AT&T IPv6 Update

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Summary Points: AT&T is IPv6 Ready

- AT&T has considerable focus on IPv6:
  - We are investing millions…similar to our Y2K efforts.
  - We have a senior executive focused on IPv6 activity across the corporation.
  - We are delivering on extensive plans to enable IPv6 across our IP products, services, IT and network infrastructure.
- We have a logical, phased approach to enabling IPv6 across our wireline and wireless IP products and our network/IT infrastructure.
- IPv6 capability is *available today* on our VPN and Managed Internet services.

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AT&T Enterprise Transport Services Are Ready

- AT&T VPN dual stack has been in the market for more than 2 years.
  - Extensive coverage in the US.
  - Global launch 1q11.
  - IPv4 side of VPN dual stack port interworks with embedded IPv4 VPNs.

- MIS dual stack introduced in March 2010.
  - Extensive coverage in the US.
  - Initial presence in rest-of-world, with gradual expansion of country footprint through 2011.

- Remote access infrastructure progressing in stages toward YE11 completion.
  - Global Network Client & Netgate box are currently IPv6 capable.
  - Currently tunnels IPv6 over IPv4 internet and v4 over v4.
  - By YE11: tunnel to dual stack VPN over any type of internet access.

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What is an "IPv6 Ready" Service?

- Can handle both IPv4 and IPv6 traffic across a single port.
- All "boxes" are tested and certified, including managed CPE.
- Same feature availability for both traffic streams.
  - Complex VPN features: CoS, multi-VPN, multicast, route groups, etc.
  - Access to "attach" services: VoIP, hosting, RAS, etc.
- IPv4 traffic on dual-stack ports interworks to embedded IPv4 ports.
- Partner/peer network interconnects are dual-stack enabled.
- Service development labs & customer proof-of-concept centers are dual stack enabled.
- External reporting and e-servicing accommodates IPv6 addresses for reporting and accessible at IPv6 URLs.
- Internal network and CPE management systems use IPv6 addresses.

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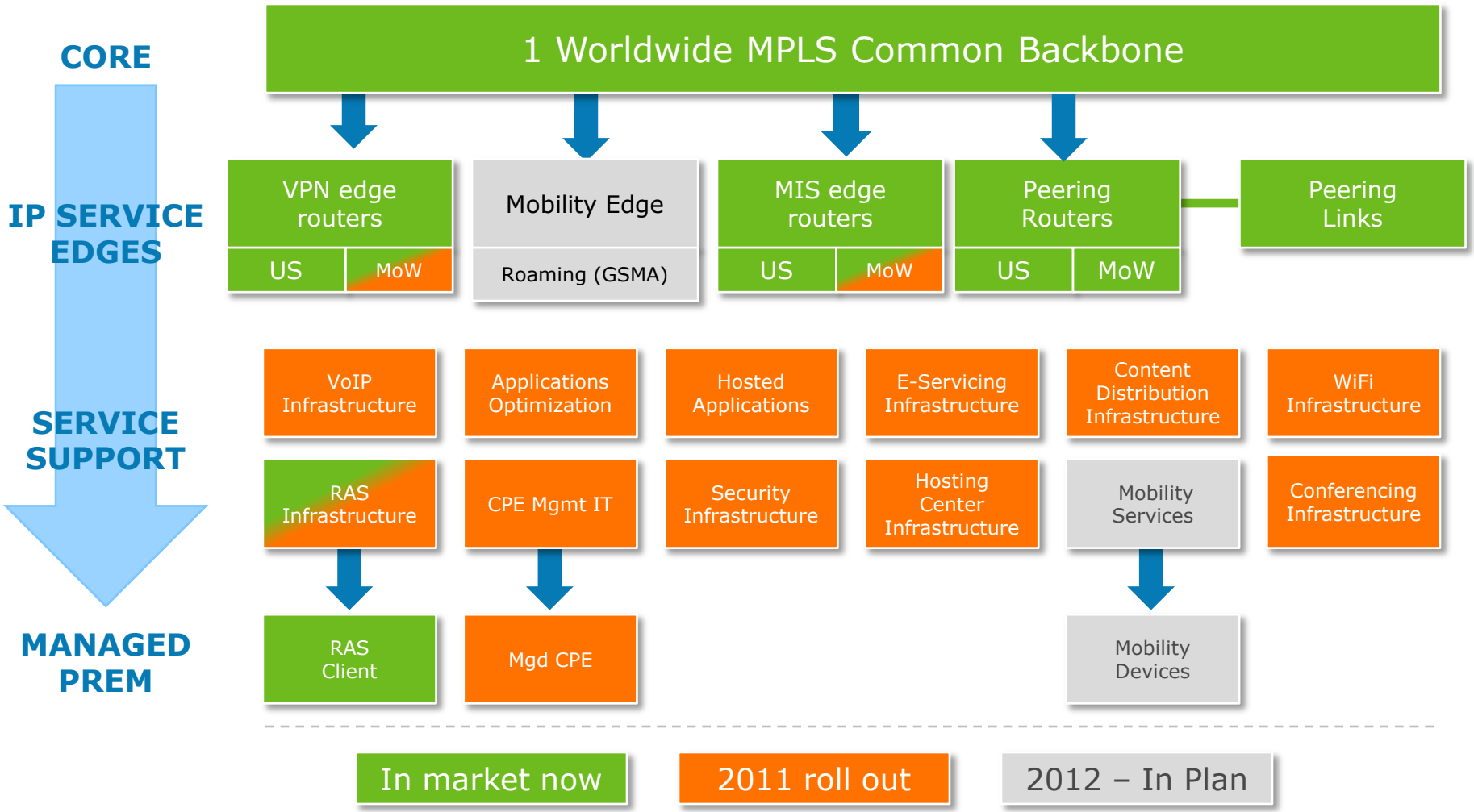
AT&T IPv6 Approach: Top to Bottom

AT&T is actively enabling IPv6 across our full range of services and infrastructure.



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AT&T Approach for Business WAN Services

- Dual Stack – Support both IPv4 and IPv6 on the same customer interface
    - Initially available on a limited number of devices in the network
- 6PE – Implementation of Native IPv6 on the MIS edge
- 6VPE – Implementation of VPN IPv6 on the VPN edge to provide AVPN

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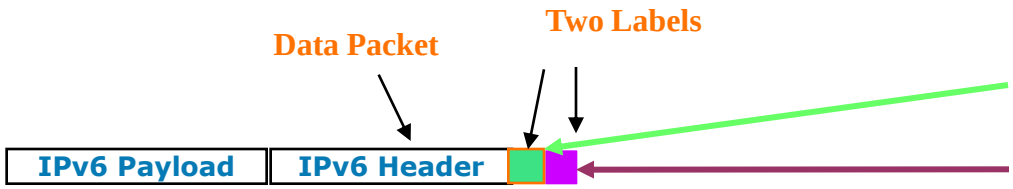
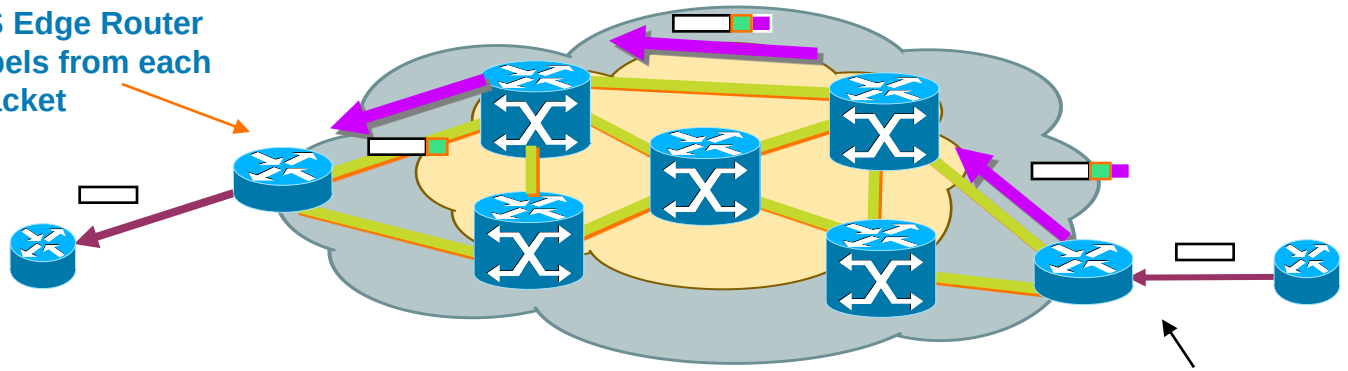
6PE and 6VPE Technology Overview



- The inner label (second-level) identifies the IPv6 customer destination address
- The outer label (first-level) is the forwarding label for transport within the core

Egress MPLS Edge Router removes labels from each packet



NOTE From core prospective Only components of MPLS affected are PE Edges and route reflectors (passes customer address which may be v6)

Ingress MPLS Edge Router adds two labels to each packet

MPLS tunnels hide IPv6 in the Core of the network enabling faster deployment of IPv6 without changing the Network Backbone.

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Current IPv6 Addressing Plan

(G)MIS will allocate IPv6 LAN blocks

- Assigned per site (aggregated by router/country)
  - /56 -> /48
- Not allowed to be advertised to other providers

Customer can bring their own PI space

- Only customers w/PI space can be multi-homed with another provider
- Minimum /48 to be advertised to Internet
- Minimum /64 routed internally

AVPN will allocate IPv6 LAN blocks

- Assigned either per site or a large contiguous block for customer to allocate on their own
- Currently – one contiguous block assigned from single region

Customer can bring their own PI space

Customer can generate Unique Local-Addresses

- RFC4193 contains algorithm for creating random prefix to prevent overlap when companies combine

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U.S. IPv6 Peers (More Planned)

AOL

Abovenet

China Telecom

Cogent

Comcast

ESnet

France Telecom

Global Crossing

Internet Initiative Japan

Level 3

NASA

NTT America (Verio)

PCCW

Qwest

Savvis

Sprint

T-Systems (Deutsche Telekom)

Tata

Telecom Italia

Telefonica

Telia

Tinet (Tiscali)

Verizon

XO

red indicates IPv6-enabled

Note that these peers account for > 95% of our inbound v4 traffic

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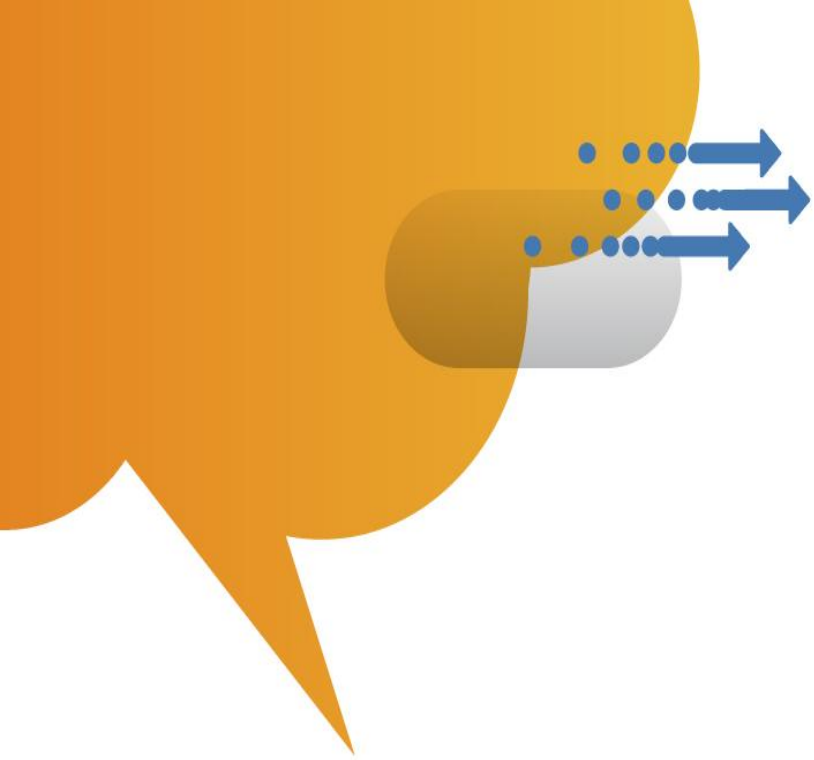

Questions?

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