

Features of Interdomain Routing Analysis in WAN-Networks

Sergey Vorontsov, Kirill Trapezon

Abstract - In this paper due to OPNET IT Guru method of simulation and studying the basic features of an interdomain routing protocol called Border Gateway Protocol are given.

Keywords – BPG, Routes, Interdomain, Simulation, System.

I. INTRODUCTION

The Internet is organized as a set of routing domains called an autonomous system (AS). An AS establishes routes with other ASs through interdomain routing protocols to create the complete WAN network. Because of this the topic that studies the ways to simulate the process of establishing routes between different AS is very urgent.

II. MODELING AND RESULTS OF ANALYSIS

Process of setting up a network with three different Ass in OPNET IT Guru is shown. Each AS is controlled by a single administrative entity. An AS uses its own interdomain routing protocol (e.g., RIP or OSPF). One of the most widely used interdomain routing protocol is the Border Gateway Protocol (BGP).

The routers that connect different ASs are called border gateways. Task of the border gateways is to forward packets between ASs. Each AS has at least one BGP speaker. BGP speakers exchange reachability information among ASs.

BGP advertises the complete path to the destination AS as an enumerated list. In this way, routing loops can be avoided. A BGP speaker can also apply some policies such as balancing the load over the neighboring ASs. If a BGP speaker has a choice of several different routes to a destination, it will advertise the best one according to its own local policies. BGP is defined to run on top of TCP, and hence BGP speakers have not need to worry about acknowledging received information or retransmission of sent information. The simulation in OPNET IT Guru start with creating a new network topology with 3 ASs, Fig. 1. Than the routers configuration should be done. To configure the Ass RIP protocol will be used as the interdomain routing protocol. To divide the network into three autonomous systems and utilize BGP to route packets among these systems the BGP Scenarios were adjusted.

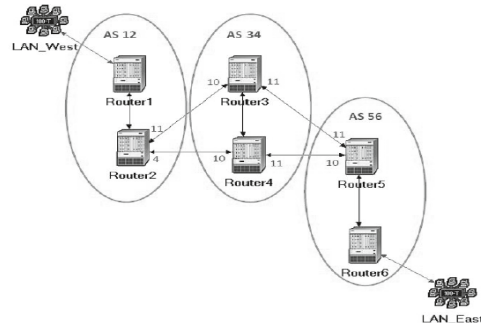


Fig.1. Network topology

The last step before viewing the results is creating the BPG with policy scenario, because BGP allows to make a routing policies. It can be enforced using route maps. In this network this feature will be utilized to configure Router2 to redirect its load on the two egress links of its autonomous system. After all these steps we should choose the Individual Statistics and Global statistics. As a result the developer has opportunity to analyze routing tables generated in the routers as well as the effect of applying a simple policy. After selection the Global statistics the appropriate graphs of the statistics will be shown previously. Due to OPNET IT Guru we can see the throughput in the Router2-Router3 link, and throughput in the Router2-Router4 link. Also the Global Statistics of Traffic Received in given. The resulting graphs resemble the graphs (Fig. 2).

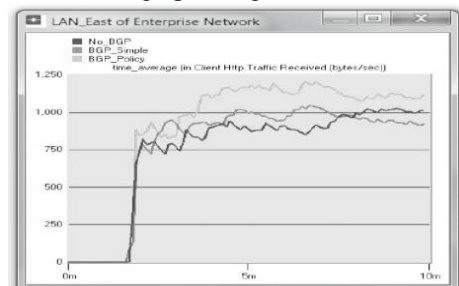


Fig.2. Global statistics of Traffic Received

III. CONCLUSION

After the simulation of BPG scenarios in network with three ASs result were gotten. Interdomain BPG protocol is very useful and helps to reduce routing loop. The graphics shows that the amount of Traffic Received had increased using BPG as opposite to nonBPG network configurations.

REFERENCES

- [1] I. van Beijnum, "BGP. Building reliable networks with the border gateway protocol," *O'Reilly Media*, 290 p., Sept. 2002.

Sergey Vorontsov, Kirill Trapezon - Kyiv Polytechnic Institute, 35, Victory str., Kyiv, 03056, Ukraine;
E-mail: trapezon@ukr.net, vser@ukr.net