



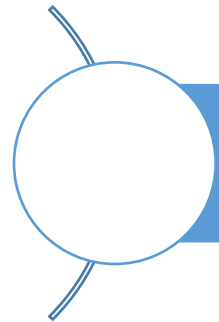
MINISTRY OF INFORMATION AND COMMUNICATIONS
VIETNAM INTERNET NETWORK INFORMATION CENTER

VIETNAM IPV6 MEASUREMENT

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Vietnam Internet Network Information Center (VNNIC)
Standing committee of the Vietnam National IPv6 Task Force

Contents

- Vietnam National IPv6 Action Plan
- Promotion activities
- Vietnam IPv6 Readiness measurement
- Things for the future



Vietnam National IPv6 Action Plan

National IPv6 Action Plan

Preparation Phase (2011 – 2012)

- Making the assessment of the network, IPv6 test, training.
- ISPs issue their own IPv6 action plan, following on the National Plan.

Implementation Phase (2013 – 2015)

- Network transition for supporting both IPv4 and IPv6.
- Forming National IPv6 Network Infrastructure; Providing IPv6 pilot services.

Accomplishment Phase (2016 - 2019)

- Ensuring the stable operation of Vietnam Internet within IPv6 based technology.

Vietnam
National IPv6
Task Force



IPv6 deployment plan during the last phase

ISP

- Providing IPv6 to fixed broadband customers.
- IPv6 ready logo for website.

Hosting IDC:

- Providing Hosting IDC services supporting IPv4/IPv6

Mobile Operator

- Providing IPv6 for 4G LTE.
- IPv6 ready logo for website.

ICP

- Making their content available over both IPv4 and IPv6.
- Joining VNIPv6TF

Registrars

- Supporting IPv6 for “.vn” hosting and registration services

Government Agencies

- Research and deploy IPv6.
- Requesting Internet Supply Providers to provide IPv6 services.
- IPv6 ready logo for website “.gov.vn”

IP member:

- Registering IPv6 for researching and deploying IPv6.



Main target

Providers

ISP, IDC

Mobile Operators

Content providers

Internet Equipment
Vendors

Provide IPv6 services
(FTTH, Hosting, LTE...)

Customers/ users

Government agencies

Training and education
organizations

Enterprise Customers

Internet Users

VNIPv6TF

(Support, promotion, connection)





IPv6 Promotion Activities

IPv6 deployment promotion activities

- IPv6 Training courses for: ISP, Government agencies, Department of Information and Communications ...
 - ~ 1000 attendance.
- Improving IPv6 knowledge of Vietnam community:
 - Vietnam IPv6 Day was set to 6 May yearly.
 - Vietnam IPv6 Day conference and workshop since 2012.
 - IPv6 article on formal Website of the Ministry of Information and Telecommunications (MIC).
 - IPv6 articles on newspaper.
 - Other events.



Vietnam IPv6 Launch (2013)



IPv6 article on MIC's Website

IPv6 deployment promotion activities

- VNIPv6TF delegation work annually with ISPs, ICT provider,... on deploying IPv6 on their networks and services.



VNIPv6TF worked with FPT Telecom in Oct 2016



Vietnam IPv6 Day 2016



VNIPv6TF worked with Viettel Corp in Oct 2016

Cooperation Activities

VNIPv6TF Studying visit to Malaysia (2016).



VNIPv6TF Studying visit to Singapore (2013).



VNIPv6TF

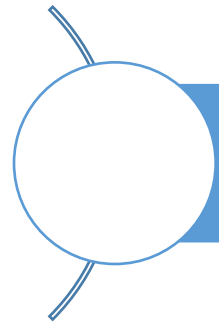
VNIPv6TF visit to Korea (2015).



VNIPv6TF Studying visit to Japan (2012).



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Vietnam IPv6 Readiness measurement

IPv6 deployment measurement in Asia

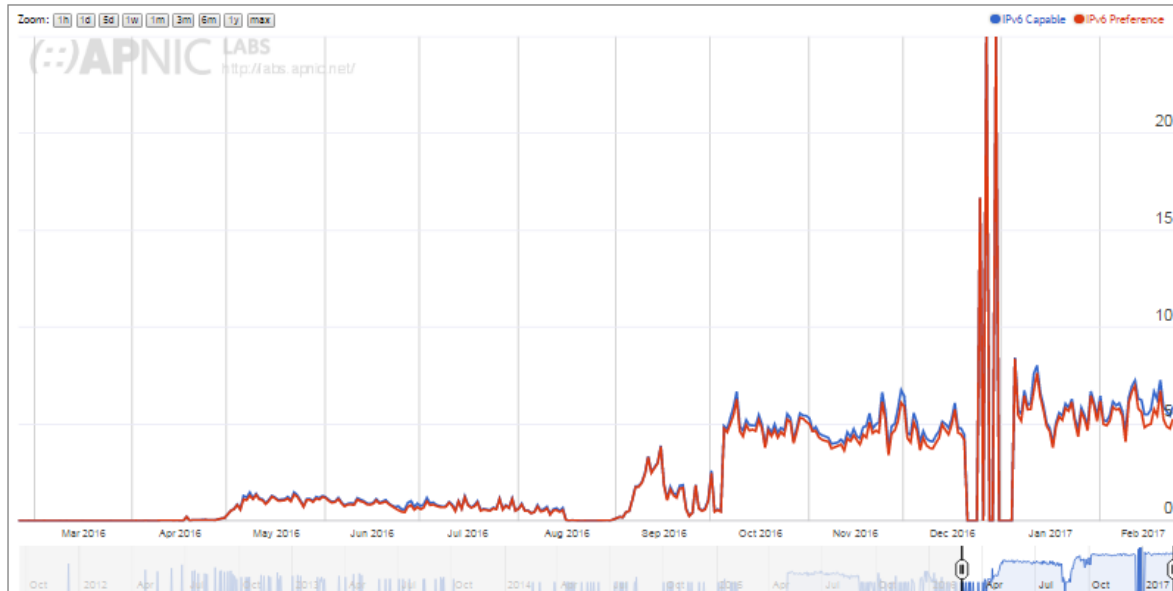
No	CC	Country	IPv6 Capable	IPv6 Preferred	Samples
1	IN	India, Southern Asia, Asia	20.23%	17.91%	23,834,694
2	JP	Japan, Eastern Asia, Asia	18.80%	16.35%	4,210,675
3	MY	Malaysia, South-Eastern Asia, Asia	15.21%	13.46%	5,850,002
4	SA	Saudi Arabia, Western Asia, Asia	6.50%	6.04%	16,015,943
5	VN	Vietnam, South-Eastern Asia, Asia	5.66%	5.30%	22,660,966
6	SG	Singapore, South-Eastern Asia, Asia	4.15%	3.26%	2,154,056
7	TH	Thailand, South-Eastern Asia, Asia	3.01%	2.91%	6,611,265
8	LK	Sri Lanka, Southern Asia, Asia	2.66%	2.42%	5,768,207
9	IL	Israel, Western Asia, Asia	1.86%	1.81%	6,633,451
10	MO	Macao Special Administrative Region of China, Eastern Asia, Asia	1.26%	0.92%	465,094

APNIC Labs (26/02/2017)

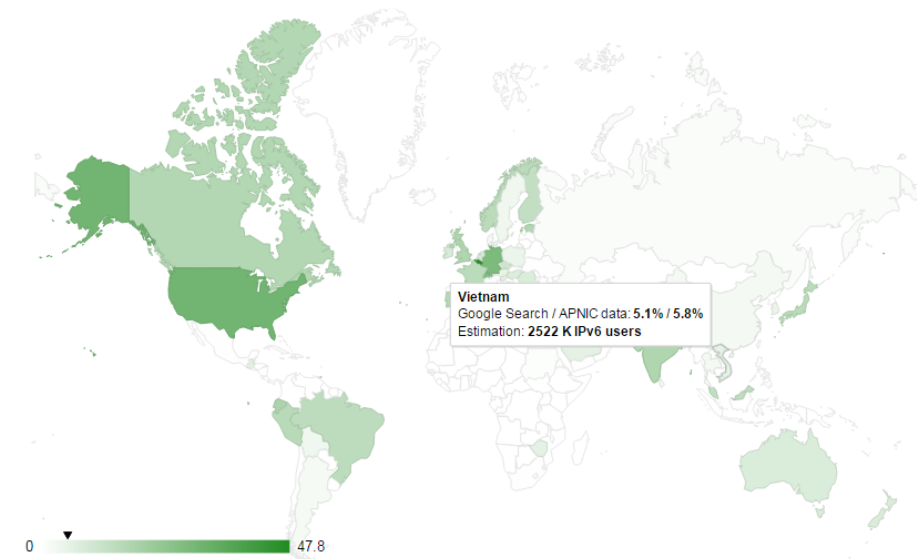


IPv6 deployment measurement in Vietnam

Use of IPv6 for Vietnam (VN)



APNIC Labs (26/02/2017)



Source: Cisco lab (26/02/2017)

Vietnam IPv6 ready

- IPv6 traffic and users rapidly grown when ISPs provide IPv6 services to customers:
 - APNIC statistics: ~ 5%, Top 3 ASEAN, Top 5 Asia (Max 25%).
 - Cisco statistics: over 2.500.000 IPv6 users.
 - Over 100 websites with IPv6.



Địa chỉ IP của bạn: 203.119.72.238

GIỚI THIỆU

Ngày 06/5/2013, nhân sự kiện Ngày IPv6 Việt Nam 2013, Mạng IPv6 Quốc gia gồm Mạng DNS quốc gia và Trạm trung chuyển Internet quốc gia (VNIX) trên IPv6 chính thức được **khai trương** với sự kết nối của 5 ISP (gồm Viettel, VNPT, Netnam, FPT Telecom, SPT, VTC); tiếp tục được duy trì ổn định với 10/19 ISP kết nối VNIX qua IPv6 là nền tảng vững chắc cho công tác triển khai IPv6 ở Việt Nam.

Để đánh giá mức độ sẵn sàng IPv6 tại Việt Nam, Trung tâm Internet Việt Nam (VNNIC) - Thường trực Ban Công tác thúc đẩy phát triển IPv6 quốc gia xây dựng Website "Viet Nam IPv6 Ready" để công bố các thông tin về mức độ sẵn sàng IPv6 tại Việt Nam, cung cấp thông tin từ các tổ chức được cấp tài nguyên địa chỉ IPv6, website sẵn sàng IPv6, các doanh nghiệp cung cấp dịch vụ, phần mềm, thiết bị đầu cuối hỗ trợ IPv6 đến việc sử dụng và đưa địa chỉ IPv6 đến người sử dụng của các doanh nghiệp. Tổng thể tạo nên bức tranh toàn cảnh về sự sẵn sàng IPv6 trên mạng Internet Việt Nam.



- www.vietnamipv6ready.vn



Top 15 enterprises with IPv6 deployment in Vietnam

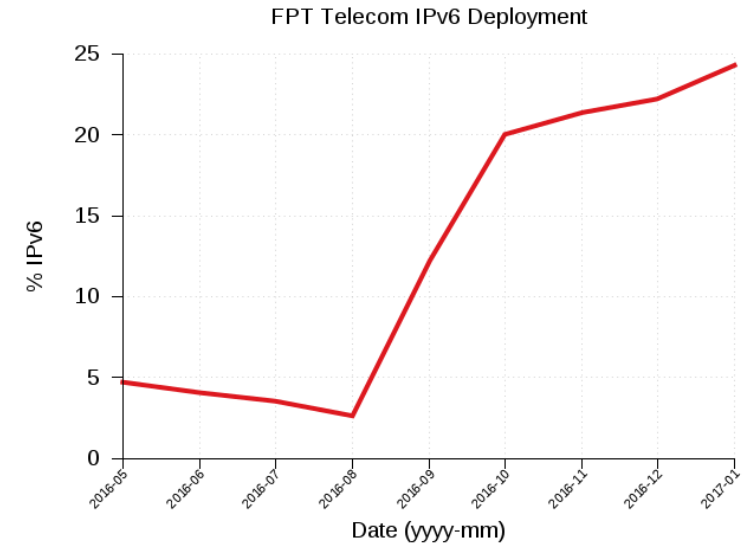
No	ASN	AS Name	IPv6 Capable	IPv6 Preferred	Samples
1	AS23902	Vietnam Internet network information center (VNNIC)	67.44%	61.63%	86
2	AS18403	FPT-AS-AP The Corporation for Financing Promoting Technology	30.35%	28.45%	4,206,318
3	AS38248	VTC-AS-VN VTC Multimedia Corporation	6.98%	6.31%	1,332
4	AS24176	Branch of Netnam Company in Ho Chi Minh City	7.07%	6.16%	8,234
5	AS24173	NETNAM-AS-AP Netnam Company	0.45%	0.45%	5,747
6	AS38731	VTDC-AS-VN Viettel - CHT Company Ltd	0.91%	0.35%	1,425
7	AS45903	CMCTI-AS-VN CMC Telecom Infrastructure Company	0.20%	0.19%	274,335
8	AS38247	HTMOBILE-AS-VN Ha Noi Telecom Mobile Center	0.06%	0.06%	1,613
9	AS131429	MOBIFONE-AS-VN MOBIFONE-VN	0.06%	0.03%	45,194
10	AS45899	VNPT-AS-VN VNPT Corp	0.02%	0.02%	8,526,899
11	AS7552	VIETEL-AS-AP Viettel Corporation	0.02%	0.02%	4,784,502
12	AS7643	VNPT-AS-VN Vietnam Posts and Telecommunications (VNPT)	0.13%	0.02%	20,788
13	AS24086	VIETTEL-AS-VN Viettel Corporation	0.00%	0.00%	1,563,917
14	AS45543	SCTV-AS-VN Saigon Tourist cable Television Company	0.00%	0.00%	488,185
15	AS7602	SPT-AS-VN Saigon Postel Corporation	0.00%	0.00%	140,796

APNIC Labs (24/02/2017)



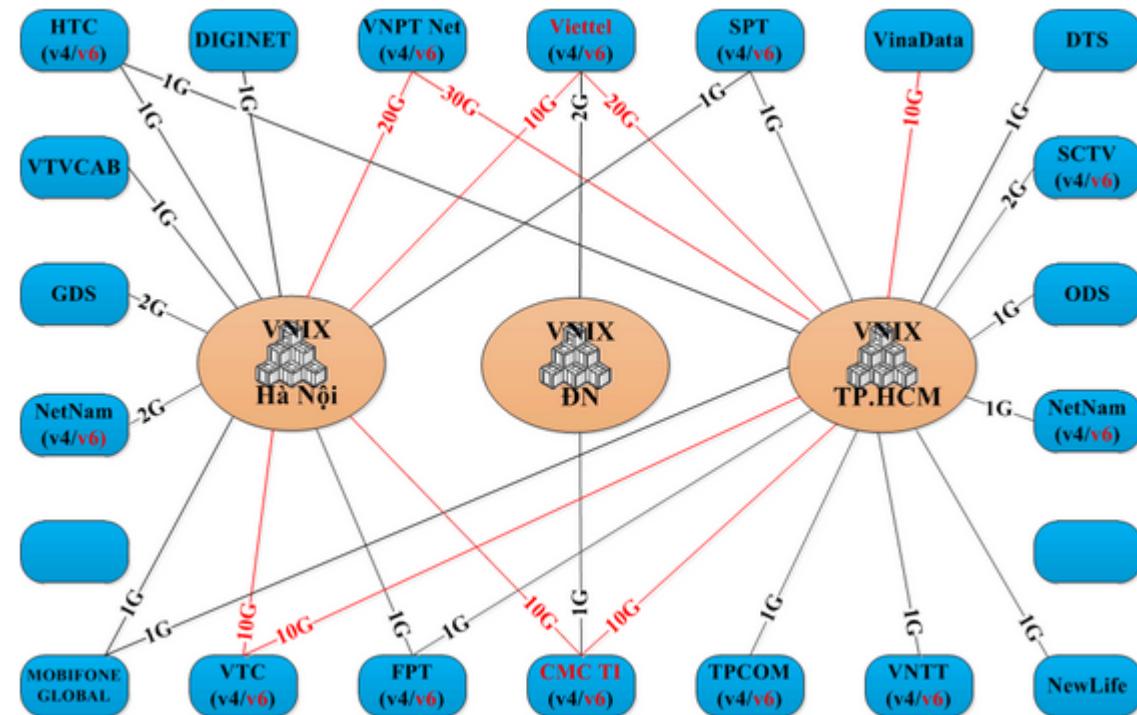
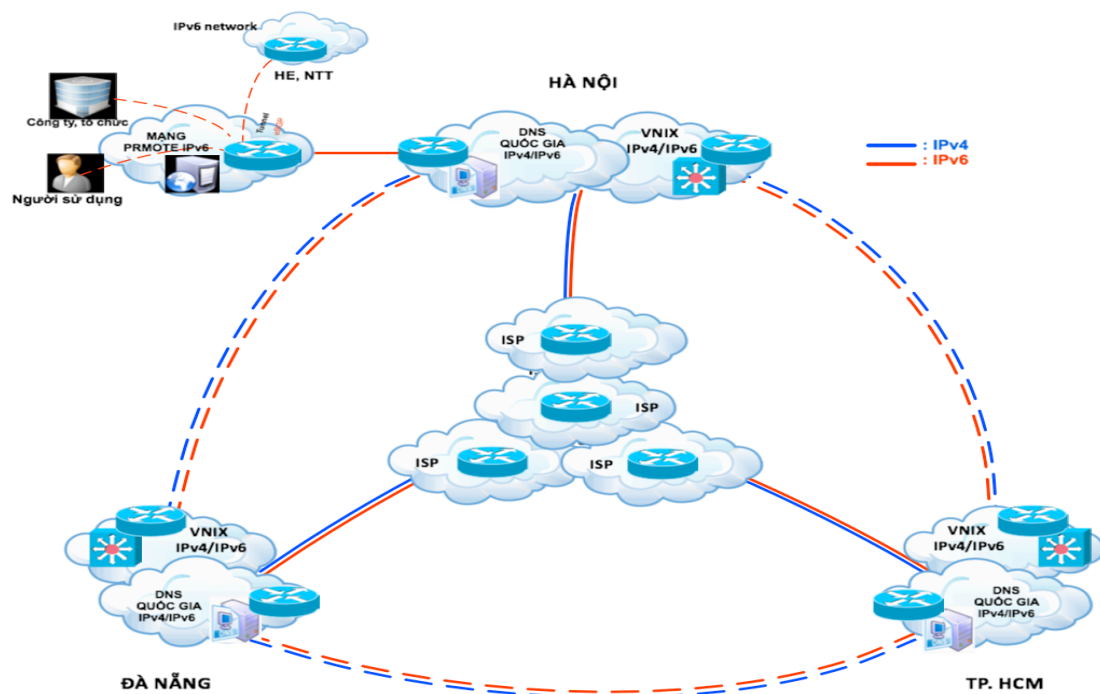
FPT - The head of IPv6 enterprises in IPv6 deployment

- **FPT Telecom:** First ISP widely offering IPv6 services for customer
 - IPv6/IPv4 dual-stack for 800.000 FTTH customers.
 - 100% websites reachable over IPv6: fpt.vn; Truyenhinh.fpt.vn; IPv6.fpt.vn; Fshare.vn; Fsend.vn; FPT Play.net; FPT Play.tv; Office365.fpt.vn...
 - ~24% IPv6 adoption, 16th in the world (World IPv6 launch).
- **FPT Online/VnExpress: content provider with IPv6:**
 - IPv6 ready sites: inone.vnexpress.net; raovat.express.net; shop.vnexpress.net; pay.vnexpress.net.
 - ~ 932.000 IPv6 users/ day.



Source: World IPv6 launch (11/01/2017)

Vietnam National IPv6 Network



- Vietnam National IPv6 Network: National DNS, VNIX.
- Vietnam National DNS: ↑ 05/7 DNSs support IPv6; A/B/C/F.dns-servers.vn ...
- ↑ 11/19 ISPs connect to VNIX via IPv6: VNPT, Viettel, Netnam, FPT ...
- 04 ISPs have international IPv6 connection to HKIX, AKAMAI, HE, Google, Microsoft, Yahoo ...

IPv6 services

- National DNS “.vn”, DNS Cache, DNS Hosting ...
- Vietnam Internet Exchange (VNIX)
- Fshare Tool of FPT Telecom.
- FTTH, mobile 4G LTE, Mobile Game ...
- Hosting IDC, Tunnel, Wi-Fi, mail
- IP transit, colocation services, Internet access
- Content: ~ 100 websites

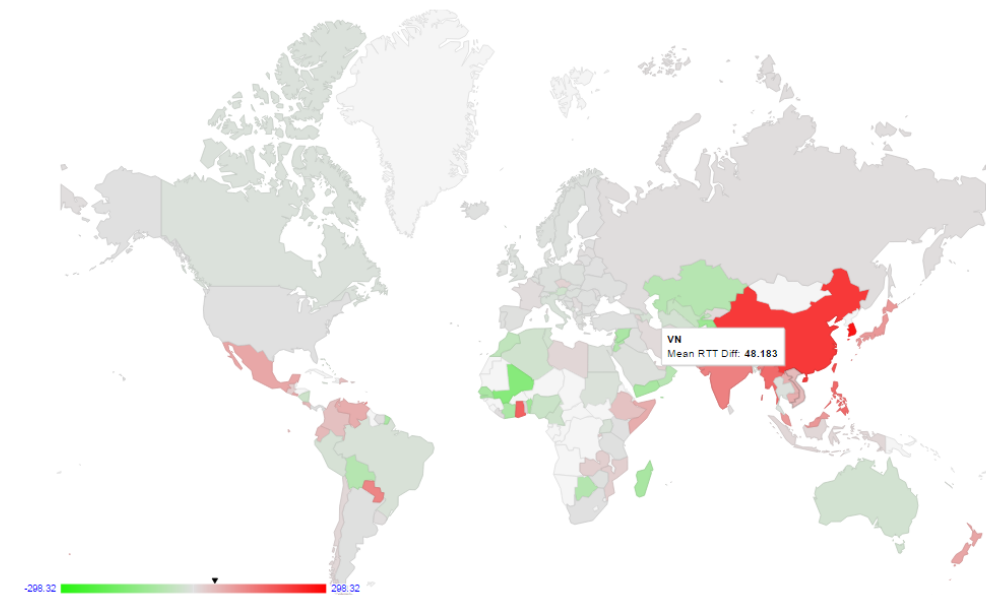


IPv6 Performance in Vietnam

Average RTT Difference (ms) (V6 - V4) for Vietnam (VN)



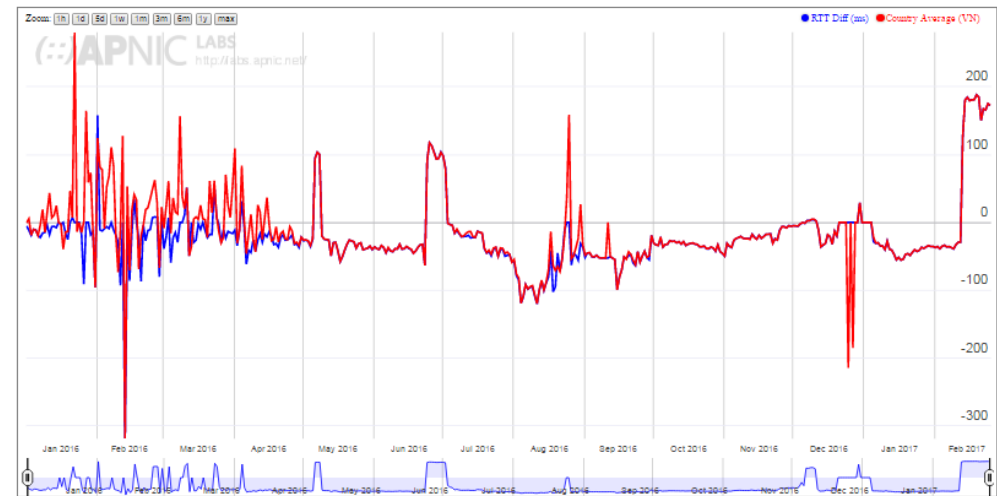
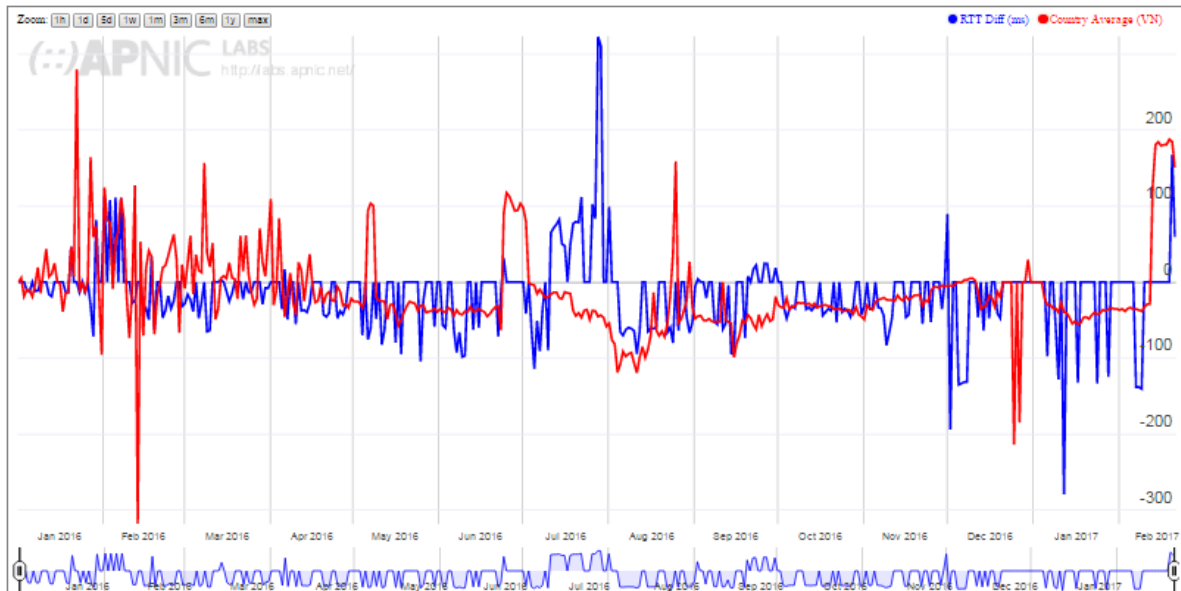
V6/V4 RTT Comparison by country (ms)



- Average RTT (v6-v4): ~ 50 (average RTT in the world: ~69.78, in Asia: 126.88)
- IPv6 fail rate: 5.92% (average the rate in the world: 2.63%, in Asia: 2.56%).

(Source APNIC Lab 26/2/2017)

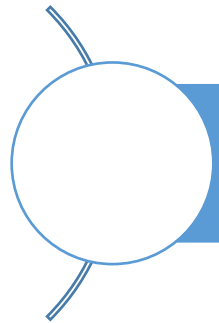
IPv6 Performance of VNNIC and FPT Telecom



- IPv6 performance in VNNIC: Almost time, IPv6 performance is better than IPv4.
- IPv6 performance in FPT Telecom: IPv6 was slower than IPv4 at the beginning. IPv6 has get more faster and has been faster than IPv4 for recently 6 months.

(Source APNIC Lab 26/2/2017)

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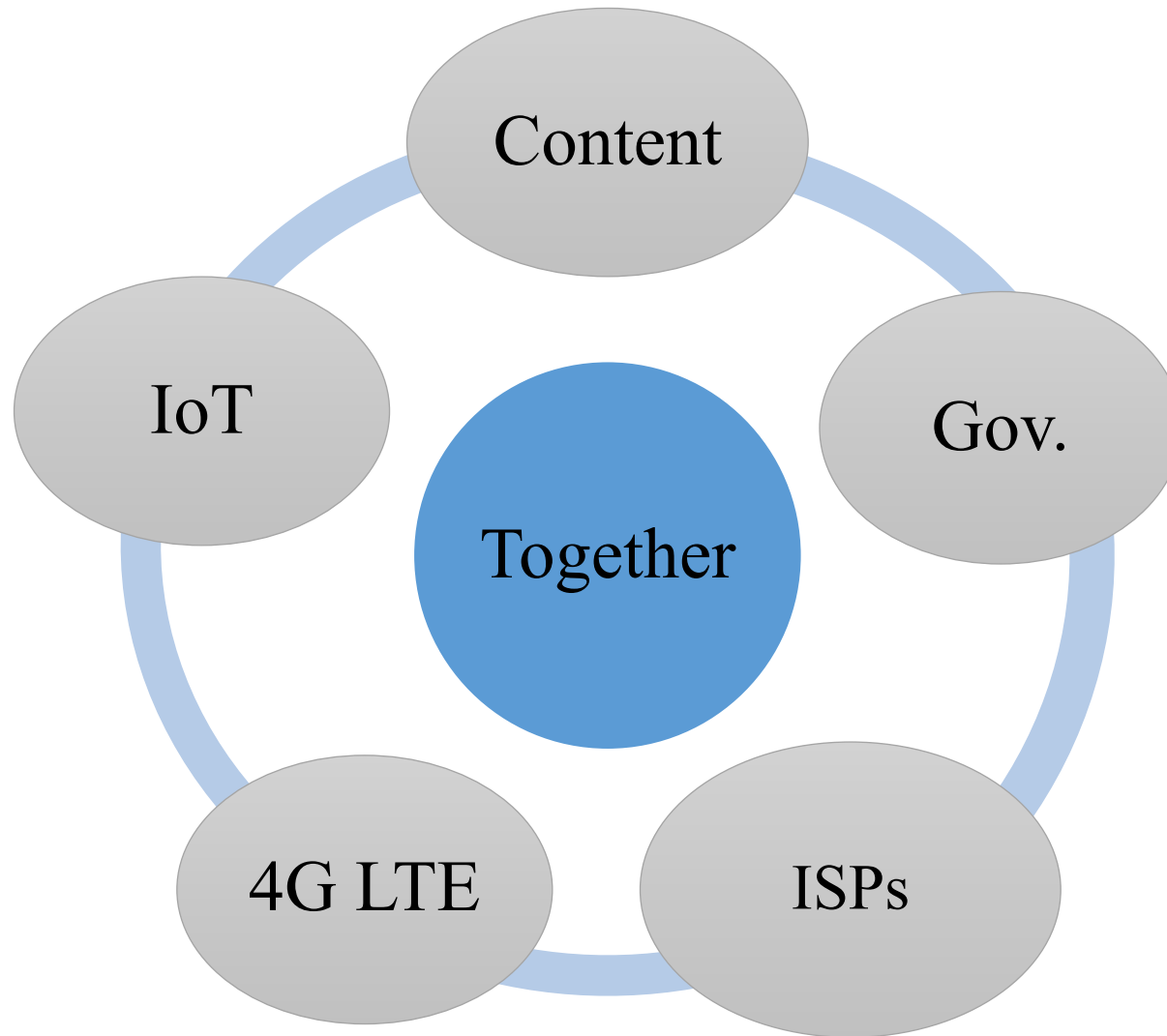


Things for the future



Issues

- Better result of IPv6 deployment (~ 5% IPv6 Preferred), but this is still lower than the average ratio of IPv6 over the world.
- Highly differences on results of IPv6 deployment between ISPs, not much IPv6 deployment in Content providers....
- There are a number of IPv6 promotion policies, but not many obligation that request enterprises to deploy IPv6.
- IPv6 deployment of Government agencies has been slow.
- IPv6 security, IoT





THANK YOU!