WHAT SERVICES ARE ACCESSIBLE VIA IPV6?

Mark Prior
Liaison Asia Pacific Research & Education Community
Juniper Networks

WHO CARES?

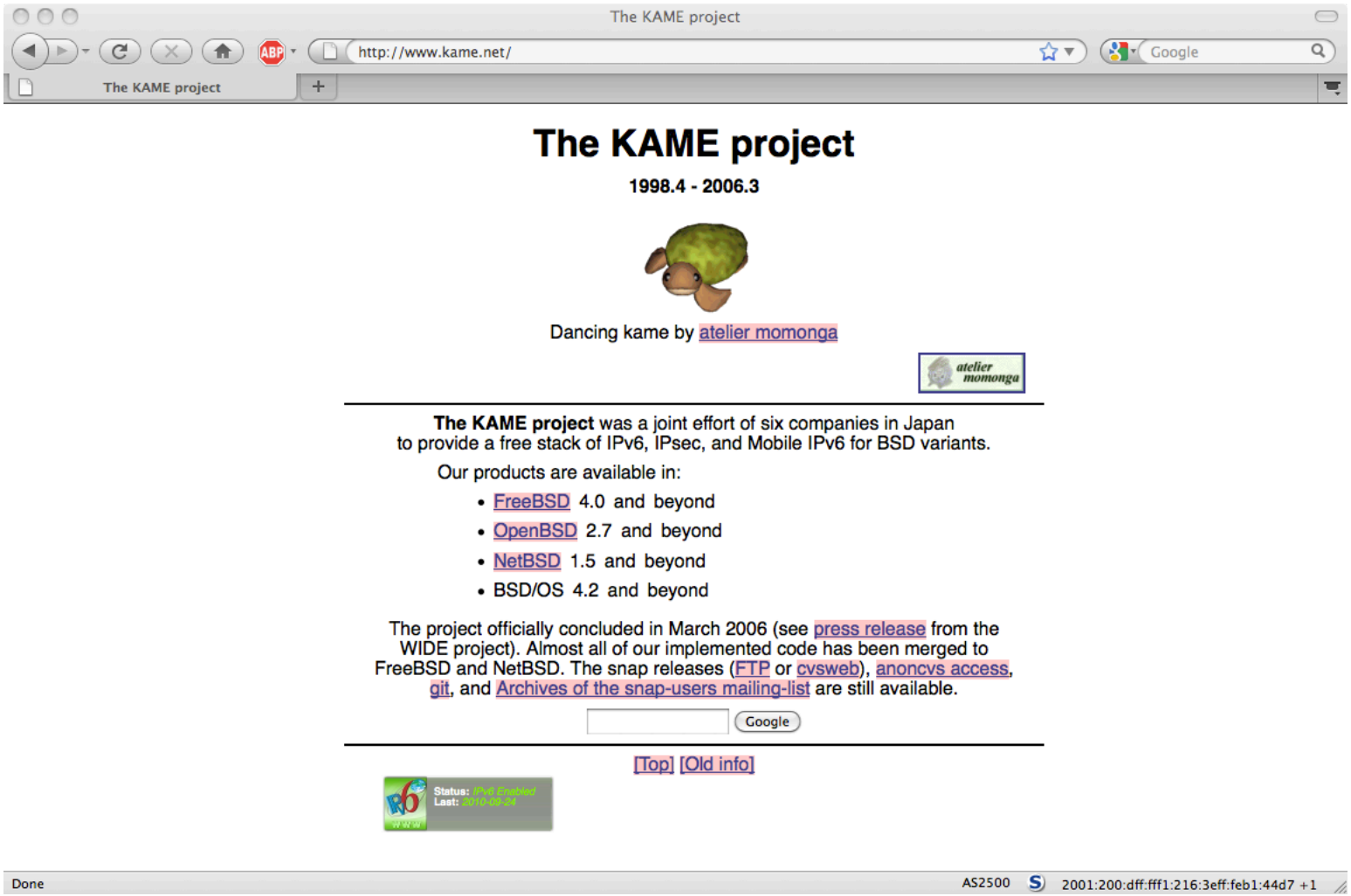
Majority of users think the Web is the Internet

- Will care if Google doesn't work but (largely) don't know or care how the packets flow to/from Google

Juniper 100 Gigabit Ethernet

RFC 1149

COMPELLING IPV6 ONLY CONTENT?



PLUMBING

No one cares about the plumbing until it breaks!

This really isn’t a chicken and egg situation

The only people who really care about the underlying infrastructure are the packet pushers (ISPs)

What are you doing to maintain the Internet’s plumbing?

REVIEW OF IPV6 DEPLOYMENT

Users are interested in services so any review should focus on what you can do

If your Internet service was IPv6 only what could you do?

Can you surf to a web site?

Can you send email to complain about a broken web site?

Can your browser even find out how to contact that site?

- OK that's not something too interesting to the users but other services build on it

THE SURVEY

Based on an idea from Ron Broersma (speaking tomorrow) during a talk at an Internet2/ESnet Joint Techs meeting in 2007

Look at various sites and test whether their web site, mail server and DNS servers were accessible via IPv6

- Ron looked at IPv6 Summit Sponsors
- I started with the Research and Education community

Make results available on a web site

- Updated daily
- Accessible via IPv4 and IPv6

THE DETAILS

Two Goals

- I want to check user experience; and
- Also see if there is progress is being made

User experience means nothing different, IPv6 is just there

Progress looks to see if there are experiments, trials, …

Colour code the result

- Green = IPv6 service available as per IPv4
  - Note it doesn't need to be the same service
- Orange = We try harder to look for evidence of a work in progress
- Red = What's IPv6? ☹

WEB SERVICE

Green = www.$domain, e.g. www.example.com

Orange = www.ipv6.$domain
or ipv6.$domain
or www6.$domain
or www.$domain6
or www.v6.$domain
or $domain

Just the name is NOT sufficient, also check for a service

- Connect to it and issue a HTTP 1.1 HEAD command
- Follow redirects
- Orange also indicates something is broken

MAIL SERVICE

Look for MX records with associated AAAA records

Green = primary MX has a AAAA record

Orange = only the secondary MX has a AAAA record

- Although in truth this is probably enough for an IPv6 only host as it's got the email to another host that might be able to deliver it

If Mail service is not hosted by the domain but outsourced to Postini, MessageLabs, … this is noted so blame can be shared

Like Web service we also connect to it and issue SMTP commands to ensure it really is an email service (and not BitTorrent :-)

DOMAIN NAME SERVICE

Look for AAAA records associated with the NS records

Attempt to query for the domain's SOA record from each of the name servers

Count how many NS records have AAAA records

Also try to work out how many are hosted by the domain

- Can be problematic if .NET used for infrastructure

Number of IPv6 reachable name servers for a zone is possibly unimportant as they might be using an anycast address to load balance across multiple servers although shouldn't the same scheme used for IPv4?

OTHER SERVICES

Also look at some other services that might be offered to the Internet

- NTP – Network Time
- XMPP – Message Service

Only concerned about an IPv6 service if there is an IPv4 one

Note if access is different, i.e. IPv4 isn't reachable but IPv6 is

- This might represent a filter bug rather than a feature

HOW ARE WE GOING?

My survey is biased towards people who want to show they are doing IPv6 and the early versions were largely R&E in nature

For the last 18 months I've been keeping a revision history for the survey results while also adding more sites

Compare the first revision with the "latest" version and look for changes among the organisations in the first revision

Sample size of 821 domains

CHANGES TO WEB

30 organisations created IPv6 based www sites

- 18 of these are www.$domain
- 3% growth

9 organisations discontinued an IPv6 based web site

- 3 are false positives (script issue?)
- 1 server not responding

30 unreachable IPv6 based web sites!

- Variety of reasons
  - No route to host
  - Routing blackholed
  - Potential firewall filter issue

CHANGES TO MAIL DELIVERY

18 additional organisations now accept email via IPv6

CHANGES TO THE DOMAIN NAME SYSTEM

"Gained" 155 IPv6 accessible DNS servers

- Could be caused by organisations sharing a common set of IPv6 enabled secondary name servers

"Lost" 16 IPv6 accessible DNS servers

- Some caused by domains reducing the number of their servers

STATISTICS

	Accessible via IPv6	Total	Percentage
Web Servers	140	1308	10.7%
Mail Servers	92	1308	7.0%
DNS Servers	678	4273	15.9%

AUSTRALIAN IPV6 SUMMIT SPONSORS/SUPPORTERS

Organisation (domain)	Web	Mail	DNS	NTP	XMPP
AUDA (auda.org.au)	FAIL	FAIL	0/3 0/3		
Australian Computer Society (acs.org.au)	FAIL	FAIL	0/0 0/3		
Australian Industry Group (aigroup.asn.au)	FAIL	FAIL (M)	0/3 0/3		
Australian Information Industry Association (aiia.com.au)	FAIL	FAIL	0/0 0/3		
Blue Coat (bluecoat.com)	FAIL	FAIL (PP)	2/2 2/4	FAIL	C:FAIL
Bluecat Networks (bluecatnetworks.com)	FAIL	FAIL (M)	0/2 0/2		
Cisco Systems (cisco.com)	www.ipv6	FAIL	0/2 0/2	FAIL	FAIL
Communications Alliance (commsalliance.com.au)	FAIL	FAIL	0/0 0/3		
eintellego (eintellego.net)	PROBLEM	PROBLEM	0/0 0/2		
Engineers Australia (engineersaustralia.org.au)	FAIL	FAIL (M)	0/0 0/2		
HP (hp.com)	FAIL (N)	FAIL	0/6 0/6		
ICANN (icann.org)	SUCCESS	SUCCESS	0/1 3/5	FAIL	
Internet Society (isoc.org)	SUCCESS	FAIL	0/0 6/6		
Internet Society of Australia (isoc-au.org.au)	SUCCESS	SUCCESS	0/0 1/4		
Internode (internode.com.au)	FAIL	FAIL	0/0 4/4		
IPv6 Forum (ipv6forum.com)	SUCCESS	SUCCESS	0/0 2/2		
IPv6 Forum Australia (ipv6forum.org.au)	SUCCESS	FAIL	0/0 1/4		
IPv6 Now (ipv6now.com.au)	SUCCESS	SUCCESS	1/2 2/6		
Juniper Networks (juniper.net)	FAIL (A)	FAIL (P)	0/3 0/5		
Mach Technology (mach.com.au)	FAIL	FAIL	0/0 0/4		
Multimedia Victoria (mmv.vic.gov.au)	FAIL	FAIL	0/0 0/3		
NICTIA (nictia.org.au)	FAIL	FAIL	0/0 0/2		
Sophos (sophos.com)	FAIL (A)	FAIL	0/2 0/2	FAIL	
Vocus (vocus.com.au)	SUCCESS	SUCCESS	3/3 3/3	Stratum 1	SUCCESS

MANAGED SERVICES

A number of organisations have out sourced handling of their web site to companies such as Akamai

Also there are a number of mail filtering companies used to reduce SPAM, Messagelabs, Postini (Google), ProofPoint, etc

None support IPv6 as yet

If this changed then there would be a significant increase in IPv6 accessible services

Clearly the IPv6 infrastructure needs to be as robust and reliable as IPv4 before they would consider it

WHAT WILL MAKE IT BETTER?

Ask your company's IT staff what they are doing about IPv6!

Still too much general brokenness

- routing issues (22)
- unresponsive services (5)
- bogus AAAA record [::1] (1)

R&E organisations need to ensure their IPv6 enabled services are accessible to the commodity Internet as well as their NREN

In summary IPv6 infrastructure needs to be taken as seriously as IPv4

CONTACT DETAILS

Mark Prior

Liaison, Asia Pacific Research and Education Community

Juniper Networks

mprior@juniper.net

See the Survey at http://www.mrp.net/IPv6_Survey.html


everywhere