



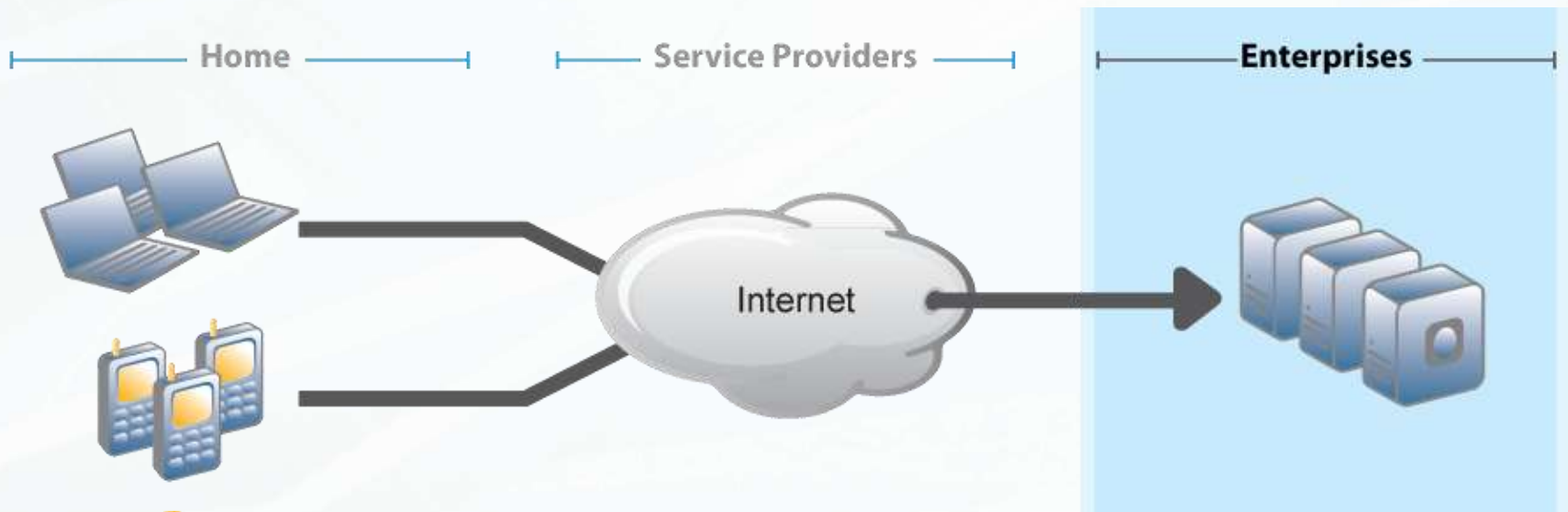
# Test Lab for Your Trial

**Dimitri Desmidt**

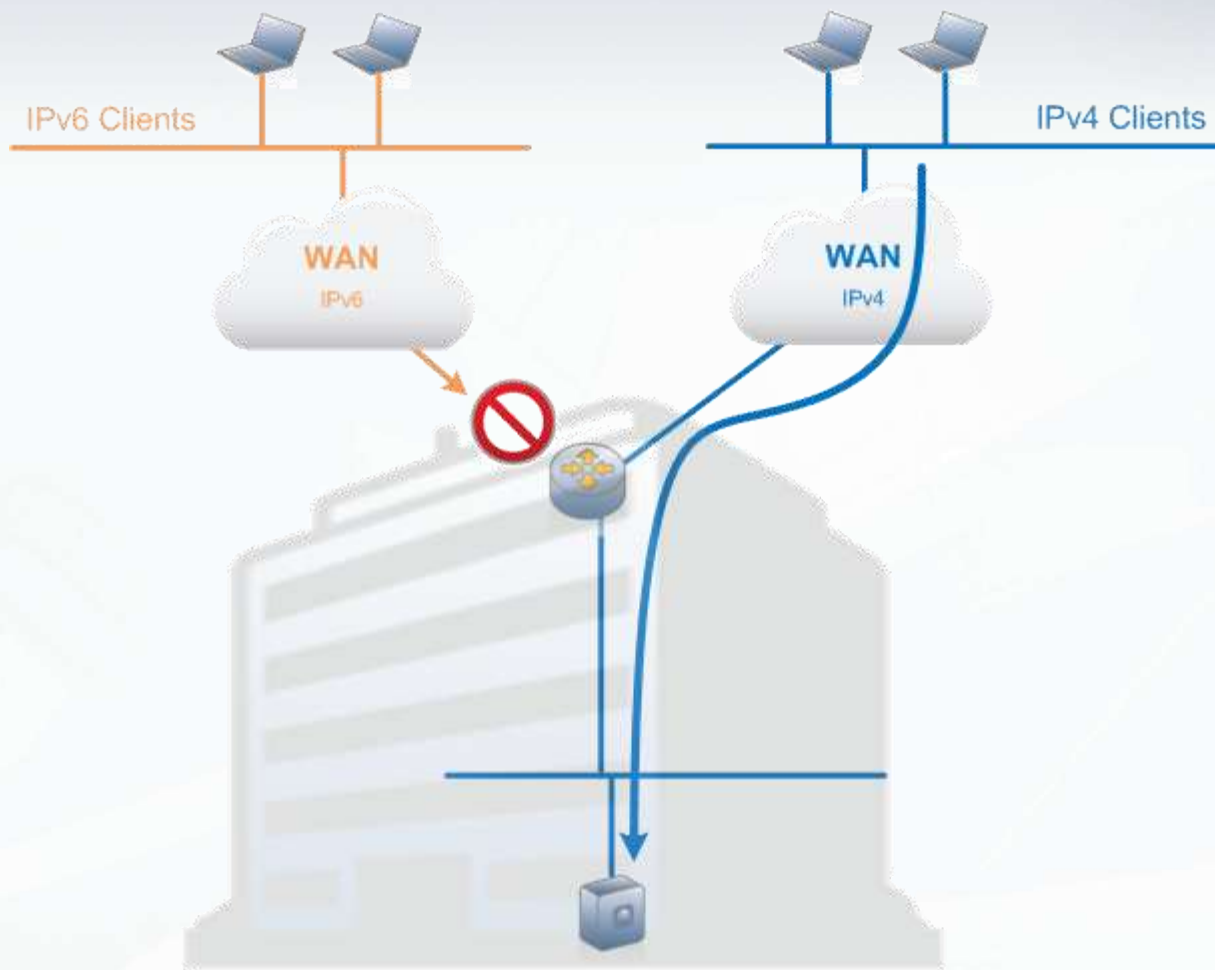
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Case1:

# Enterprise – Content Providers (*simple case* 😊)

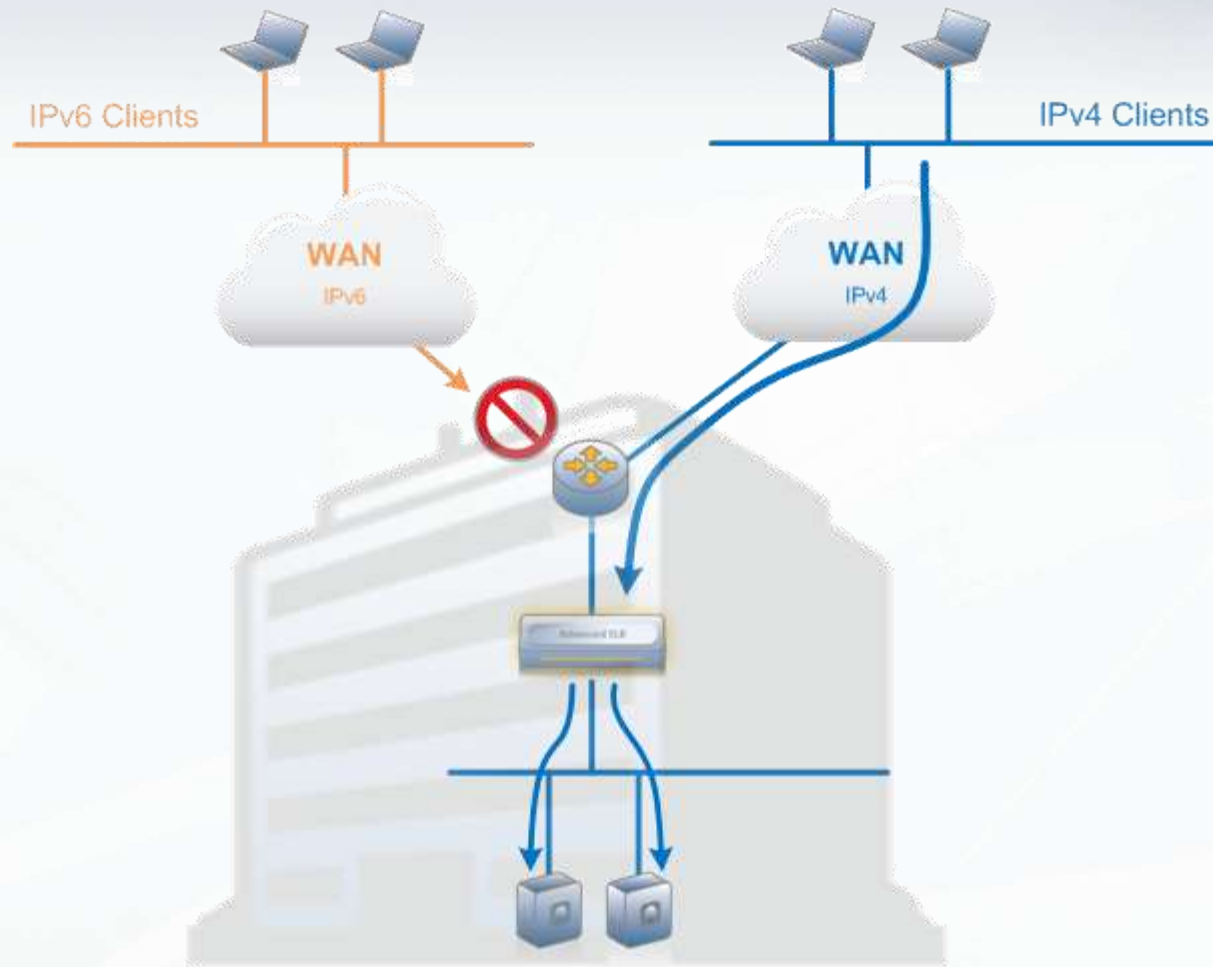


## What do you have today (1/2)?



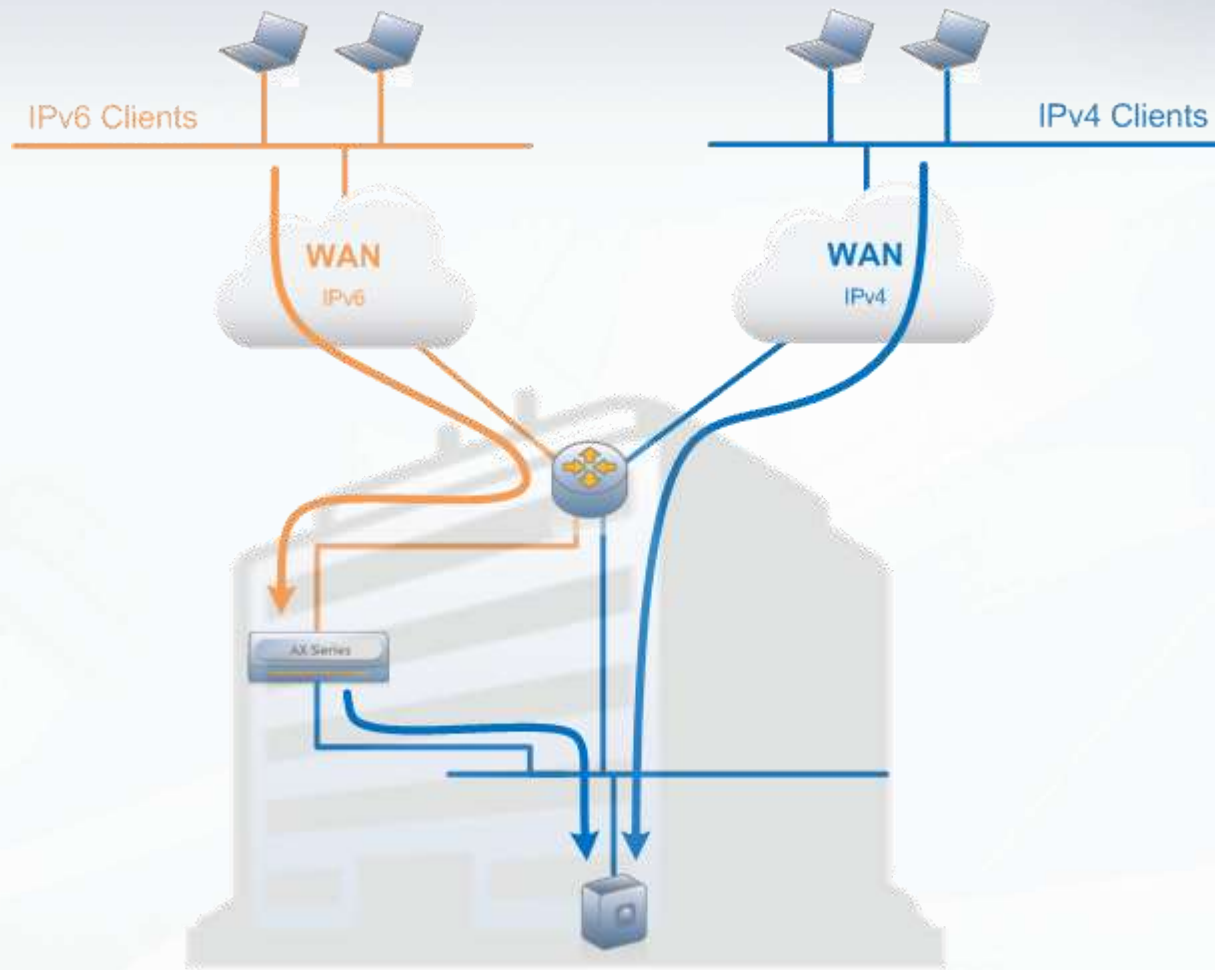
- IPv4 clients access their IPv4 service hosted on an IPv4 server
- No access for IPv6 clients

# What do you have today (2/2)?



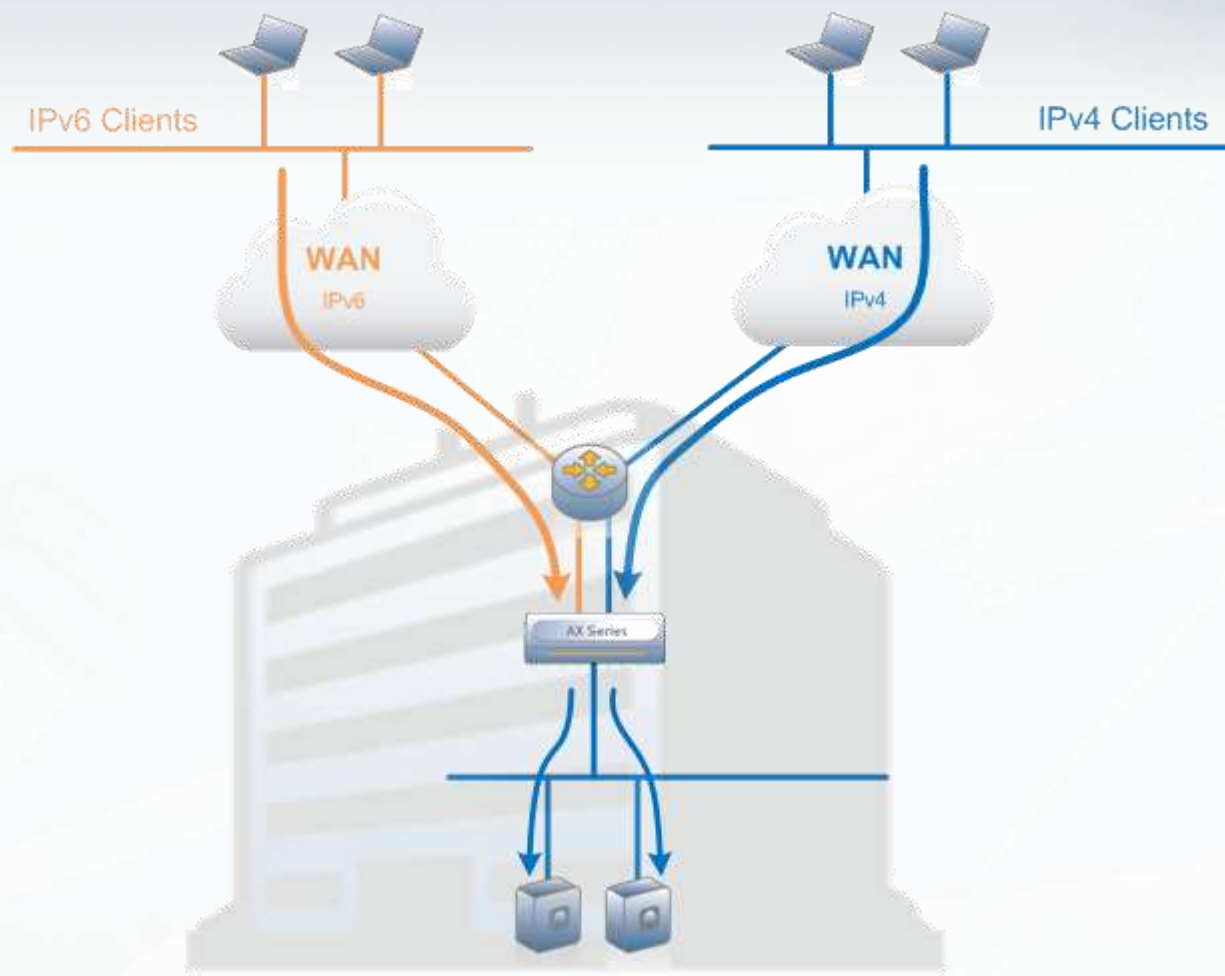
- IPv4 clients access their IPv4 service behind an IPv4 VIP hosted on a load balancer
- No access for IPv6 clients

# What could you easily do (1/2)?



- IPv4 clients access their IPv4 service hosted on an IPv4 server
- IPv6 clients access their IPv6 service via AX doing protocol translation

# What could you easily do (2/2)?



- IPv4 clients access their IPv4 service behind an IPv4 VIP hosted on the AX
- IPv6 clients access their IPv6 service via AX doing protocol translation + SLB

# What are the pre-requisites for offering services on IPv6 (1/2)?

## ➤ Not Pre-requisites:

- ◆ Buy new v6 servers to run the services
- ◆ Turn on dual -stack on existing v4 servers hosting the services
- ◆ Validate that your application runs on your v6 or dual-stack servers

# What are the pre-requisites for offering services on IPv6 (2/2)?

## ➤ Pre-requisites:

- ◆ IPv6 Internet access
- ◆ Update your DNS servers with AAAA for your services

*Note: You can use the same name :*

*www.a10networks.com A 184.168.97.137*

*www.a10networks.com AAAA 2a03:6000:1001:a10::a10*

*Or you can use different names:*

*www.a10networks.com A 184.168.97.137*

*ipv6.a10networks.com AAAA 2a03:6000:1001:a10::a10*

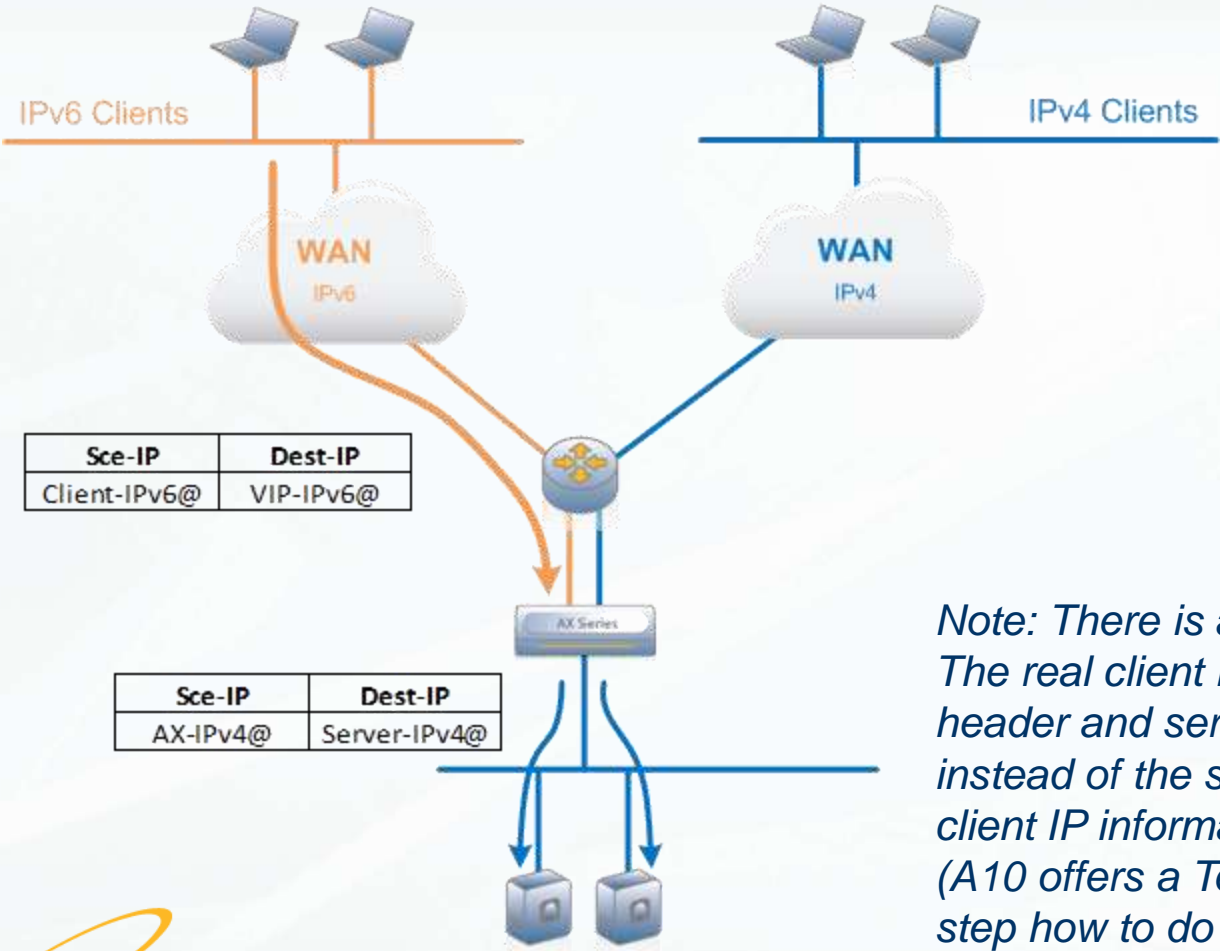
*Important Note: If you use different names, your application must accept being reached via this name too.*

- ◆ Acquire and install a device that is SLB-PT capable
- ◆ Validate that the service is working on v6 through the SLB-PT device

*Note: There is no reason for it not to work. 😊*

# What are the "gotchas"? (1/2)

➤ Your servers lose the client IP@ information



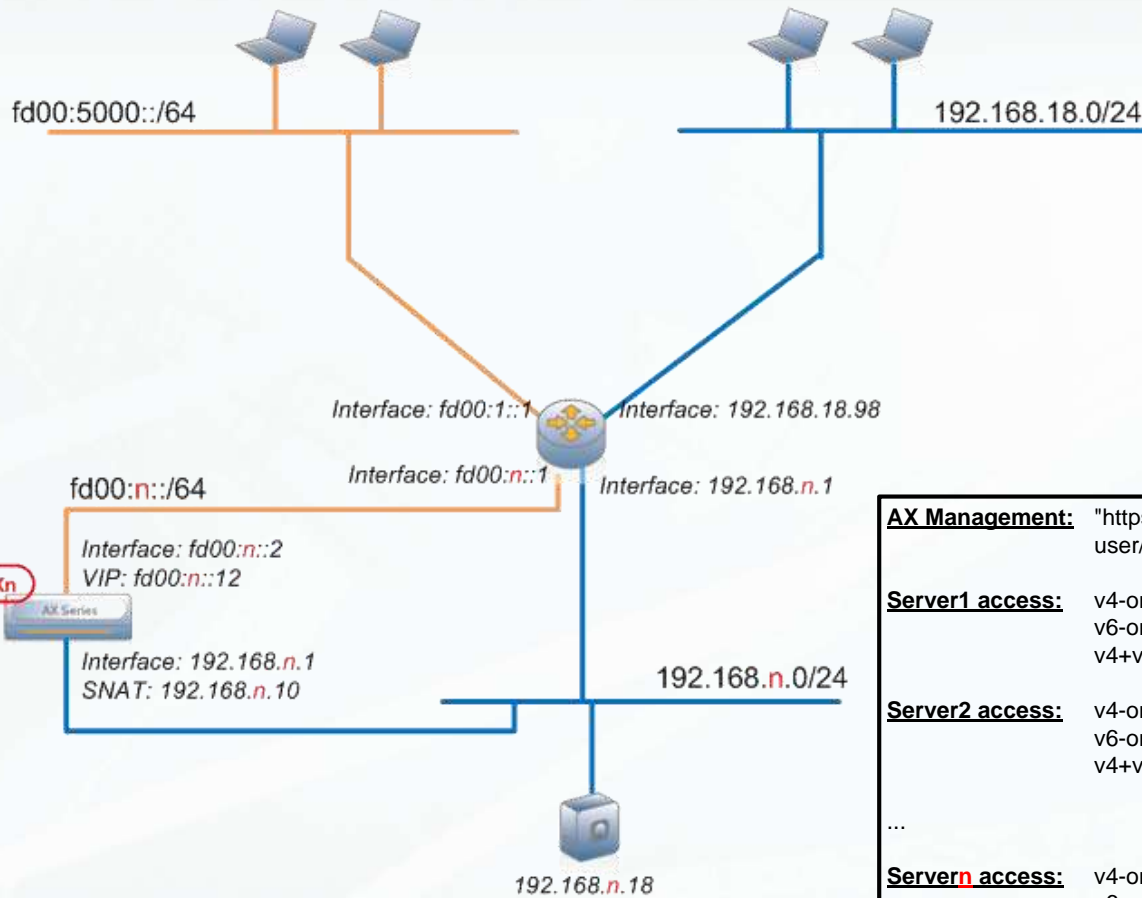
*Note: There is a "trick" for web applications. The real client IPv6@ is inserted in an HTTP header and servers look at the header instead of the source-IP@ to retrieve the client IP information. (A10 offers a Tech Note explaining step-by-step how to do this on Apache and IIS.)*

# What are the "gotchas"? (2/2)

## ➤ Application-Level Gateway (ALG)

- ◆ The vast majority of applications use one single connection, but some use multiple connections on different ports, such as:
  - ◆ FTP
  - ◆ SIP
  - ◆ Video RTSP
  
- ◆ When application access is provided through an SLB device, the device requires ALG support for that application

# Lab presentation



**AX Management:** "https://ax-mgt.a10networks.com" (IPv6@ = fd00:1000::11, IPv4@=172.31.31.11)  
user/pwd = "student1/a10"

**Server1 access:** v4-only: http://s1-v4.a10networks.com (IPv4@=192.168.1.18)  
v6-only: http://s1-v6.a10networks.com (IPv6@ = fd00:1::12)  
v4+v6: http://www1.a10networks.com

**Server2 access:** v4-only: http://s2-v4.a10networks.com (IPv4@=192.168.2.18)  
v6-only: http://s2-v6.a10networks.com (IPv6@ = fd00:2::12)  
v4+v6: http://www2.a10networks.com

...

**Servern access:** v4-only: http://sn-v4.a10networks.com (IPv4@=192.168.n.18)  
v6-only: http://sn-v6.a10networks.com (IPv6@ = fd00:n::12)  
v4+v6: http://wwwn.a10networks.com

# "For the same price", what other benefits can your A10 Networks device provide?

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- **We've already seen the following benefits:**
  1. Offer IPv6 service using your existing IPv4 services/applications
  2. Load Balancing
  
- **The same A10 Networks device can also provide:**
  3. Higher availability
    - ◆ Technique: Health Check

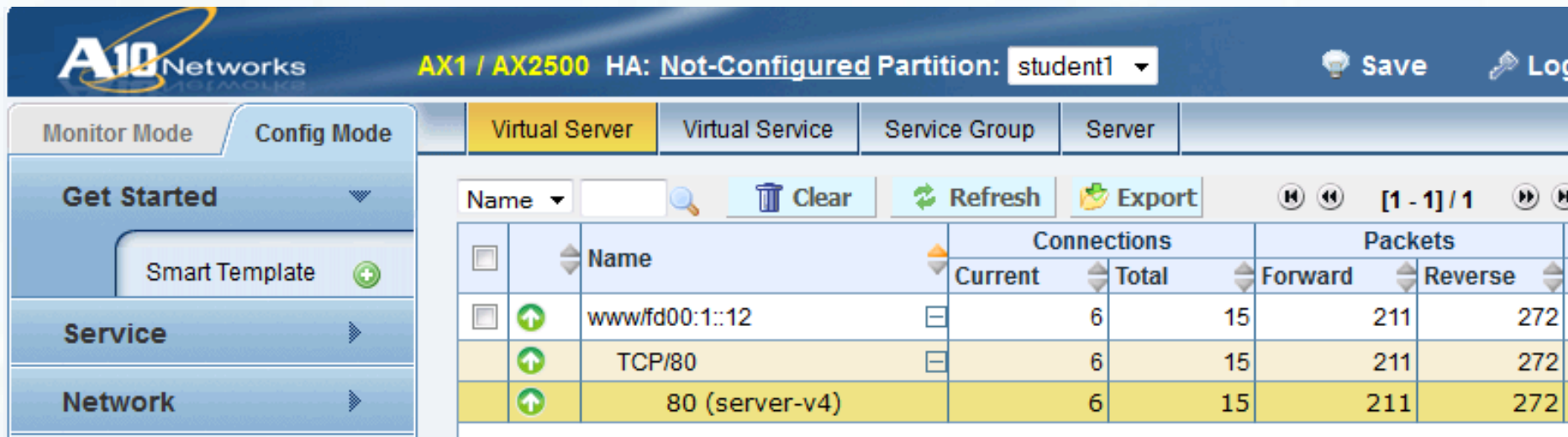


# "For the same price", what other benefits can your A10 Networks device provide?

## ➤ The same A10 Networks device can also provide:

### 4. Higher visibility

- ◆ Techniques: Advanced reporting that provides you information about:
  - ◆ Server status
  - ◆ Number of current /total connections
  - ◆ Number of requests
  - ◆ Centralized logging
  - ◆ And more



The screenshot displays the A10 Networks management interface. The top navigation bar includes the A10 Networks logo, the device model 'AX1 / AX2500', HA status 'Not-Configured', and the selected partition 'student1'. The interface is divided into 'Monitor Mode' and 'Config Mode'. The 'Virtual Server' tab is active, showing a table of virtual servers. The table has columns for Name, Connections (Current, Total), and Packets (Forward, Reverse). The data is as follows:

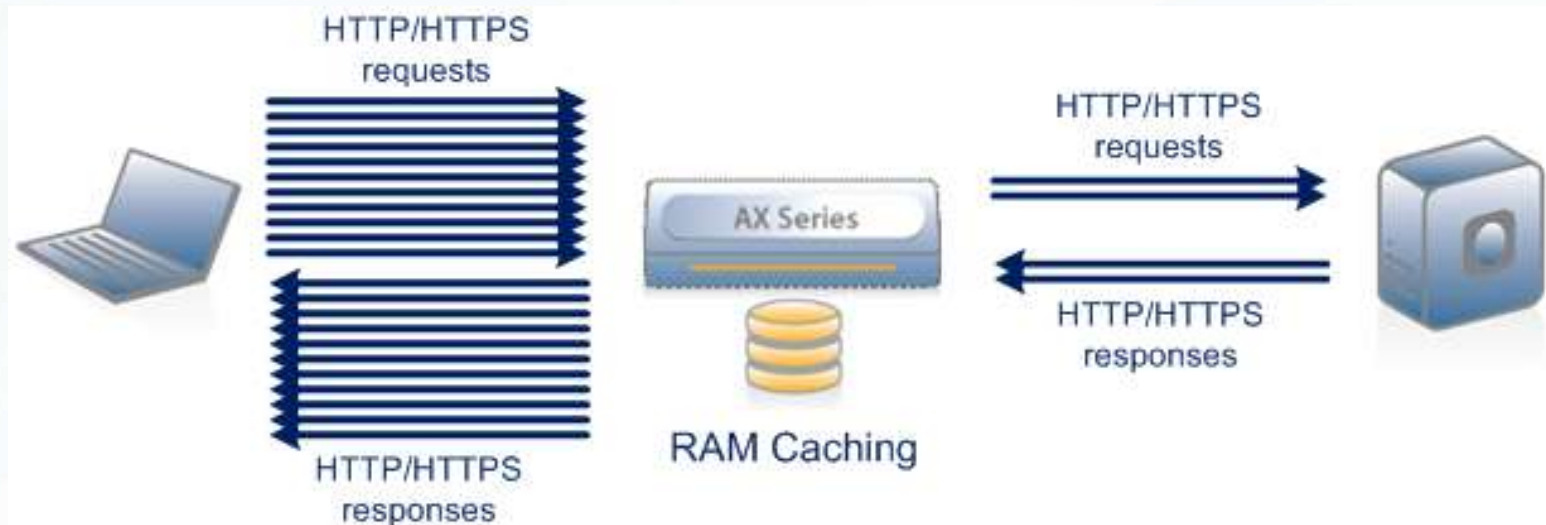
Name	Connections		Packets	
	Current	Total	Forward	Reverse
www/fd00:1::12	6	15	211	272
TCP/80	6	15	211	272
80 (server-v4)	6	15	211	272

# "For the same price", what other benefits can your A10 Networks device provide?

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## ➤ The same A10 Networks device also can provide:

5. Faster applications and services, supporting more concurrent users
  - ◆ Techniques: Load Balancing + HTTP Compression + TCP Multiplexing + SSL Off load + RAM Caching



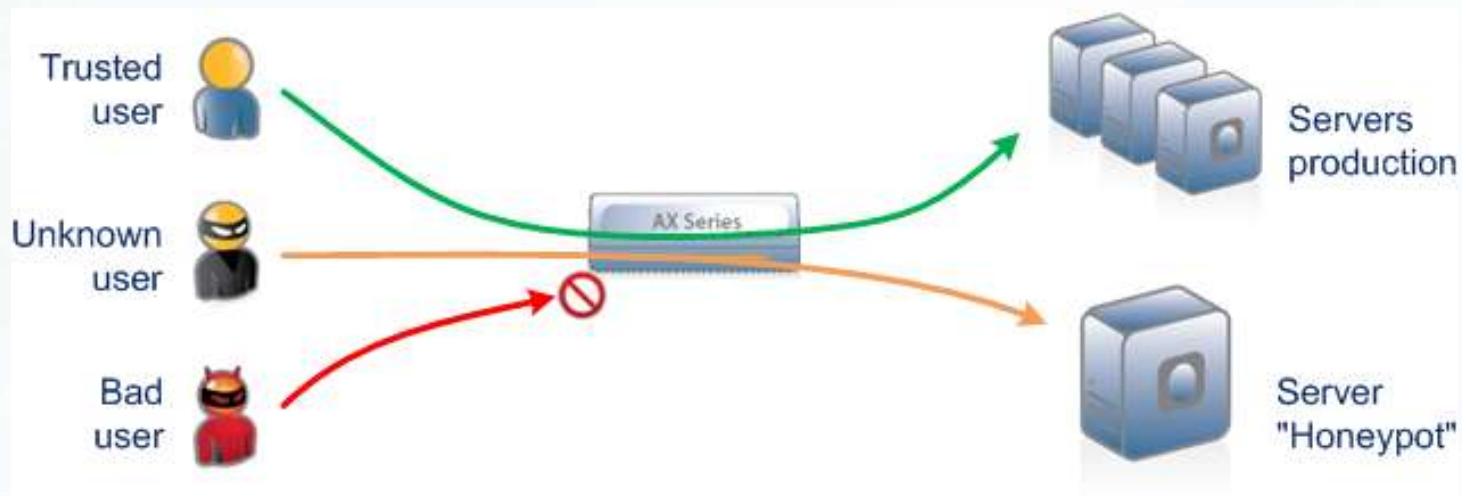
# "For the same price", what other benefits can your A10 Networks device provide?

A10

## ➤ The same A10 Networks device also can provide:

### 6. Higher protection

- ◆ Techniques: DDoS protection + protocol sanity check + Rate Limiting + hide server information



# "For the same price", what other benefits can your A10 Networks device provide?

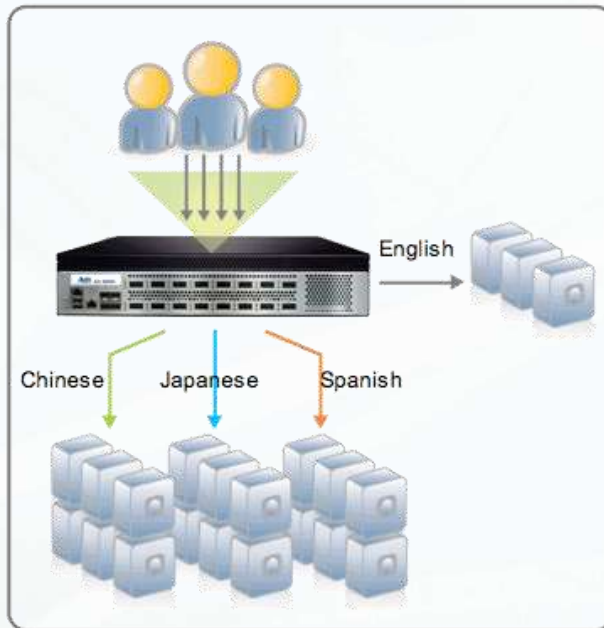
A10

## ➤ The same A10 Networks device also can provide:

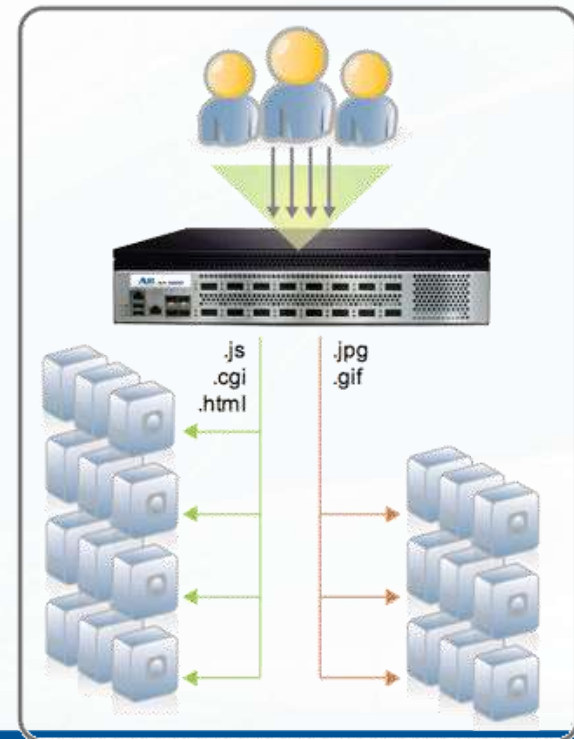
### 7. High flexibility

#### ◆ Techniques: aFleX

Automatically Provide Content in the User's Language

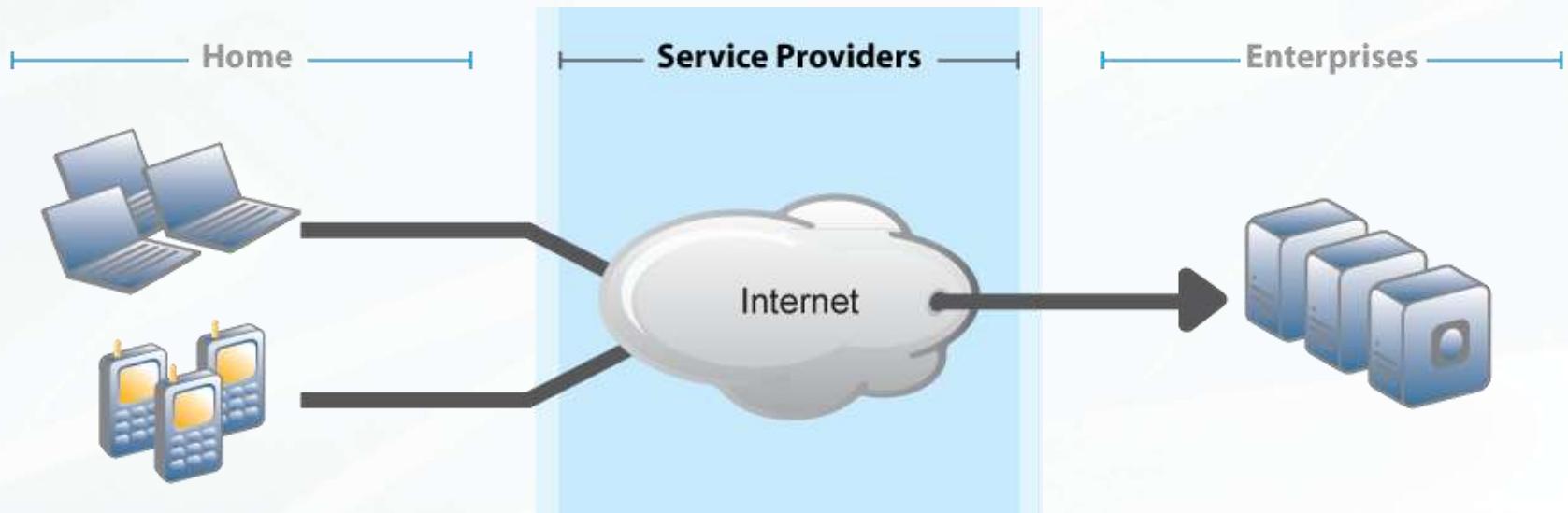


Reallocate Requests by Content Type to Optimize Data Center Resources



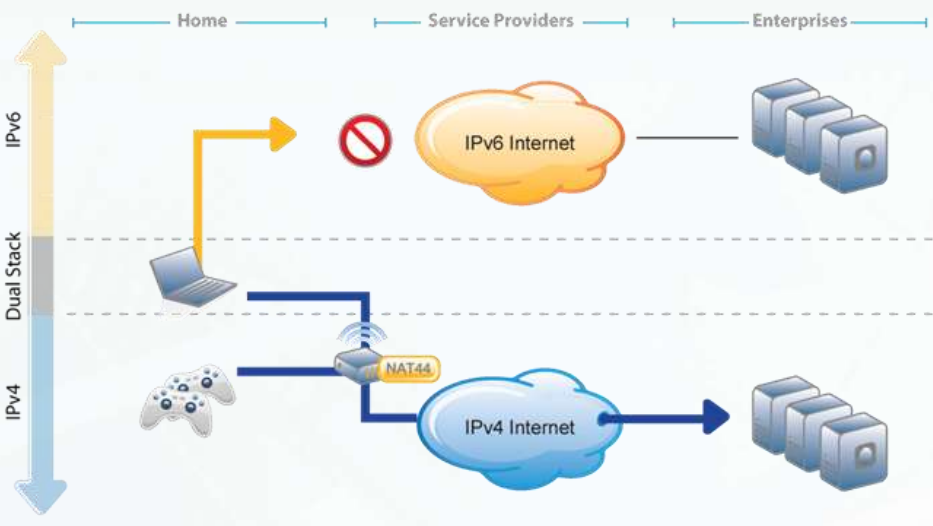
Case2:

# Service Providers *(a little bit more complex)*

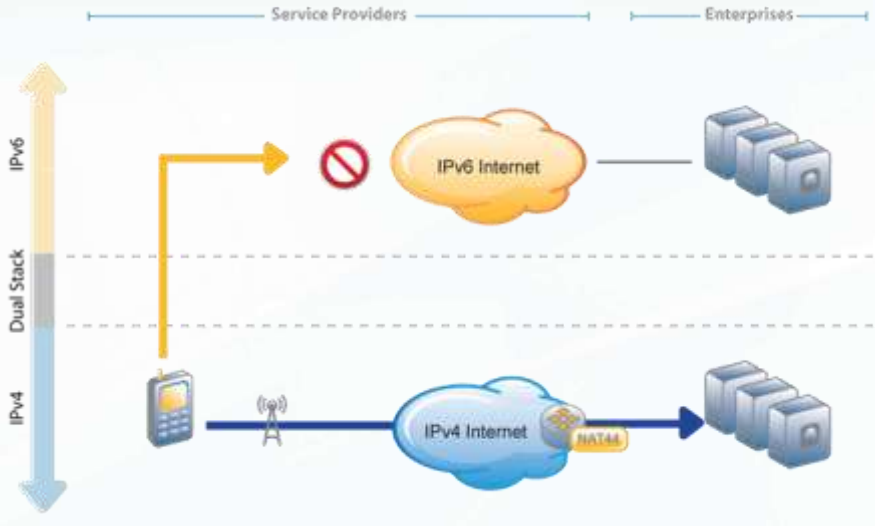


# Service Provider challenges today

## Typical ISP



## Typical MNO



### ➤ Main Challenges

- ◆ IPv4 exhaustion, IPv4 addresses for new subscribers
- ◆ No IPv6 services

# Solutions to IPv4 exhaustion

- ▶ **NAT using Large Scale NAT (also known as “CGN”)**
  - ◆ Benefits of LSN
    - ◇ Fairness
      - ◇ Guaranteed NAT resources via user quotas
    - ◇ Transparency
      - ◇ Minimum-to-no impact on most applications, including P2P applications
      - ◇ Still requires ALG for some applications; ex: FTP, PPTP
  - ◆ Techniques using LSN
    - ◇ **NAT44** – Strong interest with some deployments by MNOs. No ISP interest.
      - ◇ *Does not provide IPv6 access!*
    - ◇ **NAT444** – Strong interest with some deployments by ISPs. No MNO interest.
      - ◇ *Does not provide IPv6 access!*
    - ◇ **DS-Lite** – Some interest by ISPs; no deployments yet. Almost no MNO interest.
      - ◇ *Provides IPv6 access at the same time*

# Solutions for IPv6 service access

## ➤ Dual-Stack IPv4 and IPv6

- ◆ Some interest, deployed by some ISPs. No MNO interest.
- ◆ Sounds great; why is it not deployed more?
  - ◇ Increased OPEX/CAPEX + Requires Dual-Stack up to the CPE
  - ◇ Does not solve IPv4 exhaustion (requires NAT44 or NAT444)



## ➤ Encapsulation using 6-to-4 or 4-to-6

- ◆ Techniques using encapsulation
  - ◇ **6rd/6to4/6rd-PT** – Some interest, deployed by some ISPs. No MNOs.
    - ◇ *Does not solve IPv4 exhaustion. Must be combined (requires NAT44 or NAT444).*
  - ◇ **DS-Lite** – Some interest + not deployed yet by some ISPs. Almost no MNO interest.
    - ◇ *Does solve IPv4 exhaustion at the same time*



## ➤ DNS + NAT with Protocol Translation

- ◆ DNS64/NAT64 – Some interest by ISPs + MNOs.
  - ◇ Does solve IPv4 exhaustion at the same time



# Test Lab for your trial (1/3)

A10

## ➤ Before testing the solution:

- ◆ Select a solution!

*Note: You may select multiple solutions if your network varies in different regions.  
For instance, some regions have IPv6 in the core networks while others don't.*

## ➤ Once the solution is selected:

1. Start in a lab
2. Follow up with a "controlled" area
3. Deploy widely

# Test Lab for your trial (2/3)

## ➤ And in each step:

- ◆ Validate ALL applications with ALL operating systems

*Note: We all agree that's impossible. That said, validate the most popular ones on major operating systems and their different versions (Windows, Mac, iPhone, Android, etc.):*

- ◆ *Web with HTTP + HTTPS (popular web sites)*
  - ◆ *Webmail (gmail, yahoo, msn, etc.)*
  - ◆ *Streaming (iTunes, pandora, hulu, netflix, etc.)*
  - ◆ *IM (Yahoo, Gtalk, Skype, MSN, etc.)*
  - ◆ *VoIP (Vonage, etc.)*
  - ◆ *File transfer (FTP, SCP, idrive, box.net, dropbox, etc.)*
  - ◆ *P2P (Bittorrent, Limewire, emule, etc.)*
  - ◆ *Gaming (Xbox, PS3, Wii; etc.)*
  - ◆ *Others (RDC, VNC, NTP, Speedtest, Windows/Mac updates, antivirus updates, etc.)*
- ◆ *Keep some points in mind:*
    - ◆ *With encapsulation techniques (DS-Lite, 6rd):*
      - ◆ *Is fragmentation an issue?*
      - ◆ *Is security an issue?*

# Test Lab for your trial (3/3)

## ▶ Always ask for support

- ◆ Vendors are here to help
- ◆ More and more consultants with expertise are available

# Thank You



## ➤ For more information

- Service Providers
- Enterprises/Content Providers

## ➤ Visit [ipv6.a10networks.com](http://ipv6.a10networks.com)

- We also support legacy IPv4 clients at [www.a10networks.com](http://www.a10networks.com) ☺