



"the consolidated technology services agency -RCW 43.105.006"

IPv6 Strategy Brief

CIO Forum
March 8, 2016

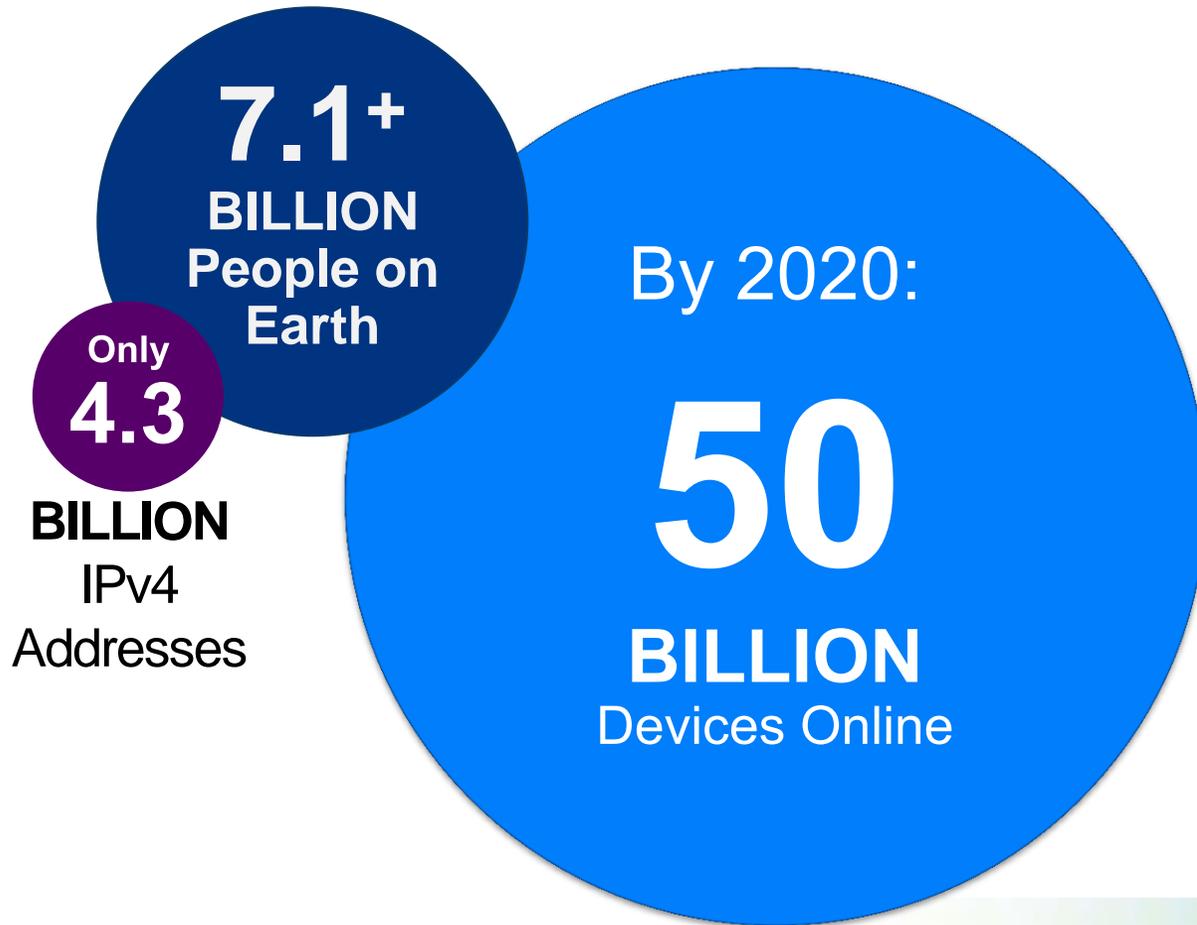


Agenda

- The IP Address Problem
- Introduce the Solution: IPv6
- Overview of IPv6 Strategy
- Next Steps



The Old System (IPv4) is Running Out Of Room



Past the Tipping Point

- IP addresses are managed and allocated worldwide by five Regional Internet Registries, such as ARIN in North America.
- ARIN allocated the last IPv4 block on September 24, 2015.
- 3.6 BILLION people yet to be connected to the Internet.

IPv6 To The Rescue!

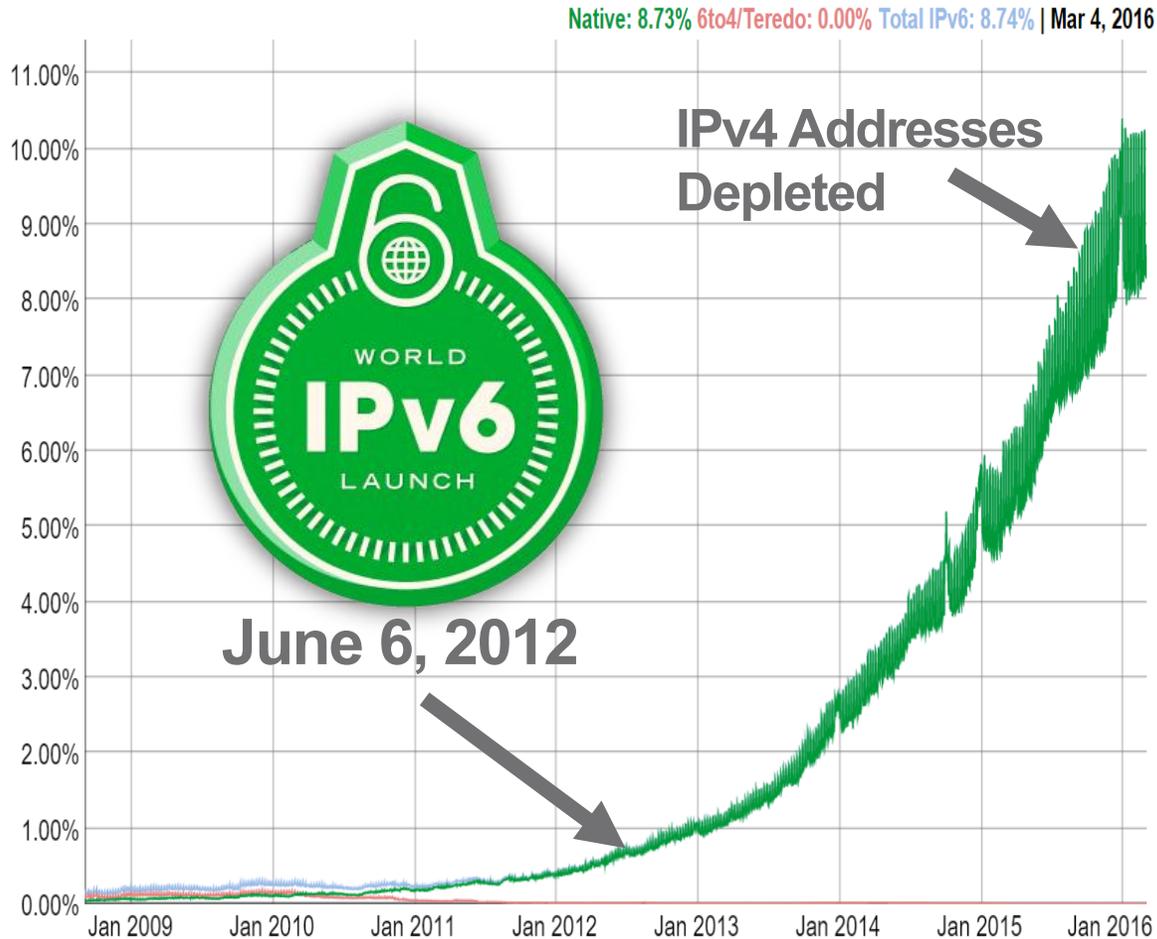
The Next Generation of the IP Standard

IPv4 = 4.3×10^9 , 4.3 Billion Addresses

IPv6 = 3.4×10^{38} , 340 Undecillion Addresses

An entire IPv4 Internet for every star in the Universe!

IPv6 Adoption



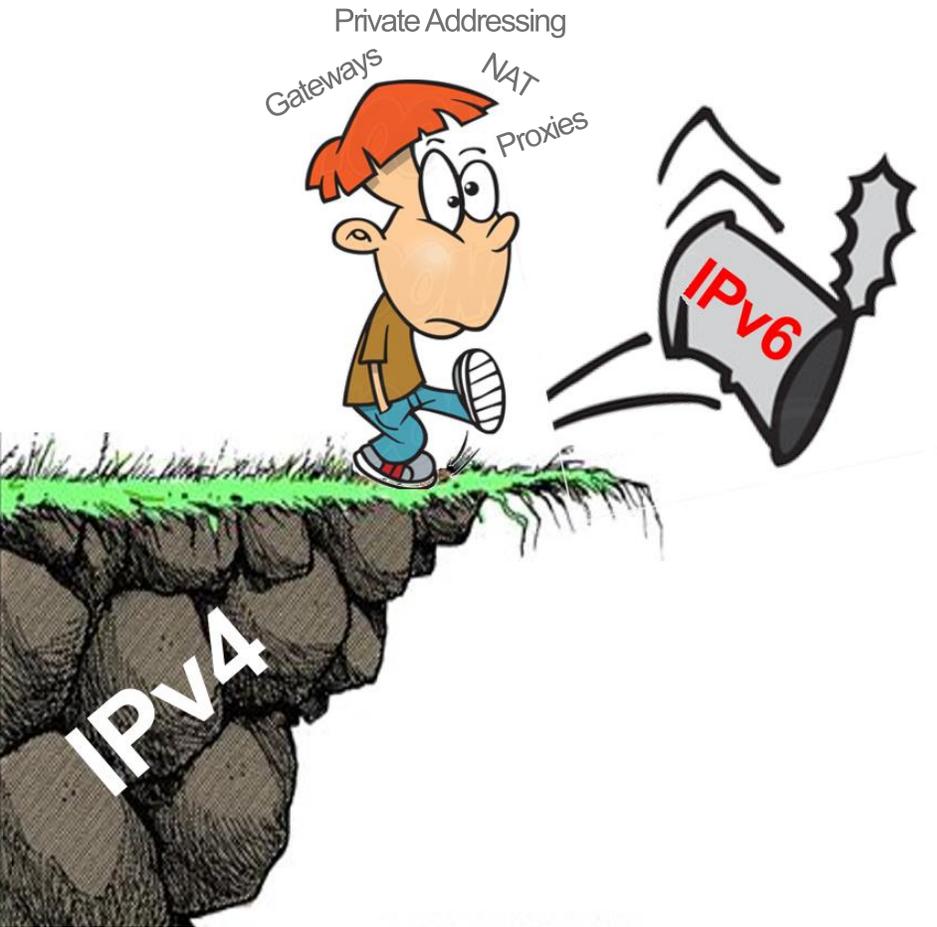
Rank	Ipv6%	Country
1	39.9%	Belgium
2	25.7%	Switzerland
3	23.7%	United States of America
4	23.0%	Portugal
5	21.7%	Germany
6	21.3%	Greece
7	17.2%	Luxembourg
8	16.0%	Peru
9	13.4%	Ecuador
10	10.4%	Estonia

Google, March 4, 2016

Why IPv6 Now?

- Public Internet resources are transitioning to IPv6
- Mandate for US government agencies ([IPv6 Web Site](#))
- >48% of mobile content sites already IPv6 enabled
 - Google
 - Netflix
 - Facebook
 - YouTube
 - Many more ...
- Mobile & Infrastructure providers default to IPv6
 - Verizon (68%)
 - Google Fiber (62%)
 - AT&T (53%)
 - T-Mobile USA (49% - IPv6 only!)
 - Comcast (42%)
 - Time Warner (26%)
- Apple iOS9 – IPv6 preferred
 - IPv6 support required for all iOS9 apps

Not Yet an Emergency, but the Time to Act is Now



- Time to get serious - similar to Y2K effort
- IPv6 is not backward compatible with IPv4 – Significant education will be required
- Enterprise architectural and planning effort – new design required for statewide IP addressing and management
- All hardware and software, from every agency, must be inventoried, tested, and possibly upgraded to be IPv6 ready
- All new hardware/software procurements should mandate IPv6 support

Gartner IPv6 Roadmap Recommendations

- Establish an Enterprise Cross-Functional IPv6 Planning Team
 - Networking
 - Security
 - Desktop / Server Platforms
 - Application Development
 - Web Hosting / Content Development
- Establish Enterprise wide IPv6 Standards and Addressing Scheme
- Inventory and Gap Analysis
 - Applications
 - Platforms
 - Network Hardware
 - Security Systems
- Register public IPv6 Address Space (WaTech purchased address space early 2015)
 - 79.2 Octillion (79.2×10^{27}) addresses
 - 1.2 Septillion (1.2×10^{24}) addresses for each agency (up to 65,536)
- Implementation and Deployment
 - Phase 1: External customer-facing services, e.g. security, DMZ services
 - Phase 2: Intranet WANs and LANs
 - Phase 3: The data center

Guidance: Don't Underestimate the Importance of Network Management and Visibility (security)

Next Steps

1. Identify an IPv6 Project Leader
2. Establish an Enterprise, Cross-Functional IPv6 Transition Team
 - a) Disseminate IPv6 education and training
 - b) Develop enterprise IPv6 policies and standards (OCIO Policy #185)
 - c) Develop enterprise IPv6 architecture and address allocation scheme
3. Each Agency Performs Inventory and Gap Analysis
 - a) Focus on external-facing applications and services
 - b) Determine IPv6 readiness (e.g. eliminate hard-coded IP addresses)
 - c) Identify potential budget impacts

Key Take-Away Points (amended 3/10/15)

- Not quite a crisis yet, but planning starts NOW!
- IPv6 is an enterprise effort - An inter-agency team will establish an enterprise plan, policies and addressing standards
- WaTech has acquired a cosmically large IPv6 address space for the state enterprise – no need for agencies to acquire separate addresses
- Roll-out can occur in phases over a number of years, beginning with edge services that support public-facing and mobile applications
- All applications and hardware must be inventoried and assessed for IPv6 readiness
- All new IT procurements should mandate IPv6 support





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Questions?

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