Rocky Mountain IPv6 Task Force

Overview of Comcast's IPv6 Trials

http://www.comcast6.net

Thursday, May 27th, 2010

NATIONAL ENGINEERING & TECHNICAL OPERATIONS

Details On IPv6 Trials

- Announced on January 27, 2010
  - Launched Comcast IPv6 Information Center, http://www.comcast6.net
  - IPv6 version of our web portal available, http://ipv6.comcast.net
- We expect to conduct 4 trials in 2010
  - 6RD
  - Native Dual Stack (residential and commercial / DOCSIS & fiber)
  - Dual-Stack Lite
- We've had >5,400 volunteers from around the country.
- Some of these are new customers, switching to Comcast due to IPv6.

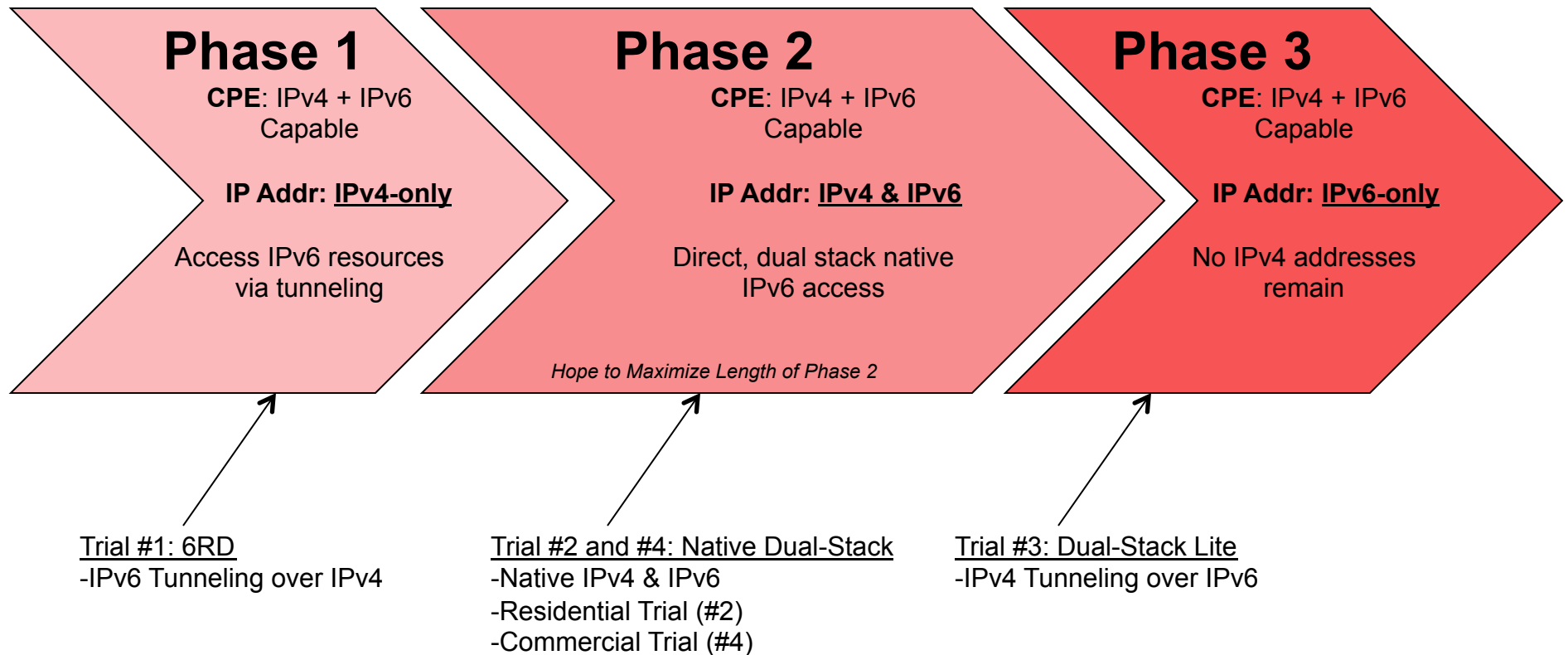Volunteers from around the U.S.

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Scope of Comcast's IPv6 Trials

- Main business & technical driver - Be Prepared!!

- Test IPv6 support in key systems:
  - Cable Modem Termination Systems (CMTSs)
  - Customer Premise Equipment

- Answer how and when will we deploy IPv6 addresses and/or capabilities to subscribers?

- What applications and processes need to adapt?
  - Internal applications (network monitoring, etc.)
  - Processes may include customer care troubleshooting scripts, installation verification steps, etc.
  - Training materials may need to be updated

- Explore other areas, such as :
  - Flesh out details for our 2011 plans
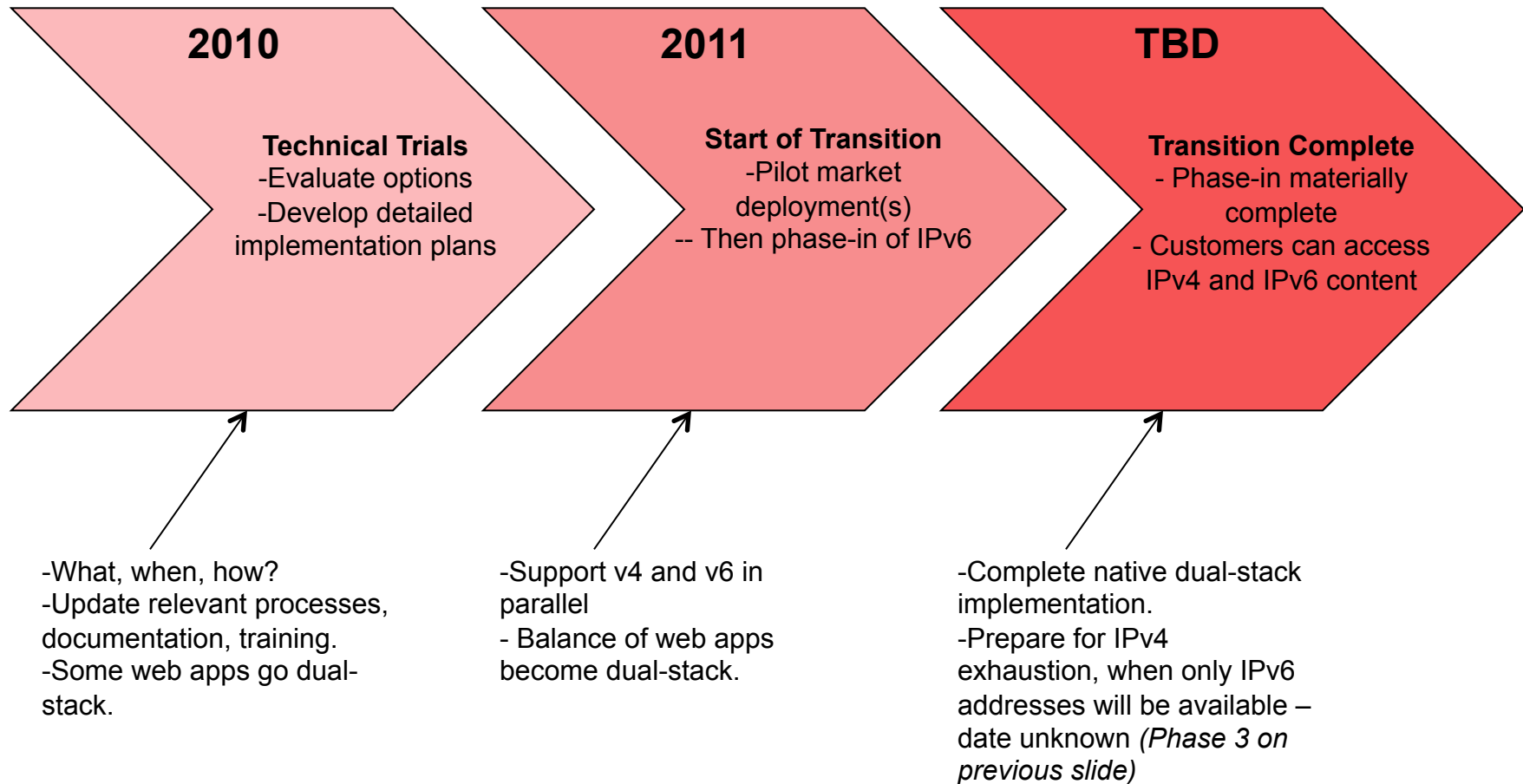 - Investigate potential for any new revenue opportunities relating to IPv6

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Scope of Comcast's IPv6 Trials

- Explore a solution / contingency plan for what we see as the three phases of IPv6 adoption:

Phase 1

CPE: IPv4 + IPv6 Capable

IP Addr: <u>IPv4-only</u>

Access IPv6 resources via tunneling

Phase 2

CPE: IPv4 + IPv6 Capable

IP Addr: <u>IPv4 & IPv6</u>

Direct, dual stack native IPv6 access

Hope to Maximize Length of Phase 2

Phase 3

CPE: IPv4 + IPv6 Capable

IP Addr: <u>IPv6-only</u>

No IPv4 addresses remain

<u>Trial #1: 6RD</u>
-IPv6 Tunneling over IPv4

<u>Trial #2 and #4: Native Dual-Stack</u>
-Native IPv4 & IPv6
-Residential Trial (#2)
-Commercial Trial (#4)

<u>Trial #3: Dual-Stack Lite</u>
-IPv4 Tunneling over IPv6

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Phases of Comcast's IPv6 Implementation

- Based on what we know now (tentative)

2010

Technical Trials
-Evaluate options
-Develop detailed
implementation plans

2011

Start of Transition
-Pilot market
deployment(s)
-- Then phase-in of IPv6

TBD

Transition Complete
- Phase-in materially
complete
- Customers can access
IPv4 and IPv6 content

-What, when, how?
-Update relevant processes,
documentation, training.
-Some web apps go dual-
stack.

-Support v4 and v6 in
parallel
- Balance of web apps
become dual-stack.

-Complete native dual-stack
implementation.
-Prepare for IPv4
exhaustion, when only IPv6
addresses will be available –
date unknown *(Phase 3 on
previous slide)*

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What is Native IPv6-Enabled Today?

• Backbone

• Peering points

• Converged regional area networks (CRANs)

• DNS servers (authoritative & resolvers)

• DHCP (to be able to issue IPv4 and IPv6 to CPE)

• Provisioning and related back office systems

Next items to natively IPv6 enable:

- Cable Modem Termination Systems (CMTSs)

  ▪ Two vendors with GA code in 2010

  ▪ Last vendor ready in 2011

- Customer Premise Equipment

- Customer Home Gateway Devices

  ▪ Often customer-owned

  ▪ Ergo, interest in HomeGate
    http://trac.tools.ietf.org/area/tsv/trac/wiki/HOMEGATE

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Interesting Data

- There will be much more data to share once our IPv6 trials begin
- Until then, info from our IPv6 monitor at http://ipv6monitor.comcast.net/
  - Increase below due partly to content owners adding Comcast DNS servers to their authoritative server whitelist (so we get AAAA and A records)
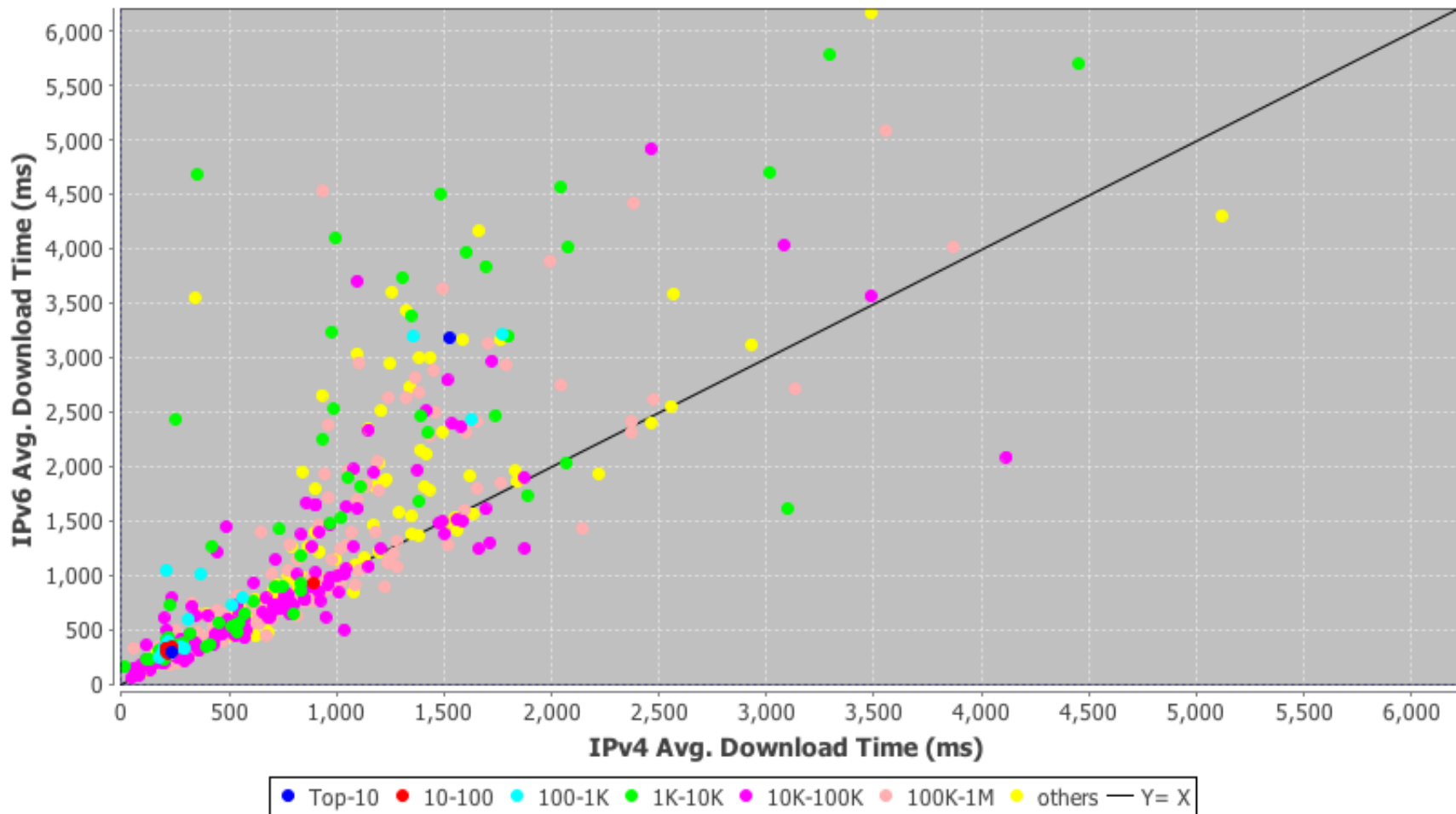
Fig-3 Relative IPv6 accessibility among top-ranking web sites

Legend: Top-10, Top-100, Top-1K, Top-10K, Top-100K, Top-1M

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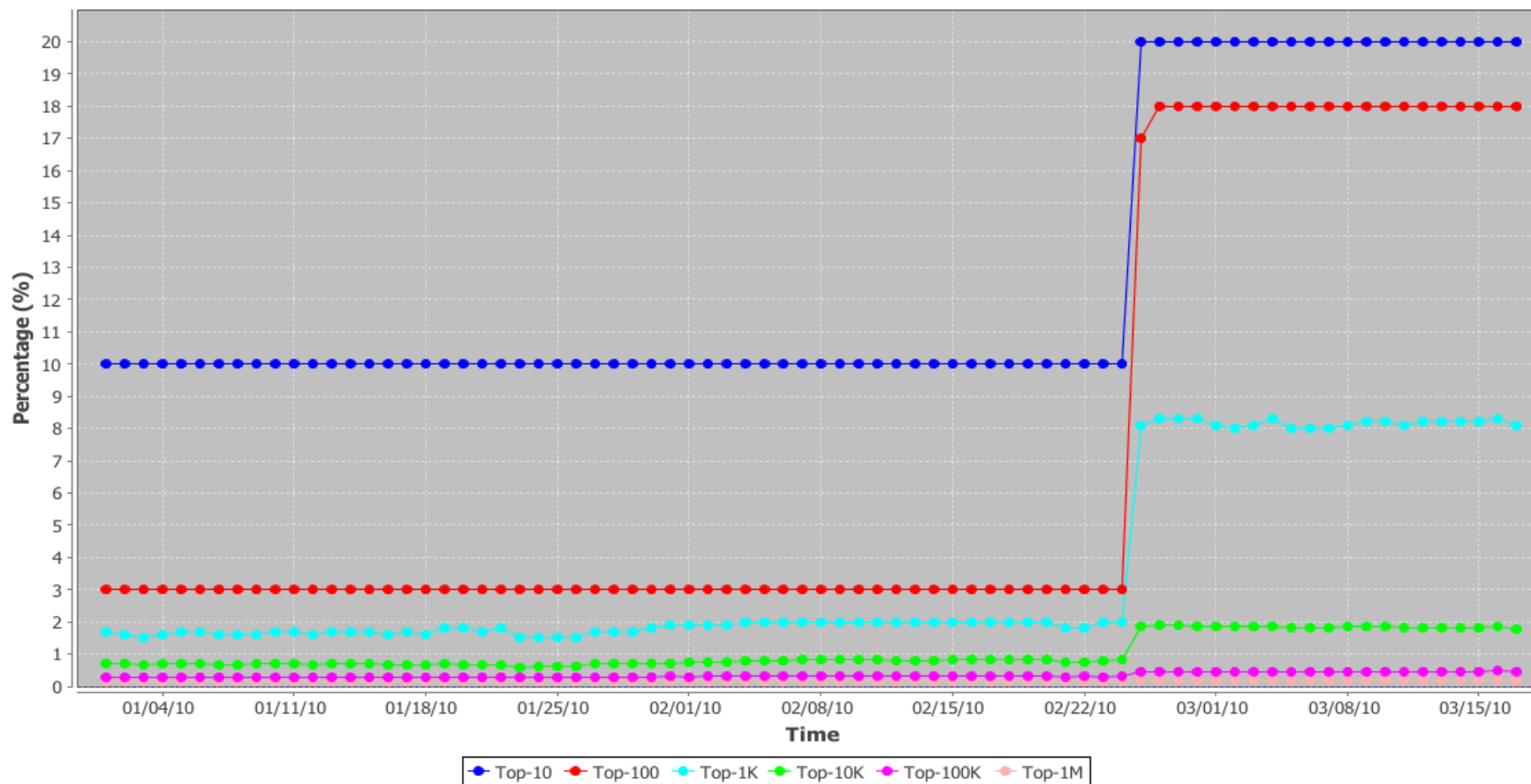
Interesting Data

• Recent comparative download times between IPv4 and IPv6 shown below (again, from http://ipv6monitor.comcast.net/)

   – Above the line means sites are slower over IPv6, below means faster

Fig-4: IPv4 vs. IPv6 Download Time

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Interesting Data

- In last 30 days, volume of 6to4 traffic up 400%
- Of our largest IP interconnect partners, 75% are IPv6-enabled
  - Increasing rapidly
    - All new connections provisioned for both v4 and v6
    - Efforts to add v6 to existing partners in full swing

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Thank You!

More information at:
http://www.comcast6.net