IPV6 and National Deployment Strategy

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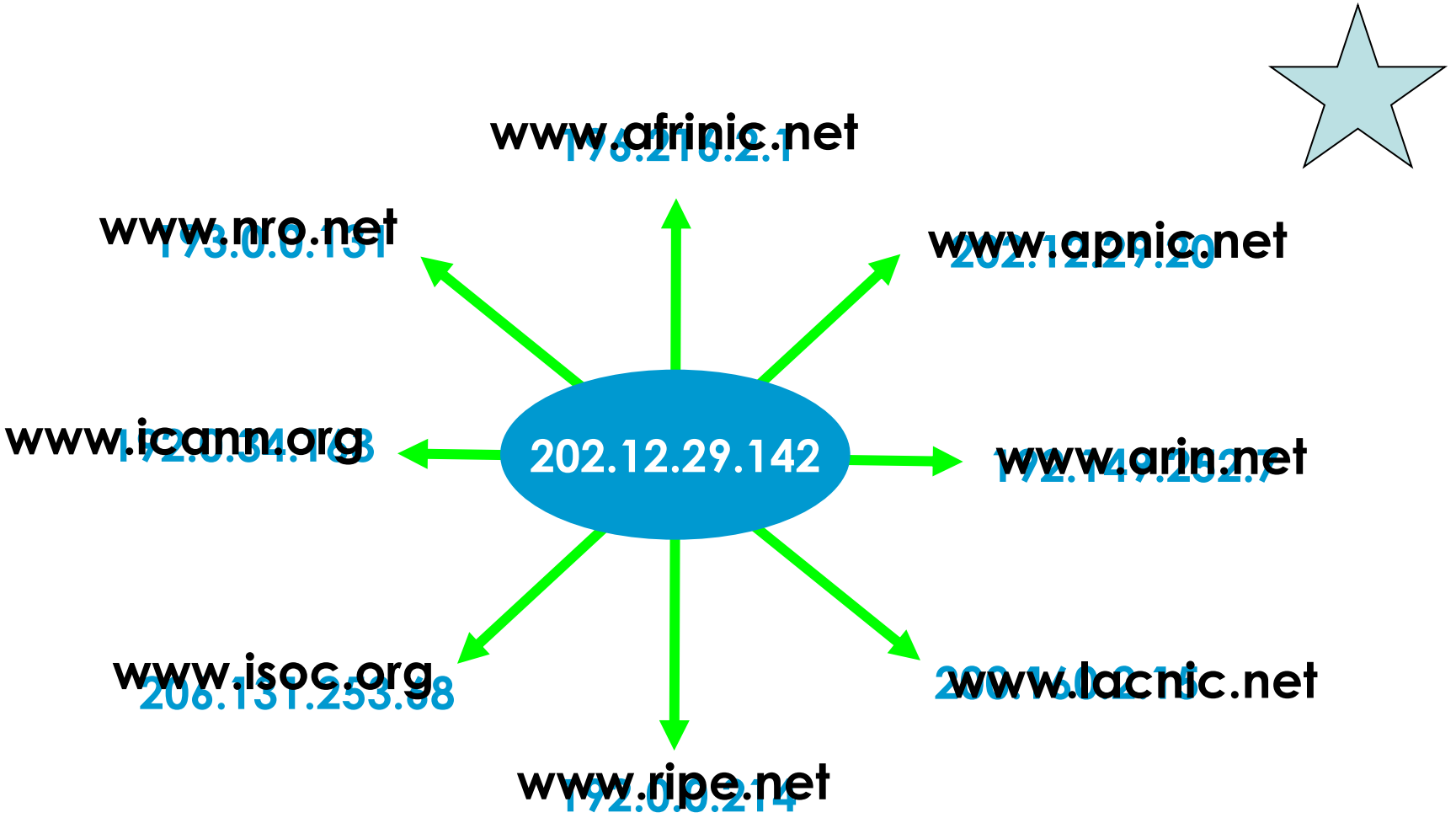
Agenda

- Introduction
- Government Policies and Initiatives
- Rollout Status
- IPv6: Enabler of socio economic growth
- Closing Remarks and Conclusion

On the Internet, you are nothing but an IP address!



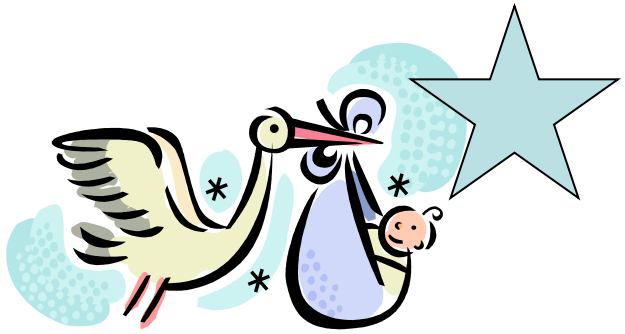
Where do IP addresses come from?

IETF

Standards

iana
Internet Assigned Numbers Authority
IANA

Allocation



APNIC
APNIC

Allocation

ISP

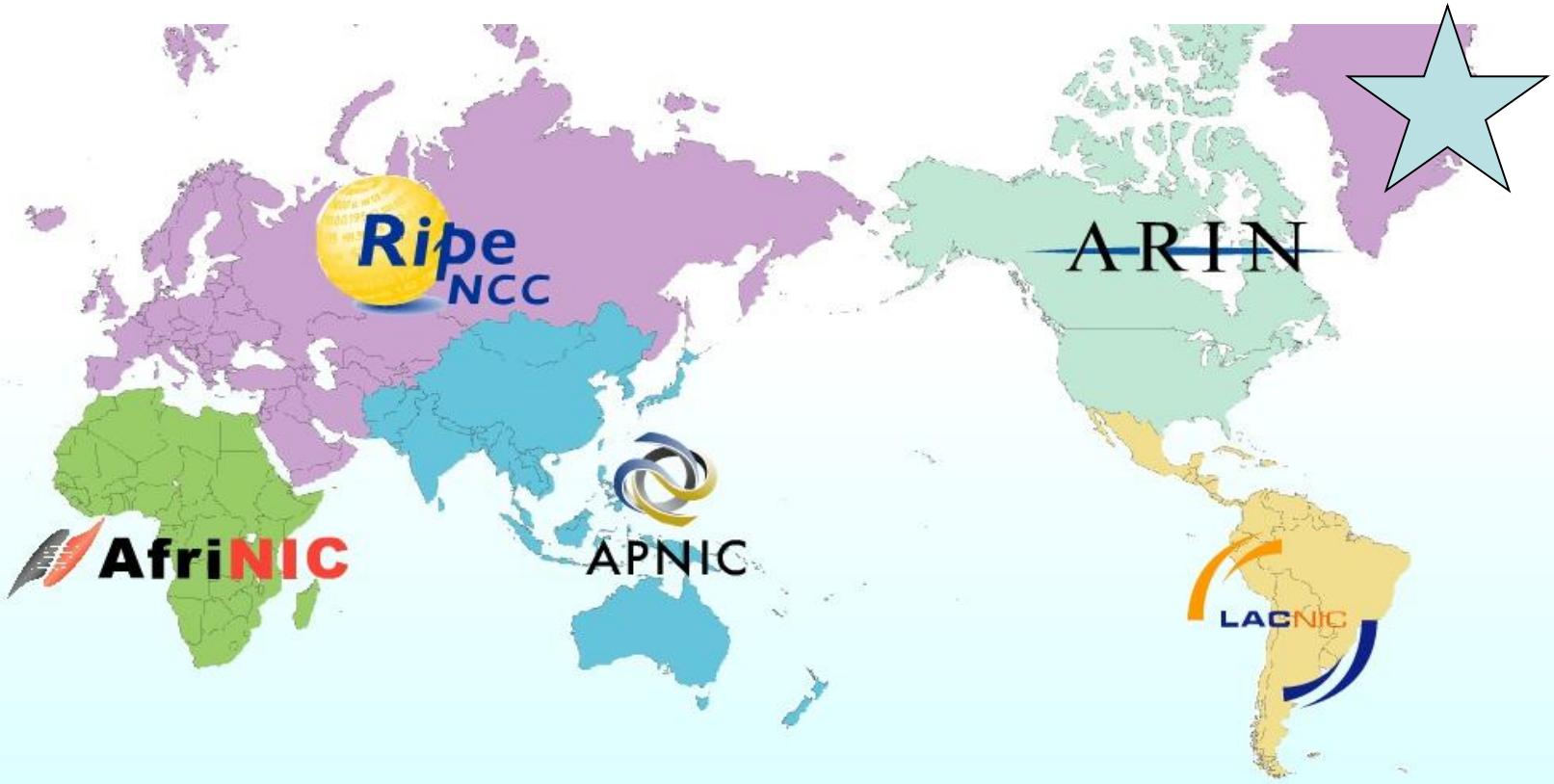
Assignment

End user

Regional Internet Registries (RIRs) distribute IPv4, IPv6, and AS numbers to the Internet community

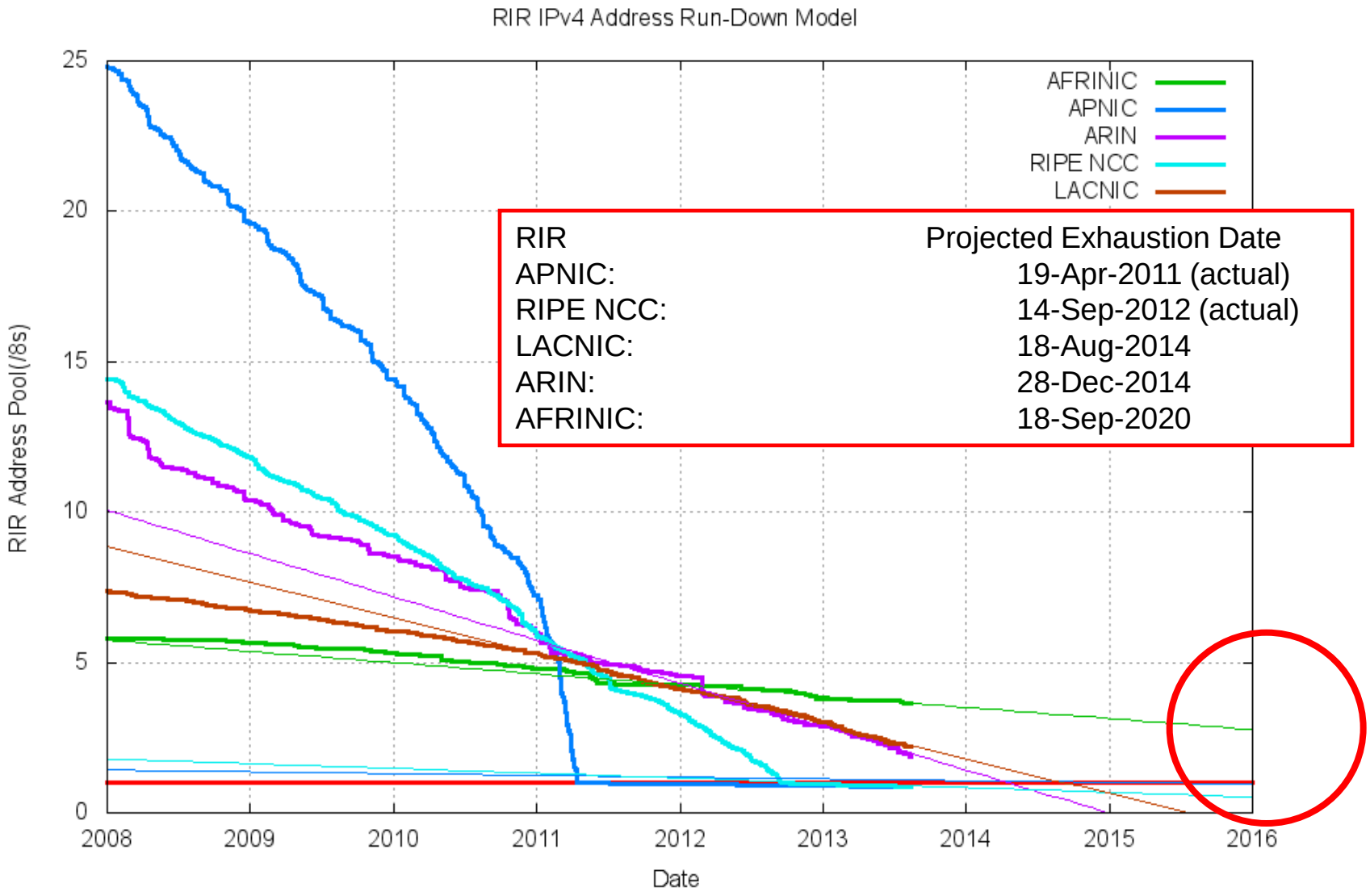
RIRs maintain accurate registration of Internet resource usage for the community

Regional Internet Registries



1992: "…it is [now] desirable to consider delegating the registration function to an organization in each of those geographic areas." (RFC 1338)

IPv4 Consumption: Projection



RIR	Projected Exhaustion Date
APNIC:	19-Apr-2011 (actual)
RIPE NCC:	14-Sep-2012 (actual)
LACNIC:	18-Aug-2014
ARIN:	28-Dec-2014
AFRINIC:	18-Sep-2020

INDIA'S IPv4 ADDRESS STATUS (As of August 2013)

Country	Country Code	Addresses(million)	Per Capita
United States	US	1575.77	5.66
China	CN	330.25	0.26
Japan	JP	201.66	1.59
United Kingdom	GB	123.62	2.07
Germany	DE	119.38	1.45
South Korea	KR	112.27	2.4
France	FR	95.85	1.62
Canada	CA	80.95	2.6
Brazil	BR	60.66	0.36
Italy	IT	53.17	0.92
Australia	AU	47.87	2.53
Russian Federation	RU	45.6	0.31
Netherlands	NL	45.46	2.87
Taiwan	TW	35.4	1.59
India	**IN**	**35.28**	**0.03**

http://www.bgpexpert.com/addressespercountry.php

More Devices than people

- Smart phones
- Smart Tablets
- Traditional Internet desktops
- Data-enabled mobile phones
- Consumer appliances
- Embedded systems
- Sensors
- RFID

Potential M2M services

Machine-to-Machine

1 **Vending Machines**
Vending Machines are connected to a centralized server

2 **ATM / POS**
ATM / POS connected to the bank's network

3 **Fleet Tracking**
The vehicles can be traced through the path they follow

4 **Emergency Call / Navigation**
In the case of an emergency, a signal is sent through mobile connection

5 **Public Transport**
Buses are monitored in real-time

6 **Industrial Telemetry**
Sensors are monitored in real-time

7 **Smart Metering for Electricity**
The electricity smartgrids reports a measurement every certain period

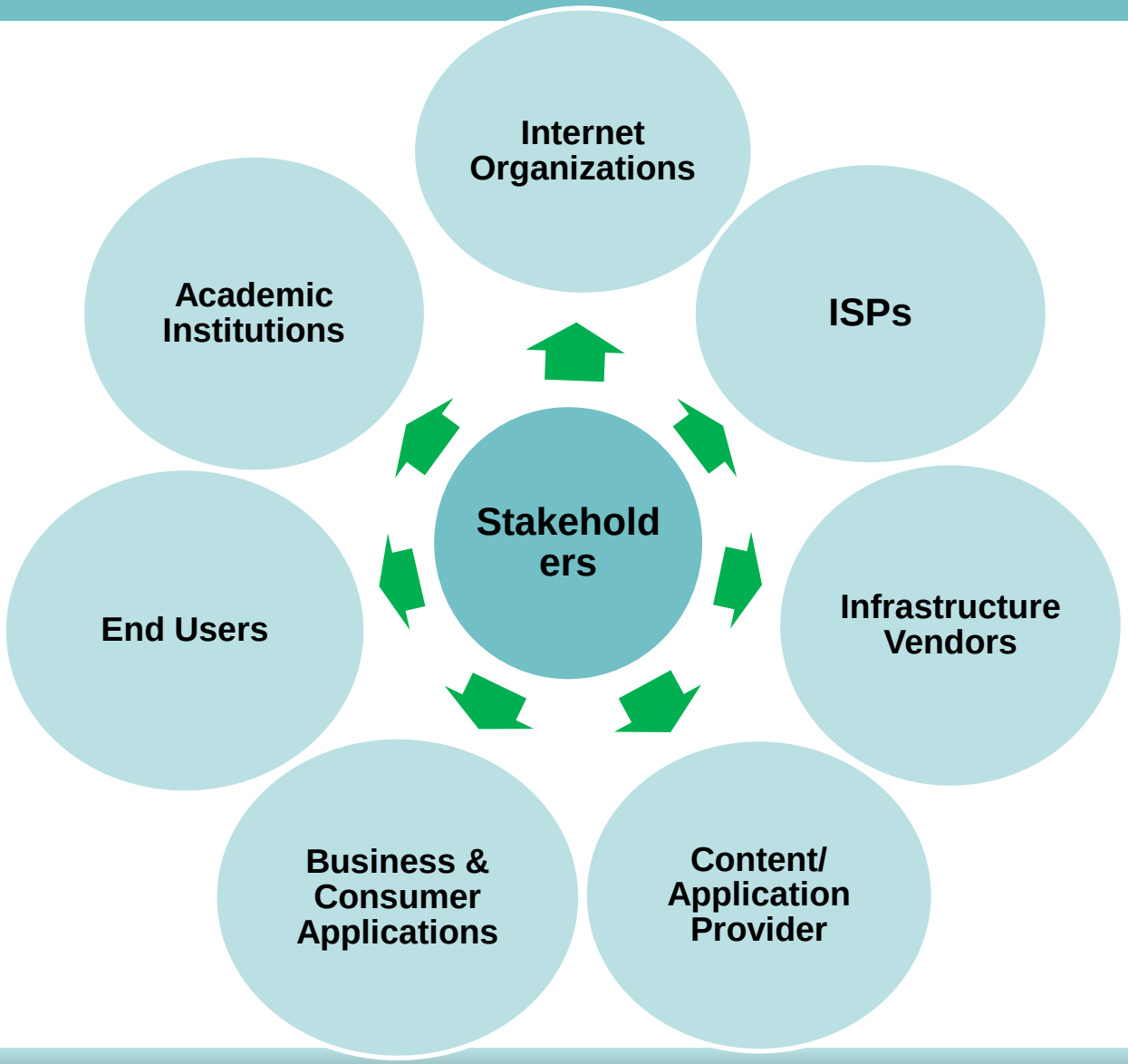
8 **Smart Metering for Water**
The water smartgrids reports a measurement every certain period

9 **Smart Metering for Gas**
The gas smartgrids reports a measurement every certain period

IPv6: Not Only Addresses, But Much More….

1. • **Internet Ready devices** like Refrigerators, IP driven Air conditioner, Ovens, IP Wireless Digital camera for surveillance.
2. • **Auto-Configuration-** With large number of IP enabled devices, IPv6 with Auto Configuration features will be of great help to the administrators.
3. • **Quality of Service-** Inherent QoS support with Traffic class and Flow label offering better granularity and uniform traffic treatment.
4. • **Security-** Minimal NAT, Inherent IPSec Support, ensuring a basic level of security inherent in all internet based communications.
5. • **Fast Access-** Streamlined Header Format lowering processing overhead in intermediate routers

Important Stakeholders



Govt Policies & Initiatives

Government Initiatives to support Internet Proliferation in India

Implementation of IPv6 : NTP-2012

1.Preamble:

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

2.Objective:

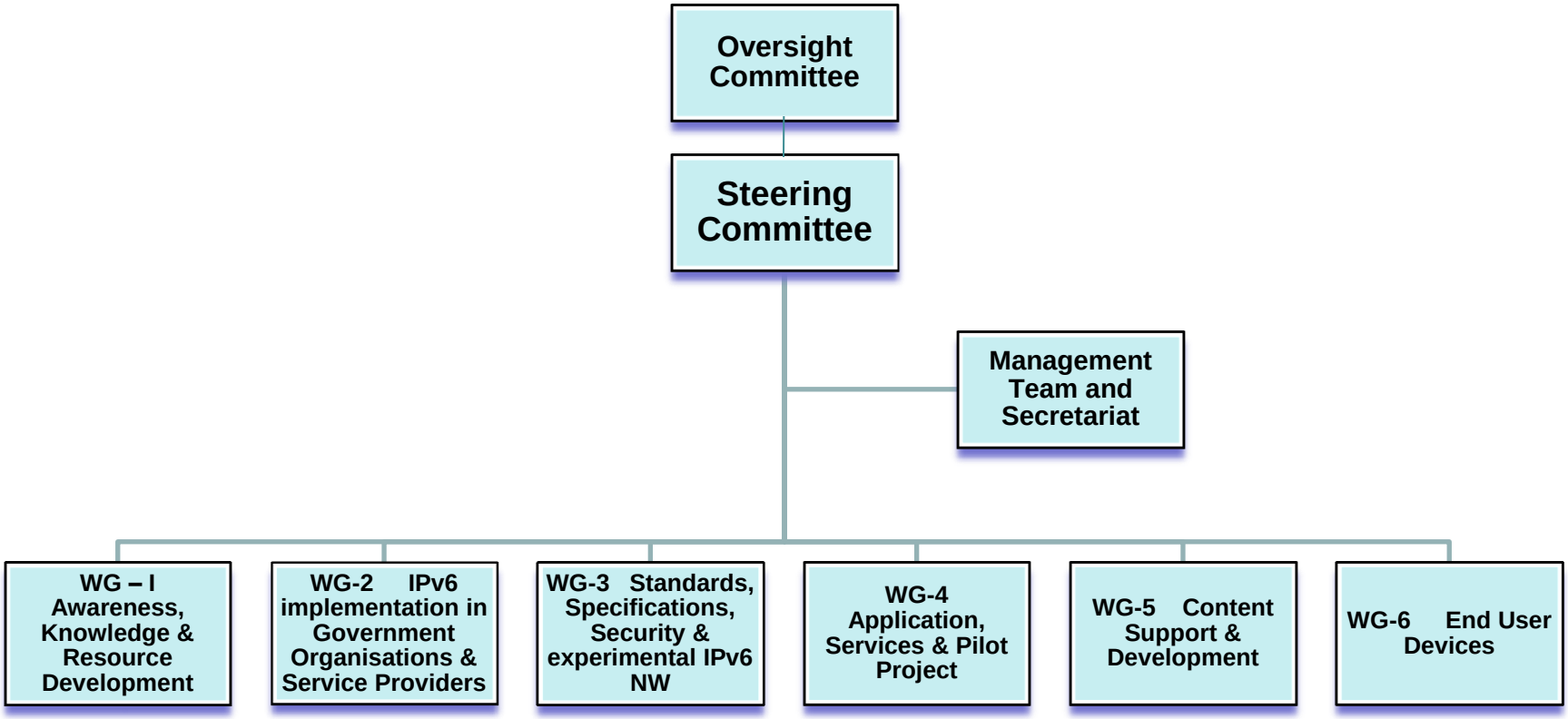
- Achieve substantial ***transition to new Internet Protocol (IPv6) in the country in a*** phased and time bound manner by 2020 and encourage an ecosystem for provision of a significantly large bouquet of services on IP platform.

Implementation of IPv6 : NTP-2012

Strategies: *Telecom enterprise data services, IPv6 compliant networks and future technologies.*

- To recognize the importance of the new Internet Protocol IPv6 to start offering new IP based services on the new protocol and to encourage new and innovative IPv6 based applications in different sectors of the economy by enabling participatory approach of all stake holders.

- To establish a dedicated centre of innovation to engage in R & D, specialized training, development of various applications in the field of IPv6. This will also be responsible for support to various policies and standards development processes in close coordination with different international bodies.


Oversight Committee
Steering Committee
Management Team and Secretariat
WG – I Awareness, Knowledge & Resource Development
WG-2 IPv6 implementation in Government Organisations & Service Providers
WG-3 Standards, Specifications, Security & experimental IPv6 NW
WG-4 Application, Services & Pilot Project
WG-5 Content Support & Development
WG-6 End User Devices

Progress Report of Important Activities

	1st Oversight on 28. 04. 2011	2nd Oversight on 04.10. 2011	3rd Oversight on 23rd Feb, 2012	4th Oversight on 11th Nov. 2012	5th Oversight on 28th Aug 2013	AS on 5th Oct 2013
Central Nodal Officers Received	60/92	70/92	74/92	81/92	89/92	92/92
States/UTs Nodal Officers Received	28/35	31/35	32/35	33/35	35/35	35/35
IPv6 implementation Activity Sheet Received (Central)	Mar-92	21/92	28/92	39/92	57/92	77/92
IPv6 implementation Activity Sheet Received (States/UTs)	Feb-35	Aug-35	16/35	21/35	26/35	27/35
IPv6 Awareness Workshop for State & UTs	Jan-26	Aug-26	15/26	26/26	9/20 (RFD) Result Frame Document	12/20
IPv6 India Task Force Newsletters Issued	--	2 issues (June & August)	4th issue (Nov & Dec 2011)	6th Issue	8th Issue	9th issue under compilation

India IPv6 Task Force: Reorganized Working Groups

S.No.	Workgroups	Objective
1	**WG – I Awareness, Knowledge & Resource Development**	▪ Coverage of IPv6 activities on internet and social networking sites. ▪ Developing newsletters, whitepapers. ▪ Conducting webinars, web-casts. ▪ Conducting trainings, Workshops, seminars and conferences.
2	**WG-2 IPv6 implementation in Government Organisations & Service Providers**	▪ To get detailed action plan from all Government Organisations. ▪ To have IPv6 based Solutions/ Architecture for different Industry Verticals. ▪ Bringing case studies. ▪ Bringing awareness in peers, customers, tier-II organizations. ▪ To develop monitoring mechanism ▪ Conducting Workshops, seminars and conferences
3	**WG-3 Standards, Specifications, Security & experimental IPv6 NW**	▪ Development of country specific standards and specifications of all IP based products. ▪ To have IPv6 Test Bed at TEC accredited by IPv6 ready logo. ▪ Bringing IPv6 Security Guidelines. ▪ Bringing IPv6 Security Case Study

India IPv6 Task Force: Reorganized Working Groups

S.No.	Workgroups	Objective
4	**WG-4 Application, Services & Pilot Project**	▪ Migration of applications to IPv6 dual stack ▪ Plan new services on IPv6 ▪ Pilot projects on IPv6 based services ▪ Development of IPv6 based Products and support indigenous manufacturing ▪ Conducting Workshops, seminars and conferences.
5	**WG-5 Content Support & Development**	▪ Migration of content to IPv6 dual stack ▪ Bringing Case Studies ▪ Compiling issues and related resolution ▪ Conducting Workshops, seminars and conferences.
6	**WG-6 End User Devices**	▪ To facilitate the transition of existing End User Devices to IPv6. ▪ Compiling interoperability issues and related resolution. ▪ Conducting Workshops, seminars and conferences.

Industry wise Adoption Timelines and Guidelines on IPv6

SERVICE PROVIDERS

- **Enterprise Customers - 01-01-2014**
- **Retail Customers (Wire line)- 30-06-2014.**
- **Retail Customers (Wireless)-**
- LTE customer 3**0-06-2013**
- GSM/ CDMA **30-06-2014**

CONTENT PROVIDERS

- **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**

EQUIPMENT MANUFACTURER

- **All mobile phone handsets/ data card dongles/ tablets and similar devices 30-06-2014.**
- **All wire line broadband CPEs 01-01-2014**

GOVERNMENT ORGANIZATIONS

- **Transition plan for transition to IPv6 by December 2017 to be prepared by December 2013**
- **The public interface for delivery of citizen centric services 01-01-2015.**
- **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 various institutes / colleges**

IPv6 Consultants

Consultants have been empanelled through EOI for:

- A------IPv6 Consulting.
- B------End-to-End IPv6 Consulting (IPv6 consulting + Project Management).
- C------IPv6 Implementation.

❑11 IPv6 Consultants have been approved namely

1.NIT Hamirpur.
2.TCS.
3. C-DOT.
4. ERNET.
5. Pricewaters house Coopers, Kolkata.
6. IIT Kanpur.
7. Ernst & Young.
8. Neosixth Technologies, Bangalore
9. Tech Mahindra.
10.TCIL.
11. HCL.

- This list of consultants shared with central and states government organization.
- The same has been uploaded on DoT website.
- Process of expansion of panel initiated.

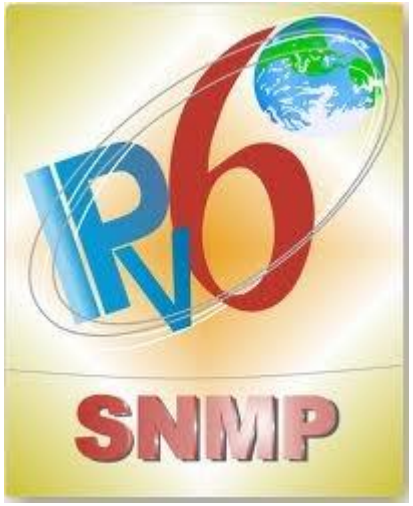
Standardization & Testing Facilities

MOU with IPv6 Forum

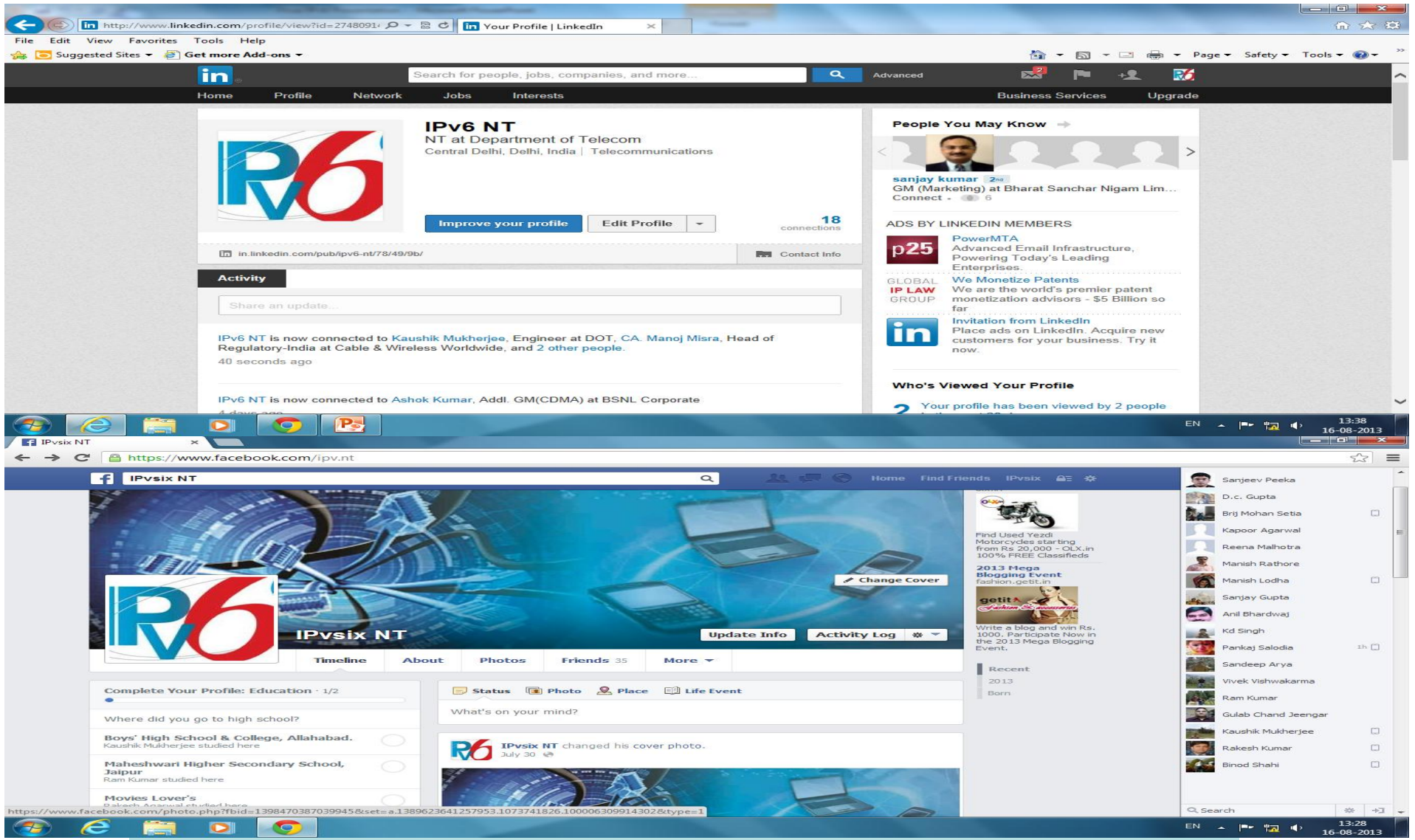
Setting up IPv6 Test Bed in TEC

NGN Lab & IPv6 Test bed for IPv6 Conformance testing of Telecom Equipment

Ready Logo Certification



Presence On Social Media



Planned Initiatives

INDIA IPv6 CENTER OF INNOVATION

A Centre of Innovation for IPv6 is planned with the vision to provide an environment of end to end IPv6 services under a single umbrella with the following main objectives:

To implement IPv6 based pilot projects

To develop model Experimental IPv6 Network

Technical support to Central and State Government units.

Conducting certified training programmes ,R& D in collaboration with premier institutes for new RFC/New applications, IPRs etc.

Consultancy support at National / International level.

Auditing of the networks & its certification.

INDIA IPv6 TRAINING & CERTIFICATION

It is proposed to develop an in country standard Training and Certification program on IPv6 with the objectives as listed below:

To build an industry recognised IPv6 certification program

To empanel organizations for IPv6 training

To build a talent pool on IPv6 skill set in the country

The training and certification proposed to be targeted towards 3 stratum of the resource pool :

-Basic level

-Professional Level

-Expert Level

Planned Initiatives

Compendium on IPv6 based Solutions/Architecture/Case studies for different industry verticals.

IPV6 DEPLOYMENT(ROLL OUT STATUS) IN INDIA

Glimpse of IPv6 Deployment in India

SERVICE PROVIDERS

- 15 Service Providers ready to handle IPv6 traffic and Enterprise IPv6 services
- 9 ready to offer Broadband services on IPv6.

CONTENT PROVIDERS

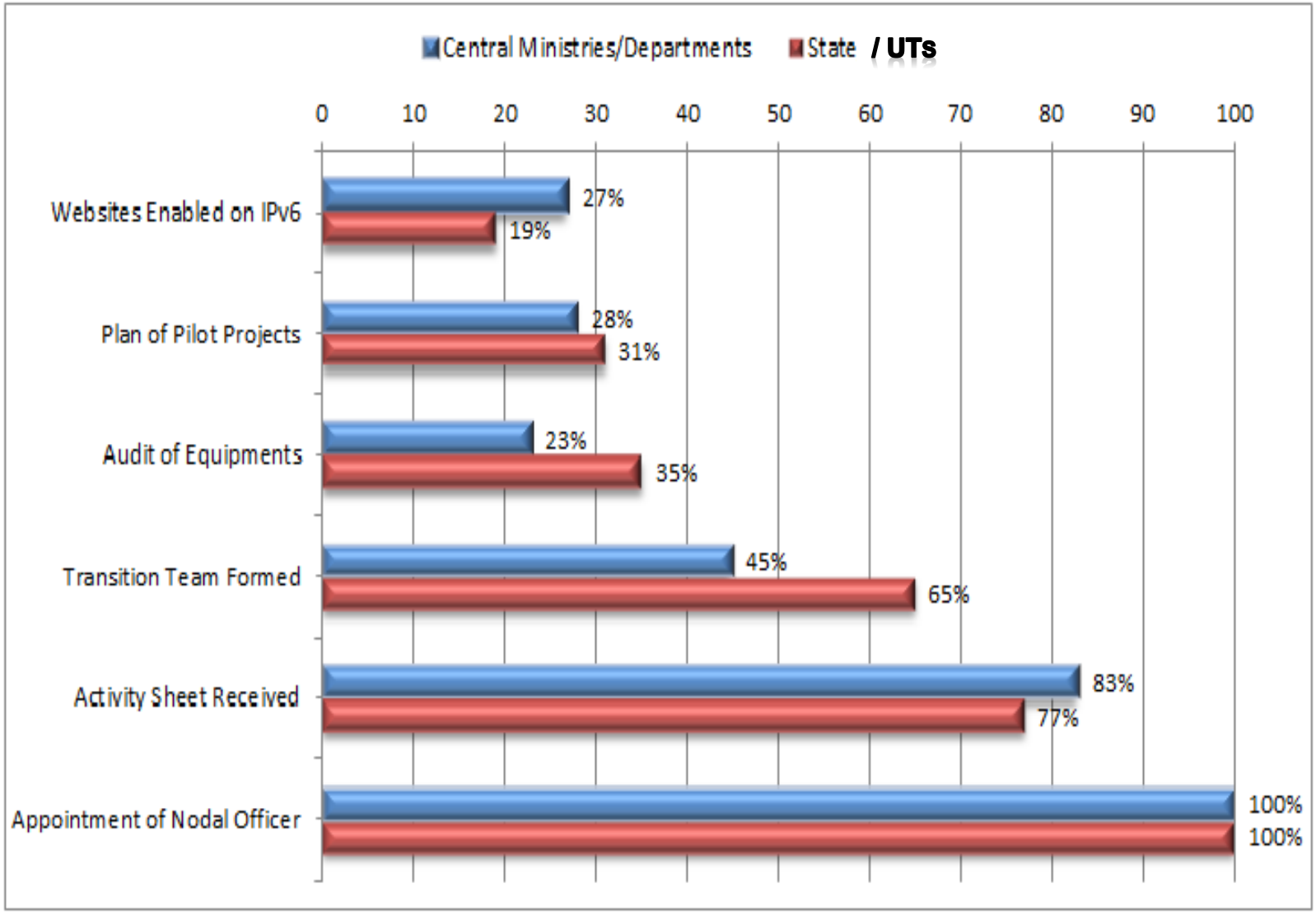
- 6 out of Top 10 Websites are on IPv6.

GOVERNMENT

- All Government Organizations, including its PSUs, have been sensitised and geared up for IPv6 transition.

ENTERPRISE

- Banking Sector is going to be ready soon
- More than 20 enterprises across India have enabled IPv6 in their network.


Central Ministries/Departments
State / UTs
0
10
20
30
40
50
60
70
80
90
100
Websites Enabled on IPv6
27%
19%
Plan of Pilot Projects
28%
31%
Audit of Equipments
23%
35%
Transition Team Formed
45%
65%
Activity Sheet Received
83%
77%
Appointment of Nodal Officer
100%
100%

Service Providers IPv6 Readiness Status

Sl. No.	Service Provider	SEGMENT READINESS		
		ENTERPRISE	WIRELESS	WIRELINE(BB)
1	Aircel	Ready	In Progress	NA
2	Airtel	Ready	In Progress	In Progress
3	Asianet	Ready	NA	In Progress
4	BSNL	In Progress	In Progress	In Progress
5	MTNL	Ready	In Progress	Ready
6	Ortel Communications	Ready	NA	Ready
7	Quadrant	Ready	NA	Partially
8	Reliance	Ready	Ready	Ready
9	Sify	Ready	NA	Ready
10	Spectranet	Ready	NA	In Progress
11	Swift	Partial	NA	Ready
12	TTL	Ready	Ready	Ready
13	Tulip	Ready	NA	Ready
14	Vodafone	Ready	In Progress	NA
15	You Broadband	Ready	NA	Ready

End User equipment Readiness Status

- **LG :** Andriod handsets are IPv6 ready.
- **Blackberry :**10 OS handsets support IPv6 as part of dual stack.
- **SONY :**Experia handsets/Tablets support IPv6 as part of dual stack.
- **HTC :**Dual stack IPv4v6 is planned to be there in all devices launched after mid-Q4-2013

IPv6 Based Pilots

•IPv6 based applications will not only boost the economy, but also the quality of life of common people.

•The Central/ State Governments are being encouraged for adoption of various innovative applications based pilot projects like smart building, tele-education, tele-medicine, intelligent transport system etc. in association with DeitY.

•Following with ministry of Power to have IPv6 in planned Smart Grid Pilot projects

•Following with ministry of Urban Development to have IPv6 in planned Smart City Pilot projects

•Initiating Follow up with ministry of heavy industry to have IPv6 based communication systems in smart electric vehicle project

IPv6 Implementations

•For IPv6 implementation across Govt. Organisations, case is being pursued and taken up at the highest level in States/UTs & Central Ministries/Departments.

•NT Cell already in touch with concerned officers in States/UTs & Central Ministries/Departments through regular meetings, letters etc.

•Special focus on the following Ministries/ Departments:

Ministry of Urban Development–	Smart Cities.
Ministry of Power	--Smart Grid.
Ministry of Finance & RBI	--Payment Gateways and public facing websites.
Ministry of Railways	-- Public facing websites like IRCTC.

Energy

- Smart Grid
- Smart Meters

Transportation

- **Intelligent transportation**
- **Smart vehicles**

Healthcare

- Emergency rural healthcare
- Smart healthcare management systems

Defense

- Network centric warfare
- Intelligent warfare systems

Banking and finance

- Payment gateways for e-commerce
- Internet banking and e-broking services

IPv6 across verticals

To Summarize

Future Internet : 2020

M2M Devices

Open Ipv6 Based communication protocols

Internet of Things

Cloud based Applications

Smart M2M application

Thank You