous system (AS) with autonomous system (AS) others. This study will analyze the authors comparison redistribution routing on dynamic routing protocols, routing protocols to find out which one is better in different networks autonomous system (AS).

Differences in routing protocol will certainly affect performance on a network. Redsitribusi routing complexity can receive various routing protocols and routing table can form a more complex, sometimes using the route selection rouitng redistribution information can not be optimal because of the knowledge and the way configurations as require.

2 LITERATURE REVIEW

2.1 Enhanced Interior Gateway Routing Protocol (EIGRP)

EIGRP is an enhanced version of the Interior Gateway Routing Protocol (IGRP) was developed by Cisco. EIGRP uses distance vector algorithm and distance information similar to IGRP. However, the convergence properties and the operating efficiency of EIGRP have improved substantially over IGRP. (San Jose, CA 95134-1706 [4]. The attributes of EIGRP could be seen in figure 1 [5].

Attributes	
Type	Distance Vector
Algorithm	DUAL
Internal AD	90
External AD	170
Summary AD	5
Standard	Cisco proprietary
Protocols	IP, IPX, Appletalk
Transport	IP/88
Authentication	MD5
Multicast IP	224.0.0.10
Hello Timers	5/60
Hold Timers	15/180

Figure 1: Attributes EIGRP (Jeremy Stretch v2.1)

2.2 Open Shortest Path First (OSPF)

OOpen Shortest Path First (OSPF) protocol, defined in RFC 2328, is Interior Gateway Protocol is used to distribute routing information within a single Autonomous System [6]. Protocol Header, Attribtutes, Link State Advertisements, Adjacency States could be seen in figure 2 [7].

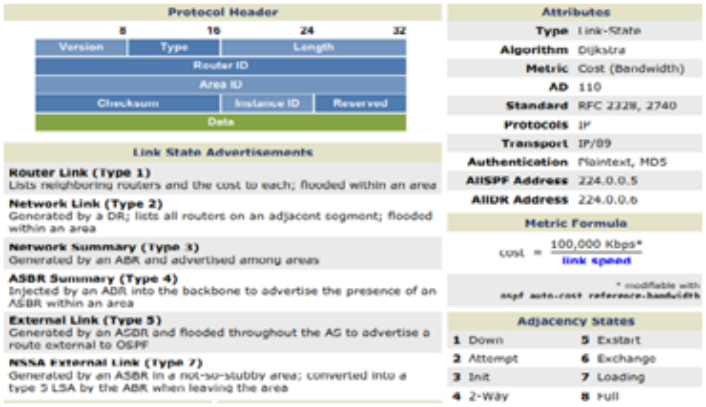

Figure 2: Protocol Header, Attribtutes, Link State Advertisements, Adjacency States (Jeremy Stretch v2.1)

2.3 Intermediate System to Intermediate System (IS-IS)

ISIS is a routing protocol that was created by the International Standardization Organization (ISO). The goal was created by ISO IS-IS routing protocol is that it be an open standard that can be used by all network devices. But the reality is more widely used is all the protocol and addressing system created based standards organization Open Systems Interconnection (OSI) [8]. The attributes IS-IS could be seen in figure 3 [9].

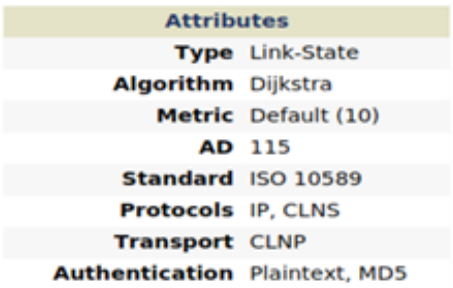

Figure 3: Attributes IS-IS (Jeremy Stretch v2.1)

3 RESEARCH METHODOLOGY

In this study, the research method to be used is an experimental method of research that is conducting experiments to see an outcome. The results will underscore how the position of a causal relationship between the variables investigated and researched.

In experiments testing is done by the load variation of 32 bytes and 60000 bytes. The purpose of giving the load variation in order to determine the quality of routing protocols when the network is in normal conditions and in conditions of busy. Tests done in one direction and two directions. One direction is where the computer that acts as a client sends

a ping packet to a computer that acts as a server. While the two directions is where the computer that acts as a client and server alike send ping packets simultaneously.

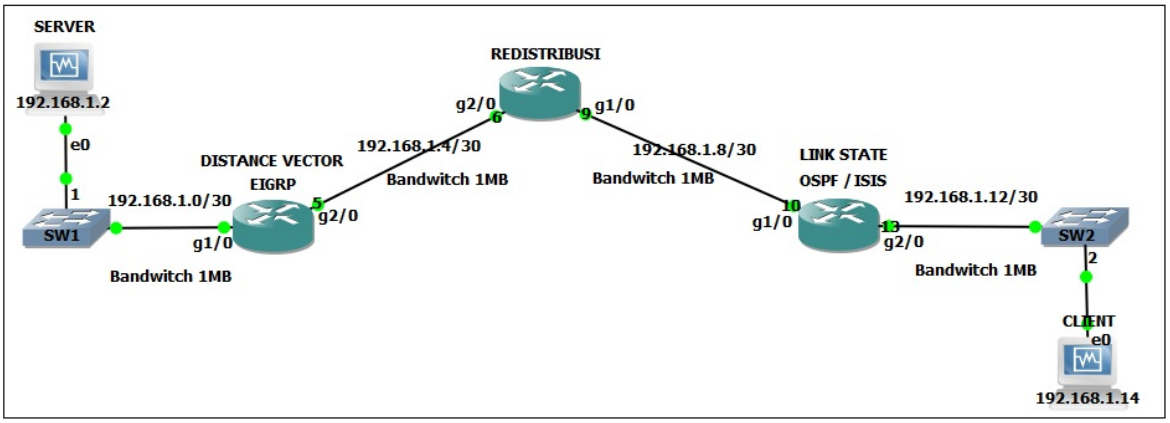

Figure 4: Redistribute EIGRP into OSPF and IS-IS

4 RESULTS AND DISCUSSION

In experiments that have been planned in advance, QoS monitoring system model used for the measurement of parameters of throughput, delay, packet loss at each routing protocol in communication testing 1-way and 2-way with a given load 32bit and 60000bit. From the above explanation, the result of experiments measuring QoS parameters consisting of throughput, delay, and packet loss are as follows:

4.1 Redistribute EIGRP into OSPF

From the test can be seen where to throughput with packet size 32 bytes in one-way communication and two-way communication has almost the same results, namely 100%, and unlike the case when the packet size of 60000 bytes value throghput for one-way communication 91%, while for the communication bidirectional 90%. This is because the load is given more weight when communication is done in two directions resulting network traffic is high.

To delay value by 32 bytes packet size is one-way communication and two-way communication has an average yield of about the same value for the 42ms and 43ms one way to two-way. Unlike the case when the packet size of 60000 bytes have the delay value generated much difference with the average value of 109 for one-way and 49 for the two-way. For the value of packet loss which saw the difference when the packet size is one-way communication 60000 yielding a value of 1%. The result of QoS on Redistribute EIGRP into OSPF could be seen in table 1-3.

4.2 Redistribute EIGRP into IS-IS

From the test can be seen where to throughput with packet size 32 bytes in one-way communication and two-way communication has almost the same results, namely 100%, and unlike the case when the packet size of 60000 bytes value throghput for one-way communica-

Table 1: Throughput value eigrp redistribute ospf

Pakcet Size(Bytes)	**Communication**	**Throghtput**		
		Sent	**Received(%)**	**Lost(%)**
32	1 direction	299	299 (100%)	0 (0%)
32	2 direction	298	298 (100%)	0 (0%)
60000	1 direction	298	270 (91%)	28 (9%)
60000	2 direction	269	269 (90%)	30 (10%)

Table 2: Delay value eigrp redistribute ospf

Pakcet Size(Bytes)	**Communication**	**Delay (ms)**		
		Min	**Maks**	**Average**
32	1 direction	25	82	42
32	2 direction	22	104	43
60000	1 direction	37	227	109
60000	2 direction	25	129	49

Table 3: Packet Loss value eigrp redistribute ospf

Pakcet Size(Bytes)	**Communication**	**packet loss (ms)**		
		Sent	**Lost**	**Lost (%)**
32	1 direction	300	0	0
32	2 direction	299	0	0
60000	1 direction	299	3	1
60000	2 direction	302	0	0

tion 92%, while for the communication bidirectional 80%. This is because the load is given more weight when communication is done in two directions resulting network traffic is high, the same happened to redistribute EIGRP into OSPF.

To delay value by 32 bytes packet size is one-way communication and two-way communication has an average yield equal to the value of 42ms for the one-way as well as for the two-way. Unlike the case when the packet size of 60000 bytes have the delay value generated much difference with the average value of 84 for the one-way and 47 for the two-way. For packet loss where the value of each condition in the test produces the same value is 0%. The result of QoS on Redistribute EIGRP into ISIS could be seen in table 4-6.

5 CONCLUSION

Routing protocol of the measurement results can be seen from the OSPF routing throughput better than routing is-is. In terms of delay and packet loss is-is a routing protocol has better perfomance than the routing protocol OSPF. Judging of each characteristic can accommodate Adjecency isis routing database of 115, this database contains all neighboring

Table 4: Throughput value eigrp redistribute is-is

Pakcet Size(Bytes)	**Communication**	**Throghtput**		
		Sent	**Received(%)**	**Lost(%)**
32	1 direction	298	298 (100%)	0 (0%)
32	2 direction	296	296 (100%)	0 (0%)
60000	1 direction	299	274 (92%)	25 (8%)
60000	2 direction	297	239 (80%)	58 (20%)

Table 5: Delay value eigrp redistribute is-is

Pakcet Size(Bytes)	**Communication**	**Delay (ms)**		
		Min	**Maks**	**Average**
32	1 direction	24	73	38
32	2 direction	31	69	38
60000	1 direction	34	169	84
60000	2 direction	24	92	47

Table 6: Packet Loss value eigrp redistribute is-is

Pakcet Size(Bytes)	**Communication**	**packet loss (ms)**		
		Sent	**Lost**	**Lost (%)**
32	1 direction	301	0	0
32	2 direction	297	0	0
60000	1 direction	301	1	0
60000	2 direction	300	0	0

routers. Besides routing protocol is-is to have a default metric of different things with the OSPF routing protocol that is dependent on the cost and bandwitch.

References

[1] Balchunas, Aaron. (2007). Open Shortest Path First". v1.31 *www.routeralley.com/guides/ospf.pdf*

[2] Balchunas, Aaron. (2007). Enhanced Interior Gateway Routing Protocol. v1.31 *www.routeralley.com/guides/eigrp.pdf*

[3] CCNA Exploration Companion Guide, Introduction to Dynamic Routing Protocols. 19 September 2015. *http://ptgmedia.pearsoncmg.com/images/9781587132063/samplechapter.pdf*

[4] Cisco System, inc. (2012), *Redistributing Routing Protocols.* Document ID: 8606

[5] Cisco System. (2007), *Introduction to Dynamic Routing Protocol.* ITE PC v4.0

[7] Cisco. (2015). Enhanced Interior Gateway Routing Protocol. 23 Agustus 2015. *http://www.cisco.com/c/en/us/support/docs/ip/enhanced-interior- gateway-routing-protocol-eigrp/16406-eigrp-toc.html*

[7] Cisco. (2015). OSPF Design Guide. 23 Agustus 2015. *http://www.cisco.com/c/en/us/support/docs/ip/open-shortest-path-first ospf/70391.htmlintro*

[8] Jose, San, 2001-2006. Cisco IOS IP Configuration Guide. USA : *Cisco System, Inc.* CA 95134-1706.

[9] Sofana, Iwan. (2009). *Cisco CCNA & Jaringan Komputer*. Bandung: Informatika.

[10] Satria, Nanda Nugraha. (2013). Analisa Pengaruh Model Jaringan Terhadap Optimasi Dynamic Routing Border Gateway Protocol. *eprints.dinus.ac.id/12754/1/jurnal_12926.pdf. 10 September 2015.*

[11] Stretch, Jeremy. 2015, Enhanced Interior Gateway Routing Protocol. 11 September 2015. *packetlife.net/media/library/2/EIGRP.pdf*

[13] Stretch, Jeremy. Open Shortest Path First. 11 September 2015. *packetlife.net/media/library/10/OSPF.pdf*

[13] Stretch, Jeremy. Intermediate System to Intermediate System. 11 September 2015. *packetlife.net/media/library/9/IS-IS.pdf*

[]