



IPv6 Deployment Update

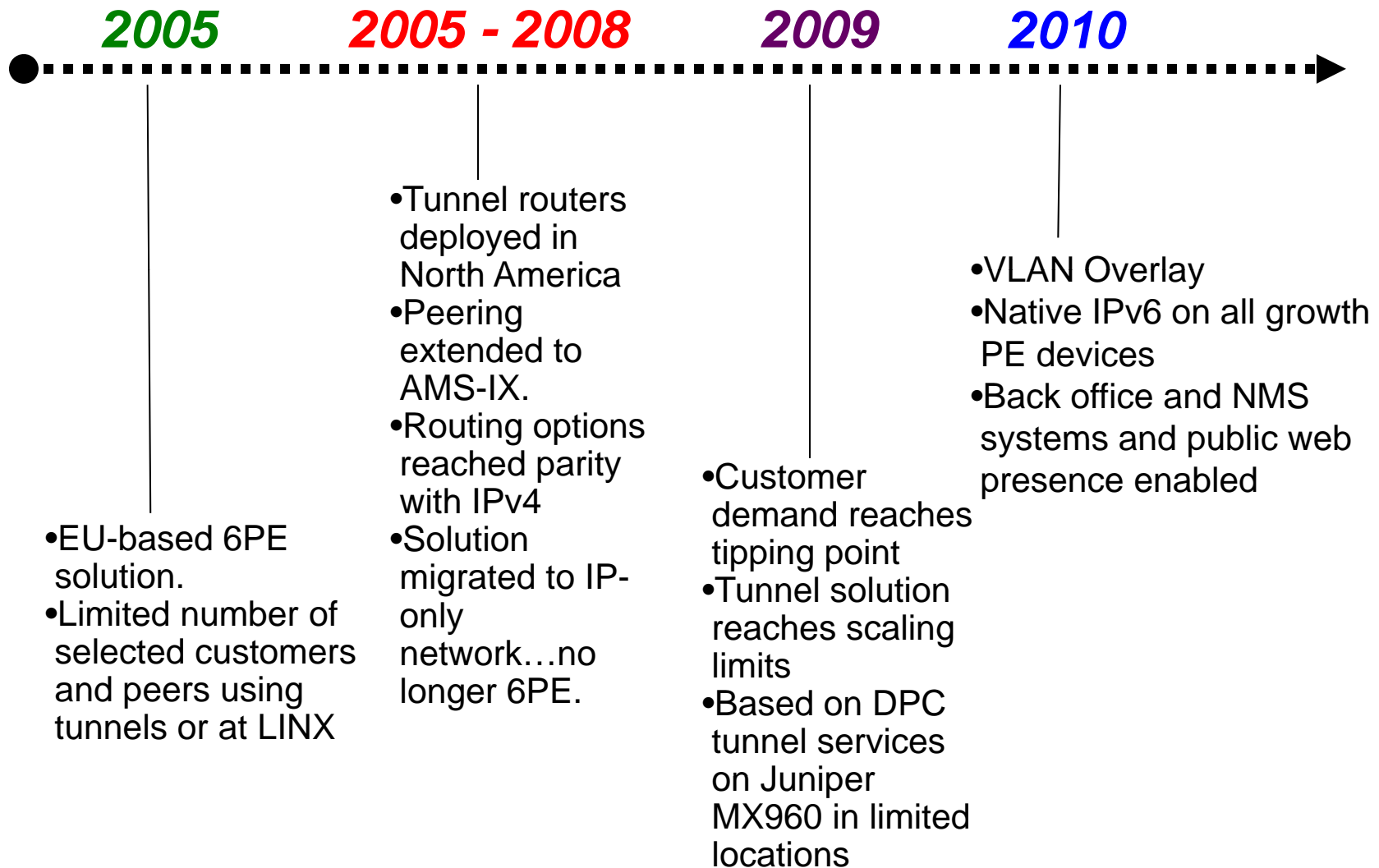
February 2011

Craig Pierantozzi

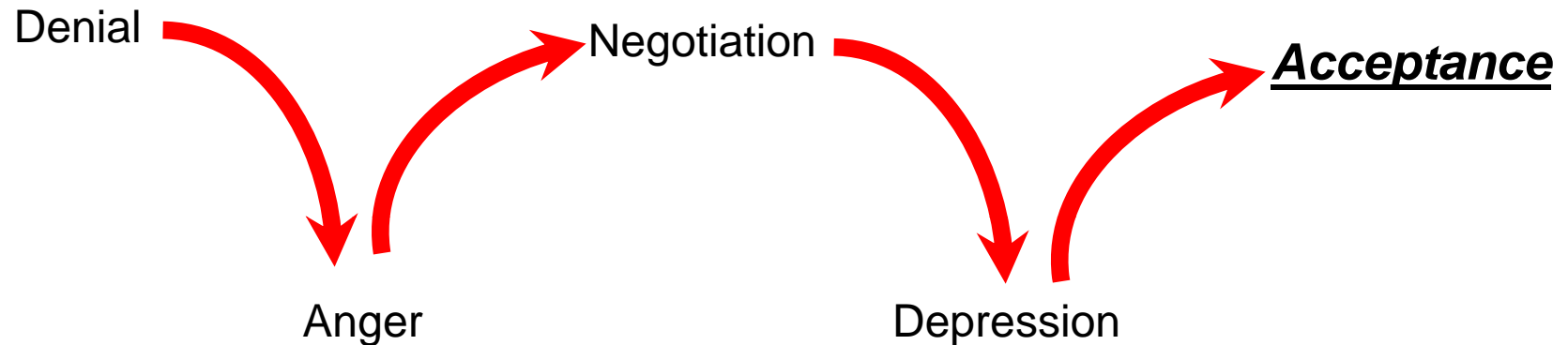
Agenda

- Level 3 IPv6 history
- IPv6 Design and Implementation
- Lessons Learned
- Quick IPv4 Update

History of IPv6 at Level 3



IPv6 Today at Level 3



- Public IP network is fully dual stack enabled, GA was July 1, 2010
- The routing ecosystem continues to evolve.

Goals and Decisions

“Thou shall not break the IPv4 network”

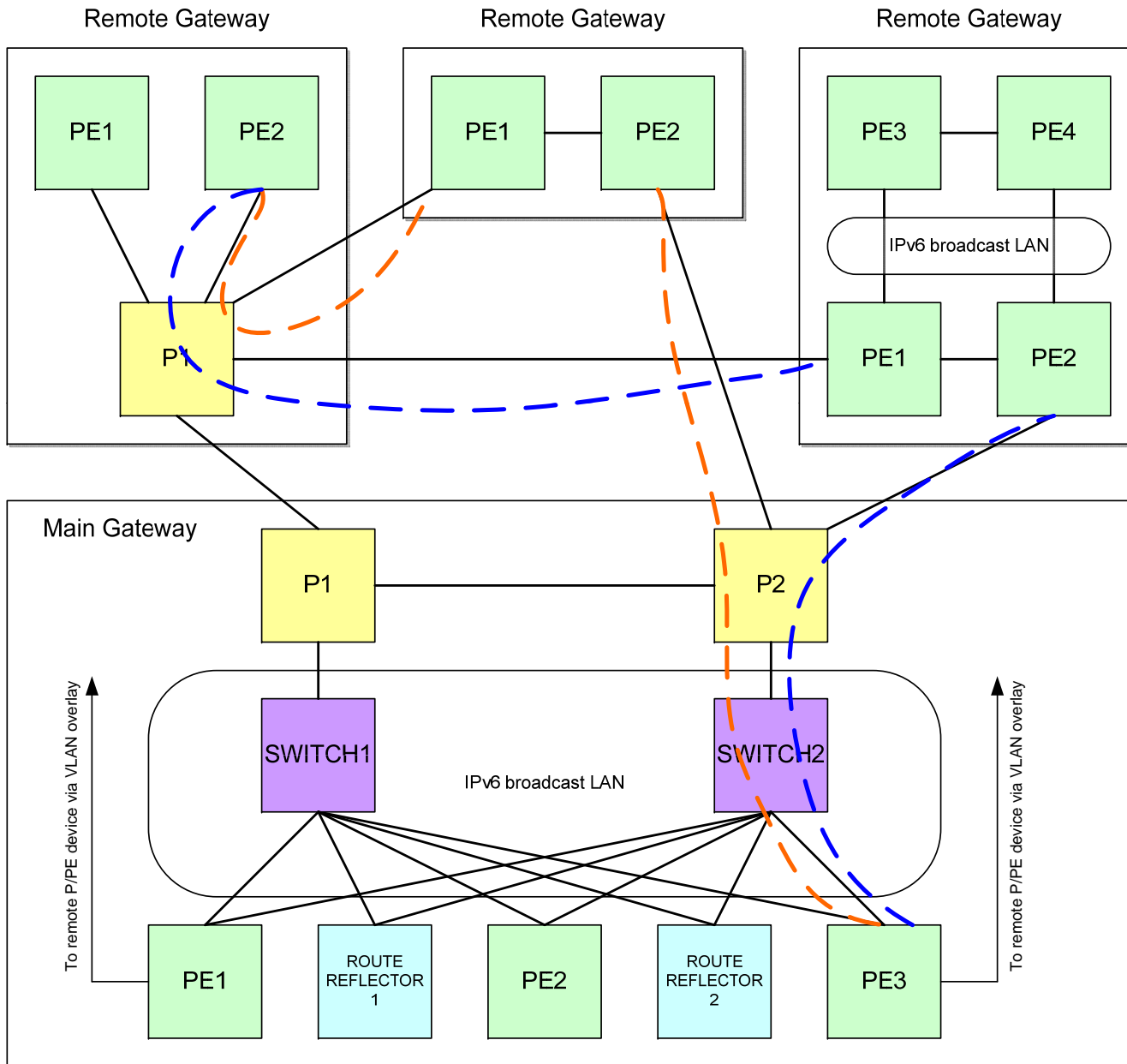
- Tunnel solution was difficult to scale and in 2009 demand for a full IPv6 solution reached the tipping point.
- Make the overall design as similar to IPv4 as possible for Operations
- IPv6 over VLAN to provide economic and technical efficiencies.
 - Allows us to provide “full speed” dual-stack IPv6 everywhere without forklifting line cards.
- Separate routing protocol for IPv6 for safety & stability reasons.
- Moved route reflection off tunnel devices onto production route reflector devices

IPv6 Everywhere...almost



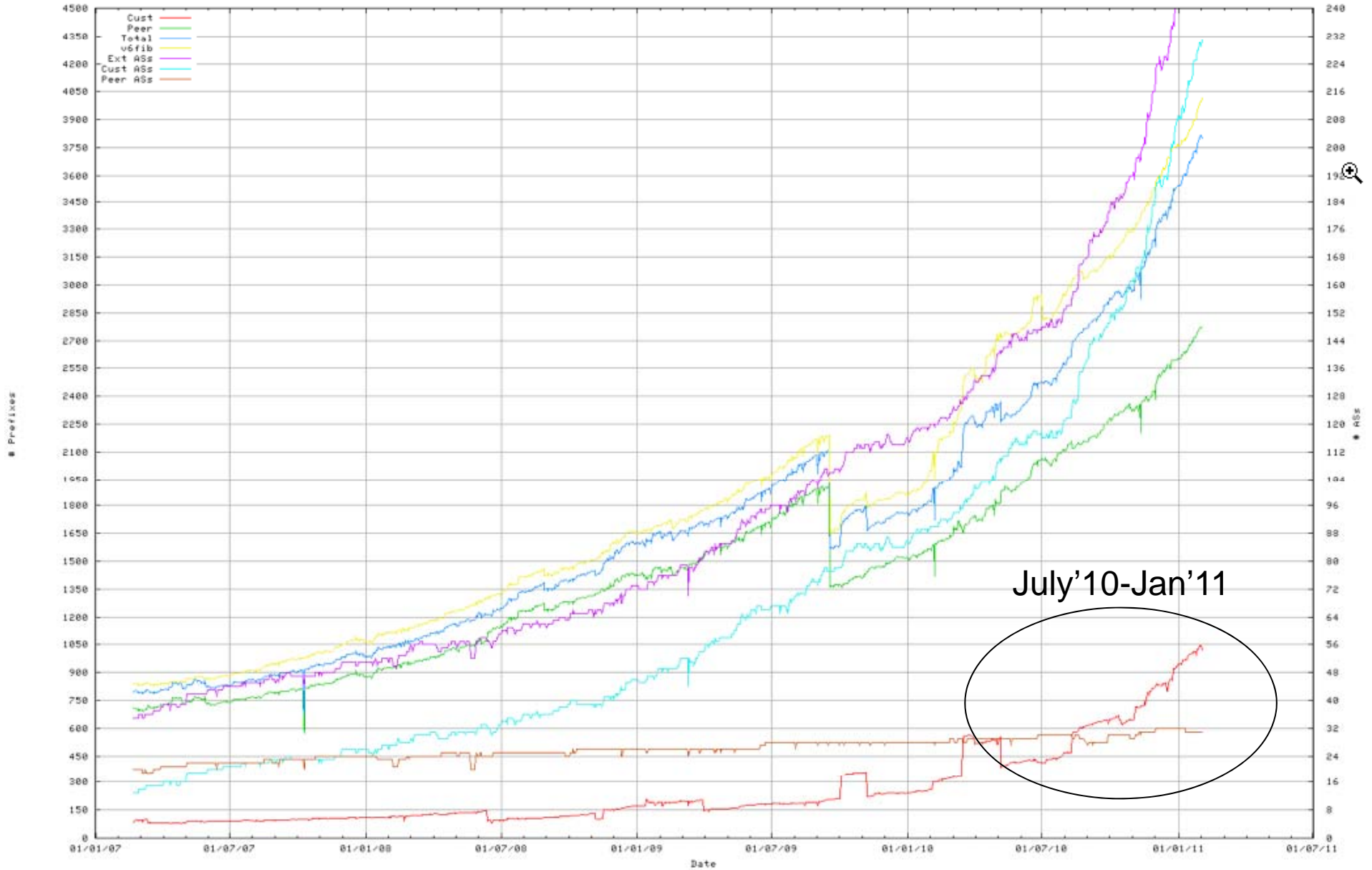
- 2011 - Dedicated Internet Access and High Speed Internet only
- 2012-2013
 - IPv6 IPVPN
 - Translation Services?

IPv6 Design



“If you build it, they will come.”

Level 3 IPv6 Analysis



Other Important Factors to Consider

- Supporting IPv6 on your network are **NOT** the biggest issues you'll encounter.
- Are your partners ready to support IPv6?
- Other internal issues include:
 - **Training your staff**
 - Technical and non-technical staff need to be trained on IPv6. They need to ensure they understand it so they can sell it correctly, and support it correctly.
 - Who is going to do your IPv6 training? Do you have an in-house expert or are you going to outsource your IPv6 training requirements?
 - Once the staff are trained, how will you keep their skills up to date?
 - **Supporting your back-office systems**
 - This can be a large number of new and old systems.
 - This is often non-trivial and can take huge amounts of time and expense.
 - Are you sure your billing system is going to be happy with IPv6?
 - **Supporting your network management platform(s)**
 - Does your existing NMS support IPv6? How about load balancers, firewalls, IDS etc?

IPv4 Status

- Level 3 controls approx 44.3M IP addresses from legacy Level 3, Genuity, WilTel, Broadwing/Focal, TelCove and ICG allocations
- Latest report shows approx. 20 million available and we are working on freeing up 4.128/9 which would make another 8.3 million available for assignment.
 - Contingent on managed modem draw down
- IPv4 routing table continues to grow
 - Currently approx 375,000 routes.

Thank You

Questions?

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