

Knowledge exchange BGP

Case Study/Workshop



1 Executive summary

Hanze University asked GN-IX to give multiple workshops for fourth-year students, so they can have the knowledge of how the Internet works, what is peering and transit and how does BGP works. Therefore GN-IX arranged two sessions at Hanze University to exchange this knowledge and give the students some exercises, so they realise and experience how this works.

2 Problem statement

Students of technical computer science got four years to gain the knowledge to fulfil their education. Since BGP is a very specific subject and four years is really short, they asked people from the business to prepare and give a one day workshop for these students.

3 Alternatives

To let the students work with BGP, there are multiple options to use as routing daemons. Examples are OpenBGPD, Quagga, BIRD and Cisco. We chose to use the Cisco emulator GNS3, since Cisco got a very well known command-set for using BGP. The first workshop we had 4 virtual routers where each group of students(about 4 students a group) could configure a virtual Cisco 7201 router. The second time we've made a VMware image, and spread this around the class. Each student now could configure their own router.

4 Conclusion

All the students found the workshop very usefull and they all learned the basicle principles of the Internet and BGP. Afterwards they all knew how to setup sessions, exchange prefixes, could explain why this protocol is based on 'trust' and why one mistake in the configuration could have huge consequenses.

The second workshop, by letting all the students work with their own router, was even more usefull since every student was more involved in the workshop.

5 Implementation

Both workshops started with a small introduction. The following items where explained:

- The history of routing
- How does the Internet works and how does networks cooperate with each other.
- What is BGP , what is an Autonomous System (AS) and how does BGP sessions work.
- How does the BGP decision process works.
- Since BGP is a protocol based on 'trust', how can you arrange the security, filtering and prevention of human mistakes.

After the presentation, there was a case where the students all can configure their own virtual router and made sessions with each other. After this was finished they had to 'ping' all the computers from the other students behind the BGP routers. When the ICMP-reply was there, they were asked to explain how this all works. After this there was another case where they could manipulate their traffic to neighbours (the other students) by using filtering based on AS-prepend and local-preference.

6 Participants

