IPv6 – A Positive "Approach"

"Perspectives"

APNIC 24 @ New Delhi

What is an IP Address?

- Internet infrastructure addresses
- Uniquely assigned to infrastructure elements, or endpoints on the Internet
- Public addresses are globally visible to the entire Internet
- Addresses are a finite “Common Resource”
  - IPv4: 32-bit number
    - e.g. 202.53.12.145
    - 4 billion different host addresses

But that was yesterday !

After all, IP address is a BUSINESS CONTINUITY matter now on….

Couple of perspectives to mull over -

What if the OIL is just over across the World ?

What if the ICE around the Arctic is no longer existing ?

What if the RIVERS dry up...so that travel by boat and drinking water become impossible ?

What if ELECTRICITY becomes unavailable in time to come ?

What if SPECTRUM runs out in a way that its not possible to add more communicators ?

What if IP ADDRESSES are exhausted around the World ?

What do we do?

OIL - We adopt newer technologies

ELECTRICITY - We adopt newer technologies

IP ADDRESSES - We adopt newer technologies

“IPv6”

Why do we need?

Number of IP Addresses in IPv4: 4,294,967,296 (4.3 billion)

Population of Earth : 6,547,251,903 (6.5 billion)

DEFICIT ? Solution – "NAT"

Issues:

- Complexity
- Problem with Security Protocols
- Poor support for Client Access
- Performance Reduction

Why do we need?

Number of IP Addresses in IPv4: 4,294,967,296

Population of Earth : 6,547,251,903

DEFICIT ? - Solution – "~~NAT~~" IPv6

Number of IP addresses in IPv6:

340,282,366,920,938,463,463,374,607,431,768,211,456

340 Trillion Trillion Trillion Trillion Addresses

~~What is IPv6 ?~~ That is again a PAST.....

"Why" to do IPv6 ?

- It is not a Software FIX to IP address

- Large address space (big plate)
- Improved Efficiency in routing and packet handling
- Support for Auto Configuration and Plug & Play
- Support for embedded IPSec
- Enhanced support for Mobile IP and Mobile Computing devices
- Elimination of NAT – Huge Cost Saving
- Support for widely deployed Routing Protocols
- Increased number of Multicast Addresses, improved support for Multicast

Some other benefits….

- Neighbor Discovery

- Router Discovery

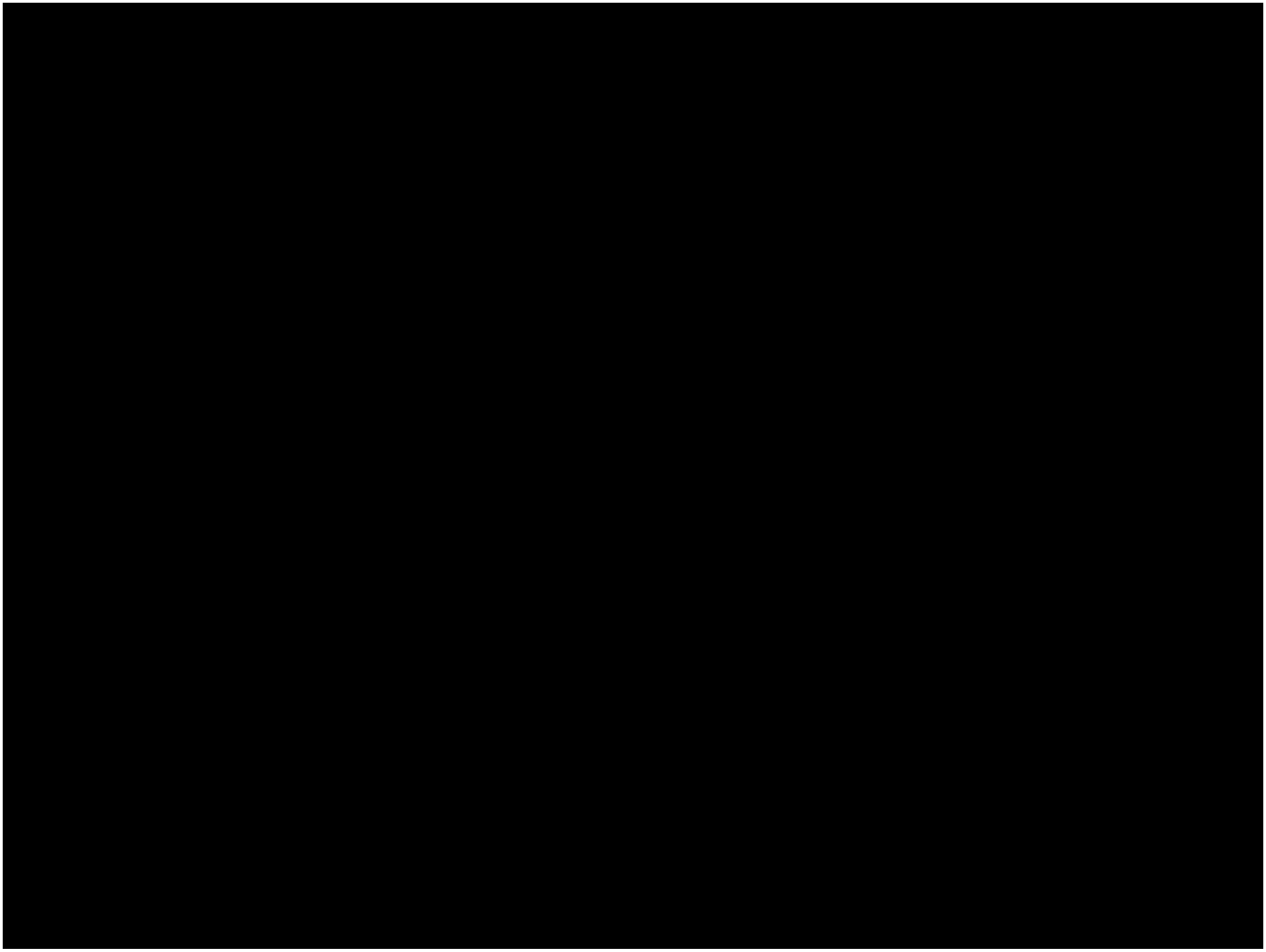
- Stateless Auto Configuration & renumbering of IPv6 nodes

----- Ofcourse, it's a matter of BUSINESS CONTINUITY

It is a matter of TECHNOLOGY and not POLICY

It is a matter of ADOPTION or TRANSITION and not MIGRATION

Current IPv6 Perception by many even now….



Current IPv6 Perception by those who understands IPv6….

Kusumba S

Do we make our network IPv6 Compatible now ?

NO

Its actually like asking; 'Do I construct my house tomorrow?'

- Its going to be a long term TRANSITION and more like being part of Network Evolution

- It's like laying foundation for future networks (current Internet in 1970s)

- It's the core for the future Next Generation Services

- It's a new challenge

- All about enabling new capabilities

- It is a Cultural Change as how the networks are conducted

- It's a new evolution process to achieve "Always on IP"

- Its your Friend Next Door

Do I need to Invest Additionally ?

IPv4:

Investments - Security, NAT, Maintenance, Network Management

IPv6:

Investments - Security (Lesser – IPSec compulsory embedding), NAT (Does not exist), Maintenance (Lesser compared to v4), Network Management (Lesser compared to V4)

“Balanced”

“Difficulty perspective”

- Easy parts
  - Dual-stacking the nets (WANs, LANs)
  - Enabling IPv6 functionality in modern operating systems
  - Establishing basic IPv6 services (DNS, SMTP, NTP)
  - Enabling IPv6 in some commodity services (HTTP)
- A little more challenging
  - Getting the address plan right
  - Operating and debugging a dual stack environment
  - Multicast (but easier than IPv4)
- Hard parts
  - Creating the security infrastructure (firewalls, IDS, proxys, VPNs, ACLs)
  - Working around missing or broken functionality
  - DHCP
  - Creating incentives to upgrade and try IPv6
  - Getting the vendors to fix bugs or incorporate necessary features

“WATCH”, “STUDY”, “PLAN”, “EXECUTE”

Do we talk about a Dead line ? But ???

- **Product Perspective**

  Compatibility

  Vendor Capability

  Vendor Support

- **Solution Perspective**

  Integration Issues

  Global Spanned networks

  Service Delivery issues

- **Application Perspective**

  Is my third party software compatible ?

  Does my current Collaboration suite work seamlessly?

  Do I have “out of box” challenges

  Security, Network Monitoring, Tools, Encryption….

Where do we need IP address ?

- Networks …. that's past again
- Your Watch…
- Your TV
- Your Refrigerator
- Your Mobile phone
- Your House / Building
- Your Car or any vehicle or Roads
- Every Soldier in the battle field

- Network then and there itself
- Make the difference : Logistics, Dispatch, Location Services, Emergency Vehicles – *Converged IP Services*
- Mobility with increased security
- Mergers and acquisitions made simple and easier

Give a thought ! – *You should have already given by now !*

- Vision – understand implications, possibilities, threats, opportunities
- Timelines – Take a practical view, Goals, Timelines, Roles
- Inventory – a complete Stock list
- Assessment – Identify, Vendors, Declare “Mission IPv6 Statement”
- Plan – Few IPs in v4; Everything connected here! Address plan, Co-Exist
- Test – Environment setup – client, server, switch, router, etc.,
- Transition – Dual Stack, Co-exist, Phased plan (Core or Access approach)

- Training – User, Maintenance, Senior Mgmt, Owners
- Declare – IPv6 Ready, Procurement Policy, Continual Assessment (ISO)

- Certification – External Agency

“Establish IPv6 Task Force in your Organization to begin with”

Must involve Technical, Marketing, Finance and Management representatives

- Infrastructure Assessment
- Adoption Plan
- Transition (with Dual Stack if needed)
- Education
- Certification

Where do I begin ?

- Infrastructure Assessment

Core Infrastructure	(Firewall, IDS, Core Routers, Switches, PKI)
Border Infrastructure	(Routers, Switches)
Access Infrastructure	(AAA, Proxy, LDAP, RAS, DSLAM, VPN Conc.)
2nd Level Infrastructure	(Mail, Web, DNS, DHCP, NMS, FAX, DB)
User Infrastructure	(Desktop, Laptop, PDA, Mobile, Wifi Phone)
Support Infrastructure	(PBX, Access Control, Video Conf, Broadcast)
Soft Ware Code	
Others	

- Adoption Plan
- Transition
- Education
- Certification

Where APNIC 35 is going to be held ?

Actually at your own Holiday home!

IPv6 Makes it all possible!

High Bandwidth + Security + Online Collaboration makes World different with Voice and Video Conferencing over such network

Word of Caution:

IPv6 Takes care of your poorly Configured Security !

Again – it is not that it is perfectly Secure, it is that it is not less secured

New Technology – New Risks

Thank you

Kusumba S

kusumba@tell-e.com