IPv6 Has Arrived! (So Where Are We and What’s Next?)

Tom Coffeen, IPv6 Evangelist
Sep. 25th, 2014
IPv4 Runout

IPv6 Network Operator Measurements

Verizon Wireless IPv6 Deployment

Comcast IPv6 Deployment

AT&T IPv6 Deployment

Time Warner Cable IPv6 Deployment
Authoritative IPv6 DNS Servers (Top 100 Alexa Sites)
Global Google Access over IPv6

4.3%
US Google Access over IPv6

9.6%
Number of IPv6 Users in the US

- US Population: 323M
- US Internet penetration: 70%
- Number of Internet Users: 232M
- Percentage of IPv6 Users: 9.6%

7% of US population uses IPv6: 22.3 Million IPv6 users!
22.3 Million IPv6 Users...

- More people than the seven most populous US cities combined (NY, LA, Chicago, Houston, Philadelphia, Phoenix, and San Antonio)

- 17x more people than the total number of Freemasons in the US

- 230x more people than subscribers needed to make Sarah Palin’s streaming TV show profitable
IPv6 Has Arrived
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RMv6TF Keynote Greatest Hits: 2013

John Curran: IPv6 Leadership

Possible Victory Conditions:

“Leading companies (e.g. Fortune 500) using IPv6 for their internal networks and desktop office wireless devices”
IPv6 Adoption Attributes (% by company)
IPv6 Economic Benefits - Cloud

“Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources that can be rapidly provisioned and released with minimal management effort or service provider interaction.”

- On-demand network, configurable computing resources
- Rapidly provisioned and released
- Minimal management effort, service provider interaction
IPv6 Economic Benefits - Cloud

IPv6 provides:
- **Unlimited scale**
- **Operational simplicity**
- **Management efficiency**
**IPv6 Economic Benefits - Cloud**

**SaaS:**
- Vendor-only environment
- Interface via browser, thin client, or app
- Translation/transition performance tax = externality, but...

Any dual-stack infrastructure OPEX costs potentially passed on to buyer
IPv6 Economic Benefits - Cloud

- Tools/libraries/components provided to the customer reflect the vendor environment
  - May rely on IPv6 components
  - IPv4 components require additional provisioning/management practice introducing friction and cost

PaaS/IaaS:
Anticipate premium pricing for IPv4 “legacy protocol” components...
New IPv6 Economics – IoT

IoT = $$$

Deutsche Bank:

“IoT has the potential for unlocking Trillions of dollars of value – through structural improvements in operational efficiencies in every industry sector. Early stage IoT initiatives in Smart Energy, Smart Retail, Cyber Security…”
“The Internet of Things, which excludes PCs, tablets and smartphones, will grow to 26 billion units installed in 2020, representing an almost 30-fold increase from 0.9 billion in 2009.”
New IPv6 Economics – IoT

IoT = IPv6

IoT devices = $10^n \times 10^9$

where $n$ might equal 1 or 2.6 or 5...
What’s Next?

An exercise left to the reader:

Will we have the skills, knowledge, and training to effectively manage tens of billions of IPv6 devices within the next 5 years?
What’s Next?

Often, IPv6 just works!

@ibc_tw

Iñaki Baz Castillo

I've tested #WebRTC with Chrome talking to a ICE-Lite WebRTC server on IPv6. It just works. Nice.

4:12 AM - 6 Aug 2014

7 RETWEETS 3 FAVORITES

At other times...
What’s Next?
Remaining Challenges: Putting IPv6 to Work

- IoT IPv6 practice

*Success and Future of IPv6 from an Electrical Utility Perspective*

- Sara Bavarian, BC Hydro and Tony Mauro, Powertech Labs
Remaining Challenges: Putting IPv6 to Work

- Enterprise IPv6 practice

Wells Fargo’s IPv6 Journey

- Wayne Smith and John Burns, Wells Fargo
Remaining Challenges: Putting IPv6 to Work

- Wireless IPv6 practice

*Municipal IPv6 Case Study: Reviewing the Results for a Government Deployment*

- Brandon Ross, Network Utility Force
Remaining Challenges: Putting IPv6 to Work

- IPv6 Cloud and SDN practice

*Delivering Services From an IPv6 Only OpenStack Cloud*

- Chip Popoviciu, Nephos6
Remaining Challenges: Putting IPv6 to Work

- IPv6 Training

*IPv6 Labs-As-A-Service: The Easy Way to Hands-on Training*

- Christian Elsen, VMware
Remaining Challenges: Putting IPv6 to Work

- Training, training, and more training!

  *IPv6 Address Planning and Allocation Approaches*  
  - Tim Rooney, BT Diamond

  *IPv6 address planning worksheet and tutorial*  
  - Tom Coffeen, Ed Horley, and Scott Hogg
Remaining Challenges: Putting IPv6 to Work

• IPv6 Address Planning, O’Reilly Media, 2014
Thank you

Tom Coffeen
@ipv6tom