IPv6 Deployment at XS4ALL

XS4ALL

First Class Internet

Timo Hilbrink, September 2015

Coming This Summer: U.S. Will Run Out of Internet Addresses

With supply nearly gone, Microsoft and Amazon scramble to buy up spares

Microsoft Execs Expressed 'Shock and Disbelief' at Internet Address Shortage

Watch Out for Next Big Shortage: Internet Addresses

By Dan Well | Thursday, 14 May 2015 07:00 AM

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XS4ALL?

★ One of the first dutch internet providers

★ Established on May 1st 1993

★ Acquired by KPN in 1998

★ Approximately 250k subscribers

★ FTTH since October 2011

★ TV and VoIP

★ Personal website, e-mail

★ Hosting services, shared and dedicated

★ Colocation

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A little XS4ALL IPv6 history

★ 6bone space in Oct 2001

★ Two RIPE /32 prefixes in 2002 (now 2x /29)

★ Tunnel server

★ Free read-only IPv6 usenet server since 2002

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Native IPv6 for DSL subscribers

Technology used

★ Juniper MX960 BRAS and AVM Fritz!Box CPE

★ ATM and Ethernet (VPLS) transport layer

★ PPPoA and PPPoE

★ Single session, dual stack

    ★ IPCP and IPv6CP

    ★ DHCPv6 PD

    ★ DNS resolvers via DHCPv6

★ /48 prefix per subscriber

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CPE

⭐ First IPv6 capable model (7270) announced by AVM at CEBIT 2009

⭐ Followed by 7570, 7340, 7390, 7360, 7490

Pilot

XS4ALL native IPv6 pilot started on April 1 2010

★ Approximately 300 subscribers active

★ Provisioning tool: vi

★ Available CPE options

  ★ Cisco 87x and 88x

  ★ AVM Fritz!Box 7270 and 7570 with beta firmware

  ★ Draytek Vigor 2130 (with Vigor 120)

★ Feedback very positive

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Production

XS4ALL native IPv6 on xDSL since

August 26 2010

★ IPv6 option available in customer portal

★ Provisioning automatic

★ Native IPv6 support available in Fritz!Box 7340

  release firmware

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Production

★ Default enabled for new subscribers since may 2012

★ Enabled for all subscribers since june 2014

★ Currently ~165.000 active IPv6 connections

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IPv6 enabled services

★ DNS

★ Colocation

★ Dedicated web hosting

★ Shared web hosting

★ IMAP

★ Webmail

★ All new services need to be available over IPv4 and IPv6

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Statistics

IPv6 in The Netherlands

ASN	AS Name	IPv6 Capable	IPv6 Preferred	Samples
AS20857	TRANSIP-AS TransIP B.V.	89.16%	89.02%	738
AS21162	ISM-HOSTING Innovative Solutions in Media (ISM) B.V.	81.82%	78.79%	66
AS3265	XS4ALL-NL XS4ALL Internet BV	64.81%	59.39%	32670
AS1837	NCIA NATO Communications and Information Agency	61.54%	0.00%	78
AS1133	UTWENTE-AS University Twente	48.12%	47.18%	850
AS51088	A2B A2B IP B.V.	45.31%	0.00%	64
AS202018	DIGITALOCEAN-ASN-3 Digital Ocean, Inc.	23.10%	1.43%	12638
AS34106	TELEGRAAF-AS TMG Online Media B.V.	13.28%	10.16%	128
AS31477	DUOCAST-AS Duocast B.V.	8.50%	0.50%	200
AS1136	KPN KPN Internet Solutions	6.34%	5.87%	248541

Source: APNIC

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Statistics

IPv6 at XS4ALL

IPv6 Preference by Month

Source: APNIC

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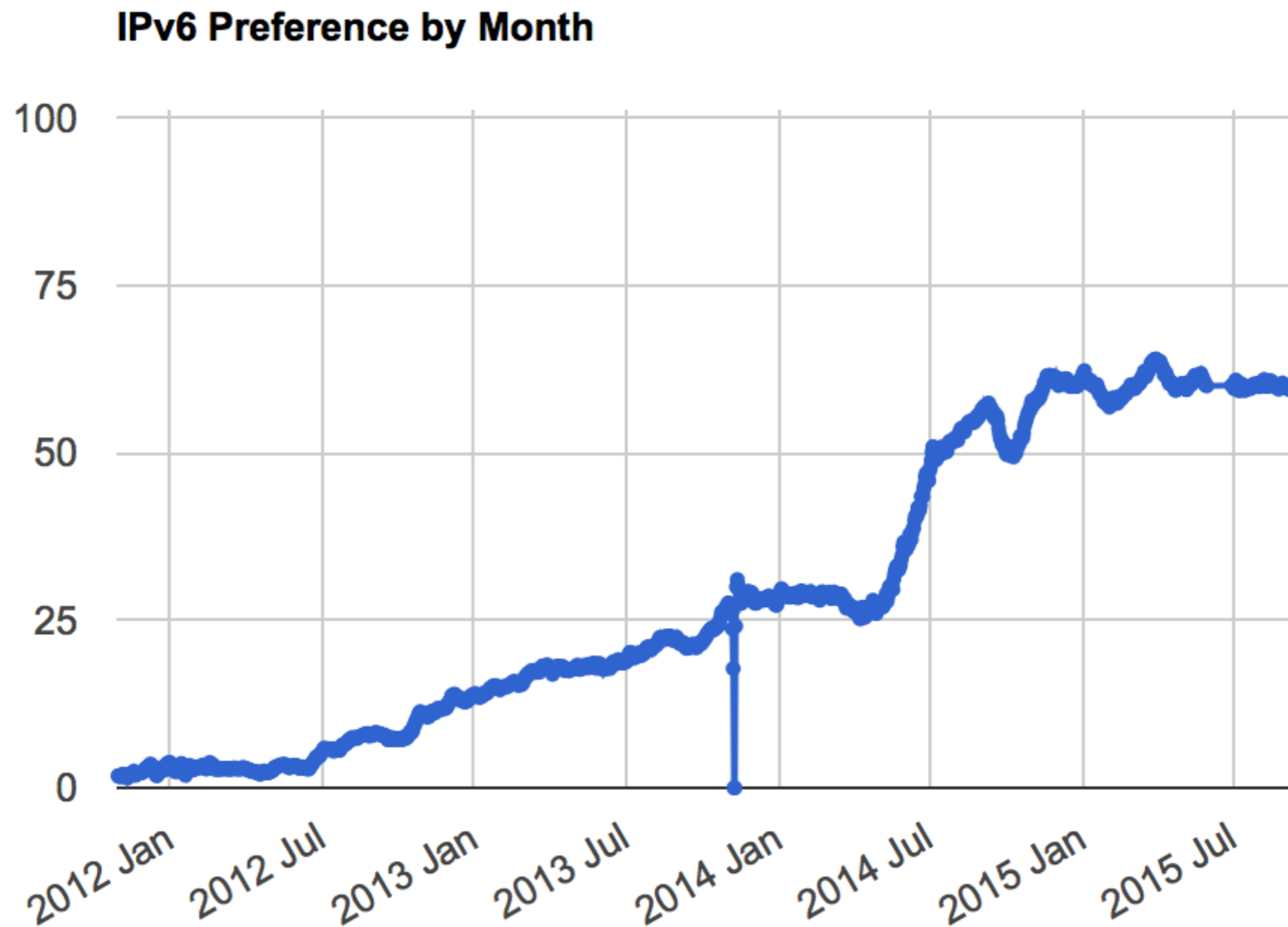
Statistics

IPv6 in The Netherlands

Source: APNIC

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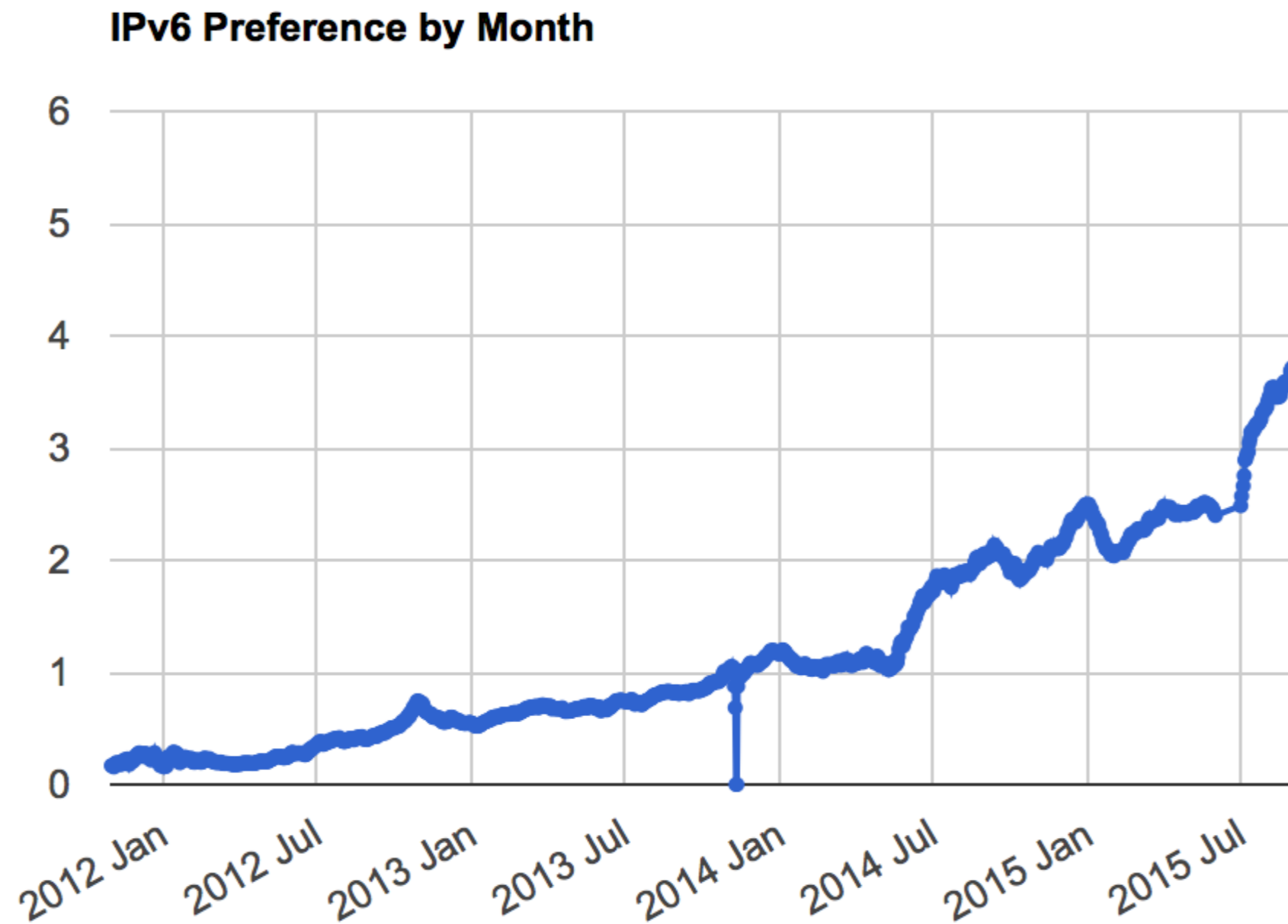
Statistics

IPv6 in Armenia

IPv6 Preference by Month

Source: APNIC

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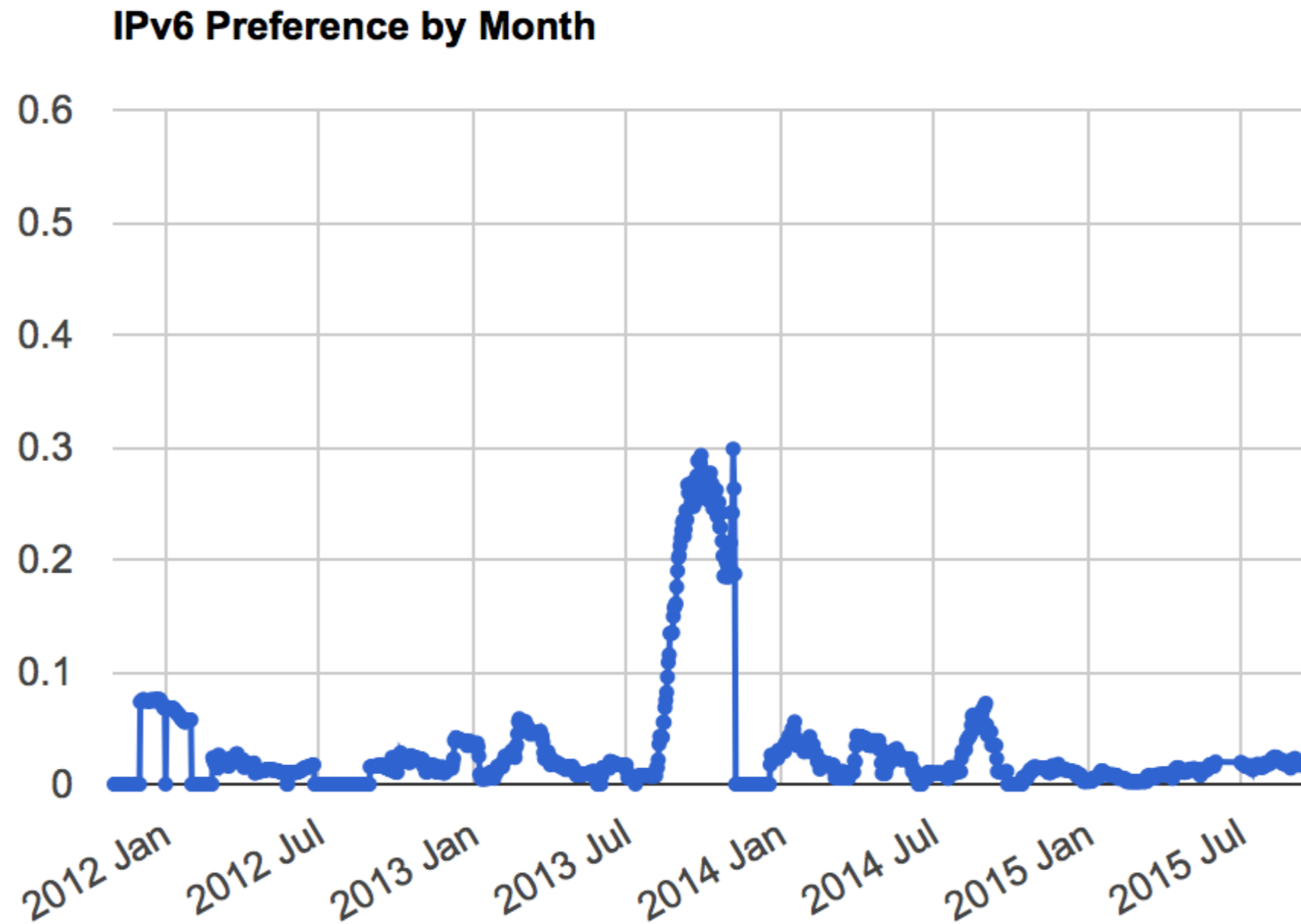
"Having all those IPv6 customers is nice, but do people actually use it?"

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IPv6 traffic

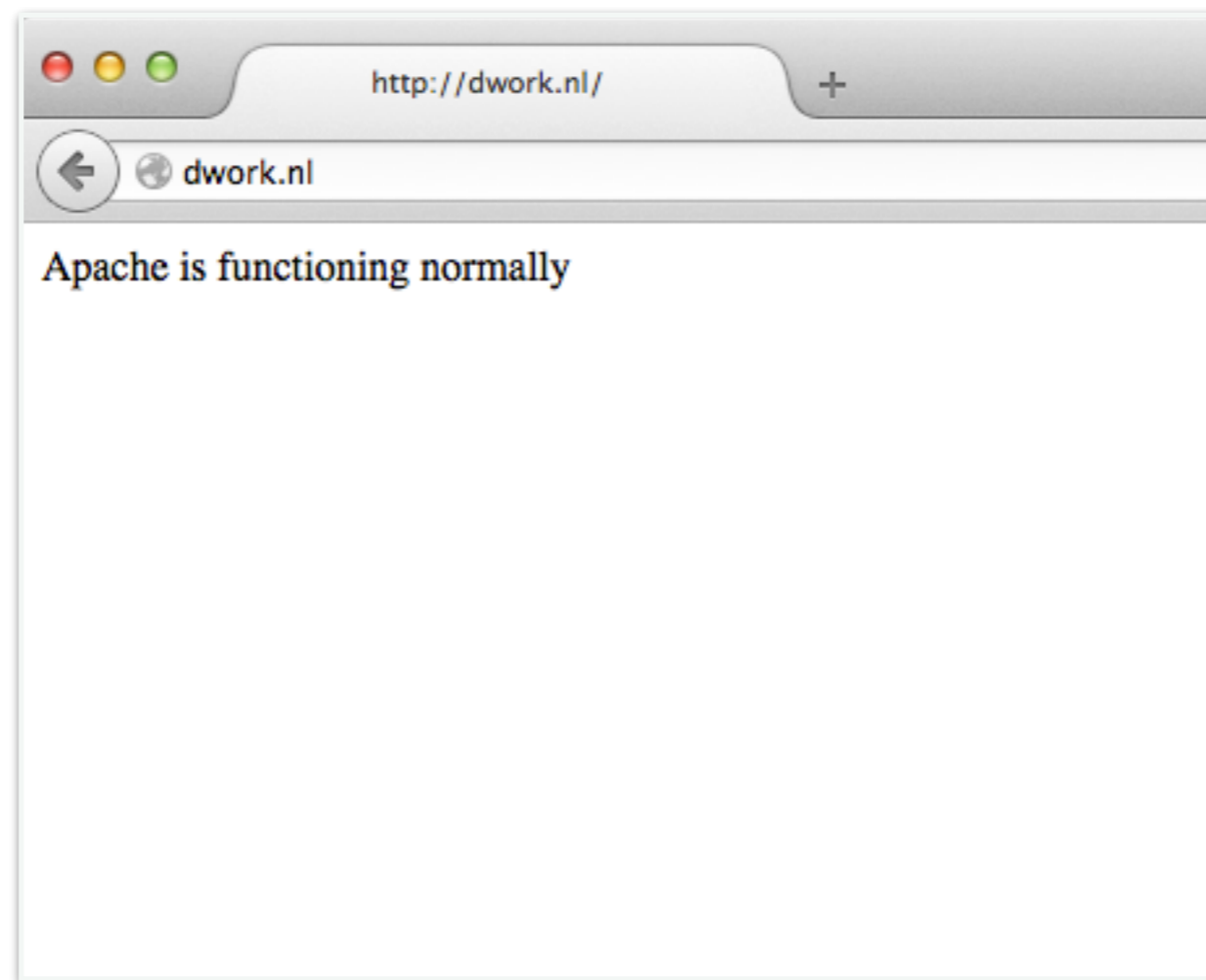Mon Sep 7 23:45:00 2015 Bits/s any protocol

access-edge

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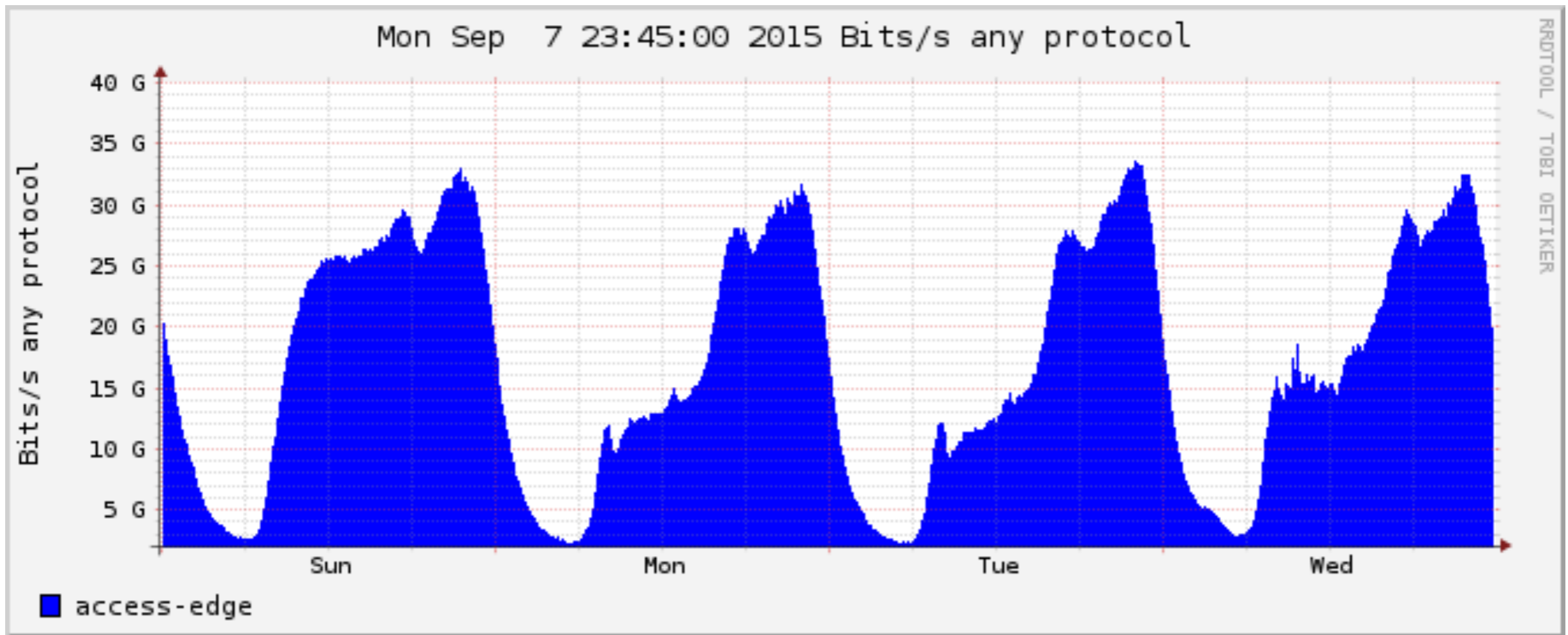
IPv6 traffic

★ Make sure you know how your traffic flows

★ IPv6 routing policies can be very different from IPv4 policies!

★ Do your peers have good IPv6 connectivity?

★ Transit providers?

★ CDN?

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Most common customer issues

★ 3rd party web sites not correctly configured for IPv6

Most common customer issues

★ 3rd party web sites not correctly configured for IPv6

The page cannot be displayed

Explanation: The Web server refused the connection, possibly because a service on the upstream server is inactive.

Try the following:

- **Refresh page:** Search for the page again by clicking the Refresh button. The timeout may have occurred due to Internet congestion.
- **Check spelling:** Check that you typed the Web page address correctly. The address may have been mistyped.
- **Access from a link:** If there is a link to the page you are looking for, try accessing the page from that link.
- **Contact website:** You may want to contact the website administrator to make sure the Web page still exists. You can do this by using the e-mail address or phone number listed on the website home page.

Technical Information (for support personnel)

- Error Code 10061: Connection refused
- Background: When the gateway or proxy server contacted the upstream (Web) server, the connection was refused. This usually results from trying to connect to a service that is inactive on the upstream server.

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Most common customer issues

★ 3rd party web sites not correctly configured for IPv6

★ MS Outlook 2003 can't handle dual stack server addresses

★ Intermittent connectivity issues with MS Outlook365

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Lessons learned

★ Start with creating an address plan

★ Involve your vendors during deployment

★ Create a "friendly user" group, and communicate

★ Take plenty of time to deploy, small steps

★ Educate colleagues and management

★ Train your support department

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