WELCOME

ALCATEL-LUCENT WORLD IPv6 DAY
OBSERVATIONS
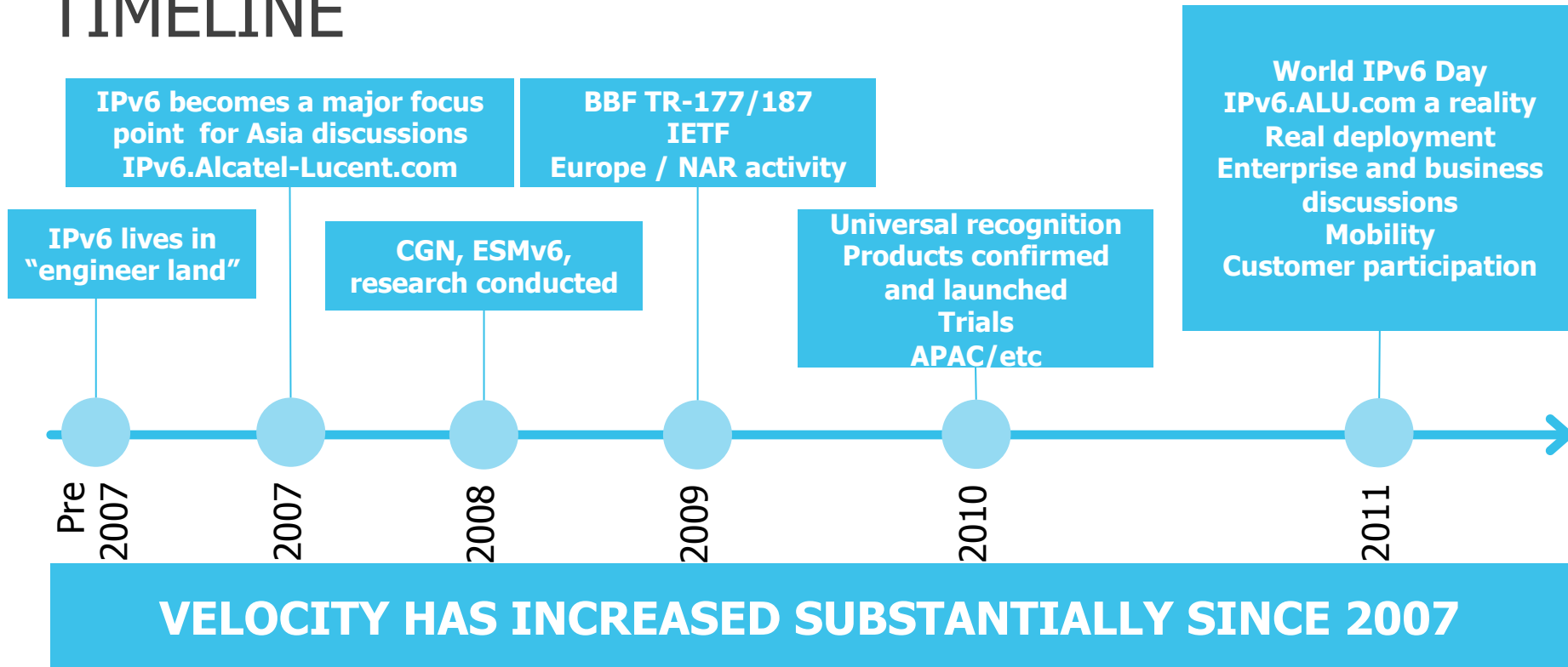
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August 2011

WORLD IPv6 DAY
TIMELINE

World IPv6 Day
IPv6.ALU.com a reality
Real deployment
Enterprise and business discussions
Mobility
Customer participation

IPv6 becomes a major focus point for Asia discussions IPv6.Alcatel-Lucent.com

BBF TR-177/187 IETF Europe / NAR activity

IPv6 lives in "engineer land"

CGN, ESMv6, research conducted

Universal recognition Products confirmed and launched Trials APAC/etc

Pre 2007

2007

2008

2009

2010

2011

VELOCITY HAS INCREASED SUBSTANTIALLY SINCE 2007

3

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A TIMELINE

Start

World IPv6 Day Announced

Internal agreement for participation. IT confirms they will do it

IT update: problems encountered!

Plan B commences

Go Live

Great Success!

2007

Jan 2011

Feb 2011

1700h 02 Jun 2011

03 Jun 2011

08 Jun 2011

09 Jun 2011

AT THE SPEED OF IDEAS
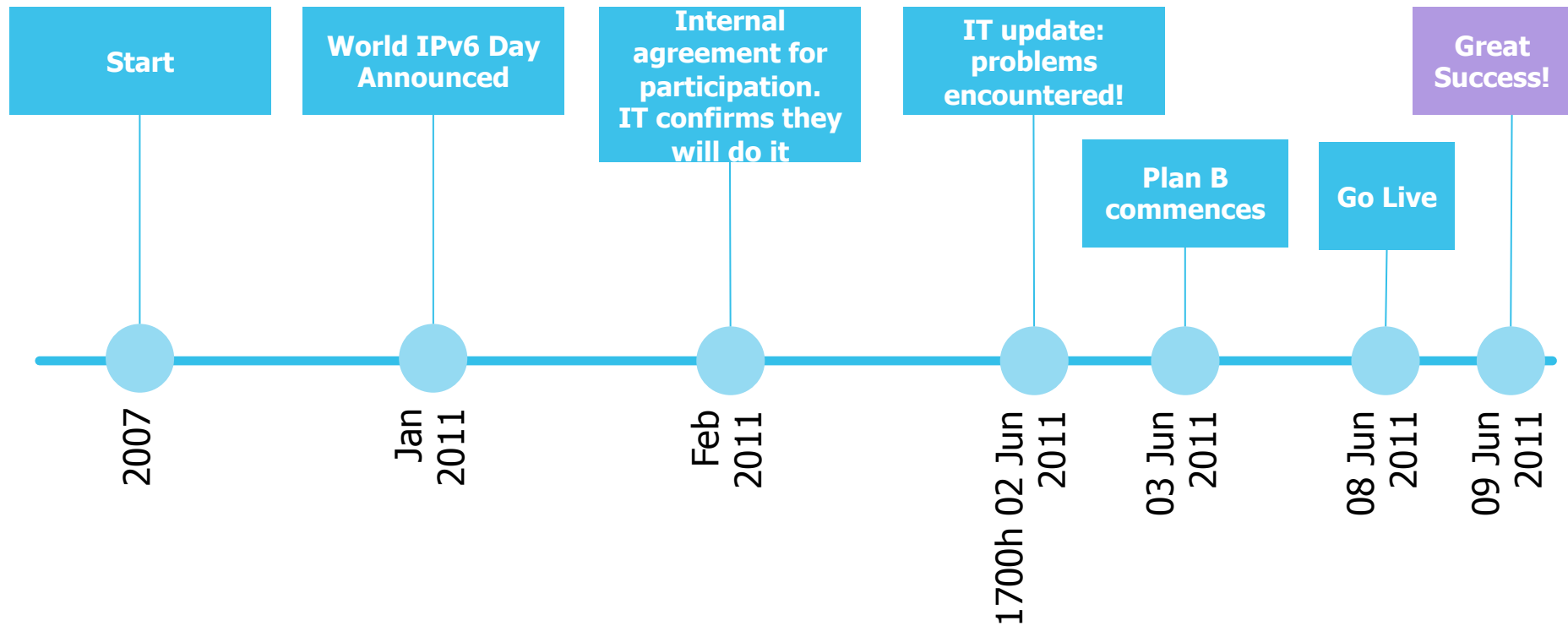
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ARCHITECTURE

CDN Node

Client

CDN Node

Border Routers

Firewalls

Load Balancers

Switching

Content Servers

Alcatel-Lucent datacenter
Naperville, IL

AT THE SPEED OF IDEAS
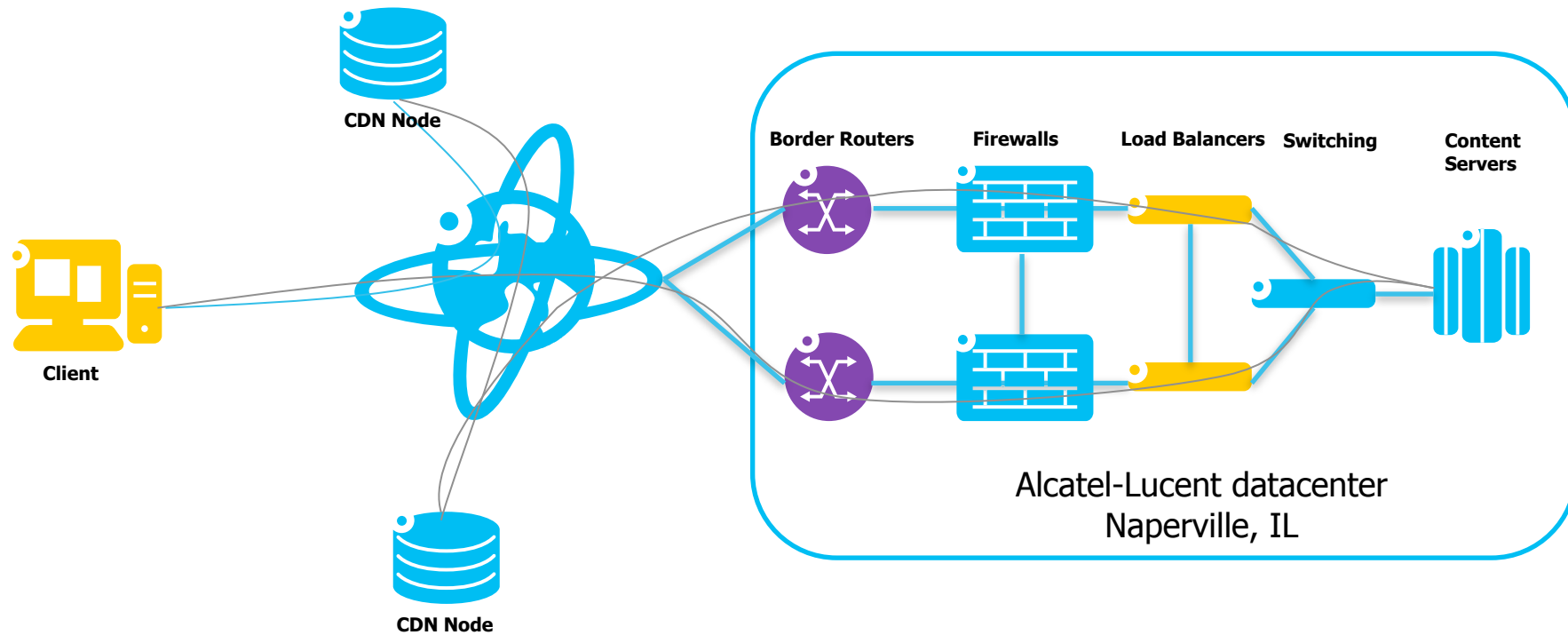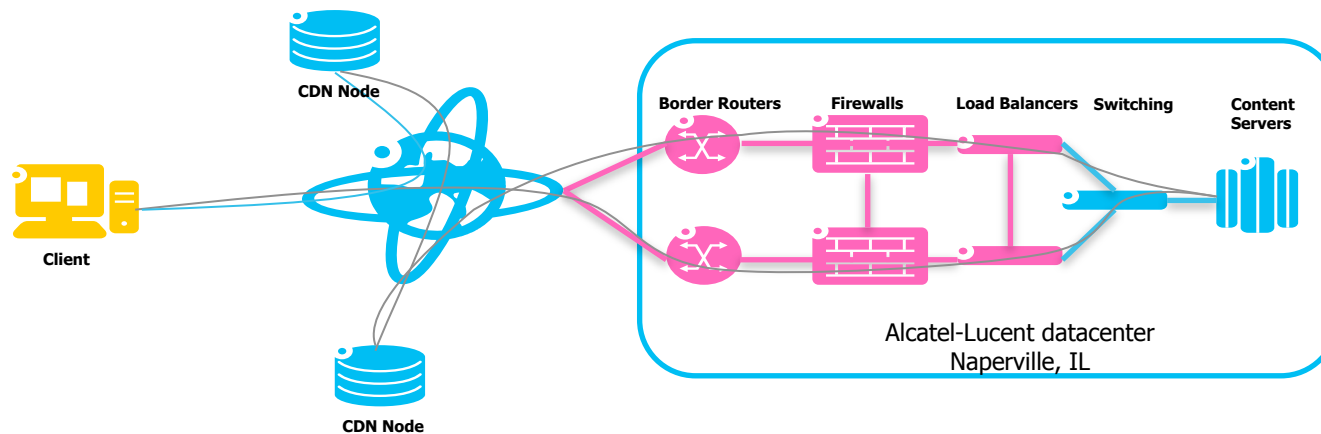
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PLAN A

- Dual stack DMZ infrastructure

- Enable IPv6 VIP on load balancer towards IPv4 real servers

- Publish AAAA records for www.alcatel-lucent.com

CDN Node

Border Routers   Firewalls   Load Balancers   Switching   Content Servers

Client

Alcatel-Lucent datacenter
Naperville, IL

CDN Node

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CHALLENGES

- Naperville datacenter is a relatively legacy location with limited recent investment in DMZ

  - Older model network equipment with limited or no IPv6 support

- No IPv6 transit at Naperville

  - Available from most of our transit providers, but not implemented

- CDN is used for delivery of main website and support sites

  - Problems for AAAA record deployment

- Business

  - Unwillingness to "risk" our primary website (customer support, etc) for an IPv6 day

  - Cost of implementing something with limited or no perceived value

  - Support from IT personnel
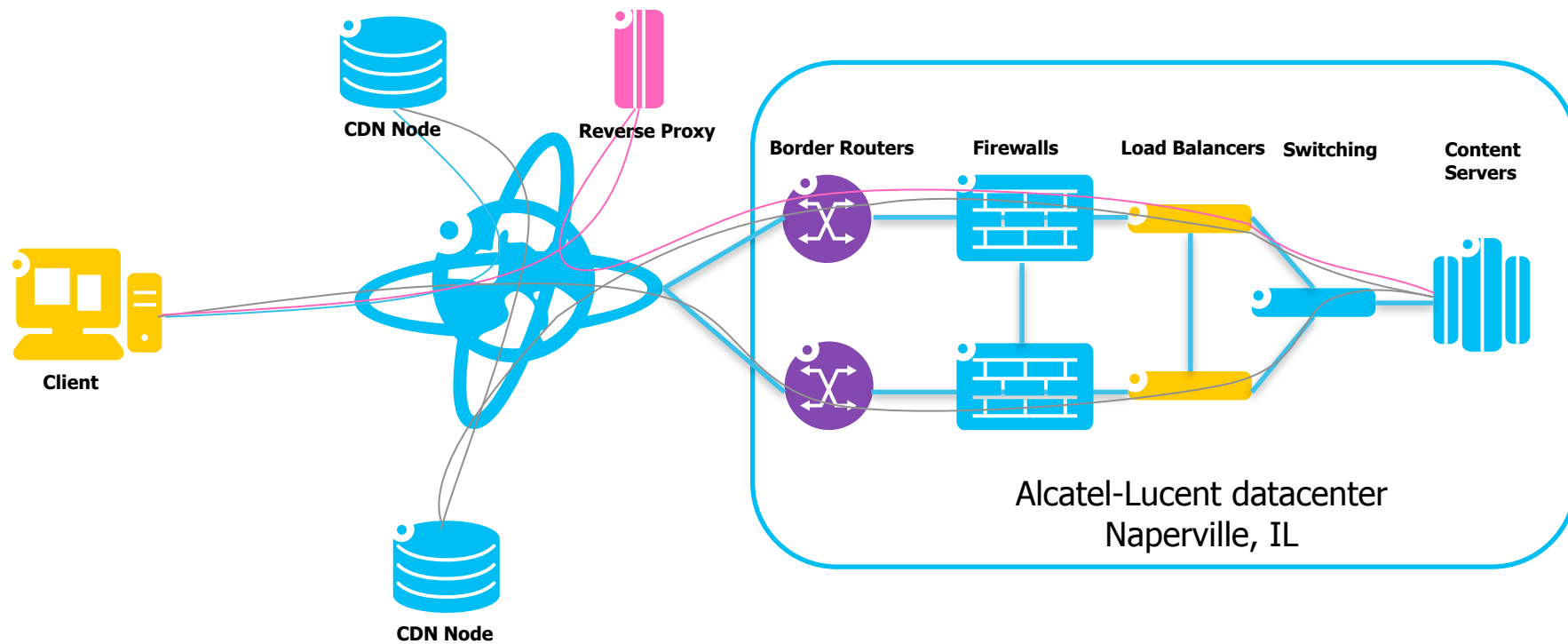
- Political

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PLAN B

- Panic mode from very late notification that IT delivered IPv6 site was not going to happen

- A quick solution was devised that will allow us to get us through World IPv6 Day

- Coordination with CDN operator was critical

  - Moved to a temporary CDN platform

  - CDN operator published AAAA record pointing towards our own IPv6 server

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PLAN B ARCHITECTURE

CDN Node

Reverse Proxy

Border Routers   **Firewalls**   **Load Balancers**   **Switching**   **Content Servers**

Client

CDN Node

Alcatel-Lucent datacenter
Naperville, IL

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PLAN B ARCHITECTURE

- Simple Apache reverse proxy located in a non-ALU native dual-stacked environment

- Configured as ipv6.alcatel-lucent.com

- Reverse proxies to IPv4 real site

- Rewrites all instances of www.alcatel-lucent.com to ipv6.alcatel-lucent.com

  - Primarily for testing and users connecting to ipv6.alcatel-lucent.com

- Seemed to work well in testing, so we published the AAAA records...

- ...but a small problem was encountered when we went live

```
<VirtualHost *:80>
ServerName ipv6.alcatel-lucent.com
CustomLog /var/log/apache/ipv6.alcatel-lucent.com/access_log combined
ProxyRequests Off
ProxyVia On
ProxyPass / http://www.alcatel-lucent.com/
ProxyPassReverse / http://www.alcatel-lucent.com/
DefaultType text/html
AddOutputFilterByType SUBSTITUTE text/html
Substitute "s|www.alcatel-lucent.com|ipv6.alcatel-lucent.com|in"
</VirtualHost>
```

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PLAN B

```
www.alcatel-lucent.com is a nickname for alcatel- lucent.v6day.akadns.net
alcatel-lucent.v6day.akadns.net has address 96.6.227.82
alcatel-lucent.v6day.akadns.net has IPv6 address 2607:f0b0:0:15:209:87:239:35
```

- When the AAAA was published, the reverse proxy suddenly locked up

- Because it proxied to itself

  - Proxying to www.alcatel-lucent.com worked just fine, **until** the AAAA records were installed, as they pointed to the proxy

- A quick change to the correct origin URL was implemented in the proxy

- Business as usual

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OBSERVATIONS

HITS
• 26,070 total hits • 18,493 IPv6-only hits • 333 unique IPv6 hosts

PROTOCOLS
• 9 hits via 6to4 • DE/ZW/PG/TK/US/NZ • 1 hit via Teredo • Remainder were 'native'

TOP FIVE COUNTRIES
1. France (86) 2. USA (71) 3. China (32) 4. Canada (17) 5. UK (20)

• A lot of unique hosts only made a few requests and did not appear to be human visitors

• France both has Iliad (free.fr) and is Alcatel-Lucent's HQ accounting for the high number of FR visitors

• A lot of traffic we received appeared to be research oriented traffic

• A couple of surprises included seeing what appeared to be Verizon Wireless LTE clients connecting over IPv6

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WORLD IPv6 DAY OBSERVATIONS

- Customer interest significantly increased after World IPv6 Day was announced

  - In the two months immediately prior to World IPv6 Day we had significant interest from operators across the globe about what they should be doing with IPv6, what we were doing, etc

- Observations from TAC and Managed Service NOCs did not see any increase in tickets due to World IPv6 Day

- Overall traffic volumes did not change in any meaningful manner

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LONG TERM PLANS

- By the end of 2011 we hope to have www.alcatel-lucent.com and most of our related sites dual stacked

  - New datacenter being designed and deployed includes native IPv6 services from day one

  - Some services (e.g. DNS) are distributed in multiple locations which makes universal native IPv6 deployment tricky, but will happen

  - Training and IPv6 knowledge is still a challenge

- Internally we are experimenting with our WAN by using 6over4 static tunnels between locations, long term plan is to implement IPv6 on WAN

  - We've mandated IPv6 in all new IP service (transit, IP-VPN) RFPs

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THE
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