



DOMAIN REGISTRY

Internet Identity For All

# **.my IPv6 Update**

**By Lai Heng Choong**

**Manager, TNI Department**

*APTLD Meeting, Colombo, Sri Lanka*

*28<sup>th</sup> June 2010*

# Agenda

1. About myDNSIPv6
2. Registry System Changes for IPv6
3. myDNSIPv6 Test Bed
4. myDNSIPv6 Project Status
5. Awareness Programs
6. Statistic
7. Challenges
8. IPv6 in Malaysia
9. Conclusion


# About myDNSIPv6

myDNSIPv6 is one of the .my DOMAIN REGISTRY Research and Development projects

## Objectives

- To actualize and facilitate IPv4 to IPv6 transition as mandated in Malaysian Information, Communication and Multimedia Services 886 (MyICMS 886)
  - IPv6 is a mandated Infrastructure
  - Government agencies to adopt IPv6 by year 2012
- To provide IPv4 and IPv6 enabled DNS registry system
  - Public are able to register .my domain name with IPv6 DNS support

# Name server modification

- Click on  to remove name server(s).

## Modify Name Server IP

Server Code	Hostname	IPv4 Address	IPv6 Address	Domain(s)
SVA020120	ns4.dnsexit.com	<input type="text" value="67.214.161.154"/>	<input type="text"/>	kids.my
SVA027478	ns3.dnsexit.com	<input type="text" value="67.214.175.73"/>	<input type="text"/>	kids.my
SVA007949	ns2.dnsexit.com	<input type="text" value="64.182.102.188"/>	<input type="text"/>	kids.my
SVA007948	ns1.dnsexit.com	<input type="text" value="69.57.160.118"/>	<input type="text"/>	kids.my

**\*\*The only acceptable values for IPv6 are as below:**

1. Without compression, valid IPv6 format contain 8 groups of 4 character (0-9, A-F) separated by colon
2. 0 within the group of 4 characters can be omitted
3. A series of 0000:0000 can be compressed to ::
4. The only symbol that is accepted is colon (:)
5. Double colon (::) can only appear once (compression).
6. ::0, 0:: or :: on its own is unacceptable.

**All below are sample of valid format of IPv6 Address:**

2001:0db8:0000:0000:0000:0000:1428:57ab  
 2001:0db8:0000:0000:0000::1428:57ab  
 2001:0db8:0:0:0:0:1428:57ab  
 2001:0db8:0::0:1428:57ab  
 2001:0db8::1428:57ab  
 2001:db8::1428:57ab

**Which are the same value and will be compressed to the value:**

2001:db8::1428:57ab

**For IPv6 addresses**

- Add / Remove / Change Name Server

# Name server modification

## Create Name Server

* Order	1
* Hostname	<input type="text"/>
* IPv4 Address	<input type="text"/>
IPv6 Address	<input type="text"/>

**For IPv6 addresses**

**\*\*The only acceptable values for IPv6 are as below:**

1. Without compression, valid IPv6 format contain 8 groups of 4 character (0-9, A-F) separated by colon
2. 0 within the group of 4 characters can be omitted
3. A series of 0000:0000 can be compressed to ::
4. The only symbol that is accepted is colon (:)
5. Double colon (::) can only appear once (compression).
6. ::0, 0:: or :: on its own is unacceptable.

**All below are sample of valid format of IPv6 Address:**

2001:0db8:0000:0000:0000:0000:1428:57ab  
 2001:0db8:0000:0000:0000::1428:57ab  
 2001:0db8:0:0:0:0:1428:57ab  
 2001:0db8:0::0:1428:57ab  
 2001:0db8::1428:57ab  
 2001:db8::1428:57ab

**Which are the same value and will be compressed to the value:**

2001:db8::1428:57ab

Create

Clear

Close

# .my Dual-Stack DNS servers

<b>Primary</b>	
dns.mynic.net.my dns1.mynic.net.my	2001:328:1000:3::5 & 192.228.180.5 2001:328:1000:3::2 & 192.228.180.2
<b>Secondary DNS</b>	
dns2.mynic.net.my ns2.cuhk.edu.hk ns5.jaring.my ns-my.nic.fr	2401:b000::36 & 202.75.39.36 2405:3000:3:60::21 & 137.189.6.21 2001:328:200:48::400 & 61.6.38.139 2001:660:3006:1::1:1 & 192.134.0.49

# .my IPv4 DNS servers

<b>Secondary DNS</b>	
ns20.iij.ad.jp ns6.jaring.my ns.uu.net	202.232.2.161 192.228.128.16 137.39.1.3

# .my's DNS Server Registration to IANA

Host Name	IP Address(es)	
dns.mynic.net.my.	192.228.180.5 2001:328:1000:3:0:0:5	Nov 2008
dns2.mynic.net.my.	202.75.39.36 2401:b000:0:0:0:0:36	May 2010
ns.uu.net.	137.39.1.3	
ns2.cuhk.edu.hk.	137.189.6.21 2405:3000:3:60:0:0:0:21	
ns20.ijj.ad.jp.	202.232.2.161	
ns5.jaring.my.	61.6.38.139 2001:328:200:48:0:0:0:400	
ns-my.nic.fr.	192.134.0.49 2001:660:3006:1:0:0:1:1	
ns6.jaring.my.	192.228.128.16	

<http://www.iana.org/domains/root/db/my.html>

# myDNSIPv6 Test Bed

- started on 17th July 2007, closed on 30th August 2007
- 181 participants
- 58 testing domain registered

## MYNIC Invites Public To Participate In .my Domain Name System Test-bed On IPv6 Technology

MYNIC, the .my domain administrator has announced that it will be conducting trials of .my domain name system (DNS) on the Internet Protocol version 6 (IPv6) technology and is inviting the public to participate in its test-bed starting from 17th July to 30th August, 2007. The .myDNSIPv6 test-bed is to enable Malaysians to begin familiarizing themselves with the DNS on IPv6 technology.



Publication : **Hardware Mag**  
 Date : **August 2007**  
 Title : **MYNIC Invites Public To Participate In .my Domain Name System Test-bed On IPv6 Technology**

## 下一代互聯網 IPv6開始公測

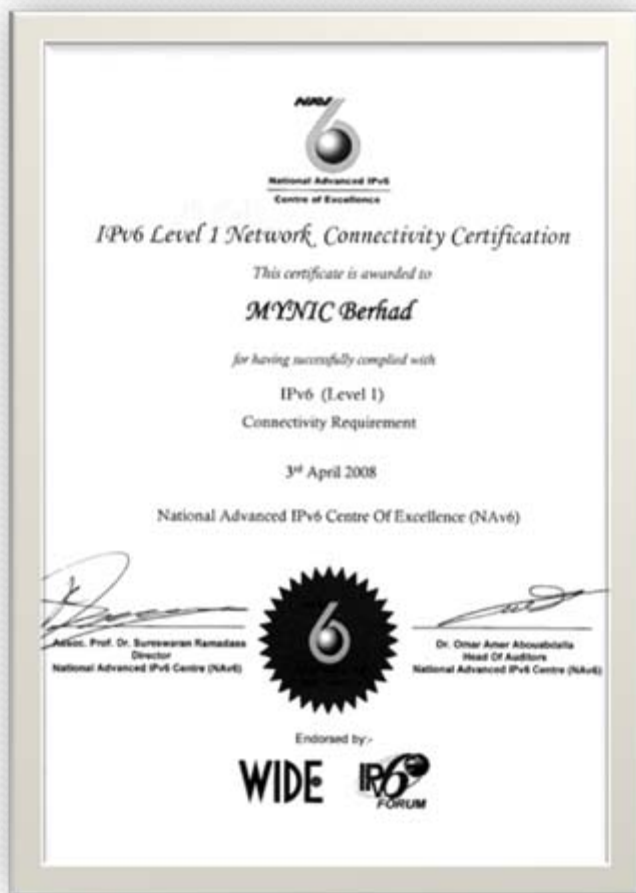
e言e語

想 试试IPv6的威力？我国域名管理局MYNIC广邀公众参与 .my域名于IPv6技术上进行测试至8月30日。这项公测是要公众习惯域名在IPv6上的运作。目前采用IPv4的域名系统，将在5至10年内用尽IP地址，而IPv6技术能生产340 Octillion（或等于340 billion, billion, billion）个地址，几乎地球上每个生物和死物都用不完。

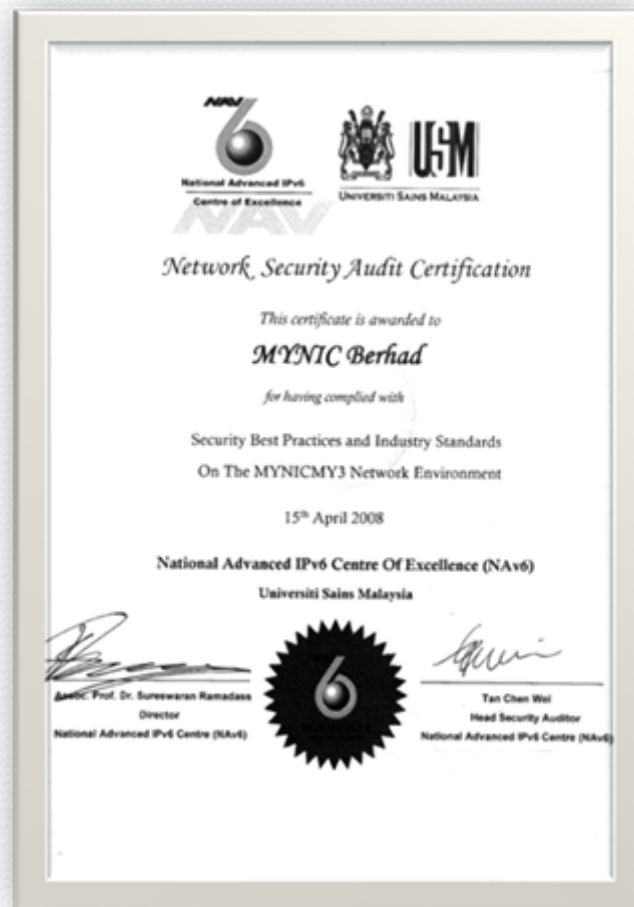
■ 欲参与测试，公众可浏览[www4.mynic.net.my/intro/](http://www4.mynic.net.my/intro/)网站。

Publication : **Sin Chew Daily – Cyberworld**  
 Date : **Wednesday 1<sup>st</sup> August 2007**  
 Title : **Public testing on next generation IPv6**

# IPv6 Connectivity and Security Audit



**Certificate for IPv6 Level 1 Network connectivity**



**Certificate for Security Audit**

# myDNSIPv6 Project Status

- Launched myDNSIPv6 on 23<sup>rd</sup> Nov 2008 with 8 categories of .my domain name
  - IPv6 address submission : via registration or modification page
  - .my Domain Registry is no 127<sup>th</sup> TLD support IPv6 out of 296 TLD in the world
- Co-Chair Asia Pacific IPv6 Task Force 2009 - 2010
- Become a member of IPv6 Working Group Malaysia
- R&D website obtained IPv6 WWW Logo from IPv6 Forum for IPv6 Enabled Website Program on 11<sup>th</sup> Aug 2009
- Involved in 2<sup>nd</sup> phase IPv6 audit for all ISPs, held from 7<sup>th</sup> Dec 2009 to 21<sup>st</sup> Dec 2009  
(provided venue for lookup class test)



# IPv6 and DNSSEC Awareness Road Show

Educate the target group in regards to the importance of DNSSEC and the need to integrate and migrate from IPv4 to dual stack (IPv4 and IPv6).



## .my Training

Yearly comprehensive 4 days technical workshops on DNS Technologies ( include IPv6 and DNSSEC ) since 2006

## Others Awareness Activities

- Articles in major publications to educate the public
- *.my Innovation Award* to promote the adoption and usage of IPv6

# Statistics

## Number of domain names:

Month*/Category	.my	.com.my	.net.my	.org.my	.gov.my	.edu.my	.mil.my	.name.my	Total
Jan 2010	18579	66229	2072	2119	1237	1471	5	443	92155
Feb 2010	18958	67136	2101	2148	1243	1505	5	443	93539
Mar 2010	19761	68872	2146	2196	1256	1551	5	454	96241
Apr 2010	20209	70668	2160	2228	1260	1585	6	456	98572
May 2010	20413	71601	2172	2233	1263	1594	6	454	99736

## Number of IPv6 domain names:

Month*/Category	.my	.com.my	.net.my	.org.my	.gov.my	.edu.my	.mil.my	.name.my	Total
Jan 2010	86	93	17	10	1	1	0	0	208
Feb 2010	90	95	17	10	2	1	0	0	215
Mar 2010	82	84	17	9	2	1	0	0	195
Apr 2010	91	87	17	9	1	1	0	0	206
May 2010	94	86	17	8	1	1	0	0	207

\* Source <http://www.domainregistry.my/statistics.php>

# Challenges in this Project

- Request IPv6 network and IPv6 addresses from ISP (take time)
- Some of the existing hardware / equipments doesn't support IPv6 traffic
- Lack of IPv6 knowledgeable engineers
- Low usage and demand from the customers

# IPv6 Connectivity Incident

- Happen recently in May 2010 at our datacenter.
- Connectivity between local ISPs is alive but there was no link to international site through IPv6.
- notified by IANA when they performing standard procedure of checking the connectivity before update the NS record.
- .my were randomly test the connectivity from several places and found that the v6 address was not advertised outside the country.

# Traceroute Result

From US :

<http://www.subnetonline.com/pages/ipv6-network-tools/online-ipv6-traceroute.php>

```

traceroute to 2401:b000::61 (2401:b000::61), 30 hops max, 40 byte packets
 1 2001:1af8:4200:b000::1 (2001:1af8:4200:b000::1) 0.919 ms 0.900 ms 0.985 ms
 2 2001:1af8:4100::5 (2001:1af8:4100::5) 0.838 ms 0.922 ms 0.990 ms
 3 be11.crs.evo.leaseweb.net (2001:1af8::9) 2.556 ms 2.569 ms 2.556 ms
 4 20gigabitethernet1-3.core1.ams1.ipv6.he.net (2001:7f8:1::a500:6939:1) 1.556 ms 1.440
ms 1.436 ms
 5 10gigabitethernet1-4.core1.lon1.ipv6.he.net (2001:470:0:3f::1) 13.640 ms 13.617 ms 13.607 ms
 6 2001:7f8:4::12b4:1 (2001:7f8:4::12b4:1) 10.039 ms 9.645 ms 9.689 ms
 7 2001:e68::9 (2001:e68::9) 301.453 ms 301.122 ms 301.542 ms
 8 2001:e68::49 (2001:e68::49) 305.106 ms 305.065 ms 305.137 ms
 9 * * *
10 * * *
11 * * *
12 * * *
13 * * *
14 * * *
15 * * *
16 * * *

```

# Traceroute Result

From Germany :

<http://www.berkom.blazing.de/tools/traceroute.cgi>

```
1 2a01:30:1000::1 1.596 ms 1.377 ms 1.206 ms
2 2a01:30:1e0f:1::1 19.829 ms 20.191 ms 22.060 ms
3 2a01:138:a006::1 20.351 ms 18.965 ms 18.860 ms
4 ge3-2.cr1.NBG1.content-core.net (2a01:138:0:1a0::1) 18.809 ms 20.108 ms 19.285 ms
5 Tenge1-3-57.cr2.FRA3.content-core.net (2a01:138:0:118::6) 22.106 ms 22.039 ms 22.365 ms
6 r1fra1.core.init7.net (2001:7f8::32e6:0:1) 27.602 ms 28.743 ms 27.203 ms
7 2001:1620:2::66 31.263 ms 35.644 ms 30.759 ms
8 2001:1620:2::6a 36.430 ms 42.952 ms 38.610 ms
9 2001:7f8:4::12b4:1 39.520 ms 40.145 ms 38.875 ms
10 2001:e68::9 330.256 ms 339.584 ms 338.115 ms
11 2001:e68::49 338.523 ms 334.718 ms 331.341 ms
12 * * *
13 * * *
14 * * *
```

# Traceroute Result

From JAPAN: <http://www.tumori.nu/IPv6/traceroute.html>

```

traceroute to 2401:b000::36 (2401:b000::36), 25 hops max, 40 byte packets
 1 2001:2e8:603:0:3:2:0:1 (2001:2e8:603:0:3:2:0:1) [AS4691] 0.143 ms 0.053 ms 0.015 ms
 2 2001:2e8:22:202::1 (2001:2e8:22:202::1) [AS4691] 0.598 ms 0.586 ms 0.671 ms
 3 2001:2e8:20::22:1 (2001:2e8:20::22:1) [AS4691] 1.867 ms 2.104 ms 2.186 ms
 4 lan-gate.dixie6.otemachi4.v6.dti.ad.jp (2001:2e8:20:11::5) [AS4691] 1.830 ms 1.834 ms 1.912 ms
 5 2001:200:0:fe00::1275:0 (2001:200:0:fe00::1275:0) [AS2500] 2.481 ms 2.477 ms 2.820 ms
 6 2001:278:0:2020:: (2001:278:0:2020::) [AS4725] 2.798 ms 2.795 ms 2.803 ms
 7 2001:278:0:2020::7 (2001:278:0:2020::7) [AS4725] 108.256 ms 107.494 ms 107.638 ms
 8 paix.ipv6.he.net (2001:504:d::10) [*] 111.233 ms 111.395 ms 111.350 ms
 9 10gigabitethernet1-1.core1.sjc1.ipv6.he.net (2001:470:0:54::1) [AS6939] 120.571 ms 120.811 ms 120.572
ms
10 v1026.core1.hkg1.he.net (2001:470:0:c3::2) [AS6939] 202.043 ms 202.340 ms 202.327 ms
11 2001:470:0:164::2 (2001:470:0:164::2) [AS6939] 250.264 ms 250.198 ms 250.439 ms
12 2001:e68::89 (2001:e68::89) [AS4788] 252.467 ms 252.638 ms 252.585 ms
13 2001:e68::49 (2001:e68::49) [AS4788] 240.327 ms 239.958 ms 241.285 ms
14 * * *
15 * * *
16 * * *
17 * * *
18 * * *
19 * * *

```

# *IPv6 in Malaysia*

# Government Initiatives

## National Agenda – MyICMS886

MyICMS 886 Goals 2006 through 2010			Areas	2006	MediumTerm (2008)	Expected Results 2010
			<b>Infrastructure</b>			
Multiservice Convergence Network	Migration of platform-based services	Complete migration of legacy service; Fixed-Mobile Convergence platform ready	Next Generation Internet Protocol (IPv6)	Pilot of IPv6 services; All ISP are IPv6 enabled	Government agencies adopt IPv6	IPv6 full device and network compliance
3G Cellular Networks	Introduction of high speed data	High speed mobile data services; Interworking of BWA with 3GPP				
Satellite Networks	National policy on satellite-based communications	Satellite as a complementing transmission medium	Critical services reachable using satellite			
Next Generation Internet Protocol (IPv6)	Pilot of IPv6 services; All ISP are IPv6 enabled	Government agencies adopt IPv6	IPv6 full device and network compliance			
Home Internet Adoption	"One Home, One Internet Access" campaign	70% household with Internet access	90% household with Internet access			
Information & Network Security	Information and network security portal Installation of network security measures Compliance to International security standards					
Competence Development	Initiate programmes for competence development Upgrading and enhancing competencies Develop R&D capabilities					
Product Design & Manufacturing	Capacity building Original Equipment Manufacturing High-tech communication Industries					

- Next Generation Internet Protocol (IPv6) is a mandated Infrastructure
- Government agencies to adopt IPv6 by year 2008

(revised to year 2012)

# MTSFB IPv6 Working Group

- Started in April 2005
- Recommend the technical standard for adoption by Malaysia.
- To promote adoption of IPv6 - benefits
- Recommend migration/deployment plan
- To derive guidelines or best current practices of IPv6 development in Malaysia
- To identify suitable contents and applications as the main drivers for fast development of IPv6 in Malaysia
- To arrange for seminars, exhibition and information releases for professionals and the public to create awareness on the IPv6



# IPv6 Compliance Audit (for ISPs)

- ISP - Phase 1 @ 2007
- ISP - Phase 2 @ 2009
- **ISP - Phase 3 @ 2010 scheduled for Q3**

## Propose Scope of Testing (in planning stage)

- ❑ Each ISP to conduct pilot project that primarily targets end users customers having IPv6 access
- ❑ ISP should be able to give basic IPv6 services to customers

# IPv6 Forum WWW and ISP

- As of 6<sup>th</sup> June 2010
- 17 www enabled websites
- 11 ISP enabled websites



## IPv6 Enabled ISP Web Sites List

Your any query or comment about the validated ISPs as follows is deeply appreciated and please [contact us](#)

Status(*)	ID	Organization Name	Website	Region/ Country	AS number	IPv6 Block
IPv6 Enabled	I1-MY-00000023	<a href="#">NTT MSC Sdn Bhd</a>	<a href="#">arcnet6.net.my</a>	MY	10204	2001:C18::/32
IPV6-ACTIVE	I1-MY-00000028	<a href="#">JARING Communications Sdn. Bhd.</a>	<a href="#">www.jaringv6.my</a>	MY	2042	2001:328::/32
IPV6-ACTIVE	I1-MY-00000034	<a href="#">Malaysian Research and Education Network</a>	<a href="#">www.myren.net.my</a>	MY	24514	2404:A8::/32
IPv6 Enabled	I1-MY-00000035	<a href="#">Maxis Communications Bhd</a>	<a href="#">ipv6.maxis.net.my</a>	MY	9534	2001:0D08::/32
IPV6-ACTIVE	I1-MY-00000037	<a href="#">OCESB</a>	<a href="#">www.sentralfon.com.my</a>	MY	24321	2407:6000::/32
IPv6 Enabled	I1-MY-00000040	<a href="#">DiGi Telecommunications Sdn Bhd</a>	<a href="#">www.digi6.com.my</a>	MY	4818	2001:4458::/32
IPV6-ACTIVE	I1-MY-00000055	<a href="#">TM</a>	<a href="#">www6.tm.net.my</a>	MY	4788	2001:E68::/32
IPv6 Enabled	I1-MY-00000059	<a href="#">Packet One Networks Sdn Bhd</a>	<a href="#">ipv6.p1.net.my</a>	MY	38322	2401:3C00::/32
IPv6 Enabled	I1-MY-00000060	<a href="#">Celcom</a>	<a href="#">www.celcom6.com.my</a>	MY	10030	2404:0160::/32
IPV6-ACTIVE	I1-MY-00000063	<a href="#">VADS Berhad</a>	<a href="#">www.vads.com</a>	MY	18206	2404:B8::/32
IPV6-ACTIVE	I1-MY-00000080	<a href="#">National Advanced IPv6 Centre</a>	<a href="#">www.nav6.org</a>	MY	45907	2400:E800::/32

# Conclusion

- IPv6 is a critical infrastructural requirement to a nation for a wide range of next generation services
- IPv6 opens up opportunity for innovation and is a catalyst for change with increased economical benefits
- ISPs in Malaysia have been very supportive in the transition plan
- Support from the Government is required
- Malaysia has developed national strategies on IPv6 deployment and has acted on it
- R&D work inline with IPv6 –
  - myDNSIPv6, MIMOS WiWi, NAv6 MCS, Network Monitoring, etc

# Thank You!



[tni@domainregistry.my](mailto:tni@domainregistry.my)  
<http://rnd.domainregistry.my>