

WholesaleData



Real World IPv6

**Afrinic IPv6 Conference and INET Indian Ocean
Mauritius, November 27-dec 1st 2006**

Yves Poppe
Director Business Development, IP Services

« ..With the internet and the proliferation of semiconductors, you'll end up with trillions of things connected – not just individuals but cars, roads, homes, appliances, health-care data, and pacemakers. »

**Samuel J. Palmisano, Chairman IBM,
interviewed by Business Week**

April 3th 2006 North-American issue, pp 52-53

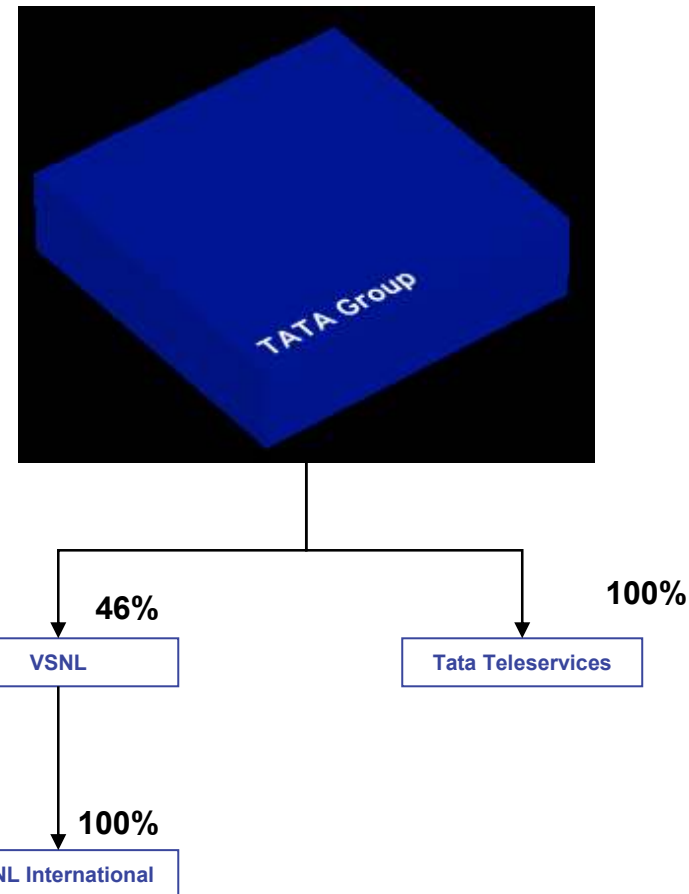
“The internet is rapidly becoming a key ingredient in our economic infrastructure – akin to electricity and roads – as well as our social structures »

**OECD Forum Conference
Paris, May 22-23th 2006**

VSNL International | Member of the Tata Group

Tata Group

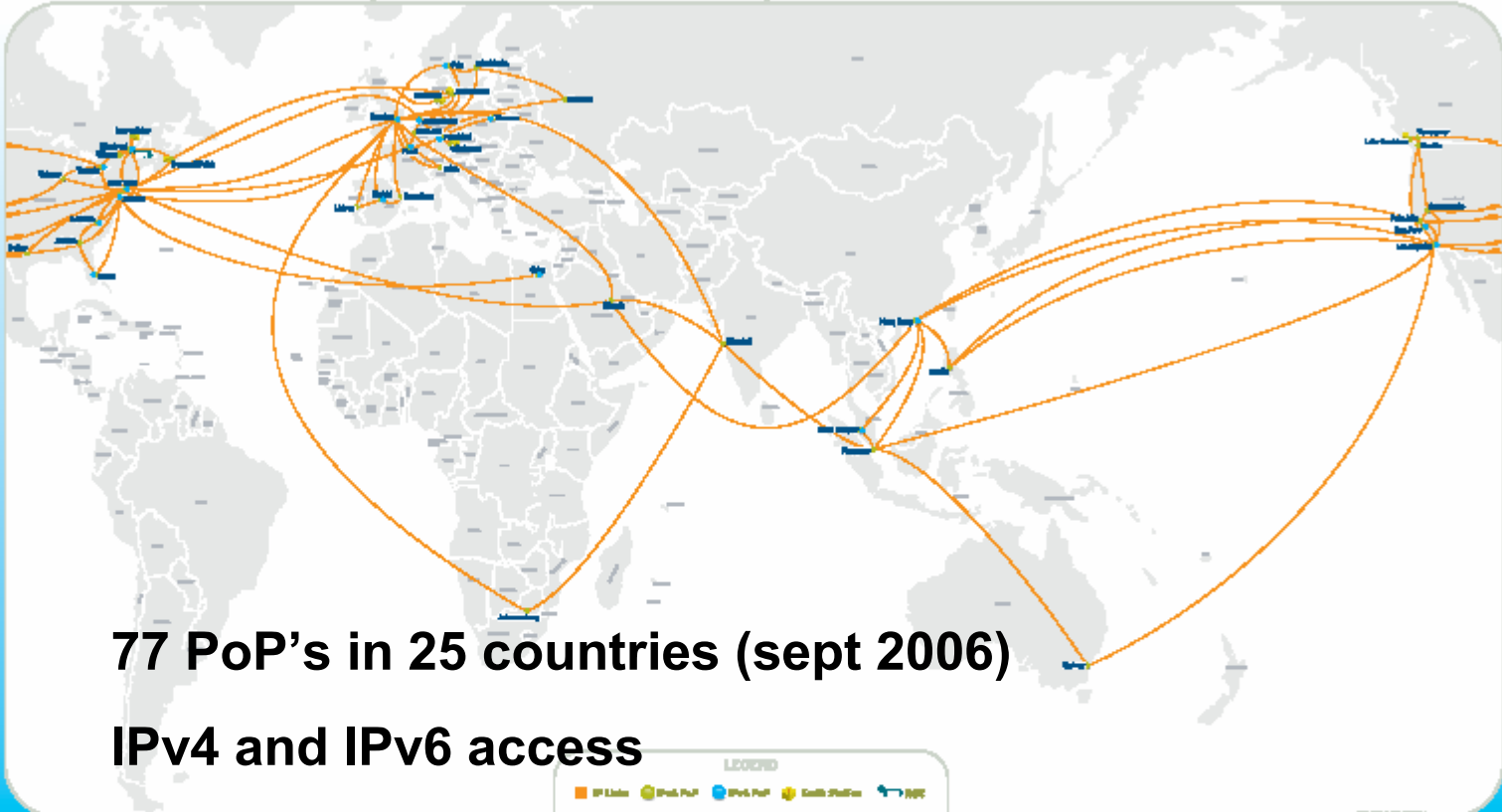
- 125-year old largest private sector group
- \$17.6 billion in revenues
- Acquired VSNL in February 2002
 - VSNL acquired Tyco in Nov 2004
 - VSNL acquired Teleglobe in Feb 2006
- Tata Consultancy Services (TCS)
 - Asia's largest software & systems integration services company
 - 33 countries across 5 continents
 - Key player in high-growth international markets



TELEGLOBE

IP BACKBONE

VSNL INTERNATIONAL™

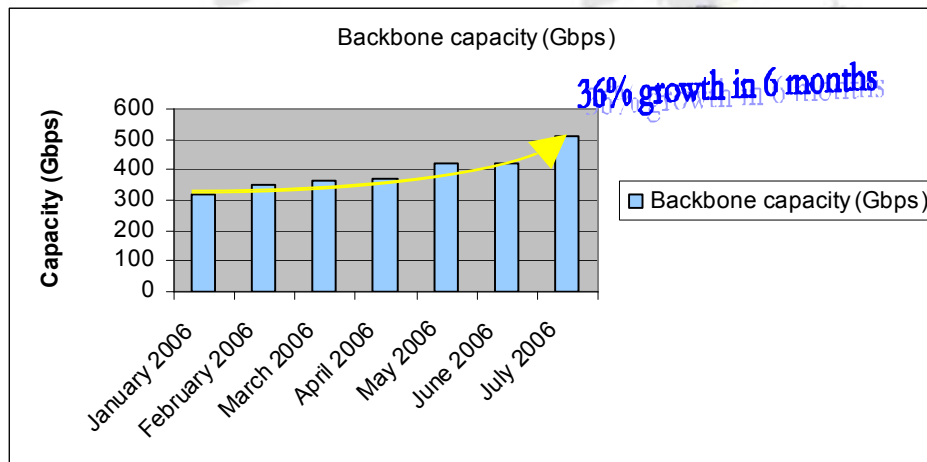


77 PoP's in 25 countries (sept 2006)
IPv4 and IPv6 access



For more information visit www.vsnlinternational.com

True Global Reach | Circling the Globe



▪ Scalability

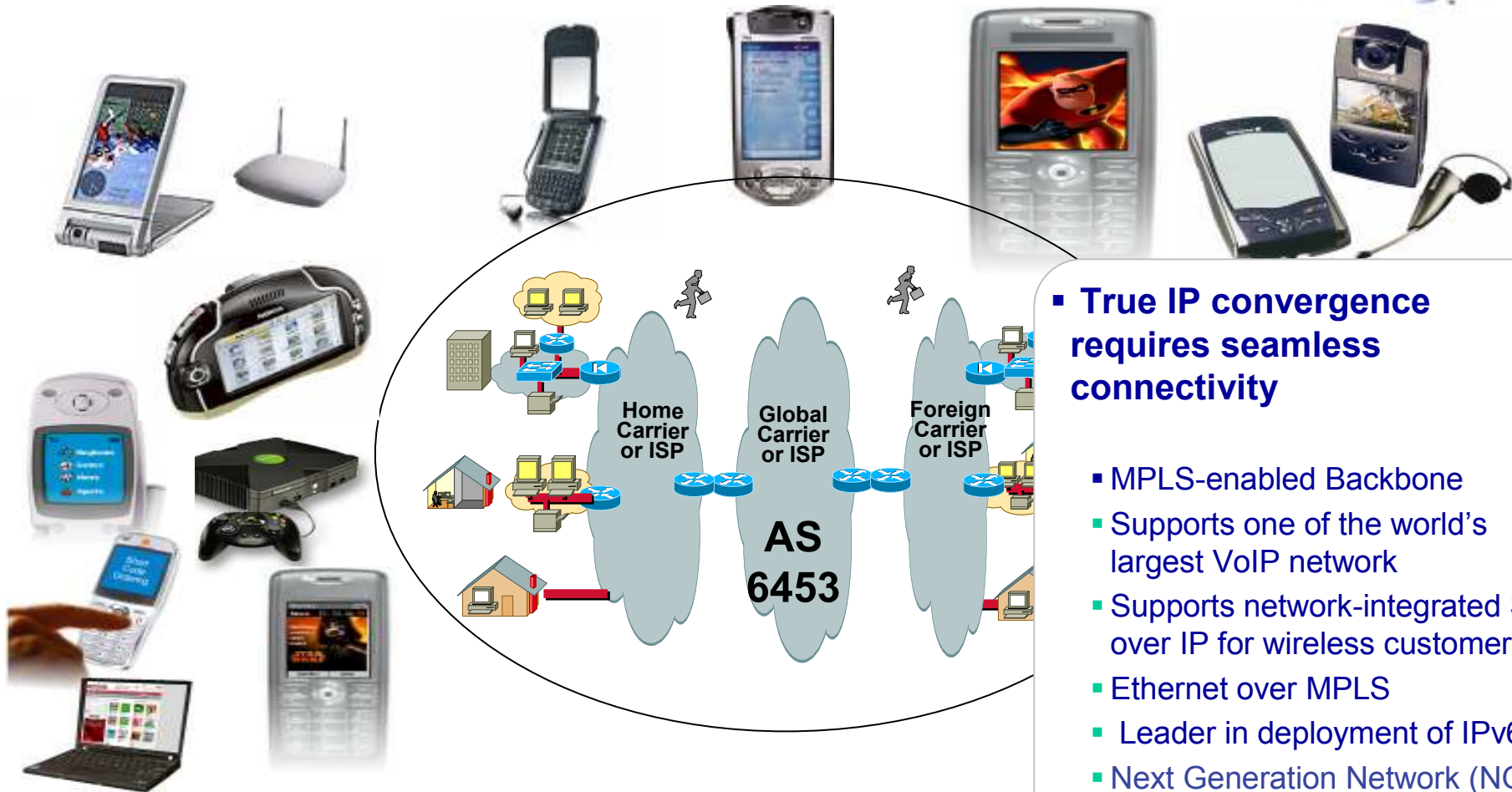
- OC48/192 MPLS backbone

▪ Explosive growth

- 100% traffic growth (2004-5) vs. 42% in average industry-wide
- 36% backbone growth within the first six months of 2006

▪ IP Network at glance

- 570Gbps of Backbone Capacity
- Carries more than 300 Petabits globally per month;
- 500G of customer connectivity
- 3 Network operation Centers (NOC) two in North America and one in Asia.

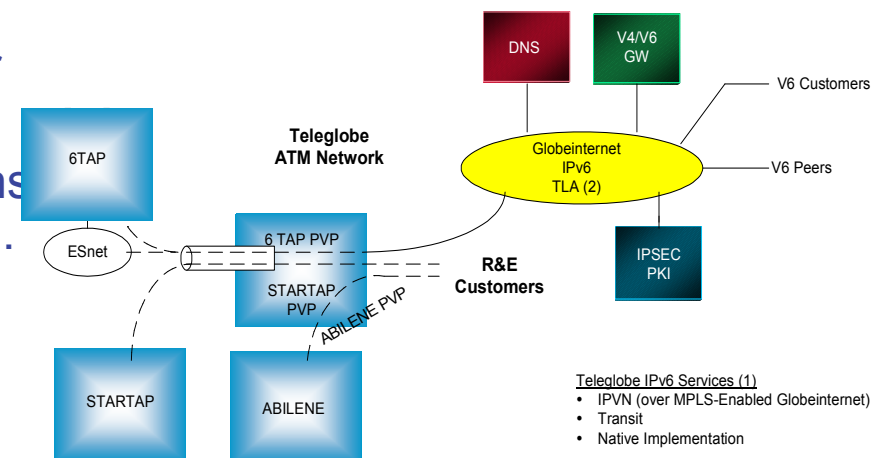


- **True IP convergence requires seamless connectivity**

- MPLS-enabled Backbone
- Supports one of the world's largest VoIP network
- Supports network-integrated SS7 over IP for wireless customers
- Ethernet over MPLS
- Leader in deployment of IPv6
- Next Generation Network (NGN) project: A unified IP platform for all services

VSNL International and IPv6 : one of the pioneers

- Teleglobe provides the first NGI intercontinental connection in 1995 for the Brussels G7 summit.
- A member of the Canarie Policy Board, Teleglobe promotes the experimentation of IPv6 and the 6bone/6TAP initiative
- Teleglobe hosts the first IPv6 node for Surfnet connection to the Chicago 6TAP located at STARTAP.
- Teleglobe facilitates the world 's first intercontinental native IPv6 connection in 1998 between CRC(Communication Research Centre) in Ottawa and Berkom in Berlin.
- Teleglobe becomes a founding member of the IPv6 forum in 1999.
- Teleglobe presents its original IPv6 plans at the Telluride March 2000 IPv6 Forum.
- 2003: Teleglobe starts an IPv6 pilot
- January 2004: service introduction

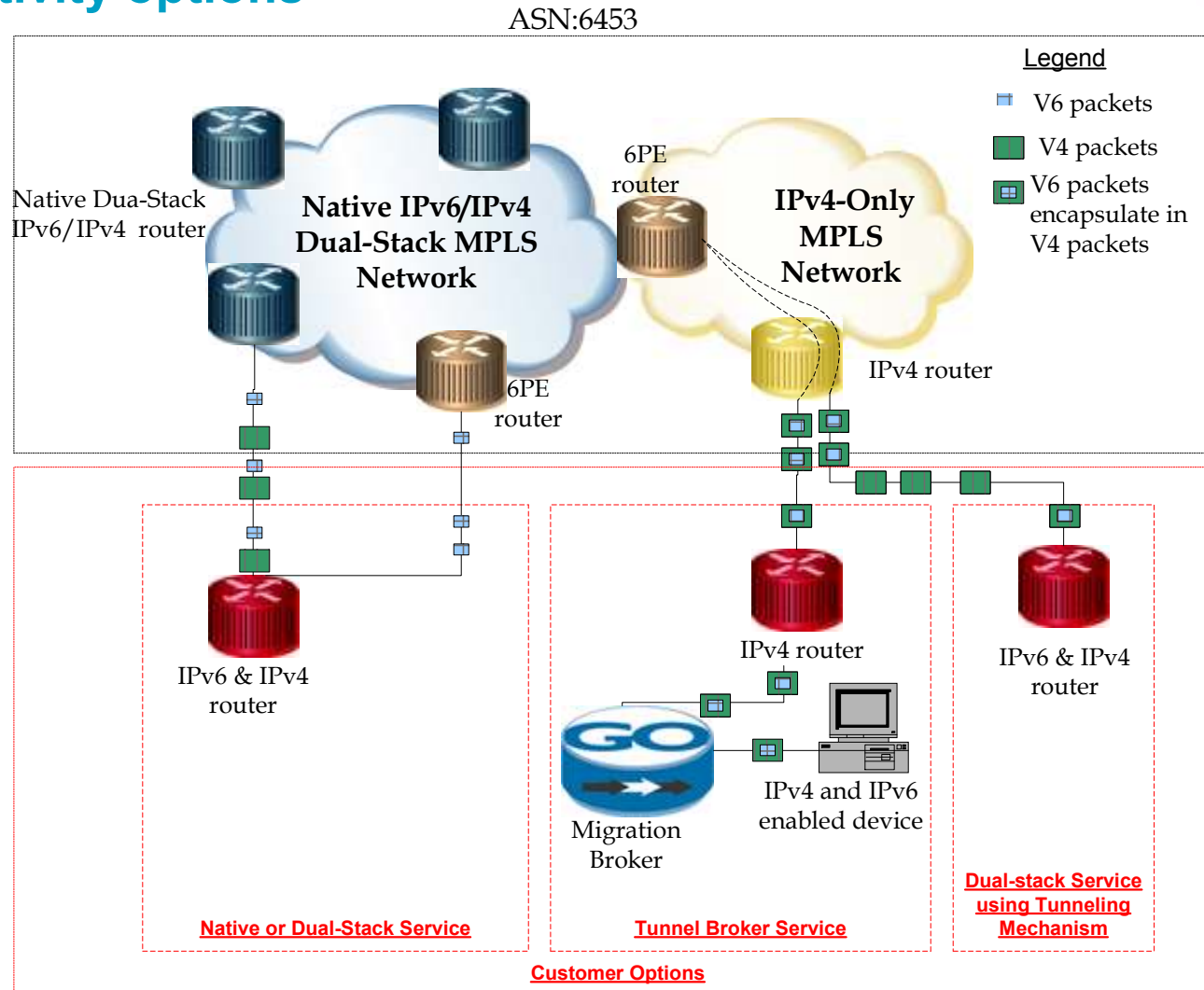


Teleglobe IPv6 Services (1)

- IPVN (over MPLS-Enabled Globeinternet)
- Transit
- Native Implementation

(1) Dependent upon CIOS 12.08 Deployment
 (2) NA, EUR & AP

IP V6 connectivity options



IPv6 network availability AS6453



IPv6 network availability AS6453



IPV6 network availability AS6453



LEGEND

- IP Links
- IPv4 PoP
- IPv6 PoP
- Earth Station
- NOC NOC

Does IPv6 justify so much attention and emphasis?

- Day to day human activity affected by and dependent on telecomms as never before:
 - Digital lifestyle: study, work, play, shop and make friends in cyberspace
 - Telecom lifestyle: everything at your fingertips anywhere, anytime
 - Business processes from design to production to promotion to selling is increasingly telecom dependent. Cyberspace is not virtual any more; it often affects bottomline if not survival.
- Day to day inanimate world activity dependent on telecomms as never before
 - Coordination of production processes and supply chains
 - Monitoring, authentication, tracking, diagnostics,
- The almost industry wide consensus is that to remain in the telecomm game will require: **IP based network convergence, multi-functionality, media rich end-devices, always on, always p2p reachability, unrestricted mobility, security, ubiquitous communication between everybody and everything, provision of ample space for user generated content and event or session based IMS billing systems..**

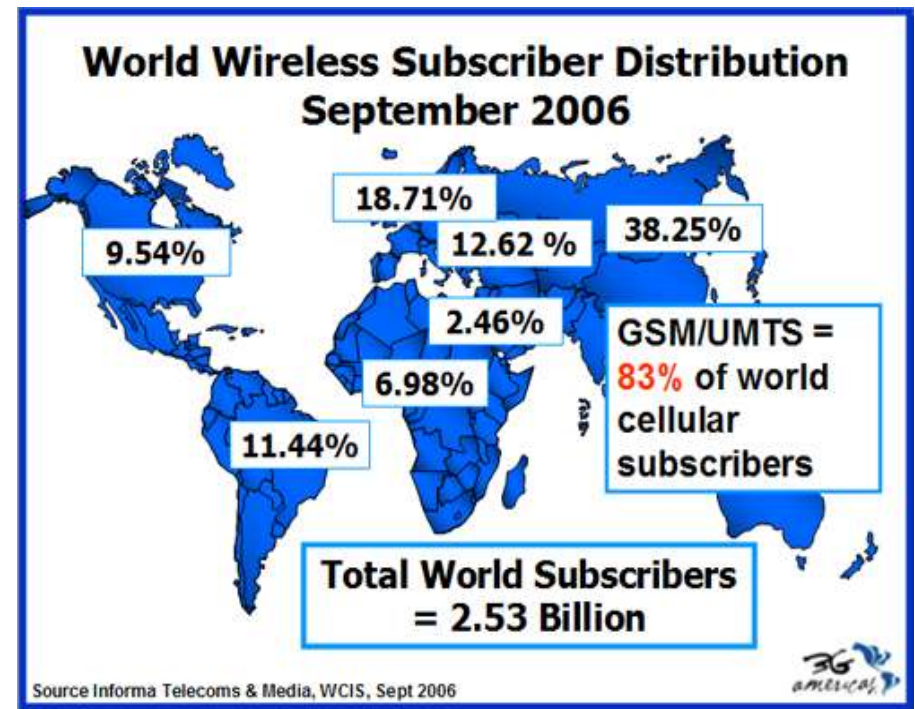
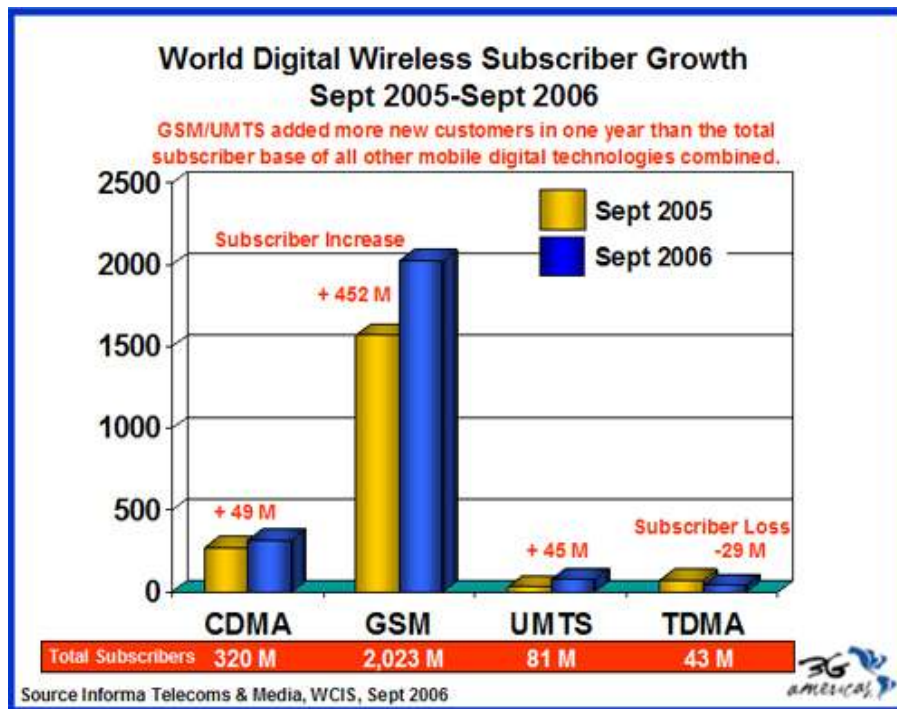
It so happens that IPv6 is one small but essential cogwheel in the IP converged World

Blurring distribution models

- The old order: discrete and distinct
 - Telecom: voice, fixed and mobile, data, internet
 - Broadcasters : radio, TV
 - Music industry
 - Movie industry
 - Print and publishing
 - Advertising
 - Gaming, gambling
 - Home entertainment
 - Production control, goods tracking
 - Services: banking, travel, auctions, sales of goods

The e-world is rather disruptive for most existing carrier and enterprise business models

The incredible growth of Mobile Communications

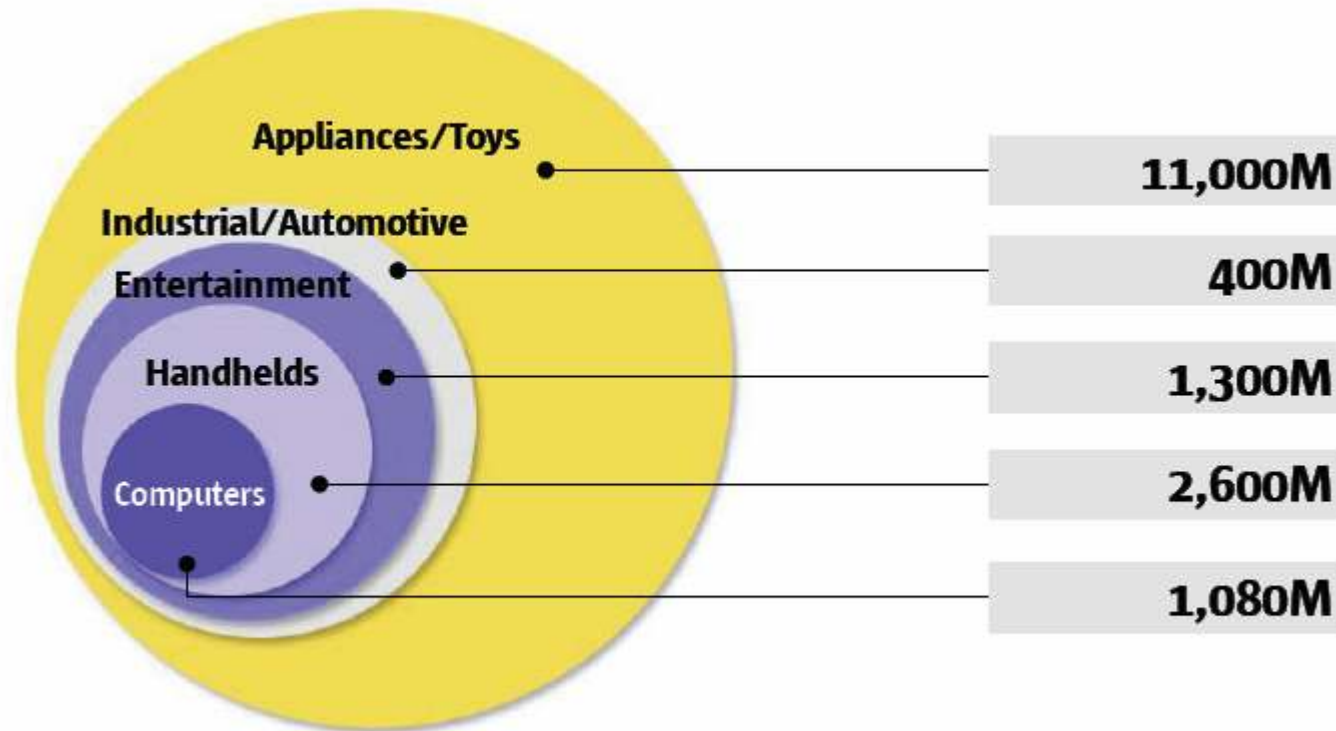


As reported by 3G Americas www.3gamericas.org

2.5 billion devices reached mid 2006, three billion by end 2007?

17 billion Networkable Devices!

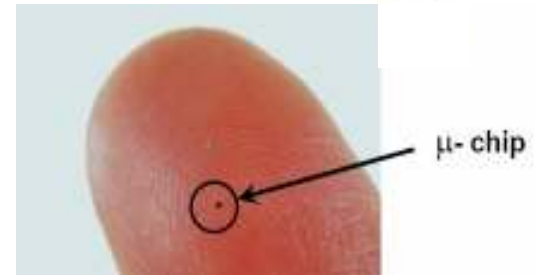
WW Installed, 2012



Source: IDC Estimates, 2004

Sun Microsystems estimates that including sensor and RFID networks the world could have a trillion communicating devices in a decade!

Toward ubiquitous communications everyone and everything



- **January 2005: The RFID bandwagon started rolling**
 - Wal-Mart Stores and DoD mandatory RFID support programs started.
- **Generalized RFID implies terabytes of traffic daily.**
- **RFID for authentication and for traceability: drugs, passports, banknotes, secure papers, concert entry ticket, casino chips, luggage tags**
- **3.1 billion tags for pallets&cases in 2006; by 2008 a US\$7.26B market with 15.3 billion tags for pallets &cases and 6.8 for non retail item level (luggage etc) 48% Asia, 32 % North America by 2010 (source: IDTechEx analysis).**
- **Visions of an “internet of things”**





Prevalence of fast digital access



- DSL and Cable
 - 250+ million were estimated mid 2006 (Ovum); 450+ million by 2010
 - It took mobile phones 5.5 years to go from 10 to 100 million subscribers worldwide; Broadband achieved this in 3.5 years.
- Wi-Fi and Wi-Max
 - 120 million wi-fi chipsets shipped in 2005
 - 100,000+ public hotspots worldwide
 - Wi-Max : potentially disruptive and potential solution to digital divide
 - **“We want to enable the next billion broadband users”**
(Ron Peck, Intel director marketing WiMax, quoted in C|net apr 18th)
- FTTx
 - From 20 million (mid 2006) to 62 million in 2010 (Ovum)
- 3G and HSDPA



National Policies: The economic and defense factor

- National policies:
 - China's CNGI
 - Korea's u-IT839
 - Malaysia's MyICMS
 - Japan's U-Japan
 - Singapore's Next Gen NII an IN2015
 - India's 10 point Agenda
- Common objectives:
 - Provide ubiquitous, affordable high speed communication over converging networks
 - Provide for substantial growth of IT share of GDP and job creation
 - Position the country for competitiveness in a Global Economy.
- Defense Policies
 - In the context of its requirements for Network Centric Warfare, the US DoD decided to mandate IPv6 support.
 - Defense mobile networking needs: adhoc networks (MANET), networks in motion (NEMO) and end system mobility are just not achievable without IPv6

A high stakes game : Internet Governance!

- The internet juggernaut of the last decade took governments, regulators and carriers by surprise
- The looming IP convergence and an era of ubiquitous communications raises growing concerns about national interests, security, privacy and control
- The transition to IPv6 is a once in a generation opportunity to influence governance and control of the evolving New Telecommunicating World.
 - For the first time since IPv4 was introduced in jan1983, the internet is moving to a new protocol version and address scheme
- Impasse, then uneasy compromise between the U.N. and the USA at the November 2005 WSIS conference in Tunis. The UN sets up IGF (Internet Governance Forum) under the UIT; first was held in Athens end october.
- At stake: more regulated structured growth versus liberal, competitive more chaotic growth

The IPv6 factor in the IP convergence equation

- Solves address shortage
- Restores p2p
- Mobility
 - Better spectrum utilization
 - Better battery life!
- Security
 - Ipvsec mandatory
- Multicast
- Better QoS (flow labels)
- Neighbour discovery
 - Ad-Hoc networking
 - Home networks
 - Plug and play
 - Auto configuration
- Permanent addresses
 - Identity (CLID)
 - Traceability (RFID)
 - Sensors and monitoring

ADSL, cable, 3G, Wi-Fi, Wi-Max provide the always-on

IPv6 a prerequisite for viable IP convergence?

- To make a commercial reality of the IP convergence vision is quasi impossible without moving to a new IP version
 - The current one (IPv4) deployed on 01 /01/1983 is totally inadequate to meet upcoming network and application needs.
 - IPv6 is the only way out of current IP address shortage for major developing economies such as China and India.
 - Essential for mobility, improved security, QoS, plug and play home networking, mobile ad-hoc networks (MANET's) and networks in motion (NEMO's)
 - Critical component for session and event based billing in the 3G and B3G (Beyond 3G) world based on IMS and SIP. One of the building blocks toward ITU-T defined NGN
- Should be prevalent around 2010 but early movers will enjoy a sizeable competitive advantage in a number of evolving application domains and associated revenues.
- All new IT related procurements should mandate IPv6 support

What about correspondence between customer and goods or services rendered in an IP address based billing environment?

Some concluding thoughts

- What will the new BB interconnected world we are creating bring?
 - Homes on-line: triple or quad play; home gateways for work, entertainment, security and monitoring.
 - Goods on-line: tagging of practically everything
 - Revenues on-line: whole industries spiraling in the vortex
 - Nations on-line: prerequisite to compete and generate wealth in a increasingly global economy.
 - Humans on-line: we will be networks in motion moving around carrying some terabytes of information and communicating with the rest of the world at gigabit speeds.
 - And what will happen to human to human communication?

Thank You for your attention