Cisco IT Case Study:
Accelerated IPv6 Adoption

Cisco IT

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Overview

- Challenge

  Accelerate adoption of IPv6 without interfering with IPv4 services

- Solution

  Gradual adoption, starting with end-to-end reference architecture and parallel IPv6 Internet presence

- Results

  First two projects nearly complete

- Next Steps

  Expand IPv6 support to more locations and services

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Challenge

Accelerate adoption of IPv6 without interfering with IPv4 services

- Cisco IT has been planning shift to IPv6 address space since 2002, balancing project with other IT priorities
- New factors made adoption more urgent:
  - Compliance requirements from governments where Cisco does business
  - Lack of new IPv4 addresses, especially in emerging markets
  - Proliferation of mobile devices
  - Need for a real-world testing ground for new solutions

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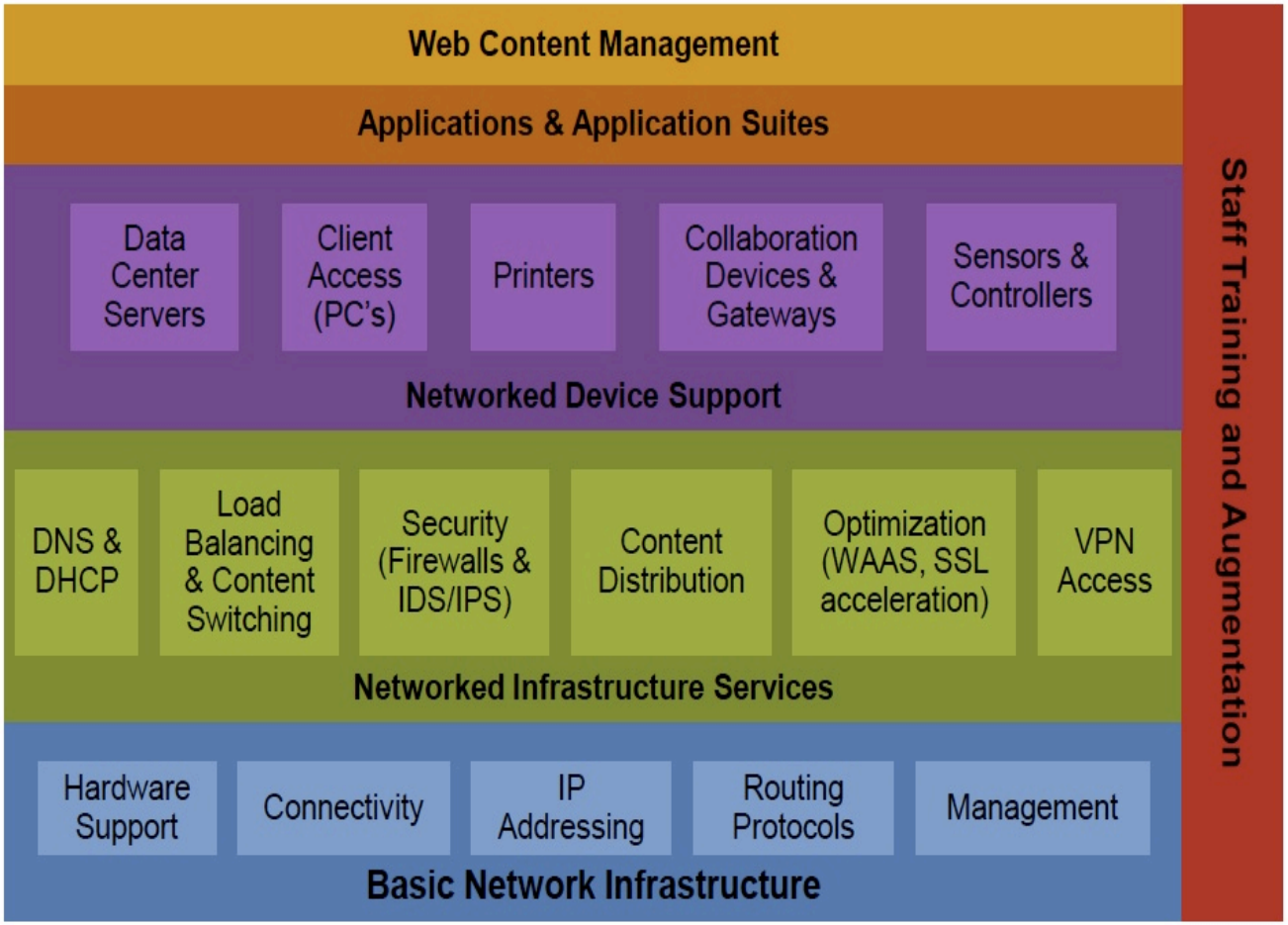
Solution

Cisco IT assembled a cross-functional team



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Solution

Gradual adoption, starting with reference architecture and Internet presence

- Main design principle: do not interfere with existing IPv4 services and applications, such as cisco.com and internal corporate network
- Dual-stack approach: all network services, including QoS and multicast, apply to both IPv4 and IPv6
- Priority projects:

  End-to-end IPv6 reference architecture for public sector customers

  www.ipv6.cisco.com, operating in parallel with www.cisco.com

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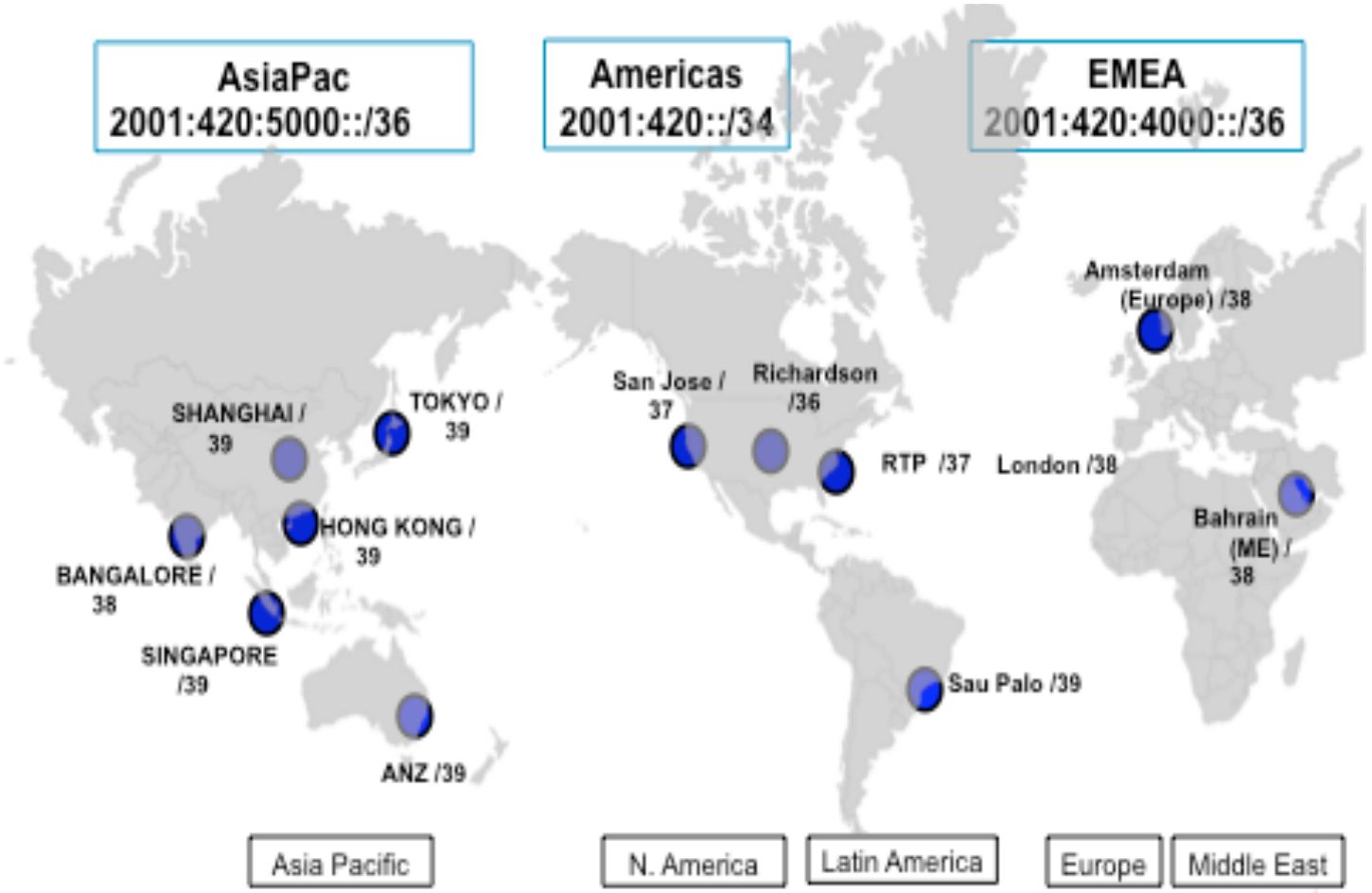
Solution

IPv6 breakout plan, based on anticipated growth in each region



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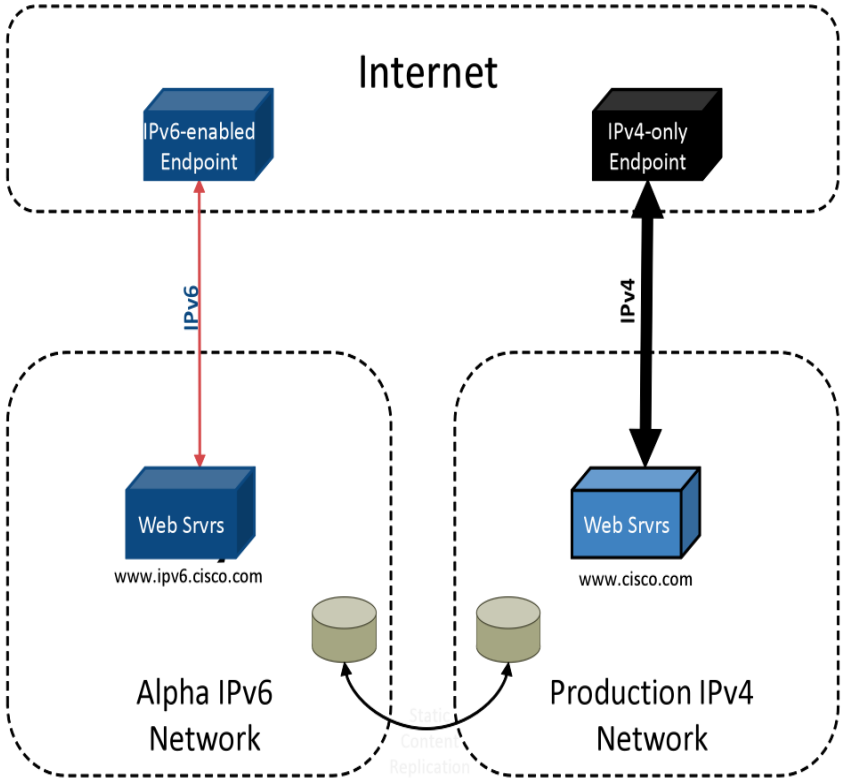
Solution

IPv6 Internet presence, phase 1

Static Content Hosted from Separate Web Tier



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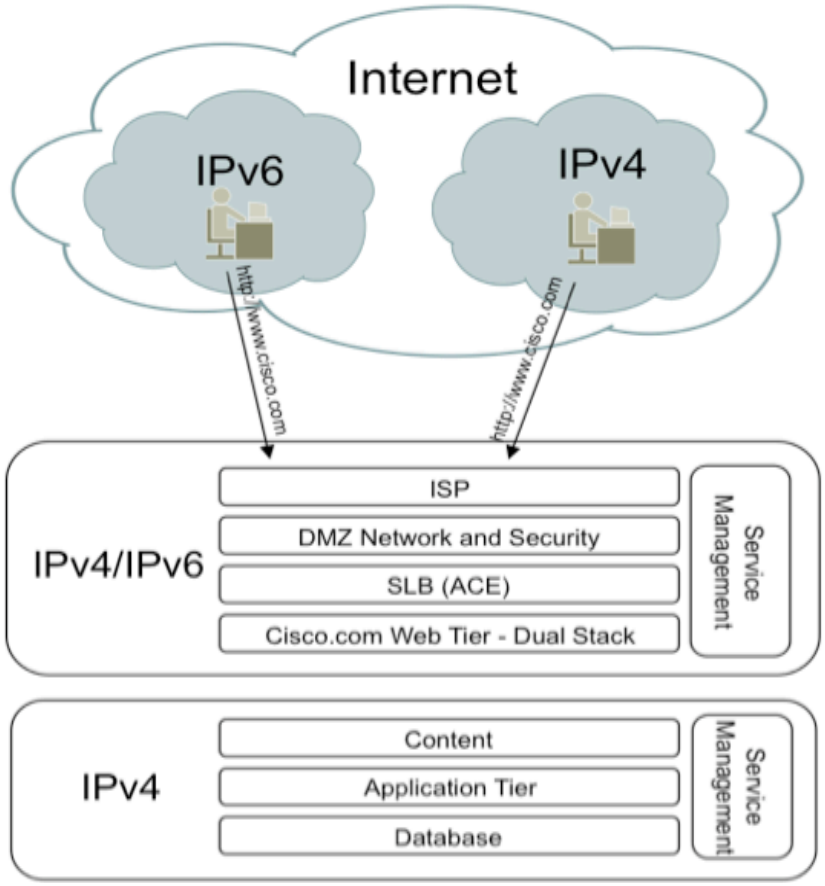
Solution

IPv6 Internet presence, phase 2



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Solution

Regional IPv6 tunnel headends

- Headends in San Jose, California and Research Triangle Park, North Carolina
- Regional services:
  - 6in4 tunnel termination
  - Intra-Site Automatic Tunnel Addressing Protocol (ISATAP)
  - Native IPv6 Internet connectivity

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Results

Internet presence and end-to-end reference architecture nearly complete

- Cisco IT participated in World IPv6 Day on June 8, 2011
- Pointed DNS entries to AAAA records, enabling clients to reach www.cisco.com over IPv6
- No major issues experienced during the event
- Compiled lessons learned from other participants about architecture, design, and operations, for internal use and to share with customers

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"As Cisco continues its journey towards a Borderless Enterprise, our IPv6 deployment is enabling many of the infrastructure requirements mandated by our present and future business strategies."

John Manville

Vice President for Network and Data Center Services, Cisco IT

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Next Steps

Expand IPv6 support to more locations and services

- Document insights from participating in World IPv6 Day
- Deliver end-to-end IPv6 in more locations, initially critical labs and sales offices
- Add IPv6 support to internal monitoring applications
- Provide an IPv6 Internet presence for all of cisco.com
- Extend IPv6 support to branch offices
- Enable IPv6 for the 21,000 Cisco teleworkers who use Cisco Virtual Office (already begun)
- Provide dual-stack support in the desktop environment
- Continue to integrate IPv6 with other Borderless Network services

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