

Overview on Future Internet Routing Activities

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This talk gives a comprehensive overview about current trends in future Internet routing and summarizes ideas from the workshop of the Routing Research Group (RRG) of the IRTF in Prague [1].

Today's Internet routing has a scalability problem. Each BGP router needs to know a path to any IP number. If BGP routers require only short prefixes of large networks in their forwarding tables for the lookup of the appropriate interface, the number of entries is small. However, short prefixes are only possible in a static hierarchical architecture where the deployment of the IP numbers respects the topology of the Internet. Due to the increasing number of subnets in the Internet with IP number blocks that cannot be aggregated, multihoming, mobility requirements, and IPv6, the number of entries in the forwarding tables is steadily increasing. The forwarding tables of today's BGP routers comprise about 200000 entries and it is not clear whether this number grows linearly, polynomially, or exponentially with time. This is a serious threat for Internet performance because increasing routing table sizes can significantly reduce the speed of core routers.

Various approaches in the past tackle this problem with different motivation and pursuing different principles. The Core Router-Integrated Overlay (CRIO) [2] reduces the sizes of the forwarding tables by setting up tunnels. The locator/identifier split (LISP) [3] proposes to separate the locator and identifier functionality of IP addresses by a mapping service which is similar to the domain name system. eFIT (enable Future Internet innovation through Transit wire) is a proposal that implements this idea in a way which is compatible with the current Internet architecture [4]. IP virtual link extensions (IPvLX) also use the idea of the locator/identifier split for routing of IPv6 addresses across IPv4 clouds [5].

References

- [1] Routing Research Group, Seminar Agenda, <http://www3.tools.ietf.org/group/irtf/trac/wiki/RRG>
- [2] Xinyang Zhang and Paul Francis and Jia Wang and Kaoru Yoshida: "Scaling IP Routing with the Core Router-Integrated Overlay", ICNP 2006
- [3] D. Farinacci and V. Fuller and D. Oran, "Locator/ID Separation Protocol (LISP)", Internet draft, <http://www.ietf.org/internet-drafts/draft-farinacci-lisp-00.txt>
- [4] D. Massey and L. Wang and B. Zhang and L. Zhang, "A Proposal for Scalable Internet Routing & Addressing", Internet draft, <http://www.ietf.org/internet-drafts/draft-wang-ietf-efit-00.txt>
- [5] F. Templin (Ed.), "IPvLX - IP with virtual Link eXtension", Internet draft, <http://www.ietf.org/internet-drafts/draft-templin-ipvlx-06.txt> (outdated)