

The Next Generation Internet Project of Taiwan



National IPv6 Program
Taiwan Network Information Center
2010/10/20




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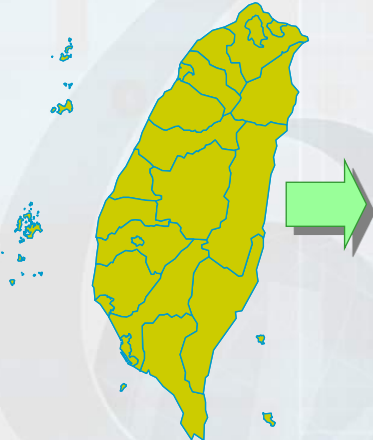


IPv6 Program in Taiwan

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Quick Look of Taiwan



- Area - 36,188KM²
- Population- 22.8 million
- Penetration Rates
 - PC - 74.3%
 - Cable TV - 84.8%
 - Mobile phone – 90%

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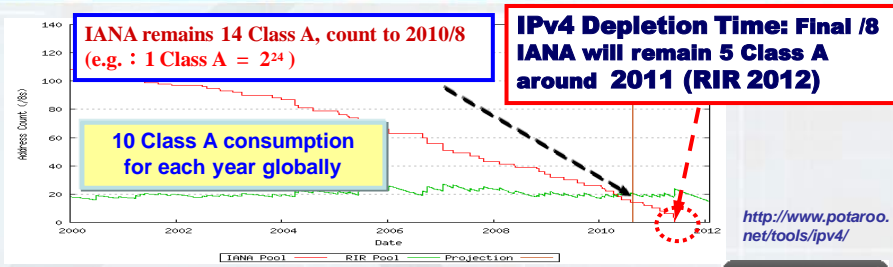


About TWNIC

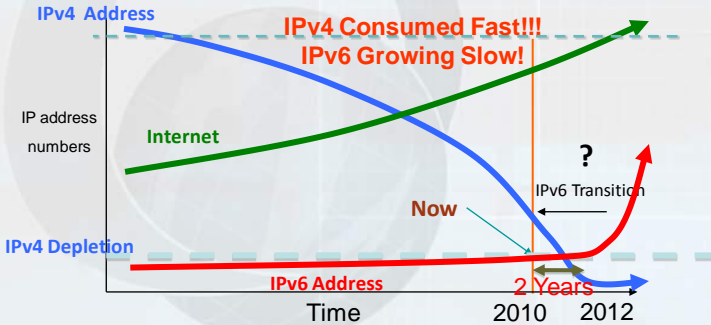
- We are a non-profit organization funded by the Ministry of Transportation & Communication
- We provide .tw domain name registration and Internet addressing services in Taiwan
- We operate .tw root DNS servers



IPv4 Depletion Crisis



<http://www.potaroo.net/tools/ipv4/>



IPv4 Exhaustion Counter

▼ Present status

Reserved blocks (IANA)

5%

14/256 blocks

X-day (estimation)

May 30, 2011

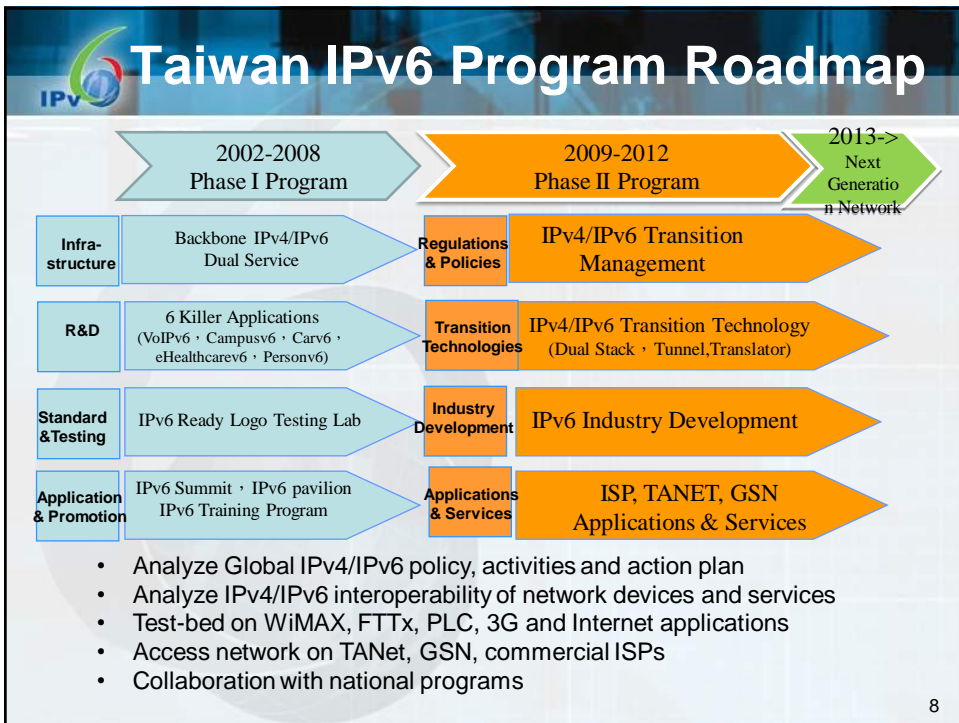
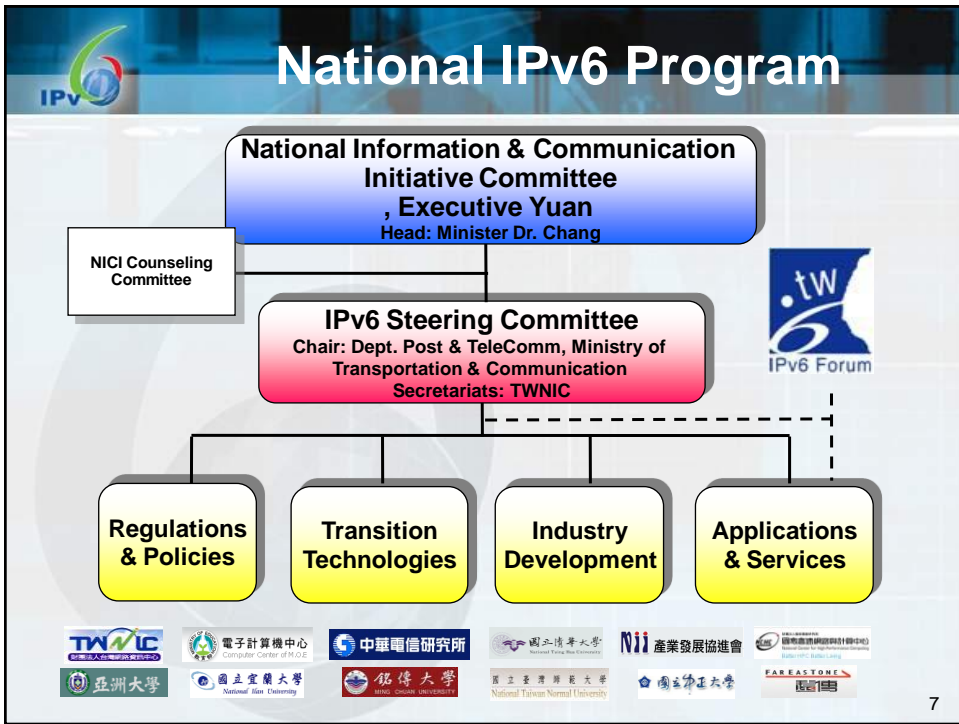
Until X-day (estimation)

279 days

Num of IPv4 Address

220,376,643

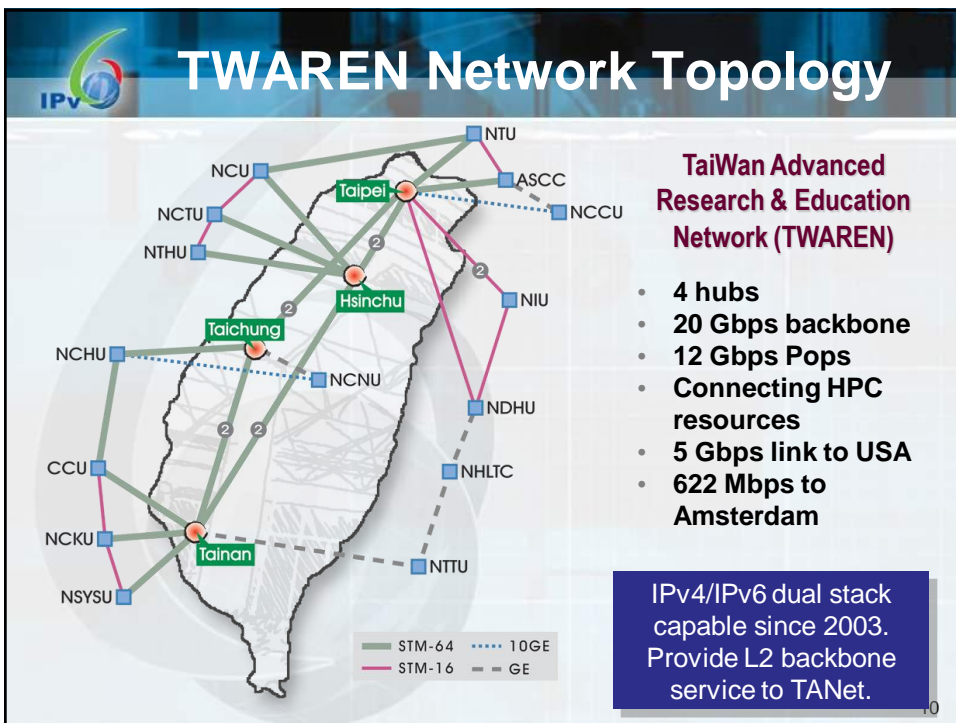
NetCore



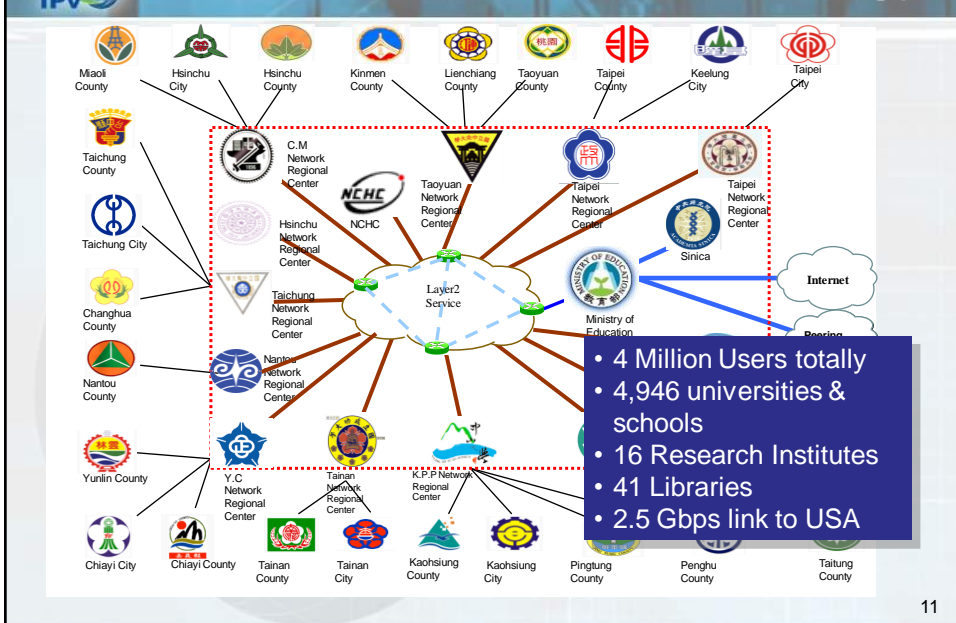


Taiwan IPv6 Network Deployment

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TANet Backbone Network Topology



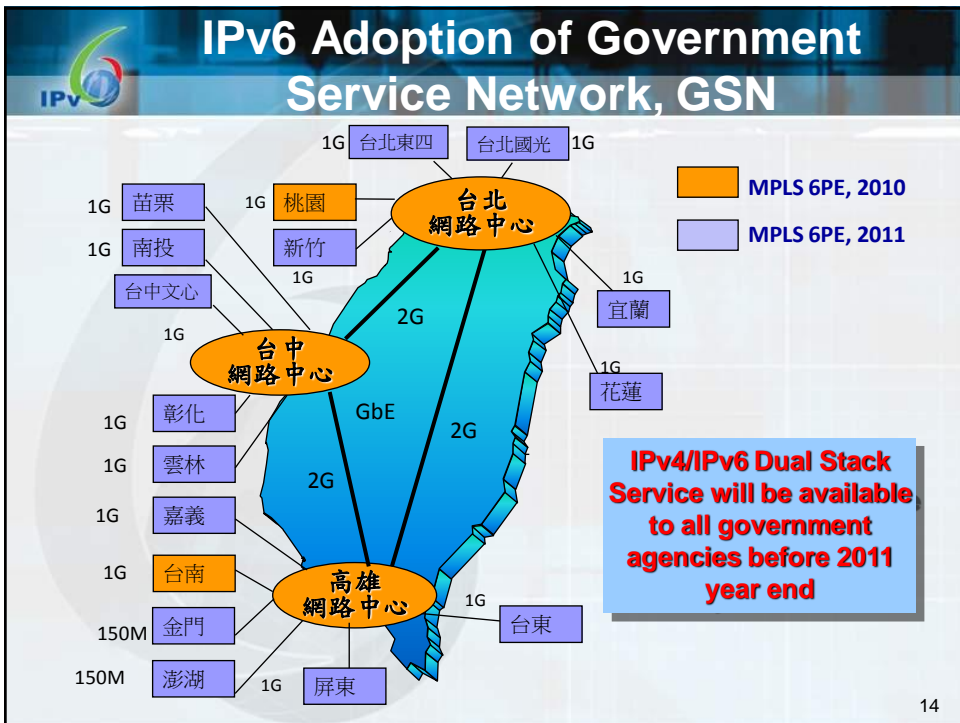
TANet IPv6 Network Deployment

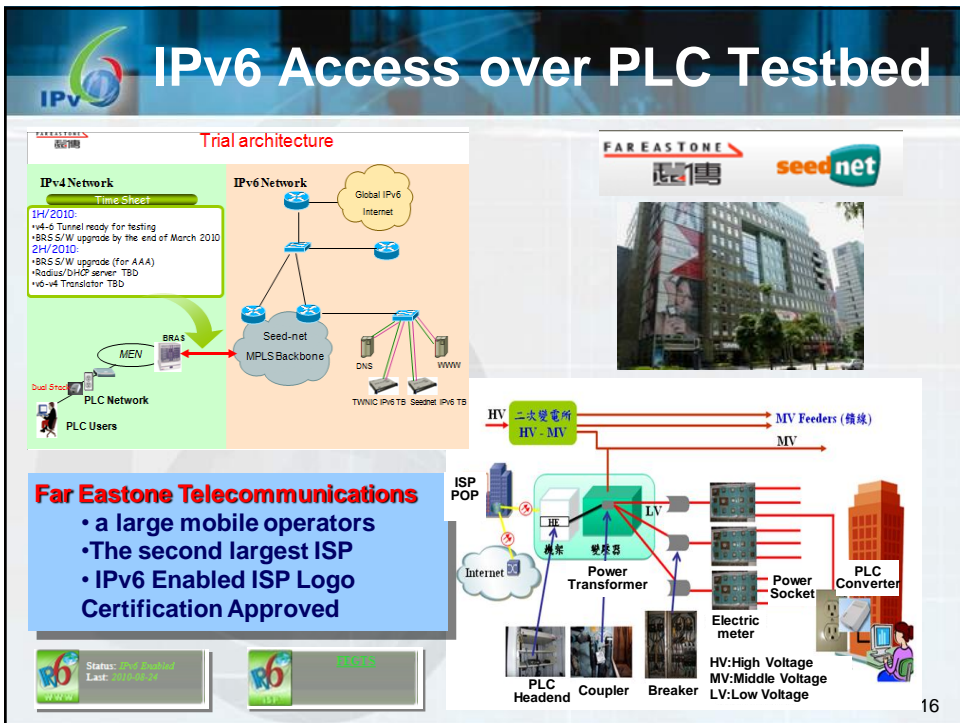
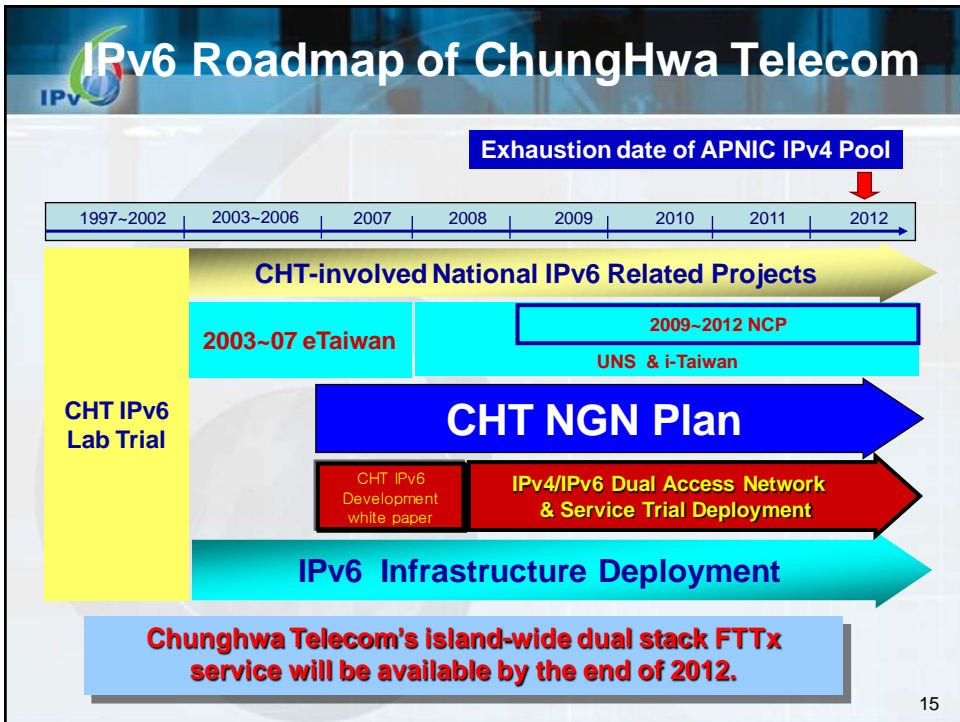
- **5 Counties demo sites deployed at 2009**
 - I-Lan County, Taipei County, Tao-Yang County, Nan-Tou County, Tai-Nan City Campus Deployment
 - IPv6 accessibility of WWW, DNS, SMTP
- **Full-scale deployment of primary and high schools at 2010**
 - 95% of schools provide IPv4/IPv6 dual stack access
 - 68% of classrooms are IPv4/IPv6 dual-stack reachable
 - VoIPv6 service is one of the major applications (over 50,000 IPv6 phones installed in the dual-stack classrooms)



IPv6 Network Deployment in Primary and High Schools

Area	DNS	WWW	Dual Stack Ppenetration	Area	DNS	WWW	Dual Stack Ppenetration
Taipei County	Yes	Yes	277/300 = 92.3%	Chiayi City	Yes	Yes	27/27 = 100%
Taipei City	Yes	Yes	200/213 = 94%	Tainan County	Yes	Yes	204/210 = 97%
Taoyuan County	Yes	Yes	247/247 = 100%	Tainan City	Yes	Yes	67/67 = 100%
HSinchu County	Yes	Yes	111/111 = 100%	Kaohsiung County	Yes	Yes	203/203 = 100%
HSinchu City	Yes	Yes	43/44 = 97.7%	Kaohsiung City	Yes	Yes	154/155 = 99.35%
Miaoli County	Yes	Yes	156/158 = 98.7%	Pingtung County	Yes	Yes	205/205 = 100%
Taichung City	Yes	Yes	89/89 = 100%	Yilan County	Yes	Yes	100/100 = 100%
Taichung County	Yes	Yes	138/215 = 64.2%	Hualien County	Yes	Yes	126/129 = 97%
Nantou County	Yes	Yes	181/181 = 100%	Taitou County	Yes	Yes	100/121 = 82.64%
Changhua County	Yes	Yes	218/218 = 100%	Penghu County	Yes	Yes	56/56 = 100%
Yunlin County	Yes	Yes	193/193 = 100%	Kinmen County	Yes	Yes	25/25 = 100%
Chiayi County	Yes	Yes	148/170 = 87%	95% Schools (3267 over 3437) are IPv6 Ready			



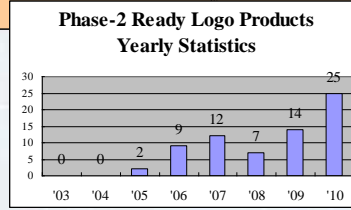
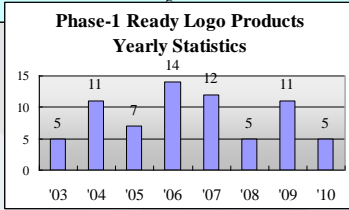
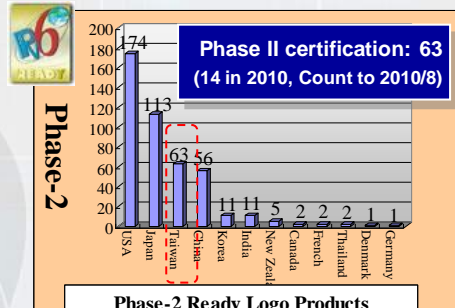
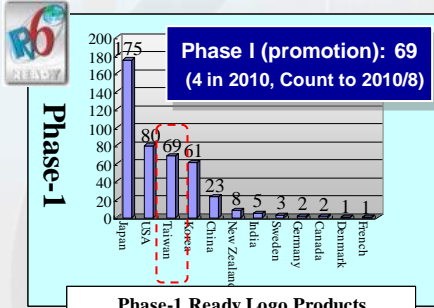






IPv6 Ready Logo Products

- National IPv6 Standard & Interop Testing Lab was Established in July 2003

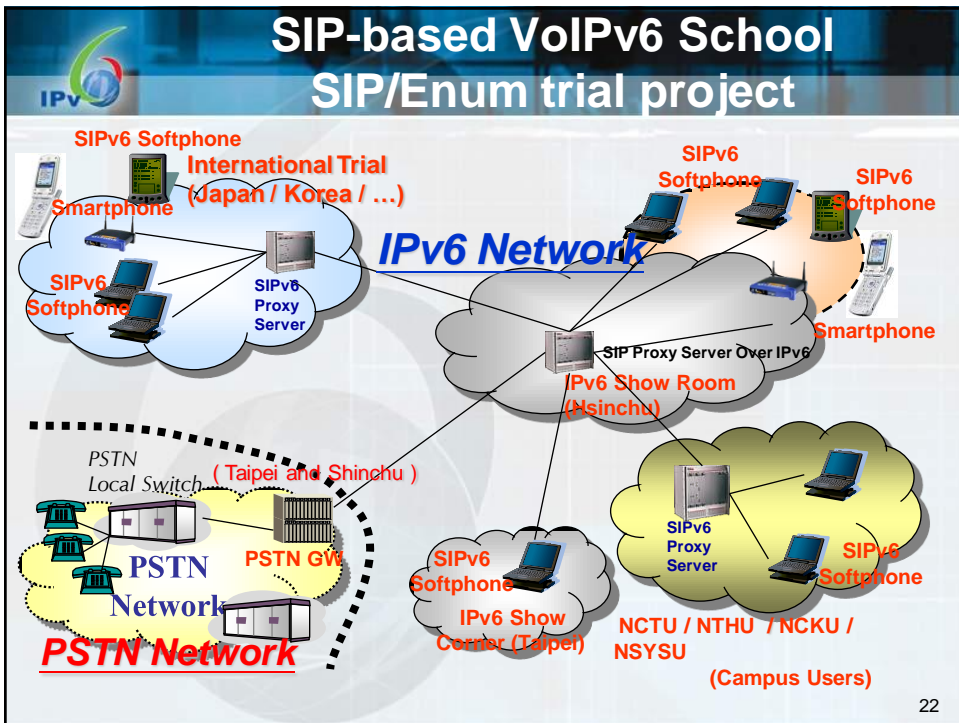


Applications Development

Applications & Services Development

- **Phase I Program**
 - VoIPv6, EcoGridv6, Carv6, Personv6, Campusv6, Healthcarev6, IPTV, Energy Saving
- **Phase II Program**
 - IPv6 video streaming platform
 - Flooding and mudslide forecasting
 - IPv6 RFID sensor and navigation
 - IPv6 healthcare and physiological signal monitoring system
 - Live E! IPv6 guesthouse weather sensor

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Eco-Grid & Carv6 Scenario

Eco-Grid 生態格網
長期生態研究網
計算資源中心
格網維護中心
網路維護中心

1. MANETv6
Voice Server
Application Server
IPv6 Internet
IPv4 Internet
IPv6 On Board Unit
Multi-hopping
Layer 3 handover
IPv6 On Board Unit
2. Mobile IPv6 Access Network
IPv6 Message Gateway

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IPv6 P2P IPTV Services

IPv6 網路 TV

Live broadcasting of ophthalmic surgery video from Czech hospitals to Taiwan **over IPv6**

Internet
TWAREN IPv6/IPv4
CISCO 7609P
GSLB交換器
影音播控系统
影音服務系統
國網中心(新竹)
國網中心(台南)

Global Server Load Balance and Redundancy System

IPv6 網路 TV

MLB Live broadcasting **over IPv6**

eHealthCare RFID over IPv6

- U-Healthcare Service Platform
- RFID Notification System for Getting Out of Room
- Active RFID Voice Notification System for Elder Falls

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LiveE! IPv6 Weather Sensors

- Joint project with LiveE!
- 5 Lodges installation of LiveE! weather sensors in 2009
- Integration of 60 campus weather systems with LiveE!
- Data exchange with Central Weather Bureau


WMR968 and MOXA

Antenna

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IPv6 Portal and Training Materials

- **IPv6 Portal and E-learning**
(www.ipv6.org.tw)



- **IPv6 Training Material**

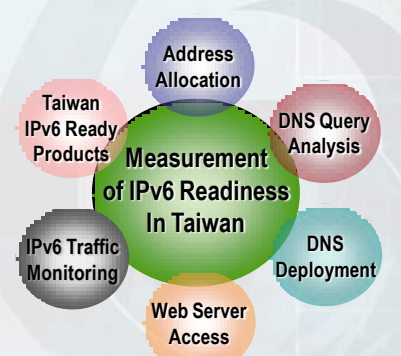
<p>IPv6 Introduction</p> <ul style="list-style-type: none"> ● History of IP Network ● Introduction to IPv6 ● IPv6 Header Format ● IPv6 Addressing ● IPv6 Host IP Configuration ● Feature of IPv6 Protocol ● IPv6 IPSec and QoS 	<p>IPv4/IPv6 Coexistence & Interoperation</p> <ul style="list-style-type: none"> ● Dual Stack ● Tunneling ● Translator ● Introduction to IPv6 Ready Logo ● Introduction to IPv6 Enabled Logo ● IPv6 Transition Consideration
<p>IPv6 Enterprise Network Scenarios</p> <ul style="list-style-type: none"> ● Legacy Network Check List ● Deployment Scenarios / Strategy ● IPv6 Connectivity Options ● Address Planning / Assignment ● Network Topology Consideration ● Routing Planning ● Proxy / Load Balance ● Application Service Systems 	<p>IPv6 Transition Case Study</p> <ul style="list-style-type: none"> ● Case Study—Small Campus ● Case Study—Large Campus ● Case Study—Enterprise and SOHO
<p>IPv6 Routing</p> <ul style="list-style-type: none"> ● IPv6 Static Routing ● IPv6 RIPng ● IPv6 OSPFv3 ● IPv6 iBGP / eBGP ● Router Configuration Example 	<p>IPv6 Control and Management</p> <ul style="list-style-type: none"> ● IPv6 ICMP / Neighbor Discovery ● IPv6 Multicast ● IPv6 SNMP / MIBs ● IPv6 Netflow ● IPv6 Security
<p>IPv6 Service</p> <ul style="list-style-type: none"> ● WWW ● Mail ● DNS 	<p>IPv6 Service</p> <ul style="list-style-type: none"> ● DHCP ● FTP ● Firewall ● VoIP

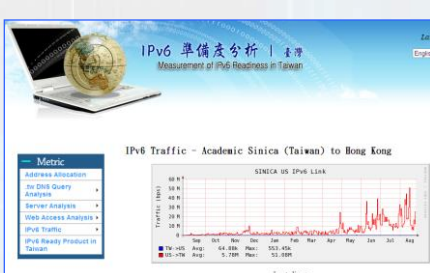
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Taiwan IPv6 Readiness Survey (cont)

- <http://v6readiness.ipv6.org.tw/>
- <http://v6metric.ndhu.edu.tw/>
- IPv4: 134.208.9.115
- IPv6: 2001:e10:c00:2:20c:29ff:fee2:2ba1

IPv6 準備度 調查項目	2009/8	2010/8	成長率
internation IPv6 traffic (Mbps)	2.46	32.96	1338%
IPv6 enabled servers	2,083	3,050	146%
IPv6 / IPv4 DNS queries	0.050%	0.462%	921%
IPv6 Ready Logo	98	135	138%





Source: Taiwan Network Information Center (TWNIC)

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Taiwan IPv6 Readiness Survey (cont)

	2009/08	2010/08	Growth Rate
Total IPv4 Address Allocation	24,433 (/16)	28,334 (/16)	116%
Total IPv6 Address Allocation	2,307 (/32)	2,311 (/32)	100.2%
# of IPv6 LIRs	13	19	146%
International IPv6 Transit Traffic	2.46 Mbps	32.96 Mbps	1338% (collected at v6 IX run by Academia Sinica)

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Taiwan IPv6 Readiness Survey (cont)

	2009/08	2010/08	Growth Rate	Description
IPv6 Tunnel Broker Traffic	0.46 Mb/s	29 Mb/s	630%	Accumulated traffic of 10 tunnel brokers deployed in 5 major ISPs
IPv6 enabled Servers	2,083	3,050	146%	Ratio of v6 to v4 servers DNS: 0.4% WWW: 0.2% SMTP: 0.04%
DNS Queries (IPv6/IPv4)	0.050%	0.462%	921%	Ratio of DNS queries originated from IPv6/IPv4
# of Products with IPv6 Ready Logo Approved	98	135	138%	# of IPv6 Ready Logo approved (accumulated) Phase I: 70 Phase II: 65

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IPv6 Enabled Websites in Taiwan

- .edu.tw: 655
- .gov.tw: 4
- .org.tw: 6
- .com.tw: 45
- .idv.tw: 13

類別	所屬單位	網站名稱	公司	康翔科技股份有限公司	http://ez-care.tw
公司	各界貿易有限公司	http://delonghi.com.tw	公司	Edo Popken Consulting	http://edopopken.tw
公司	麟瑞科技股份有限公司	http://www.ipv6.ringline.com.tw	公司	Webassess	http://meteovista.tw
公司	汎美郵購有限公司	http://dear.com.tw	公司	Novso	http://novso.tw
公司	天心藥局	http://condom.com.tw	公司	BIT BV	http://tokina.tw
公司	泓阜資訊企業有限公司	http://thenet.com.tw	公司	JYKK JAPAN INC.	http://www.snowscoot.com.tw
公司	五一零數位科技有限公司	http://510tech.com.tw	公司	汎美郵購有限公司	http://www.dear.com.tw
公司	智勝數位科技股份有限公司	http://373834.com.tw	公司	Edo Popken Consulting	http://www.edopopken.tw
公司	Tommy Hilfiger Licensing	http://hilfiger-denim.com.tw	公司	CESNET, z.s.p.o.	http://www.cesnet.tw
公司	康翔科技股份有限公司	http://ez-care.tw	公司	richliu's blog	http://blog.richliu.com
公司	Edo Popken Consulting	http://edopopken.tw	公司	Pichu no Assam Lab	http://www.thepliabs.com

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IPv6 Taiwan Directory

<http://v6directory.twnic.net.tw>

您目前使用IPv6 位址 - 2001:288:4:0:2dfefaf1:d45c:bb96
共有 16 網站已登錄
自 2010/7/30 起到訪人數: 3445

說明
IPv6網站名錄
新增IPv6網站
查詢IPv6網站
FAQ

序號	類別	所屬單位	網站名稱 點選可查詢網站	IPv6位址	登錄時間	IPv6連線狀態
1	教育	台北縣江翠國中	http://ipv6.cjh.tpcc.edu.tw	2001:e10:1440:fff::148	2010-08-13	正常運作
2	教育	高雄市後勁國小	http://www.ipv6.hjes.kh.edu.tw	2001:288:82a0:120c:29ff:fe51:4f7	2010-08-13	正常運作
3	公司	速傳電信	http://ipv6.seed.net.tw	2001:4580::2	2010-08-09	正常運作
4	公司	richliu's blog	http://blog.richliu.com	2001:b02a::17:0:0:2	2010-08-04	正常運作
5	公司	財團法人台灣網路資訊中心	http://v6directory.twnic.net.tw	2001:b020::77:0:0:12	2010-08-04	正常運作
6	組織	財團法人台灣網路資訊中心	http://v6readiness.ipv6.org.tw	2001:e10:c00:220c:29ff:fee2:2ba1	2010-08-04	正常運作
7	公司	麟瑞科技股份有限公司	http://www.ipv6.ringline.com.tw	2001:b021:28::1	2010-07-31	正常運作
8	組織	中華電信研究所	http://interop6.ipv6.org.tw	2001:ca0:1:110::2	2010-07-27	正常運作
9	教育	台北市教育網路中心	http://web.tp.edu.tw	2001:288:1200::178	2010-07-12	正常運作
10	教育	樹德科技大學	http://tp.stu.edu.tw	2001:e10:c41:eeee::1	2010-07-10	正常運作
11	教育	彰化縣教育網路中心	http://www.chc.edu.tw	2001:288:5600::103	2010-07-10	斷線狀態
12	教育	嘉義縣教育網路中心	http://www.cyc.edu.tw	2001:288:9600:70:31	2010-07-10	正常運作
13	教育	宜蘭縣教育網路中心	http://www.ilc.edu.tw	2001:288:a201::66:73	2010-07-10	斷線狀態
14	教育	高雄市教育網路中心	http://www.kh.edu.tw	2001:288:8201:2::11	2010-07-10	正常運作
15	教育	金門縣教育網路中心	http://www.km.edu.tw	2001:288:3400::4	2010-07-10	正常運作
16	教育	高雄縣教育網路中心	http://www.ks.edu.tw	2001:288:8401::163:16:121	2010-07-10	正常運作
17	教育	屏東縣教育網路中心	http://www.ptc.edu.tw	2001:288:8600:9::1001	2010-07-10	正常運作
18	教育	台南市教育網路中心	http://www.tn.edu.tw	2001:288:7200:1::2	2010-07-10	正常運作
19	教育	台南縣教育網路中心	http://www.tnc.edu.tw	2001:288:7400:200::3	2010-07-10	正常運作
20	公司	台灣高品質學術研究網路	http://tp.twaren.net	2001:e10:5c00:5::9	2010-07-09	正常運作



Conclusion

- IPv4 Exhaustion is a real threat now, and IPv6 is the most commitment solution to that!!!
- Driven by the IPv6 program, TAnet, TWAREN, ISP, Telcos, and the vendors are working closely.
- Taiwan Internet is being upgraded from IPv4 to IPv4/IPv6.
- IPv6 promotion is a global effort, we look foreword to cooperating with all the world.

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Thank you!



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