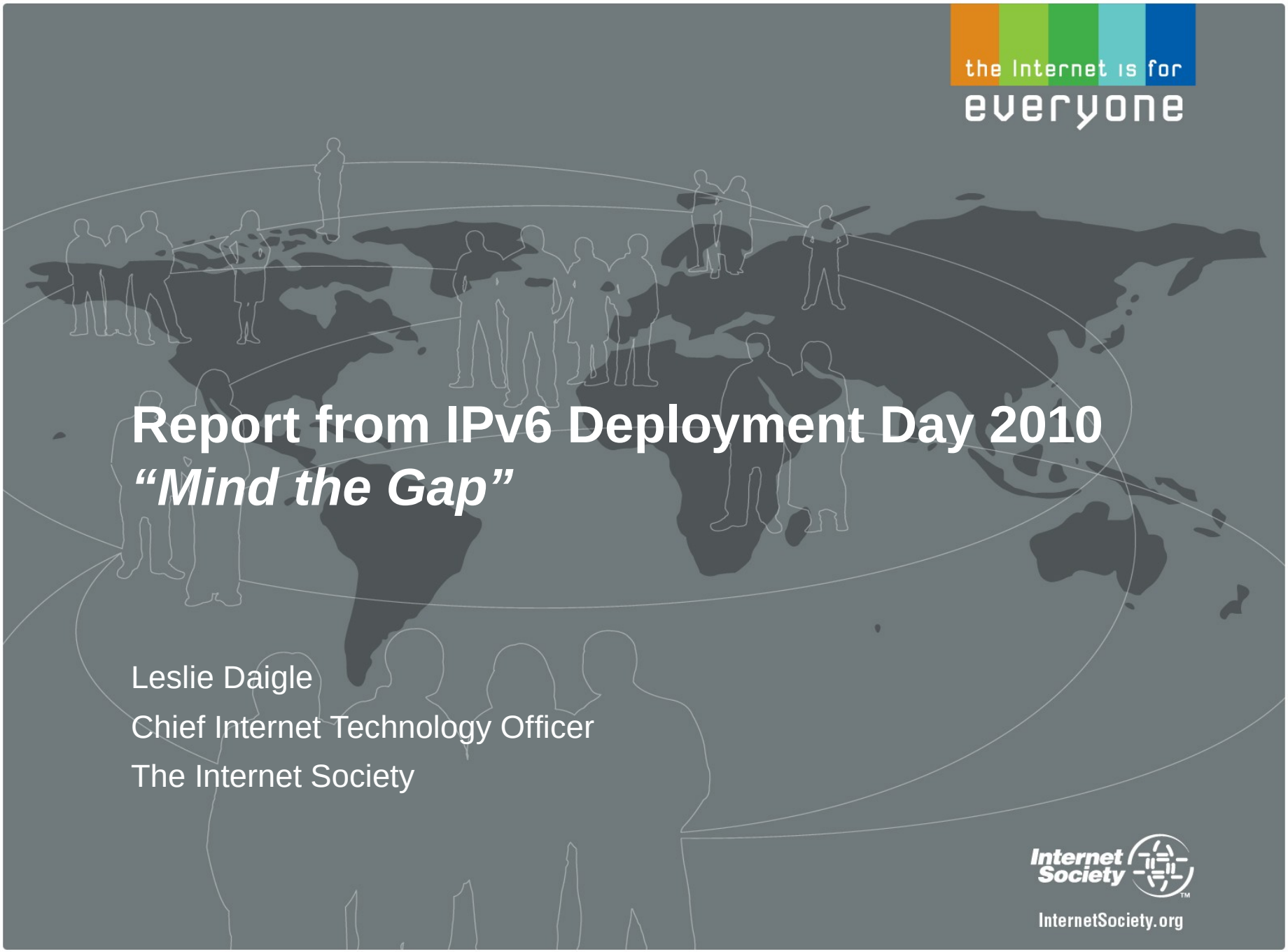


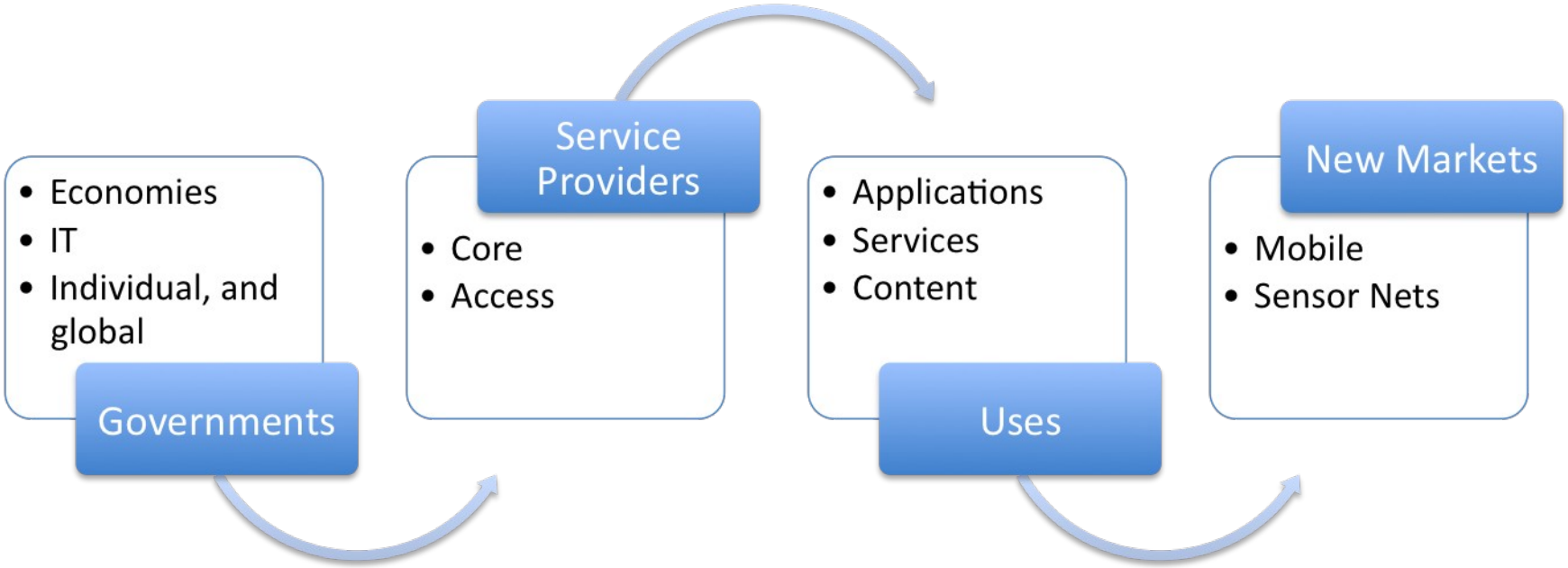
Report from IPv6 Deployment Day 2010
"Mind the Gap"

Leslie Daigle
Chief Internet Technology Officer
The Internet Society

Internet Society
InternetSociety.org

Our motivation: tapping into momentum

Who is impacted by IPv4/IPv6?



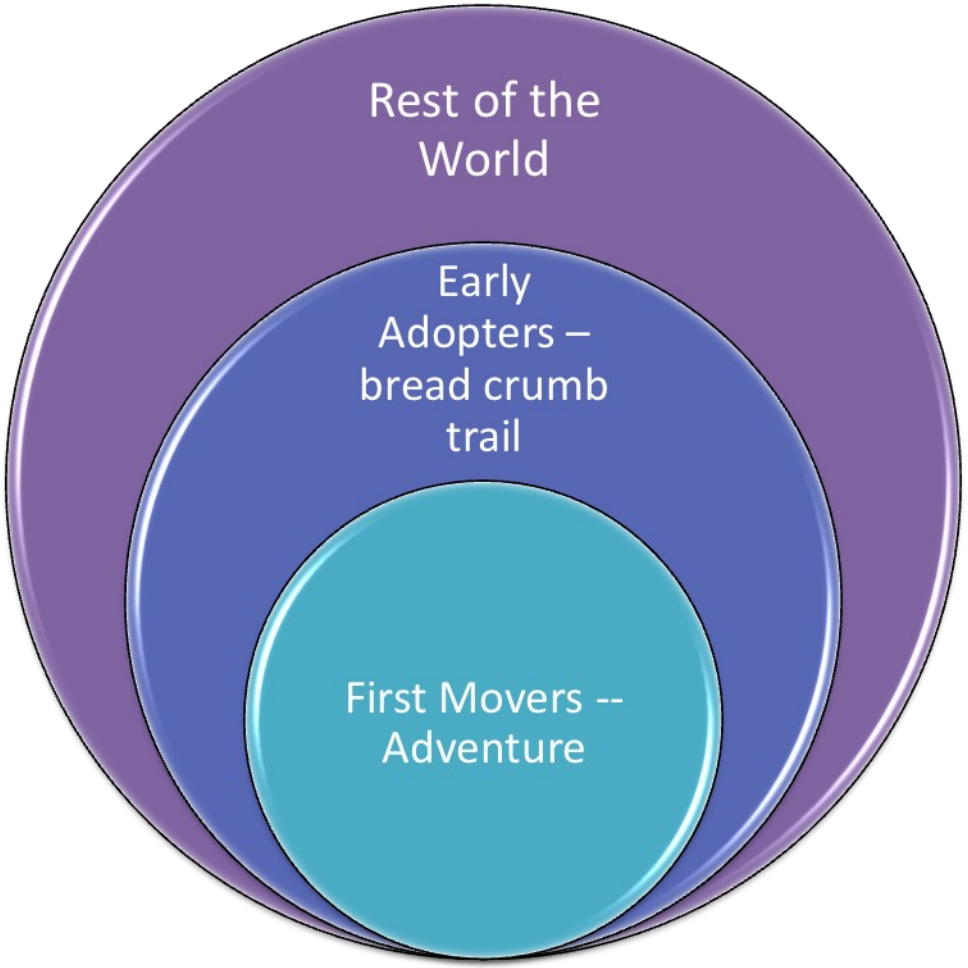
Headlines from Service Providers (core & access)

- 2007
  - Free (France) turns on IPv6 access – available to every subscriber
- 2009
  - Hurricane Electric expands its IPv6 offering
    - http://www.networkworld.com/news/2009/112009-hurricane-electric-ipv6.html
  - 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
- Expected by 2011
  - Japanese ISPs and access networks are IPv6 capable
- Generally – service providers recognizing that they are in danger of losing government IT contracts without IPv6

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.
    - http://www.networkworld.com/news/2009/032509-google-ipv6-easy.html
- 2009
  - Netflix streaming content over IPv6
  - Limelight providing IPv6 services (content delivery network)
- 2010
  - YouTube accessible over IPv6
- Expected by 2011
  - eBay & Facebook
    - http://www.networkworld.com/news/2010/020410-ipv6-web-sites.html

Expanding layers of adoption



IPv6 Deployment

Now this is not the end of the work to get IPv6 deployed. It is not even the beginning of the end. But it is, perhaps, the end of the beginning.

-- with apologies to Winston Churchill

2010 – ISOC IPv6 Deployment Day

http://www.isoc.org/isoc/conferences/ipv6deployment/

Internet Society IPv6 Deployment Day 2010

- About 50 engineers from operators, vendors, and interested parties met:
  - to further the deployment of IPv6 in the Internet
  - by developing topical information on IPv6 deployment
- The agenda featured service and content providers with deployment experience to share
  - business reasons for deploying IPv6 today
  - lessons learned from those who are pioneering commercial deployment for residential access and Internet
  - issues facing the Internet community as a whole.
  - The agenda and presentations are online here:
    - http://www.isoc.org/isoc/conferences/ipv6deployment/
- A working meeting and a work in progress

Excerpts (1)

- Comcast – cable ISP
  - IPv6 touches nearly everything in service delivery network, back office systems, OSS tools, custom tools, IT networks, Security, testing/certification processes, and operations personnel training.
  - Business Continuity is Top Motivator
    - Threat of a limited resource being depleted needs to be assessed and either dismissed or acted upon
    - Growth of Comcast business
    - Level of effort and broad scope of program drove decision to start in 2005
  - Comcast is in customer trials now
  - Recognize that they need (more) content available over IPv6 to make those trials worthwhile for customers

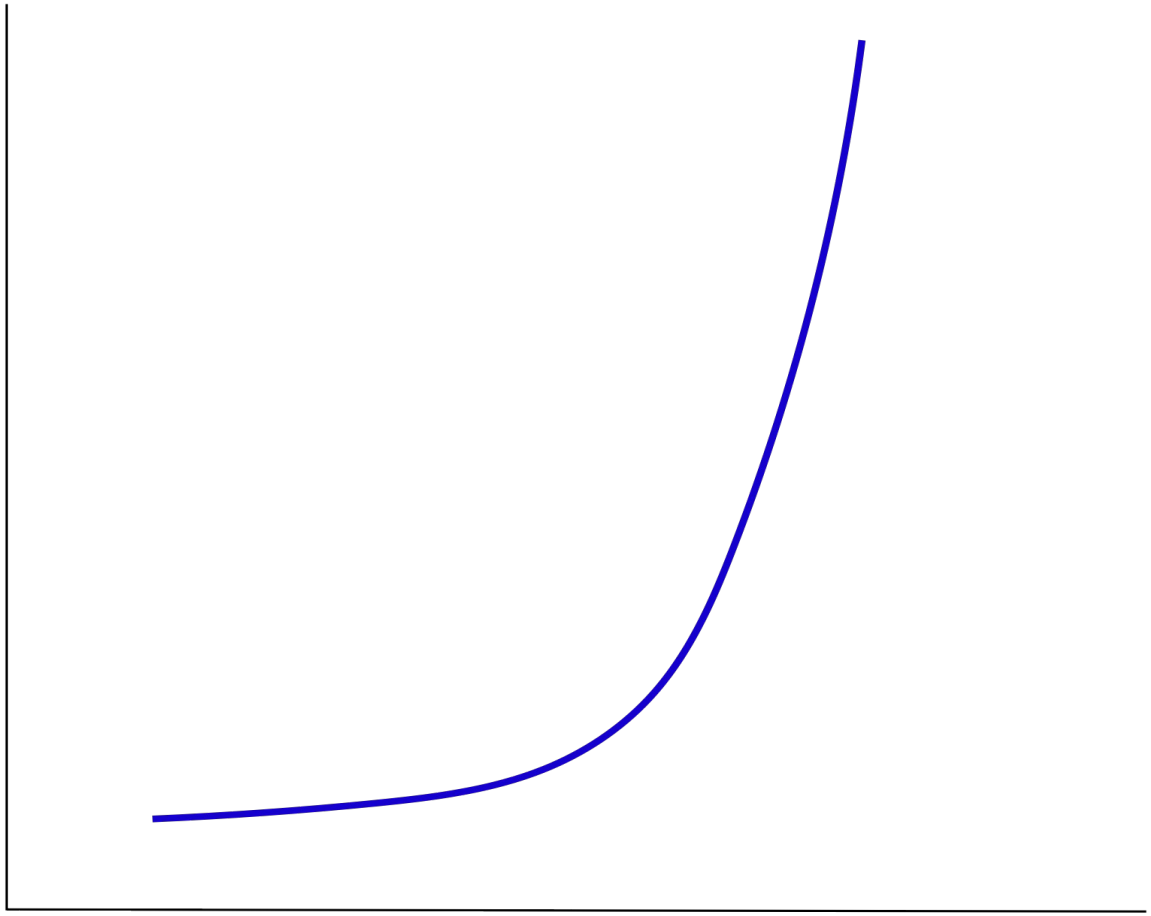
Excerpts (2)

- Limelight Networks
  - Has
    - Provision of http://ipv6.limelightnetworks.com
      - Delivering IPv6 traffic to eyeballs today
    - IPv6 in the core
      - Transit to 3+ providers
      - Peering with critical networks
    - Minimal time to provisioning at the CDN edge
    - Parallel DNS architecture
  - Needs/working on
    - IPv6 functionality for all standard CDN products
    - Standardized v4/v6 DNS architecture
    - Geolocation for IPv6

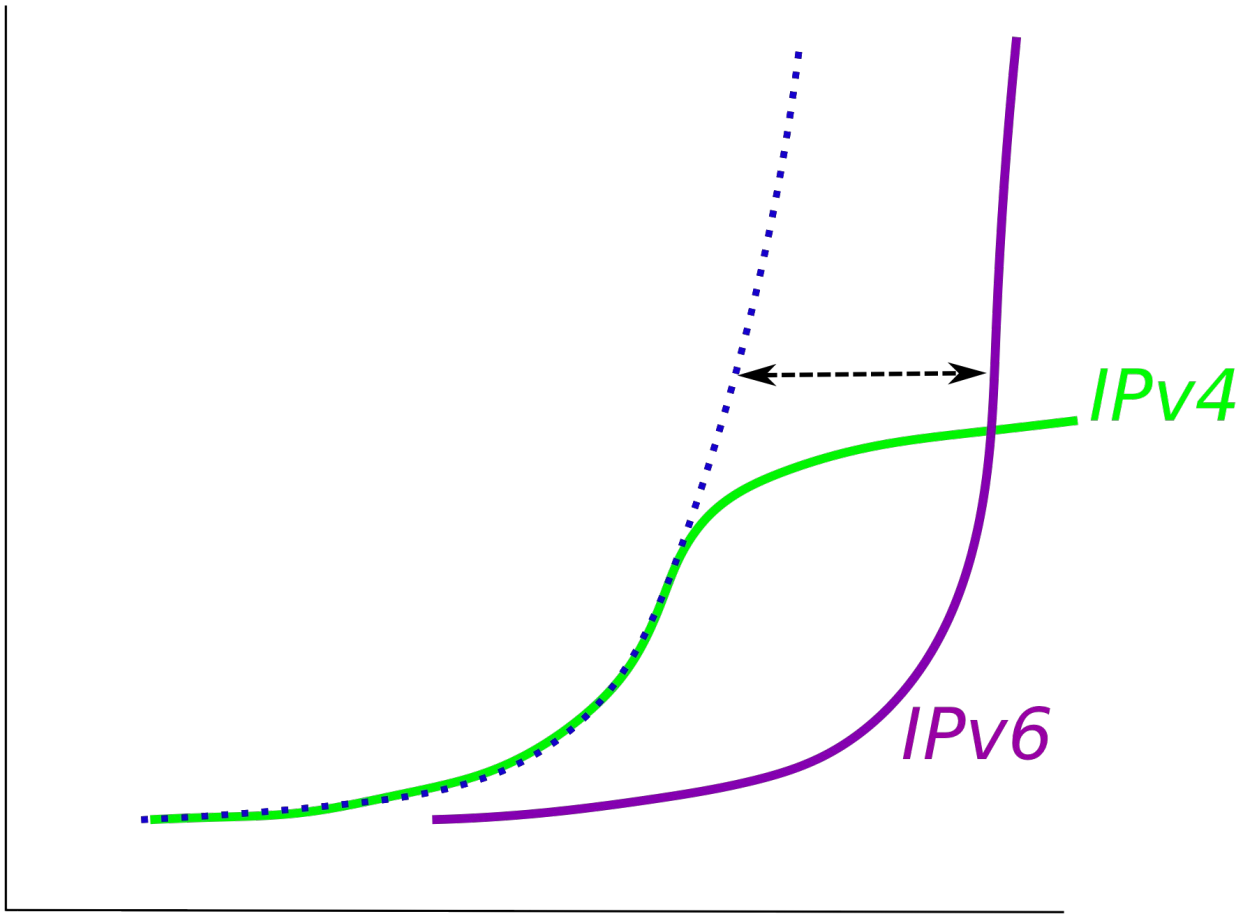
What was that you said about a business case?

- Many C-level executives in ISPs and content providers are blocked today
  - Know there is a need and would like to start deploying IPv6, but…
  - CEO/CFO with decision making power doesn't see the business case
  - Not possible to make a business case for someone else
    - But it is possible to relate why others have made the decision to deploy now
- Presentations focused on ongoing growth of the Internet, opportunities that brings, and the strategic cost of continued business stability
    - "Business continuity is top motivator" – Comcast
    - See following slide from Carlos Ralli of Telefonica
  - Panel members explored further more specific reasons for deployment
  - Momentum brings its own reward
  - "It's good to see people talking about many of these issues publicly now."

Growth of the Internet



IP version and Internet Growth



03 State of the Art

Where we are …

Strategy:	IPv6 deployment now considered as a highly possible fact.
Driver:	Address Exhaustion
Momentum:	Performing audit projects evaluating alternatives and costs.

Business Concerns

TELCOs IPv6 Deployment Impact Analysis

Not in Revenue/Income Increase

Not in CAPEX/OPEX Reduction

New apps will demand truly E2E

Scalability will demand addressing

Research Vision

1

IPv6 as Strategic Cost

- Continuation of Business
- Quality & Interoperability

2

Once it's there

- Best OPEX evolution
- New Developers will exploit IPv6 abilities

Slide from Carlos Ralli, Telefonica

Where do I start? And then what do I do?

- First movers have done this, way beyond that
- Registries and regional operating groups are training people and have lots of resources (RIPE, ARIN, APNIC all shared pointers)
- But once we get going, then what do we need to know?
- Discussion and documentation of operational practices
  - People are discovering operational issues and fixing them as they go; others will have to do the same work, perhaps there is a way to help them along
  - There is urgency both for deployment and knowledge about deployment
- People volunteered to help with this, but at this point no clear next steps

What are the hot issues?

- Discussion and documentation of issues in IPv6 deployment
  - Issues are emerging that cross business boundaries and impact IPv6 operations in the Internet
  - Comcast, Yahoo, and RIPE shared their experiences and issues around DNS whitelisting
  - Comcast contributed a paper: http://www.comcast6.net/IPv6_DNS_Whitelisting_Concerns_20100416.pdf
- There are other issues and will continue to be as deployment experience grows
- These issues get discussed in a variety of places (RIR mailing lists, NOG mailing lists, IETF mailing lists)
- Is there a need for a forum for discussing and agreeing on IPv6 deployment issues in the nearterm?

Ongoing IPv6 Deployment Days?

- First meeting was intended to be a working meeting
  - Creating the trail of bread crumbs for the early adopters to follow the first movers with business rationales, operational practices, and hot issues
- Folks volunteered to produce and disseminate information along these lines
- Is there a need for an ongoing global operational activity devoted to IPv6 deployment beyond the current regional discussions?

Any Questions?

Feedback appreciated!

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