

Experience Sharing Deployment of IPv6 in OFTA

at "Kickstart IPv6!" Seminar on World IPv6 Day

Warren Kwok
Telecom Engineer
OFTA

OFTA IPv6 Approach

Develop a transition plan (tentative)

Stage 1	v6 tunneling for OFTA website	Feb 2010
Stage 2	Native IPv6 for OFTA web site, with IPv6-ready firewall	May 2011
Stage 3	Email system supports dual stacks	March 2012
Stage 4	All PCs dual-stack configured after moving to Windows 7	End 2013



Interim v6 Web Server

- Hurricane Electric offers free 6to4 and 6in4 tunnels in HK (users share 1 Gbps bandwidth)
- Have considered 6in4 and 6to4 tunnels
 - 6in4 – manual configured tunnel with account name & password, plus a startup script to fire up the v6 interface whenever reboot
 - 6to4 – automatic tunnel, always on, no startup script required
- 6to4 tunnel chosen
- a new server was put in place to handle incoming v6 traffic



Security issue of auto 6to4 address

- Windows auto 6to4 address risky
Example 202.81.93.74 mapped to
2002:ca51:5d4a::ca51:5d4a (202 dec= ca hex)
the 3rd – 6th octets matching 13th – 16th octets
exposed the OS
- Change the 13th – 16th octets to other arbitrary
hexadecimal number
Example 202.81.93.74 mapped to
2002:ca51:5d4a::aaaa:ffff



Limitation of 6to4 Web Server

- Low traffic, attract 150 v6 hosts per day at peak
- dual-stack hosts (native v4 + native v6) select native IPv4 path to reach a website which has both native IPv4 and 6to4 addresses
- 95 % traffic comes from Windows 7/ Vista hosts with 6to4 addresses enabled
- Hosts are non-NAT with PPPoE or Metro-Eth
- If 6in4 tunnel is chosen, dual-stack hosts with native IPv6 connection can reach our 6in4 Web Server

Look at v6 traffic

Most Recent


Most Recent Visits			
	Visitor	Country/Region	Time of Last Access
1	2002:cbc6:█:█:█:█ █.com	Hong Kong	Wed, Mar-31-2010 23:59:59
2	2002:3a98:█:█:█:█ █.com	Hong Kong	Wed, Mar-31-2010 23:59:22
3	2002:3a98:█:█:█:█%0 █.com	Hong Kong	Wed, Mar-31-2010 23:59:22
4	2002:█:41cd:█:█:41cd █.com	Hong Kong	Wed, Mar-31-2010 23:56:12
5	2002:█:d8f2:█:█:█:█ █.com	Hong Kong	Wed, Mar-31-2010 23:54:57
6	2002:b4bc:█:█:█:█	Hong Kong	Wed, Mar-31-2010 23:51:27
7	2002:█:31ee:█:█:█:█ █.com	Hong Kong	Wed, Mar-31-2010 23:45:19
8	2002:77ed:█:█:█:█ █.com	Hong Kong	Wed, Mar-31-2010 23:41:07
9	2001:250:3000:█:█:█:█	Unknown	Wed, Mar-31-2010 23:37:35

Windows
6to4 address

native IPv6
address



Native IPv6 from an ISP

- 
- 2M/2M Dedicated Internet Access
 - SLA, 99.9 % availability
 - Forward lookup optional but not mandatory
 - Mandatory reverse v6 lookup
 - Allocation prefix /48 or more
 - Provision of v6 firewall NOT necessary


Comparisons of v4 and v6 links

	IPv4	Dual Stack (IPv4 + IPv6)
bandwidth	100 Mbps	2 Mbps
Availability	99.95 %	*99.9 %
Support	7 x 24 x 365	7 x 24 x 365
DNS service	Mandatory	Mandatory
Monthly Cost	HK\$3,000	HK\$4,800

*The serving ISP can offer 99.95 % availability for dual-stack service.::8



v4 and v6 SMTP Server Problem

- 
- Anti-spam engine closely integrated with IPv4 SMTP Server but can't support IPv6
 - Dedicated IPv6 SMTP Server
 - Pass IPv6 incoming email to existing IPv4 SMTP Server through a dedicated network interface
 - Will move to a dual-stack SMTP config when the Anti-spam engine can fully support IPv6



v6 Firewall

- Mature and affordable products in the market
- Proper filtering of ICMPv6 messages e.g. Packet too big and destination unreachable should not be blocked
- Block inbound Router Advertisement
- Must allow UDP > 512 bytes to pass
- Do not blindly replicate v4 rules

Test on IPv6 brokenness for World IPv6 Day (IPv4 network)

Test your IPv6. - Windows Internet Explorer

http://test-ipv6.com/#

File Edit View Favorites Tools Help

Test your IPv6. Home Feeds (1)

Test IPv6 FAQ IPv6 Day Mirrors

Test your IPv6 connectivity.

Summary Tests Run Technical Info Share Results / Contact

- Your IPv4 address on the public internet appears to be 202.██.██.██
- No IPv6 address detected [\[more info\]](#)
- World IPv6 day is June 8th, 2011. No problems are anticipated for you with this browser, at this location.** [\[more info\]](#)
- You appear to be able to browse the IPv4 internet only. You will not be able to reach IPv6-only sites.
- Your DNS server (possibly run by your ISP) appears to have no access to the IPv6 internet, or is not configured to use it. This may in the future restrict your ability to reach IPv6-only sites. [\[more info\]](#)

Your readiness scores

10/10 for your IPv4 stability and readiness, when publishers offer both IPv4 and IPv6

0/10 for your IPv6 stability and readiness, when publishers are forced to go IPv6 only

Click to see [test data](#)

(Updated server side IPv6 readiness stats)

Need something simpler? <http://omqipv6day.com> Spread the word!

No brokenness on World IPv6 Day

Test on IPv6 brokenness for World IPv6 Day (IPv6 network)

Test your IPv6 - Windows Internet Explorer

http://test-ipv6.com/

Test your IPv6

Test IPv6 | FAQ | IPv6 Day | Mirrors

Test your IPv6 connectivity.

Summary | Tests Run | Technical Info | Share Results / Contact

- Your IPv4 address on the public internet appears to be 203. [redacted]
- Your IPv6 address on the public internet appears to be 2001: [redacted] 2::2
- World IPv6 day is June 8th, 2011. **No problems are anticipated for you** with this browser, at this location. [\[more info\]](#)
- Congratulations! You appear to have both IPv4 and IPv6 internet working. If a publisher publishes to IPv6, your browser will connect using IPv6. Your browser prefers IPv6 over IPv4 when given the choice (this is the expected outcome).
- Your DNS server (possibly run by your ISP) appears to have no access to the IPv6 internet, or is not configured to use it. This may in the future restrict your ability to reach IPv6-only sites. [\[more info\]](#)

Your readiness

10/10 for your IPv4 stability and readiness, when publishers offer both IPv4 and IPv6

9/10 for your IPv6 stability and readiness, when publishers are forced to go IPv6 only

Click to see [test data](#)

(Updated server side IPv6 readiness stats)

Like 3209 likes. Sign Up to see what your friends like.

Tweet 1,681

Need something simpler? <http://omgipv6day.com> Spread the word!

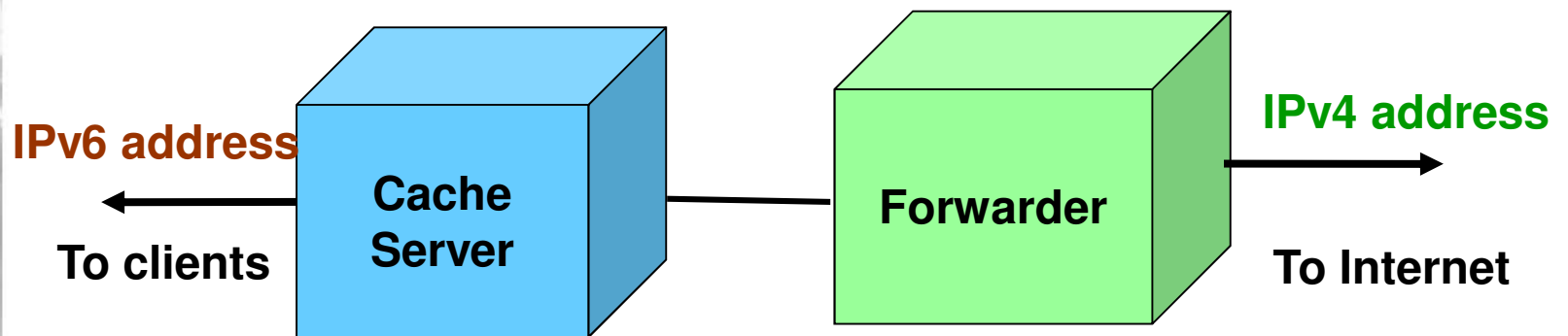
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[Mirrors](#) | [Partnering](#) | [Mission](#) | [Source](#) | [Email](#) | [Attributions](#) | [Debug](#)

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Done

Trusted sites | Protected Mode: Off | 100%

Resolver System



- Might affect global IPv6 reachability if name records placed in v6 only name servers
- The Forwarder shall be dual-stack
- Not a network fault at this moment
- Alert serving ISP already



Our Next Actions

- Staff training on DHCPv6, v6 firewall rules and other v6 essential network skills
- Consider a single v4/v6 dual-stack link to serve both v4 and v6 networks
- Monitor the development and availability of
 - i. v6 load-balancer
 - ii. v6 packet shaper / bw manager
 - iii. v6 IDS/IPS



Wish List for 2011

- Local v6 NTP Server available
- More ISPs in HK provide IPv6
- ISPs lower v6 connection charges
- ISPs offer advices on interim v6-v4 tunnel solutions
- ISPs offer regular briefings to corporate customers
- ISPs get “IPv6 ISP Certified Logo”



Thank You !



OFTA - Home - Windows Internet Explorer

http://www.ofta.gov.hk/en/index.html

File Edit View Favorites Tools Help

Home Feeds (1) Read Mail Print Page Safety Tools Help

Registration of Consultants
Contact Us
Tools
Links

RSS Downloadable Software

W3C WAI-A WCAG 1.0

6 This website is IPv6 enabled S/N: W1-HK-0000558

Mobile Internet Services Thematic Website

OFTA @YouTube

Blue Tone's Tips for Broadband Service Users

SafeWiFi

- TA Decisions -
 - Direction issued under Section 36B of the Telecommunications Ordinance (Chapter 106) to New Dot Communication Limited **PDF** **NEW**
- TA Notices -
 - Notice Pursuant to Section 36C of the Telecommunications Ordinance to Impose Financial Penalty on New Dot Communication Limited for Breach of Special Condition 7.1 and 8.1 **PDF** **NEW**
- Consultation Papers -
 - Second Consultation Paper on Review of Local Access Charge **PDF**
 - Executive Summary **PDF**
- Public Education Activities -
 - "Check Data Usage Enjoy Mobile Internet" - TV and Radio Announcements

Spectrum Utilization Fee

Registration Scheme for Buildings with Optical Fibre Access Networks

Industry Focus Mobile Content Services

Consumer Alert: Mobile Data Services

Landing of Submarine Cables in Hong Kong

Unsubscribe from Commercial e Messages

Stay in Touch in Country Parks

Digital Terrestrial TV Coverage & Reception Database

javascript:openwin('http://app1.ofta.gov.hk/apps/dtt/content/disclaimer.asp?language=english')

Internet 100%

