IPv6: *Technology Deployment in the Multistakeholder Internet*

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We're all in it, together

- The Internet was built with standards intended to facilitate the inter-connection of diverse and separate networks
  - inter-networking
- Global growth and development is *not*
  - planned
  - uniform
  - paid for by some central authority

- Which is great – for innovation
- And problematic, when there is a global threat, such as the end of availability of new IPv4 addresses


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IPv6 Development and Deployment, the early years

- You've heard it all before
- And how no one paid attention
- But, lately…

The future Internet, some expectations

- Even though Internet-connected devices are getting smaller and more diverse, users still expect “the Internet”
  - Not just a subset of data services
- There will be more Internet hosts than IPv4 addresses well before the end of this decade
  - Even if we could re-use every IPv4 address, there aren’t enough

✓IPv6 is the only answer for a globally-connected future Internet

Movement on the Global Stage

- OECD
  - 2008: Internet Address Space: Economic Considerations in the Management of IPv4 and in the Deployment of IPv6, Ministerial Background Report, DSTI/ICCP (2007)20/FINAL, http://www.oecd.org/dataoecd/7/1/40605942.pdf, pp5-6.
  - To create a policy environment conducive to the timely deployment of IPv6, governments should consider:
    - 1) Working with the private sector and other stakeholders to increase education and awareness and reduce bottlenecks
    - 2) Demonstrating government commitment to adoption of IPv6
    - 3) Pursuing international co-operation and monitoring IPv6 deployment
- APEC TEL
  - TELMIN 8 completed recommendations on IPv6 deployment for regional economies,
  - http://www.apec.org/apec/ministerial_statements/sectoral_ministerial/telecommunications/2010.html

Headlines from Governments

- 2008
  - EU issues call to action – target 25% by 2010
  - USG publishes IPv6 profile
- 2009
  - Japan publishes its IPv4 address exhaustion plan in October
    - Almost all Japanese ISPs are following this plan and preparing IPv6 service launch in the April 2011 timeframe
  - USG issues a FAR putting the USGv6 program NIST has been developing into the USG procurement rules.
    - http://edocket.access.gpo.gov/2009/E9-28931.htm
  - Australia moved up their action dates
    - Pursuing whole government deployment by end of 2012 (moved up from 2015)
    - http://www.ipv6.org.au/summit/talks/DBeauchamp_JHillier.pdf
- 2010
  - US CIO issues directive accelerating IPv6 operational deployment in all federal agencies
    - http://www.cio.gov/Documents/Transition-to-IPv6.pdf
  - Indonesia publicizes its IPv6 plan at TELMIN8 ministerial
    - http://www.apectelmin8.go.jp/

Headlines from Service Providers (core & access)

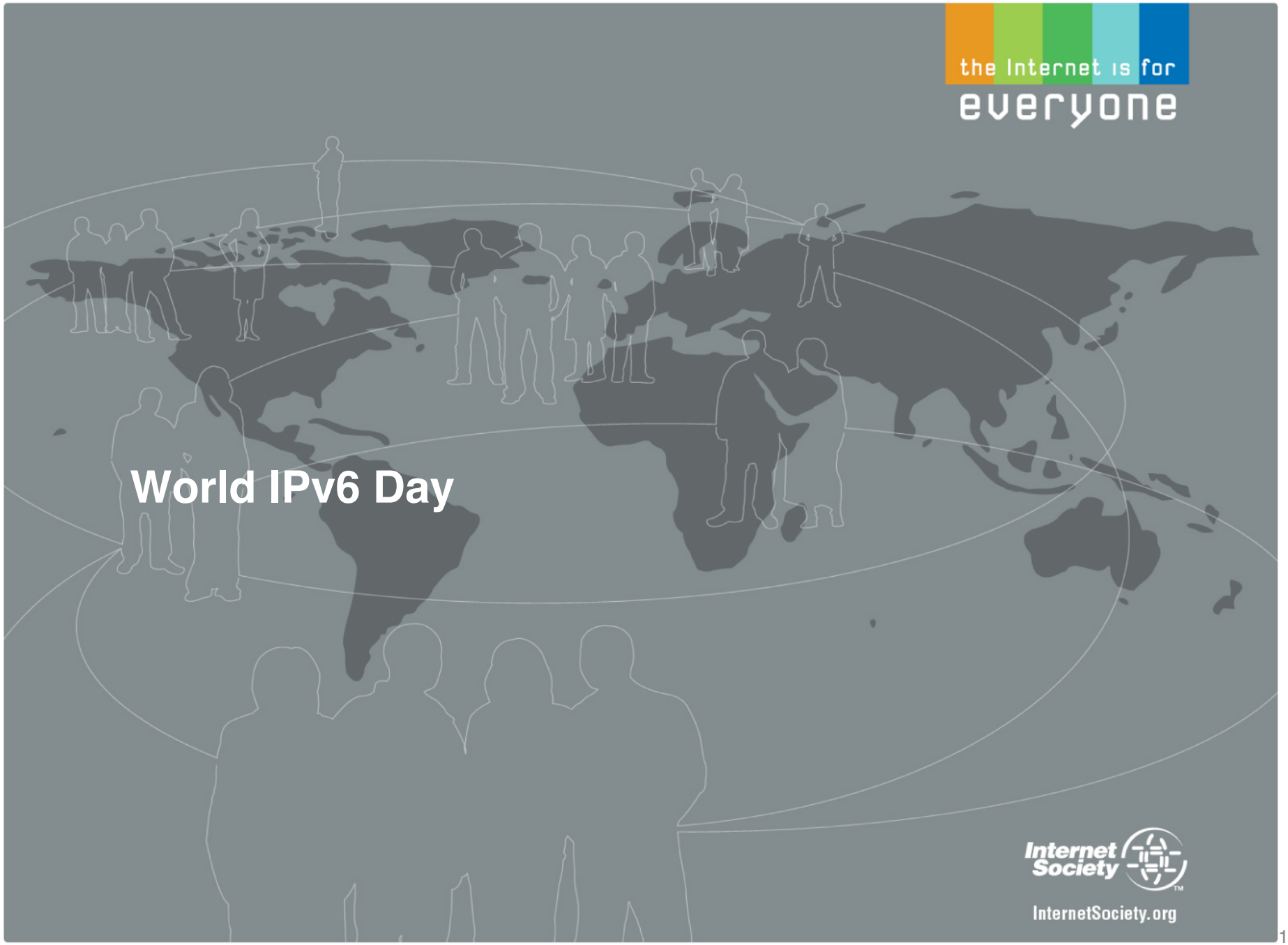
- 2007
  - Free (France) turns on IPv6 access – available to every subscriber
- 2009
  - Hurricane Electric expands its IPv6 offering
  - Verizon presses requirement of IPv6 in LTE wireless access specs
- 2010
  - Comcast (US) announces IPv6 production trials
  - Verizon (US) announces IPv6 network trials
  - NTT announces worldwide rollout of a dual-stack IP VPN service
  - Verizon and ATT announce and promote business services on IPv6
  - Quest announces IPv6 offering for all USG customers
  - XS4ALL offers IPv6 to all subscribers
- 2011
  - Comcast (US) announces dualstack IPv4/IPv6 offering
- Expected by 2011
  - DT has announced it will offer dual-stack service to all its DSL subs
  - Japanese ISPs and access networks are IPv6 capable

Headlines from Content Providers

- 2008 Google begins
  - Building a pilot IPv6 network “was not expensive,” said [Lorenzo] Colitti, who recommended rolling out IPv6 in stages. “There’s nothing inherently unreliable about IPv6.”
  - Google is already reaping the benefits of IPv6. “It’s refreshingly simple” to look at a network with globally addressable devices, Colitti said.
- 2009
  - Netflix streaming content over IPv6
  - Limelight providing IPv6 services (content delivery network)
- 2010
  - YouTube accessible over IPv6
- Expected by 2011
  - eBay & Facebook
  - Akamai expects commercial IPv6 service for all customers

But…

- Ongoing measurements show that enabling dual-stack for web content results in some users experiencing connectivity issues
- Very small percentages, but potentially a large number of users for major content providers
- This creates a disincentive for an individual large content provider to act unilaterally
- ***Solution***
  - Internet is an exercise in collaboration
  - ISOC can provide a platform to help build confidence across the industry to tackle these IPv6 deployment issues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World IPv6 Day – what it is

- June 8 2011 – 00h00-23h59 (UTC)
  - Major content providers turn on IPv6 access on their “front door”
    - Not just “side door” special hostnames
  - This is not about turning off IPv4
- The goal of this test flight is to motivate organizations across the industry – Internet service providers, hardware makers, operating system vendors and web companies – to prepare their services for IPv6 to ensure a successful transition as IPv4 addresses run out.
- It is an opportunity for the Internet industry to collaborate to test IPv6 readiness. We expect to lay the groundwork for large-scale IPv6 adoption and help make IPv6 ready for prime time.
- It is not a first – there have been important local efforts, already (e.g., heise.de).

What we've seen already

- Lots of interest
  - Content providers, ISPs, websites with content
    - More than 210 entities contacted us in the first month
    - 34 websites listed in the first month who plan to turn on v6 June 8
    - (it's growing so fast, you'll need to check to see what's current)
    - Created space for lots of sites who are running dual stack already
    - Created space for networks, hosting companies, etc. who offer commercial v6 and are interested in helping their customers participate
- All across the globe
  - People around the globe are organizing in their local region (already have links to Japan and Slovenia, more will be appearing)
  - Interest from people on every continent

What we hope to see

- Nothin'!
- It'll all work, right? ☺
- Test your IPv6 readiness:
  - http://test-ipv6.com/
- And, various measurements, tests, will be undertaken
  - Connectivity from different perspectives
  - Configuration brokenness ("self testing")

http://isoc.org/wp/worldipv6day/

- Information for what you need to do if you want to come play
  - Website owners
    - Send us the URL of the website you intend to make available
    - Contact info for a network engineer
    - A webpage describing why IPv6 is important for your business is a plus
  - Network operators, hosting companies, etc.
    - A commercial IPv6 service offering
    - A webpage describing why IPv6 is important for your business, customers, etc.; we'll link to it
- Contact us…
  - If you're interested in participating
  - If you're planning to do some measurements or testing
- Help us make this a truly GLOBAL IPv6 Day

World IPv6 Day Deployment enthusiasm snowballs v6 deployment effect

- “Yes, we plan to make our website available over IPv6. We also plan to offer our clients dual stack hosting. By June 8 we hope to have dual stack IPv4 & IPv6 as standard in all hosting packages, collocation service, dedicated and virtual servers.”

- (paraphrase from a major web company) “We’re rolling this out in our website in Europe, and I’m working on getting the folks in the US to do so also.”

- “I've received approval this evening for you to list … as well. They’re one of our clients who is … very excited.”

- (paraphrase) “I’ve seen the website in Japan for organizing IPv6. We’ve been working on v6 in our country and I’d like to do the same thing and encourage the companies we work with to participate also.”


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World IPv6 Day Takeaway

- The Internet Society is supporting World IPv6 Day as part of its efforts to accelerate IPv6 deployment.
  - 2011 is a pivotal year in IPv6 deployment
  - World IPv6 Day will be an important milestone
- IPv6 has to work
  - It must work for existing companies – business viable
  - We need to see a lot more actual traffic and usage – out of the realm of the hypothetical
- IPv6 deployment has been a bit of a moving target
  - Much easier to set up and test your own config if you know there is a body of content available
  - Much better to measure actual impact of v4/v6 coexistence than to estimate

General IPv6 Takeaways

- Recommended Actions for Leading Organizations
  - **Make IPv6 a top priority for the organization**
    - With visibility and awareness to the senior executive levels
  - **Accelerate IPv6 deployment plans**
    - Commit to being ahead of the curve on your deployment
  - **Communicate IPv6 plans and status in public**
    - The rest of the industry will follow the leaders


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Thank you!
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