

IPv6 deployment in India, with MAP-T Trials

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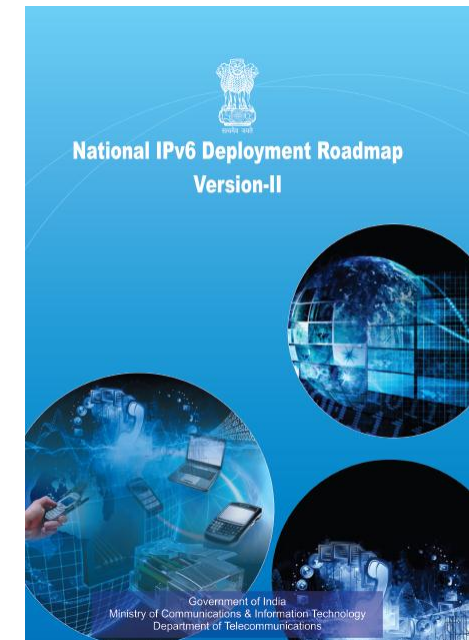
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Agenda

- (Self-Introduction)
- Overview - v6 Deployment status in India
- IPv6 for FTTH Services
- Operational Considerations and Challenges
- References
- (Acknowledgements)

Overview- v6 Deployment - Policy

- DOT had launched National IPv6 Development Roadmap(version II) in March, 2013, detailing Policy Guidelines :
 - Government Organizations
 - Service Providers
 - Content & Application Providers
 - Equipment Manufacturers (Both Network Equipment and End User Devices Manufacturers)
 - Cloud Computing / Data Centers
- Akamai's State-of-the-internet report ranks India at 48 with only 0.1% of IPv6 Connectivity.
- SP-Networks India BGP Table
 - <http://bgp.he.net/country/IN>




 **Networks: India**

ASN	Name	Adjacencies v4	Routes v4	Adjacencies v6	Routes v6
AS9498	Bharti Airtel Ltd	1,146	11,737	152	424
AS4755	Tata Communications (formerly VSNL)	403	2,016	66	182
AS18101	Reliance Communications Ltd	225	962	19	39
AS55410	Vodafone India Limited	172	1,825	20	54
AS9583	Sify Ltd	165	1,398	62	76
AS45820	Tata Teleservices ISP AS	92	344	7	27
AS9730	Bharti Telesonic Ltd	72	591	0	0
AS133229	Host Palace Internet Services	44	6	1	1
AS10201	Dishnet Wireless Limited. Broadband Wireless	41	391	2	2
AS9829	BSNL (Bharat Sanchar Nigam Ltd)	31	1,695	9	30
AS10029	Spectranet	28	445	6	10
AS55824	NKN Core Network	26	229	10	36
AS17439	Netmagic Datacenter Mumbai	25	344	6	11
AS17762	Tata Teleservices Maharashtra Ltd	21	442	3	4

Overview- v6 Deployment - Status

- DoT Released the Status Last year Decemeber.
- Service Provider
 - 100 % Enterprise Segment Readiness
 - Broadband and Mobile Services on IPv6 is in Progress
- All handsets launched after 30-06-2014 are IPv6 ready.

 Government of India Ministry Of Communications & Information Technology Department of Telecommunications				
IPv6 Readiness Status of Service Providers				
Sl. No.	Service Provider	SEGMENT READINESS		
		ENTERPRISE	WIRELESS	WIREFINE(BB)
1	Aircel	Ready	In Progress	NA
2	Airtel	Ready	In Progress	In Progress
3	Asianet	Ready	NA	In Progress
4	BSNL	Ready	In Progress	In Progress
5	MTNL	Ready	In Progress	Ready
6	Ortel Communications	Ready	NA	Ready
7	Quadrant	Ready	NA	In Progress
8	Reliance	Ready	Ready	Ready
9	Sify	Ready	NA	Ready
10	Spectranet	Ready	NA	In Progress
11	TTL	Ready	Ready	Ready
12	Tulip	Ready	NA	Ready
13	Vodafone	Ready	In Progress	NA
14	You Broadband	Ready	NA	Ready
15	TCL	Ready	NA	NA
16	SSTL	NA	In Progress	NA
17	SISL	Ready	NA	Ready
18	Tikona	Ready	NA	NA
19	Hathway	NA	NA	Ready
20	Hughes	NA	In Progress	NA

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Overview- v6 Deployment – Status (Contd..)

- All Central Ministries/Departments and 30/36 States/UTs have submitted their IPv6 Adoption Milestone to DoT.
- Websites of around 12 Scheduled Commercial Banks are ready on IPv6 and the payment gateways are underway to be ready on IPv6. 85 Urban Cooperative Banks(UCBs) have completed transition to IPv6.
- NIC is working on all Govt. Websites to make it IPv6 ready.
- Only 80 websites in India have already been on IPv6.
- NIXI is working for .in transition to IPv6.

IPv6 for FTTH Services

- Too many v4 only hosts/local content provider
 - Need to have encapsulation/Translation Mechanism for the same.
 - Considerable number of Host on Win 95 OS, in rural part of India (not supported by reference.)
- Dual Stack did not completely suffice, v4 exhaustion issue
- CG-NAT undergoing Field Trial
 - Statefull Solution,
 - Creates large Log files
 - Bulk Port Allocation reduces logging but leads to Inefficient IPv4 Address Sharing
- FTTH service over pure v6 transport is being looked at.
 - MAP-T vs. MAP-E

Operational Considerations

- HTTP Redirection
 - Issues while having MAP-E as compared to MAP-T Mechanism.
 - Redirection is designed to happen at the entry point in SP Network and not on the edge
- Per-Subscriber Policies
 - MAP-E leaves the L4-Header hidden, hence making it difficult to do per-Subscriber QoS/SLA etc.
- DPI Enablement in network
 - Customer Statistical Analytics
 - Customized User services,
 - Tiered Services – (Walled/Open Garden, All You Can Eat, One Size Fits All)
 - Readiness/intelligence of DPI Devices to work in MAP environment

Summary - Operational Challenges

- Still too many content hosted on v4-only.
- Home Gateway Cost Factor
 - Low-cost HGW still not in production
- MAP-T is (or was) not an IETF Standard yet,
 - Difficult to enforce vendors to support DHCPv6 or TR-069 on Home Gateway for relaying v6 (MAP-T) related Parameters.

References

- Policy Guidelines and Status-I by DOT,
<http://dot.gov.in/sites/default/files/Pv6%20POLICY%20GUIDELINES%20%20STATUS1.pdf>
- Akamai State-of-the-Internet Report,
<http://www.stateoftheinternet.com/trends-visualizations-ipv6-adoption-ipv4-exhaustion-global-heat-map-network-country-growth-data.html>

Thank you..!