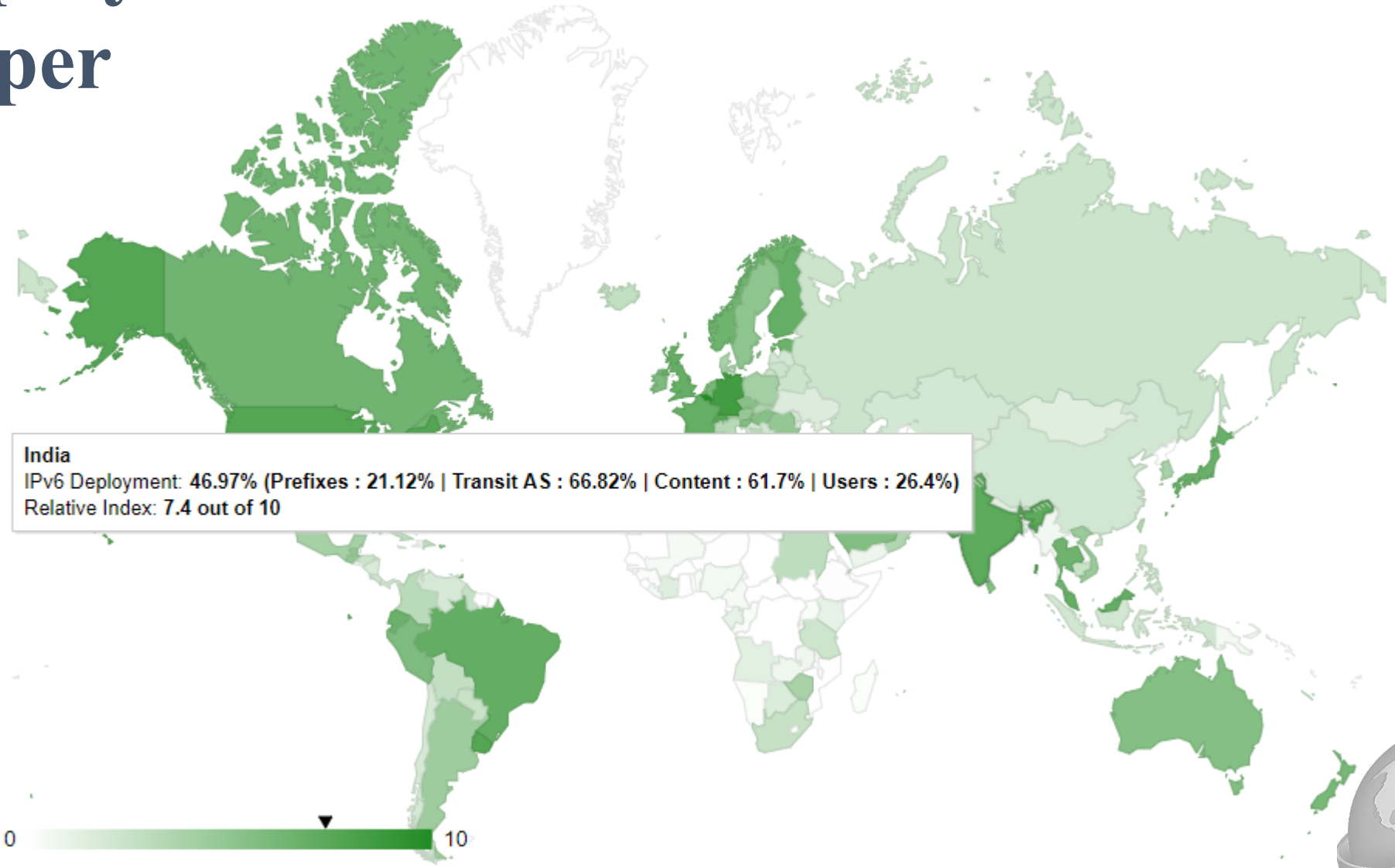


India IPv6 Measurement

AJAI KUMAR,
CIO, MUMBAI IX
AJAI@MUMBAI-IX.NET

APNIC 45
26-02-2018

IPv6 Deployment in India as per Cisco



Source: http://6lab.cisco.com/stats/index.php 24-02-2018

IPv6 in India

- Department of Telecommunications, Ministry of Communications, Government of India was running a program for adoption of IPv6 in the all networks in India.

- Sify Technologies Limited, a private Internet service provider, rolled out IPv6 since in 2005.

- ERNET India done the project on IPv6 along with IIT,Kanpur with help of Department of IT in 2005.

- IRINN is delegating the IPv6 Resources virtually free.

- Reliance Jio is running on IPv6 from its first day and 100 million LTE customers are on IPv6.



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15 Countries/ Economies on IPv6 Deployment in Asia

No.	CC	Country	IPv6 Capable	IPv6 Preferred	Samples	Weight	Weighted Samples
1	IN	India	57.06%	55.64%	114,538,463	1.19	136,203,594
2	JP	Japan	28.14%	24.79%	3,334,736	10.04	33,491,006
3	MY	Myanmar	25.40%	24.68%	14,241,760	0.45	6,353,643
4	KR	South Korea	15.90%	13.25%	14,896,721	0.85	12,674,233
5	SA	Saudi Arabia	14.02%	13.27%	18,458,555	0.34	6,275,177
6	MO	Macao	12.16%	11.66%	216,382	0.61	132,713
7	TH	Thailand	10.33%	10.20%	6,744,808	1.27	8,538,885
8	VN	Vietnam	8.90%	8.55%	20,184,618	0.72	14,503,237
9	SG	Singapore	8.56%	6.68%	4,340,531	0.32	1,381,170
10	LK	Sri Lanka	6.82%	6.58%	4,240,097	0.42	1,774,288
11	IL	Israel	2.51%	2.42%	1,427,316	1.24	1,771,391
12	AE	UAE	2.51%	1.98%	3,209,405	0.79	2,534,606
13	IR	Iran	1.79%	1.69%	715,024	16.21	11,592,018
14	TW	Taiwan	0.87%	0.80%	9,921,433	0.55	5,461,902
15	OM	Oman	0.56%	0.54%	1,740,706	0.57	992,624



Source: APNIC Labs (24/02/2018)

IPv6 in Internet Exchange Points in India

- **NIXI the first Internet Exchange in India has taken up a number of steps to encourage IPv6 activities in the country.**
- **NIXI did set up of parallel IPv6 Exchange Routers (test bed) in Mumbai and Delhi Exchange points during 2007-2008.**
- **All Exchange Routers of NIXI was made in Dual stack mode.**
- **Mumbai IX(the the largest Internet Exchange in India) is also running on Dual Stack.**
- **Mumbai IX website is IPv6 enabled**
- **50% peers are on IPv6 peering too at Mumbai IX.**
- **Mumbai IX is planning to have IPv6 workshop in India**



IPv6 Awareness Programme in the country

NIXI hosted around Hands-on training on IPv6 configuration, in association with APNIC.

NIXI sponsored free of cost training program to 115 engineers across the country for IPV6 online training.

NIXI hosted awareness seminar on IPv6 road ahead with APNIC held in Delhi & Mumbai.

NIXI & DoT,ERNET,BSNL conducted awareness seminars on IPv6 at major cities in India.

ERNET trained many Government staff with support of Ministry of Electronics and Information Technology.



IPv6 Readiness of .IN CCTLD

- **Registry DNS infrastructure hosted on dual stack.**
- **Registry can Accept and Respond to DNS queries on dual-stack infrastructure.**
- **Registry zone-file has been accepting the AAAA records.**
- **Registry has been supporting Registrants with their domains hosted on dual-stack connectivity.**



IPv6 Readiness of .IN CCTLD

- Registry System is capable of accepting connectivity on dual stack.
- Registrars can submit their IPv6 subnets for whitelisting, in order to connect to registry.
- WHOIS service is also available on dual stack connectivity.



Government Initiatives



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IPv6

NTP-2012 : Implementation of IPv6

Objective

Achieve substantial ***transition to new Internet Protocol (IPv6) in the country in a*** phased and time bound manner by 2020 and encourage an ecosystem for provision of a significantly large bouquet of services on IP platform.

Preamble

NTP-2012 recognizes futuristic roles of Internet Protocol version 6 (IPv6) and its applications in different sectors of Indian economy.



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Policy Decisions in July 2010 Roadmap v-I

- **All Major Service Providers will offer IPv6 services by 12/2011.**
- **All Government, shall start using IPv6 services by 03/2012.**
- **Formation of the India IPv6 Task Force:**

Three tier Structure of Task Force–

- ***Oversight Committee.***
- ***Steering Committee.***
- ***Working Groups.***



National IPv6 Deployment Roadmap II (Timelines)

SERVICE PROVIDERS	CONTENT PROVIDERS	EQUIPMENT MANUFACTURER	GOVERNMENT ORGANIZATIONS
• Enterprise Customers -01-01-2014 • Retail Customers (Wire line)- 30-06-2014. • Retail Customers (Wireless)- • LTE customer 30-06-2013 • GSM/ CDMA 30-06-2014	• New contents & applications 30-06-2014 • Existing 01-01-2015. • Financial ecosystem 30-06-2013. • The new registrations on '.in' domain 01-01- 2014. • The entire '.in' domain June 2014	• All mobile phone handsets/ data card dongles/ tablets and similar devices 30-06-2014. • All wire line broadband CPEs 01-01-2014	• Transition plan for transition to IPv6 by December 2017 to be prepared by December 2013 • The public interface for delivery of citizen centric services 1-1-2015. • The Government procurement to be either TEC certified or IPv6 Ready Logo certified. • The IPv6 to be included in the curriculum of technical courses being offered by institutes.

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Revised IPv6 Transition Timelines Dated 25-05-2016

SERVICE PROVIDERS	CONTENT PROVIDERS	EQUIPMENT MANUFACTURER	CLOUD COMPUTING / DATACENTER'S	GOVERNMENT ORGANIZATIONS
•**Enterprise Customers** •No change in the timeline •**Retail Customers (Wire line)-** •01-01-2017 •**Retail Customers (Wireless)-** •LTE, GSM/CDMA customer 01-01-2017	•**New contents & applications 01-01-2017** •**Financial ecosystem 01-01-2017.** •**The entire '.in' domain** *should endeavour to adopt IPv6 (dual stack) by 01-01-2017* **01-01-2017**	•**No change in the timeline.**	•All public cloud computing service /data centers providers should Endeavour to adopt IPv6 (dual stack) latest by 01-01-2017	•**No change in the timeline.**



Standardization & Testing Facilities

MOU with IPv6 Forum
Setting up IPv6 Test Bed in TEC
NGN Lab & IPv6 Test bed for IPv6 Conformance testing of Telecom Equipment
Ready Logo Certification







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Status of Nodal Officers & Activity Sheet

States/UTs

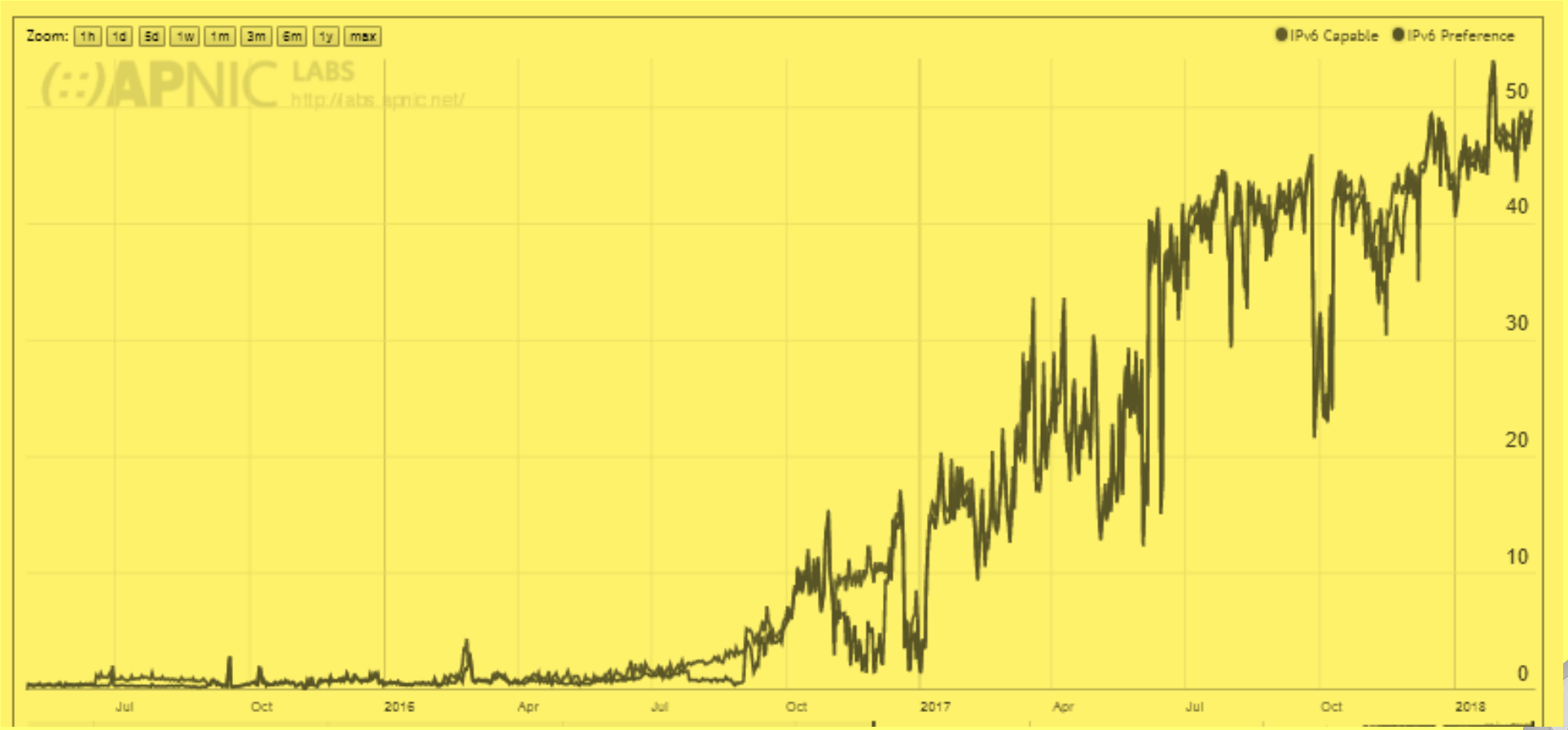
Nodal Officers (**Received**) States/UTs	IPv6 Implementation Activity Sheets (**Received**)
35/35	35/35

CENTRAL GOVERNMENT (Ministries/Departments)

Nodal Officer Nominations (Received) Ministries/Departments	IPv6 Implementation Activity Sheet (Received)
92/92	92/92



Use of IPv6 for India



Source: APNIC Labs (24/02/2018)

ASN	AS Name	IPv6 Capable	IPv6 Preferred	Samples
AS55836	Reliance Jio Infocomm Limited	91.13%	89.59%	62,573,487
AS45609	Bharti Airtel Ltd.	2.46%	2.36%	14,136,531
AS38266	Vodafone Essar Ltd	38.86%	37.52%	12,215,368
AS45271	Idea Cellular Limited	37.01%	31.25%	8,294,340
AS9829	BSNL-National Internet Backbone	0.02%	0.01%	3,535,669
AS24560	Bharti Airtel Ltd., Telemedia Services	0.03%	0.01%	1,745,879
AS18209	Atria Convergence Technologies pvt ltd	0.03%	0.02%	909,329
AS17488	Hathway IP Over Cable Internet	0.03%	0.01%	683,228
AS55441	Tata Teleservices -ISP DIVISION	23.33%	22.67%	617,561
AS55831	Aircel Ltd.	0.01%	0.01%	589,855
AS24309	Atria Convergence Technologies Pvt. Ltd	0.02%	0.01%	580,253
AS45194	Syscon Infoway Pvt. Ltd.	0.03%	0.01%	345,152
AS133982	Excitel Broadband Private Limited	0.02%	0.01%	303,044
AS17813	Mahanagar Telephone Nigam Limited	0.04%	0.01%	301,225
AS45769	D-Vois Broadband Pvt Ltd	0.03%	0.01%	292,659

Top 15 Enterprises with IPv6 Deployment in India

Source: APNIC Labs (**24/02/2018**)




Thank You!