

EU-China FIRE: IPv6 Best Practices

EU-China Future Internet Common Activities and Opportunities by Latif Ladid, Research Fellow,
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Latif Ladid, IPv6 Forum President

The EU-China FIRE project has formed an EU-China IPv6 Best Practices expert group. A focus was made at the beginning on attracting IPv6 experts from the leading Telecom and ISP worlds from China and Europe as they are the first enablers of IPv6 and therefore have the appropriate skills and resources. China Telecom, China Mobile and China Unicom as the main Chinese Internet Service Providers have come forward with very detailed IPv6 deployment best practice papers. From Europe, France Telecom/ Orange, Telefonica and Deutsche Telecom accepted to supply their concise, but valuable, input. These best practice papers are very important tools for learning from major industry players about their deployment experience and the issues they encountered. This modus operandi has been traditionally practiced throughout the Internet history; sharing lessons learned and interoperability issues, as the peering is quite important to everyone's business. In a second round, we have also attracted experts who could address horizontal topics and new areas where IPv6 will play a networking role, such as Cloud Computing, SDN-NFV, IoT and practical deployment in the government sector.

The IPv6 Deployment worldwide is becoming a reality now with some countries achieving more than 15 % user penetration as of January 2015 with Belgium (38%), Germany (17%), Luxembourg (14%) and Switzerland (12%) ranking at the top (see <http://labs.apnic.net/dists/v6dcc.html>) according to Google IPv6 statistics. Many Autonomous System Networks (ASNs) reach more than 50% with IPv6-preferred or IPv6-capable penetration (see <http://labs.apnic.net/ipv6-measurement/Economies/US/>). Over 200 million users are accessing the Internet over IPv6 and probably not even knowing it. The US remains by far the highest adopter of IPv6, in terms of numbers, with some 22 million users, followed by Germany, Japan and China with each more than 5 million users. Worldwide, IPv6 deployment has passed the 4% Google usage and is doubling every 6 months (see <http://www.google.com/intl/en/ipv6/statistics.html>). If this trend continues, we should achieve 50% by 2017 which would be the inflection point when the full rollout of IPv6 becomes a strategic plumbing decision of network operators; a topic that has been avoided so far due to many strategic and resources issues (lack of top management decision-making, lack of IPv6 skilled engineers and IPv6 deployment best practices, very limited ISP IPv6 access deployment, ..).

On the other hand, the deployment of Carrier-Grade NAT is in full swing making networking and user experience more brittle. The security and cybersecurity issues are - like always - brushed over at this stage, due mainly to the lack of IPv6 security skills. New topics are more in the limelight such as Cloud Computing, Internet of Things, SDN, NFV, 5G. However, these fields are taking IP networking for granted, designing them on IPv4/NAT, and therefore building non-scalable and non-end to end solutions. The ECIAO project is driving new initiatives to garner support and create awareness on the impact of IPv6 on topics such as Cloud Computing, IOT, SDN-NFV and 5G.

IPv6 Experts Group

We have been much honored to win following very high level experts from China and Europe to join the IPv6 Expert Group to stand by this project with their contributions with focus on practical deployment recommendations and lessons learned that can be exploited by the rest of the industry: ▶

| NAME | JOB TITLE | BEST PRACTICE |
|-------------------------|--|--|
| Mr. Hu Jie | Senior Network Engineer/ CNGI (China Next Generation Internet) Project Manager, China Telecom | "IPv6 Deployment Best Practice by China Telecom" |
| Ms Qian Wang | Senior Network Engineer, China Telecom | |
| Mr. Tianle Yang | IPv6 Project Manager in China Mobile, Author of many IETF RFCs. | "IPv6 Progress in China Mobile" |
| Ms. Xiaoxia Zhou | Technology Strategy and Network Evolution Policy Supervisor, China Unicom. | "IPv6 construction and migration" |
| Professor Li Xing | Deputy Director of China Education and Research Network (CERNET) Center. One of the major architects of CERNET. | "IPv6 Backbone Deployment BP of CERNET2" |
| Professor Ma Yan | Deputy Director of the Network Information Center of the Beijing University of Posts and Telecommunications (BUPT). | "IPTV APP over v6 of the 80 TV channels at BUPT" |
| Carlos Ralli-Ucendo | Tefónica I+D, S.A.U. Future Internet Architect, IPv6 Expert. | "IPv6 deployment in an international ISP (fixed & Mobile)" |
| Antonio J. Jara | Vice-Chair, IEEE ComSoc IoT ETC, University of Applied Sciences Western Switzerland (HES-SO), Sierre, Vallais, Switzerland. | "The Internet of Things through IPv6: An Analysis of Challenges, Solutions and Opportunities " |
| Axel Clauberg | Vice President, Aggregation, Transport, IP (CTO-ATI) and Fixed Access (CTO-FIA) Architecture at Deutsche Telekom AG. Board Member ONF | "IPv6 Fixed Deployment BP in Germany/Croatia" |
| Patrick Grossetete | Distinguished Technical Marketing Engineer, working on Field communication architecture and design in Cisco Internet of Things Business Unit. | "IPv6 in Smart Metering" |
| Christian Jacquenet | Director of the Strategic Program Office for the evolution of the IP backbones operated by France Telecom's Group, and he's responsible of the Group-wise IPv6 Program that aims at defining (and driving the enforcement of) the IPv6 strategy of France Telecom. | "An IPv6 Experience" |
| Wolfgang Fritsche | Head of Internet Competence Center at IABG | "IPv6 introduction within the German public sector" |
| Janos Mohacsi | Currently is working for NIIF as a Deputy Director of Networking. | "Campus IPv6 Deployment" |
| Dr. Antonio F. Skarmeta | Professor, University of Murcia – Associate editor of the IEEE SMCPart B | "Extending the IoT to IPv6 with Software Defined Networking" |
| Ciprian Popoviciu | President and CEO of Nephos6 | "IPv6-enabled Cloud Computing" |
| Dr. Jianping Wu | Director, CNGI-CERNET2 | "CNGI-CERNET2: an IPv6 Deployment in China" |

We have selected the following best practice papers with highest value to industry for this first year of the project:

| CONTRIBUTORS | BEST PRACTICE |
|---|---|
| Mr. Hu Jie, Senior Network Engineer/ CNGI (China Next Generation Internet) Project Manager, China Telecom | IPv6 Deployment Best Practice by China Telecom |
| Ms Qian Wang, Senior Network Engineer, China Telecom | |
| Mr. Tianle Yang, IPv6 Project Manager in China Mobile, Author of many IETF RFCs. | IPv6 Progress in China Mobile |
| Ms. Xiaoxia Zhou, Technology Strategy and Network Evolution Policy Supervisor, China Unicom. | IPv6 construction and migration |
| Tefónica I+D, S.A.U. Future Internet Architect, IPv6 Expert. | IPv6 deployment in an international ISP (fixed & Mobile) |
| Axel Clauberg, Vice President, Aggregation, Transport, IP (CTO-ATI) and Fixed Access (CTO-FIA) Architecture at Deutsche Telekom AG. Board Member ONF | IPv6 Fixed Deployment BP in Germany/Croatia |
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| Antonio J. Jara, Vice-Chair, IEEE ComSoc IoT ETC, University of Applied Sciences Western Switzerland (HES-SO), Sierre, Vallais, Switzerland. | The Internet of Things through IPv6: An Analysis of Challenges, Solutions and Opportunities |
| Dr. Jianping Wu, Director, CNGI-CERNET2 | CNGI-CERNET2: an IPv6 Deployment in China |

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