APRICOT 2010, Feb 23 – Mar 5, 2010

IPv6 Adoption, the Current Scenario in Malaysia

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Outline

- Government Initiatives on IPv6
- IPv6 Deployment in Malaysia
- ISPs Current Status of IPv6
- IPv4 & IPv6 Address allocations
- Awareness & Promotion
- Training
- IPv6 Forum & Working Group
- General recommendations
- Conclusion

Government Initiatives on IPv6

- ✓ 2004, National IPv6 Council, established by MEWC (MICC now)
  - ✓ To provide leadership, and strategic planning for IPv6 implementation
  - ✓ Members: MICC, MOF, EPU, MAMPU, MOSTI, MCMC, and ISPs
- ✓ Mar 2005, National Advanced IPv6 Centre of Excellence (NAv6), established by MEWC
  - ✓ To spearhead IPv6 activities in Malaysia
  - – Functions:

National Agenda with respect to IPv6

MyICMS 886 Strategy

SERVICES	INFRASTRUCTURE	GROWTH
1. High Speed Broadband	Hard	1. Content Development (e.g. education, entertainment, games)
2. 3G & Beyond	1. Multiservice Convergence Networks	2. ICT Education Hub
3. Mobile TV	2. 3G Cellular Networks	3. Digital Multimedia Receivers (set top box)
4. Digital Multimedia Broadcasting	3. Satellite Networks	4. Communication Devices (e.g. VoIP phones)
5. Digital Home	Soft	5. Embedded Components, Devices (e.g. RFID)
6. Short Range Communications (e.g. RFID-based)	4. **Next Generation Internet Protocol (IPv6)**	6. Foreign Ventures
7. VoIP/Internet Telephony	5. Home Internet Adoption	
8. Universal Service Provision	6. Information & Network Security	
	7. Competence Development	
	8. Product Design & Manufacturing	

Source: MyICMS Strategy http://www.ktak.gov.my

RMK-9 (2006-2010)

Promoting Targeted Technologies for New sources of growth

12.55 *IPv6, Grid Computing and Language engineering*. The anticipated Migration from IPv4 to IPv6 will spur R&D activities in the areas of IPv6 compatible applications, quality and security, which are new features available within the IPv6 Protocol

Source: http://www.epu.jpm.my/RM9/english/Chapter12.pdf

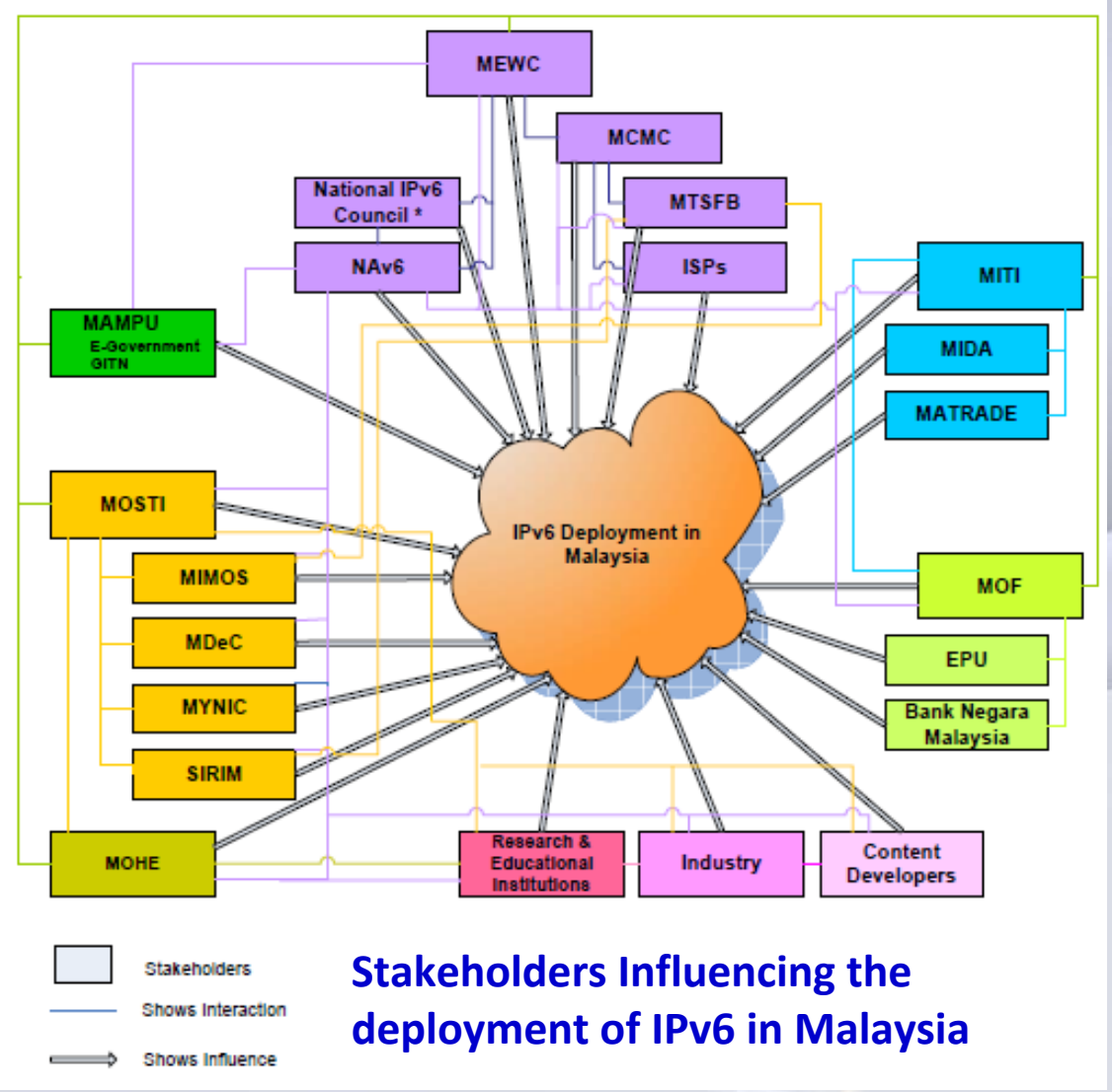
MyICMS 886 goals w.r.to IPv6

- ISPs to be IPv6 enabled by 2006
- Government Agencies to commence IPv6 deployment by 2008
- IPv6 expected to be proliferated nationwide by 2010
- Public Sector to be IPv6 ready by 2011
- Malaysia by 2012

Source: http://www.mampu.gov.my/pdf/Slide/NAv6-Apa.pdf

National Strategic IPv6 Roadmap

- ✓ Developed by NAv6, commissioned for MEWC (MICC now), done June 2008
- ✓ Includes IPv6 Roadmap Action Plan

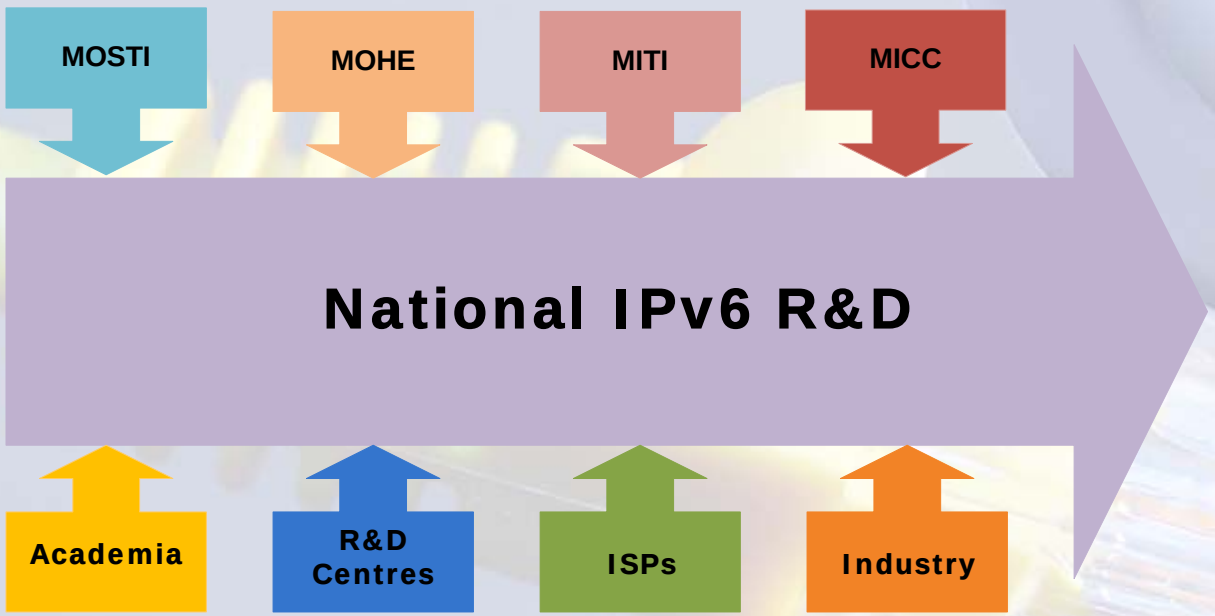


Stakeholders Influencing the deployment of IPv6 in Malaysia

Source: National Strategic IPv6 Roadmap www.nav6.org

National IPv6 R&D Roadmap

- ✓ Developed by NAv6, commissioned for MOSTI, done Dec 2008
- ✓ To be a part of the National ICT Roadmap developed by MIMOS, commissioned for MOSTI

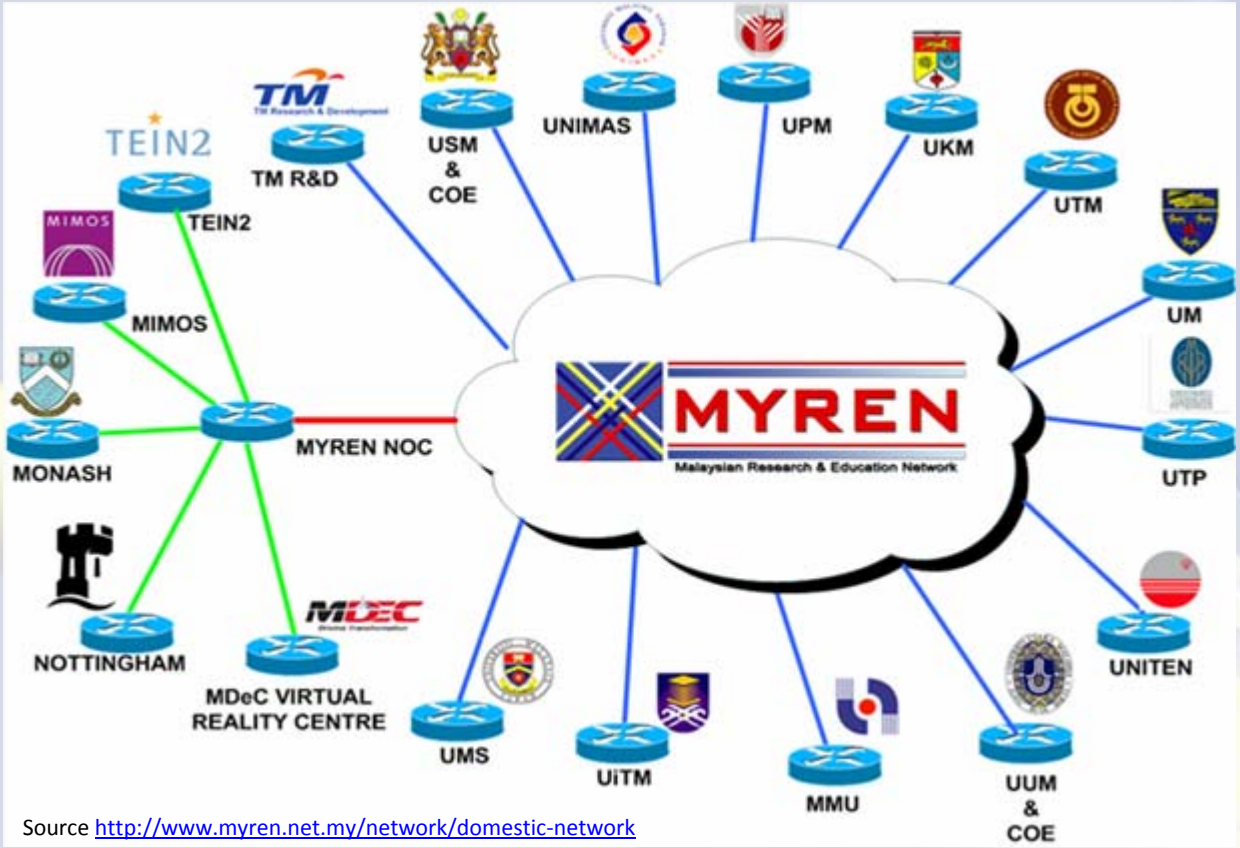


Stakeholders influencing IPv6 R&D in Malaysia

IPv6 Deployment in Malaysia

- 2003, MY6 a joint IPv6 network was formed by ISPs - Jaring, Maxis, Arcnet, TM, TIME, DIGI, and Celcom
- To conduct trial and exploring the next generation IP services in Malaysia

Malaysia Research & Education Network (MYREN)



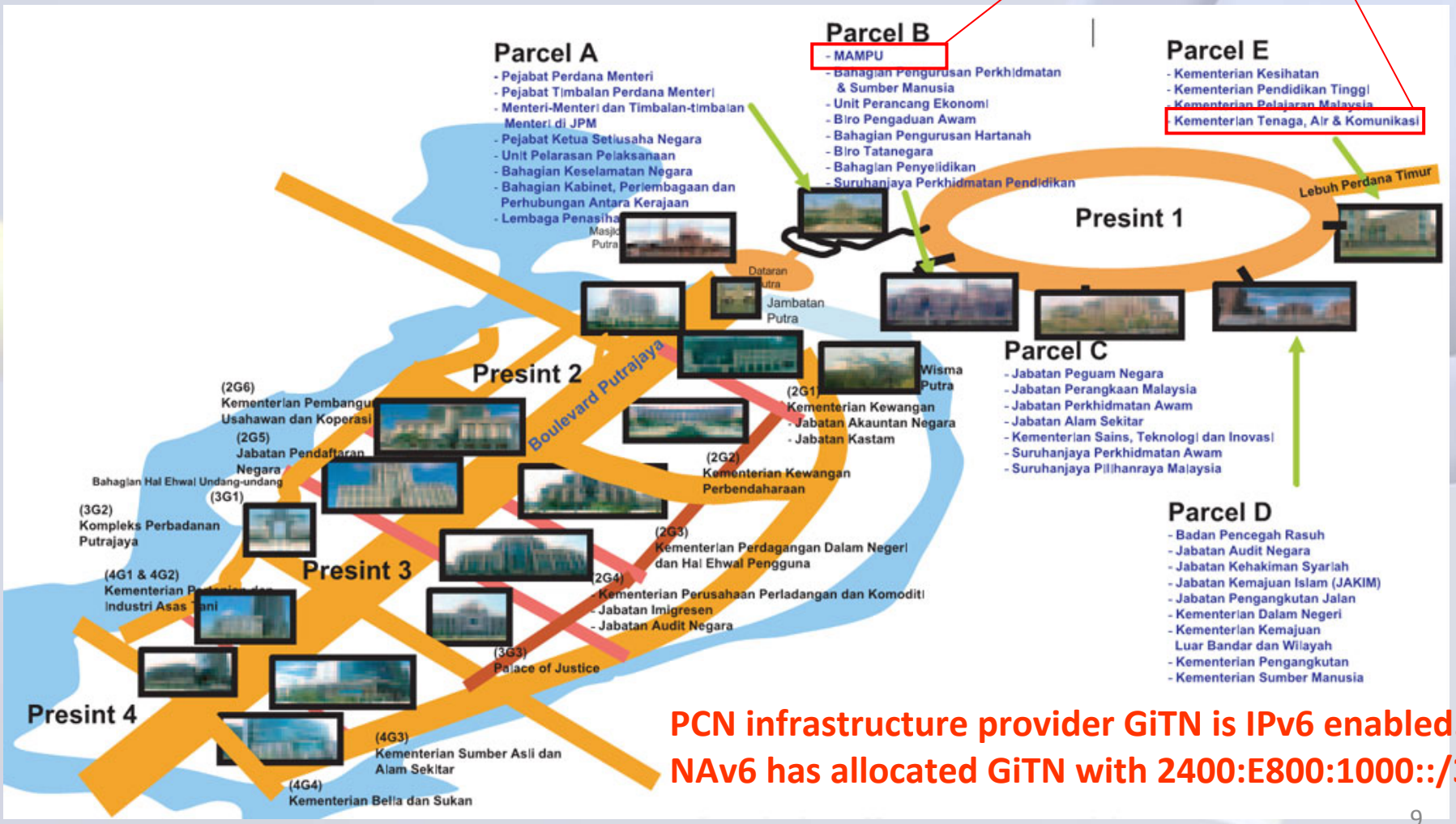
Source http://www.myren.net.my/network/domestic-network

certified

- ✓ 2005, MYREN was established
- ✓ Connected to other NREN via TEIN3 and Internet2 with backbone capacity of 155Mbps

Government Agencies Transition to IPv6

IPv6 Pilot Project, MEGTW & MAMPU



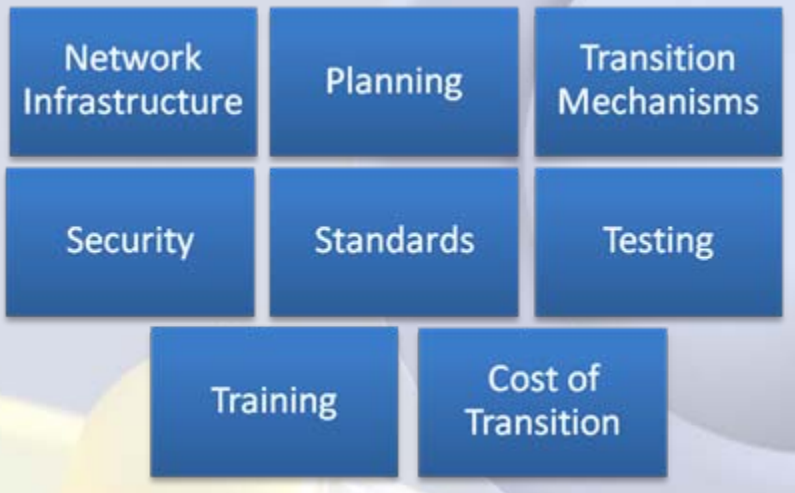
PCN infrastructure provider GiTN is IPv6 enabled.
NAv6 has allocated GiTN with 2400:E800:1000::/36

Governments agencies that uses PCN at Putrajaya

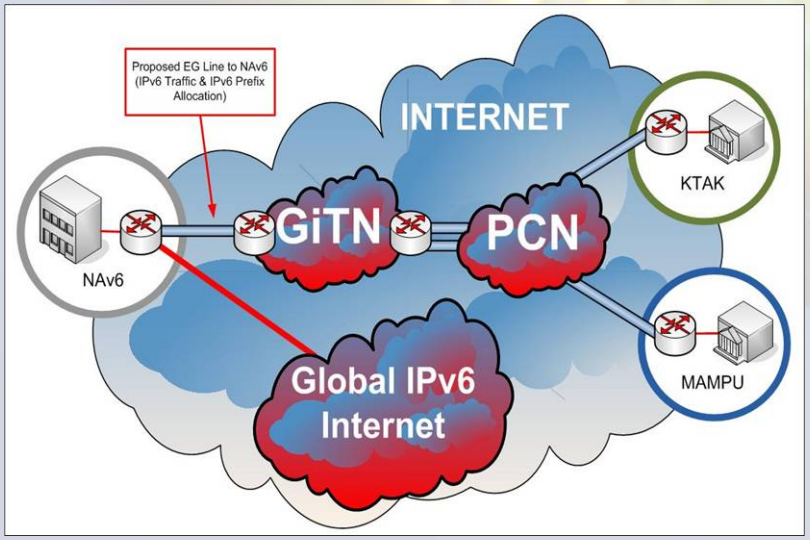
Pilot Implementation

Objective: To establish IPv6 capability with the agencies backbone and LAN

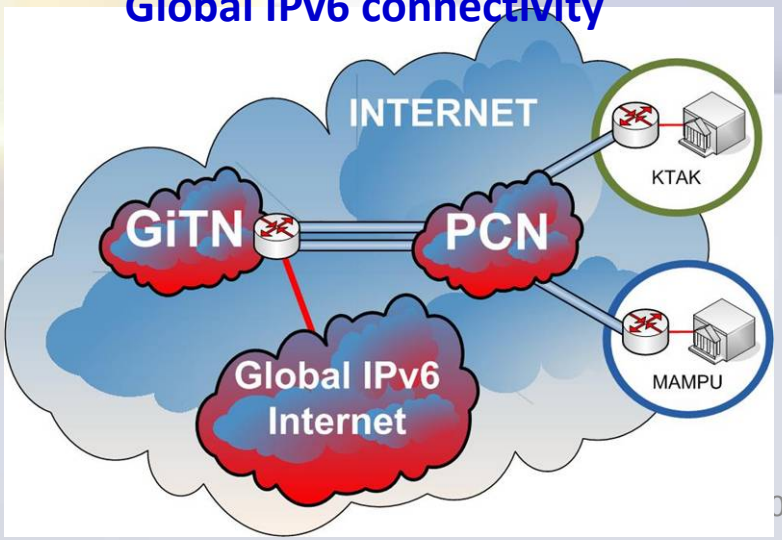
Areas of focus



Trial Implementation



Global IPv6 connectivity



Agencies global IPv6 connectivity

- MAMPU and Ministry of Energy Green Technology & Water (MEGTW) will be IPv6 ready on the public Internet soon
- IPv6 focus group of MAMPU

#	Reference Field
1	Identifying the readiness of agencies for the migration to IPv6 and providing support
2	Assisting the Public Sector Coordination and Implementation Team in preparing the IPv6 Deployment Guideline for Malaysian Government Agencies.
3	Providing the necessary training and Core team development
4	Managing the awareness program for agencies
5	Providing advice and consultancy on IPv6 deployment to the agencies.
6	Monitoring the migration process of agencies
7	Presenting the progress report of IPv6 deployment by agencies to the Public Sector Coordination and Implementation Team

Challenges in IPv6 deployment

1. Lack of staff with IPv6 knowledge & experience
2. Budget constraints
3. Configurations considerations
4. Porting Applications considerations
5. Time constraints
6. Security considerations
7. Vendor Support

ISPs Current Status of IPv6

- Tier-1 ISPs IPv6 Compliance Audit & Certification
  - Phase 1 :- Basic network connectivity tests
  - Phase 2 :- Interconnectivity tests
  - Phase 3 :- Commercial & Advanced Network services

.my domain registry is IPv6 enabled, validated May '08

Tier1 ISPs are IPv6 enabled (Phase-1), validated Mar '07 by MCMC

ISPs Current Status of IPv6

ISP's that completed IPv6 Compliance Audit Phase-2 (7-21 Dec '09, validated by MCMC)

1. Celcom (M) Berhad
2. DiGi Telecommunications Sdn Bhd
3. Extreme Broadband Sdn Bhd
4. Global Transit Communications Sdn Bhd
5. JARING Communications Sdn Bhd
6. Maxis
7. NTT MSC Sdn Bhd
8. Optical Communication Engineering Sdn Bhd
9. Packet One Networks (M) Sdn Bhd
10. Telekom Malaysia Berhad
11. TT dotCom Sdn Bhd
12. TM Net Sdn Bhd

ISP's IPv6 Compliance Audit Phase-3 to be done by April 2010

Source: http://www.skmm.gov.my/ViewWhatIsNew.asp?cc=64612378&winrid=9176273

ISPs Current Status of IPv6

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	NTT MSC Sdn Bhd	arcnet6.net.my	MY	10204	2001:C18::0/32
IPV6-ACTIVE	I1-MY-00000028	JARING Communications Sdn. Bhd.	www.jaringv6.my	MY	2042	2001:328::/32
IPV6-ACTIVE	I1-MY-00000034	Malaysian Research and Education Network	www.myren.net.my	MY	24514	2404:A8::/32
IPv6 Enabled	I1-MY-00000035	Maxis Communications Bhd	ipv6.maxis.net.my	MY	9534	2001:0D08::/32
IPV6-ACTIVE	I1-MY-00000037	OCESB	www.sentralfon.com.my	MY	24321	2407:6000::/32
IPv6 Enabled	I1-MY-00000040	DiGi Telecommunications Sdn Bhd	www.digi6.com.my	MY	4818	2001:4458::/32
IPV6-ACTIVE	I1-MY-00000055	TM	www6.tm.net.my	MY	4788	2001:E68::/32
IPv6 Enabled	I1-MY-00000059	Packet One Networks Sdn Bhd	ipv6.p1.net.my	MY	38322	2401:3C00::/32
IPv6 Enabled	I1-MY-00000060	Celcom	www.celcom6.com.my	MY	10030	2404:0160::/32
IPV6-ACTIVE	I1-MY-00000063	VADS Berhad	www.vads.com	MY	18206	2404:B8::0/32

http://www.ipv6forum.com/ipv6_enabled/isp/approval_list.php

1 - 10 of 10

10/44 listed as on 19 Feb 2010

IPv4 & IPv6 Address allocations*

Malaysia	
Population	25,998,172
Internet Users	14,506,979

IPv4	
/32s Allocated	5,254,912
/32s Advertised	4,203,392
/32s Unadvertised	1,051,520
% Used	79.99%

IPv6	
/48s Allocated	2,031,619
/48s Advertised	1,081,346
/48s Unadvertised	950,273
% Used	53.22%

APNIC IPv4 Allocation			
/8s Assigned	/8s Allocated	/8s Advertised	/8s in RIR Pool
38	34.91	29.57	3.09

Source http://bgp.potaroo.net

* As on 19 Feb 2010

Global IPv6 Address Allocation by RIRs

IPv6 DFP's per country
Total number of countries: 123

Pos	Flag	Country	V	A	VP
1		United States	229	704	8.28%
2		Germany	109	210	3.94%
3		United Kingdom (Great Britain)	66	142	2.39%
4		Japan	72	137	2.60%
5		Netherlands, The	55	100	1.99%
6		France	32	74	1.16%
7		Switzerland	33	71	1.19%
8		Italy	34	68	1.23%
9		Australia	23	57	0.83%
10		Korea	19	54	0.69%
11		Sweden	22	54	0.80%
12		Russia	21	52	0.76%
13		Canada	21	52	0.76%
14		Czech Republic	24	42	0.87%
15		Poland	19	41	0.69%
16		Austria	20	41	0.72%
17		China	19	40	0.69%
18		Norway	8	37	0.29%
19		New Zealand	19	34	0.69%
20		Spain	14	32	0.51%
21		Taiwan	19	31	0.69%
22		Denmark	7	25	0.25%
23		Vietnam	2	25	0.07%
24		Ireland	14	24	0.51%
25		Belgium	8	23	0.29%
26		South Africa	8	23	0.29%
27		Indonesia	11	22	0.40%
28		Thailand	10	22	0.36%
29		Finland	13	21	0.47%
30		Mexico	6	20	0.22%
31		Argentina	5	20	0.18%
32		Portugal	8	19	0.29%
33		Malaysia	9	19	0.33%
34		Europe	12	18	0.43%
35		Turkey	1	18	0.04%
36		Singapore	6	18	0.22%
37		India	4	18	0.14%
38		Hong Kong	8	17	0.29%
39		Hungary	6	16	0.22%
40		Luxembourg	6	14	0.22%
41		Venezuela	8	14	0.29%
42		Philippines	8	12	0.29%

As on 25 Nov 2008

IPv6 DFP's per country
Total number of countries: 150

Pos	Flag	Country	V	A	VP
1		United States	376	1062	9.29%
2		Germany	162	291	4.00%
3		United Kingdom (Great Britain)	91	201	2.25%
4		Japan	91	167	2.25%
5		Netherlands, The	92	155	2.27%
6		Australia	38	107	0.94%
7		France	47	98	1.16%
8		Russia	46	94	1.14%
9		Switzerland	52	93	1.29%
10		Italy	44	88	1.09%
11		Canada	37	81	0.91%
12		Brazil	18	79	0.44%
13		Sweden	38	74	0.94%
14		Czech Republic	38	66	0.94%
15		Poland	32	65	0.79%
16		Austria	30	61	0.74%
17		Korea	12	57	0.30%
18		Norway	18	54	0.44%
19		China	20	50	0.49%
20		New Zealand	22	47	0.54%
21		Spain	16	40	0.40%
22		Belgium	14	33	0.35%
23		Taiwan	20	33	0.49%
24		Ireland	24	32	0.59%
25		Singapore	9	31	0.22%
26		Denmark	15	31	0.37%
27		Indonesia	14	30	0.35%
28		Malaysia	13	29	0.32%
29		Vietnam	4	27	0.18%
30		Mexico	7	27	0.17%
31		Finland	14	26	0.35%
32		South Africa	11	26	0.27%

As on 17 Nov 2009

IPv6 DFP's per country
Total number of countries: 152

Pos	Flag	Country	V	A	VP
1		United States	422	1143	9.31%
2		Germany	179	324	3.95%
3		United Kingdom (Great Britain)	100	224	2.21%
4		Netherlands, The	102	176	2.25%
5		Japan	93	176	2.05%
6		Australia	41	152	0.90%
7		Russia	53	116	1.17%
8		France	49	110	1.08%
9		Brazil	29	103	0.64%
10		Switzerland	55	101	1.21%
11		Canada	38	93	0.84%
12		Italy	45	91	0.99%
13		Sweden	41	83	0.90%
14		Czech Republic	45	72	0.99%
15		Poland	38	70	0.84%
16		Austria	39	70	0.86%
17		New Zealand	23	63	0.51%
18		Korea	14	58	0.31%
19		Norway	20	58	0.44%
20		China	21	54	0.46%
21		Spain	16	42	0.35%
22		Indonesia	19	39	0.42%
23		Belgium	12	36	0.26%
24		Malaysia	17	36	0.38%
25		India	7	36	0.15%
26		Denmark	16	36	0.35%
27		Hong Kong	17	35	0.38%
28		Finland	21	35	0.46%
29		Singapore	10	34	0.22%
30		Taiwan	19	33	0.42%
31		Ireland	24	33	0.53%

As on 19 Feb 2010

Source: http://www.sixxs.net/tools/grh/dfp/

IPv6 DFP visibility : APNIC

IPv6 DFP's per country

Total number of countries: 22

Pos	Flag	Country	V	A	VP
1		Japan	72	125	14.04%
2		Australia	23	56	4.48%
3		Korea	19	52	3.70%
4		China	19	37	3.70%
5		New Zealand	19	34	3.70%
6		Taiwan	19	29	3.70%
7		Vietnam	2	25	0.39%
8		Indonesia	11	22	2.14%
9		Thailand	10	18	1.95%
10		Malaysia	9	18	1.75%
11		Hong Kong	8	17	1.56%
12		Singapore	6	17	1.17%
13		India	4	17	0.78%
14		Philippines	8	12	1.56%
15		Asian Pacific	3	12	0.58%
16		Pakistan	3	7	0.58%

As on 25 Nov 2008

Total number of countries: 31

Pos	Flag	Country	V	A	VP
1		Japan	91	155	13.02%
2		Australia	38	106	5.44%
3		Korea	12	55	1.72%
4		New Zealand	22	47	3.15%
5		China	20	47	2.86%
6		Taiwan	20	31	2.86%
7		Singapore	9	30	1.29%
8		Indonesia	14	30	2.00%
9		Malaysia	13	28	1.86%
10		Vietnam	4	27	0.57%
11		Hong Kong	15	25	2.15%

As on 17 Nov 2009

IPv6 DFP's per country

Total number of countries: 35

Pos	Flag	Country	V	A	VP
1		Japan	93	176	10.08%
2		Australia	41	152	4.44%
3		New Zealand	23	63	2.49%
4		Korea	14	58	1.52%
5		China	21	54	2.28%
6		Indonesia	19	39	2.06%
7		India	7	36	0.76%
8		Malaysia	17	36	1.84%
9		Hong Kong	17	35	1.84%
10		Singapore	10	34	1.08%
11		Taiwan	19	33	2.06%
12		Vietnam	4	28	0.43%

As on 19 Feb 2010

Source: http://www.sixxs.net/tools/grh/dfp/

Domain name statistics of Malaysia

Number of domain names:

Month*/Category	.my	.com.my	.net.my	.org.my	.gov.my	.edu.my	.mil.my	.name.my	Total
Aug 2009	16362	62686	1991	2009	1199	1384	5	422	86058
Sep 2009	16957	63582	1990	2037	1206	1401	5	450	87628
Oct 2009	17268	64125	2020	2067	1209	1406	5	453	88553
Nov 2009	17749	64841	2022	2079	1217	1432	5	453	89798
Dec 2009	18226	65685	2041	2102	1227	1449	5	453	91188
Jan 2010	18579	66229	2072	2119	1237	1471	5	443	92155

Number of IPv6 domain names:

Month*/Category	.my	.com.my	.net.my	.org.my	.gov.my	.edu.my	.mil.my	.name.my	Total
Aug 2009	72	91	16	10	1	1	0	0	191
Sep 2009	75	92	16	10	1	1	0	0	195
Oct 2009	77	92	15	10	1	1	0	0	196
Nov 2009	80	92	15	10	1	1	0	0	199
Dec 2009	85	94	17	10	1	1	0	0	208
Jan 2010	86	93	17	10	1	1	0	0	208

*Based on end of month statistics

Source: http://www.domainregistry.my/statistics.php

Planned to have at least 50% of the registered websites to support IPv6 by 2012

IPv6 Enabled websites in Malaysia

Status(*)	ID	Organization Name	URL	Region/ Country	Tags	Approved Time
IPv6 Enabled	W1-MY-00000250	5 Linux Monsters	www.5lm.net	MY	Personal Site	2009-07-02 08:56:36
IPv6 Enabled	W1-MY-00000255	NTT MSC Sdn Bhd	arcnet6.net.my	MY	Enterprise Site	2009-07-03 06:57:59
IPv6 Enabled	W1-MY-00000278	SimonExploreIT	www.simonexploreit.com	MY	Personal Site	2009-07-10 10:43:35
IPv6 Enabled	W1-MY-00000313	.my DOMAIN REGISTRY	rnd.domainregistry.my	MY	Government Site	2009-08-11 05:45:12
SERVICE-OUT	W1-MY-00000343	Malaysian Research and Education Network	www.myren.net.my	MY	Others	2009-08-27 10:37:21
IPv6 Enabled	W1-MY-00000347	TM	www6.tm.net.my	MY	Enterprise Site	2009-08-17 08:33:56
IPv6 Enabled	W1-MY-00000357	OCESB	www6.sentralfon.com.my	MY	IT Site	2009-08-25 11:05:04
SERVICE-IN	W1-MY-00000359	OCESB	www.sentralfon.com.my	MY	IT Site	2009-08-25 11:04:18
IPv6 Enabled	W1-MY-00000367	Maxis Communications Bhd	ipv6.maxis.net.my	MY	Others	2009-12-22 10:15:35
IPv6 Enabled	W1-MY-00000377	National Advanced IPv6 Centre	www.nav6.org	MY	Government Site	2009-09-10 11:27:23
IPv6 Enabled	W1-MY-00000383	MLabs Systems Bhd	www.mlabs.com	MY	Enterprise Site	2009-09-17 11:25:34
IPv6 Enabled	W1-MY-00000420	V6.MY	www.v6.my	MY	Personal Site	2009-10-13 05:42:45
IPv6 Enabled	W1-MY-00000498	TIME dotCom Berhad	ipv6.time.net.my	MY	Others	2009-12-10 04:06:39
IPv6 Enabled	W1-MY-00000499	global transit communications	v6.globaltransit.net	MY	Others	2009-12-10 07:42:37
IPv6 Enabled	W1-MY-00000505	Packet One Networks Sdn Bhd	ipv6.p1.net.my	MY	IT Site	2009-12-23 08:50:52

15/357 listed as on 19 Feb 2010

http://www.ipv6forum.com/ipv6_enabled/approval_list.php

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Awareness & Promotion

INET KL 2009, IPv6 the next step 20 July '09

16 – 19 June, CommunicAsia 2009 Singapore

28 Aug '08, IPv6 Road show, PICC, Putrajaya

IPv6 Awareness for Malaysia's Government Agencies, 26 Nov 2007, PICC

Awareness & Promotion

No.	Date	Event	Venue
1	8 Dec 2009	MAMPU IPv6 Seminar for Public Sector, 2009	Putrajaya
2	5 Oct 2009	MAMPU IPv6 Seminar for Public Sector	Miri, Sarawak
3	11 Aug 2009	Awareness Seminar on Telecommn. Standards & Practices, MOSTI, MCMC, MTSFB, SIRIM	MCMC, Cyberjaya
4	20 July 2009	INET KL 2009, IPv6 the next step	Times Square Hotel, KL
5	8 July 2009	delegates from Uzbekistan for MutiaraCom, Kuala Lumpur	NAv6 Centre
6	16 – 19 June 2009	CommmunicAsia 2009	Singapore Expo Centre
7	23 – 25 Feb 2009	ASEAN ICT/IPv6 workshop	NAv6 Centre
8	28 – 30 Oct 2008	MyBroadband Exhibition and Conference 2008	KLCC
9	28 August 2008	Towards Implementation of Wireless Sensor Technology and Applications over IPv6 Network	PICC, Putrajaya.
10	17 – 20 June	CommmunicAsia 2008, The 19th International Communications and Information Technology Exhibition & Conference.	Singapore Expo Centre
11	30 - 31 July 2007	ASEAN IPv6 Workshop	Park Royal Hotel, Penang
12	15-17 March 2007	NGN Symposium: Malaysia IPv6 Forum Kickoff & IPv6 Certification Training.	IOI Marriott, Putrajaya.
13	17 Nov 2006	National IPv6 Technology Forum, Moving To IPv6 Enabled Nation	Park Royal Hotel, Penang
14	26 Aug 2006	Penang IPv6 Awareness Forum: Latest Technology & Deployment Strategy	USM, Penang
15	27-30 July 2006	27th BKS-PTN-BARAT Rector Meeting.	Bengkulu, Indonesia
16	17-21 July 2006	22nd APAN IPv6 Task force Meeting	Singapore
17	27 Feb-1 Mar 2006	APT-NAv6 Joint IPv6 Workshop	Berjaya Resort, Langkawi.
18	22-47 Jan 2006	21st APAN IPv6 Task force Meeting.	Tokyo, Japan.
19	22 to 23 Sept 2003	MCMC Next Generation Networks Workshop 2003.	PWTC, Kuala Lumpur.
20	19 – 20 June 2003	IPv6 Workshop 2003	NAv6, USM, Penang.
21	15 – 16 Oct 2000	AI3-IPv6 Workshop 2000	NAv6, USM, Penang.

CNE6 Training

IPv6 Training

Professional Certification

- ✓ **Certified Network Engineer in IPv6 (CNE6) – Level 1 & 2**
- ✓ **Certified Network Programmer in IPv6 (CNP6) - Level 1**

- Curriculum with systematic approach and lots of hands-on
- Completely developed by NAv6 at USM
- First of a program to be offered in the world on IPv6
- About 400 participants have been trained from the Public (250) and Private (150) Sector. IPv6 Certified Participants list at www.nav6.org
- **Community development,** 70 participants being trained on IPv6 by NAv6 under Youth Skill Development Programme implemented by NCIA and Yayasan Kemajuan Sosial Malaysia (YKSM)

IPv6 Forum and WG

MTSFB IPv6 WG

- developing standards, defining best current practices for the particular implementation of IPv6
- to ensure network operability between service providers, and between service providers and end-users.
- formulated 'Guidelines on IPv6 Implementation and Compliance Test' document

APAN – MY

- 28th Meeting was in KL, 20-23 July 2009

Malaysia IPv6 Forum

http://www.ipv6forum.my/

General Recommendations to Governments

- National Strategic Plan
  - Roadmap, IPv6 deployment and R&D
  - IPv6 Implementation Action Plan
  - Guidelines on IPv6 deployment
- Infrastructure capability on IPv6
  - ISPs followed by individual organizations
  - IPv6 transition by sectors
- Government support & leadership
- Awareness & Promotion
- HR Training on IPv6

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
- Realizing this Malaysia has developed national strategies on IPv6 deployment and has acted on it
- With support of all the stakeholders on IPv6 deployment- Government, Industry and Academia Malaysia has made good progress, still long way to go..
- Society has and will be benefited from IP based services
- Let us move forward and embrace IPv6

Thank you

Terima kasih

Merci	Xie xie	Khawp khun	Shukran
Gracias	Arigato	Sas efharisto	Shukriya
Cám ơn	Atto	Komapsumnida	Malimali
Danke	Dankie	Dank u	Vinaka

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