

Taiwan Government's Initiative to Deploy IPv6



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Contents

- The Roadmap and Structure of IPv6 Program in Taiwan
- Taiwan IPv6 Current Status and readiness survey
- Survey of Government Network Service Systems and Action Plan
- Findings from Analyzing the survey result
- Conclusion



National IPv6 Program

2002-2008
Phase I
Study

2009-2012
Phase II
Pre-Implementation

2012→2016
Phase 3
Upgrade Program

NICI, Executive Yuan
Head: Minister Dr. Chang

NICI Counseling
Committee

IPv6 Steering Committee
Chair: Dept. Post & TeleComm, MOTC
Secretariats: TWNIC

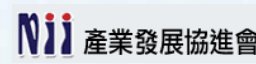
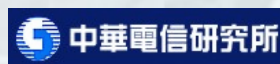


**Regulations
& Policies**

**Transition
Technologies**

**Industry
Development**

**Applications
& Services**





Taiwan IPv6 Current Status



Taiwan ISPs IPv6 Current Status

- 10 commercial ISPs deployed IPv6 backbone
- IPv6 Tunnel Services are provided in major ISPs (HiNet, Sparq, SONET, APOL, TFN) since 2007.
- Chung-Hwa Telecom(HiNet) provides IPv4 and IPv6 dual stack NGN (FTTX) services since 2011.

- Backbone upgraded to dual stack since 2003
- Fully deployment to primary and high schools in 2010
- 1,612 IPv6 websites

IPv6 Enabled	units	websites
Primary school	1,067	1,069
J. high school	339	342
S. high school	51	52
University/college	23	80
Others	57	69
Total	1,537	1,612

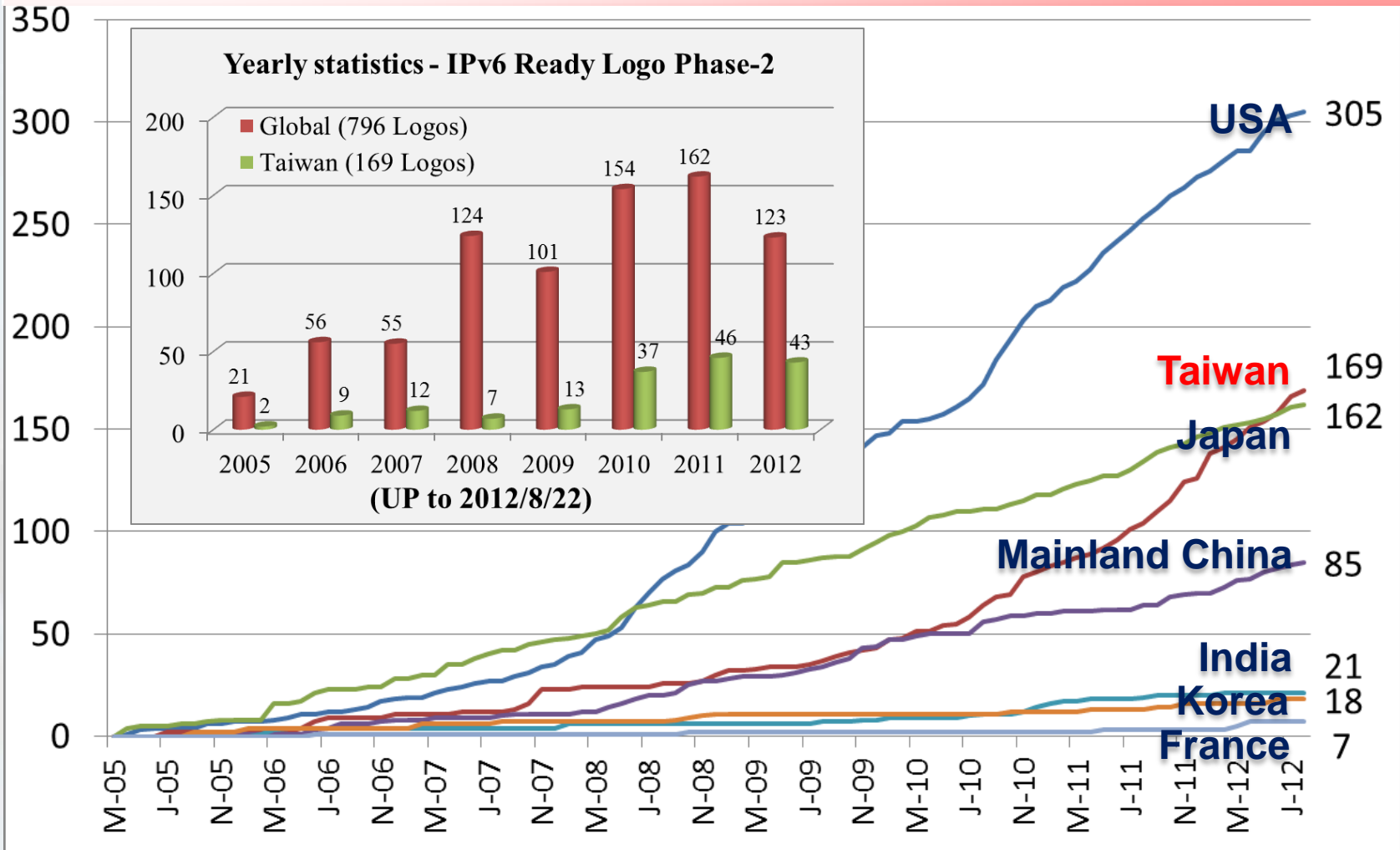
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IPv6 Ready Logo P2 Products

43 P2 Logos in 2012. Total 169 logos with world rank #2.



Source : <https://www.ipv6ready.org/>, 2012/08/22

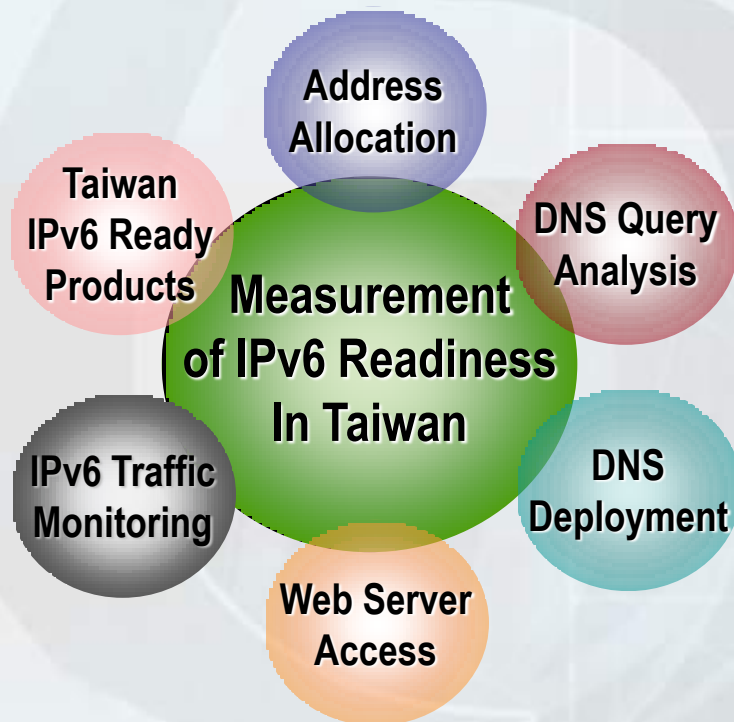


Taiwan IPv6 Readiness Survey

• <http://v6readiness.ipv6.org.tw/>

–IPv4: 61.220.48.10

–IPv6: 2001:b020:0:77::12



IPv6 Readiness	2011/07	2012/07	Growth
International IPv6 Traffic (Mbps)	118	197	170%
IPv6 WWW Server	7,322	7,824	107%
IPv6 DNS Server	900	1,405	156%
IPv6 Email Server	48	87	181%
IPv6 / IPv4 DNS Query Ratio	0.56%	1.12%	200%
IPv6 Ready Logo Phase-2 Products	101	166	164%



Taiwan IPv6 UP Program by Executive Yuan, Republic of China

Motivation of Taiwan IPv6 Initiative



- **Why did we conduct the IPv6 initiative?**
 - Face the fact of IPv4 address exhaustion and the rapid growth of IPv6 services.
 - Let government be the driving wheel of IPv6 upgrade.
- **How we did?**
 - We made a proposal of IP Network Development Strategies to government last Dec.
 - And then the government launched “**IPv6 UP Program**” subsequently.
- **Challenge**
 - How to find **cost-effective strategies** to have a seamless transition
 - **The solution is to upgrade in accordance with the age-replacement of network device.**



The Goal of IPv6 UP Program

- Smoothly upgrade Government Service Network (GSN) to IPv6
 - Upgrade the first half of public network services (Web, DNS, Email) to be dual stack enabled **2012-2013**
 - Upgrade the second half of public network services to be dual stack **2014-2015**
- Encourage the research and development of IPv6 enabled appliances and services
- Encourage and stimulate the creation of intelligent IPv6 applications



Strategies of IPv6 Initiative

- **Strategy 1:** **Make a survey** to find the problems and difficulties.
 - From small scale to large scale.
- **Strategy 2:** Define ***the standard operating procedure (SOP)*** of the IPv6 upgrade for major Internet services.
- **Strategy 3:** Encourage ISPs to provide ***dual-stack or tunneling for the IPv6 network connection.***
- **Strategy 4:** **Technical training courses** for IPv6 professional cultivation.

Action plan

- **Principle** :Make a survey of public network service systems and their related hardware/software.
- **Step 1**(Preparation) : Establish 5 SOPs of IPv6 upgrade and build a survey data management system including the data acquisition authoring and on-line help tools.
 - technical trial to verify these SOPs.
- **Step 2**(Launch) : Make a proposal of IPv6 deployment survey plan for government agencies.

Action plan (cont.)

- **Step 3** : Pre-survey trial (a small scale survey) for 6 voluntary government agencies
- **Step 4**(Checking and revising) :
 - Revise the survey plan according to the feedback
 - technical training
- **Step 5** : Full scale survey (5,343 network services) and Data analysis.
- **Step 6**: Make a summarized upgrade proposal.
- **Step 7: Progress tracking and monitoring.**



Expected IPv6 ready for Service Systems

781 of 826 (95%) Gov. units have finished survey, totally 5,343 services. 66% of them will be upgraded to dual stack by 2013 and 94% by 2015.

Type of Service	Web	Email	DNS	FTP	Other	Total	Upgrade percentage by year					
							Web	Email	DNS	FTP	Other	Total
Already Ready	12		5		5	22	0.3%		0.9%		0.9%	0.4%
Year 2012	287	50	53	1	29	420	8%	8%	11%	3%	6%	8%
Year 2013	1,865	466	399	21	327	3,078	61%	81%	85%	59%	63%	66%
Year 2014	323	43	30	1	41	438	70%	88%	91%	62%	70%	74%
Year 2015	853	42	27	13	123	1,058	94%	94%	96%	97%	92%	94%
Year 2016	169	31	15	1	46	262	99%	99%	98%	100%	100%	99%
TBD	52	4	9			65	100%	100%	100%	100%	100%	100%
小計	3,561	636	538	37	571	5,343	67%	12%	10%	1%	11%	



Expected IPv6 ready for Network Devices

	Total Devices	With IPv6 Capability	% of IPv6 Capability Done	To be turned on of IPv6					
				2012	2013	2014	2015	2016	
Server System	5,623	4,202	75%	136	582	3,211	444	857	394
Server Software	5,713	3,676	64%	159	583	3,239	421	939	372
Firewall	1,710	1,053	62%	68	177	1,195	73	124	73
Load Balance	458	212	46%	5	35	351	18	42	7
Network Device	2,900	1,359	47%	108	397	1,894	144	217	141
Others	2,504	1,278	51%	27	173	1,486	190	456	172
Total	18,908	11,780	62%	503	1,947	11,376	1,290	2,635	1,175

Date:2012/8/22



Server systems distribution

The priority of developing training materials is based on survey results.

	WWW	Email	DNS
1	IIS6 (42%)	Exchange (26%)	BIND (46%)
2	Apache (23%)	Sendmail (13%)	Windows 2003 (35%)
3	IIS7 (16%)	Mail 2000 (12%)	Windows 2008 (9.9%)
4	IIS5 (6.6%)	Postfix (8.9%)	Windows 2000 (7.4%)
5	Tomcat (3.6%)	RaidenMAILD (6.0%)	NIOS (0.4%)
6	Oracle (2.5%)	Omail (4.9%)	Smart DNS (0.2%)
7	WebSphere (1.7%)	Open WebMail (3.2%)	CITRIX Netscale (0.2%)
8	JBoss (0.8%)	Share Tech (2.8%)	Infoblox (0.2%)
9	Sunweb (0.7%)	SPAM SQR (2.6%)	RaidenDNSD (0.2%)

Date:2012/8/22



Findings from Network Services Survey

- Most of government IT staffs are happy to be involved in the IPv6 UP Program and eager for the technical supports and training.
- About 20% data of survey are faulty due to the lack of IPv6 knowledge.
- Start from small scale trial is a good approach to understand the problems and difficulties in advance.
- Security and budget allocation are the most concerned issues.



IPv6 Training courses and SOP

	Training Course	Organized	Provided	Participants
Introduction Program	IPv6 Basic Technology	11	11	849
	IPv6 Advanced Technology	8	6	682
Hands-on Program	IPv6 Routing and Firewall Lab	14	8	185
	Windows Server IPv6 Lab	14	8	177
	Linux Server IPv6 Lab	14	7	152
On-Demand	By request	4	4	172
	Total	65	44	2,217

IPv6 Hands-on SOP

- IPv6 Networking planning
- Windows Server 2003/IIS6/DNS
- Windows Server 2008/IIS7/DNS
- Linux Server/Apache/BIND
- IPv6 Application – Email
- IPv6 Application – FTP
- IPv6 Home Gateway

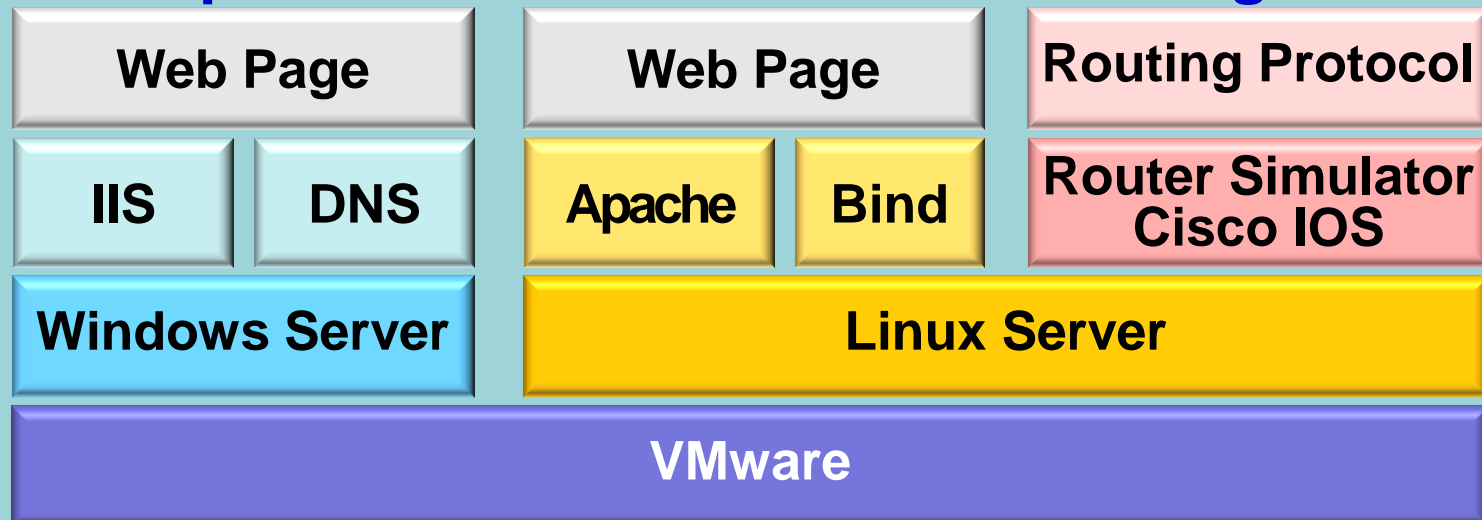
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Future Activities

- Hands-on IPv6 Assessment Program (Nov. 2012)
 - IPv6 configuration for Windows server / IIS / DNS
 - IPv6 configuration for Linux server / Apache / Bind
 - IPv6 configuration for static Routing / RIP / OSPF
- Creative IPv6 Multimedia Contest (Nov. 2012)

Participants must finish dual stack configuration



Course 1

Course 2

Course 3



2012 IPv6 Summit in Taiwan

- When / Where
 - Nov. 20-23, 2012, NTUH International Convention Center, Taipei
- Theme
 - The Global Trend of Comprehensive IPv6 Transition
- **Welcome to join our IPv6 Summit**

Conclusion

- Government's IPv6 transition initiative is a good approach to motivate the ICT industry to develop IPv6 service.
- **Cost-effective strategies are successful.**
- We will continuously encourage the research and development of IPv6 enabled appliances and services.
- We will continuously encourage and stimulate the creation of intelligent IPv6 applications.

Thank you!

