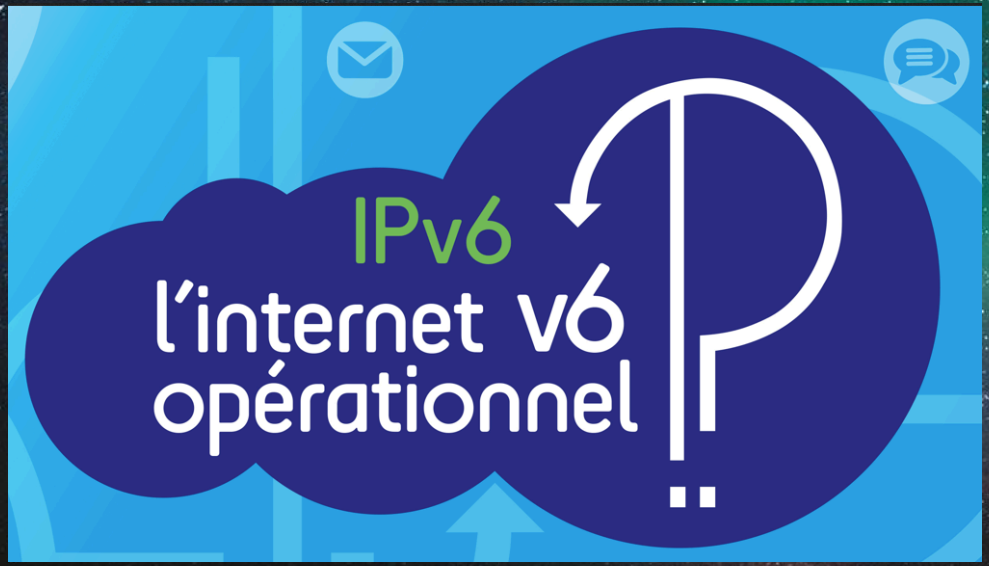
*TOMORROW starts here.*




cisco

# Déploiement d'IPv6 en Entreprise

**Fayçal HADJ**

**Solution Architect IPv6**

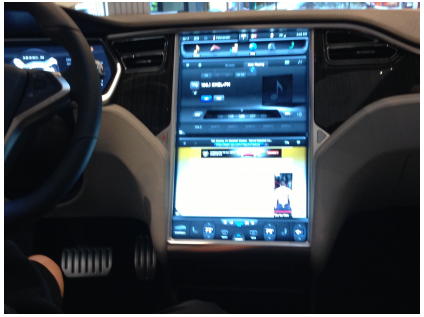
**Cisco France**

**http://gblogs.cisco.com/fr-ipv6/blog**


Where is the network?
The network is not ready, users don't care, I don't want to risk a poor end-user experience today for potential gains tomorrow
Where is the content?
Do I pay less or get new applications?
Where are others doing ?
Device
Enterprise
Government
Mobile Operator
Where are the devices ?
Market forces alone, have failed to create the right incentive

# Business Drivers






# Technology Drivers

Cloud/MSDC
- Scale
- Virtualization
- Automation
- Simplification


Mobile Internet
- Scale: 10 Billions
- 4G-LTE / VoLTE
- Simplification
- Mobile networks

Internet of Things
- Scale: 50 Billions
- Automation-Self Networked
- IoT Protocols are IPv6 only

http://www.cisco.com/go/vni

# Mean while … IPv4 run-out is very real

IPv4 & IPv6

## RIPE NCC Begins to Allocate IPv4 Address Space From the Last /8

14 Sep 2012

On Friday 14 September, 2012, the RIPE NCC, the Regional Internet Registry (RIR) for Europe, the Middle East and parts of Central Asia, distributed the last blocks of IPv4 address space from the available pool.

This means that we are now distributing IPv4 address space to Local Internet Registries (LIRs) from the last /8 according to section 5.6 of "IPv4 Address Allocation and Assignment Policies for the RIPE NCC Service Region".

This section states that an LIR may receive one /22 allocation (1,024 IPv4 addresses), even if they can justify a larger allocation. This /22 allocation will only be made to LIRs if they have already received an IPv6 allocation from an upstream LIR or the RIPE NCC

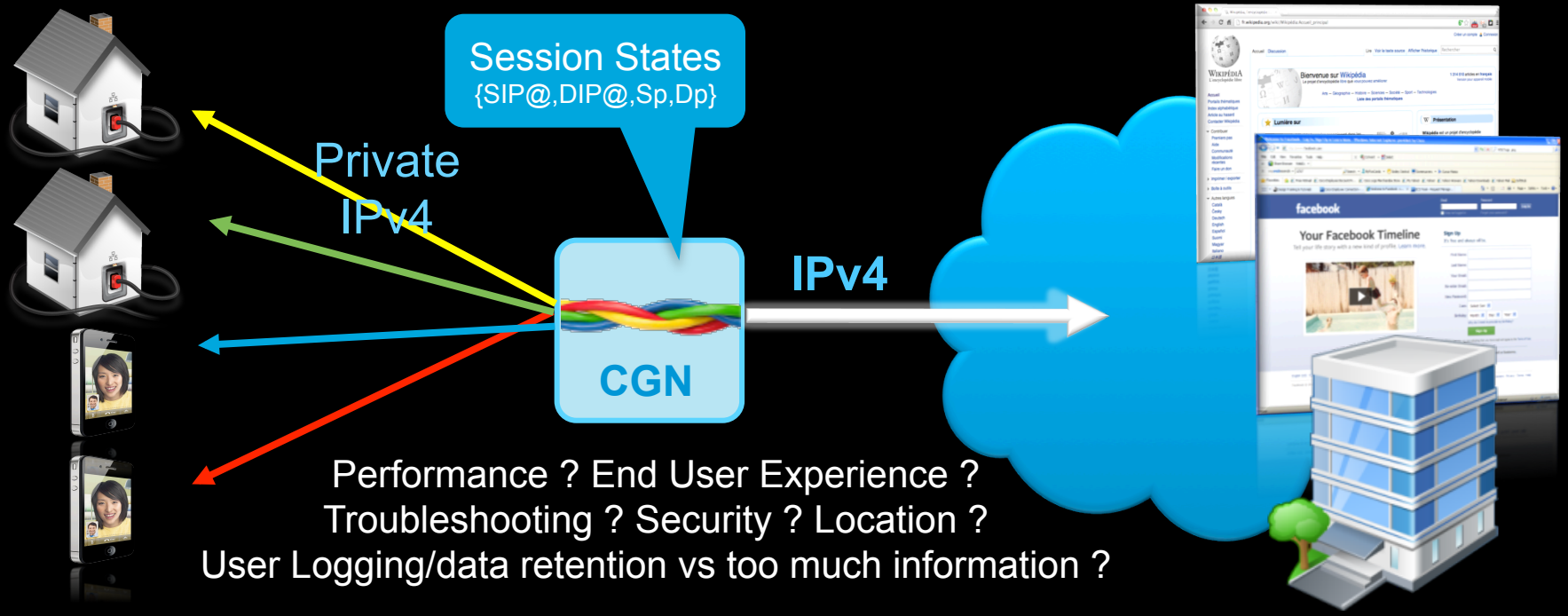
No new IPv4 Provider Independent (PI) address space can be assigned.

It is now imperative that all stakeholders deploy IPv6 on their networks to ensure the continuity of their online operations and the future growth of the Internet.

HURRICANE ELECTRIC INTERNET SERVICES

http://ipv6.he.net/statistics/

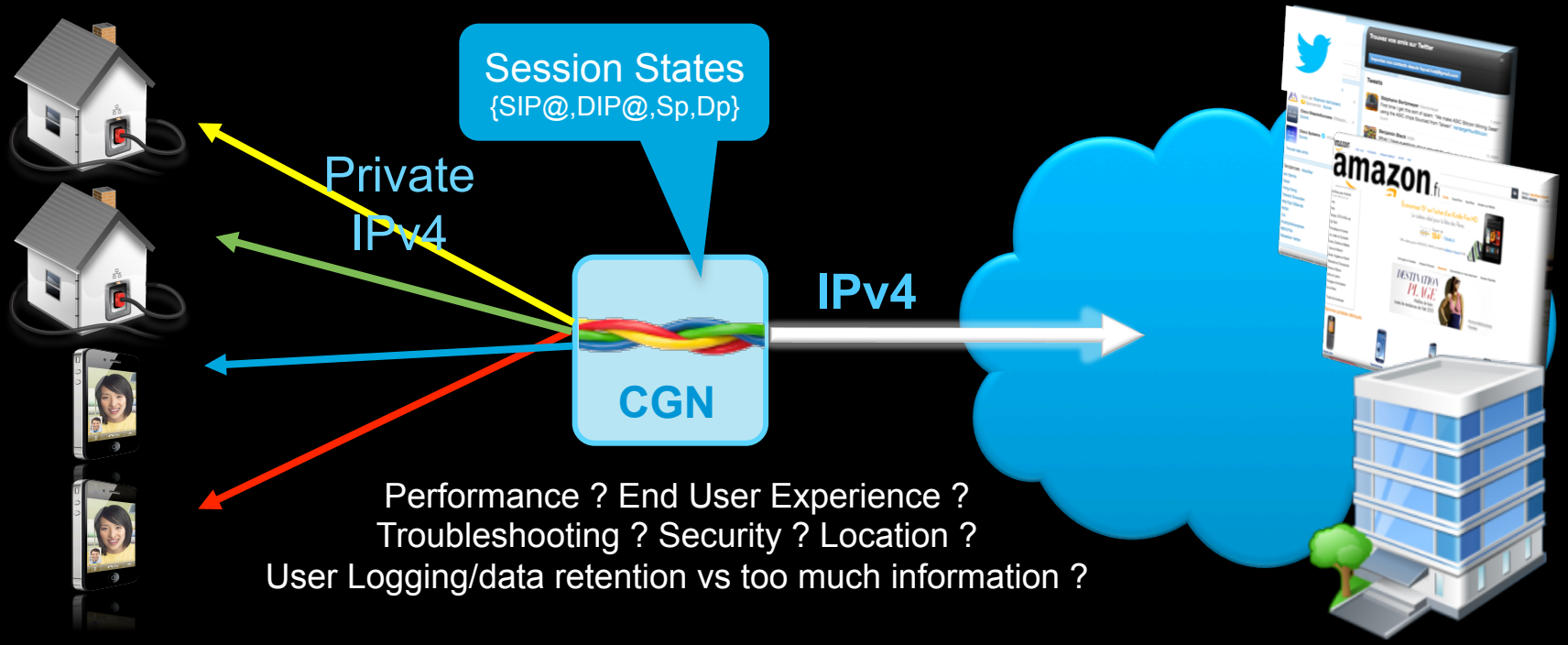
# Carrier Grade NAT: Sharing public IPv4 addresses




Performance ? End User Experience ?
Troubleshooting ? Security ? Location ?
User Logging/data retention vs too much information ?

Makes the Internet Statefull ! … Really ?

# Carrier Grade NAT: Sharing public IPv4 addresses

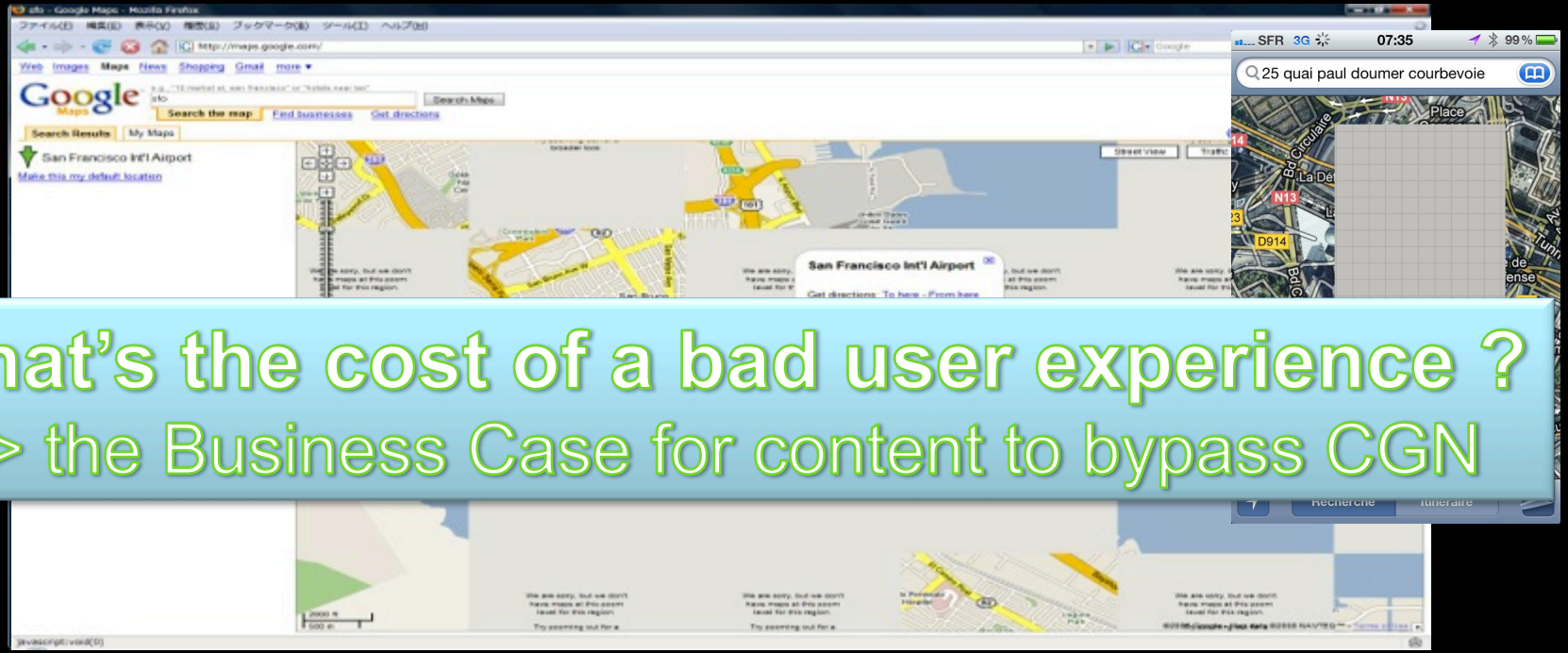



Makes the Internet Statefull ! … Really ?

# Impact of CGN-NAT on User Experience

## How many concurrent sessions will your business require?

**1 to 16 NAT Sessions times millions of users**



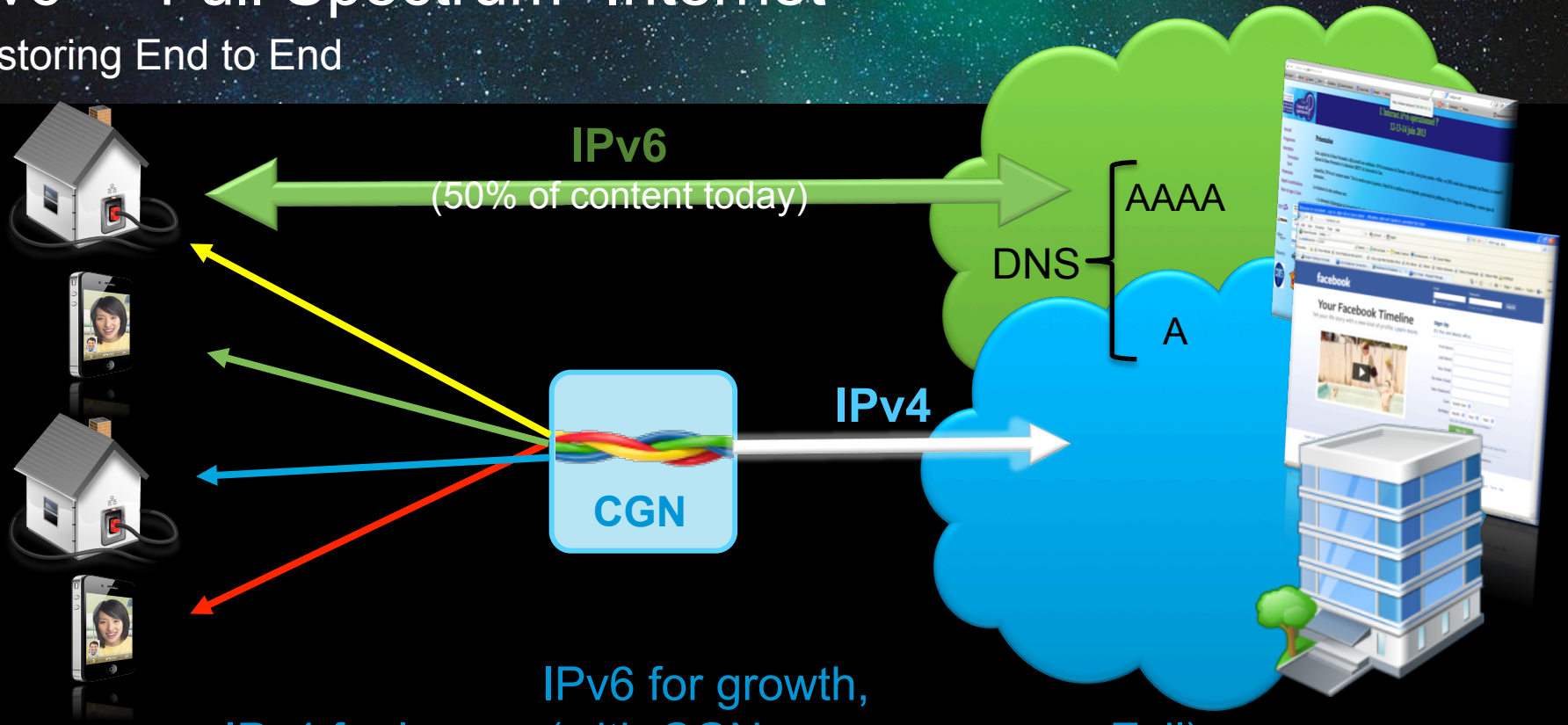

**What's the cost of a bad user experience ?**

**=> the Business Case for content to bypass CGN**

Web 2.0 (ex: AJAX) Application Behavior Under Constrained NAT Resources

# IPv6 – “Full Spectrum” Internet

## Restoring End to End

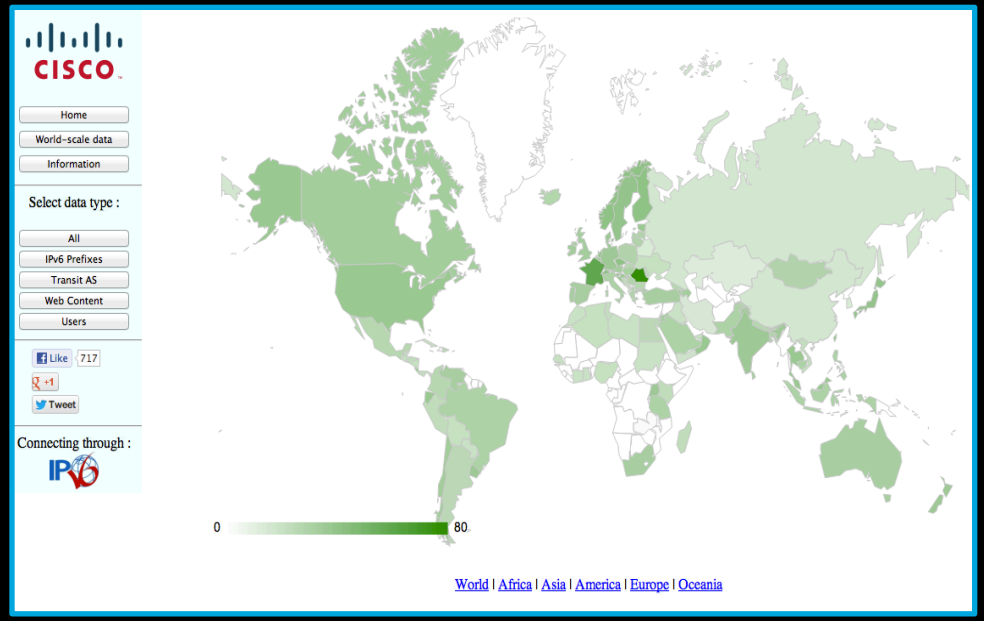



IPv6 for growth,
IPv4 for legacy (with CGN == a necessary Evil)

# Measuring IPv6 adoption life cycle


- Measurement and Analysis are important for people who is considering deployment IPv6 in the network.
- 6lab.cisco.com/stats is a Cisco contribution to the industry
- What kind of information provide on Cisco IPv6 stats?

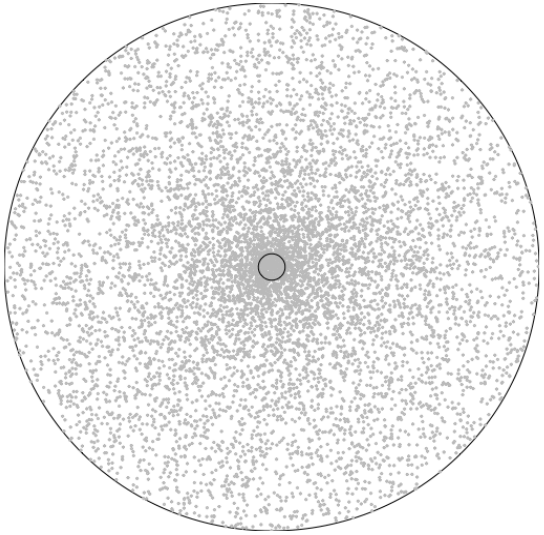
# IPv6 Market adoption: 6lab.cisco.com/stats

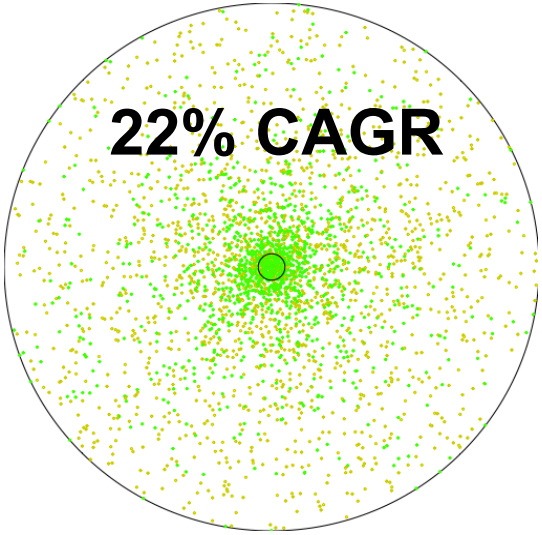



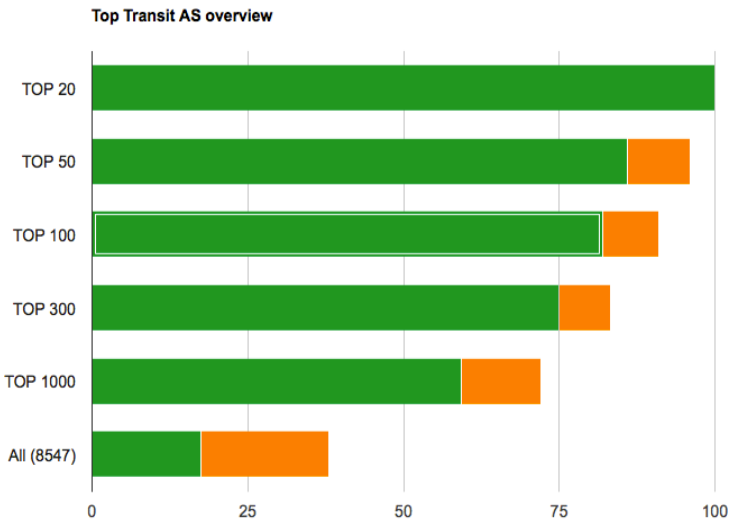


*Based on data from RIR, routeviews, DNS roots, Alexa, Google, ITU and APnic*

# Internet IPv6 Transit System readiness






IPv4 transit AS's: 8645

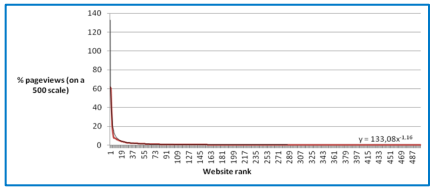
IPv6 transit AS's: 1501*

IPv6 enabled AS's: 3249

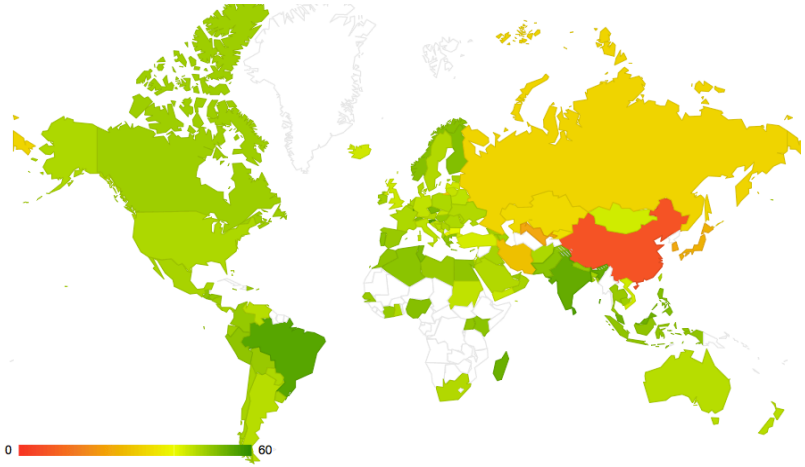
Concentrated in TOP 300
(75% of AS's are IPv6 transit)

# How much Content on IPv6 Internet ?


+

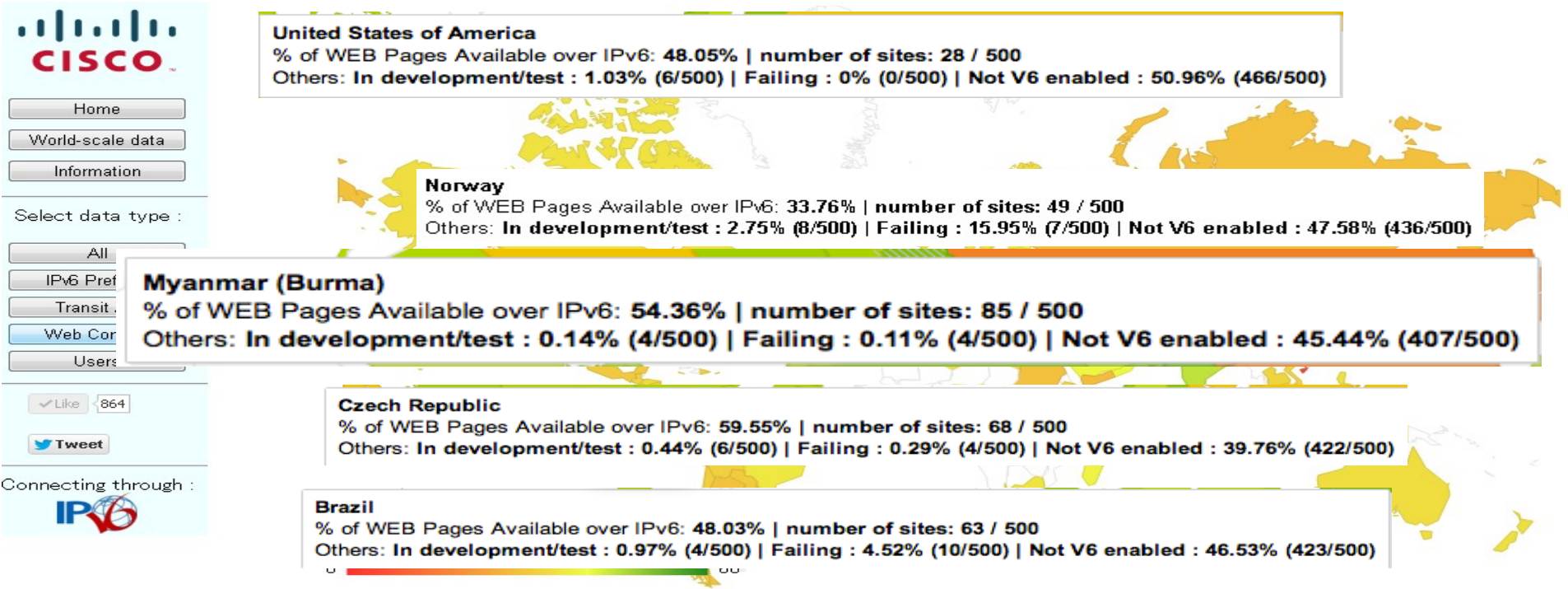



=>

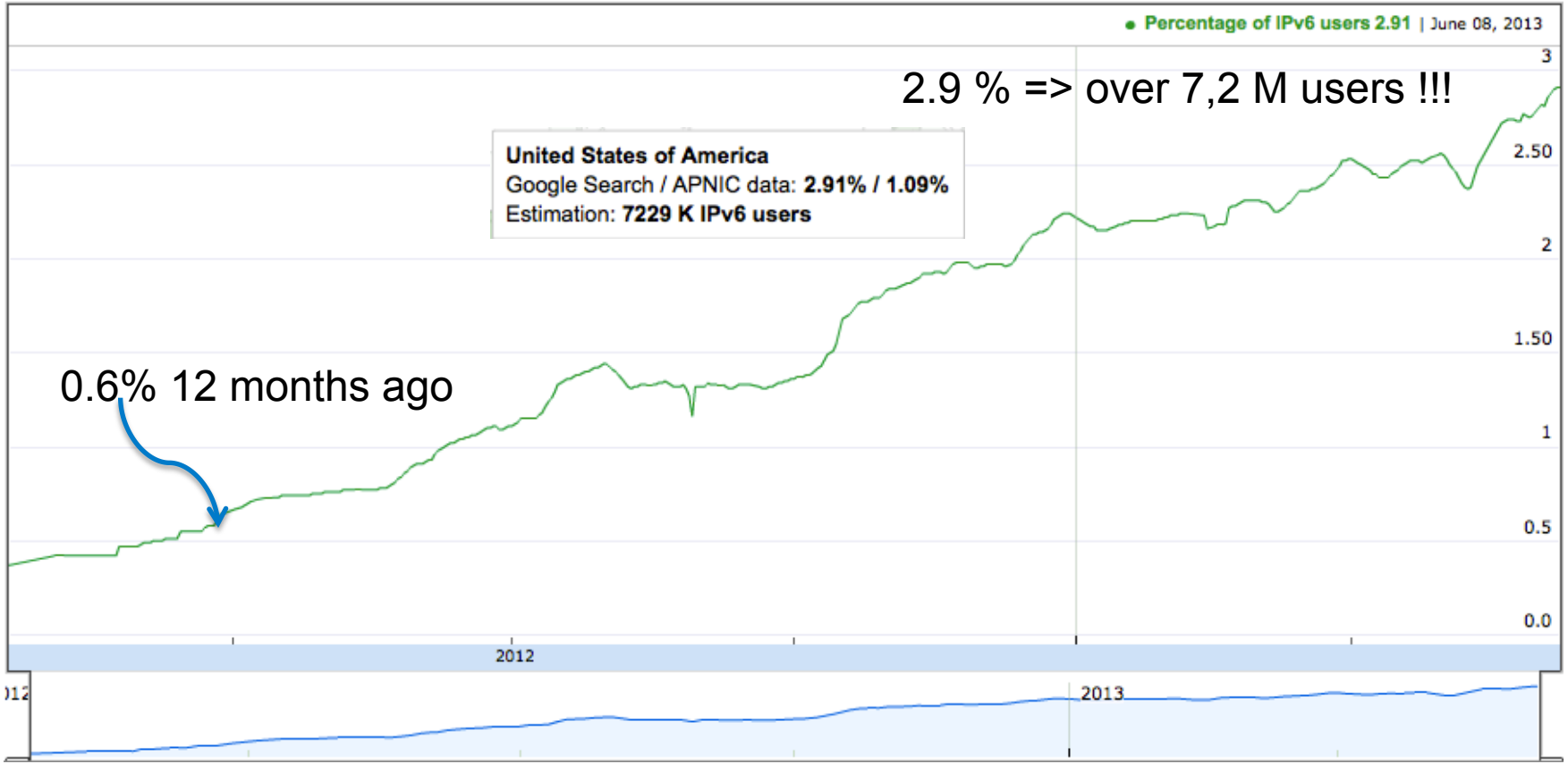



1. Test AAAA + httpget over IPv6 to top 500 Web sites for 125 countries (per alexa.com)
   - and/or IPv6 shadow test domain (ex: iPv6.domain.com , www6.domain.com.…etc…)
2. Based on their respective rank, apply the corresponding % of traffic they represent (Pareto function above)
3. Sum this up => Estimated available IPv6 content/activity for 125 countries

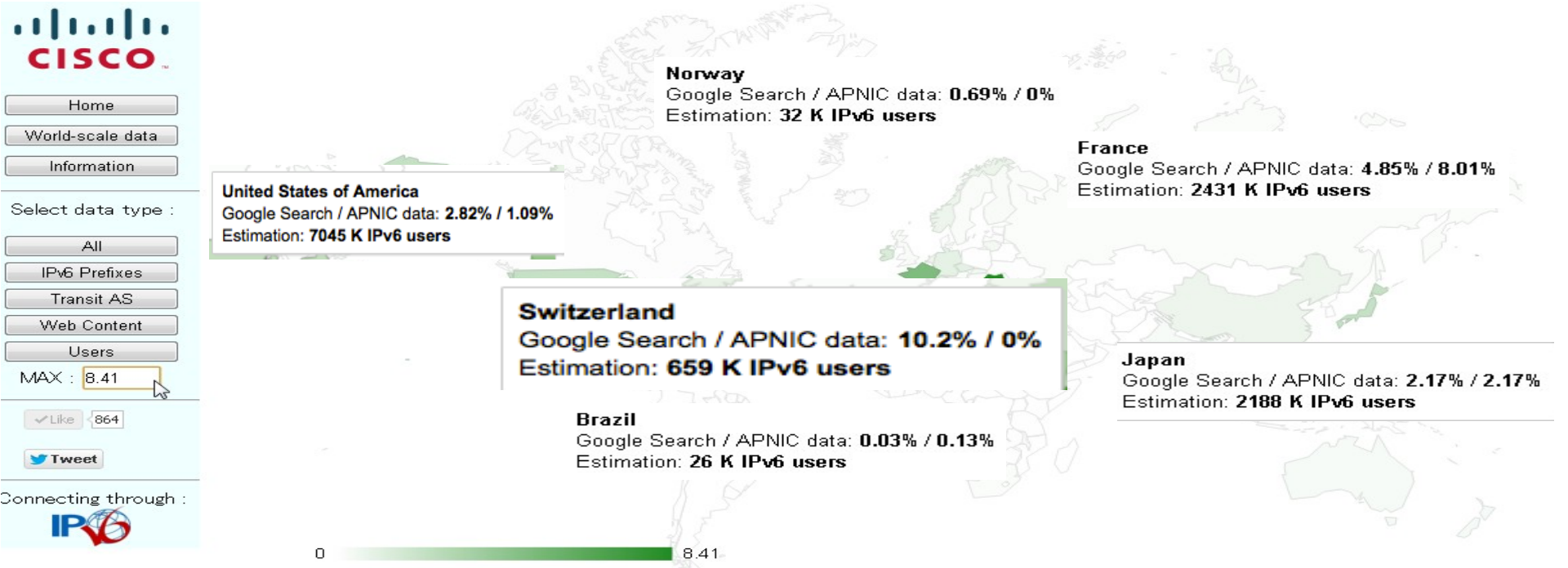
# IPv6 adoption stats, web contents



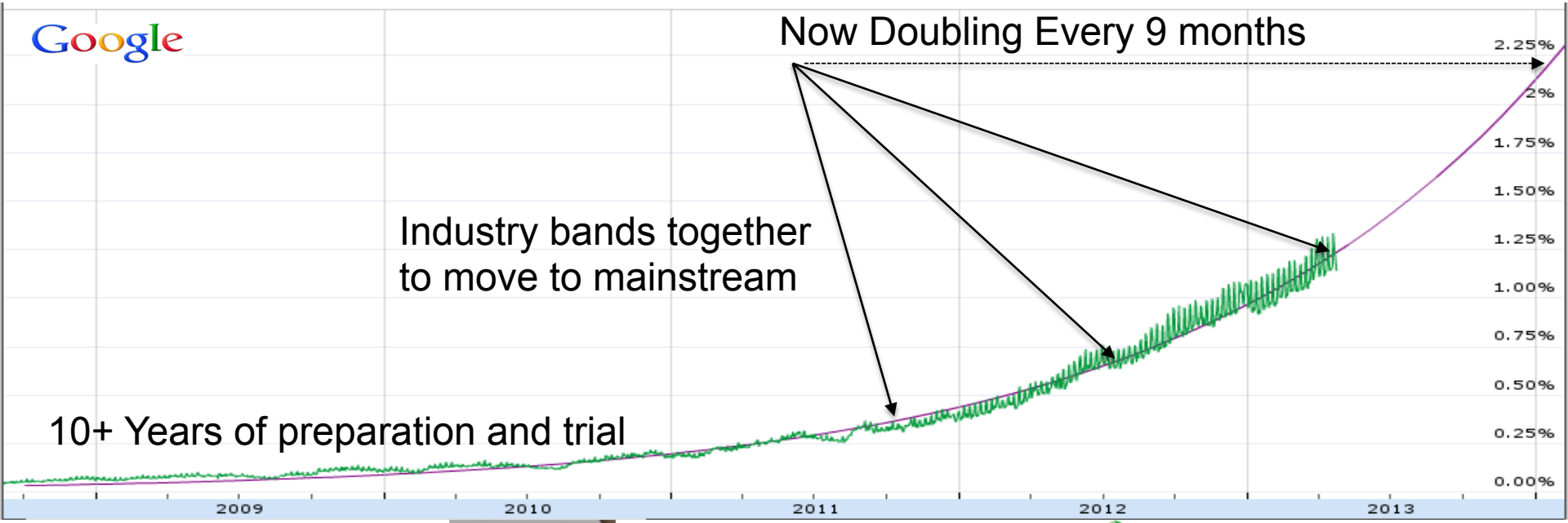
# IPv6 Users : USA



# IPv6 adoption stats, users



# IPv6 Global Deployment To Users





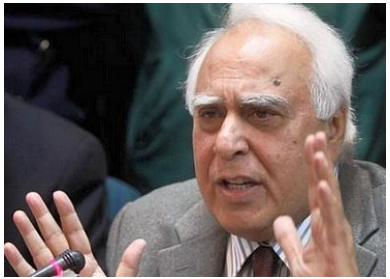
Cisco's commitment
to IPv6
June, 2010

"World IPv6 Day"
June, 2011

"World IPv6 Launch"
June, 2012

Cisco Live
June, 2013

# IPv6 DoT Roadmap !!



The DoT has released IPv6 deployment roadmap version II on March 26, 2013, with an objective for effective transition from IPv4 to IPv6 in a time-bound manner. The guidelines allow that public interface of all government projects for citizen-centric services should support IPv6 traffic by Jan 15, 2014.

The government also mandates service providers to ensure GSM/CDMA customers acquired after June 30, 2014 shall be capable of carrying IPv6 traffic while the LTE consumers after June 30 shall be IPv6 complaint.

## Huge impact on B… for Rest of the world

### CONTENT PROVIDERS

- All contents & applications providers should target to adopt IPv6 for new contents & applications by 30-06-2014 and for existing ones latest by 01-01-2015.
- The complete financial ecosystem including payment gateways, financial institutions, banks, insurance companies etc. should transit to IPv6 latest by 30-06-2013.
- The new registrations on '.in' domain to be compulsorily on dual stack with effect from 01st January 2014. The entire '.in' domain should migrate to IPv6 latest by June 2014

…2: Key Recommendations

…and is being released by Honorable Minister …13. The Key recommendations are:

…QUIPMENT …NUFACTURER

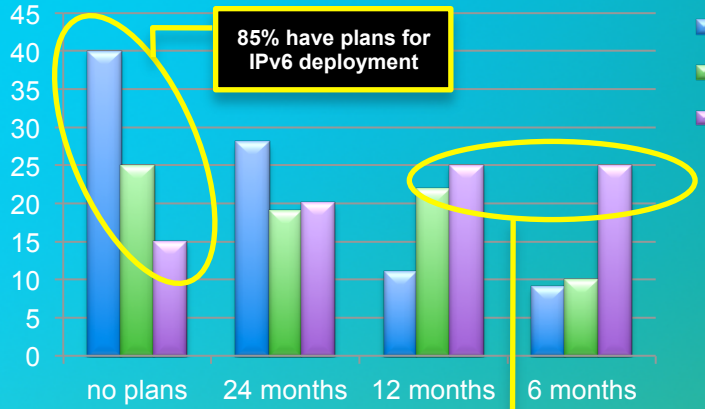
…obile phone handsets/ …ard dongles/ tablets and … devices sold in India after …2014 shall be capable of …g IPv6 traffic.

…ire line broadband CPEs … India after 01-01-2014 …e capable of carrying IPv6

GOVERNMENT ORGANIZATIONS

- Govt organisations should prepare detailed plan for transition to IPv6 by Dec 17. Plan should be prepared latest by Dec 13
- Public interface of all Govt projects for delivery of citizen centric services should be dual stack supporting IPv6 traffic by Jan 15.
- Govt organisations should procure IPv6 Ready equipments (Dual Stack). It should be either TEC certified or IPv6 Ready Logo certified.
- IPv6 should be included in curriculum of technical courses being offered by various institutes / colleges

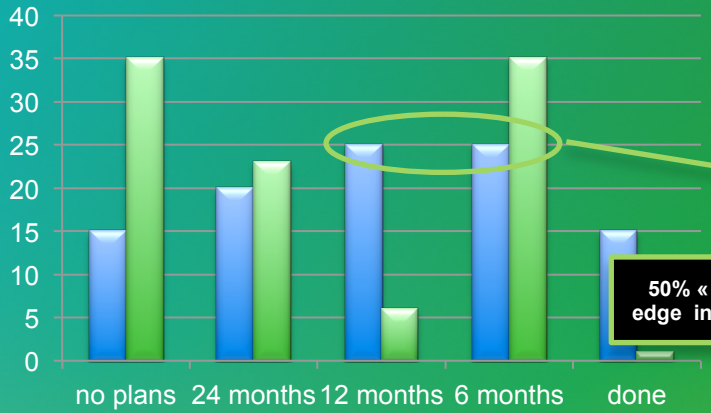
## When are you planning to deploy IPv6 in production ?




85% have plans for IPv6 deployment

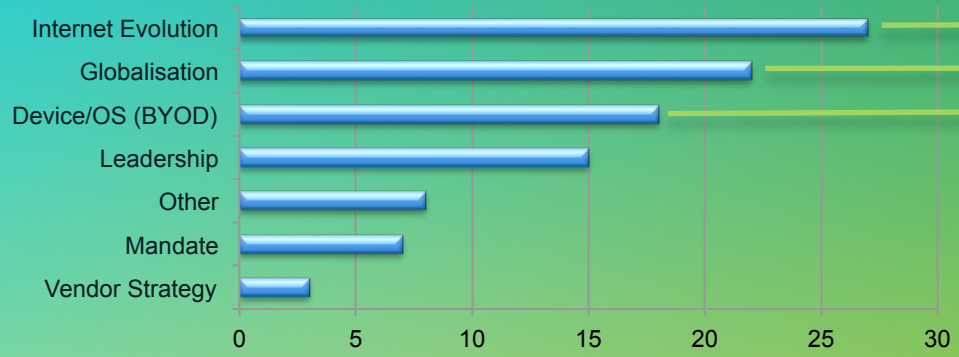
50% « will deploy in the next 6/12 months »

## Internet Edge vs Internal Network deployment




50% « will deploy at Internet edge in the next 6/12 months »

## What are your main drivers for deployment ?



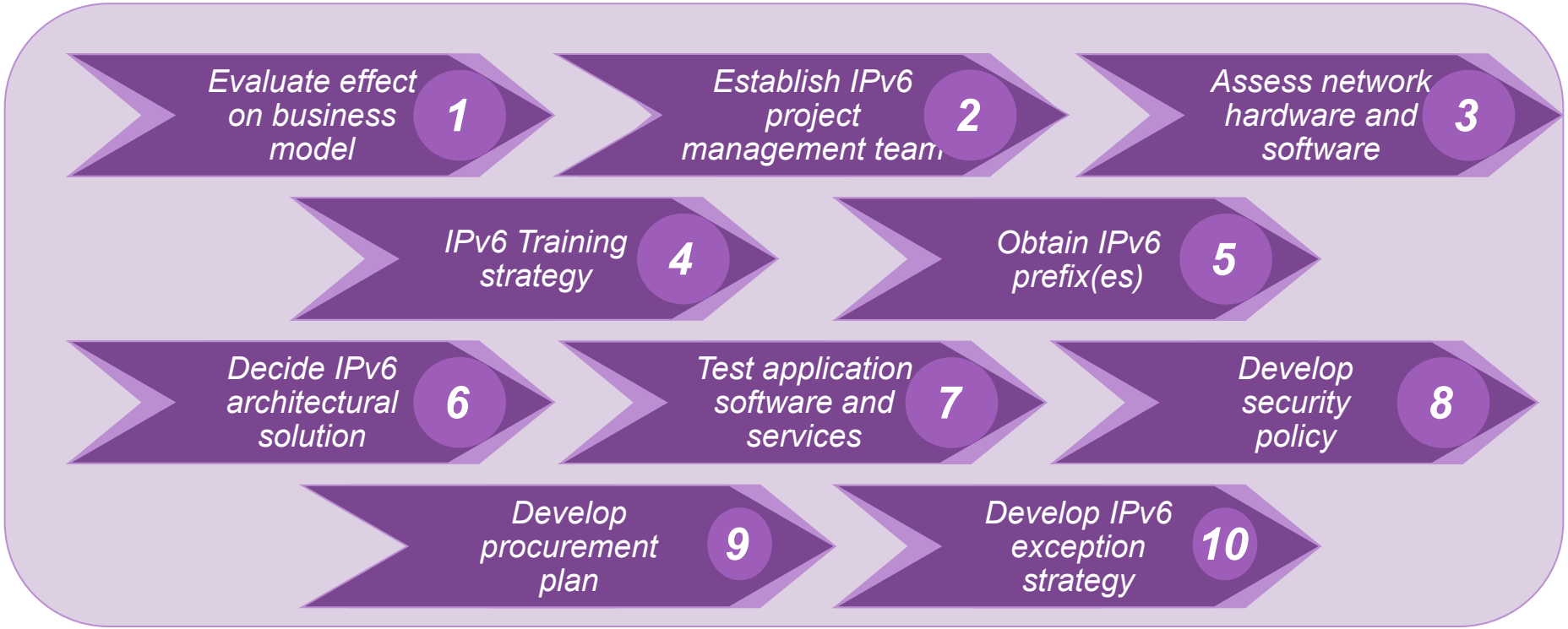

Cloud, Web Applications: IPv6 end-to-end connectivity means better user experience and mobile web

Customers and Employees connecting access from IPv6-only areas of the world

IPv6-enabled personally-owned unmanaged devices bringing IPv6 into your network.
IPv6 = ability to manage

Cisco ETAB Survey, 2010, 2011, 2012

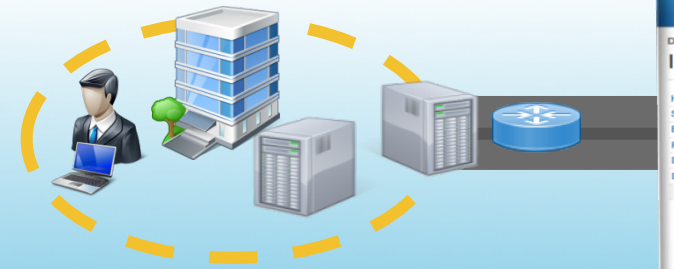
# IPv6 Planning Steps



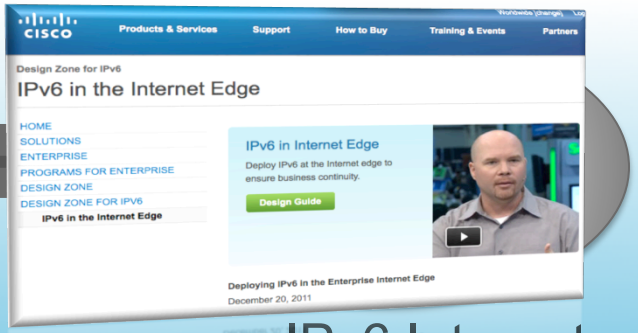
# Enterprise Deployment Options

## Outside – In

Internet Evolution
Business Continuity
B2C, B2B



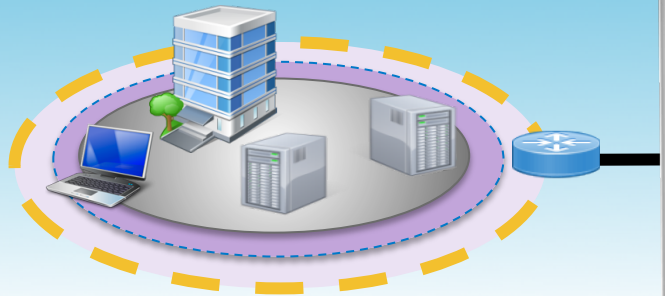
IPv4 Enterprise



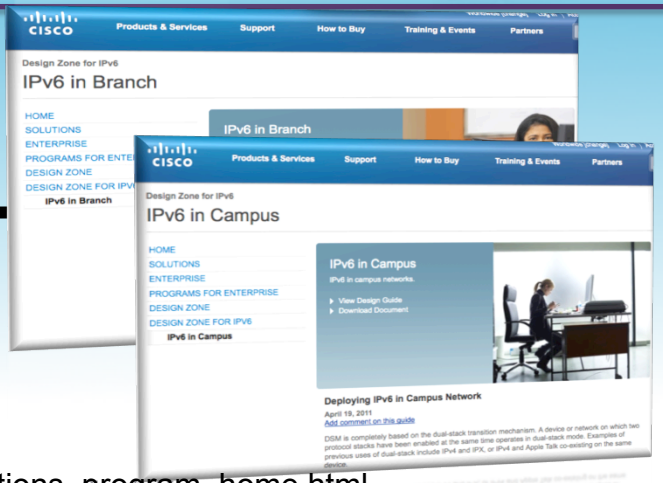

IPv6 Internet

## Inside – Out

Globalization
Technology Leadership
Industry mandate
BYOD-Security-Visibility
Flatten management plane

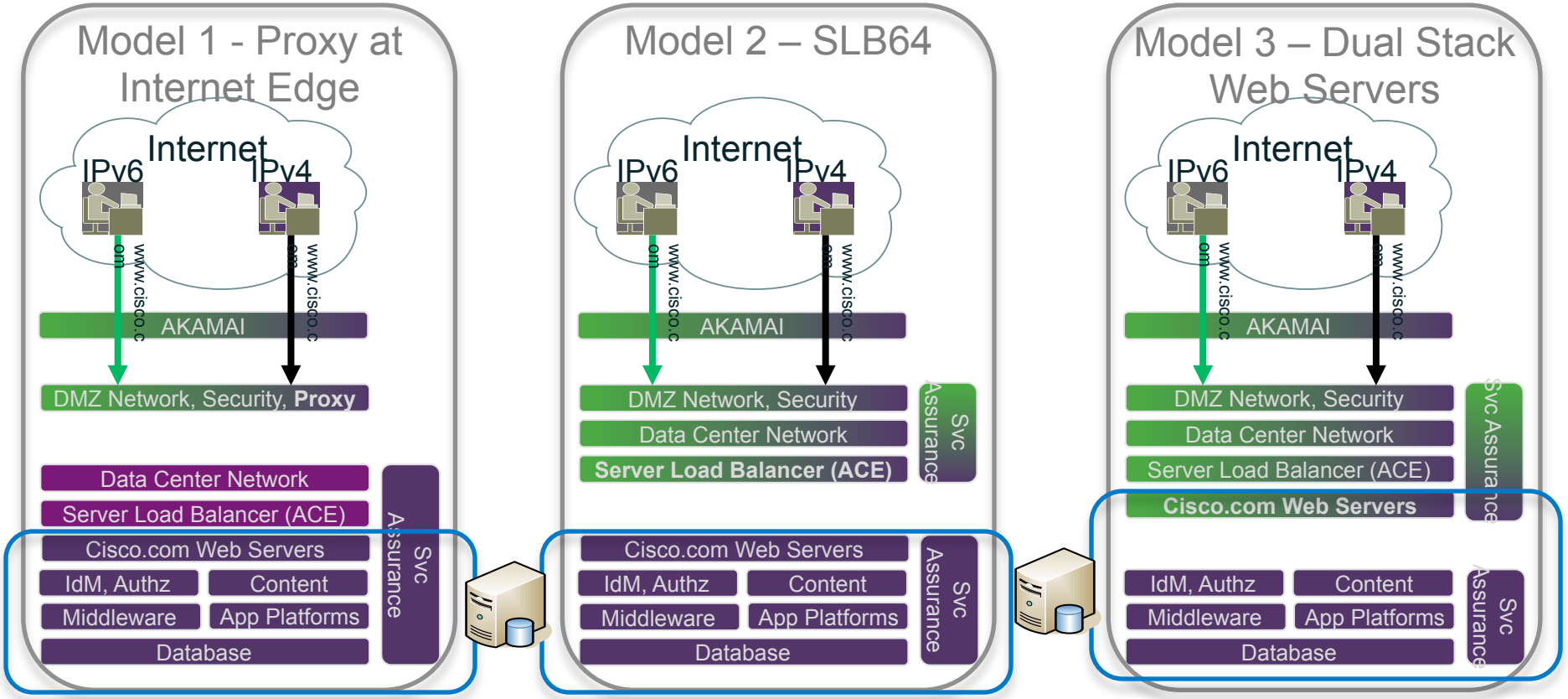


Dual-Stack Enterprise



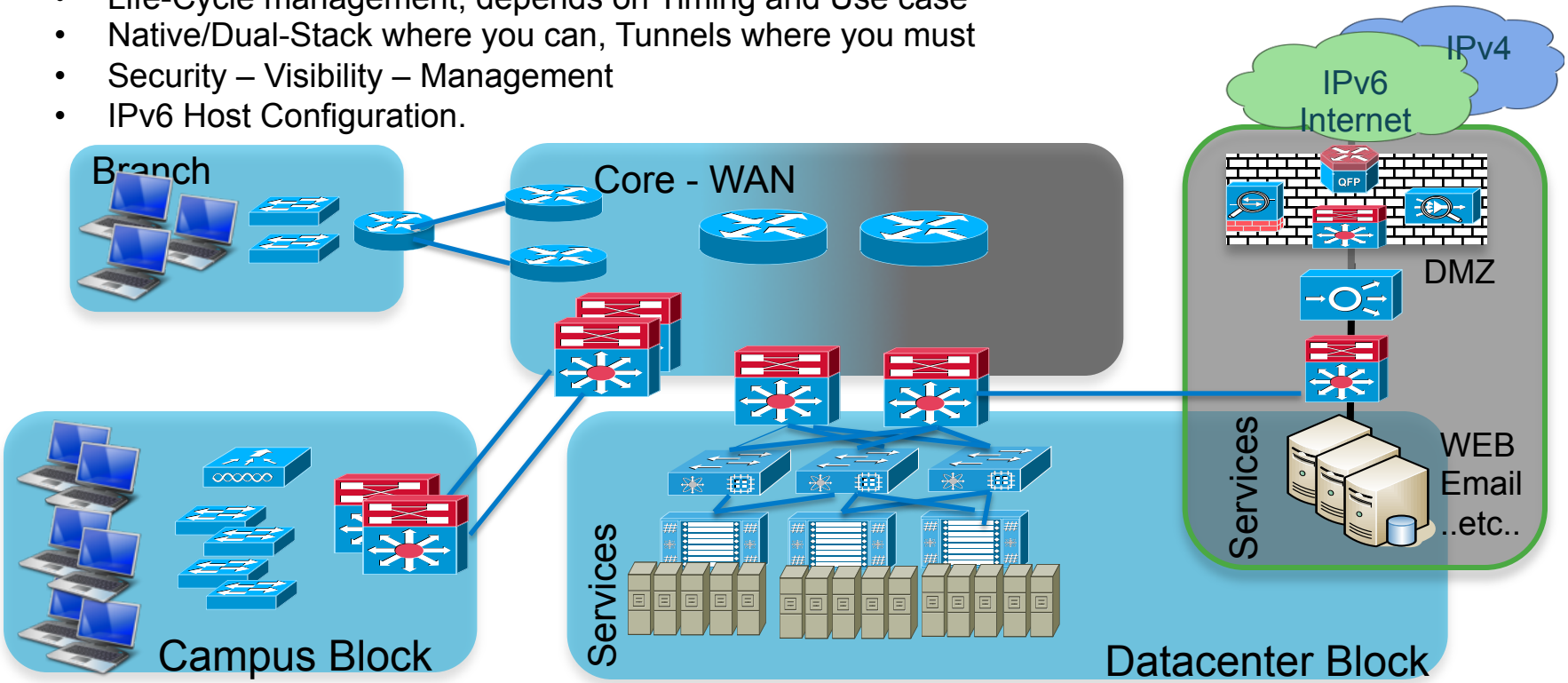

http://www.cisco.com/en/US/netsol/ns817/networking_solutions_program_home.html

# Architecture for IPv6 Web Presence outside-in



# Internal Network: Where do I start ? Inside-out

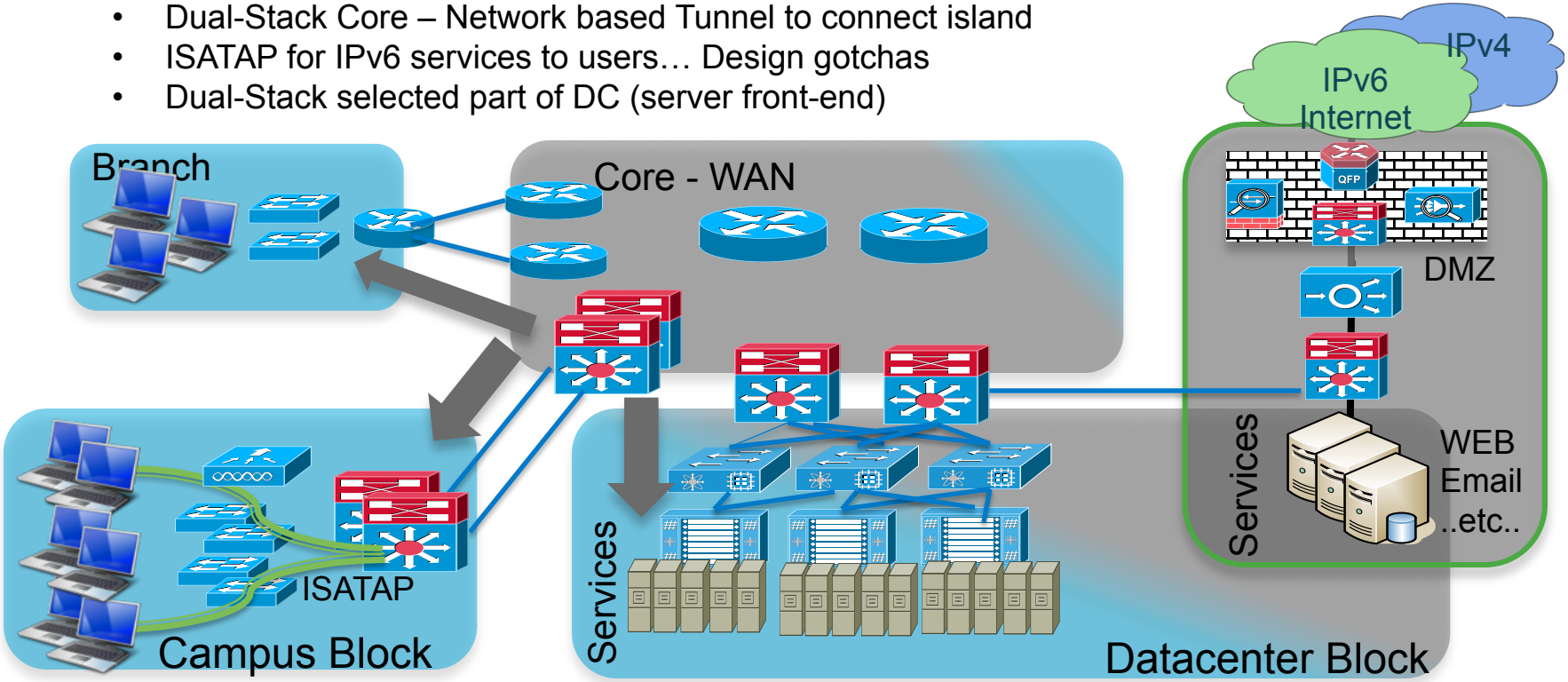
- Life-Cycle management, depends on Timing and Use case
- Native/Dual-Stack where you can, Tunnels where you must
- Security – Visibility – Management
- IPv6 Host Configuration.



# Core to Edge ! Inside-out

**Orderly Transition – Slow to dual-Stack all the way to user**

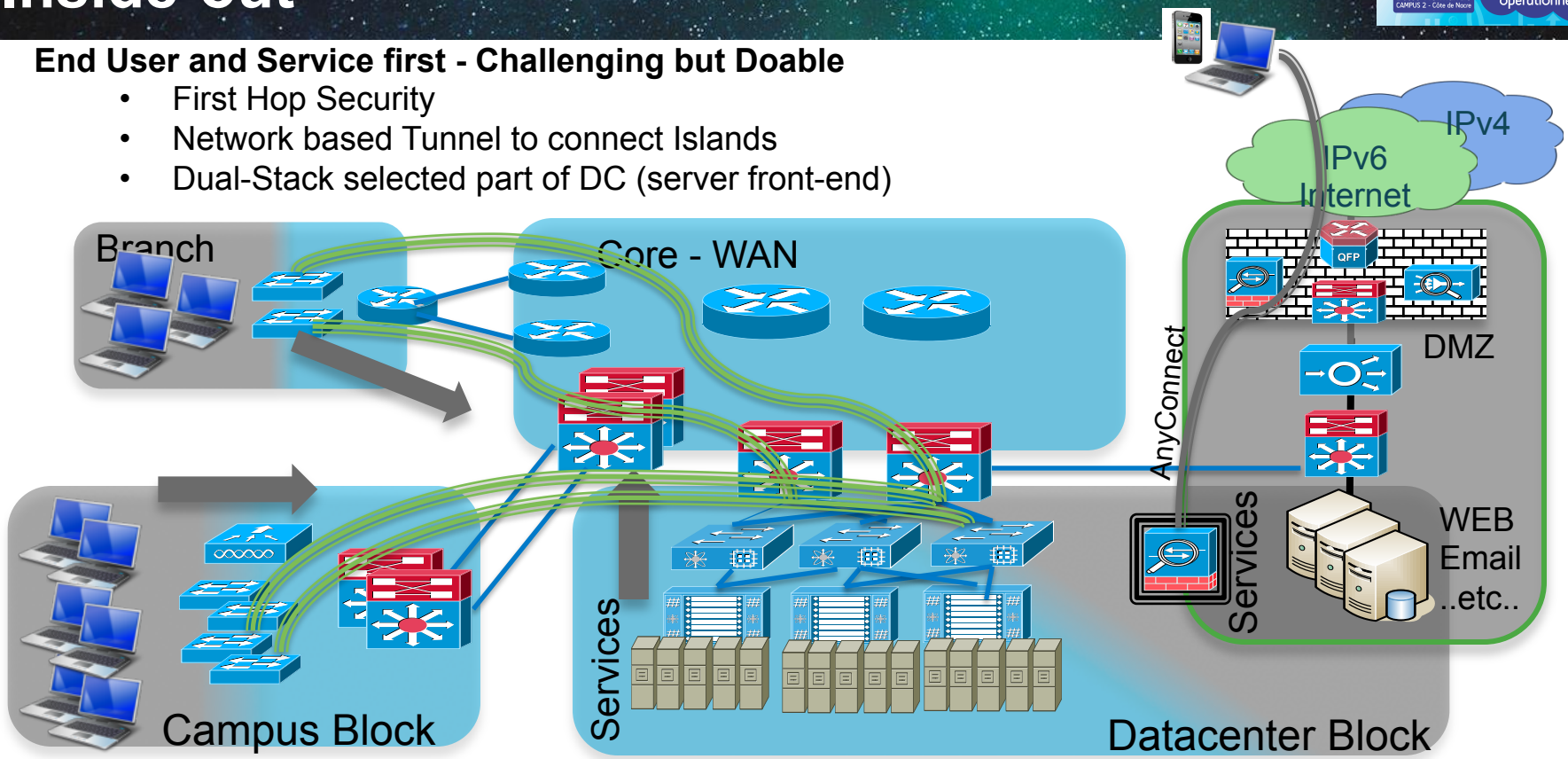
- Dual-Stack Core – Network based Tunnel to connect island
- ISATAP for IPv6 services to users… Design gotchas
- Dual-Stack selected part of DC (server front-end)



# Edge to Core!
# Inside-out

**End User and Service first - Challenging but Doable**

- First Hop Security
- Network based Tunnel to connect Islands
- Dual-Stack selected part of DC (server front-end)



# Service Provider Support – ISP Inside-out

- Will the same SLA apply for IPv6?
- Can the circuit that services the existing IPv4 connection be converted to dual-stack without the physical changes?
- Are full IPv6 global routes available to end customers?
- Is there an IPv6 “looking glass”?
- Are there any restrictions on prefix advertisements?
- What percentage of your IPv4 peers to you currently peer with for IPv6
- Are you partitioned from any other major networks? (i.e. lacking global reach-ability to other major networks)

*See http://docwiki.cisco.com/wiki/What_To_Ask_From_Your_Service_Provider_About_IPv6*

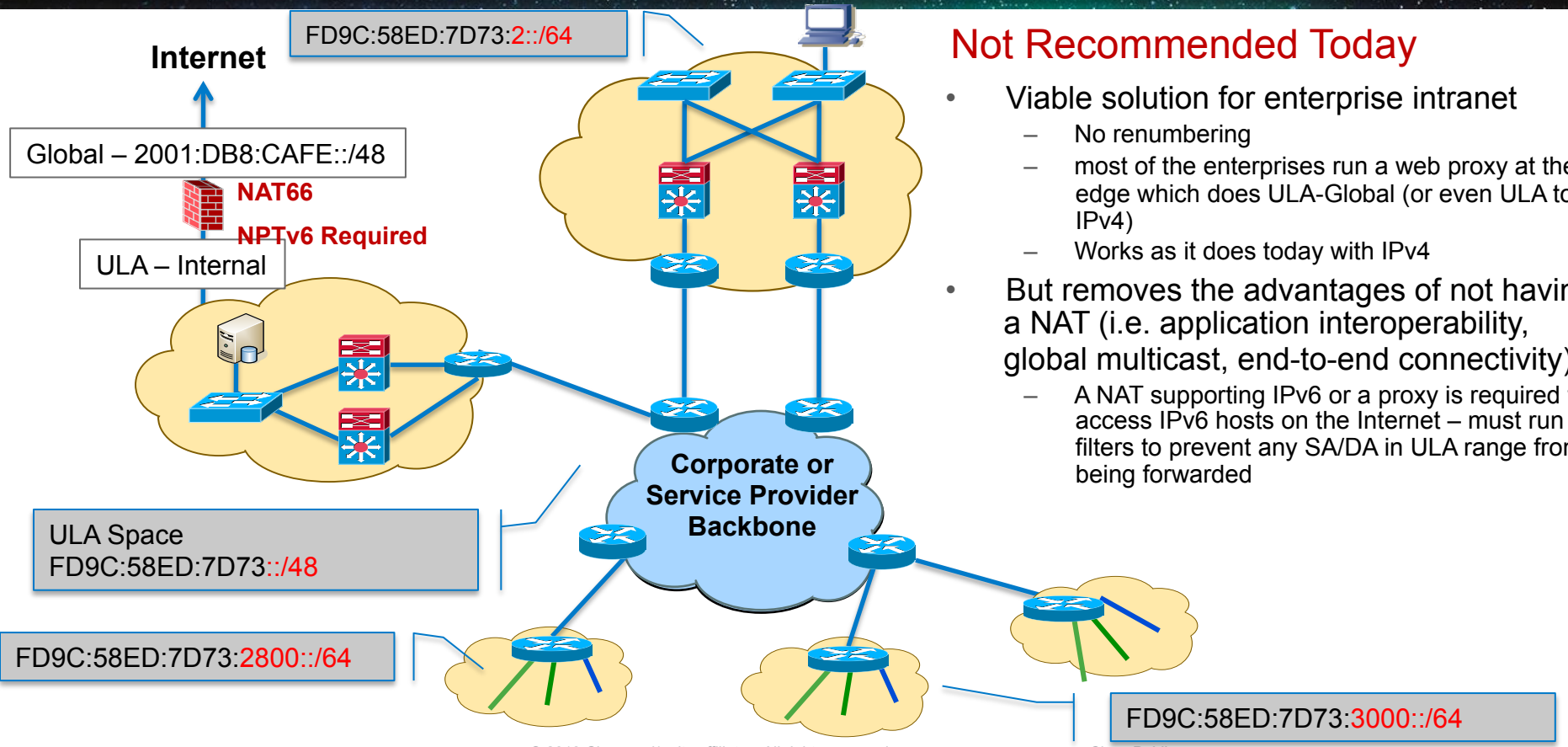
# IPv6 addresses can be allocated in three ways


- Provider Assigned (PA)
  - Addresses and prefixes assigned to subscribers from prefix pool assigned to service provider
  - PA provides prefix and route aggregation
  - This is good because Internet routing table size minimised
- Provider Independent (PI)
  - Addresses and prefixes assigned to subscribers independent of provider pool
  - PI allows subscriber to change between service providers; PA requires renumbering of subscriber network
  - Allows multi-homing with same address space
  - This is not so good – eventually we have same problem as IPv4
    - Routing tables may grow excessively
- Unique-Local Addressing (ULA)
  - Addresses and Prefixes assigned to subscribers for local communications
  - Not routable on the Internet

# ULA, ULA + Global or Global

- What type of addressing should I deploy internal to my network? It depends
  - Each interface can have multiple addresses intended for different purposes. For this reason, RFC3484 provides a standardized method to choose source and destination IPv6 addresses with which to attempt connections – Source Address Selection (SAS)
- Unique Local Addresses (ULA) – FC00::/7
  - Globally unique prefix with high probability of uniqueness and is intended for local communications, usually inside a site
  - Prefix FC00::/7 is reserved by IANA for ULA (bit 8 determines if locally or centrally assigned, so ULA or ULA-Central).
- Global-only – 2000::/3
  - Recommended approach but the old-school security folks that believe topology hiding is essential in security will bark at this option
- ULA + Global
  - Allows for the best of both worlds BUT at a price – much more address management with DHCP, DNS, routing and security
  - Source Address Selection (SAS) does not always work as it should

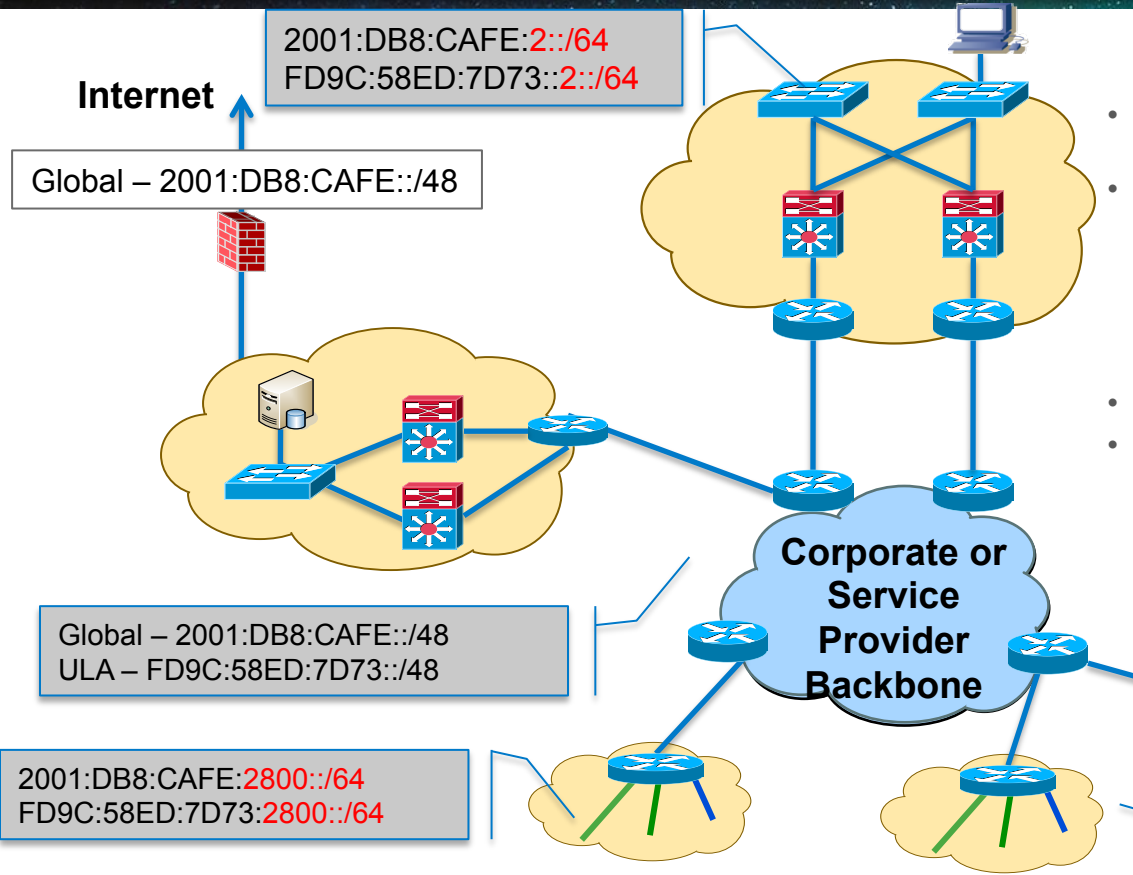
# Unique-Local Addressing (ULA) Only




## Not Recommended Today

- Viable solution for enterprise intranet
  - No renumbering
  - most of the enterprises run a web proxy at their edge which does ULA-Global (or even ULA to IPv4)
  - Works as it does today with IPv4
- But removes the advantages of not having a NAT (i.e. application interoperability, global multicast, end-to-end connectivity)
  - A NAT supporting IPv6 or a proxy is required to access IPv6 hosts on the Internet – must run filters to prevent any SA/DA in ULA range from being forwarded

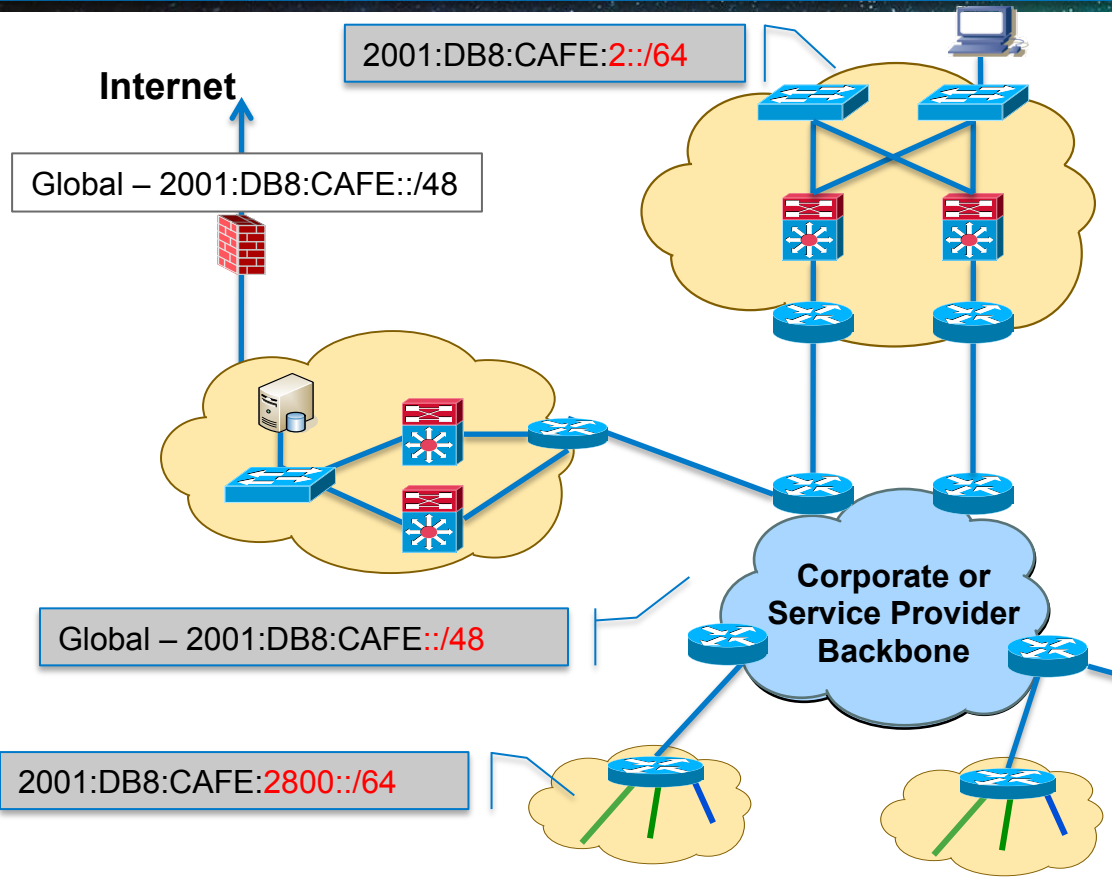
# ULA + Global




## Not Recommended

- Both ULA and Global are used internally except for internal-only hosts
- Source Address Selection (SAS) is used to determine which address to use when communicating with other nodes internally or externally
  - In theory, ULA talks to ULA and Global talks to Global – SAS 'should' work this out
- Easier to renumber w/o disruption
- But
  - Define a filter/policy that ensures your ULA prefix does not 'leak' out onto the Internet and ensure that no traffic can come in or out that has a ULA prefix in the SA/DA fields
  - Management overhead for DHCP, DNS, Routing, Security, etc…

# Global-only




## Recommended

- Global is used everywhere
- No issues with SAS
- No requirements to have NAT for ULA-to-Global translation
- Easier management of DHCP, DNS, Security, etc…
- Only downside is breaking the habit of believing that topology hiding is a good security method ☺
- But if PA Prefixes, a change of ISP requires renumbering (and potential disruption)

# Link Level—Prefix Length Considerations


## 64 bits

- Recommended by RFC3177 and IAB/IESG
- Consistency makes management easy
- MUST for SLAAC (MSFT DHCPv6 also)
- Significant address space loss (18.466 Quintillion)

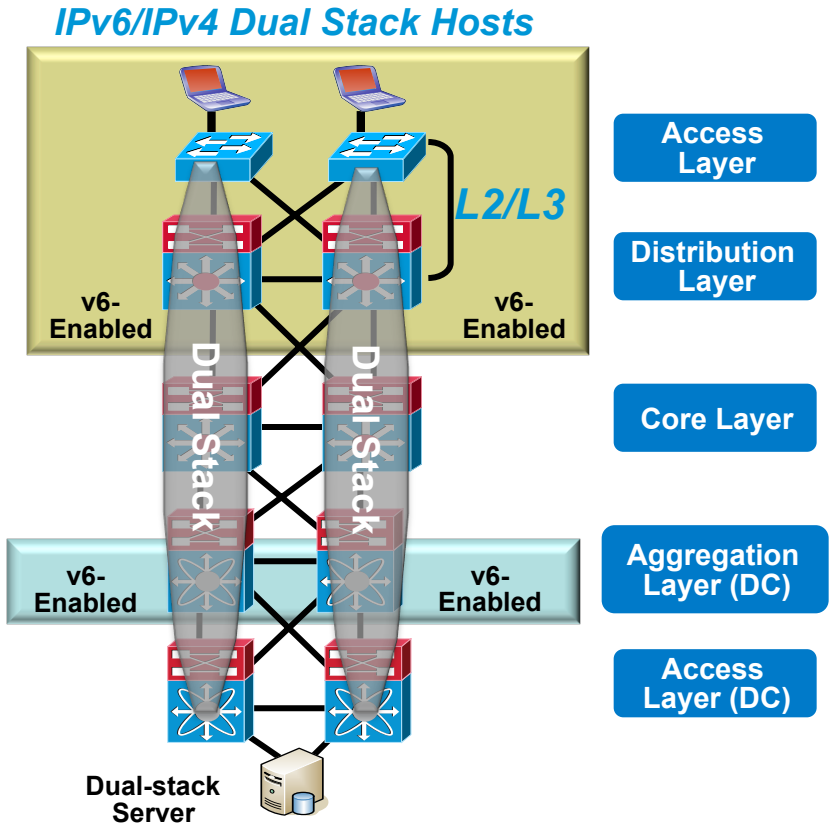
## > 64 bits

- Address space conservation
- Special cases:
  /126—valid for p2p
  /127—valid for p2p if you are careful – RFC6164 (RFC3627)
  /128—loopback
- Must avoid overlap with specific addresses:
  Router Anycast (RFC3513)
  Embedded RP (RFC3956)
  ISATAP addresses

- /64 everywhere
- /64 + /126
  - 64 on host networks
  - 126 on P2P
- /64 + /127
  - 64 on host networks
  - 127 on P2P
- /128 on loopback

# Campus IPv6 Deployment Options
## Inside-out

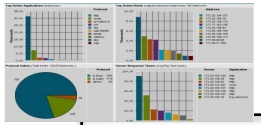

- Dual Stack = Two protocols running at the same time (IPv4/IPv6)
- #1 requirement—switching/ routing platforms must support hardware based forwarding for IPv6
  - –3560/3750, 3560-X/3750-X +
  - –4500 Sup6E, Sup7E +
  - –6500 Sup32/720, Sup2T +
- IPv6 is transparent on L2 switches but consider:
  - –L2 multicast—MLD snooping
  - –IPv6 management—Telnet/SSH/HTTP/SNMP
  - –Intelligent IP services on WLAN
- Expect to run the same IGPs as with IPv4
- Dual stack where you can, tunnel where you must



# IPv6 Traffic Visibility

IPv6 MIBs and host support

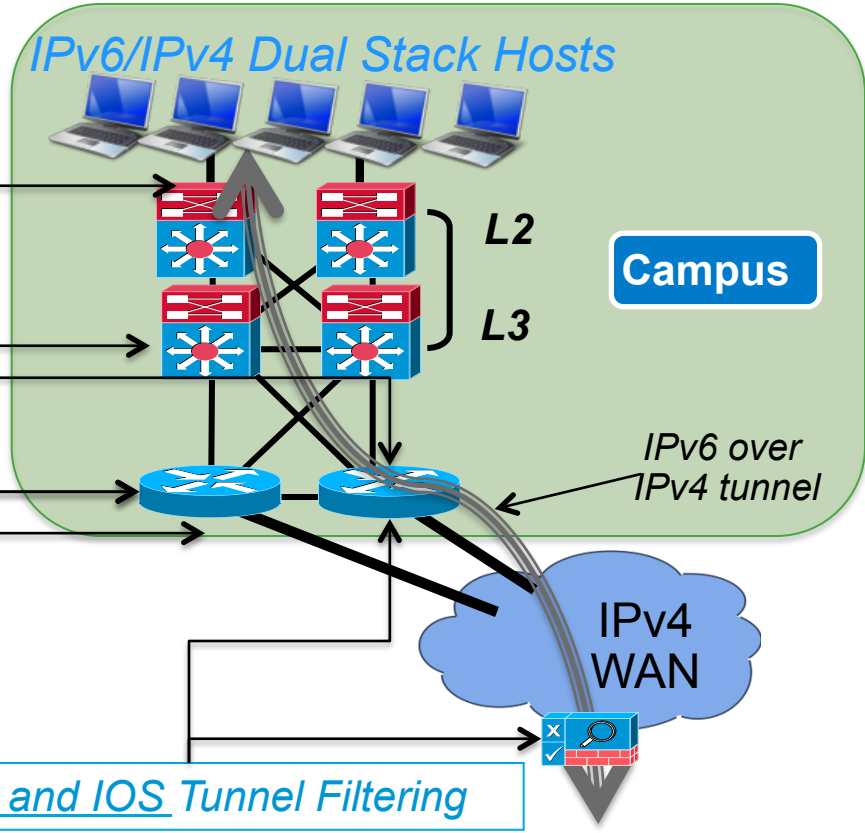
NAM Traffic Analyzer
Integrated Management & Reporting Console



IPv6 Traffic Metering with NAM and Flexible Netflow, including tunnel
(export over IPv4)

IPv6 SLA: E2E test, measurement
(UDP-Jitter, UDP-Echo, ICMP Echo, TCP Connect)

IPv6 Apps and Tunnel detection with NBAR2

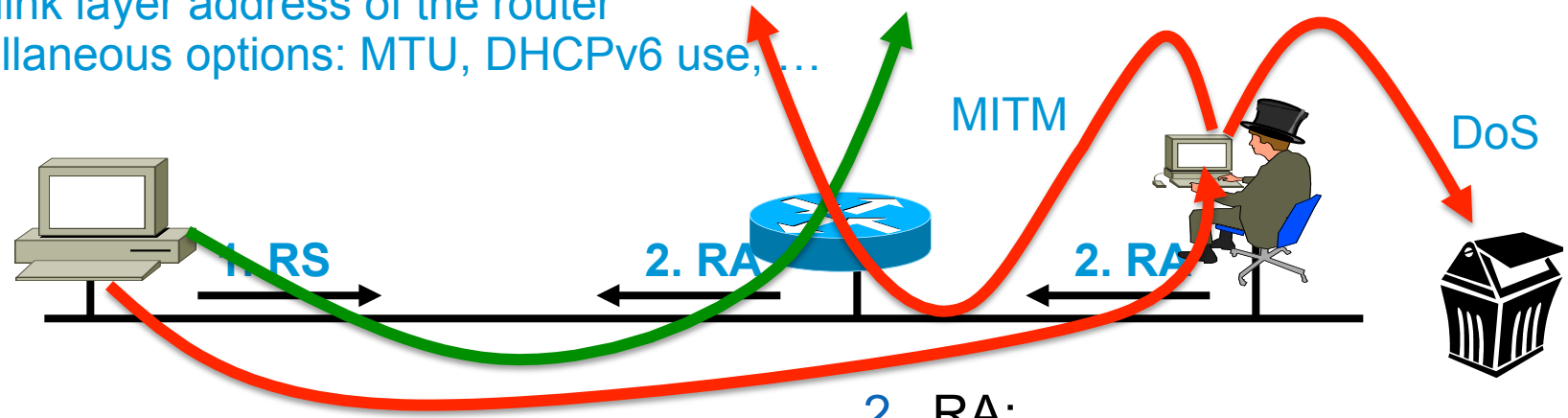



ASA and IOS Tunnel Filtering

# Rogue Router Advertisement Inside-out


**RA w/o Any Authentication Gives Exactly Same Level of Security as DHCPv4 (None)**

Router Advertisements contains:
-Prefix to be used by hosts
-Data-link layer address of the router
-Miscellaneous options: MTU, DHCPv6 use,…




2. RA:

–Data= options, **prefix**, lifetime,
A+M+O flags**, Default Router**

# IPv6 First Hop Security Inside-out



**802.1x and Port ACL**
- Authorize Device
- Filter traffic on Layer 2 ports

**Port Security:**
- Prevents TCAM overflow

**NDP Address Gleaning**
- Discover Address binding
- Audit Trail
- Revoke inactive devices

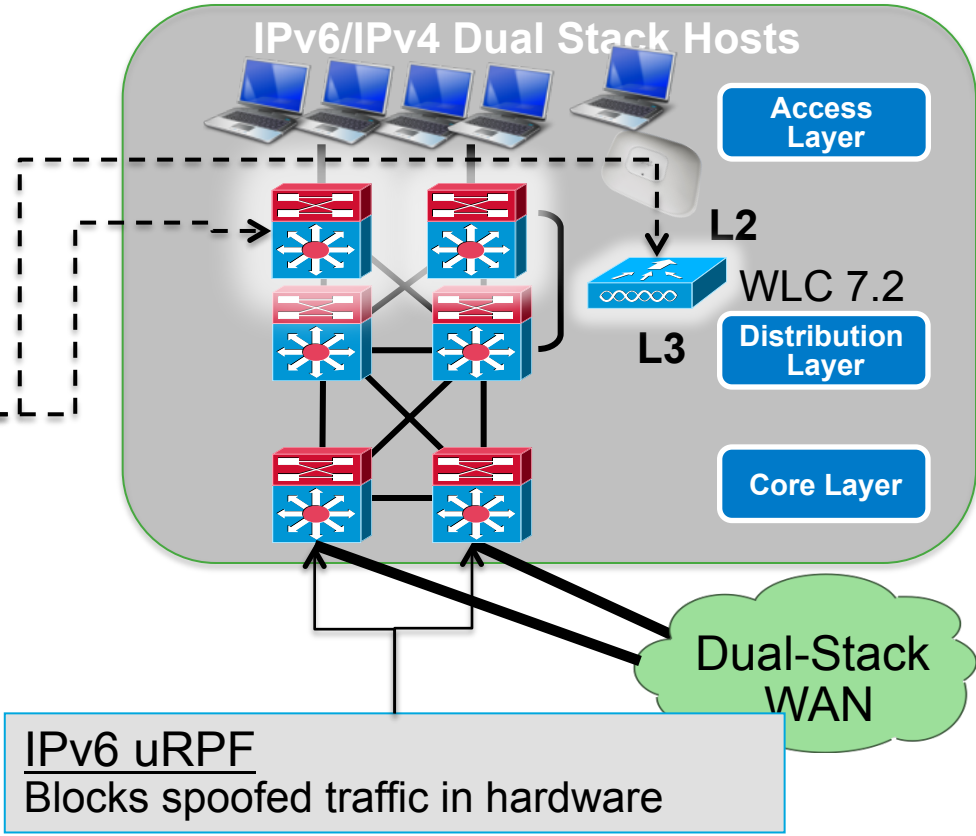
**IPv6 NDP inspection**
- Enforce Mac/IPv6 binding
- Prevents Neighbor Discovery spoofing attacks

**IPv6 RA Guard / Throttler**
- Stops Rogue Router Advertisement threats

**DHCP Guard**
- Prevent rogue DHCP server

**Source Guard:**
- Stops traffic from un-authorized sources.

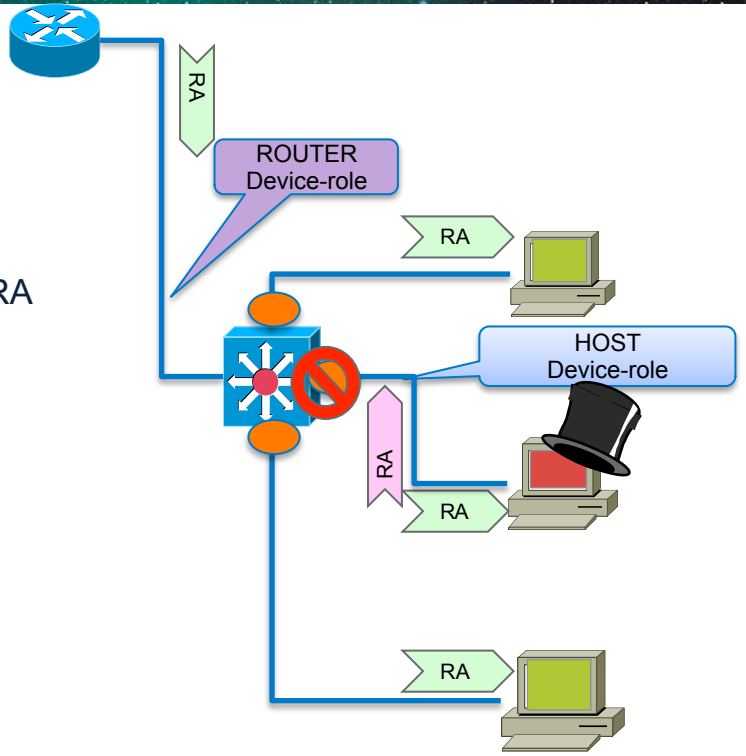
IPv6 First Hop Security Suite




**IPv6 uRPF**
Blocks spoofed traffic in hardware

# First Hop Security
## Inside-out

- **Port ACL** blocks all ICMPv6 RA from hosts
  - `interface FastEthernet0/2`
  - `  ipv6 traffic-filter ACCESS_PORT in`
  - `  access-group mode prefer port`
- **RA-guard lite** (12.2(33)SXI4 & 12.2(54)SG ): also dropping all RA received on this port
  - `interface FastEthernet0/2`
  - `  ipv6 nd raguard`
  - `  access-group mode prefer port`
- **RA-guard** (12.2(50)SY, 15.0(2)SE)
  - `ipv6 nd raguard policy HOST device-role host`
  - `ipv6 nd raguard policy ROUTER device-role router`
  - `ipv6 nd raguard attach-policy HOST vlan 100`
  - `interface FastEthernet0/0`
  - `  ipv6 nd raguard attach-policy ROUTER`



# IPv6 First Hop Security Inside-out


| Feature | C6500 | C4500-X<br>C4500<br>C4900 | C3750-X<br>C3560-X<br>C2960[2]<br>Compact | C3850 | AIR-CT5760 | N7K/N5K |
|---|---|---|---|---|---|---|
| RA Guard | 15.0(1)SY | 15.1(2)SG | 15.0.(2)SE | 15.0(1)EX | 7.2 | NXOS 7.1 |
| IPv6 Snooping | 15.0(1)SY[1] | 15.1(2)SG | 15.0.(2)SE | 15.0(1)EX | 7.2 | NXOS 7.1 |
| DHCPv6 Guard | 15.2(1)SY | 15.1(2)SG | 15.0.(2)SE | 15.0(1)EX | 7.2 | NXOS 7.1 |
| Source/Prefix Guard | 15.2(1)SY | 15.2(1)E | 15.0(2)SE[3] | 15.2(2)E | 7.2 | NXOS 7.1 |
| Destination Guard | 15.2(1)SY | 15.1(2)SG | 15.2(1)E | 15.2(2)E | 15.2(2)E | NXOS 7.1 |
| RA Throttler | 15.2(1)SY | 15.2(1)E | 15.2(1)E | 15.0(1)EX | 7.2 | |
| ND Multicast Suppress | 15.2(1)SY | 15.1(2)S | 15.2(1)E | 15.0(1)EX | 7.2 | |

Available Now  Not Available  Roadmap

# Exemples de déploiement IPv6 en France

# Déploiement IPv6 : CRBN

**Contacts presse :**

**Hill & Knowlton**

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Nathalie Ayache – nathalie.ayache@hillandknowlton.com
Tel : 01 41 05 44 48 / 44 29

**Le Conseil régional de Basse-Normandie déploie des technologies de collaboration IPv6-ready de Cisco pour simplifier son infrastructure, accroître l'efficacité opérationnelle et stimuler l'innovation**

- Le Conseil régional de Basse-Normandie a déployé les technologies Cisco® Unified Communications Manager dans le but de simplifier son infrastructure de communication.
- Ces déploiements faciliteront la mise en œuvre d'applications et de services de collaboration basés sur IPv6 et contribueront à améliorer l'efficacité opérationnelle.
- Le nouveau système fonctionnera avec le réseau d'enseignement et de recherche VIKMAN du Conseil régional, qui utilise le protocole IPv6 pour assurer une connexion Internet haut débit entre les sites d'enseignement et les laboratoires de recherche de la région.
- Le Conseil régional de Basse-Normandie est l'un des premiers Conseils régionaux à déployer la dernière version de la solution Cisco Unified Communications Manager, qui prend en charge le protocole IPv6.

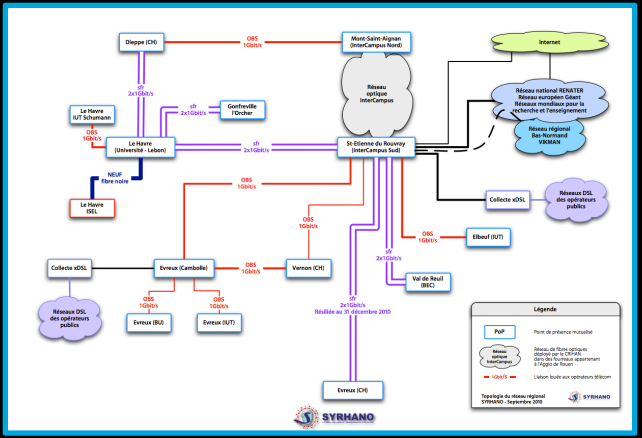
**Emmanuel Roussel, CRBN's Networking and Systems Department manager**

*"As a public sector organization we are continually looking for ways to improve the efficiency of our operations and the services for our public end users in Normandy through leadership and innovation." said CRBN's Networking and Systems Department Manager Emmanuel Roussel. "We believe Cisco's IPv6-ready Unified Communications Manager will enable us to provide our customers with the most future-proof environment possible, stimulating us as well about the different new service creation opportunities that IPv6 is offering us."*

http://www.cisco.com/web/FR/documents/pdfs/press/cdp/2009/CP_10_30_CRBN_FINAL.pdf

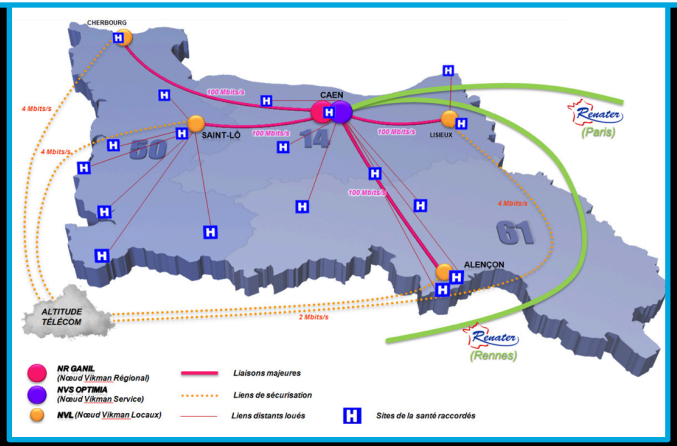
# Déploiement IPv6 : CRIHAN / VIKMAN

- *Support for both IPv4 and IPv6*—Both the current and future IP standard specifications were in demand by the user base, to facilitate the broadest range of applications.




> "Moving from ATM to an IP infrastructure is a win for the entire CRIHAN community. Our staff has been offloaded from much of the daily network management tasks. Our financial management team sees the streamlined operations and lowered total cost of ownership, and our users gain new high-speed services."
>
> Hervé Prigent, Technical Manager, The CRIHAN

Outre un modèle de raccordement, VIKMAN a développé un espace d'innovation tant en terme technologique que de services mutualisés (IPv6, diffusion en mode Multicast IPv4 et IPv6, DNS, Visioconférence sur IP, déploiement du protocole MPLS)




http://www.cisco.com/web/FR/documents/pdfs/press/cdp/2009/CP_10_30_CRBN_FINAL.pdf
http://www.vikman.fr/index.php?option=com_content&view=category&layout=blog&id=14&Itemid=3

# Déploiement IPv6 : Renater

Cisco Systems

Cisco Case Study

RENATER Network-Delivery of IPv6 services through
**Cisco IOS Software**: A Successful Deployment
from Pilot to Production

"Cisco innovations such as the Cisco Service Separation Architecture will help us layer the multiple RENATER research networks onto a single converged networking system, while logically isolating and protecting each distinct research network."
– Dany Vandromme, CEO, RENATER

http://wwwin.cisco.com/sptg/crbu/products/12000/files/renater_case_study.pdf
http://www.cisco.com/en/US/prod/collateral/iosswrel/ps6537/ps6553/case_study_core_renater.pdf

# Déploiement IPv6 : ILLIAD-FREE

PRESS RELEASE

**Free (Iliad Group) Implements Cisco Carrier-Grade IPv6 Solution**

One of the World's Largest Residential Broadband Solution Deployments

SAN JOSE, Calif., Sept. 2, 2010 – Cisco today announced that Free (Iliad Group), a leading broadband solutions operator in France, has deployed the Cisco® Carrier-Grade IPv6 Solution using Internet Protocol version 6 rapid deployment technology, also known as 6rd, allowing more than four million Free residential broadband customers to be a part of one of the world's largest live IPv6-enabled residential Internet service deployments.

The investment lets Free prepare for and mitigate the impending IPv4 address exhaustion, while scaling its network to address the rapid growth of Internet-connected devices. Free customers will benefit from Internet connectivity that can scale to meet the growing number of devices and applications.

Cisco ASR 1006

- **Maxime Lombardini, chief executive officer, Free (Iliad Group, France)**

*"Free is committed to providing the latest innovations for its customers, including full support today for the IP Next-Generation Network, IPv6. We have chosen the Cisco Series Aggregation Services Routers ASR 1000 router for their support of an integrated high-performance IPv6 Rapid Deployment or 6rd technology, which allows us to supply IPv6 to our users in a remarkably simple and cost-efficient manner."*


http://newsroom.cisco.com/dlls/2010/prod_090210.html
http://newsroom.cisco.com/dlls/2009/prod_052709e.html
http://newsroom.cisco.com/dlls/2006/prod_121206.html

# Déploiement IPv6 : SFR

PRESS RELEASE

**SFR France Deploys Cisco Carrier Grade IPv6 Solution**

Delivers IPv6 over L2TP while protecting existing IPv4 network investments

**SAN JOSE, Calif., 8h June, 2011** – Cisco today announced that SFR France has selected its Carrier-Grade Internet Protocol Version 6 (CGv6) Solutionas a first step in the transition of their network infrastructure to IPv6. SFR, the second largest telecommunications operator in France, has deployed the Cisco ASR 1000 Seriesrouter, enabling IPv6 access to the Internet for residential customers.

SFR required a simple, cost effective solution to transition its IPv4 network to IPv6. The Cisco ASR 1000, utilizing Layer 2 Tunneling Protocol (LT2P), enabled SFR to leverage its existing investment in IPv4 network access infrastructure to quickly provide IPv6 services to their customers.

**Highlights/Key Facts**

- Because of the exponential growth of Internet services and increasing number of end users, Service Providers are looking for new ways for their current network architecture to meet the needs of Internet-ready appliances, new applications, and services. IPv6 is designed to enable service providers to meet these challenges and provide new services to their customers. As the number of devices per broadband user exponentially increases worldwide, cable, DSL, Ethernet to the home, wireless, and other always-on access technologies can benefit from the huge address range of IPv6.
- The IPv6 over L2TP approach requires limited investment and impact on existing infrastructure. Dual-stack IPv4/IPv6 services on the Residential Gateway (customer) side are enabled. The solution enables IPv6 sites to communicate with each other over an IPv4 core.The technology significantly reduces the lead-time to IPv6 deployment for service providers while protecting their existing network investment.
- Cisco has taken a leadership position to author and drive an open standard for L2TP, as defined in (RFC 5571), which describers IPv6 global connectivity over an IPv4 core. This document was approved in August 2009 by the Internet Engineering Steering Groupto be published as a Standards Track RFC.

L2TP Softwire Tunnel technology is a component of Cisco's Carrier-Grade IPv6 (CGv6)solution that outlines the three approaches of Preserve, Prepare and Prosper for customers looking to transition to IPv6. The framework was launched in October 2009 with the Cisco CRS family, ASR series and other products supporting this solution.



http://newsroom.cisco.com/uk/press-release-content?articleId=358080&type=webcontent

# Déploiement IPv6 : Cisco

**2012 Achievements**
- ✓ Core 100% dual stack enabled
- ✓ DCs and iPoP required for World IPv6 Launch & end user DHCPv6
- ✓ 5 campus & 8 remote office buildings

**FY 2013**
- All 21 production DCs
- All 15 iPoPs
- Additional 106 buildings
- Covert 140 tunnelled labs to dual stack
- Enable AnyConnect VPN headends
- Enable 12 Extranet hubs

# Déploiement IPv6 : Cisco

Network operator measurements, 22nd May 2013 (notes)

Show 10 entries Search: 109

| Participating Network | ASN(s) | IPv6 deployment |
|---|---|---|
| Cisco | 109 | 17.62% |

Showing 1 to 1 of 1 entries (filtered from 110 total entries)

First Previous 1 Next Last

17,6%

# Déploiement IPv6 : autres










# …even more information

The business case for IPv6
http://blogs.cisco.com/borderless/business-case-for-ipv6/

What enterprises should do about IPv6
http://www.cisco.com/en/US/prod/collateral/iosswrel/ps6537/ps6553/whitepaper_c11-586154

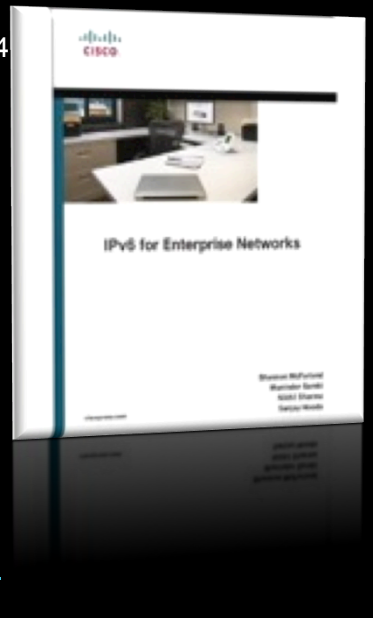
TechWiseTV: IPv6 implementation plan
http://www.youtube.com/watch?v=bvyDWq6D8xk

CVD: Deploying IPv6 in Campus Networks
http://www.cisco.com/en/US/docs/solutions/Enterprise/Campus/CampIPv6.html

CVD: Deploying IPv6 in Branch Network
http://www.cisco.com/en/US/docs/solutions/Enterprise/Branch/BrchIPv6.html

CVD: Deploying IPv6 at the Internet Edge
http://www.cisco.com/en/US/solutions/ns340/ns414/ns742/ns817/landing_ie_ipv6.html

Cisco IPv6 Services
http://www.cisco.com/en/US/services/ps6887/ps10716/docs/Cisco_IPv6_Services_AAG.pdf

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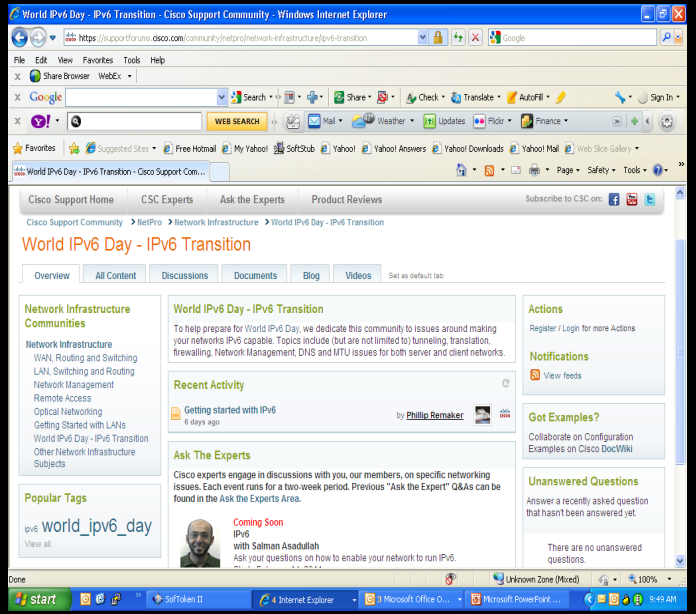
Find **relevant** technical documentation

Engage with over 200,000 **top technical experts**

**Seamless** transition from discussion to TAC Service Request *(Cisco customers and partners only)*

Visit the Cisco Support Community booth in the World of Solutions for more information

**supportforums.cisco.com**
**supportforums.cisco.mobi**




**The Cisco Support Community is your one-stop community destination from Cisco for sharing current, real-world technical support knowledge with peers and experts.**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# *TOMORROW starts here.*

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