Verizon IPv6 Transition

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IP Network Architecture and Design

Outline

Infrastructure Readiness

Verizon IPv6 Professional Services

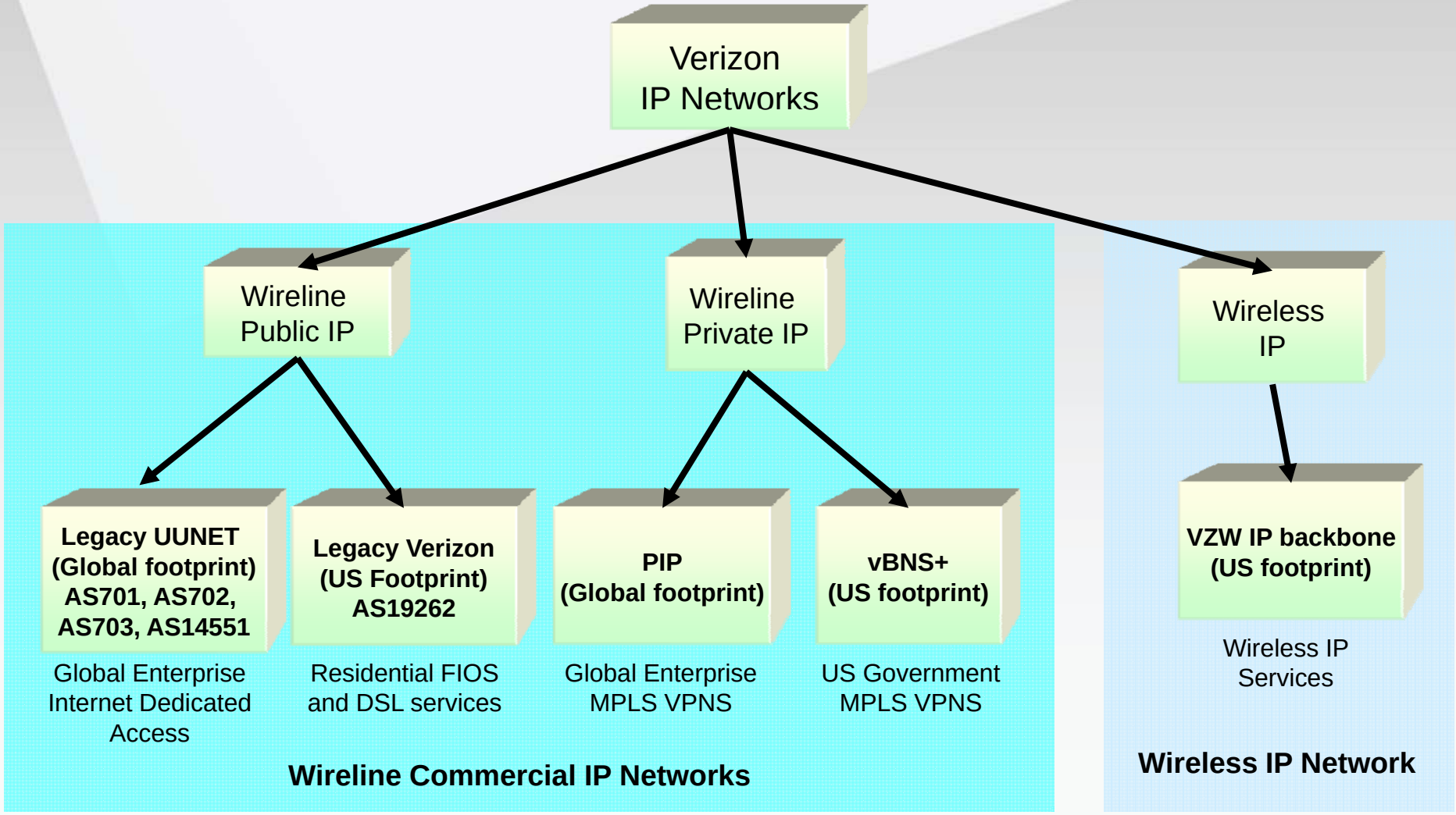
Verizon has made a firm commitment to evolve its global IP infrastructures to support IPv6 while continuing to expand and sustain IPv4 services

1998 – 2009: Phased adaptation to control rollout risks and costs.

2009 – Present: Accelerated IPv6 Transition Momentum driven by IPv4 address depletion

New network capital investments must incorporate IPv6 functionality.

Taxonomy of Verizon Commercial IP Networks

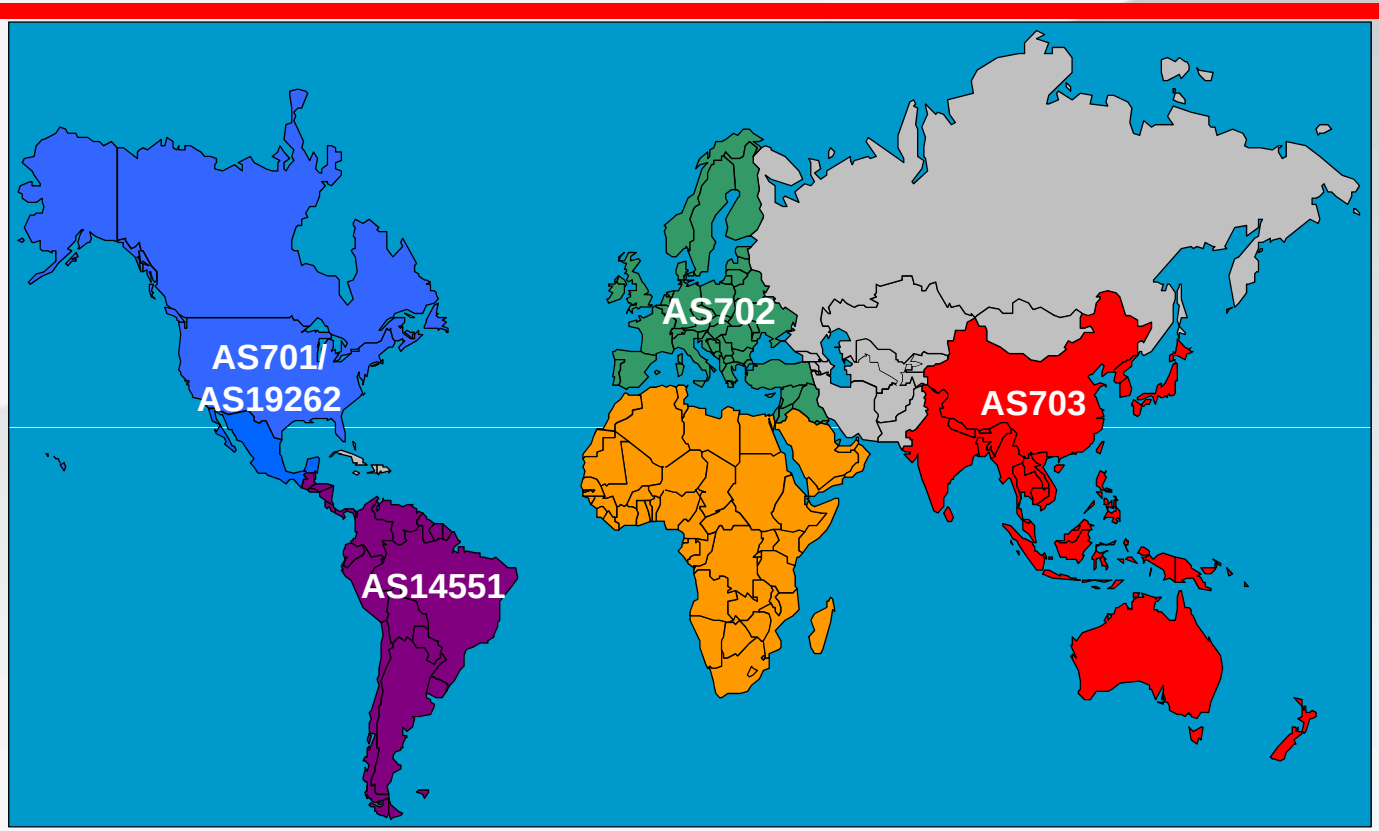


Verizon Global Public IP Overview

Global facilities-based vertically integrated IP network infrastructure

One of the most expansive global Internet backbone networks

Spectrum of IP communications services for business and consumer markets



IPv6 Service Strategy for Global Public IP

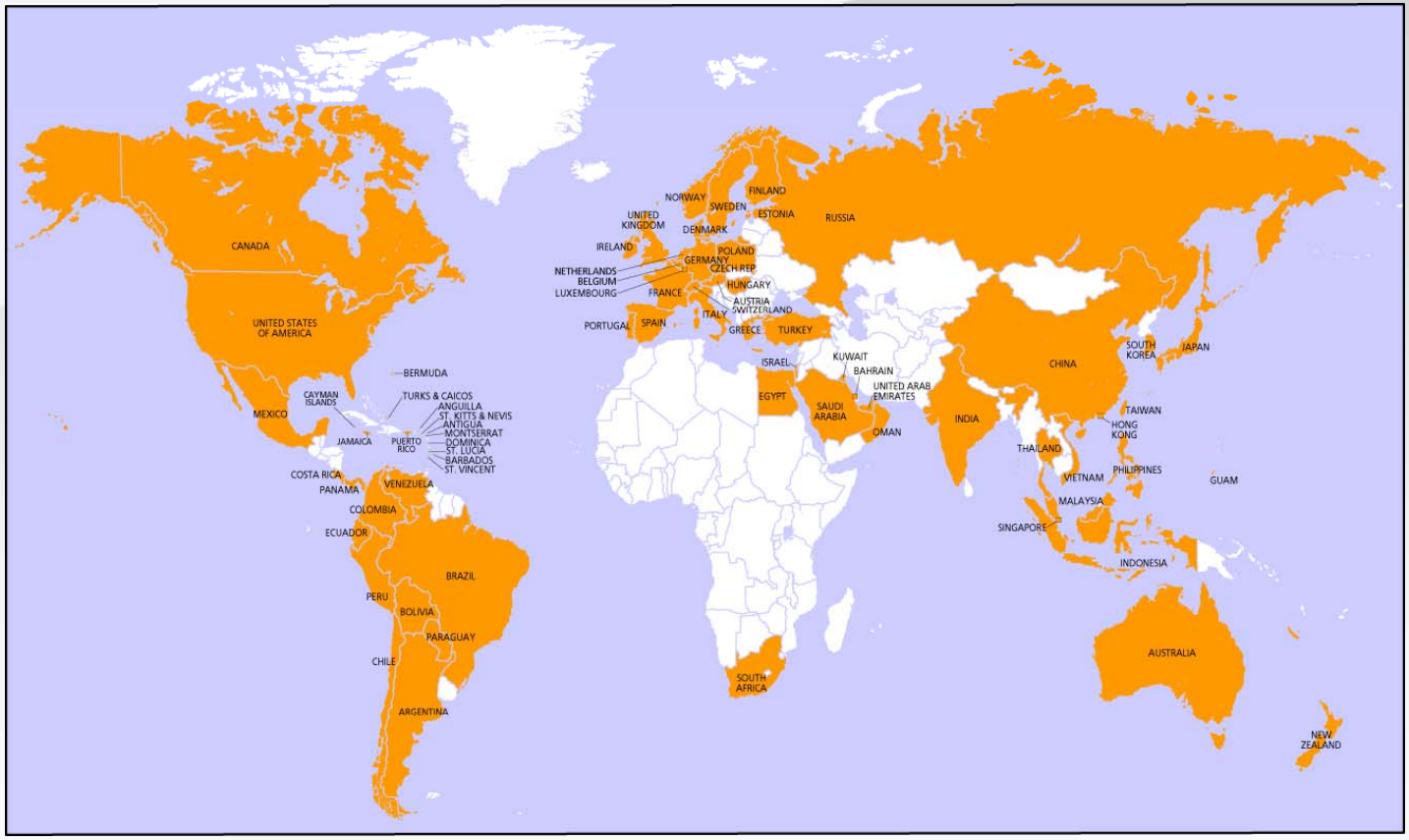
Initial Service Goal is to achieve IPv6 feature parity with existing IPv4 Internet Services.
Longer term goal is to offer value added Machine-to-Machine IPv6 services

Verizon Global Private IP (PIP) Overview

Verizon owned and operated global private infrastructure

Carrier-class global MPLS-based IP VPN service

Feature-rich, with QoS, multicast, and a wide of range access speeds and methods

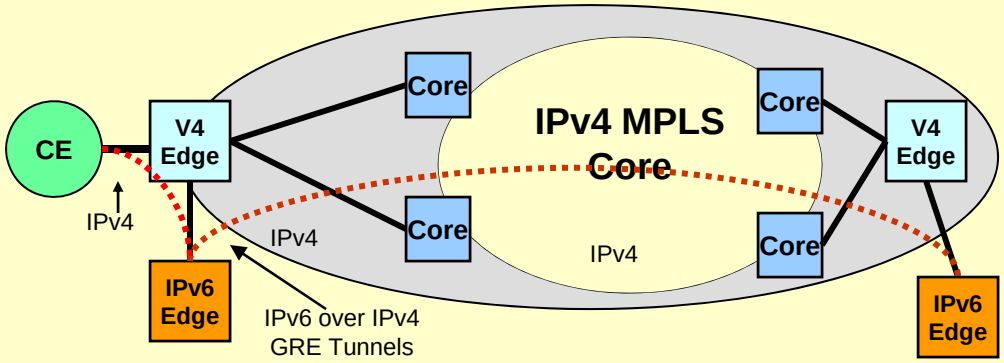


IPv6 Evolution at Verizon

- **1998 – Experimental VBNS IPv6 Service**
- **2002 – MAE Internet Exchange IPv6 Peering Service**
- **2004 – Public IPv6 Internet Service**
  – Experimental Phase – Overlay model with GRE Tunnels
- **2006: Production IPv6 VPN Service for Government Customers**
  – Domestic US Dual-Stack VPN service on VBNS+ using 6VPE
- **2007 – Dual-stack Public IPv6 Internet Dedicated Service**
  – Domestic US Public dual-stack IPv4/IPv6 service on AS701 using 6PE
- **2010 – Launched Verizon IPv6 Professional Services**
- **2010 – Launched Verizon Wireless LTE with full IPv6 capability**
- **2011 – Dual stack edge and core on Verizon's global public IP network**
  – Native IPv6 and IPv4 end-to-end on Verizon Global Public IP (US, Europe, Asia)
- **2011 – Dual stack VPN service on Verizon global PIP network**
  – Using 6VPE

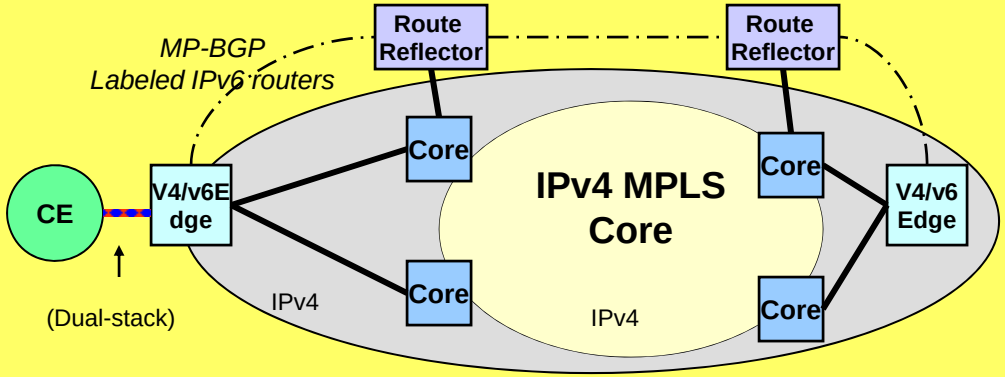
Verizon Public IPv6 Architecture Evolution

2004 – 2007:
Experimental Phase:
GRE Overlay Model

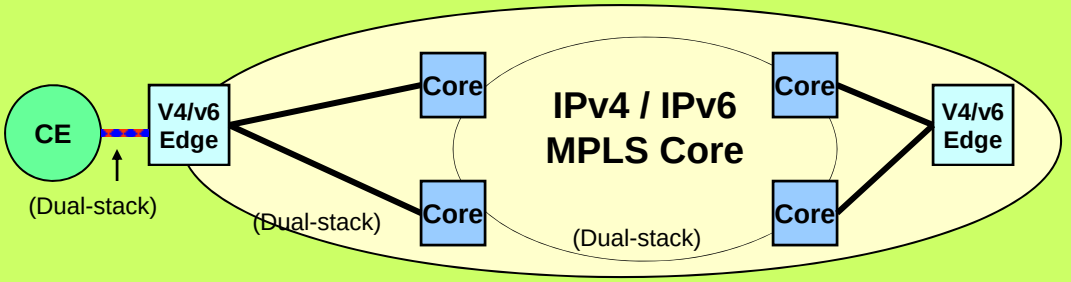


2007– 2010:
Initial Production Model:
6PE: Dual Stack Edge and IPv4 MPLS Core

6PE Implementation Based on RFC 4798



2011:
Final Production Model:
Dual Stack Public IP Edge and Core



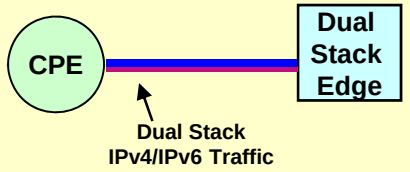
VZ Public IPv6 Access Options

- **Public IPv6 (Internet) Access Options for Enterprise and Government Customers**

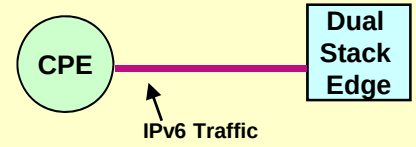
  Flexible options for Enterprise and Government customer IPv6 access

  1. Dual-stack IPv4 / IPv6 Direct Access
  2. IPv6 only Direct Access
  3. IPv4 only Direct Access
  4. Indirect IPv6 access using GRE Tunnels
     - This option will only be supported on public IP)

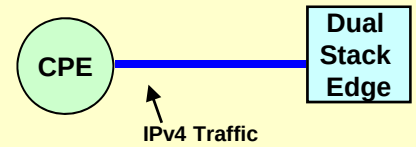
1) Dual Stack IPv4/IPv6 Direct Access



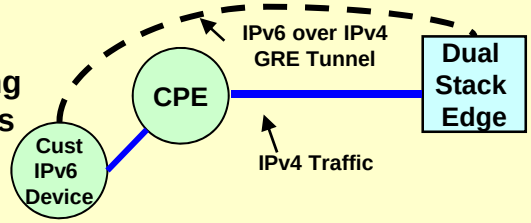
2) IPv6 Only Direct Access



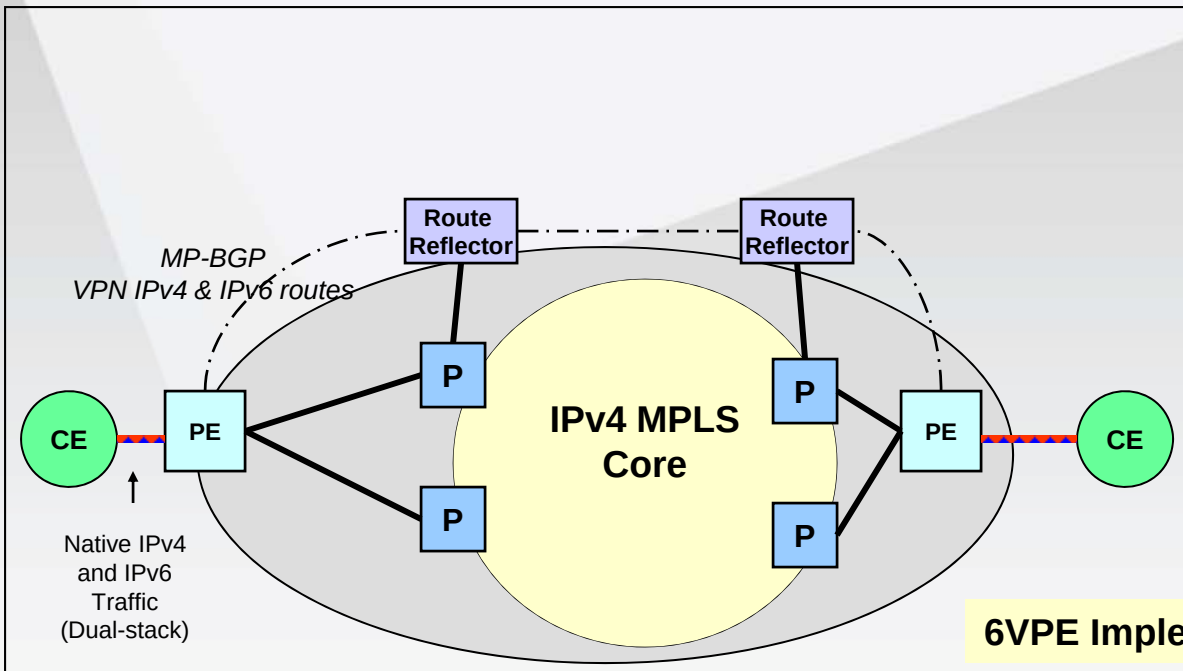
3) IPv4 Only Direct Access



4) Indirect Access using GRE tunnels



Private IP and VBNS+ IPv6 Architecture



PIP / VBNS+:
Dual stack Edge
IPv4 MPLS Core

BGP MPLS VPN Service

6VPE Implementation Based on RFC 4659

Verizon IPv6 Professional Services

- Verizon IPv6 Transition Professional Services **was Launched in 2010**
- Verizon experts can assess, design, and implement an IPv6 migration plan for large business and government customers
- These services are intended to meet an organization's specific business and infrastructure requirements
- Basic IPv6 Professional Services Include:
  - IPv6 Impact Assessment and Gap Analysis
  - IPv6 Transition Planning
  - IPv6 Implementation

A smooth transition to IPv6 requires clearly set expectations, sound planning, and execution.

Questions?