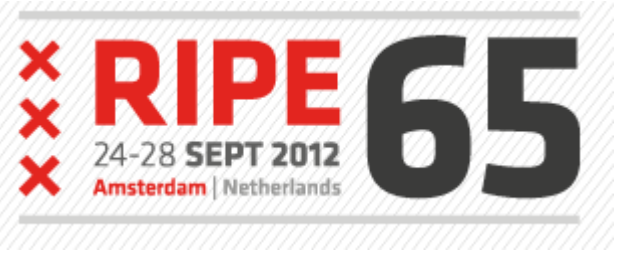

IPv6 Deployment And W6L issues

Yannis Nikolopoulos
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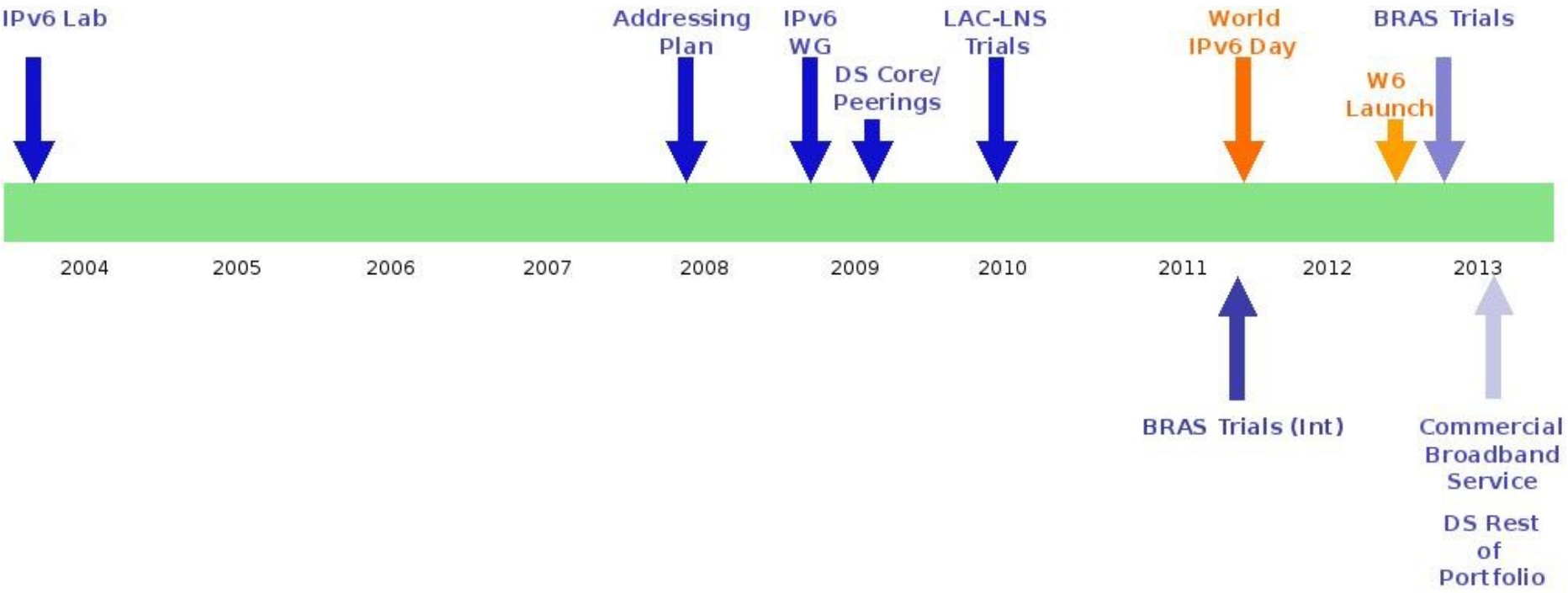
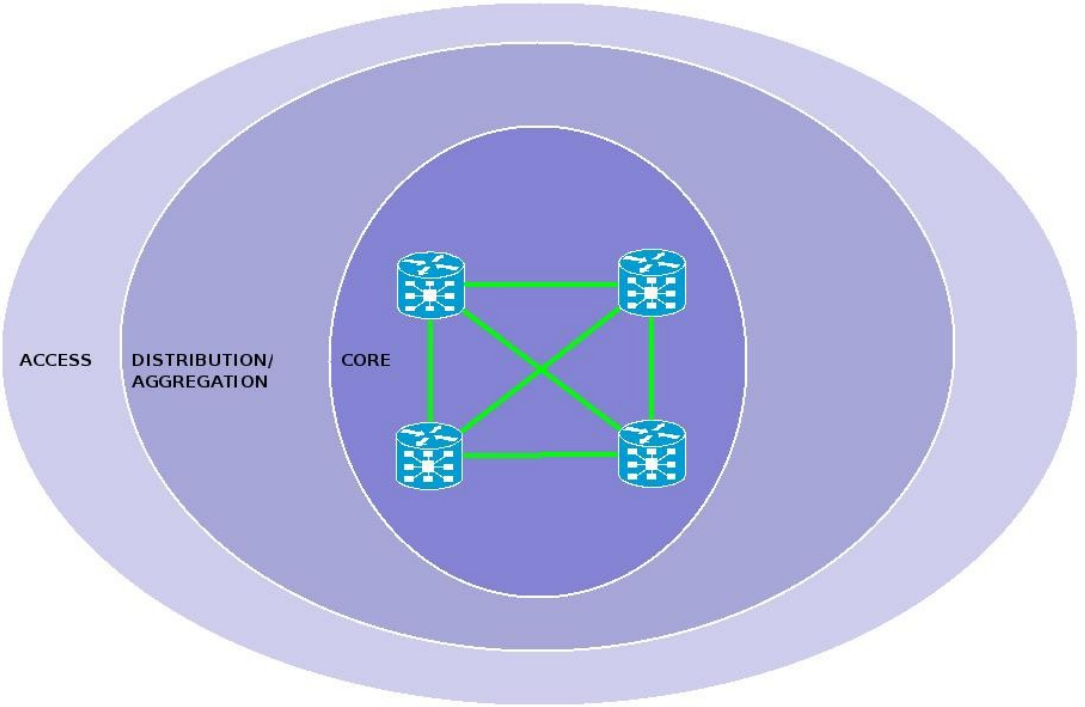
Company in Brief

- Largest Greek ISP/TelCo
- 1.4 million broadband subscribers (ADSL2+)
- 3.2 million land-lines
- 50k IPTV subscribers
- IMS (Public Sector)
- 150 Gbps xconnections (intl,local IX)

IPv6 Timeline



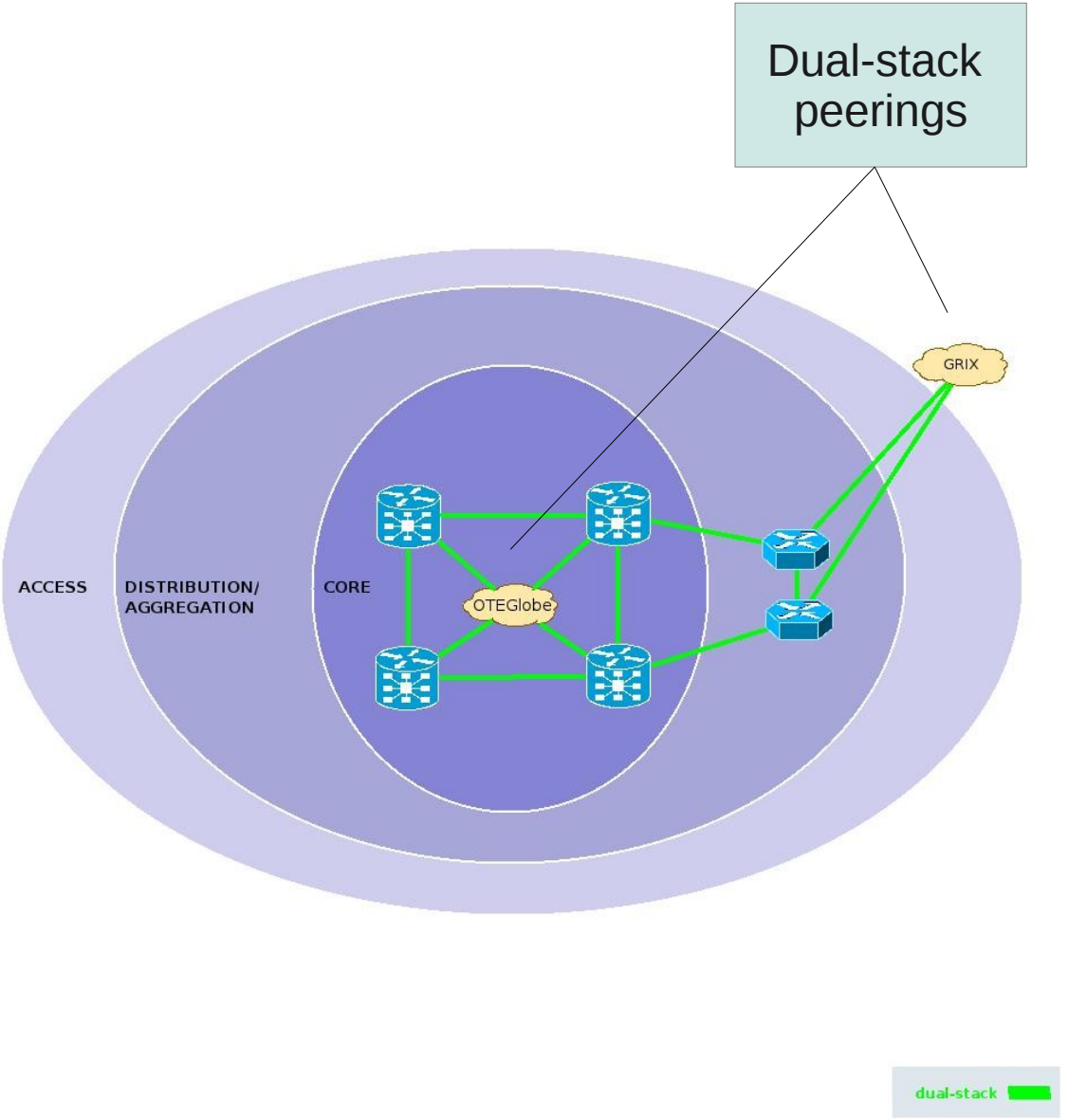
Deployment



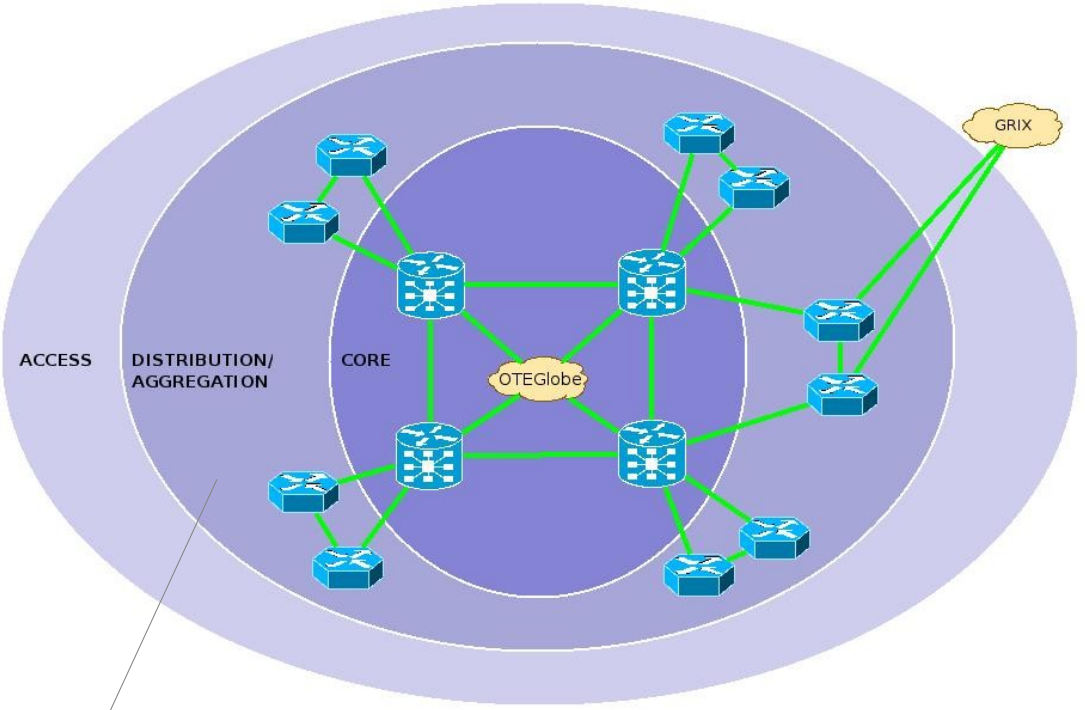
dual-stack

Transition method of choice: Dual Stack
Direction: CORE->EDGE

Deployment


Dual-stack peerings
GRIX
ACCESS
DISTRIBUTION/ AGGREGATION
CORE
OTEGlobe
dual-stack

Deployment

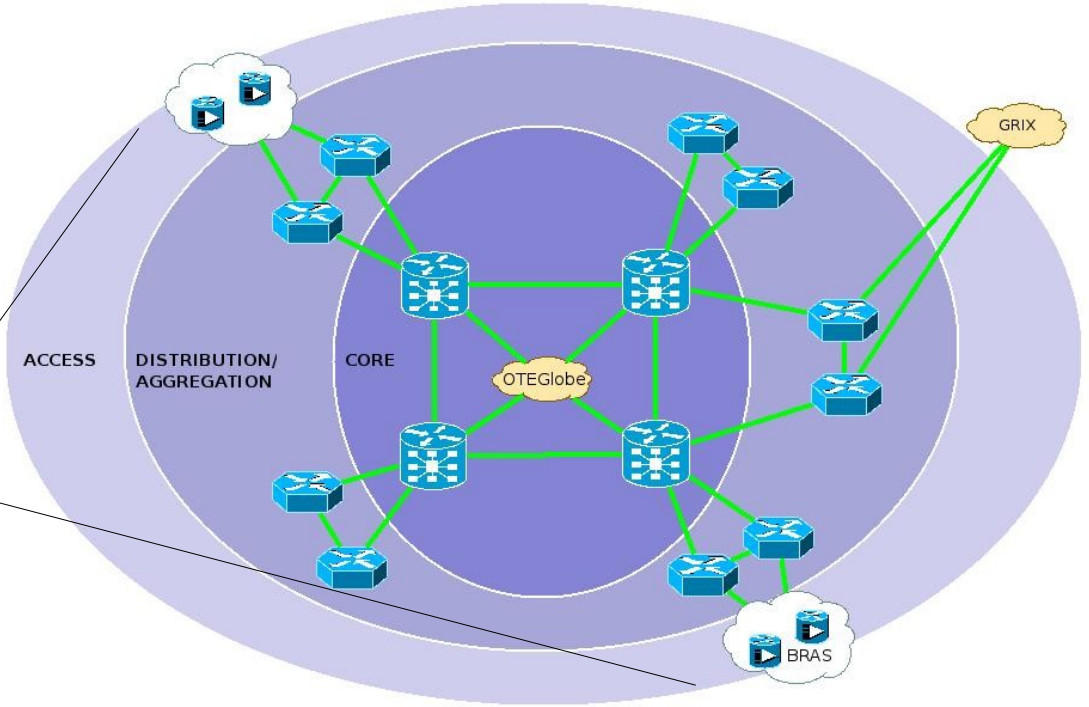


dual-stack

Aggregation layer
Fully dual-stacked

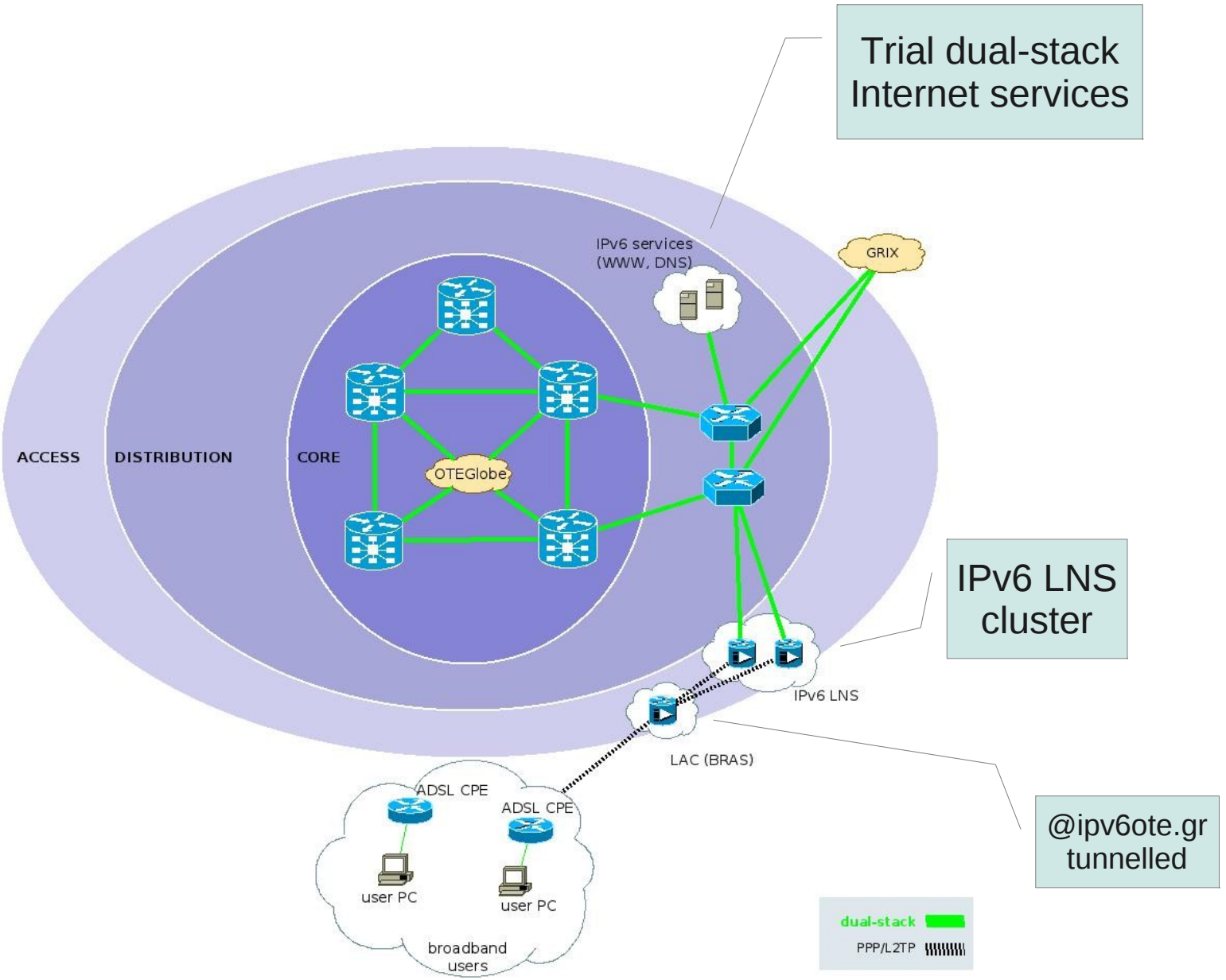
Deployment

Access layer
Dual-stack
(core-facing)

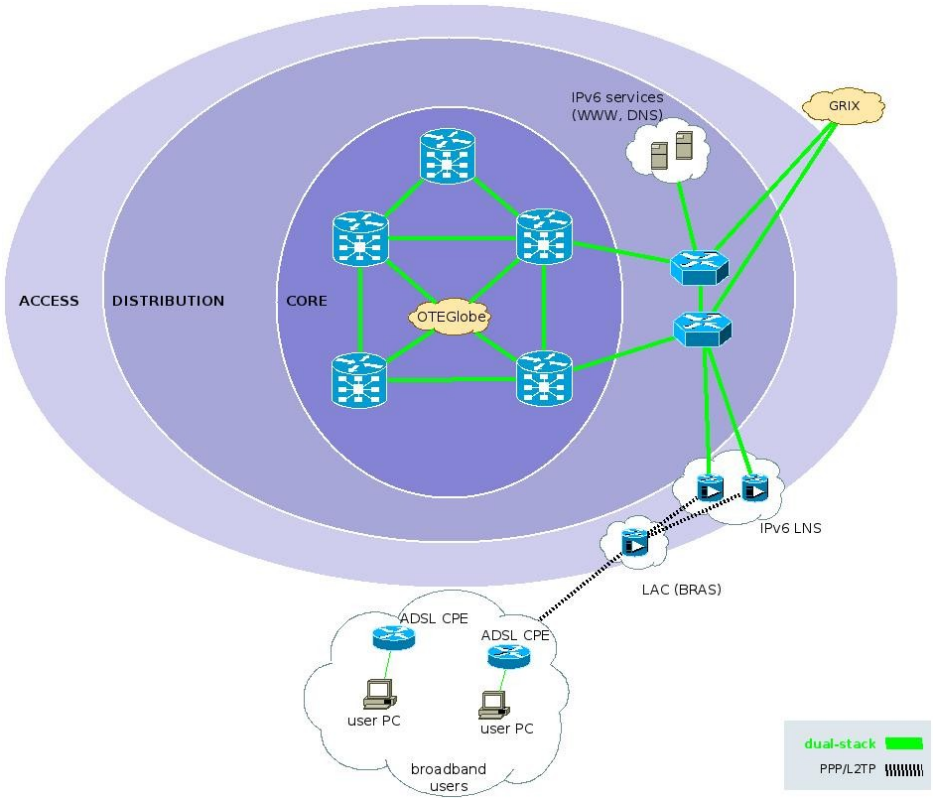


dual-stack

Ongoing Trials: LAC-LNS

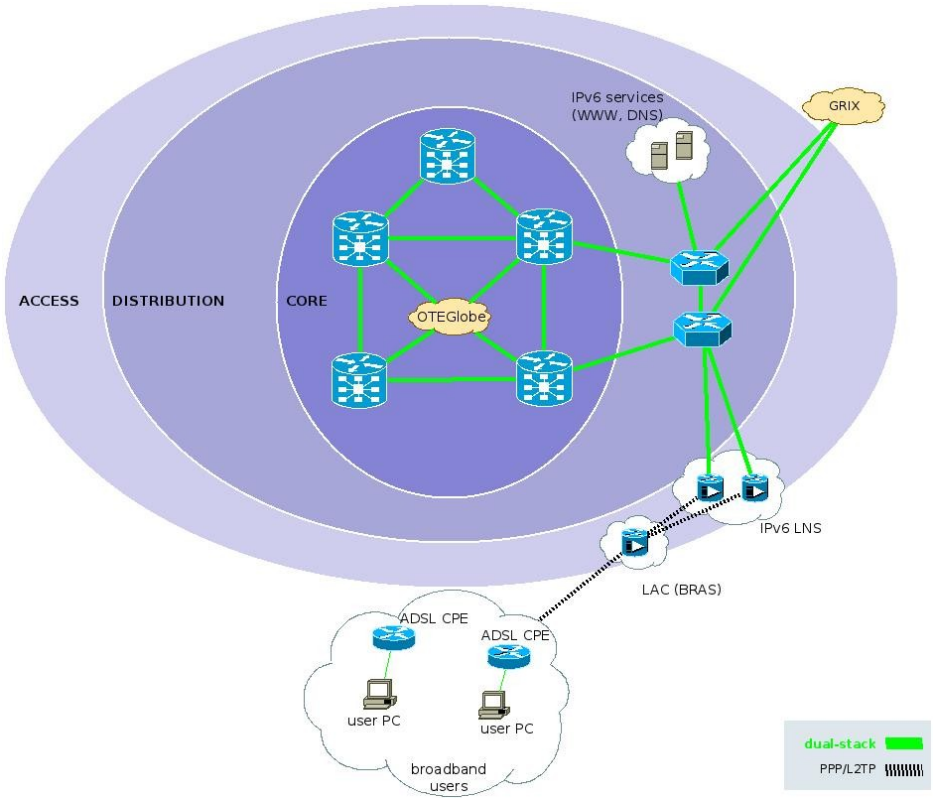


Ongoing Trials: LAC-LNS:Static



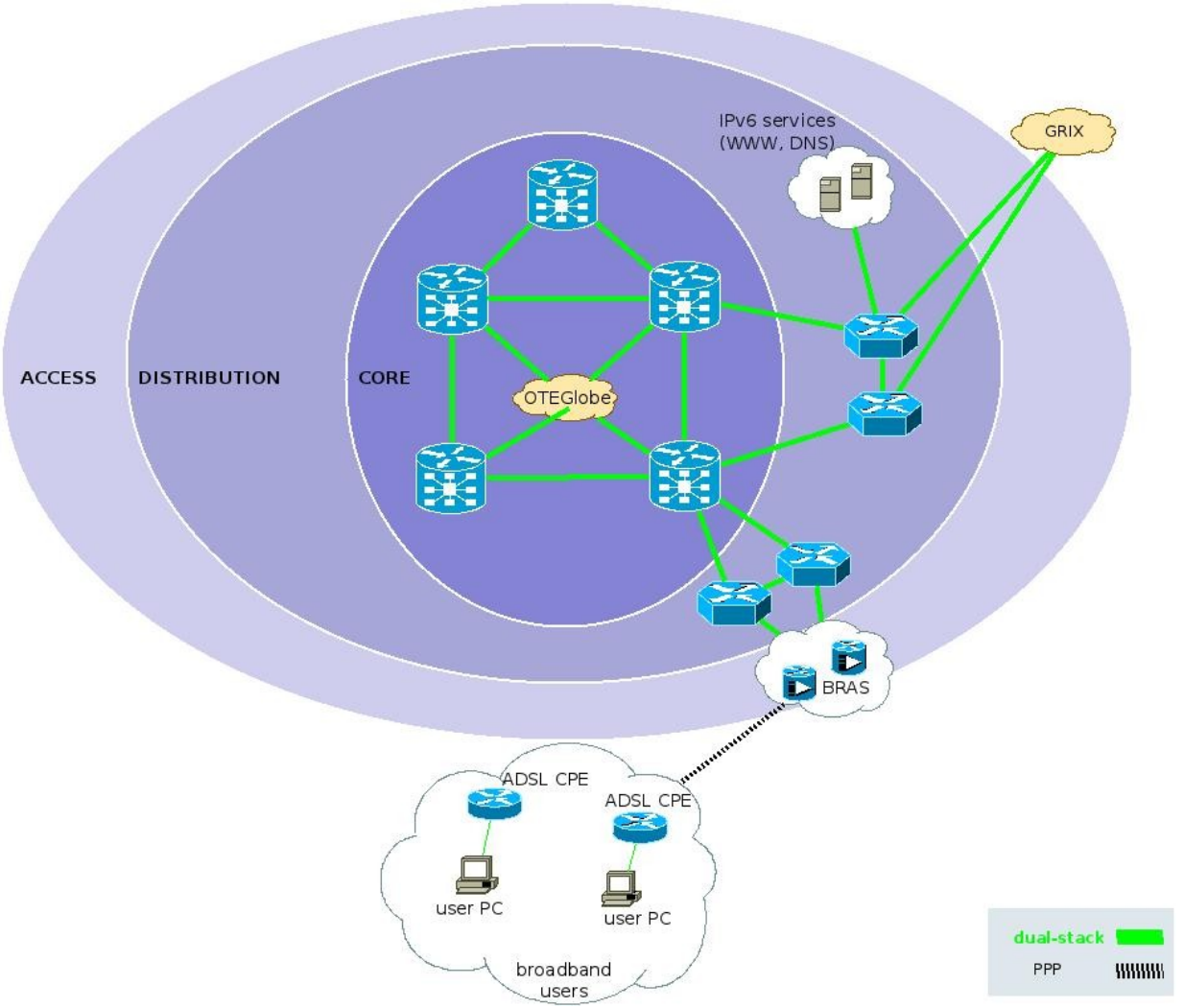
- Static /56 assigned to user
- No RDNS support (yet)

Ongoing Trials: LAC-LNS:Static:Future



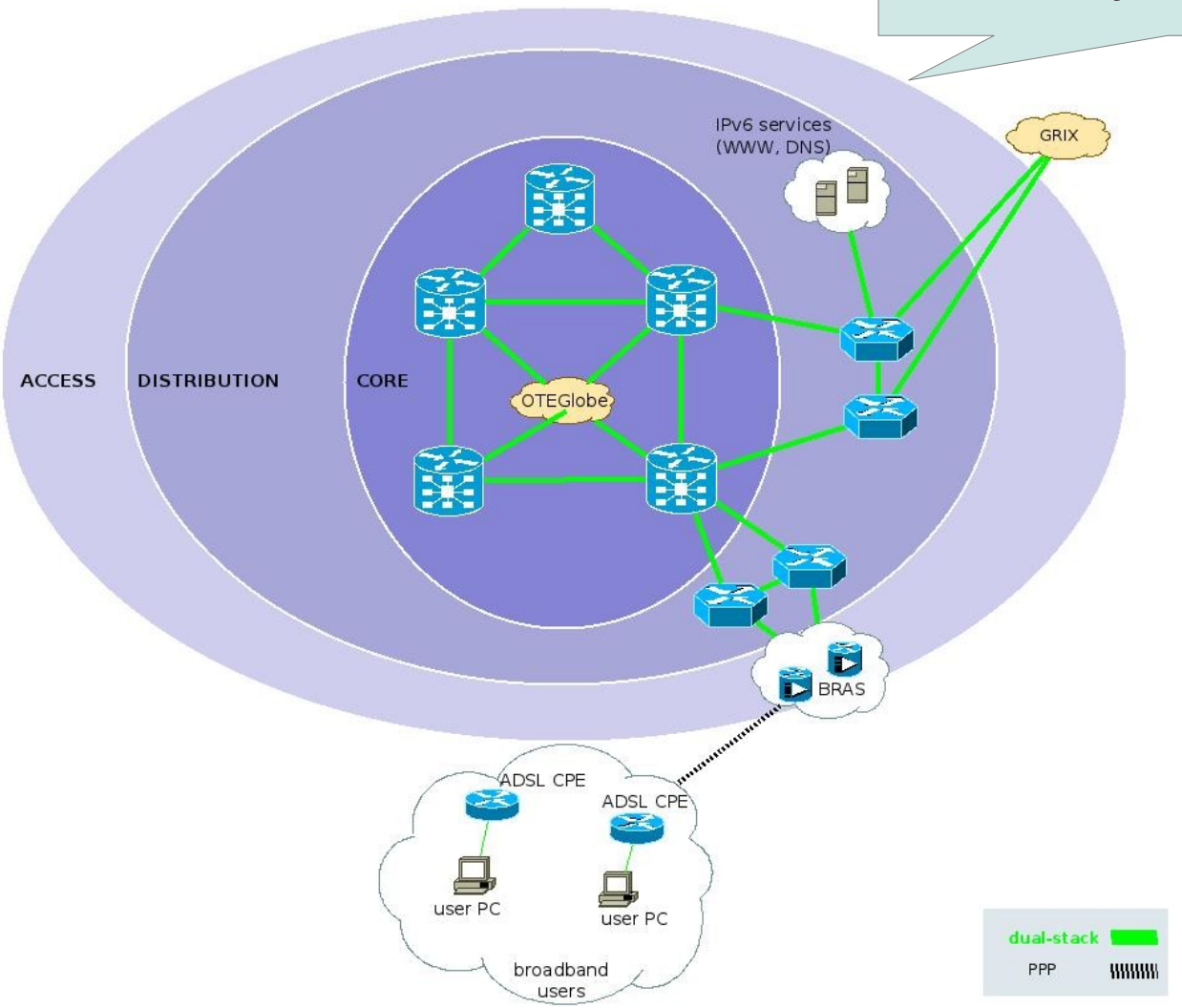
- Static /56 assigned to user
- No RDNS support (yet)
- Static Pools will be “local” (per PoP?)
- No “roaming” static

Upcoming Trials:BRAS



Upcoming Trials:BRAS

- Enabled by default
- No extra configuration
- No extra provisioning
- User may “fall back” if needed



What Next?

Involve rest of organization

- IT: implement (OSS, provisioning)
- PD: discuss
- Sales: educate
- Call Centers: prepare (for the “new world”)

What Next?

- “adjust” existing products and services (for DS) Incorporate new features
- No re-branding necessary (hopefully)
- Next 18 months Critical commercial services launch

World IPv6 Launch

THE FUTURE WAS FOREVER
6 JUNE 2012

World IPv6 Launch:Preparations

- Spread the word
  - internally (Call Centers in specific)
  - Externally (our subscribers)
- IPv6 Brokenness

World IPv6 Launch:Brokenness

- Attempt to measure broken IPv6 connections
- Measurements according to http://fud.no/ipv6/
- Cooperation with Hellenic IPv6 Taskforce
- Web statistics from 2 high-traffic Greek sites

World IPv6 Launch:Brokenness

- Attempt to measure broken IPv6 connections
- Measurements according to http://fud.no/ipv6/
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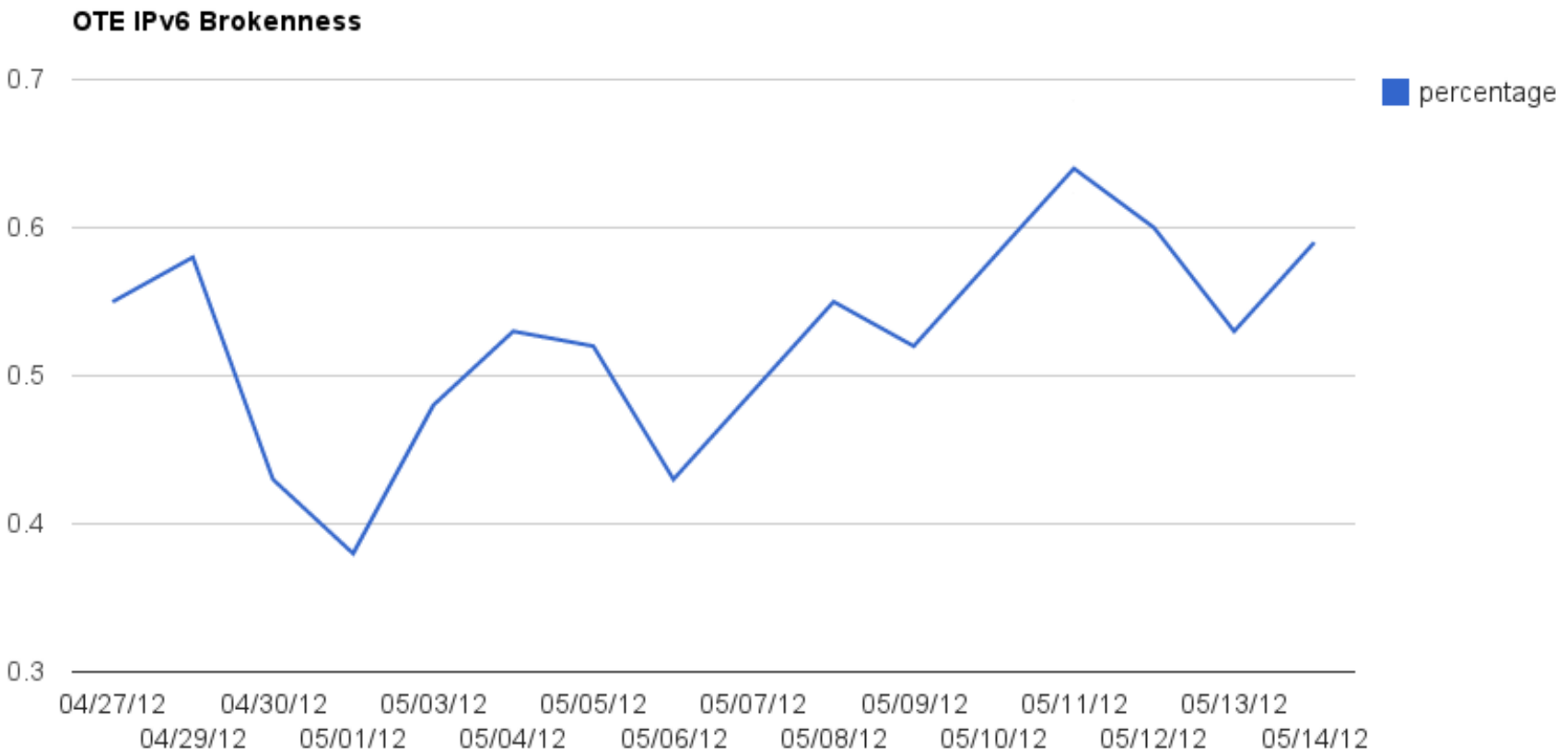
- Web statistics from 2 high-traffic Greek sites

- Country-wide Google Stats hinted the issue

World IPv6 Launch:Brokenness



Before World IPv6 Launch:The Issue

The Horror!

```
Προσαρμογέας Ethernet Τοπική σύνδεση:

   Επίθημα DNS συγκεκριμένης σύνδεσης: ipv6  tenet.gr
   Περιγραφή . . . . . . . . . . . . . : Broa com NetXtreme Gigabit Ethernet
   Φυσική διεύθυνση. . . . . . . . . . : F0-4 -A2-6D-5B-A4
   Ενεργοποίηση DHCP. . . . . . . . . . : Ναι
   Αυτόματη ρύθμιση ενεργή . . . . . . : Ναι
   Διεύθυνση IPv6. . . . . . . . . . . : 3ffe:501:ffff:100:4073:da3a:66f1:b606(Προτιμώμενο)
   Προσωρινή διεύθυνση IPv6. . . . . . : 3ffe:501:ffff:100:58ad:8e2a:d3ef:871e(Προτιμώμενο)
   Διεύθυνση IPv6 τοπικής σύνδεσης . . : fe80::4073:da3a:66f1:b606%10(Προτιμώμενο)
```

Before World IPv6 Launch:The Issue

- CPE advertises 3ffe prefix to its LAN interface even though IPv6 is disabled at the WAN interface
- Non-issue for trial dual-stack users
- big ISSUE for IPv4-only users accessing dual-stack sites!

Before World IPv6 Launch:The Issue

- CPE advertises 3ffe prefix to its LAN interface even though IPv6 is disabled at the WAN interface
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- big ISSUE for IPv4-only users accessing dual-stack sites!

CPE+v4 user+IE = disaster

Before World IPv6 Launch:The Issue

How did this issue remain invisible?

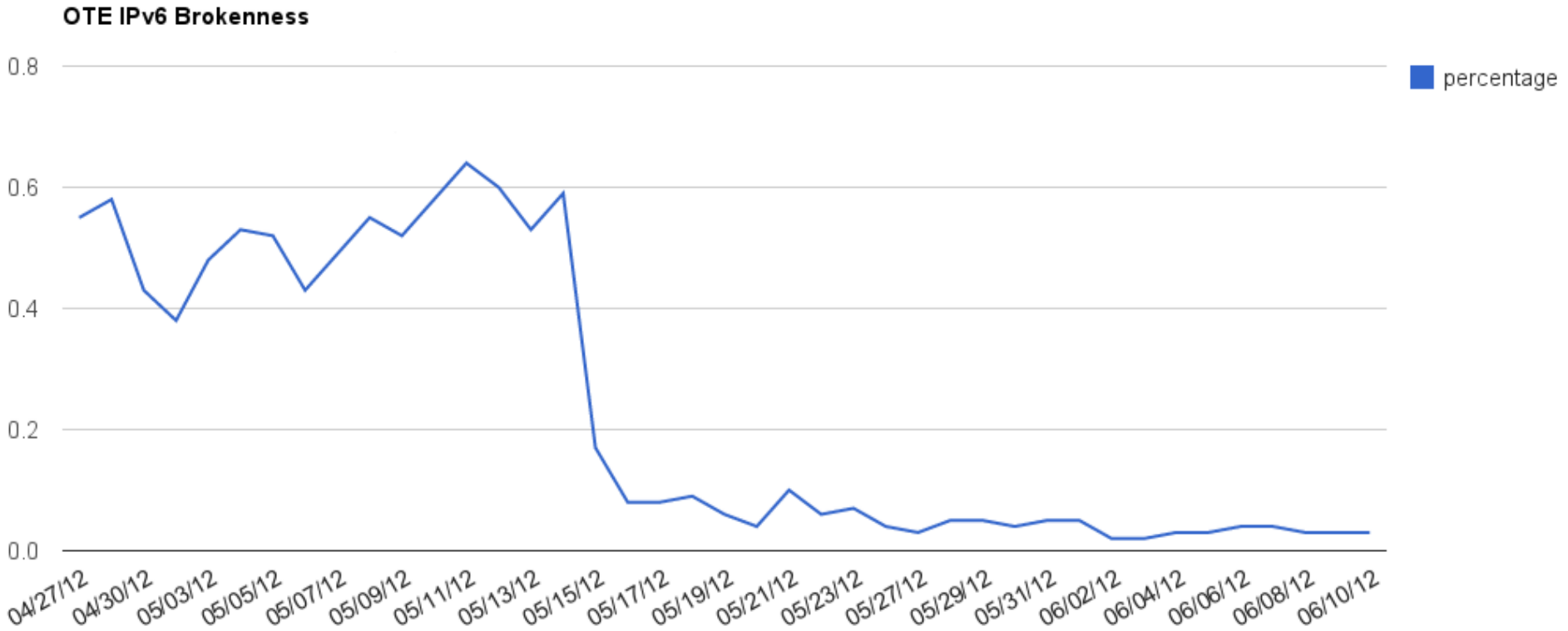
- Not many dual-stack sites before W6L, so customers' complaints falsely identified
- IPv6 feature set was optional(*) for the CPE in question (no rigorous testing)

(*)IPv6 feature set has been mandatory for the past 2 years

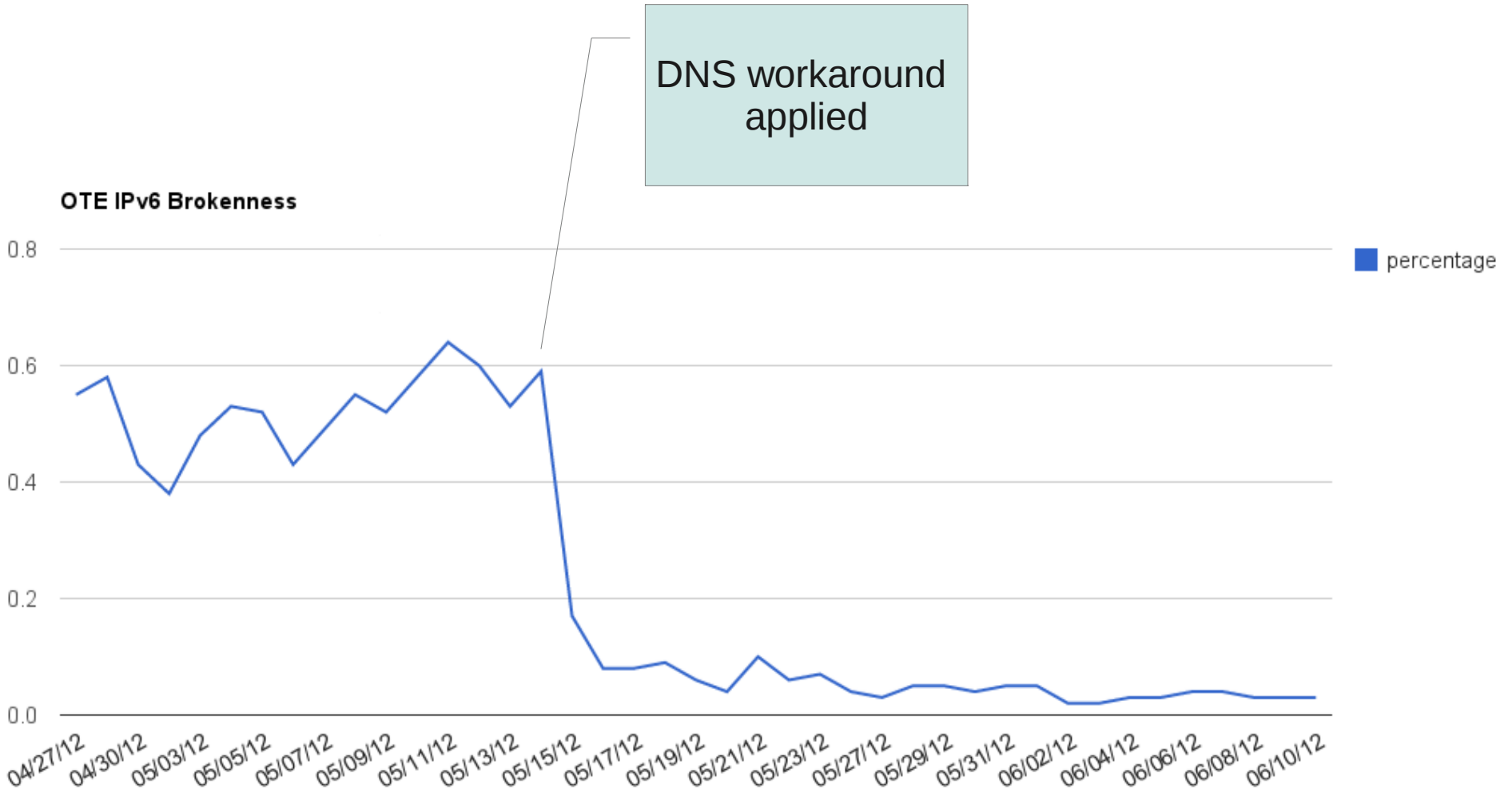
Before World IPv6 Launch:Actions

- Contact CPE vendor, request new firmware
- Implement DNS workaround
  - Trial users: unaffected
  - Rest of users: unaffected

World IPv6 Launch:Brokenness



World IPv6 Launch:Brokenness

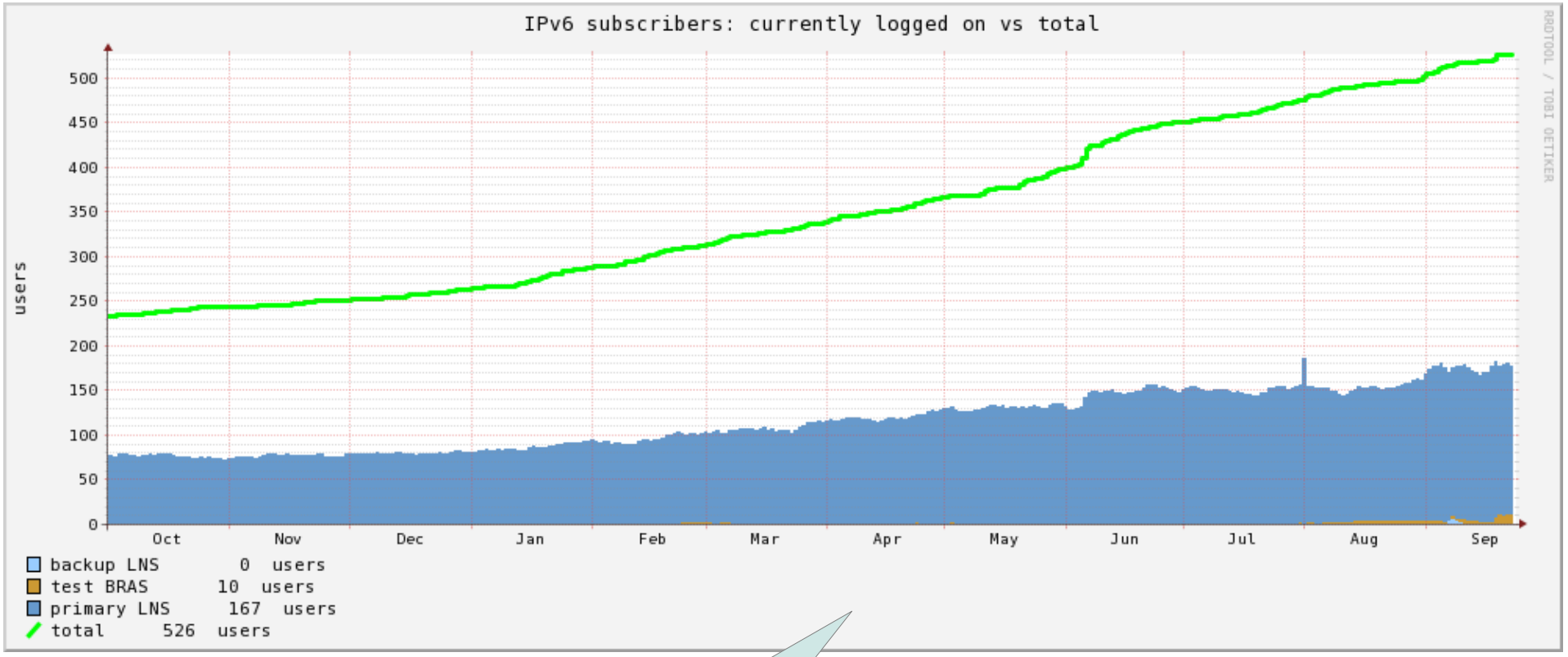


World IPv6 Launch:Brokenness

- DNS workaround is a temporary fix until new f/w
- New f/w is nowhere to be seen yet...

- DNS workaround “masking” other possible issues (need to be on the lookout for “new” issues)

Statistics: Total IPv6 users (broadband)



Userbase expanding slowly
Driver needed for boost: CPE
(almost there)

http://ipv6.ote.gr
http://twitter.com/oteipv6
ipv6@otenet.gr