

# Design and Implementation of Web-based

## BGP Analysis and Visualization System Tool on KOREN

<sup>1</sup>Seok-Hoon Choi, <sup>2</sup>Se-Jung Jung, <sup>2</sup>Ji-Tae Shin, <sup>3</sup>Seo-Mee Choi, <sup>3</sup>Dae-Young Kim, <sup>4</sup>Hyun-Ryong Lee,  
<sup>4</sup>Jong-Won Kim, <sup>5</sup>Jae-Hwa Lee, <sup>6</sup>Sung-Joon Hwang, and <sup>1</sup>Chul-Hee Kang  
<sup>1</sup>Korea University, <sup>2</sup>Sungkyunkwan University, <sup>3</sup>Chungnam University, <sup>4</sup>GIST, <sup>5</sup>KT, <sup>6</sup>NCA  
shchoi@widecomm.korea.ac.kr, sjjung@ece.skku.ac.kr, jtshin@ece.skku.ac.kr, smhoi@ccl.cnu.ac.kr,  
dykim@cnu.ac.kr, ifjesus0153@hotmail.com, jongwon@netmedia.gist.ac.kr, jhlee4@hotmail,  
hsj92@nca.or.kr, chkang@widecomm.korea.ac.kr

### ABSTRACT

In this paper, we have proposed and developed the BGP Analysis system on Korea Advanced Research Network (KOREN) networks. As the number of people with access to high speed Internet has grown, the size of the routing table related to IP Routing increases. Also the analysis of the routing table becomes essential to maintain a reliable connection to the Internet. Therefore, many engineers are greatly interested in the perception of the BGP path information changes and the analysis of using gathered traffic at the management level. Hence, the implementation of Routing table analysis tool and analysis of Routing table on KOREN is necessary for the future network extension. We have constructed a system that uses the routing information gathered from the router in the real Korea Internet Exchanger connected via Interior BGP. Through this experiment we expect the settlement of the Multiple Origin Autonomous System change (MOAS) problem.

### I. INTRODUCTION

Internet is a conglomeration of Autonomous Systems that define the administrative authority and the routing policies of different organizations. Autonomous Systems are made up of routers that run Interior Gateway Protocol (IGP) and interconnect via an Exterior Gateway Protocol (EGP). The Border Gateway Protocol [1], [2] is the routing protocol currently used for interdomain routing in the Internet for peering between Internet Service Providers (ISPs). BGP is the only protocol that is designed to deal with a network of the Internet <sup>1</sup>size, and the only protocol that can deal well with having multiple connections to unrelated routing domains.

Routing information between ISPs is essential for stable network management, so it must be well kept. The main management components include peering information between ASs, the number of Transit routes between source AS and destination AS, Transit route information changes, and the number of Transit route information changes. When there are numerous Transit route information changes, they become the critical information to the administrator to consider that there exist several problems at network setting and routing topology.

In this paper, we develop the BGP Analysis System on KOREN network to investigate and analyze BGP messages against BGP errors and instabilities. To support such a route information management task, efficient BGP path information gathering schemes, an optimized data mechanism for the gathered information and well organized characteristic schemes for the large BGP path information are needed before all else. For such reasons, the tools for analyzing the routing table on

the KOREN research network are required to improve KOREN network efficiency, as well as other network. Also, we provide statistics to monitor BGP errors, especially anomalies [2], [3], and the growth behavior of BGP tables. Our work distinguishes different classes of Multiple Origin AS change [4] and provides significantly more information on their occurrence, impact and causes.

The rest of the paper is organized as follows. The related work in this topic is explained in Section II. Section III presents our proposed scheme in detail and Section IV shows the implementation model we have used and discussions on the performed results. Finally, section VI concludes and presents our plans for future work.

### II. RELATED WORK

There have been some other studies that consider the various IP routing information analyses and visualization stabilities in BGP.

#### *APAN-JP NOC ? BGP Routes*

Figure 1 shows a web-based peer AS exchanged BGP route from APAN-JP NOC. BGP routing tables, Perl-based, are obtained from APAN Tokyo XP in Japan. This page furnishes IPv4 and IPv6 peers, received routes with peer and advertised routes with peer such as prefix, AS path and origin.

#### *University of Oregon Route Views Project*

Figure 2 presents BGP routing table information from the University of Oregon, U.S.A. The report was generated from an analysis of the BGP routing table within AS1221 (Telstra), and was produced on 2 Sat Oct