IPv6 protokoll bevezetésének tapasztalatai a Cisco belső hálózatában

Nagy Tibor
Cisco Systems Magyarország Kft.
tinagy@cisco.com

Cisco Systems

The Global Cisco Family

- **300 locations in 90 countries**
- **450+ buildings**
- **51 data centers and server rooms**
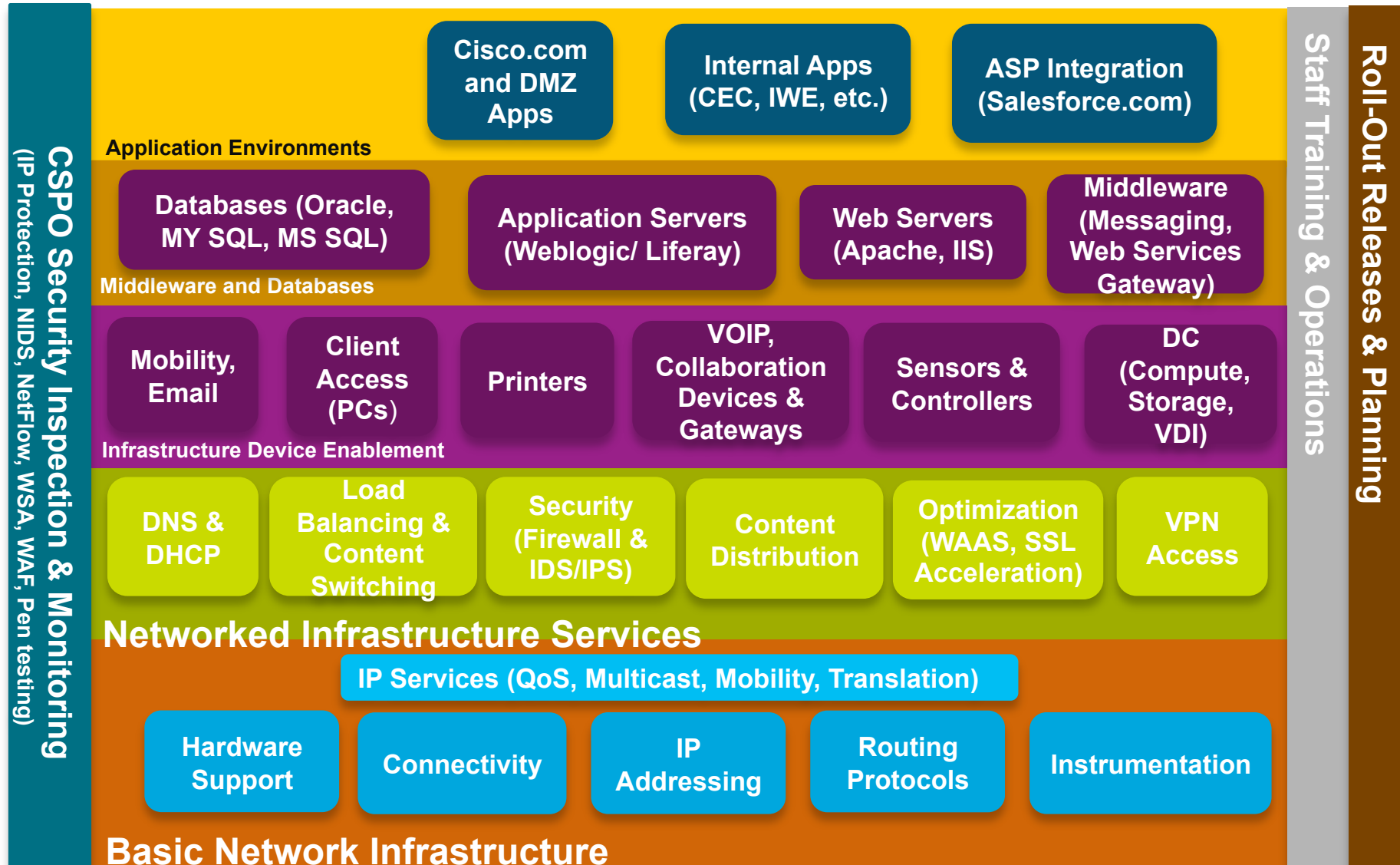- **1500+ labs world wide (500+ in San Jose)**

Engineering, Sales, TAC, IT and Execs

- **66,000+ Employees**

  20,000 Channel Partners
- **110+ Application Service Providers**
- **210+ Business and Support Development Partners**

Over 180,000 people around the world in the extended Cisco family

Estimated Numbers

A legfontosabb kezelendő IT területek

CSPO Security Inspection & Monitoring (IP Protection, NIDS, NetFlow, WSA, WAF, Pen testing)

Staff Training & Operations

Roll-Out Releases & Planning

Application Environments

- Cisco.com and DMZ Apps
- Internal Apps (CEC, IWE, etc.)
- ASP Integration (Salesforce.com)

Middleware and Databases

- Databases (Oracle, MY SQL, MS SQL)
- Application Servers (Weblogic/ Liferay)
- Web Servers (Apache, IIS)
- Middleware (Messaging, Web Services Gateway)

Infrastructure Device Enablement

- Mobility, Email
- Client Access (PCs)
- Printers
- VOIP, Collaboration Devices & Gateways
- Sensors & Controllers
- DC (Compute, Storage, VDI)

Networked Infrastructure Services

- DNS & DHCP
- Load Balancing & Content Switching
- Security (Firewall & IDS/IPS)
- Content Distribution
- Optimization (WAAS, SSL Acceleration)
- VPN Access

Basic Network Infrastructure

IP Services (QoS, Multicast, Mobility, Translation)

- Hardware Support
- Connectivity
- IP Addressing
- Routing Protocols
- Instrumentation

Az IPv6-ra való átállás motivációi

Business Drivers

- **Product Readiness**
- **Leadership and Mindshare**

IT Drivers

- **Enable IPv6 infrastructure for development and testing**
- **Cisco on Cisco**
- **Corporate growth (IPv4 address depletion)**

Goals

- **IPv6 Internet presence (www.cisco.com)**
- **User access (Dual Stack)**

Constraints
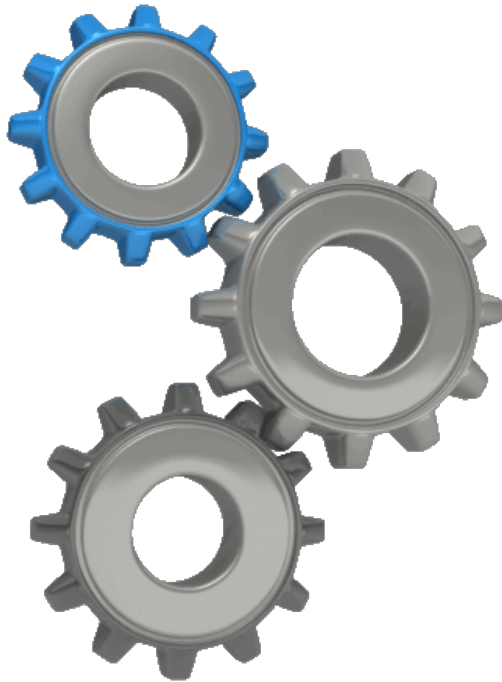
- **No Compromise on IPv4 SLA or Security Posture**
- **Time to Delivery – Quickly enable Product Development and Sales Offices**
- **Minimal Funding**
- **Product Gaps**

Implementációs stratégia

- Dual Stack where we can, tunnel where we can't

- Have a quick and scalable solution in hand to relieve delivery pressure

- Absorb cost in established upgrade process rather than rip and replace

- Rip and replace only where necessary (Fast track projects)

- Develop a short term (relief) plan and a long term (absorbed) plan

- Management via IPv4 with IPv6 Service Monitoring

- Ongoing Training and exposure for I & O teams

Ütemterv I.

Short Term – Relief Efforts

- IPv6 User Access – Regional tunnel head ends to offer:
    - 6in4 Manual Tunnels for IPv6 Labs (Support product development and testing)
    - Anycast based Regional ISATAP – Provide desktop IPv6 access for users
    - Production level SLAs for Tunnelled IPv6 services

- IPv6 Internet Presence
    - Alpha supported Dual Stacked iPoP with native IPv6 Internet connectivity
    - IPv6 enabled DMZ to host segmented namespace IPv6 Internet presence (www.ipv6.cisco.com)
    - IPv6 enabled DMZ to host IPv6 to IPv4 proxy based solution using the ACE30 for World IPv6 Day. IPv6 enabling www.cisco.com for one day

iPoP Services Offered:
1. Regional 6in4 Tunnel Termination
2. Regional ISATAP service
3. Native IPv6 Internet connectivity via SJ and RTP

Ütemterv II.

Long Term – Absorbed Rollout

- **IPv6 User Access (HW/SW Lifecycle Absorbed)**
    - Dual Stack Core outwards
    - Simultaneous projects across Desktop, DC, Remote Access, iPoPs
    - Accelerated deployment for select remote sites / services (Non-Fleet)
    - DC Infrastructure services Dual Stacked (DNS, DHCPv6, etc)
    - Production level SLAs for IPv6 services

- **IPv6 Internet Presence**
    - Production iPoPs Dual Stacked
    - Dual Stacked ISP links
    - 6 to 4 Proxy hosted in production DMZDC using ACE30
    - IPv6 enabling the Web Tier as DMZDCs get Dual Stacked
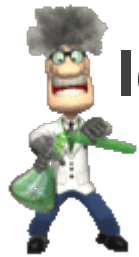
Időzítés

Lab Deployment
- 6 Bone
- ARIN Address Block
- NAT-PT
- HE/Sprint Tunnels
- Single Tunnel Headend
- 6in4 for Labs
- ISATAP
- Single 6to4 Relay
- Non-Production
- No SLA – Best Effort

Short Term Plan - Relief Efforts
- Expanded IPv6 Tunnel Infrastructure
- Anycast Based ISATAP Service
- SLA / Formal Support Process
- www.ipv6.cisco.com
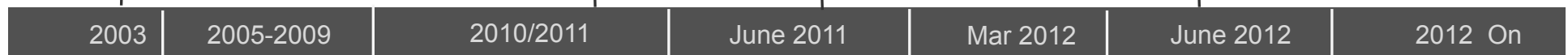- Dual Stacked Alpha iPoP with Native IPv6 Internet Connectivity
- IPv4 Address Recovery

Long Term Plan – Formal IPv6 Program Launch (Native IPv6 Across)
- Desktops
- DC
- Remote Access
- Internet Presence (www.cisco.com)
- Core

World IPv6 Launch

IPv6 Lifecycle Deployment everywhere

2003	2005-2009	2010/2011	June 2011	Mar 2012	June 2012	2012 On

Alpha IPv6
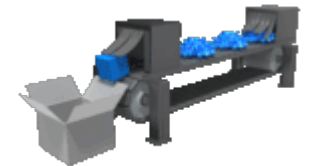- Non-Prod
- Test Network
- Separate Jacks for Dual Stack
- 2 Buildings and 1 DC

IPv6 Planning
- Business / Technical Drivers
- Use Cases
- Risk Assessment
- Implementation Schedules & Resources

WORLD IPv6 DAY

Dual Stacked
- Pilot Desktops
- DC
- Remote Access
- Internet Presence (www.cisco.com)
- Core

Cisco IT IPv6 Roadmap

2012	Absorbed Rollout beyond 2012

Ubiquitous IPv6 User Access

Dual Stack Pilots

Dual Stack Production

IPv6 Internet Presence

Dual Stack Internet Edge/DMZ

Proxy-based Web Presence

Dual Stack Web Presence

Internal Systems, Services, Applications

Dual Stack Data Center Networks

Network Management Systems

Cisco Collaboration Services

Corporate Apps and Services

* Only FY12 committed

Tanulságok

- Cross functional effort across the IT Stack

- Absorbed effort integrated into existing upgrade process

- Easy business case for IPv6 Internet Presence for most enterprises

- Tough business case for User Access for most enterprises

- Chicken and Egg question for the enterprise : Application first or network first?

- Security concerns and mitigation

- Enterprise network management and tooling

Köszönöm a figyelmet!