IGF 2016
Best Practice Forum on IPv6

'Understanding the commercial and economic incentives behind a successful IPv6 deployment'

Executive Summary

The Best Practice Forum (BPF) *Understanding the commercial and economic incentives behind a successful IPv6 deployment* was part of the community intersessional work program of the Internet Governance Forum (IGF). This document is the outcome of an open and iterative process over the months preceding the 11th meeting of the IGF in Guadalajara, Mexico, 6-9 December 2016. A BPF collects best practices from around the world and provide an opportunity to learn from each other by sharing experiences.

IPv6 adoption was selected as a topic for a BPF in 2015 and 2016. While in the first year the BPF focused on best practices to create an environment favorable to IPv6 adoption, in 2016 the BPF explored the commercial and economic incentives behind IPv6 deployment.

Generally speaking, devices connect to the Internet via numerical Internet Protocol addresses (IP addresses). The first pool of IP addresses was created in the 1970s and contained approximately 4 billion unique numbers. This is the Internet's legacy addressing system – Internet Protocol version 4 (IPv4). The growth of the Internet has virtually exhausted the IPv4 address pool.

A new addressing system, Internet Protocol version 6 (IPv6), was developed in 1995 to deal with IPv4 exhaustion. The IPv6 address pool is huge by comparison. The practical size of the IPv6 space can be equated to 32 Billion times the size of the IPv4-based Internet.

Anyone running the old protocol needs to adopt the new one. For the Internet user, IPv6 secures the quality of service of his/her Internet connection and assures that he/she continues to be able to use new services and applications and to connect to all content on the Internet. Technologies – for example "NAT" and "CGN" – have been developed to extend the life of IPv4. They should be considered only as temporary solutions.

The number of networks that already support IPv6 today proofs that IPv6 adoption is a technically feasible option for businesses. IPv6 adoption is on the rise – not only in the global North, but also in a number of countries in the southern hemisphere. The BPF invited people to share their commercial experiences with IPv6, with the aim of establishing a better understanding of the commercial and economic incentives that sit behind a successful deployment of IPv6.

Based on the case studies, the BPF formulated the following observations:

- The imminent shortage of IPv4 is the obvious and most cited motivation behind the decision to deploy IPv6. IPv6 is regarded as the long-term solution to prepare the company's or organization's network for the future.
- Deploying IPv6 now to avoid the expected and increasing cost of the alternative solutions to extend the life of IPv4 is an important incentive.
- The higher quality of service with IPv6 and related benefits is a third reason for the decision to deploy IPv6. This includes, for some, providing new services (e.g. VoLTE, IoT, M2M communication) that would be very hard to deploy in full scale without IPv6.
- Deploying early, and creating a momentum for others to follow has been the motivation for early adopters, among which are several universities and national research and education networks (NRENs).
- Being known as an early adopter of new technologies fits well in the branding strategy of Internet companies and service providers.
- In some areas the government or regulator acted as an external motivator for IPv6 deployment, e.g. by defining guidelines and timelines, or via its own procurement policy. Elsewhere, sector organizations have been promoting IPv6 deployment and provided information or support.

Based on the collected examples of successful IPv6 deployment, the BPF document describes per sector the main observations, incentives and challenges (see section 4 and 5). Short descriptions of the different case studies, per geographical region and country, can be found in section 6. Based on the received input and discussion the BPF formulated takeaways for policy and decisions makers. They can be found in section 7.

The reader will notice from the case studies that no situation is alike. As a consequence, there exists no one size fits all solution that works in all circumstances and for every company, network, country or region. This is an important takeaway for governments that wish to support the IPv6 uptake in their country. They should reach out to decision makers in the industry and stimulate them to deploy IPv6 (not regulate!) and lead by example.

The BPF on IPv6 held a workshop at the IGF meeting Guadalajara. A video recording can be found on the link below:

BPF on IPv6 workshop at the 11th IGF meeting
7 December 2016, Guadalajara, Mexico
https://youtu.be/g9EmjZXpscA (YouTube link)